Wisconsin Crop Manager

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Wisconsin Crop Manager

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What's New?

Fertility & Soil

The Complete Wisconsin Crop Manager-Volume 16 is Now Available

The complete Wisconsin Crop Manager-Volume 16 is now available on our website. To view all the 2009 issues of the Wisconsin Crop Manager in one PDF file complete with a table of contents click here.

Pest Management Fast Facts Update

The NPM/IPM publication "Pest Management Fast Facts" was recently updated. Among more up-to-date information, the newer version includes new sections such as "Wheat – Pesticide application periods at various growth stages" and how to "Avoid Fungicide Resistance in Field Crops".

There is a PDF version of the file. To access this PDF click here or visit the section "WCM Downloads".

Organic Farming Conference and Organic University to offer Continuing Education Units for Certified Crop Advisors

Kevin Shelley, UWEX Nutrient and Pest Management Program, 608-262-7846.

Certified Crop Advisors (CCA) certified through the American Society of Agronomy currently working in organic crop production, and those interested exploring approaches to organic production, can obtain continuing education units (CEU's) at this year's **Organic Farming Conference** and **Organic University**. The two events, conducted by the Wisconsin-based Midwest Organic and Sustainable Education Service (MOSES), will be held **February 25-27 at the La Crosse Center in La Crosse, WI**. A total of **96.75 CEU's** have been assigned in the areas of Crop Management (35.25), Pest Management (23.75), Soil and Water Management (17.75), Nutrient Management (4.5), and Professional Development (15.5).

The Organic Farming Conference (February 26, 27) is billed as the foremost educational and networking event in the organic farming community in the United States and attracts more than 2,600 attendees. The conference emphasizes "practical workshops designed to help beginning, transitional, and experienced organic farmers." Workshops are led by experienced practitioners as well as researchers and educators from several Midwest universities. There is also a pre-conference Organic University, February 25, which offers intensive day-long sessions on specific topics in organic agriculture. There is also a trade show featuring more than 140 exhibitors from resource groups, certification agencies, buyers, processors, cooperatives and suppliers in the organic industry.

Although a relatively small percentage of the U.S. food supply, sales of organic food products grew 20 percent per-year for the 15 years preceding 2008. Organic farming in Wisconsin grew 90 percent from 2002 to 2007. The 2007 US Ag Census lists sales of organically produced commodities in Wisconsin valued at $80,630,000. Wisconsin ranks second in the United States for number of organic farms. It is among the top five states for organic corn, soybeans, oats, barley and rye, and is first in organic dairy operations and organically raised livestock.[1]

For more information on the Upper Midwest Organic Farming Conference and the Organic University, see the MOSES website at http://www.mosesorganic.org/. Or, contact MOSES at P.O. Box 339, Spring Valley, WI. 54767. Phone: 715-772-3153. For a listing of CEU assignments for specific conference sessions, see the ASA event calendar at https://www.certifiedcropadviser.org/calendar/.

[1]*Organic Agriculture in Wisconsin, 2007 Status Report, Organic Dairy Production*, February 2008: UW Center for Integrated Agricultural Systems; Wisconsin Department of Agriculture Trade and Consumer Protection; UW Center for Dairy Profitability.

Does a Custom Manure Hauler Need to Be a Certified Pesticide Applicator to Apply Instinct?

Roger Flashinski, Pesticide Applicator Training Program, University of Wisconsin-Madison

The Question

Instinct, like N-Serve, is a nitrogen stabilizer to inhibit the bacteria that naturally convert N from the ammonium form to the mobile nitrate form. Unlike N-Serve, however, Instinct is a microencapsulated formulation that remains stable on the soil surface for up to 10 days, allowing growers flexibility in fertilizer application and incorporation and, thus, making it an ideal choice when applying liquid manure. But, like N-Serve, it too is registered by EPA as a pesticide so the question came up whether a custom manure hauler applying manure containing Instinct needs to be a certified and licensed pesticide applicator.

The N-Serve Example

Not too long ago, a similar question was asked whether a co-op employee needs to be a certified and licensed pesticide applicator when applying N-Serve and the answer to that question is 'no'. The reason for this is two-pronged: first, the application of N-Serve, a pesticide, is to the fertilizer itself with the purpose of protecting the fertilizer and, as such, the fertilizer with N-Serve is considered a “treated article”, exempt from further EPA regulation. Second, the untreated fertilizer in most cases is owned by the co-op, and being N-Serve is a non restricted-use pesticide, a co-op employee may mix (add) N-Serve to the nitrogen fertilizer without being certified or licensed. And being the co-op applicator is applying a treated article, even if the article was previously treated with a restricted-use pesticide, that person too is not legally required to be certified and licensed. A detailed discussion on N-Serve and pesticide certification requirements may be searched in the Wisconsin Crop Manager newsletter archives (ipcm.wisc.edu).

So, if a co-op employee does not need to be a certified and licensed pesticide applicator to mix and/or apply N-Serve, and because Instinct is protecting the nitrogen in manure making it a treated article as it is with ammoniacal fertilizers protected by N-Serve, it would seem logical that a custom manure hauler also would not need to be a certified and licensed pesticide applicator when mixing and/or applying manure treated with Instinct. To answer this question, we have to separately discuss the handling task of mixing and the handling task of applying. The reason why the handling tasks of mixing and applying becomes important boils down to who owns the fertilizer product at the time Instinct is mixed or applied. When dealing with N-Serve, we indicated that in most cases the co-op owns the fertilizer. But when dealing with Instinct, it is typically the farmer who owns the manure, not the manure hauler.

The Answer to Different Scenarios

Mixing (adding) Instinct with manure. Farmers may mix Instinct with manure, and load and apply this manure to property in their control, without becoming certified pesticide applicators because Instinct is not a restricted-use pesticide. Uncertified farmers also are allowed to mix, load, and apply Instinct for up to three different producers not to exceed 500 acres in any one calendar year. However, any farmer exceeding these allowable limits would require certification and licensing as a commercial pesticide applicator in the Field & Vegetable Crops category.

Likewise, an uncertified farmer may mix Instinct to manure they own prior to application by a custom manure hauler.

If a custom hauler mixes Instinct to manure owned by others, then he/she would need to be certified and licensed as a commercial pesticide applicator in either the Mixer/Loader category (mix and load pesticides) or the Field & Vegetable Crops category (mix, load, or apply pesticides). Wisconsin law requires that commercial applicators for hire must be certified and licensed to mix, load, or apply any pesticide, whether or not the pesticide is restricted-use.

Applying manure pre-mixed with Instinct. If the farmer premixes Instinct with manure before application by a custom hauler, the hauler would not require pesticide applicator certification and licensing to apply the manure because it is considered a treated article (the very same reason why a co-op employee is exempt from pesticide applicator certification and licensing when applying a fertilizer already treated with N-Serve).

Applying manure and Instinct simultaneously. If the farmer-owned manure and Instinct are applied or injected simultaneously by a custom hauler/applicator, the person performing this operation must be certified and licensed as a commercial pesticide applicator in the Field & Vegetable Crops category because this is considered a for hire pesticide application (also true of a co-op employee injecting N-Serve to farmer-owned nitrogen fertilizer).

Anaerobic Digestion of Animal Manure to Produce Soil Amendments

Sharon C. Long, Associate Professor and Richard P. Wolkowski, Extension Soil Scientist, Department of Soil Science, UW-Madison

As more anerobic manure digestors go on-line there has been increased interest in modifying the by-product solids to create marketable soil amendments for non-farm use. It has long been recognized that manure has the potential to contain infectious pathogens. With improved medical diagnostics, the significance of zoonotic (animal to human) transmission of infectious diseases has gained renewed attention. Recently, researchers and practitioners are re-considering the operation of manure digesters to achieve pathogen reduction goals. Lessons can be borrowed from domestic wastewater treatment practices to determine if this is possible.

The objective of sludge digestion in domestic wastewater treatment processes is to produce an organically stable and pathogen-free biosolids product that may be land applied with little or no risk to public health and the environment. Key factors that can produce stress on microorganisms that lead to inactivation in digesters include temperature, treatment time, pH, other chemicals in the reactor environment, and microbial competition. The U.S. Environmental Protection Agency (EPA) has set out pathogen and indicator limits to meet Class A

standards, essentially unrestricted use, for processed domestic wastewater solids (i.e. biosolids, see Table 1).

Table 1. Class A Pathogen and Indicator Limits and Pathogen Destruction Requirements

Indicator or Pathogen	Density Limits (dry wt basis)
Class A	
Salmonella	<3 MPN/4 g or
Fecal coliforms	<1000 MPN/g and
Enteric viruses	<1 PFU/4 g and
Viable helminth ova	<1 ova/4 g
Pathogen	**Reduction Criteria**
Enteric viruses	3 $\log_{10}$
Viable helminth ova	2 $\log_{10}$

MPN - most probable number

The EPA has also funded and conducted research into process conditions that results in acceptable pathogen destruction and removal efficiencies. Under the Federal Part 503 regulations, in order for a biosolids product to meet Class A, it must meet one of six pathogen-reduction criteria and/or meet maximum pathogen (indicator) concentration levels (McFarland, 2001). To meet *Alternative 1* for thermally treated biosolids of less than 7 percent solids, the temperature of biosolids during treatment must be 50˚C (122˚F) or higher for at least 30 minutes. *Alternative 2* applies to high pH/high temperature processes. If *Alternative 3* is chosen, the biosolids must meet pathogen concentration limits for enteric viruses and viable helminth ova each required monitoring period. To meet *Alternative 4,* unknown process, the biosolids must be monitored for all four indicator and pathogens each required monitoring period and meet concentration limits for all four microbials (see Table 1). *Alternatives 5 and 6* are met by applying processes to further reduce pathogens (PFRP). PFRP criteria have been defined by EPA for composting, heat drying, heat treatment, thermophilic aerobic digestion, β-ray irradiation, γ-ray irradiation, and pasteurization. There currently is no criteria specific for anaerobic digestion. Depending on the operational conditions of the individual anaerobic digestion process, fecal coliform and *Salmonella* densities above Class A levels may remain in digested biosolids. By inference, the potential for transmission of pathogens then also remains.

For anerobically digested manure, pathogen safety can be evaluated by testing for target microorganisms. The allowed analytical methods for biosolids are summarized in Table 2. The EPA recommends Methods 1680 and 1681 for measuring fecal coliforms in sewage sludge/biosolids, and Method 1682 for measuring *Salmonella* (72 *Fed. Reg.* 57 (26 March 2007)).

Table 2. Microbial Methods Biosolids Required Under Part 503

Analysis	Methodology
Fecal Coliform	Standard Methods Part 9221E or Part 9222D (APHA *et al.*, 2005) Method 1680 (recommended; U.S. EPA, 2006) Method 1681 (recommended; U.S. EPA, 2006a)
Enteric Viruses	ASTM Method D 4994-89 (ASTM, 1994)
Salmonella spp.	Standard Methods Part 9260D (APHA *et al.*, 2005) Kenner and Clark (1974) Method 1682 (recommended; U.S. EPA, 2006b)
Viable Helminth Ova	Yanko (1987)

While pathogen standards have yet to be codified for modified manures, it is reasonable to suggest that they should not differ substantially for those established for biosolids. Testing for all four target microorganisms is available through various commercial laboratories. On a limited basis, testing using Methods 1680, 1681 and/or 1682 can be conducted through Dr. Sharon C. Long's laboratory in the Soil Science Department at the University of Wisconsin - Madison.

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UW-River Falls Field Scout Training Class

Bryan Jensen, IPM Program

The University of Wisconsin-River Falls, UW-Extension and the Integrated Pest Management Program will co-sponsor the IPM Field Scout Training Class to be held on the UW-River Falls campus, March 17-18, 2010. The goal is to provide instruction in those subject areas that are necessary to monitor and diagnose pest and nutrient problems in field crops. Topics covered include, pest identification and biology, damage symptoms, economic thresholds and scouting techniques for insects, weeds, plant pathogens, herbicide injury and nutrient deficiency symptoms for corn, alfalfa, soybean and wheat. CCA Credits will be applied for in the areas of pest and nutrient management.

Non-student registration fee is $100/person and covers the cost of the training and copies of the Field Crop Scout Training Manual and Ontario Weeds. To register, send a check payable to UW-Extension to Bryan Jensen, Dept. of Entomology, 1630 Linden Drive, Madison, WI 53706. *Registration maybe limited and is available on a first-come, first-served basis*.For more information call Bryan Jensen at (608) 263-4073 or email at bmjense1@facstaff.wisc.edu

*****AGENDA ATTACHED AT END OF ISSUE*****

Winter Manure Applications: It's About Risk Management

Paul Kivlin, UW Nutrient and Pest Management Program , UW Discovery Farms Program

As days become longer and spring approaches, many of us begin to think about things to do on the farm once the snow and ice disappear. But as snow and ice disappear, a time appears when the majority of water (and nutrient) movement on our farms begin.

Discovery Farms research has shown that a significant amount of the water that leaves our farm fields annually actually runs off in February and March. On a no-till farm in Southwestern Wisconsin, over a four year period (three sites), 78% of the runoff occurred in February and March (see table). Across all of Discovery Farm monitoring locations (81 site years), 54% of the runoff occurred during frozen or snow covered periods.

		78% of runoff
January **8%**	February **52%**	March **26%**
April	May **9%**	June **3%**
July **2%**	August **<1%**	September
October	November	December

Data from no-till farm in Southwestern Wisconsin, over a four year period (three sites).

So, let's talk about winter manure spreading. Those of you familiar with the NRCS 590 nutrient management standard know that there are a number of restrictions when frozen or snow covered ground prevents effective incorporation at the time of manure spreading.

These winter restrictions include:

- Do not mechanically apply manure within 1,000 feet of a lake or 300 feet of a perennial stream.
- Do not exceed (in manure phosphorus) the phosphorus removal of the following growing season's crop.
- Do not apply manure in areas prohibited in your conservation plan.
- Limit liquid manure applications to 7,000 gallons per acre.
- Do not apply manure on slopes greater than 9%, unless the field is contoured, then up to 12%.

Okay, these are the rules designed to protect you against having manure nutrients lost from your fields. But manure applications are never risk free. Every time we apply manure (or other nutrient sources) there is a chance that it will move off our fields. It becomes an issue of risk management requiring the selection of the best fields, and the best times on those fields, for winter manure applications.

It's becoming clear that manure applications made closer to runoff events (usually spring) or on large amounts of accumulated snow (usually later in the winter) have the greatest risk of nutrient loss. So if you must apply manure on your fields during the winter, think about how water moves on your farm and target higher risk (more water movement off-site) fields for late fall manure applications and save low risk fields (less water movement off-site) for winter and early spring applications.

Through smart management and common sense we can minimize sediment and nutrient losses from our agricultural lands.

Drying Progress of Corn Standing in the Field Over Winter

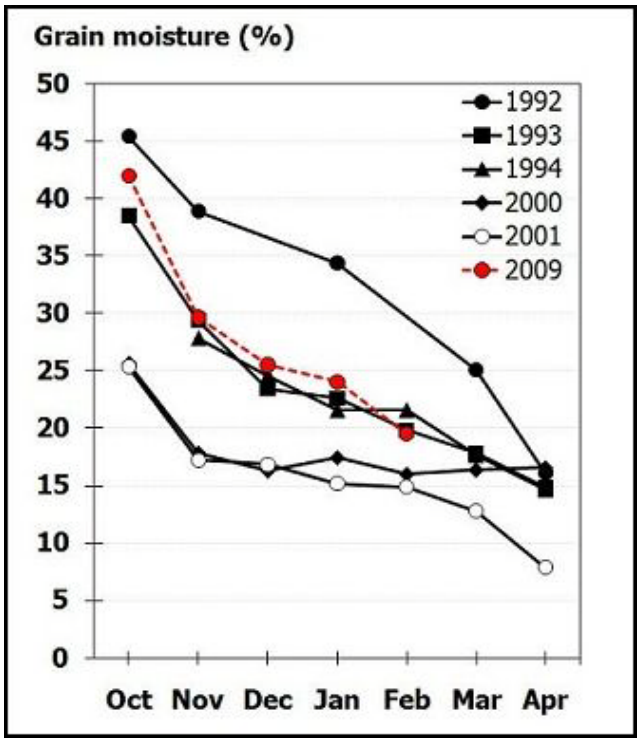
Joe Lauer, Corn Agronomist

Due to the unusually cool growing season during 2009, many farmers left their corn standing in the field over winter. On December 7, 2009 USDA reported that about 23% of Wisconsin's corn crop had not been harvested. Shortly after the report, a large snow storm and sub-zero temperatures brought grain harvest to a standstill. Some harvesting has occurred since early December, but if approximately 15 to 20% of the acres have not been harvested, then it amounts to 440,00 to 590,000 acres of corn left standing in the field. This year was the most expensive corn crop ever produced by Wisconsin farmers. In the PEPS Program, cash corn cost $531 per acre to produce. Thus, the standing corn left to overwinter in the field represents $234 to $313 million of value.

The 2009 growing season was the coolest of the previous 30 years at the Arlington and Marshfield Agriculture Research stations. Other years that had low Growing Degree Day accumulation were 1992 and 1993, but unlike those years, 2009 was a record yield year at 153 bushels per acre.

Usually corn is left standing in the field because it is either too expensive to dry, or grain dryers cannot keep up so harvest gets behind and eventually farmers are caught by bad weather. Corn drying is expensive when corn is wet. Grain moistures were running 30% or greater for many fields during October which was a cool wet month. To dry corn from 30% moisture to 15% moisture for storage, it would cost $0.96 per bushel using a 1.4% shrink factor and $0.05 per point of moisture for each bushel. For a 150 bushel yield level, this amounts to $144 per acre just for drying and shrink costs (see calculator).

We have been monitoring a field of corn planted at Arlington with the objective of determining the grain drydown pattern and yield impact on corn left standing through the winter until spring. The field was planted on May 12 with Pioneer 35F40 (105 day RM, Hx1, LL, RR2). The grain moisture on October 22 was 42%. Today, it was 19.5% grain moisture. The drydown pattern is similar to 1993 when grain ended up drying to about 15% moisture. So far the hybrid has had good standability and ear retention even though there have been heavy snow and ice events on the field this winter. So far yield has not been affected.



As spring approaches farmers that left corn standing in the field over winter will be hard pressed to finish last year's grain harvest, prepare fields for 2010, and plant in a timely manner. Everything will need to go right. So the more preparation that can be done from this point forward will pay off for the 2010 growing season.

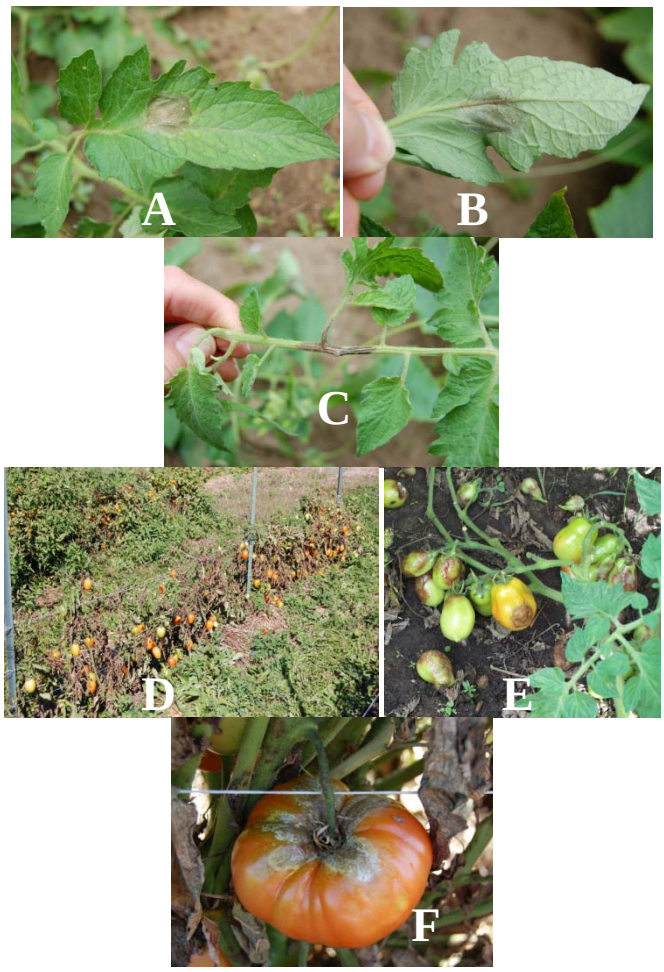
Managing Late Blight in Tomatoes

Amanda J. Gevens, Extension Plant Pathologist, Anna Seidl Graduate Research Assistant, Brian Hudelson, Director of Plant Disease Diagnostics Clinic, Dept. of Plant Pathology, Univ. of Wisconsin, Madison,

Introduction:

Late blight is a potentially destructive disease of tomatoes (and potatoes) caused by the fungal-like organism, *Phytophthora infestans*. This pathogen is referred to as a 'water mold' since it thrives under wet conditions. Symptoms of tomato late blight include leaf lesions beginning as pale green or olive green areas that quickly enlarge to become brown-black, water-soaked, and oily in appearance. Lesions on leaves can also produce pathogen sporulation which looks like white-gray fuzzy growth. Stems can also exhibit dark brown to black lesions with sporulation. Fruit symptoms begin small, but quickly develop into golden to chocolate brown firm lesions or spots that can appear sunken with distinct rings within them; the

pathogen can also sporulate on tomato fruit giving the appearance of white, fuzzy growth. The time from first infection to lesion development and sporulation can be as fast as 7 days, depending upon the weather. In Wisconsin, late blight has not been identified on tomatoes or potatoes since 2002. However, in 2009 we reported tomato late blight in 26 WI counties. We know that the strain or type of *Phytophthora infestans* that we had in WI in 2009 is aggressive on tomato and potato. Based on the biology of the pathogen, we know that this late blight strain cannot produce persistent overwintering spores in the soil. However, the pathogen can overwinter on infected plant material that is kept alive through the winter. Such plant materials can include late blight infected tomato plants kept warm in a compost pile and late blight infected potato tubers that remain in the soil after harvest or are stored in a warm place. For this reason, do not compost late blight infected tomatoes or potatoes, get seed potatoes from a certified clean source, and control volunteer tomato and potato plants in your 2010 planting. Although the late blight pathogen has the potential to infect other plants in the Solanaceae family (tomato, potato, pepper, eggplant, nightshade weeds), we saw late blight on just tomatoes and potatoes in 2009.



Symptoms of tomato late blight on foliage and fruit. **A.** Brown, water-soaked lesion on surface of leaf. **B.** Brown lesion with white pathogen sporulation on leaf underside. **C.** Brown and sporulating lesion on stem. **D.** Entire row of plum tomatoes with dead foliage. **E.** Brown, firm, lesions on 'Roma' tomato fruit. **F.** Sporulating lesion on shoulders of a ripening fruit.

Management:

Every effort should be made to avoid introducing late blight into the production field. This includes getting potato seed from certified clean sources and purchasing only healthy-appearing tomato transplants (or raising your own transplants from seed). There are tomato varieties with varying levels of resistance to late blight. A list of tomato varieties with documented late blight resistance is included at the end of this document. Once late blight has been identified in a region, it is critical that tomato plants be protected prior to first infection. Although there are several fungicides registered for control of tomato late, there are considerations to be made for your specific production system.

For organic production,

Coppers are most effective if applied before initial infection and applied repeatedly. Copper products must be present on new foliage in order to have a protective, disease-slowing effect, so repeat sprays are necessary. Little disease control can be had when copper applications are made only after disease onset. A recent study compared copper and non-copper containing organic-approved fungicides for late blight control on potato. Results from these replicated trials showed that the best organic-approved fungicide for potato late blight control was copper (Dorn, et al. 2007. Control of late blight in organic potato production: evaluation of copper-free preparations under field, growth chamber, and laboratory conditions. Eur. Journal of Plant Pathology 119:217-240). OMRI-approved copper products are listed below (list compiled by Dr. Ruth Genger, Univ. of WI Plant Pathology).

Copper product (OMRI approved)	**Manufacturer**
Britz Copper Sulfur 15-25 Dust	Britz Fertilizers, Inc.
Champ WG	NuFarm Americas, Inc.
COC WP	Albaugh, Inc.
Concern® Copper Soap Fungicide	Woodstream Corp.
CSC Copper Sulfur Dust Fungicide	Martin Operating Partnership, L.P.
Cueva Fungicide Concentrate	W Neudorff GmbH KG
Cueva Fungicide Ready-To-Use	W Neudorff GmbH KG
Lilly Miller® Cueva™ Copper Soap Fungicide Ready-To-Use	Lilly Miller Brands
Nordox® 75 WG	Nordox AS
Nu Cop® 50 WP	Albaugh, Inc.
PHT Copper Sulfur Dust	J.R. Simplot Company
Ready-To-Use Worry Free® Brand Copper Soap Fungicide	Lilly Miller Brands
Basic Copper 53	Albaugh, Inc.
Copper Sulfate Crystals	Chem One, Ltd.
Quimag Quimicos Aguila Copper Sulfate Crystal	Fabrica de Sulfato El Aguila, S.A. de C.V.

For conventional production:

There are many fungicides registered for managing tomato late blight. A complete list of registered products can be found in the University of Wisconsin Extension publication entitled Commercial Vegetable Production in Wisconsin Guide A3422 (available at the UW-Extension Learning Store). For smaller operations or home gardens, the list is a bit more narrow and includes products which contain chlorothalonil and/or copper. Both products can be effective when applied in advance of initial infection and when applied repeatedly, if conditions remain favorable for disease. Be sure to follow all label instructions to ensure that the product you select is used in the safest, most effective means possible.

Frequently asked questions

Where did this late blight come from?

Based on symptoms, timing of appearance of symptoms, and spread of this disease in WI, it is likely that inoculum (source of spores for late blight infection) entered the state on air that had moved into WI from other nearby states with reports of late blight on tomato and potato. The late blight pathogen produces a lot of spores on infected plants and spores can move in air up to 40 miles. Many states have experienced late blight epidemics on tomatoes and potatoes this season. Such states include: NY, ME, SC, NC, MD, VA, NJ, PA, OH, MI, IN, IL, WI, and ND.

Where can I find more information on tomato late blight symptoms and management?

http://www.extension.org/article/18351

http://www.extension.org/article/18361

http://www.attra.org/attra-pub/lateblight.html

http://www.plantpath.wisc.edu/wivegdis

How do I destroy and/or dispose of my late blight-infected tomato plants?

There are several methods of destroying infected plants: 1) pull up plants by the roots, bag, leave in the sun for a few days for plant and pathogen to die, and put out for trash pickup. This method is OK for a few plants. 2) For many infected plants, plants can be cut at the base and allowed to die in place. Once plants are dead, you can go in and remove stakes, strings, and plastic and dead plant material can be incorporated into the soil. Shallow incorporation of debris is recommended to avoid creating a warm, sheltered environment which would keep the plant tissue and pathogen alive for extended periods of time beneath the soil surface. 3) Plants can be flame-killed with a propane or other torch; and 4) infected plants can be pulled and placed in a small pile covered over with a dark colored plastic tarp and left in the sun. This will create heat in the pile from the sun beating on the plastic tarp and plants will die within a few days. The winter will provide an excellent freeze kill for exposed infected plants. Do not compost late blight infected plant material, as many piles may have warm centers that can allow plant material and the pathogen to remain viable. The goal is to kill the plants and this will kill the pathogen.

Are tomato fruits from late blight infected tomato plants safe to eat?

Healthy-appearing fruit from late-blight-infected tomato plants are safe for human consumption. If they have been infected, but aren't yet showing symptoms, they won't keep in storage. There are some concerns about canning infected fruit because bacteria can enter late-blight infected fruit and impact quality. UW-Extension food science extension specialist, Dr. Barbara Ingham recommends avoiding canning tomatoes that exhibit late blight infection.

Further information:
http://www.uwex.edu/news/2009/9/tomatoes-and-potatoes-infected-with-late-blight

How fast will late blight infected tomato plants die?

This depends upon how many points of infection the plant received, the cultivar (some cultivars are more susceptible than others), the history of use of protectant fungicides (such as copper), and on the weather. Hot, dry, sunny weather typically holds back late blight; whereas cool, rainy, overcast weather will cause late blight to progress rapidly killing the plant in 7 to 10 days.

I have tomato late blight in my garden – will I get it next year if I plant tomatoes again?

The strain of late blight that we had in WI in 2009 cannot survive outside of living plants. It requires living plants or plant parts to remain viable and infective. Therefore, it is critical to kill infected tomato plants and plant parts such as fruit. Infected potato tubers can also serve as a source of overwintering inoculum and should be destroyed.

Can late blight be seedborne in tomatoes?

Generally, the late blight pathogen is not considered a seedborne pathogen in tomato.

Late Blight Resistant Tomato Cultivars

Information in this table was compiled from commercial seed catalogs, field observations, and a Cornell University online report by Drs. Tom Zitter and Meg McGrath.

Cultivar	Sources	Organization Claiming Resistance	Comments	Fruit Type
Mountain Magic	Bejo Seeds, Seedway *Limited or not available in 2010*	North Carolina State University, Cornell University, many producers	Excellent resistance to many strains of late blight (LB) including new strain of late blight seen in WI and other US states in 2009, also has resistance to early blight, Verticillium wilt 1+2 and Fusarium wilt 1 +2, fruit are crack resistant with a long shelf life	Compact, indeterminate, red Campari-type, small to medium size
Regal Plum	Bejo Seeds *Limited or not available in 2010*	North Carolina State University, Cornell University, many producers	Excellent resistance to many strains of LB including new strain of late blight seen in WI and other US states in 2009, also has resistance to early blight, TSWV, Fusarium 1+2, and Verticillium, fruit are resistant to gray wall and cracking	Determinate, red large plum, high yielding, late maturing, fruit taste described as 'heirloom quality'
Legend	Jung's, Victory Seeds, Territorial Seed Co., Tomatofest, Ed Hume Seeds, Twining Vine Garden, and many others	Cornell University, Oregon State University, Jung's, many producers	Excellent LB resistance	Determinate, large round red fruit, early bearing, large fruit, self fertile,
Wapsipinicon	Reimer, Tomatofest, Diane Seeds, Seed Savers, Amishland Seeds, and many others	Many producers	Some resistance to new strain of LB seen in WI and other US states in 2009	Indeterminate, high yielding, 2 inch pink-yellow fuzzy (peach-like) fruit, flavorful and sweet
Matt's Wild Cherry	Johnny's, Tomatofest, Seeds of Change, Reimer Seeds, and others	Inglis et al. 2000	Good LB tolerance, frost tolerance	Indeterminate rampant vines; many fruit per plant, borne in clusters, red cherry ½ in. sweet flavor
Juliet	Johnny's, Harris Seeds, Reimer Seeds, 2B Seeds, Park Seed, and others	Cornell, Dillon et al. 2000	Some resistance to LB based on field trials in NY, crack resistant fruit	Indeterminate, red grape tomato

Cultivar	Sources	Organization Claiming Resistance	Comments	Fruit Type
Stupice	Reimer Seeds, Victory Seeds, Diane's Flower Seeds, and others	Dillon, et al. 2005	Some LB resistance in field trials, potato leaf type, heavy yielding, early ripening	Indeterminate heirloom, round, medium sized red fruit
Slava	Reimer Seeds, Tomatofest, and others	Dillon, et al. 2005	Some LB resistance in field trials, early fruiting, potato leaf variety, described often as 'blight resistant'	Indeterminate heirloom, 2 inch round red
Golden Sweet	Johnny's	Cornell University	Some LB resistance, fruit resistant to cracking	Indeterminate yellow grape
Pruden's Purple	Johnny's, Tomatofest, Victory Seeds, Heirloom Seeds, and many others	Inglis et al. 2000	Good resistance to LB, potato leaf vine type	Indeterminate brandywine type, color is purple to black
Wisconsin 55	Jung's, Reimer Seeds, Tomatofest, and others	Pristou and Gallegly, 1954, University of Wisconsin (bred by J.C. Walker in the 1940's)	May not be resistant to new strains of LB, with some resistance to blossom end rot, early blight, and leaf spot, resists shoulder cracks, good shipping tomato	Semi-determinate, large red tomato fruit
Better Boy	Burpee, Urban Farmer, and others	WI field observations 2009	Some resistance to new strain of LB seen in WI and other US states in 2009, excellent overall disease resistance	Indeterminate, large red fruit
Sun Sugar	Reimer, Henry Field's, and others	WI field observations 2009	Some resistance to new strain of LB seen in WI and other US states in 2009, also resistant to Fusarium wilt race 1 and tomato mosaic virus (ToMV), crack resistant	Orange cherry fruit, high yielding, very sweet and flavorful, thin skin
Green Zebra	Territorial Seed Co., Tomatofest, Golden Harvest Organics, Local Harvest, and others	WI field observations 2009	Some resistance to new strain of LB in WI and other US states in 2009, no other disease resistance claims	Indeterminate, ~2 inch round gold with green stripes, green flesh, lemon-lime flavor
Roma	Gurney's, Peter's Seed Co., Territorial Seed Co., Yankee Gardener, and many others	WI field observations 2009	Some resistance to new strain of LB seen in WI and other US states in 2009, also resistance to Verticillium wilt, Fusarium wilt race 1, and Alternaria Stem Canker	Determinate, pear-shaped red plum type fruit, open pollinated, few seeds in meaty fruit, good for canning and sauces
New Yorker	Tomato Fest, Hudson Valley Seed Library and others	Cornell University	Some resistance to LB and Verticillium wilt	Determinate, beefsteak fruit, 4-6 oz. sweet, round meaty red

Cultivar	Sources	Organization Claiming Resistance	Comments	Fruit Type
West Virginia 63	West Virginia Univ. Greenhouse at 304-293-4480, few sources	Cornell University; West Virginia University	Some resistance to LB, Fusarium and Verticillium Wilt.	Indeterminate, med-large fruit 6-8 oz., sweet, red and meaty, uniform ripening
Aunt Ginny's Purple	Tomato Fest, Tomato Growers Supply Company, Reimer seeds and others	Cornell University	Good resistance to LB, resistant to cracking	Indeterminate, vigorous, large pink beefsteak fruit 12-16 oz.
Aunt Ruby's German Green	Tomato Fest, Seed Savers, Victory Seeds and others	Cornell University	Moderate resistance to LB	1 lb fruit, pale greenish color, with a slightly flat shape
Big Rainbow	Burpee, Southern Exposure, Park Seed, Local Harvest and others	Cornell University	Good resistance to LB	Indeterminate, color variation on fruit – green to red, large fruit 2 lb
Black Krim	Planet Natural, eCrater, Local Harvest and others	Cornell University	Moderate resistance to LB, susceptible to cracking	Indeterminate, med-sized fruit, 10-12 oz, maroon color with dark green shoulders
Black Plum	Diane's Flower, White Flower Farm, Cozy Cabin Nursery and others	Cornell University	High resistance to LB	Indeterminate, sweet, meaty, oval-shaped fruit 2-4 oz
Brandywine	Local Harvest, Versey's, American Meadows and others	Cornell University	Moderate resistance to LB	Large meaty 1lb beefsteak fruit, pinkish to red color, ribbed
Red Currant	Local Harvest, Park Seed, White Flower Farm and others	Cornell University	Good resistance to LB	Indeterminate, vigorous, small, red, tart fruit 1/3 inch diameter
Tigerella (AKA Mr. Stripey)	Pase Seeds, eCrater, and others	Cornell University	Good tolerance to LB	Indeterminate, apricot sized fruit, orange & yellow stripes, high yields
Yellow Currant	Bonanzle, eCrater, Tomato Growers Supply Co. and others	Cornell University	Excellent tolerance to LB	Indeterminate, tiny sweet yellow fruit

2010 UW River Falls Field Scout Training Class

Wednesday, March 17, 2010 Rm. 217 Agricultural Sciences Building		**Thursday, March 18, 2010 Rm. 217, Agricultural Sciences Building**	
7:45	**Registration -outside Rm. 217, Agricultural Sciences Building**	**8:00**	**Introduction to Nutrient Management Planning Scott Sturgul, NPM Program**
8:00	**Introduction Bryan Jensen Integrated Pest Management Program, UW-Madison**	**9:15**	**Break**
8:15	**Grass and Sedge Weed Identification Tim Trower, UW-Madison Dept. of Agronomy**	**9:30**	**Insect Pests of Corn, Alfalfa, Soybeans and Wheat Bryan Jensen**
9:30	**Annual Broadleaf Weed Identification Tim Trower UW-Madison Dept. of Agronomy**	**11:30**	**Lunch (on your own)**
10:30	**Break**	**12:15**	**Field Crop Insect Lab Rm. 221 Bryan Jensen**
10:45	**Biennial and Perennial Weed Identification Tim Trower, UW-Madison Dept. of Agronomy**	**1:45**	**Break**
11:45	**Lunch (on your own)**	**1:55**	**Diseases of Corn, Alfalfa, Wheat and Soybeans Dr. Brian Hudelson Dept. of Plant Pathology, UW-Madison**
12:45	**Herbicide Mode of Action and Injury Symptoms Tim Trower, UW-Madison Dept. of Agronomy**	**3:55**	**Field Crop Disease Lab Rm. 221 Dr. Brian Hudelson**
2:00	**Break**	**5:30**	**Identification Test (optional for non students)**
2:15	**Weed Identification Lab, Greenhouse Tim Trower UW-Madison, Dept. of Agronomy**		
4:00	**Dinner on your own**		
5:30	**-Soil and Plant Tissue Sampling -Nutrient Deficiency Symptoms -Introduction to Nutrient Managment Scott Sturgul Nutrient and Pest Management Program**		
8:15	**Quiz**		
8:45	**Adjourn**		

Wisconsin Crop Manager

Volume 17 Number 3 --- University of Wisconsin Crop Manager --- March 11 ,2010

Dr. Larry Binning to Answer Weed Management Questions in Annual Cropping Systems

UWEX and the Agronomy department have hired Dr. Larry Binning part-time to provide assistance to extension personnel and growers with respect to weed management in annual cropping systems. This is a temporary solution reached by both the University of Wisconsin Extension and Agronomy department until a decision can be made about hiring the position recently vacated by Chris Boerboom (Dec. 2009). Larry has started in this role as of February 15th, and can be reached by email (lbinning@facstaff.wisc.edu) or phone (office:608 262 1392; cel:608-575-0947).

Many already know Larry as he is an emeritus weed scientist who studied weed biology, ecology and management within the horticulture department at Wisconsin from 1969-2001. Larry's talent and expertise will prove helpful in the 2010 season as questions arise specific to weed management in annual cropping systems.

Specifically Larry will respond to emails and phone calls relevant to weed management in corn, soybean, and small grain crops in Wisconsin. Since Larry's position is part time, he will be prioritizing calls, therefore it is recommended to route questions through county faculty if possible as these questions will be given priority. Larry will also be updating the Pest Management in Wisconsin Field Crops bulletin (A3646) for 2010, so information within this bulletin continues to be relevant to agriculture's ever changing products and practices.

Due to these other duties he will not be able to participate in field-days, tours, and trainings or write articles for newsletters, trade magazines or other news media. While we understand that these are important services, the nature of Larry's hire will not allow him time to accomplish these tasks.

When you have a moment, please welcome Larry back into "active" weed science extension duties in Wisconsin.

Spring Planter Checkup

Matthew Digman, Assistant Professor and Machinery Systems Specialist, UW-Madison

As spring sets in, with the days are getting longer and the snow receding, many of us are eager to get into the fields for spring planting. While we can't rush Mother Nature into anything, we can take steps to be ready when she is.

Before we get started, it is important to take precaution to ensure your safety when working with farm machinery. Start out with the planter on a level surface and block the wheels. It is also important to lock or block the raised planter before servicing. If the planter is connected to the tractor, engage the parking brake and/or place transmission in park, and remove the key. When handling planter components, be sure to use proper skin, eye and respiratory protection to avoid contact with residual seed treatment, fertilizer, herbicides and pesticides. Always follow precautions labeled by the manufactures of these products.

Once safety precautions are in place, we'll start with spring-cleaning and I don't think I need to mention that this will be easier if you cleaned your machine up at the end of last season. Starting with the chains, clean any dirt or grease that may have accumulated. Dirt-laden grease can be abrasive, causing unnecessary wear to the drive components. While cleaning these areas, take a moment to check the chain alignment and attend to any sprockets that may have migrated out of place.

The sprockets themselves may also have a story to tell. Check for excessive wear or for evidence that the chain has been not riding properly on the sprocket. These signs could indicate a misaligned sprocket or excessive chain elongation. Chains also may have rusted over the winter from condensate. Rusty chain joints can become stiff, resulting in irregular power transmission to the planter's seed, pesticide and fertilizer metering systems. When lubricating chains, do not use chain lube or any other heavy petroleum-based lubricants that may cause a buildup of dust or dirt on the chain or associated sprockets.

Manufacturers recommend removing, emptying and cleaning seed meters at the end of the season and storing them indoors over the winter. If you didn't have the time to do this last year, the next step is to clean the meter housing, chamber and seed disk with mild detergent and soft brush. While cleaning the meters, take the chance to inspect its components.

If you have a finger pick-up meter, turn the meter by hand to see if the meter's springs are holding the tabs of the fingers against the carrier plate at the appropriate time and clearance and adjust if necessary. See your operator's manual for tolerances and adjustment procedures specific to your machine. When inspecting the meter never turn it backwards as this could cause damage. Depending on the design of the meter, you may need to disassemble it to properly clean.

Those with vacuum or pressurized meters will need to follow similar procedures when cleaning and inspecting, however, there are some specific points of interest. First, check the double eliminator brushes for wear, specifically for gaps large enough for seed to pass through. Check seals and disk wipers to ensure they are not weathered or cracked. Finally, inspect the seed disk itself for wear around the edge as well as in and around seed cells. If wear is detected, take note and monitor that row unit during the season. Irregular, worn holes can heighten the occurrence of doubles, increasing spacing variability and population. If you're not willing to wait and test the seed disk wear in the field, take the meter to your dealer and have them run it on their test stand. This is a good way to try the meters out and to diagnose problems before you hit the fields. Expect to pay $10-$20 per meter to have it evaluated at your dealer.

Another cleaning step associated with vacuum planters is to purge the manifold and the hoses to each row unit of dirt and seed treatment. Eye and respiratory protection are needed for this step. With the vacuum pump running, remove each vacuum hose from its meter, shake and replace. When finished, remove manifold end caps to purge the manifold.

The final spot to clean are the seed tubes. Dust and seed treatments can build up on the seed sensor and in the seed tube. This buildup can become significant enough to interrupt the sensor signal light, resulting in low population counts at the planter monitor. Special seed tube brushes available at your dealer can be used in conjunction with mild detergent to remedy this problem. Also check the seed tube and seed tube guard for wear. Worn or dirty seed tubes could interrupt the smooth transition the seed needs to make from the meter to the furrow for accurate seed placement.

Now on to the dirty work. Each season, all-wheel and non-sealed coulter and row cleaner bearings should be disassembled, cleaned and re-packed with grease. Be sure to check your operator's manual for specific instructions for your machine regarding bearing seals and for setting the bearing and adjusting play.

Disk openers and gauge wheels are the next item on the checklist. Those using double disk openers should inspect to be sure the openers aren't too worn so that they are no longer touching and thus allowing dirt to pass though, leading to non-uniform seed furrow depth. Your operator's manual should provide a minimum allowable disk diameter. Also, to prevent a buildup of dirt or trash between gauge wheels and the opener, you may need to adjust so they properly sit against disk blades.

Finally, check your planter's tire pressure. Most of our planters utilize a drive tire for seed and chemical metering and therefore need to have properly inflated (proper diameter) tires to maintain the gear ratio and the validity of the seed, fertilizer and insecticide charts in your manual. You'll need to keep an eye on tire pressure throughout the planting season.

One more thing, are you thinking of putting a new tractor on the planter this year? Double check that your planter is level; an improperly-leveled planter can inhibit the action of the row unit's parallel-bar linkage, potentially leading to non-uniform seeding depth. You'll probably need to check levelness in the field, but for now, your operator's manual should get you in the ballpark by a simple hitch height measurement. Also, if you are adding or removing any row unit attachments be sure to monitor row units so that depth is maintained. You may need to adjust down pressure to maintain depth. Remember, your gauge wheels should be carrying some of the row unit's weight while planting.

These steps should help you feel like you've made some progress as we wait for spring to well, spring. Look here for more information and in-field planting tips before planting. Until then, I hope this keeps the spring planting jitters under control.

Wisconsin Crop Manager

Volume 17 Number 4 --- University of Wisconsin Crop Manager --- March 25 ,2010

2010 Agronomy/Soils Field Day – Save the date

Dick Wolkowski, Publicity Chair

The 2010 Agronomy/Soils Field Day is scheduled for Wednesday, 25 August at the Arlington Agricultural Research Station. CALS researchers will be presenting current research information and offering recommendations on crop, soil, and pest management topics. Certified Crop Advisor CEU's will be available. Information on tours and other details will become available later this spring as the program is developed. Check http://www.soils.wisc.edu/extension/ for the latest program information.

Alfalfa stand assessment: Is this stand good enough to keep?

In this seven minute video Dr. Dan Undersander, UWEX forage agronomist from the University of Wisconsin-Madison Agronomy department, visits an alfalfa field and demonstrates steps you can take to help answer this question. Is this stand good enough to keep?

Click here >>>
http://www.youtube.com/watch?v=jujW3-FE4zE

Be sure to click on the "480p" button just below the video to see the clearest picture. If you have comments on the video, you can contact Dan Undersander (content) or Roger Schmidt (technical production).

For more in-depth stand assessment information, including how to use stem count to estimate current yield potential, please see UWEX publication A3620 here >>>
http://learningstore.uwex.edu/pdf/A3620.pdf

This video was produced by the UW Integrated Pest Management program. Look for more of these timely topics later in the season. They will be posted to the UWEX channel on Youtube.com. UWEX has several education videos on Youtube.com that are free to view anytime.

http://www.youtube.com/user/uwcoopextension

Calibrating your grain drill or seeder can save both seed and money

Matthew Digman,Assistant Professor and Machinery Systems Specialist,UW-Madison

Admittedly, the agronomic impact of over-seeding or under-seeding a field is complex and beyond the scope of this article. However, we can agree that the most farmers have worked out a seeding rate with their agronomist and exceeding that rate may not be productive, especially at $265+ per bag in the case of alfalfa ($500 for switchgrass). If you plan to seed at a rate of 12 lb per acre and your actual seeding rate is 14 lb, then you are applying a little over $10 of extra alfalfa seed each acre that you cover. Increase that to 16 lb and now $20 of extra seed is hitting the dirt. Over-seeding costs add up, even across a small number of acres. Calibrating and maintaining your drill will pay important dividends.

Before we get started, it is important to take precaution to ensure your safety. Start out with the drill on a level surface and

block the wheels. It is also important to lock or block the raised drill before servicing. If the drill is connected to the tractor, engage the tractor parking brake and/or place transmission in park, and remove the key. When handling drill components, be sure to use proper skin, eye and respiratory protection to avoid contact with residual seed treatment, fertilizer, herbicides or pesticides. Always follow precautions indicated on the product label.

The first step in fine-tuning your drill should be maintaining its seed meters and drive components. Most of these machines use a fluted-wheel seed meter. These meters are adjusted in two ways: changing how much of the wheel is exposed to the seed and altering the rotational speed of the fluted-wheel relative to ground speed. The meters are usually driven by the press wheels or one of the drill's tires, so that seeding rate is linked to ground speed. A chain or inter-meshing gear drive is used to generate a ratio between ground traveled and meter rotations. Sprockets with differing number of teeth (diameter) can change this ratio and therefore vary the range of seeding rates. It is important to realize this ratio begins at the press wheel or drive tire. This is our first adjustment. Tire diameter, the ratio between forward speed and subsequent seeding rate is maintained by proper tire inflation. An under-inflated tire will reduce the gear reduction of the drive, leading to a higher seeding rate as the tire makes more rotations for each acre of ground covered. The opposite is true for an over-inflated tire.

The next step before calibration is to clean out any dirt or grease that may have accumulated on the drive chains, idlers and sprockets or gears. Dirt-laden grease can be abrasive, causing unnecessary wear to the drive components. While cleaning these areas, take a moment to check the chain alignment and attend to any sprockets that may have migrated out of place. The sprockets themselves may also have a story to tell. Check for excessive wear or for evidence that the chain has been not riding properly on the sprocket. These signs could indicate a misaligned sprocket or excessive chain elongation. Chains also may have rusted over the winter. Rusty chain joints can become stiff, resulting in irregular power transmission to the planter’s seed metering system. When lubricating chains, do not use lubricants that may cause a buildup of dust or dirt on the chain or associated sprockets. Ask your dealer’s parts or service department to recommend the latest in drill chain lubricants.

After servicing the chains, check the meters themselves. Meters and seed tubes should be cleaned of all seed or fertilizer before storing the drill at the end of the season. Any movement of the fluted-wheel adjustment handle should be followed by equal movement of each fluted-wheel. All fluted-wheels should respond with the same displacement to ensure the same volume of seed is metered at each wheel. Also, make sure the feed gate is adjusted for your particular crop. Larger seeds (soybeans, peas) require the gate to be more open whereas smaller seeds (wheat, oats) require the gate to be nearly closed.

Because fluted-wheels meter by volume and agronomists talk in pounds, we need a translation. That translation is built into the seeding rate chart in your operator's manual or the drill's cover. The drill manufacturer developed this chart and it's their best effort to relate seeding rate to meter gear ratio and fluted-wheel position. The relationship between chart and actual seeding rate could be off for many reasons, for instance if your seed has a different bulk density than the seed that was used to make the chart. If your seed has a lower bulk density than the chart, less weight will fit into the volume of each flute and the meter will dispense less weight with each revolution, causing the seeding rate to be lower than indicated in the chart. If more weight fits in, then the seeding rate will be higher.

There are two ways to create your own calibration. The first is a field method and the second can be done in a stationary setting. Each has its own advantages. The field method's advantage is the calibration is determined using field conditions, accounting for any slip or deviation in the diameter of the drive wheel. The second method is a little more involved but can be done before you can get into the field and gives you a little more control in the way the seed is measured. This is the method that I present here.

First, you'll need to measure the diameter (height) of the drill’s tire or press wheels. A level and tape measure will make quick work of this. Tire diameter (squat) will change as weight is lost during seeding, so it is a good idea to measure the tire height with the drill about half full. This will give us an average tire diameter. Next, safely block up the drill at its drive tire.

The next step is to simulate covering 1/10thof an acre by rotating the drive wheel or press wheels. Here is some math to calculate how many times to rotate the tire to cover that area for your drill:

Rotations = 16,639 ÷ (W(ft) x D(in))

Example:
W = 10 ft
D = 30 9/16 inches

Rotations = 16,639 ÷ (10 x 30.56) = ***54***

In this equation, the number of tire rotations needed for 1/10 th of an acre is related to a constant divided by the product of the width of the drill (W) in feet and the loaded diameter of the drill's drive tire or the diameter of the press wheels (D) in inches.

During the calibration, you’ll need to collect the seed so the total amount metered during calibration can be weighed. To collect the seed for the weight measurement, individual bags can be placed at the end of each seed tube or a tarp can be placed under the drill. After rotating the tire, carefully collect all of the seed dispensed and weigh. The weight of this seed multiplied by 10 is the seeding rate in pounds per acre. For example, if 1.2 lbs is collected, then the drill is seeding at a rate of 12 lb per acre. Repeat this process two to three times to assess your measurement error and if the measurements aren't too far off take an average. If getting a scale this accurate is not possible you may need to seed more area (e.g., one-fifth of an acre) so scale resolution is less of a concern. Multiply number of rotations by two to cover one-fifth acre. Seeding rate will now be calculated by multiplying collected seed by five. Those with scales accurate to one-half pound may need to cover an acre, which would be 544 revolutions of the tire in the above example!

The drill calibration should be repeated as you change crops or if there is a considerable change in seed size (bulk density). Also, note the important role that tire diameter plays in the

process. On drills ground driven by a pneumatic tire, tire pressure should be checked daily. Finally, check your drill’s operator's manual for more specific information on calibration.

Calibrating your drill may seem like a considerable time commitment, but let's consider seeding 20 acres of alfalfa at a 14 lb rate instead of 12 with $265 per bag seed. That's $10 of extra seed per acre multiplied by 20 acres, yielding you $200. If you spend two hours getting the calibration right as the snow melts, that's a payback of $100 per hour.

Wisconsin Crop Manager

Volume 17 Number 5 --- University of Wisconsin Crop Manager --- April 8 ,2010

2010 Wisconsin Soybean Yield Contest

Shawn P. Conley, State Soybean and Wheat Extension Specialist, University of Wisconsin, Madison

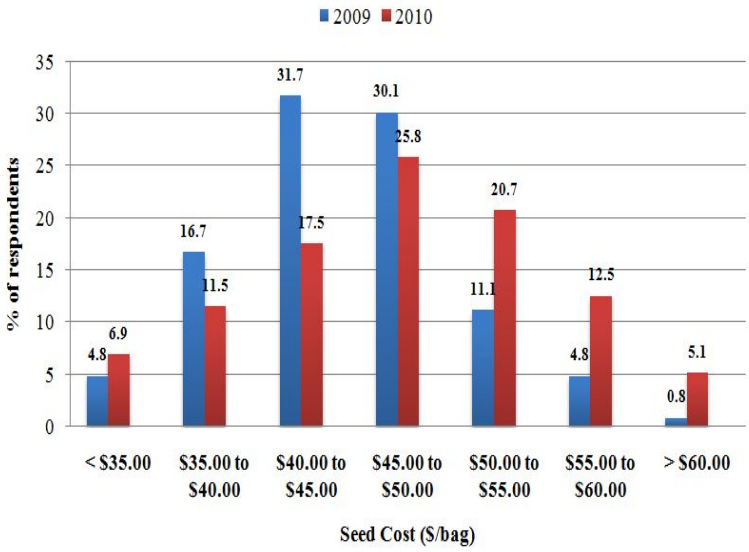
The Wisconsin Soybean Association yield contest has been organized to encourage the development of new and innovative management practices and to show the importance of using sound cultural practices in WI soybean production. This new program encourages growers to challenge themselves to produce higher yields and to be rewarded for their efforts. Top growers will be recognized for achieving high yields while using sound, environmentally friendly production practices that are profitable as well. For more information regarding this program please go to www.coolbean.info.

Factors to Consider If Using Lower Soybean Seeding Rates in 2010

Shawn P. Conley, State Soybean and Wheat Extension Specialist, John Gaska, Outreach Specialist, University of Wisconsin, Madison

Though not as dramatic of a seed price increase as 2009, soybean seed prices have risen again in 2010. Given the number of rebates, seed treatments, and programs available through seed and chemical companies, it is often difficult to get at the true cost growers pay for seed. To try and capture this "***true***" cost, we sampled grower and dealer clientele that participated in the 2009 and 2010 Agronomy Update Meetings (N=126 and 217, respectively). Results from this survey indicated that seed prices ranged from under $35.00 to over $60.00 per bag (Figure 1). The largest percentage (32%) of those surveyed indicated that they paid between $40.00 and $45.00 per bag in 2009. In 2010, the largest percentage of growers (26%) paid between $45.00 and $50.00 per bag. We also saw a dramatic increase in the percentage of seed purchased at over $50.00 per bag (129%).

Figure 1. Comparison of soybean seed prices in Wisconsin for 2009 and 2010. Data collected during the 2009 and 2010 Agronomy Update Meetings (N=126 and 217, respectively).



Given this dramatic increase in soybean seed prices, most growers will likely consider decreasing their seeding rates in 2010. The extent of this reduction may be dramatic in some cases compared to the current seeding rates used in Wisconsin. In a grower survey conducted with cooperation and support from the Wisconsin Soybean Marketing Board (WSMB) we found that a majority (38%) of Wisconsin growers' plant between 200,000 and 224, 000 seeds per acre in rows spaced ≤ 10 inches. A majority of growers that plant in rows spaced over 11 inches, plant at 175,000 to 199,000 seeds per acre (Table 1). A key factor to remember as growers contemplate dropping their seeding rate is they need to plant enough seed to achieve a minimum harvest stand (target density) of 100,000 to 120,000 plants per acre.

To successfully achieve our target density we must first make sure our equipment is well maintained and calibrated. At $15.00 to $20.00 per bag, many growers didn't take the time to

Table 1. Soybean seeding rates and rows spacings in Wisconsin in 2007.

Row	Seeding rate (1,000) < 125	≥ 125 - 149	≥ 150 - 174	≥ 175 - 199	≥ 200 - 224	≥ 225	% Total
	% Respondents						
≤ 10	7	4	4	29	38	17	46
11 - 19	4	5	20	50	20	2	37
≥ 20	0	12	39	46	4	0	17
% Total	5	6	16	40	25	9	N = 153

properly calibrate, however at $45.00 + per bag, it is well worth the time and money to make sure our equipment is in proper working order. For information on drill calibration, please see Grain Drill Metering Systems and the Need for Calibration.

Once we have determined that our equipment is working properly, we must next consider seed quality. Unlike the problems we ran into in 2008, soybean seed quality in 2010 should not cause growers any concern, though it is still important to take the time to read the tag and check the germ to ensure a proper seeding rate. In a normal year, we assume 90% of the live soybean seed we plant will emerge.

Therefore to estimate our final stand density, we conduct the following calculation:

(Seeding rate) x (% germ) x (% expected emergence) = estimated final stand

Example 1: (180,000 seeds/a) x (0.94) x (0.90) = 152,280 plants/a

Example 2: (180,000seeds/a) x (0.80) x (0.90) = 129,600 plants/a

In Example 1, a grower plants 180,000 seeds/acre of 94% germ seed, and assumes 90% emergence. The estimated soybean stand will be = 152,280 plants/acre. If a grower planted 80% germ seed, the estimated soybean stand would be = 129,600 plants/acre (Example 2) Under most environmental conditions 129,000 plants/acre would produce 100% yield potential, however if we do not achieve our assumed 90% emergence rate due to poor early season growing conditions, we rapidly approach lower stands where yield loss may occur.

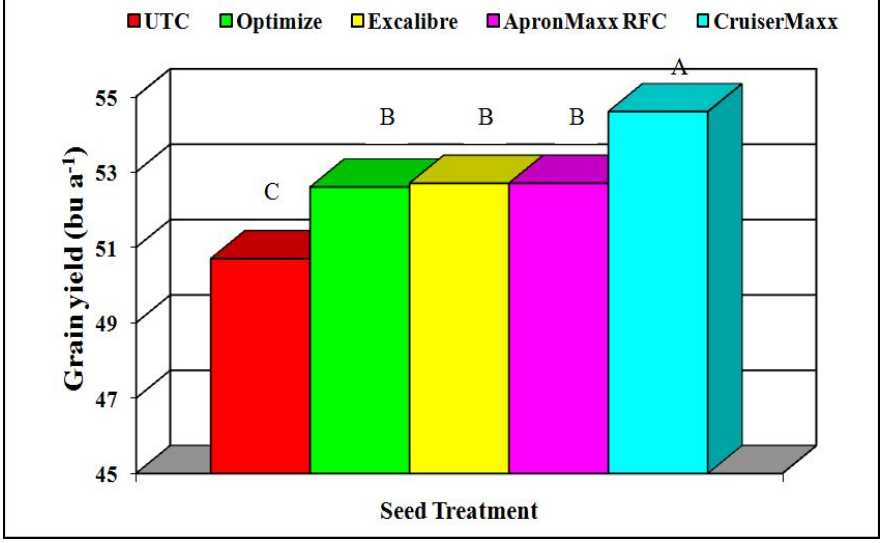
A significant change we have seen over the last five+ years is the dramatic increase in seed treatments available to growers. Among the seed treatments available, the most common are fungicides and insecticides. Given the high value of establishing a soybean crop today, seed treatments are being marketed as "insurance" to growers. If you choose to use a seed treatment, it is important to remember to select products that have efficacy on the pest complex that is present on your farm. Selecting a product that insures you against a pest that you do not have is like buying flood insurance for a house that sits on the top of a mountain. It may be cheap, but unnecessary.

To evaluate the need for seed treatments in Wisconsin, we initiated a 9 location study (n=432 plots) in 2008. Averaged across all locations (9) and varieties (4), we did not see a benefit from using either ApronMaxx® or CruiserMaxx® in 2008. Analysis of the data however indicated a significant variety by seed treatment interaction suggesting that in some varieties, use of seed treatments significantly increased yield.

We expanded this work in 2009 by adding two inoculants to the experiment (n=540 plots) (Figure 2). Averaged across all locations (9) and varieties (4), we saw a yield response ($p \leq 0.01$) to all seed treatments. The variability in yield response between years was not caused by establishment problems as there were no stand differences (stand counts taken at V2 soybean) among the UTC, the inoculants and Apron Maxx RFC treatments. A 9% stand increase was noted in the Cruiser Maxx treatment in 2009. Note that all stands were at or above a minimum target density of 100,000 plants per acre.(data not shown)

The yield response we saw in 2009 may have been caused by poor nodulation (Please refer to "Year of the Yellow Bean"), early season diseases that impacted stands after our V2 stand counts, insect presence, or other factors not measured in this experiment. This research will be continued in 2010

Figure 2. Soybean yield response to seed treatments across three regions in 2009.



Lastly, as we begin the planting season, we must remember to re-evaluate our soybean seeding depth. We recommend a seeding depth range of 0.75 to 1.25 inches for soybean. Based on our WSMB survey data, only 30% of Wisconsin growers

planted in this optimal range (Table 3). Fifty-nine percent of growers seeded between 1.25 and 2.0 inches and 9% seeded at ≥ 2.0 inches deep. Deeper planting depths were likely relevant 10 years ago given later planting (i.e. warmer soil temperatures and dry soil conditions) and cheaper seed; however in today's economic environment, planting at the proper seeding depth can reduce some of the risk.

Table 3. Percentage of WI growers planting their soybean seeds at various depths.

< 0.75 inches	0.75 ≥ x < 1.25 inches	1.25 ≥ x < 2.0 inches	≥ 2.0 inches
2%	30%	59%	9%

Planter field adjustments

Matthew Digman,Assistant Professor and Machinery Systems Extension Specialist, UW-Madison

With today's modern planting monitors, keeping tabs on planter performance is easier then ever before; however, it doesn't hurt to take a break to do some double-checking. Taking field breaks reduces operator fatigue and stress which can distract from safely operating equipment. A walk around the planter can also give the operator a chance to ensure the planter is operating normally.

Planter Levelness

First, check that your planter is level; an improperly-leveled planter can inhibit the action of the row unit's parallel-bar linkage, potentially leading to non-uniform seeding depth. To check this, stop the planter during planting. The planter's tongue and the row units' parallel-bar linkages should be nearly level (parallel) to the ground. Symptoms of an unlevel planter can include inconsistent seed spacing and depth. A severely unleveled planter may have difficulty closing the seed furrow.

Down force

Many planters have springs or air bags in the parallel-bar linkage. These devices transfer weight from the planter's frame to the row unit to help disk opener and residue clearing/cutting coulter (if equipped) penetration and to minimize unit bounce in rough soil conditions. Row unit down force should be adjusted when adding or removing row unit attachments, if there is a significant change in soil conditions (texture, moisture, tillage) or if the row units are bouncing when planting. Pay particular attention to row units that follow in tractor tire tracks as they may require additional down force. Too little down force can result in row unit bounce and, subsequently, shallow seed placement. However, too much down force could accelerate wear on the row units' ground-engaging components and could negatively affect early plant development.

Row cleaners (if equipped)

Row cleaners, trash wheels, or trash whippers are designed to sweep residue out of the path of the opener and, as such, must be adjusted to just touch the ground. Row cleaners adjusted too high will not rotate and will leave residue in the path of the opener. Adjusted too low and they may move too much soil which could affect seeding depth and cause the seed to planted in cool, damp soil. Long residue can wrap around the row cleaners. In this case, a lead coulter may be needed to cut the residue before it can be moved out of the way be the row cleaner.

Tire Pressure

On planters ground-driven by a pneumatic tire, tire pressure should be checked daily. These planters use the tire for ground driving the seed, fertilizer and chemical metering systems and therefore the tire needs to be properly inflated to ensure the same tire diameter used to create the rate charts in your operator's manual. An under-inflated tire will reduce the gear reduction of the drive, leading to a higher seeding/fertilization rate as the tire makes more rotations for each acre of ground covered. The opposite is true for an over-inflated tire.

Checking Seed Population

To check population, pick a couple of row units to monitor for a repeated measurement. Release the closing wheel down force and use a chain or strap to restrain the closing wheels so they don't touch the ground. Then plant long enough so that you have a chance to get the planter up to speed. This may require planting a little farther than desired, but it will ensure the observed population will be representative of the rest of the field.

Next, measure the length of the row that will represent 1/1000th of an acre. This will make calculating population easy. Use the table below to determine how far to measure for your planter setup. After you have measured the correct distance that corresponds to 1/1000th of an acre, count the number of seeds found in that distance. To find your population, simply multiply the number of seeds counted by 1000. For example, if you are planting 30-inch rows and you count 32 seeds in 17 ft 5 in, then the seed population will be 32,000 seeds per acre. Because seeds can be difficult to see in the furrow, it is a good idea to do this test over a couple of rows to get a good idea of the actual seed population.

Planting distance needed to cover 1/1000th of an acre for each row. First measure the correct distance for your planter setup, then count the number of seeds in the furrow and multiply by 1000 to convert to seeds/acre.

Planting width (in)	Distance
15*	34 ft 10 in
20	26 ft 1 in
30	17 ft 5 in
38	13 ft 10 in

* This number can also be used for twin-row planted on 30-inch centers.

Planting speed

The effect of planting speed on planter performance is well known. Manufacturers have worked to design planters to operate at higher speeds, but seed singulation and depth control still become more difficult at higher planting speeds. I'm not advocating slowing down, but if you're not happy with the performance of your planter, slowing down a bit is an easy way to potentially improve planter performance.

All together these suggestions could consume a considerable amount of time, but coupled with needed breaks they will ensure your planter is performing as expected. I hope these tips ensure you a safe and productive plating season.

Wisconsin Crop Manager

Volume 17 Number 6 --- University of Wisconsin Crop Manager --- April 22 ,2010

Corn Disease Management Surveys

Paul Esker, Field Crops Extension Plant Pathologist

During the week of April 12th, a corn disease management survey was completed and sent to randomly selected corn growers and Certified Crop Advisors in Wisconsin, Illinois, Iowa, and Ohio. Funding for this survey is provided by the USDA-National Institute of Food and Agriculture, Risk Avoidance and Mitigation Program. The objective of the study is to understand the risks corn growers face with regards to corn disease management, and the tools you have as either a corn grower or crop advisor to assist in continuing to improve yields. The information you provide by completing the survey will be used to help develop educational materials and tools for corn growers and crop advisors to better manage corn diseases.

If you were randomly selected for this survey, we hope that you take the time to fill the survey out. All questions about the survey should be addressed to Kelly Elver at the University of Wisconsin Survey Center, at (608) 262-7360, or toll free at (800) 291-8624, extension 9762.

Management Recommendations and Considerations for Winter Wheat Based on Early Season Wheat Diseases

Karen Lackermann, Paul Esker, Shawn Conley, and John Gaska

Graduate Research Assistant, Field Crops Extension Plant Pathologist, State Soybean and Small Grains Specialist, and Senior Outreach Specialist, UW-Madison

Over the past week, we have been scouting the Winter Wheat Performance Trial fields at Arlington, Chilton, Janesville, and Lancaster. We have observed symptoms of powdery mildew and Septoria leaf blotch (Figures 1 and 2). The wheat growth stage is approximately Feekes 4-5 (jointing, Figure 3) at all locations except Janesville, where the wheat is slightly behind in development. This is a function of the later planting last fall (13 November). At this point in the growing season, it is time to start scouting for foliar diseases. As you begin these assessments, it is critical to estimate incidence and severity and how this may impact wheat productivity later in the growing season. We will discuss different factors that should be considered in more detail below.

Disease management decisions for wheat in 2010 begin with knowledge of the disease resistance package of the wheat variety or varieties that you planted last fall. As we have seen in our early-season scouting, not all varieties are susceptible to powdery mildew and/or Septoria, as evidenced by the lack of symptoms in many of our plots. The second step is to actively scout in your wheat fields to determine which diseases are present and what the incidence and severity levels are in those fields. Incidence is defined as the number of plants infected by a specific disease and severity is defined as the average area of the leaf covered with a specific disease. We recommend taking these assessments from 10 locations within the field and 10 plants within a location. The most important wheat growth stages for field assessments of diseases are: (i) jointing (Feekes 4-5 or Zadoks 30), (ii) second detectable node (Feekes 7 or Zadoks 32), (iii) flag emergence into early boot (Feekes 8-10 or Zadoks 39-45), and (iv) flowering (Feekes 10.51). Throughout the growing season, we will provide updated reminders of these growth stages in relation to the diseases we observe. In terms of foliar disease management, most control efforts are targeted toward protecting the flag leaf from disease, which becomes visible around Feekes 8. However, if you begin scouting for wheat diseases early and make a committed effort to continue scouting throughout the growing season, you will be better prepared to determine if a foliar fungicide spray will be warranted. A recent check of some of the local co-ops in

Figure 1. Powdery mildew pustules on wheat leaves. Powdery mildew was observed in the Winter Wheat Performance Trials at both Arlington and Chilton the week of April 12th. (Image sources: John Gaska and Karen Lackermann)

Figure 2. Septoria leaf blotch observed at Arlington, WI on 14 April 2010. Note the characteristic necrotic brown lesion with black pycnidia. (Image source: Karen Lackermann)

Wisconsin indicates that fungicide prices (product alone) are ranging from $13-14/acre to $20-23/acre, and these prices are dependent on the different active ingredient and recommended application rates.

As discussed earlier, symptoms of powdery mildew (*Blumeria graminis*) were observed at Arlington and Chilton. Symptoms of this disease and signs of the pathogen were found primarily in the lower canopy, which is typical for this time of the growing season, although we are seeing symptoms earlier than in 2009. Powdery mildew is characterized by powdery white to gray fungal growth that can occur on leaves, stems, and heads (Figure 1). This disease is quite common in Wisconsin and is often one of the earliest diseases to develop each spring. Infection can occur during the fall.

At Arlington, Septoria leaf blotch (*Septoria tritici*) was also found. This is another fungal disease that is commonly found in the lower canopy early in the growing season.

Figure 3. Wheat approaching Feekes 4 (jointing). The growing point (pictured at right) was just below the soil surface when this picture was taken (14 April 2010). (Image source: Karen Lackermann)

There are two phases to Septoria leaf blotch: the first occurs during the fall just after wheat emerges and the second occurs both in the spring and summer on the upper leaves of wheat plants. The source of inoculum is either pynicida (survival structure, Figure 2) that can survive on infested residue upwards of 2-3 years or mycelia in diseased live wheat.

Part of the reason we may be observing powdery mildew and Septoria leaf blotch earlier in 2010 compared with 2009 is conditions late last fall. The cool and wet conditions during the fall may have promoted early establishment of both diseases in some areas of the state. Late planted wheat, such as our Janesville performance trial location, may have escaped these fall infections. Conditions this spring have largely been warm and wet, both of which favor disease development.

Evidence of disease in the lower canopy at this time of the growing season may not translate to subsequent problems later in the growing season. Recommendations for fungicides at jointing are limited and thresholds for foliar fungicides applications exist mainly for powdery mildew, wheat leaf rust, and Septoria leaf blotch. For powdery mildew, the early-season threshold for considering a foliar fungicide is an average of 10 powdery mildew pustules per leaf on the uppermost leaf. However, consider the cost of application (discussed above) and the potential return on investment. Based on multiple years of research, our results suggest that the most optimum timing for fungicide applications for control of foliar diseases is during flag leaf emergence (Feekes 8 and 9) and not with early season applications.

Several useful resources are available to help in guiding disease management decisions in wheat. These include multiple Wisconsin Crop Manager articles that discuss scouting and disease management for wheat diseases:

1) Foliar Fungicides for Winter Wheat in 2008, 10 April 2008
2) Identifying Wheat Diseases Controlled by Foliar Fungicides, 10 April 2008
3) Flag Leaf Emergence and Foliar Fungicides in Winter Wheat, 29 May 2008
4) Do I need to Spray a Foliar Fungicide in Wheat in 2009?, 26 March 2009

Further online resources to use during 2010 to stay up to date on wheat production and management in Wisconsin:

- The Soy Report Blog: http://thesoyreport.blogspot.com
- Field Crops Plant Pathology: http://www.uwex.edu/ces/croppathology
- CoolBean.info: http://coolbean.info
- USDA Cereal Rust Laboratory – Reports and Bulletins: http://www.ars.usda.gov/Main/docs.htm?docid=9757
- Fusarium Head Blight Prediction Center: http://www.wheatscab.psu.edu/

On-Farm Manure Spreader Calibrations

Karen Talarczyk, Southwest Regional NPM Specialist

Manure spreader calibrations took place recently on ten farms in southwestern Wisconsin. A requirement of the WDATCP's *Nutrient Management Plan Checklist*, is that manure spreaders be calibrated to determine the application rate applied to the farm's fields. Checklist question #5 asks: Are manure application rates realistic for the calibrated equipment used? Calibration involves weighing the manure spreader both full and empty, and then subtracting the empty total from the full total and dividing by 2,000 to determine the tons of manure per load. Full means the typical load size normally taken out to the field. Field records kept showing the number of loads applied to a particular field multiplied by the tons manure/load and then divided by the field acreage give the estimated tons/acre application rate.

Late March's disappearing snow cover coupled with the somewhat early signs of spring has involved me scheduling a partnership project with a Certified Crop Advisor from a southern Wisconsin Cooperative. The project was manure spreader calibrations on ten farms in Lafayette, Iowa and Dane Counties. This information was need for the completion of each farm's nutrient management plans - - particularly, the accounting of manure credits and the associated reduction in commercial fertilizer need. The livestock farms involved were mostly dairy, some beef, with manure management on the rolling terrain of southwestern Wisconsin. The various manure spreaders - four box end unloading, five slinger, and one V-max - were weighed using portable pad scales with a 20,000 lb. capacity per scale. Manure loads ranged from 3.0 - 4.5 tons except for one slinger with a weight at 9.5 ton. Viewing the spreading technique at each farm, coupled with a short exchange with the landowners on their manure spreading habits on these mostly daily haul farms, resulted in initial estimated spreading rates of 25 – 35 tons per acre. More fine tuning would come once records were checked against the exact number of loads applied to each field. The compact NPM Fast Facts publication was referred as well as the manure dial and both publications were left at the farm. The three short morning sessions involved a good verbal exchange. The farmers discussed the current economic farming challenges and the need and interest to be aware of and comply with present regulations. I learned that within the farming community there is sincere interest in managing inputs to protect the environment.

Mid-term CRP land management of smooth brome: 2010 update

Mark J. Renz and Richard T. Proost

The Conservation Reserve Program (CRP) was initially established as a cropland set-aside program but, priorities for this program have shifted to improve wildlife habitat, specifically nesting habitat, food and cover for upland birds. Consequently, fields that are dominated by cool season grasses such as smooth brome are now considered improper for this program. Recently, the Farm Service Agency (FSA) has required owners to suppress cool season grasses and diversify the plant species present on these CRP properties. This requirement is intended to enhance wildlife habitat by

increasing plant species and structural diversity as well as remove duff and control woody vegetation. While options for management are provided by the National Resource Conservation Service (NRCS), limited information exists on the effectiveness of herbicides, tillage, and planting in suppressing cool season grasses and the response of broadleaf plants and overall plant diversity to these management practices. We have established research to evaluate the effects of these management activities in two CRP-like fields dominated with smooth brome.

For a detailed report discussing the results please click this link.

In brief we have been evaluating spring and fall herbicide treatments of glyphosate (Roundup), sethoxydim (Poast) and fluazifop (Fusilade) in suppressing smooth brome dominated stands compared to tillage (spring only) and untreated plots (see tables for rates) at two sites. Herbicides and tillage were applied in the spring on 4/29/08 and 5/12/08 at New Glarus and Horicon respectively. At the New Glarus, plots were inter-seeded with alfalfa using a no-till drill 1 day after treatments (DAT) were applied. Fall treatments were applied in 2008 (11/1/08) at Horicon just after a frost damaged 50% of smooth brome leaf tissue.

INITIAL OBSERVATIONS

Although spring glyphosate was more effective at suppressing populations and allowing for establishment of other plant species (alfalfa) in the first year, no treatment differences were seen in smooth brome cover the following year. Management with glyphosate in the fall appears to enhance control of smooth brome, but this was only conducted at one site. Response of fluazifop and sethoxydim was variable, but fluazifop in the spring offered better suppression of smooth brome than sethoxydim. If desirable forbs (broadleaf plants) are present in smooth brome infestations, the use of fluazifop would be best to maximize smooth brome suppression while preventing injury to forbs. Disking, while effective in suppressing smooth brome did not provide suppression that lasted more than the year it was conducted. As many CRP fields in Wisconsin are prone to soil loss, this management method should only be used on lands that are not highly erodible. Broadleaf plants responded differentially to management between sites. The site dominated by smooth brome had a greater response in the year of treatment while the site that already contained some broadleaf plants present responded the year after treatment. This suggests that areas that already contain some desirable plants may not improve their cover one year after treatment from management of smooth brome. Fall applications of glyphosate may provide the best control of smooth brome, and since these applications are made in the late fall after many of the forbs have already senesced, it should have minimal effect to desirable forbs. These plots will continue to be monitored to document any changes in plant composition and diversity. Although visually a more diverse plant structure was observed between plots, only glyphosate at the highest rate had greater plant diversity the year following treatment. While the goals of CRP mid-contract management are to improve plant diversity and structure, it appears that management in the spring resulted in few changes to plant diversity, but improved plant structure. Although only one site was planted, it was successful in placing a desirable species into the mixture of plants. Future work should continue to access which species are beneficial and which are not and whether planting is warranted for specific CRP plantings.

Vegetable Crop Update, 2010-1

Vegetable Crop Update newletter issue one for 2010 is out! This is the first newsletter of the 2010 year. Weekly updates should be available as disease, insect, weed, fertilty, and crop progress changes. Direct link to Vegetable Crop Update 2010-1

The first issue has been posted on the IPCM web site on a page titled appropriately : The Vegetable Crop Update page. Look for a menu item under "WCM-News" to find this page, or click here >>>
http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Wisconsin Crop Manager

Volume 17 Number 7 - - - University of Wisconsin Crop Manager - - - April 29, 2010

Updated Nitrogen Application Rate Guidelines for Corn

Carrie Laboski, Extension Soil Scientist, Department of Soil Science, University of Wisconsin-Madison

In 2005, the N application rate guidelines for corn were updated to follow a regional approach called maximum return to N or MRTN. This method allows farmers to select a N rate that is appropriate for their economic situation, soil, and cropping system.

The MRTN and range of profitable N rates is calculated using data from N response experiments in Wisconsin. Since the MRTN debuted in 2005, corn N response data have been added to the database annually. These new sites comprise small plot trials at UW Ag Research Stations along with many more replicated field strip trials conducted by County Extension Agents in cooperation with farmers, consultants, and ag businesses. A total of 62 new sites were added to the database since 2005 (Table 1, next page).

The current database comprises 157 sites; the location of these trials are shown in Figure 1 (next page). Because so much new data was acquired, it was time to determine how much the addition of this data would affect the MRTN and if the MRTN guidelines needed updating.

(continued on next page)

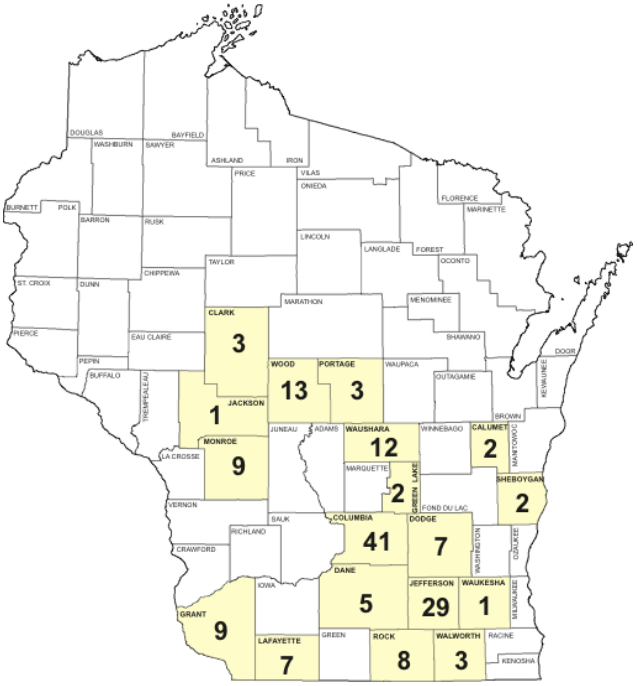
Also in this issue (page 28):

The first 2010 UW-Extension/ Madison Plant Disease Diagnostic Clinic (PDDC) Update

Table 1. Number of corn N response sites added to the database since 2005.

Soil Yield Potential	Previous Crop	Sites added since 2005
High/Very High	Corn	14
	Soybean	24
Medium/Low	Corn	8
	Soybean	9
Irrigated sands/loamy sands	All	1
Non-irrigated sands/loamy sands	All	6
TOTAL		62

Figure 1. Location of MRTN trials comprising the Wisconsin corn N response database (April 2010).



So what was found when the new larger database was analyzed?

First, no relationship between grain yield and the amount of N needed to obtain that yield was found (Figure 2, next page). Second, the contribution of mineralized soil N towards maximum yield is substantial (Table 2, next page).

For example, yield when no N was applied was 65 and 61% of maximum yield for corn following corn on high/vey high and medium/low yield potential soils, respectively. When corn followed soybean, 74 and 85% of maximum yield was achieved with no N for high/very high and medium/low yield potential soils, respectively. Irrigated sand/loamy sand soils with low organic matter contents are highly responsive to N fertilization whereby soil N mineralization only contributed 35% of the total yield. When these soils are not irrigated, they are limited more by water than lack of N as evidenced by the fact that the soil supplied enough N for 52% of maximum yield. It should be noted that maximum yields in Table 2 are the average for each soil yield potential and previous crop category in the database. There are numerous very high yielding (>200 bu/a) sites in the high/very high yield potential and irrigated sands/loamy sands categories. Both of these observations confirm previous findings.

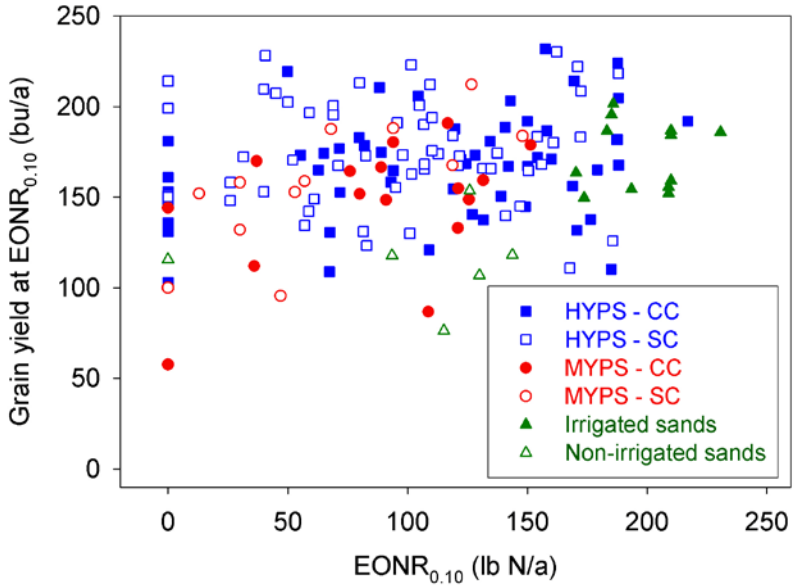


Figure 2. Relationship between the economic optimum N rate at the 0.10 N:corn price ratio ($EONR_{0.01}$) and grain yield at the $EONR_{0.01}$ for sites comprising the Wisconsin corn N response database.

Table 2. Contribution of mineralized soil N towards maximum yield.

Soil Yield Potential	Previous Crop	Yield at 0 lb N/a	Maximum Yield	Relative Yield
		——— bu/a ———		%
High/Very High	Corn	110	169	65
	Soybean	130	176	74
Medium/Low	Corn	91	148	61
	Soybean	134	158	85
Irrigated sands/loamy sands	All	61	174	35
Non-irrigated sands/loamy sands	All	61	118	52

The MRTN was calculated using four N:corn price ratios (0.05, 0.10, 0.15, and 0.20) with the corn price being set at $4/bu. The third finding of the data analysis is that the MRTN obtained using the new, larger database is 5 to 25 lb N/a greater than when the old database was used. This difference was deemed large enough to justify updating the guidelines. The new MRTN guidelines are presented in Table 3. The biggest changes occur in the non-irrigated sands/loamy sands, all previous crops and medium/low yield potential soils, corn following soybean categories. These larger increases result from the new data, added since 2005, comprising a large portion of the total data in those categories. The N rates that represent the range in profitability (within $1/a) surrounding the MRTN rate also changed. Where the MRTN rate increased substantially, the range in profitable N rates shifted upwards accordingly. For soil yield potential and previous crop categories where the MRTN did not change by more than 5 lb N/a, the range in profitable N rates became somewhat smaller.

Table 3. 2010 Updated Maximum Return to N (MRTN) N rate guidelines for corn.

Soil Yield Potential[1]	Previous Crop	N:Corn Price Ratio			
		0.05	0.10	0.15	0.20
		lb N/a (total to apply)[2]			
High/Very High	Corn, Forage & Vegetable legumes, Green manure[5]	**170**[3] 155 – 185[4]	**150** 135 –160	**130** 120 – 145	**115** 105 – 125
	Soybean, Small grains[6]	**140** 125 – 160	**120** 105 – 135	**105** 95 – 115	**95** 80 – 105
Medium/Low	Corn, Forage & Vegetable legumes, Green manure[5]	**125** 110 – 140	**110** 100 – 115	**100** 95 – 110	**95** 85 – 100
	Soybean, Small grains[6]	**110** 90 – 125	**85** 70 – 95	**70** 60 – 80	**60** 50 – 70
Irrigated sands/loamy sands	All	**215** 205 – 225	**205** 195 – 215	**195** 180 – 205	**180** 170 – 195
Non-irrigated sands/loamy sands	All	**140** 130 – 150	**130** 120 – 140	**120** 110 – 130	**110** 100 – 120

[1] To determine soil yield potential, consult UWEX publication A2809 or contact your county agent or agronomist.

[2] Includes N in starter.

[3] Maximum return to N (MRTN) rate

[4] Profitability range within $1/a of MRTN rate.

[5] Subtract N credit for forage legumes, legume vegetables, animal manures, green manures.

[6] Subtract credits for animal manures and second year forage legumes.

The updated MRTN guidelines are effective as of May 1, 2010. The next release of SNAP Plus will contain the updated guidelines. Soil test reports will have the new guidelines printed on them by July 1 at the latest.

For more information on how to use the MRTN guidelines see Chapter 6 Nitrogen in UWEX Publication A2809 *Nutrient Application Guidelines for Field, Vegetable, and Fruit Crop in Wisconsin* (http://www.soils.wisc.edu/extension/pubs/A2809.pdf).

For more information on the philosophy behind the regional MRTN approach see Iowa State University Extension Publication PM2015 *Concepts and Rationale for Regional Nitrogen Rate Guidelines for Corn* (http://www.extension.iastate.edu/Publications/PM2015.pdf).

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC from January 1 to April 27, 2010.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Soybean	White Mold	*Sclerotinia sclerotiorum*	Sauk
FORAGE CROP			
Alfalfa	Aphanomyces Root Rot	*Aphanomyces euteiches*	Columbia, Dane
	Crown Rot	*Fusarium* spp., *Pythium* spp.	Dane
	Phytophthora Root Rot	*Phytophthora medicaginis*	Columbia, Dane
FRUITS			
Apple	Bitter Rot	*Colletotrichum gloeosporoides*	Walworth
VEGETABLES			
Carrot	Root Rot	*Fusarium* sp., *Rhizoctonia* sp.	Dane
Spinach	Heterosporium Leaf Spot	*Heterosporium* sp.	Winnebago
Pepper (Green Bell)	Tobacco Mosaic	Tobacco mosaic virus	Waukesha
Potato	Bacterial Soft Rot	*Pectobacterium carotovorum*	Oneida, Waupaca
	Black Dot	*Colletotrichum coocodes*	Oneida
	Early Blight	*Alternaria solani*	Dane
	Fusarium Dry Rot	*Fusarium* sp.	Waupaca
	Late Blight	*Phytophthora infestans*	Langlade
	Potato Virus S	Potato virus S virus	Waushara
	Potato Virus Y	Potato virus Y virus	Waushara
Tomato	Bacterial Canker	*Clavibacter michiganensis* pv. *michiganensis*	Douglas
	Cucumber Mosaic	Cucumber mosaic virus	Douglas, Waukesha
	Tobacco Mosaic	Tobacco mosaic virus	Douglas, St. Croix, Waukesha

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu

Wisconsin Crop Manager

Volume 17 Number 8 --- University of Wisconsin Crop Manager --- May 6 ,2010

Understanding Factors that Influence the Efficacy of Seed Treatments for Soilborne Pathogens in Corn and Soybean

A.J. Peltier[1], A. Amiri[1], and P.D. Esker[2], [1]Postdoctoral Research Associates and [2]Field Crops Extension Plant Pathologist, University of Wisconsin – Madison, Department of Plant Pathology

As of the May 3rd Wisconsin Crop Progress report (Source: USDA-NASS), 51% of corn and 8% of soybean acres were planted around the state. Although weather conditions have been quite favorable for planting, soil temperatures continue to fluctuate (Figure 1). Seed and seedling diseases of corn can occur in localized areas every year and, if fields are not routinely inspected after planting, can cause hidden yield loss. Fungicide seed treatments are a standard disease management practice in corn production and are becoming a much more common practice for soybean production. With the increasing cost of seed, numerous questions have been raised regarding the need and use of fungicide (and nematicide) seed treatments.

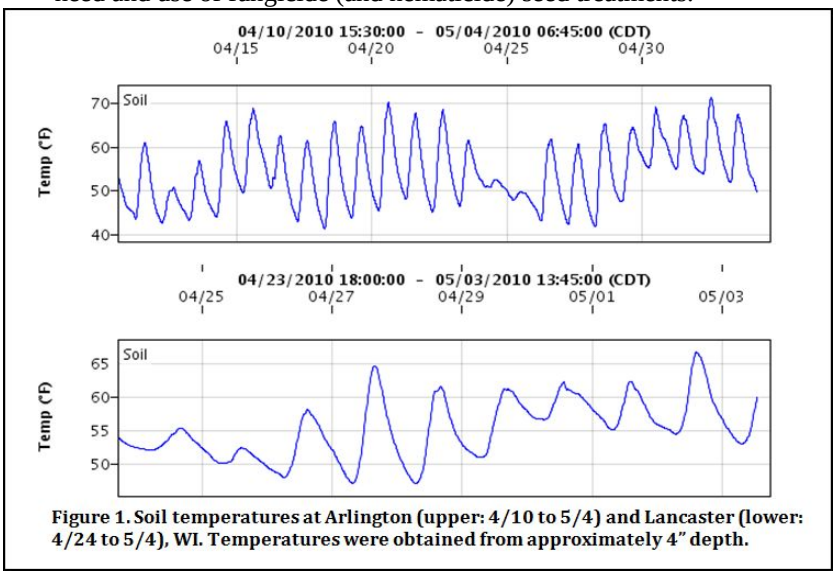


Figure 1. Soil temperatures at Arlington (upper: 4/10 to 5/4) and Lancaster (lower: 4/24 to 5/4), WI. Temperatures were obtained from approximately 4" depth.

Disease scouting is important in order to make the most informed choice for controlling seed and seedling pathogens present in your field.

Symptoms of corn and soybean seedling disease. Seedling diseases result in lower plant populations and also reduced vigor, which directly translates to yield loss. This is often more important for corn as soybeans can compensate for lower plant stands through lateral growth. However, as many soybean producers have reduced their seeding rates in 2010 due to increase seed costs, seed treatment fungicides may be an option to maintain desired final plant populations at harvest.

Those seedlings that do emerge may have rotten root or stem tissue, resulting in decreased plant vigor and plant death. *Pythium* and *Fusarium* spp. are the most common fungi associated with seed and seedling disease in corn. In soybean, several pathogens can cause seedling diseases, including *Phytophthora sojae*, *Pythium* spp., *Rhizoctonia solani*, *Fusarium* spp., and to a lesser extent *Phomopsis longicola*. From 2003 to 2005, reduction in soybean yield due to these different soilborne pathogens was estimated to be 5 million bushels in Wisconsin (Figure 2). This represented approximately 3 to 5% of annual production in the state. Nationwide, it has been estimated that approximately 275 million bushels of soybean have been lost due to seedling diseases between 2000 and 2008.

Besides lower plant populations, above-ground symptoms of *Pythium* infection include dark, slimy lesions on seedling roots or hypcotyl tissue, root rot and yellowed, stunted leaves (White, 1999; Hartman, et al., 1999). *Fusarium* symptoms include tan or reddish-brown lesions that can cause shriveling of the root or hypocotyl tissue and root rot. Symptoms are sometimes accompanied by signs of the pathogen, including pink or purple colored mycelium. *Rhizoctonia solani* can also cause seeding disease, with symptoms typified by distinct reddish-brown, sunken lesions and plant lodging due to root decay. *Phomopsis longicola* infection causes seed decay and pre- or post-emergence damping off. *Phytophthora* symptoms include pre- and post-emergence damping off, and root and stem rot of seedlings. For further information about early-season soybean diseases, please consult the following.

Environmental conditions favoring corn and soybean seedling diseases. Corn and soybean germinate and emerge quickly at temperatures above 68 °F. Although seeds can imbibe water at temperatures above freezing, seed metabolism and therefore germination and emergence are greatly retarded at temperatures below 55 °F.

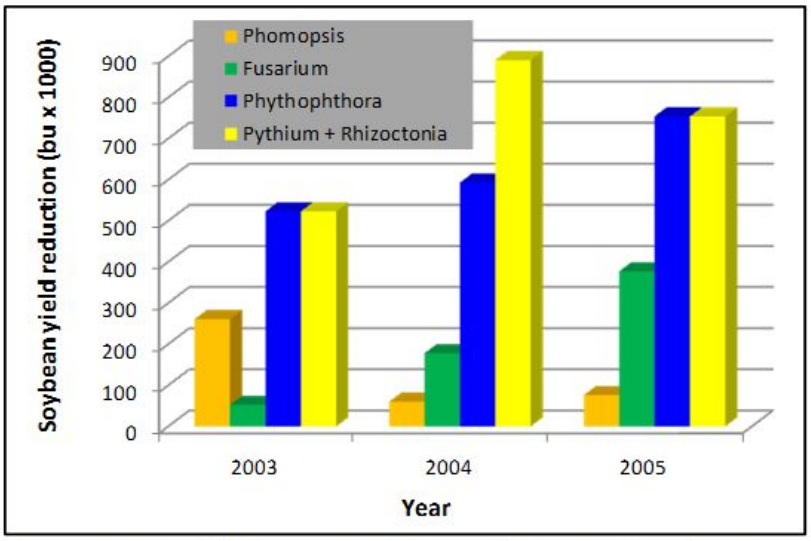


Figure 2. Estimated reduction in soybean yield in Wisconsin due to most important seedling diseases between 2003 and 2005 (Source: Wrather & Koenning, 2006).

Additionally, cell damage that occurs when seeds imbibe very cold water can predispose seeds to seed rotting pathogens. It is during this delay in germination and emergence that seed and seedling pathogens can cause problems. Very wet soil conditions are required for *Pythium* and *Phytophthora* infection, while *Fusarium* and *Rhizoctonia* are favored by only wet soil conditions, and *Phomopsis* prefers dry soil. Cool temperatures favor both *Pythium* (50 to 60 °F) and *Fusarium* (59 °F) (Munkvold and O'Mara, 2002; Table 1), as well as *Phytophthora* in soybean. *Rhizoctonia solani* and *Phomopsis longicola* are generally favored by higher soil temperatures and can infect seedlings under a wide temperature optimum (*R. solani* - 46 to 82 °C) (White, 1999). A recent article from the UW-Extension Soybean Agronomy program discusses soybean emergence and the use of growing degree-units.

Management practices to control corn and soybean seedling disease. If you still have fields to be planted to corn or soybean, it is important to monitor conditions that could favor development of seedling diseases, including excessive moisture and cool soil temperatures. Also, pay particular attention to planter calibration for optimal seeding depth. Tillage may also help to control disease, as crusted or compacted soil tends to favor seed and seedling disease by delaying emergence or damaging emerging seedlings.

Fungicide seed treatments are also a disease control option. Very little published data is available for efficacy of fungicides labeled for seed treatment in corn. In one Wisconsin reduced tillage study comparing no fungicide, captan, captan + Apron®, and Maxim® + Apron® treatments, plots with fungicide treated seed had 66% emergence while those with untreated seed had 34% emergence (Lauer, 1997). Additionally, all seed treatments increased grain yield by 50% over untreated control.

In soybean, results from Wisconsin in 2008 and 2009 have been variable. Results in 2008 indicated that there was not a uniform response to ApronMaxx® or CruiserMaxx® across locations. There was evidence of a soybean variety x seed treatment interaction indicating that for some varieties, there was a response to seed treatment fungicides. In 2009, results indicated that there was a response to the use of seed treatment fungicides across locations. Conditions were quite different between the two years and in 2009, cool and wet soil conditions may have led to an increase in early season seedling diseases. Regionally, Bradley (2008) found that there was a net economic return of $13/acre when using seed treatment fungicides in North Dakota.

Most hybrid corn seed, especially those with herbicide or insect resistance transgenic traits, come pre-treated with a seed treatment. However, as all active ingredients are not alike, it important that you select the right active ingredients to treat the pathogens that have historically caused problems in your fields (CDMS, 2010; Table 2). Active ingredients such as captan, thiram and carboxin have a general "fungicide, seed treatment" label, and are not labeled to target specific fungi. Others, such as fludioxonil, pyraclostrobin, and ipconazole are labeled to only control *Rhizoctonia* and *Fusarium* spp. while metalaxyl only controls oomycetes such as *Pythium* and *Phytophthora* spp. Costs of seed treatments will differ. For example, treatments considered "standard" will often be more inexpensive ($1.25 per 50 pounds of seed) while those considered a "specialty" seed treatment may cost $3.50 or more per 50 pounds of seed.

A comprehensive knowledge of disease problems both above and below ground is important to maximize yield. For nematodes that may affect corn, digging plants and carefully examining the roots can provide clues as to whether nematodes are a problem in your field. However, to fully determine if nematodes are the cause, submit a sample to the Plant Disease and Diagnostic Clinic. With the recent labeling of Activa Complete Corn, there is now available chemistry to combat corn nematodes.

Charts detailing current pathogens and seed treatments for corn and soybean are on the following page

A number of factors are important to fully understand the risk and cost-benefit for using seed treatment fungicides, including knowledge of previous crop histories and diseases, planting date, plant population, tillage, and environmental conditions during the early growing season.

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Table 1. Summary chart of corn and soybean seedling pathogens and the environmental conditions that favor disease.

Pathogen	Crops affected		Environmental conditions favoring disease		
	Soybean	Corn	Warm, dry soil	Warm, wet soil	Cool, wet soil
Phytophthora sojae	X			X	
Pythium spp.	X	X			X
Fusarium spp.	X	X		X	X
Rhizoctonia solani	X	X		X	
Phomopsis longicola	X		X		

Table 2. Summary chart of current corn and soybean seed treatment active ingredients, examples of trade names, and the pathogens that they control.

Active Ingredient[1]	Trade name examples[2]	Crop[3]	*Rhizoctonia solani*	*Pythium* spp.	*Phytophthora* spp.	*Fusarium* spp.	nematodes
pyraclostrobin	Stamina, Acceleron DX-109[4]	Corn soybean	X	X		X	
metalaxyl, mefanoxam,	Acquire, Apron Maxx, Maxim XL, Acceleron DC-309, Inovate, Allegiance-FL, Apron XL, Activa Complete Corn,	Corn soybean		X	X		
abamectin	Activa Complete Corn, Activa Dual Corn						X
fludioxonil	Maxim XL, Activa Complete Corn, Maxim 4FS	Corn soybean	X			X	
trifloxystrobin	Accerleron DC-709	corn	X			X	
azoxystrobin	Dynasty, Activa Complete Corn	corn	X	X		X	
harpin αβ protein	Acceleron HX-209	corn					X
ipconazole	Acceleron DC-509, Inovate	Corn soybean	X			X	
captan[4]	Captan Moly, Vitavax MDC	Corn soybean					
thiram[4]	Thiram technical	Corn soybean					
carboxin[4]	Vitavax MDC	soybean					

[1] Active ingredients may have synonyms, depending upon company.
[2] Consult the specific specimen label for further information about the different Acceleron technology and numbering.
[3] Specific trade names may be registered for corn, soybean or corn and soybean.
[4] General “fungicide, seed treatment” labeling.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between April 28 and May 4, 2010:

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FORAGE			
Alfalfa	Spring Black Stem	*Phoma medicaginis*	Fayette (IA)
FRUIT			
Apple	Cytospora Canker	*Cytospora* sp.	Milwaukee
VEGETABLES			
Pepper	Bacterial Canker	*Clavibacter michiganensis* subsp. *michiganensis*	Washington

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Spot Check for Alfalfa Weevil

Bryan Jensen, IPM Program

Some counties in Southern Wisconsin have already accumulated 300 Weevil Degree Day. It is time to get and out start spot checking alfalfa fields to determine the damage potential in your area. This is one of the earliest calendar dates that I can remember when we have reached this milestone. When I reminisce back to the "weevil days" of the previous century, it was those years with a rapid spring warm up that would have significant damage prior to harvest. During those years, larval development would outpace alfalfa growth and we would reach the economic threshold of 40% tip feeding well before cutting.

Figure 1. Diseased Alfalfa Weevil Larvae

In the southern part of Wisconsin, I would suggest scouting fields for weevil activity very soon. In the central and northern counties there is still some time and spot-checking sandy knolls and south facing slopes will give you some important information and help time future field visits. Sweep nets are not a good tool for sampling weevil populations to make treatment recommendations. Instead, examine stem tips for larvae and signs of feeding. Small larvae will be found in the folded leaflets and/or you can look for tiny feeding holes. Treatment can be suggested if 40% of the stems have feeding and if you are more than one week from harvest. Otherwise, early cutting can be a great form of cultural control. Look for diseased (tan/brown) larvae while scouting. Presence of diseased larvae can be useful when deciding if control is necessary, especially if cool wet weather is expected.

Figure 2. Alfalfa Weevil Larvae

Occasionally you'll find what can appear to be huge alfalfa weevil larvae that are far ahead of anticipated alfalfa weevil

development. These could be clover leaf weevil. They are similar to alfalfa weevil larvae in color but have a tan head instead of the alfalfa weevil's black head. Clover leaf weevil larvae are larger than alfalfa weevil when full grown but overwinter as larvae instead of eggs like the alfalfa weevil.

Figure 3. Clover Leaf Weevil Larvae

Wisconsin Crop Manager

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Free Alerts Via Email or Text Message for Fusarium Head Blight in Wheat in 2010

Paul Esker, Field Crops Extension Plant Pathologist

If you are interested in receiving real-time alerts for updates on Fusarium head blight (as well as general field reports), the U.S. Wheat & Barley Scab Initiative is offering a free subscription service in 2010. To sign up for these alerts, please sign up on the U.S. Wheat & Barley Scab Initiative webpage, available here. The alerts are a summary of commentary made by wheat disease specialists throughout the country that are posted on the Fusarium Head Blight Prediction Center. You can receive alerts in email and/or text message form. You can also sign up for different types of reports, such as just a national summary or for specific regions. For example, if you just want to see a summary from Wisconsin and the corresponding soft winter wheat region, you should mark the "Mid West/Northern Region, Soft Winter Wheat". Feel free to contact me if you have any questions about this service.

The Risk in Early Planting Dates

Joe Lauer, Corn Agronomist

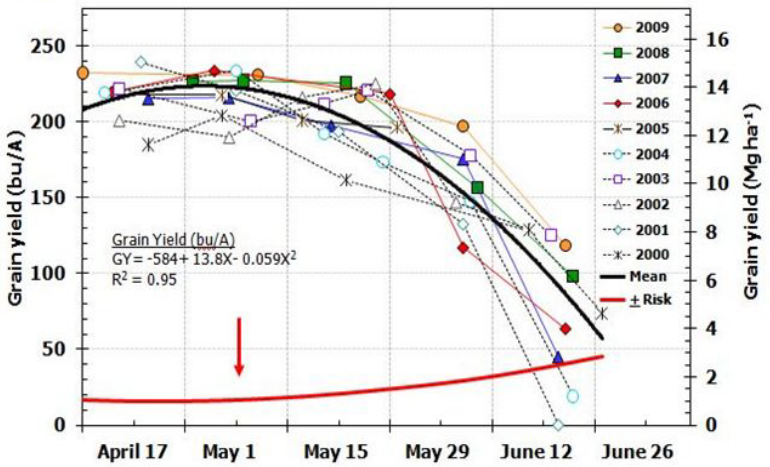
As of May 2 about 51% of the corn crop acreage was planted. With the exception of the eastern 1/3 of Wisconsin, most farmers have finished corn planting and have moved on to planting soybean. USDA-NASS began keeping records in 1979 on various stages of crop progress during the growing season. This season is the earliest we have ever hit the 50% mark for corn acreage planted.

Grain harvest and fall work was delayed at the end of the 2009 production season and growers were thankful for the warm spring to catch up with much of this work. I heard of some farmers that started planting the 2010 crop before they were done harvesting the 2009 crop!

Our standard recommendation is to plant corn anytime field conditions are conducive after April 20 in southern and after April 30 in northern Wisconsin. If you can plant all of your corn on one date, then the best date is May 1 in southern and May 7 in northern Wisconsin. Earlier planting must take into account soil temperature and insurance policies. Corn growth occurs anytime temperatures are above 50 degrees.

Even though corn planting finished early, some farmers are looking over their shoulders and are anxious about the risk of planting so early. We have been collecting planting date response data since 1974. Figure 1 shows the last 10 years of data for Arlington, WI. The optimum date to plant corn at Arlington is May 1. There are some years (2002 and 2003) were the May 1 planting date was lower yielding than adjacent planting dates. Usually, planting earlier or later than May 1 in many years will decrease grain yield. But any early yield decreases are made up by lower drying costs at the end of the growing season. Later planting dates not only decrease yield, but also result in higher drying costs due to greater grain moisture at the end of the growing season.

Figure 1. Grain yield response of full-season corn planted on various dates at Arlington, WI. The optimum date to plant corn is May 1. Risk is defined as the standard deviation (i.e. spread) of the points along the mean.



Evaluating the risk of earlier planting date is done much like analyzing trends in the market. We are most interested in the grain yield of a planting date decision (mean), but we also need to know the variance, skewness and kurtosis of points surrounding the mean. These statistical terms basically refer to the "pattern" of the points around the mean. Figure 1 shows an estimate of variance (or "spread") of the points around the mean called the standard deviation. From April 17 to May 7 the standard deviation is ± 15 to 20 bu/A. Standard deviation begins to increase on May 7 and later increases to nearly ± 45 bu/A by June 19, which is almost equal to the mean. In other words, if you planted full-season corn on June 19 you would most likely produce somewhere between 0 and 95 bu/A.

Skewness is an estimate of the likelihood a decision will be "positive/upside" or "negative/downside". For the planting date decision, as planting is delayed there is a significant, but weak downside risk with delayed planting. In other words, there is a slightly greater likelihood that planting dates will be more negative as planting is delayed. So again, you are better off planting closer to the optimum date.

Kurtosis is an estimate of the frequency of "extreme" environments. The pattern of the points in the graph below visually show this in that in that grain yield ranges from about 180 to 230 bu/A on May1, while the range around June 12 is from 0 to 130 bu/A. A significant, but weak increase in the frequency of extreme environments occurs as planting is delayed. Some years you could plant a full-season hybrid late and get some yield, but other years you could plant late and get nothing.

Risk on planting dates prior to May 1 is similar to planting dates after May1 through about May 15. After which risk begins to significantly increase and the decision will likely be negative and have more extreme yields. One of the characteristics of a high producing or record year is that the year begins with early planting of corn. We need early rains to activate herbicides. There are always exceptions, but we set ourselves up for a good production season by getting the corn crop planted and emerging as early as possible.

Black Cutworms

Bryan Jensen, IPM Program

The WDATCP Pest Survey Team has indicated a significant increase in migrating adult black cutworms in their pheromone trap network for Columbia, Dane, Dodge, Jefferson and Rock Counties. This included an intense capture in Jefferson County. Based on trap captures and degree day models, DATCP also indicated cutting may begin around May 24. Although trap captures don't always translate to economic injury, that information does indicated it will be time to start monitoring corn fields.

I would suggest scouting corn fields soon to get a handle on the expected severity and frequency of cutworm damage. Focus your attention on corn fields which are most attractive for oviposition. Although any field may have significant cutworm feeding, female moths prefer soybean residue to both corn and wheat residue for sites to lay eggs. Many times, these eggs may be deposited prior to tillage, planting and even corn emergence. Early season weed growth is also attractive for oviposition as are low lying areas of fields. My point in scouting these areas is to get an early warning for potential damage. Not to ignore the rest of the fields. Rather, this information will better prepare you for potential problems in the next few weeks.

When scouting for early season damage to corn seedlings, look for holes or irregular feeding injury to the corn leaves. Early instar black cutworm larvae are not capable of cutting plants. Although this injury by itself is non-economic, it does indicate a potential for more serious cutting and below ground tunneling by larger larvae. Other corn insect pests (seedcorn maggot, wireworms, etc.) may cause injury that is somewhat similar. However, seedcorn maggot injury is usually confined to the first or second leaf and newly emerging leaves will be free of damage. Above ground signs of wireworm damage will be caused by below ground tunneling and you will likely find these larvae still feeding below ground until later this spring.

Treatment is suggested if 5% of the plants have damage. Dig up several larvae and compare to the black cutworm head capsule gauge which is Table 2-9, page 63 in the Pest Management in Wisconsin Field Crops bulletin (http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2010-P155.aspx). Doing so will give you information on how much longer these larvae may be feeding and their potential for cutting plants. All important information needed to make a recommendation.

Black Cutworm Field Observation

Eileen Cullen, Extension Entomologist

As a supplement to Bryan Jensen's feature article on Black Cutworms in this Wisconsin Crop Manager issue, I include the following field observation provided this week by Nick Schneider, Winnebago County Agriculture Agent:

"Just made an interesting find yesterday. 2-3 black cutworm (4th instar) per large field pennycress in a field. They seemed to have a preference for that plant. Let's keep an eye on no-till."

A small population of black cutworms overwinters in Wisconsin, which explains Nick's find of 4th instar larvae. However, damaging populations come from moths that migrate to Wisconsin in May.

Females lay their eggs either singly or in clusters on low-growing vegetation such as chickweed, curly dock, mustards, (or pennycress as Nick observed) and plant residue from the previous year's crop. Corn planted after soybean is often a preferred oviposition site.

For more information and images, please visit the black cutworm page under the Insects heading on my web site: http://www.entomology.wisc.edu/cullenlab/insects/info/bcw.html#Images

Keeping up with Bt Corn Insect Traits and Refuge Requirements

Eileen Cullen, Extension Entomologist

For growers who incorporate Bt corn technology into their insect pest management strategy, Bt insect trait decisions are made during the hybrid selection process. Moreover, all Bt corn hybrids are sold with a low rate neonicotinoid insecticide seed treatment for protection against early season soil insect pests. Seed traits and seed treatment are input costs committed to before planting. This requires a good understanding of these inputs to make sure they are a necessary, effective, and economical fit for insect pest populations and history on a given farm and crop rotation. This article provides a synopsis of the increasing array of Bt corn hybrids available in 2010. Some of the Bt corn types have been available for 5-10 years, while others are only recently announced and will be planted on a limited acreage basis throughout the Corn Belt for 2010.

Single Bt trait to control European corn borer

Corn with this type of single Bt trait produces the Cry1Ab insecticidal protein from *Bacillus thuringiensis* (B.t.) effective against larvae (caterpillar stages) of European corn borer, southwestern corn borer and sugarcane borer. In Wisconsin and the North Central Region, they are commonly referred to as "Bt Corn Borer" hybrids because ECB is the primary target pest in the region. Corn earworm, fall armyworm and stalk borer are suppressed, but not controlled, by these single trait Bt hybrids. Suppression implies that feeding damage and yield impact may reach economic injury level under heavy pest pressure.

- **Products:** YieldGard® Corn Borer, Agrisure® CB/LL, Agrisure GT/CB/LL
- **Bt protein: Cry1Ab**
- **Refuge Required:** 20% (with corn hybrid that does not contain Bt technology for control of corn borers)
- **Refuge Structure:** within ½ mile, block, in-field strips at least 4 rows wide, in-field perimeter

Single Bt trait to control European corn borer and western bean cutworm

Another single Bt trait hybrid corn produces the Cry1F insecticidal Bt protein effective against larvae of European corn borer, southwestern corn borer and sugarcane borer. In addition, the Cry1F single trait controls western bean cutworm. Black cutworm and fall armyworm are also listed as pests controlled by Cry1F, and corn earworm is suppressed.

- **Products:** Herculex® 1
- **Bt protein: Cry1F**
- **Refuge Required:** 20% (with corn hybrid that does not contain Bt technology for control of corn borers)
- **Refuge Structure:** within ½ mile, block, in-field strips at least 4 rows wide, in-field perimeter

Single Bt trait hybrids that control either caterpillar pests above ground or corn rootworm larvae below ground.

Single Bt trait to control corn rootworms

This type of single Bt trait corn produces one insecticidal Bt protein, **either Cry 3Bb1, Cry34/35Ab1 or mCry3A**, effective against western and northern corn rootworm larvae. Protection does not extend to adult control later in the season, so you can find CRW beetles feeding on silks in a Bt CRW cornfield. These beetles may come from other fields. Additionally, some adult beetles are produced from surviving larvae in the Bt CRW cornfield. Compared to Bt proteins for European corn borer, Bt CRW proteins are expressed at a lower dose in the corn plant.

- **Products:** YieldGard® Rootworm, YieldGard VT Rootworm, Herculex®RW, Agrisure®RW, Agrisure GT/RW
- **Bt protein: Cry3Bb1** (YieldGard RW, YieldGard VT Rootworm); **Cry34/35Ab1** (Herculex RW); **mCry3A** (Agrisure RW, Agrisure GT/RW)
- **Refuge Required:** 20% (with corn hybrid that does not contain Bt technology for control of corn rootworms)
- **Refuge Structure:** within field or directly adjacent, block, in-field strips at least 4 rows wide, in-field perimeter

Stacked Bt traits to control caterpillar pests and corn rootworms

The important thing to remember about these Bt corn hybrids is that they combine two different types of Bt insecticidal proteins, for caterpillar pests and corn rootworms, but only one trait for each pest group. A "stacked" trait will have a single Bt corn rootworm trait and a single Bt corn borer or corn borer/western bean cutworm trait. These traits offer the same spectrum of pest control or suppression as their single trait

Stacked Bt trait hybrids combine a single trait to control caterpillar pests above ground with a single trait to control corn rootworms below ground.

options explained above, but are combined in one plant. A common refuge must satisfy the 20% refuge requirement for both pest groups, corn borers and corn rootworms. This means growers need to go with the more conservative structure and cannot place the refuge up to ½ mile from the Bt corn field. The refuge must be positioned to best suit corn rootworm.

- **Products:** YieldGard® Plus, YieldGard Plus RR2, YieldGard VT Triple, Herculex®XTRA, Agrisure® CB/LL/RW, Agrisure 3000GT

- **Bt proteins:** **Cry1Ab + Cry3Bb1** (YieldGard Plus, YieldGard Plus RR2, YieldGard VT Triple); **Cry1F + Cry34/35Ab1** (Herculex XTRA); **Cry1Ab + mCry3A** (Agrisure CB/LL/RW, Agrisure 3000GT)
- **Refuge Required:** 20% (common refuge with corn hybrid that does not contain Bt trait; separate refuge for each pest group can also be planted. Follow seed dealer instructions)
- **Refuge Structure:** within field or directly adjacent, block, in-field strips at least 4 rows wide, in-field perimeter.

Pyramided Bt traits to control caterpillar pests and/or corn rootworms

Pyramided Bt trait hybrids contain multiple Bt transgenes targeting the same pest complex.

The EPA recently approved Genuity® and Genuity SmartStax™(July 2009), and Agrisure® Viptera™ (April 2010) corn hybrids utilizing the "pyramid" strategy of a transgenic corn crop producing multiple Bt toxins targeting the same pests. For example, Agrisure Viptera 3111 targets Lepidopteran pests with both Vip3A and Cry1Ab genes and corn rootworms with mCry3A, and requires a 20% refuge. For the SmartStax corn hybrid products, Cry3Bb1 and Cry34/35Ab1 both target corn rootworms, while Cry1F and Cry1A.105+Cry2Ab2 target the Lepidopteran pest complex. EPA approval enables growers in the Midwest U.S. Corn Belt to reduce structured refuge size from 20% to 5% for SmartStax hybrids. According to EPA, multiple modes of action for corn rootworm and multiple modes of action for the Lepidopteran pest complex are a factor in reduced structured refuge size and long-term durability of corn Bt insect trait technologies. This "pyramid" strategy is based on the concept that selection for resistance to 1 toxin does not cause cross-resistance to the other toxin.

- **Products:** Genuity® VT Double Pro (VT2P), Genuity VT Triple Pro (VT3P), Genuity SmartStax™ (GENSS), Agrisure® Viptera™ 3111
- **Bt proteins:** **Cry1A.105 + Cry2Ab2** (VT2P); **Cry1A.105 + Cry2Ab2+Cry3Bb1** (VT3P), **Cry1A.105 + Cry2Ab2 + Cry 1F + Cry3Bb1 + Cry34/35Ab1** (GENSS), **Vip3A + Cry1Ab + mCry3A** (Agrisure Viptera 3111)
- **Refuge Required:** 5% for VT2P and GENSS; 20% for VT3P and Agrisure Viptera 3111.
- **Refuge Structure:** 5% within ½ mile for VT2P, 20% adjacent for VT3P, 5% adjacent for GENSS, and 20% adjacent for Agrisure Viptera 3111.

In-the-bag products that blend Bt trait corn and refuge corn

In early May 2010, the US EPA approved the first seed blend Bt Corn option. Current seed blend products are registered by Pioneer as Optimum®AcreMax™.

Seed blend "refuge in the bag" Bt trait hybrids.

AcreMax 1 corn is sold as a seed blend of 90% Herculex XTRA, and 10% of a hybrid of the same genetic family with Herculex I trait, which serves as the corn rootworm refuge. As mentioned previously, Herculex XTRA is a stacked trait corn combining corn borer/western bean cutworm protection above ground with corn rootworm protection below ground. The 10% Herculex 1 seed blended in the bag does not contain a Bt corn rootworm trait, thus is can serve as the CRW refuge. According to US EPA, the seed blend spatial arrangement in the field is a factor in allowing refuge in the bag at a reduced percentage (10%) for corn rootworm. However, the 20% corn borer refuge requirement still needs to be met and can be placed up to ½ mile from the AcreMax1 Bt corn field.

Optimum AcreMax RW is an in-the-bag product that contains 90% of a Pioneer brand hybrid with Herculex RW and 10% of a Pioneer non-Bt hybrid with herbicide tolerance that serves as the corn rootworm refuge.

- **Products:** Optimum AcreMax RW, Optimum AcreMax 1
- **Bt proteins:** **Cry34/35Ab1** (Optimum AcreMax RW), **Cry1F + Cry34/35Ab1** (Optimum AcreMax 1)
- **Refuge Required:** 10% in the bag (Optimum AcreMax RW), 10% in the bag for CRW and 20% up to ½ mile for corn borer (Optimum AcreMax 1).
- **Refuge Structure:** no structure for corn rootworm refuge (in the bag), block up to ½ mile away to serve as corn borer refuge.

Please see **Table 1** for a master list of transgenic traits with target pests and refuge requirements for Midwest corn. The table also includes information on herbicide tolerance and seed company registrants for the Bt corn product trade names. Special thanks to Dr. Chris DiFonzo, Michigan State University Field Crop Extension Entomologist, for sharing Table 1.

2010 is the first growing season in which multiple Bt corn options with a wider array of target pest complexes, differing refuge percentages, and structure vs. seed blend options are available simultaneously. Make sure to follow refuge percentage and structure requirements for the particular Bt corn products on your farm. Most Bt corn products available in 2010 in Wisconsin and the Corn Belt are stacked trait and single trait hybrids with a 20% structured refuge requirement. Estimated seed availability for SmartStax introduction is 3 to 4 million

acres across the Corn Belt, and Optimum AcreMax seed blend corn rootworm refuge in-the-bag less than that.

The introduction and trend toward an increasing array of Bt corn technologies is gradual in 2010, but expected to accelerate in 2011. Additional new registration requests and data from seed companies are currently in review by EPA. When selecting corn hybrids in the future it is important to base your decision on your field observations and knowledge of insect pest species, pest pressure and history on your farm or farms on which you consult.

Other Wisconsin Crop Manager articles this season will provide information about the importance of refuge requirements for insect resistance management and also as an opportunity to monitor Bt corn insect control performance. The overall goal of these articles is to help keep application of Bt corn technology within an integrated pest management (IPM) context.

"Refuge-in-the-Bag" Registration Approved by US EPA for Optimum AcreMax 1

Mike Gray, University of Illinois Urbana-Champaign, Crop Sciences

Note: We are pleased to reprint Mike Gray's article here with permission. Mike wrote an excellent article condensing detailed information and highlighting the key points related to last week's US EAP registration approval of "refuge-in-the-bag" Optimum AcreMax 1 Bt corn. The article was originally published May 7, 2010 in the University of Illinois Bulletin newsletter (No. 5, article 1)
http://ipm.illinois.edu/bulletin/article.php?id=1299

-Eileen Cullen

On May 3, DuPont announced that the US Environmental Protection Agency (EPA) had approved the company's request for a seed mixture refuge for corn rootworms when planting Optimum Acre-Max 1 Pioneer corn hybrids (seed blend of 90% Herculex Xtra [Cry 1F + Cry34/35Ab1] and 10% Herculex I [Cry 1F]). The press release indicated that this new approach will be used in some producers' fields this year in preparation for the 2011 growing season. Farmers who elect to use Optimum Acre-Max 1 Pioneer corn hybrids will be able to reduce their corn rootworm refuge from the current structured 20% to a 10% seed mixture. According to the May 3 media alert, "In addition to the Optimum® AcreMax™ 1 product registration announced April 30, the EPA also has granted Pioneer registration for Optimum® AcreMax™ RW products, which integrate 90 percent Herculex® RW seed and 10 percent of a hybrid from the same genetic family without biotech insect protection. All seed in the bag is herbicide tolerant." Herculex RW corn hybrids express the Cry 34/35Ab1 binary proteins.

On April 30, the US EPA Office of Pesticide Programs, Biopesticides and Pollution Prevention Division, released a 33-page Biopesticides Registration Action Document titled *Optimum®AcreMax™ B.t. Corn Seed Blends*. A number of quotes from the document, which may shed some additional light on this significant development, follow.

- "Given the potential benefits attendant to the blended refuge concept, EPA concludes that it is in the best interests of the public and the environment to issue the registrations for OAM 1 and OAM RW without delay for the 2010 growing season. The registration is only effective for the current growing season. Therefore, consistent with the Agency's policy for making certain registration actions more transparent, EPA is issuing these time-limited registrations with an initial period to expire September 30, 2010, and, concurrent with their issuance, providing a 30-day public comment period on the time-limited registrations" (p. 13).
- "The data from these model simulations indicate comparative durability values of 11.3 years for the 10% blended refuge and 20.2 years for the 20% block refuge. Thus, the 10% blend was 45% less durable than the 20% block refuge currently required for single trait CRW PIPs" (p. 7).
- "Based on our current assessment, we conclude that significant acreage of a 10% seed blend with a single, non-high dose mode of action such as Cry34/35Ab1 likely increases the risk of resistance for all B.t. corn products containing Cry34/35Ab1. But, the current time-limited registration will not likely increase the risk of resistance to Cry34/35Ab1" (p. 12).
- "Pioneer projects that the time-limited registrations being granted for the 2010 growing season will result in planting on only approximately 0.042% of acres of non-Red Zone geography corn acres; and only on approximately 0.077% of Red Zone geography corn acres. In the context of 90 million acres of corn planted in the United States annually, we conclude that plantings on such limited acreage will not have effects on CRW resistance development" (p. 12).
- "The Red Zone is defined by Pioneer as 90 counties that have a 100% chance of corn rootworm infestation in any given year. These counties are primarily located in northeastern Illinois, northwestern Indiana and, to a lesser extent, southeastern Wisconsin and southwestern Michigan. Because of the strong selection pressure present in the Red Zone, it is considered a potential area for corn rootworm resistance to develop" (p. 4).
- 90 days from the date of registration: "Pioneer must provide the Agency with a copy of the grower agreement, associated stewardship documents, and written description of a system, which assures that growers will sign grower agreements and persons purchasing OAM1 corn will annually affirm that they are contractually bound to comply with requirements of the insect resistance management (IRM) program" (p. 15).
- By December 1, 2010, for western corn rootworms and December 1, 2011, for northern corn rootworms:

"Pioneer must implement an enhanced resistance monitoring plan for OAM1" (p. 15).

- By December 1, 2010: "Pioneer must submit a detailed OAM1-specific resistance monitoring and remedial action plan, including an analysis to determine the expected field performance criteria for OAM1 products so that unexpected damage can be benchmarked" (p. 15).
- "Because the refuge for corn rootworm is blended in each bag or box of OAM1 seed, no additional corn rootworm refuge is required. A refuge must be planted for corn borers. The refuge must be planted with corn hybrids that do not contain Bt technologies for the control of corn borers" (p. 16).
- "External refuges must be planted within ½ mile. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The refuge can be protected from lepidopteran damage by use of non-Bt insecticides if the population of one or more of the target lepidopteran pests of OAM1 in the refuge exceeds economic thresholds" (p. 16).
- "We expect OAM1 to have the following benefits: (1) Reduced pesticide use in the refuge. . . . (2) Significantly less complicated refuge deployment for the corn rootworm active ingredient. . . . (3) Increased grower compliance with IRM requirements for the corn rootworm active ingredient" (p. 9).
- "In addition, *indirect benefits* of introducing Optimum® AcreMax™ 1 may include reduced energy consumption for manufacture, transport, and application of chemical insecticides; reduced waste streams arising from pesticide manufacture; reduced disposal of pesticide waste containers; and reduced residues from pesticide applications" (p. 10).

This registration opens up a new chapter in the implementation of resistance management strategies designed to delay or prevent resistance development to Bt corn hybrids. This development raises many additional questions:

- Will Pioneer's registrations for OAM1 and OAM RW be extended to include growing seasons beyond 2010?
- Will corn growers be sufficiently interested in this seed-blend approach to IRM if 10% of the seed must serve as a refuge? Our surveys of growers at the 2010 Corn and Soybean Classics indicated that if the refuge seed comprises 6% to 10% of a bag, interest in this approach fell below 60%. (See this article in issue 2 of *the Bulletin* for more details.)
- Will the US EPA extend registrations to other companies that allow seed mixtures to form the core of their IRM plans for Bt hybrids?
- Although producers who plant SmartStax hybrids in 2010 must implement a structured 5% refuge, will this requirement change to a seed- mixture IRM approach at the 5% level in subsequent growing seasons?
- With the likely transition to seed mixtures as the IRM foundation for corn rootworms, how much longer will the agribusiness community sustain the discovery, development, and marketing costs associated with soil insecticides?
- If corn rootworm resistance to Bt does develop at some point, what options will remain for growers to control this insect pest effectively? With crop rotation no longer an effective management option in many areas of the "Red Zone," we could have some significant challenges to confront if the soil insecticide market were to completely "dry up."

As I've indicated in earlier articles in the Bulletin, the early planting this season and favorable root establishment could help corn rootworm populations rebound from the past two seasons. Large root systems at the time of larval hatch (usually late May across central Illinois) could lower intraspecific competition for larval feeding sites and result in greater densities of western corn rootworms this year. I look forward to your reports this summer regarding how well corn rootworm products are performing.--*Mike Gray*

Protect your corn from cranes: Anthraquinone seed treatment spares crop

Eileen Cullen, Extension Entomologist

Of the approximately 4 million acres of corn planted by Wisconsin farmers every year, almost 3 million acres are potentially at risk from damage due to the Greater Sandhill Crane. To avoid crop loss, farmers can plan ahead by selecting seed that is pre-treated with the biopesticide anthraquinone, or by obtaining liquid seed treatment from a seed treatment retailer after seed purchase and before planting.

The US EPA has re-authorized the AvipelÒ Section 18 for anthraquinone field and sweet corn seed treatment for 2010.

A new UW Extension publication (A3897) explains why cranes are drawn to cornfields and how corn seed treatment can be an effective deterrent that takes corn seed off the cranes' "menu," protecting the corn crop while cranes remain in the field foraging for soil insects and waste grain.

Please visit the Cooperative Extension Learning Store web site to order hard copies, or download a free PDF of the A3897 fact sheet at:

http://learningstore.uwex.edu/Protect-Your-Corn-from-Cranes-P1416.aspx

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between May 5 and May 11, 2010:

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FORAGE			
Alfalfa	Crown Rot	*Fusarium* sp.	Green
	Phytophthora Root Rot	*Phytophthora* sp.	Green

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

(See next page for BT Corn tables) >>>

Table 1. Master list of transgenic traits with target pests and refuge requirements for Midwest corn updated 18 May 2010. (Adapted from: Chris DiFonzo, Michigan State University Entomology Dept)

Trait Group/ Name	Type of Bt	Target Pest(s)*	Herbicide tolerant?	Refuge % & Location
Agrisure Products [Syngenta; Syngenta + Mycogen/Dow]				
Agrisure CB/LL	Cry1Ab	ECB FAW, CEW, SB	LL	20% - ½ mile
Agrisure GT/CB/LL	Cry1Ab	ECB FAW, CEW, SB	GT LL	20% - ½ mile
Agrisure RW	mCry3A	CRW	--	20% - adjacent
Agrisure GT/RW	mCry3A	CRW	GT	20% - adjacent
Agrisure CB/LL/RW	Cry1Ab mCry3A	ECB FAW, CEW, SB CRW	LL	20% - adjacent
Agrisure 3000GT	Cry1Ab mCry3A	ECB FAW, CEW, SB CRW	GT LL	20% - adjacent
Agrisure Viptera 3110	Vip3A Cry1Ab	ECB FAW, CEW, SB BCW WBC	GT LL	20% - ½ mile
Agrisure Viptera 3111	Vip3A Cry1Ab mCry3A	ECB FAW, CEW, SB BCW, WBC CRW	GT LL	20% - adjacent
Herculex Products [Mycogen/Dow and DuPont/Pioneer]				
Herculex 1	Cry1F	ECB FAW, BCW WBC	LL RR2**	20% - ½ mile
Herculex RW	Cry34/35Ab1	CRW	LL	20% - adjacent
Herculex XTRA	Cry 1F Cry34/35Ab1	ECB FAW, BCW WBC CRW	LL RR2**	20% - adjacent
Optimum AcreMax Products [DuPont/Pioneer]				
Optimum AcreMax RW	Cry34/35Ab1	CRW	RR2	10% in the bag
Optimum AcreMax 1	Cry 1F Cry34/35Ab1	ECB FAW, BCW WBC CRW	LL RR2	10% in the bag for CRW 20% - ½ mile for ECB
YieldGard/ Genuity Products [Monsanto]				
YieldGard CB (YGCB)	Cry1Ab	ECB FAW, CEW, SB	--	20% - ½ mile
YieldGard RW (YGRW)	Cry3Bb1	CRW	--	20% - adjacent
YieldGard Plus	Cry1Ab Cry3Bb1	ECB FAW, CEW, SB CRW	--	20% - adjacent
YieldGard Plus w/ RR2	Cry1Ab Cry3Bb1	ECB FAW, CEW, SB CRW	RR2	20% - adjacent

YieldGard VT	Cry3Bb1	CRW	RR2	20% -adjacent
YieldGard VT Triple (VT3)	Cry1Ab Cry3Bb1	ECB FAW, CEW, SB CRW	RR2	20% - adjacent
Genuity Products [Monsanto; Monsanto + Mycogen/DowAgro]				
Genuity VT Double Pro (VT2P)	Cry1A.105 Cry2Ab2	ECB FAW, CEW	RR2	5% - ½ mile
Genuity VT Triple Pro (VT3P)	Cry1A.105 Cry2Ab2 Cry3Bb1	ECB FAW, CEW CRW	RR2	20% - adjacent
Genuity SmartStax (GENSS) - Monsanto or SmartStax - Mycogen	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34/35Ab1	ECB FAW, CEW, BCW, WBC CRW	RR2 LL	5% - adjacent

* ECB - European corn borer; CRW - corn rootworm; FAW – fall armyworm; BCW – black cutworm; CEW – corn earworm; WBC – western bean cutworm; SB – stalk borer. LL-Liberty Link (glufosinate) herbicide tolerant, GT-gylphosate herbicide tolerant, RR2-Roundup Ready herbicide tolerant

** Some hybrids also RR2 tolerant

TRAIT LIST

Trait	Event	Gene/Protein	What it does
Syngenta traits			
Agrisure GT	GA21	EPSPS	glyphosate tolerant
Agrisure CB/LL	Bt 11	Cry1Ab + PAT	controls ECB
Agrisure RW	MIR604	mCry3Aa	controls CRW
Agrisure LL		PAT	glufosinate tolerant
Agrisure Viptera	Pacha	Vip3A	controls various Leps
Monsanto traits			
RR, RR2	NK603, MON603	CP4	glyphosate tolerant
YieldGard CB	MON810	Cry1Ab	controls ECB
YieldGard RW	MON863	Cry3Bb1	controls CRW
VT RW	MON 88017	Cry3Bb1 CP4	controls CRW glyphosate tolerant
VT Pro	MON 89034	Cry1A.105 Cry2Ab2	controls ECB
Mycogen/Dow and DuPont/Pioneer traits			
Herculex 1	TC1507	Cry1F PAT	controls ECB glufosinate tolerant
Herculex RW	DAS-59122-7	Cry34/35Ab1 PAT	controls CRW glufosinate tolerant

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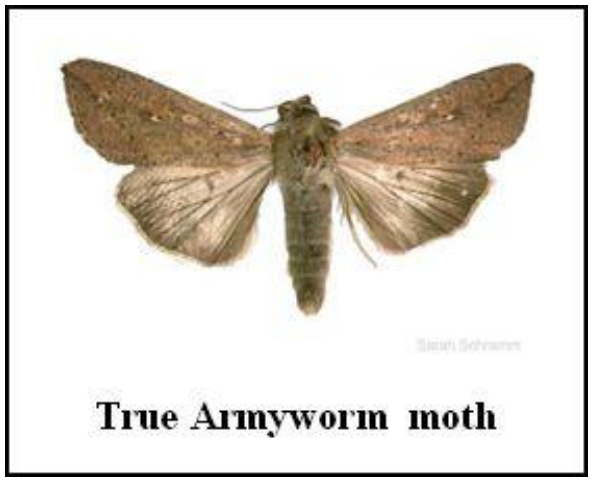
True Armyworm Reminders for Corn and Small Grains

Eileen Cullen, Extension Entomologist

The Wisconsin Pest Bulletin http://pestbulletin.wi.gov for May 14th reported that True Armyworm black light trap count at Janesville in Rock County decreased from the week before, but migrants may be abundant enough to cause localized problems in grasses and small grains. Moth flights typically increase in May and first generation larvae can be found feeding in corn and small grains in June.



True Armyworm moth

Grasses and small grains are the preferred egg-laying sites for female moths. For first generation, corn fields with crop residue, weeds or dead grass should be watched closely. Presence of grass weeds will attract moths for egg laying. Corn fields preceded by a winter rye crop may also attract female moths. As small grains are cut or grass weed hosts dry down, armyworm larvae can move quickly to corn, this can happen following a herbicide burn down in no-till or conventional tillage fields.

The greenish white eggs are laid in rows or clusters on leaves. One week to 10 days after the eggs are laid, larvae begin to emerge and feed. After 3-4 weeks, larvae pupate for 2 weeks and emerge as adults. There are three generations per season, each generation lasting approximately 5-6 weeks. The success of the first generation will set the stage for 2nd generation later in July. (The third, fall generation is typically not injurious and is often heavily parasitized by beneficial insects, fungi and viruses).

Larvae tend to feed at night or on cloudy days and hide in soil or under foliage during the day. Leaf feeding begins from the outer leaf margins, inward toward the leaf midrib – giving corn leaves a ragged appearance.

True armyworm larvae are brownish green, hairless, and have alternate dark and light stripes down their backs. There are six larval instars, reaching approximately 1-1/2 to 2-inches when full grown. After larvae reach approximately 1-inch, they are nearly full grown and will stop feeding and pupate. Therefore control recommendations are based not only on the number of larvae but also their size (smaller larvae will continue to feed for a longer time). Armyworm **economic thresholds for corn** (scouted from several areas in the field, checking 5 sets of 20 plants) are 2 or more armyworms at ¾-inch length or smaller per plant on 25% of the plants, OR, 1 armyworm (3/4-inch or smaller) per plant on 75% of the plants.

In wheat and pasture grasses, examine the soil between two rows at several points in the field and determine the number of larvae per square foot, populations at 3 larvae per square foot may justify treatment.

Photo credit Kevin Black

True Armyworm mature larva

Consult UW-Extension bulletin A3646 Pest Management in Wisconsin Field Crops for insecticide label information for armyworm in corn, small grains and pasture if economic thresholds are reached.

http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2007-P155C31.aspx

Keep in mind; none of the Bt corn rootworm or corn borer insect trait corn hybrids will control true armyworm. Bt fields should be scouted for armyworm activity in late May and June, and again in July for second generation.

For additional information and images, please visit the True Armyworm page at my UW Madison Field and Forage Crop entomology web site:

http://www.entomology.wisc.edu/cullenlab/insects/info/taw.html#Images

Soybean Aphid Overwintering Update

Eileen Cullen, Extension Entomologist

The North Central IPM Center Regional Soybean Aphid Suction Trap Network http://www.ncipmc.org/traps/index.cfm is coming on line for the 2010 growing season. Traps in 10 Midwestern states are turning on the suction traps for the season and will soon be monitoring winged soybean aphid dispersal from buckthorn to soybean fields throughout the region. We have started trapping at a few of the Wisconsin locations and all 7 Wisconsin suction traps should be operational over the next couple of weeks.

In early May, Dr. David Voegtlin, Illinois Natural History Survey and suction trap network coordinator, visited *Rhamnus cathartica* sites in Indiana, Ohio and Michigan. He found soybean aphid colonies at all the locations visited. As observed in Illinois earlier this spring, soybean aphids were not abundant at any location and most colonies were quite small.

The abundance reflected what Dr. Christian Krupke and Voegtlin observed last fall in egg deposition. They saw the most eggs in the Rome City area of N.E. Indiana and the colonies were most common there this spring. A few were producing winged individuals and at least half had late instar non-winged nymphs. They did not observe any fields with soybeans coming up in them, however, Dr. Dave Ragsdale at University of Minnesota says that the spring migrants appear to be very good at finding volunteer soybeans that have sprouted from last years crop.

For those watching for early spring colonization of soybeans this may be the place to look. Winged aphids produced now don't appear to have abundant host available but this seems to be the case every year and they do succeed.

To recap, fall 2009 soybean aphid suction traps in the North Central region recorded a massive September flight to Buckthorn. Over 3,000 winged soybean aphids were captured from the 7 Wisconsin locations for September. Over 50,000 soybean aphids were captured in September and October for the region.

- Although fall 2009 flights were very heavy, naturally occurring aphid-killing fungi had greatly decreased soybean aphid on buckthorn by November.
- Soybean aphids are susceptible to at least 7 species of entomopathogenic fungi, *Pandora neoaphidis b*eing one of the more common species.
- Strong biological control link likely in 'off-season' as demonstrated by aphid pathogenic fungi later in fall 2009, and correspondingly small colonies recovered from buckthorn in spring 2010.
- Fungal pathogen has dampened, but not eliminated, potential for soybean aphid infestation summer 2010. Populations may be lower than they would have otherwise been had the massive fall 2009 overwintering flights led to high overwintering survival.

New Factsheets Available that focus on Invasive Plant Control

Brendon Panke and Mark Renz, University of Wisconsin-Madison and University of Wisconsin-Extension.

There are a number of invasive plant fact sheets and fact sheet series available through a host of organizations. The preponderance of these sheets deals with the identification of invasive species and provides minimal information about control. While these are effective at educating people on how to identify these plants, more detailed information is required so effective management plans can be developed for these species. To resolve this issue the Renz lab in the UW-Madison Agronomy Department In cooperation with University of Wisconsin-Extension Team Horticulture, Wisconsin Department of Natural Resources and the Midwest Invasive Plant Network are developing a series of fact sheets on invasive plants and urban weeds.

This series summarizes important identifying characteristics for each featured species, as well as information necessary for developing a management plan. The bulk of each sheet lays out non-chemical and chemical control methods. Information highlighted includes timing of treatment for each technique, effectiveness of treatments, and remarks and cautions particular to each technique. Products or techniques known to provide effective control as documented by researchers and land managers or in common use are included. Those that do not provide sufficient control or lack information for effectiveness on target species have been omitted. It is our hope that these sheets will provide everyone with the information needed to manage invasive species in their specific situation. Below is a link to the first five sheets which are now available. We expect to create twenty factsheets over the summer of 2010. These will be announced as they become available, and will be located within the following website (http://ipcm.wisc.edu/Publications/WeedSciencepublications/tabid/116/Default.aspx)

NEW FACTSHEETS

Bush Honeysuckles

Canada Thistle

Wild Parsnip

Dame's rocket

Garlic mustard

Wisconsin Vegetable Crop Update, 2010-2

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue two is out! This marks the second newsletter of the 2010 year. Weekly updates should be available as disease, insect, weed, fertility, and crop progress changes.

The second issue has been posted on the IPCM web site on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page, or click here >>>
http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

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Carl Nachreiner: WI CCA of the Year

Bryan Jensen, IPM Program

Congratulations to Carl Nachreiner on being named the 2010 Wisconsin CCA of the Year! Carl is an agronomist for Landmark Services Cooperative and has over 30 years of crop advising experience. Including being part of the inaugural classes of Wisconsin CCA's in 1994. Carl's primary focus is on crop production including soil fertility, pest management and farm nutrient and conservation planning.

What is evident from Carls's nomination packet is that he places a high value on his integrity and the accuracy of his advice to growers and colleagues. His clients always come first and he makes himself available to them around the clock. This dedication to customer service is demonstrated by his ability to accurately assessing their needs; develop recommendations that have his client's best interest in mind, dissemination of timely information through newsletters and his continued commitment to training and education.

Carl's professional career includes volunteer work with several agriculture committees that include, but certainly not limited to, two terms on Wisconsin CCA Board (1998-2004), Wisconsin Atrazine Advisory Board, WCPA's Environmental Partnership Program, UW Extension's WeedSOFT beta testing group and the SE Wisconsin Nutrient and Pest Management Advisory Board. Carl also assists colleagues with review of their facilities and operating practices for environmental quality standards.

Many of us will run into Carl during the growing season or the winter meeting season. Please take the time to congratulate him on a job well done.

Congratulations Carl!

Delayed Soybean Emergence and Cotyledon Loss

Shawn P. Conley, State Soybean and Wheat Extension Specialist, John Gaska, Outreach Specialist, University of Wisconsin, Madison

Differing weather patterns across the state of Wisconsin this spring have left some growers extremely pleased with their soybean stands while others find themselves at various degrees of displeasure or disgust. In a previous article, I discussed Predicting When Soybeans Will Emerge. The model described in that article does not take into account the physics behind soybean emergence in compacted or crusted soil environments. Soybean emergence in tough environments like these can lead to low or variable stands, cotyledon loss, plant injury, or plant death.

To facilitate emergence in compacted or crusted environments, the soybean hypocotyl will swell to increase the force against the soil surface (Image 1). The force is sometimes too great and the hypocotyl snaps and the plant dies (Image 2). Other times, one or both cotyledons are broken off during emergence; however the unifoliate (and thus the apical growing point) remains intact (Image 3). If a plant loses one cotyledon, yield loss would be negligible. However if both cotyledons are lost, a yield loss of 2 to 7% is possible. Though I have not seen this in 2010 in 2009, I noted several fields where the soybean had leafed out under the soil surface prior to emergence. When these plants emerged, the unifoliates appeared bleached. Once photosynthesis began these symptom quickly dissipated. (Image 4).

Given the significant variability in soybean emergence we are currently experiencing, the logical question that will arise is "*Will this variability in soybean emergence lead to yield loss?*". It has been well documented by many corn agronomists that varibility in corn emergence can cause yield loss (Please see Trouble with Doubles, Gaps and Peepers by Joe Lauer). Yield loss caused by variable soybean emergence however has not been quantified in soybean, though anecdotal reports and testimonials may indicate otherwise. Stands that are below a threshold of 100,000 plants per acre at harvest will lead to decreased yield.

Image 1. Swollen hypocotyl.

One way to mitigate stand loss due to crusted soils is to use a rotary hoe to breakup the crust as soybean are emerging. We have successfully used this implement for many years with very positive results. A small amount of damage to an existing stand of soybeans will occur when using a rotatoy hoe, however the benefits from breaking up the crust and allowing the soybeans to emerge will far outweigh the damage. Set the hoe to only breakup enough soil to allow the plants to emerge. Rotaty hoeing can be delayed or eliminated if significant rain (usually over ¾") is in the forcast when soybean seedlings are struggling to emerge. Planning appropriate tillage ahead of time can reduce the need for rotary hoeing and insure a good stand of soybeans. This includes not working the soil when it is too wet, using no-tillage systems, and not overworking the soil so that the structure remains intact. Most crusting and compaction problems arise from excessive tillage at the wrong time.

Image 2. Broken hypocotyl and plant death.

Image 3. Cotyledon loss due to crusted soil.

Image 4. Soybean plant that had leafed out under the soil surface prior to emergence.

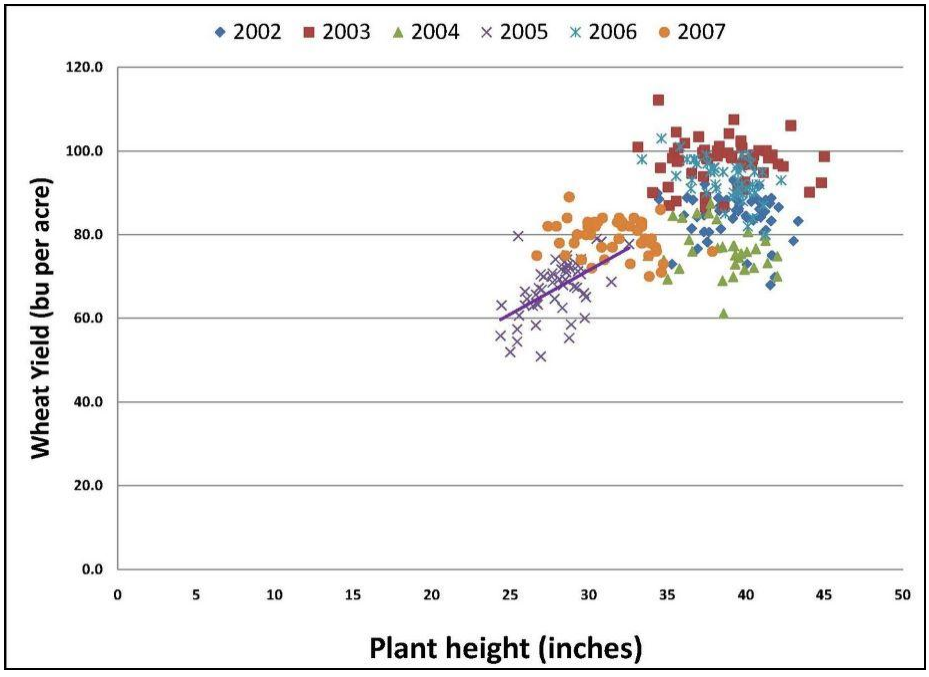
Plant height impact on wheat yield

Shawn Conley

As wheat begins to move into the flag leaf (Feekes 9) and boot (Feekes 10) growth stages many growers and consultants are commenting on the short stature of the 2010 wheat crop. We must first address the cause of the short wheat before we can assign yield estimates. Let's first address planting date. Late-planted wheat will generally be shorter than on-time planted wheat. The yield loss attributed to late-planted wheat is not merely a function of height but reduced tiller number and biomass capacity (planting date impact on wheat yield).

For our on-time planted wheat, development and in this case height is governed by many factors including water, temperature, as well as light quality and quantity. Data from our 2002-2007 winter wheat variety trials show only one year (2005) where there was a positive relationship between yield and plant height (Chart 1.). This suggests that height alone has no direct influence on wheat yield. As long as the minimum threshold for LAI (leaf area index) is reached wheat yield will then be determined by head number, head size, kernel number per spikelet, and kernel size. Since head number, head size, and kernel number per spikelet are already determined we are just waiting on the grain fill period to finalize our 2010 yield.

Chart 1. Relationship between plant height and grain yield.



Seed Treatment Choices for Growers Planting RR2Y Soybean in 2011

In a recent article published in Reuters, "Monsanto making changes amid farmer complaints" by Carey Gillam, Monsanto executive vice president Brett Begemann, indicated that growers will no longer be required to use seed treatments when planting RR2Y® soybean. This change in marketing strategy will effectively give growers the choice in 2011 to use no seed treatment, Monsanto's *Acceleron*™ seed treatment products or a competitors.

Youtube Video on Soybean Early Season Injury Questions

Dr. Shawn Conley, the Wisconsin soybean and small grains Extension specialist, visits a soybean field to demonstrate the process.

Please visit http://www.youtube.com/watch?v=xOZV9vLCMxs to view a video on diagnosing early season soybean injury.

For more information from Dr. Conley, visit http://www.coolbean.info

Are Early Season Applications of Foliar Fungicides Needed for Corn in Wisconsin?

Paul Esker, Field Crops Extension Plant Pathologist

Corn planting in Wisconsin continues to progress with 89% of the expected acreage planted and 51% emerged (Source: USDA-NASS, 24 May 2010). As we look ahead to the early part of the growing season for corn diseases, we have received questions about the use of early applications of foliar fungicides for improved corn plant performance. These early season applications correspond to the V4 to V7 growth stages and reasons for considering the use of such applications are discussed very well in a recent Iowa State University article. To date, there is somewhat limited data from the NC-Region about these early season applications of foliar fungicides, but a summary of regional trials can be found at the University of Illinois. We will discuss our 2009 Wisconsin trial in more detail below, but the overall results compiled from across the region indicated that the greatest yield response to foliar fungicides were found in trials where applications were made at VT/R1 and also in situations where disease intensity was highest.

Focusing back on Wisconsin from 2009, we had one trial located at the Lancaster Agricultural Research Station that examined different timings and application rates for Quilt, Quilt Xcel, Stratego and Headline fungicides. Of those treatments, early season applications were only conducted for Headline and Quilt Xcel. This trial did have hail damage, as on July 24, pea to marble size hail occurred. As such, we modified our late season disease assessments to incorporate measures for ear rots and early stalk lodging that may be correlated with hail damage. The trial was harvested in late October and results are presented in Table 1. For grain yield, moisture, and test weight, there was no evidence of an effect of fungicide treatment (either early or at VT/R1) on these measures. Also, there was no evidence of differences in ear molds, top dieback or anthracnose stalk rot among these treatments. Results from our 2009 trial were

variable and this is something we hypothesized was more due to the hail event than to other factors like disease. For example, the CV for grain yield was 25%, a value that was much higher than we would normally expect in our trials. However, there was no evidence that fungicide applications improved grain yield or other yield responses in the presence of hail in addition to our initial focus on early season fungicide applications. A table can be found at the bottom of this page detailing the foliar fungicide trials conducted at the Lancaster ARS in 2009.

Looking Ahead in the Wheat Crop – Fusarium Head Blight

Paul Esker, Extension Field Crops Plant Pathologist

In some areas of Wisconsin the winter wheat crop is starting to move into early heading (or Feekes 10.1). With the warm weather we are currently experiencing, it is expected that the wheat crop will remain ahead of 2009 conditions and that we should soon seen evidence of flowering in portions of the state. In order to better prepare for the decision-making process for control of Fusarium head blight, consult the UWEX You Tube video by Shawn Conley on identifying anthesis in wheat.

Additionally, I have begun to monitor more closely the risk predictions for Fusarium head scab in wheat forecast and will be providing updates over the next few weeks as the wheat growth changes in different areas of the state. As of the week of May 24, the current predicted risk across the state is **low**. Overall, our observations of leaf diseases during 2010 have indicated that powdery mildew is the primary disease of concern but there have also been reports of Septoria leaf blotch, low levels of leaf and stripe rust, and some evidence of bacterial leaf diseases. The latter is one disease(s) that we have few options for control (i.e., fungicides are not effective) at this point in the growing season.

As a reminder, paying attention to the wheat growth stage as we move into flowering is very critical. Most commercial fungicide products are only labeled through Feekes 10.5 (full heading) and others have restrictions based on days to harvest. Below is a partial summary of many products and this can also be accessed here. Note that not all products may be listed and that not all products (especially some generic forms of tebuconazole) may be approved in WI. It is important to always check the label for specific use requirements.

Restrictions based on growth stage of Feekes 10.5 = Quadris, Headline, Tilt, Propimax, Bumper, Twinline, Quilt, Quilt Xcel

Restrictions based on a 30 day PHI = Caramba, Proline, Prosaro, Tebuconazole-based products (e.g., Folicur, Embrace, Monsoon, Muscle, Orius, Tebucon, Tebustar, Tebuzol, Toledo, Tegrol)

Restrictions based on a 35 day PHI = Stratego (also has a Feekes 10.5 restriction)

Table 1. Summary of the foliar fungicide trial conducted at the Lancaster ARS in 2009 that examined early-season applications of foliar fungicides for corn. Disease assessments presented in this table were made on 8 September 2009 and the harvest date was 27 October 2009.

Treatment	Rate	Grain yield	Grain moisture	Test weight	Ear rots**	Top dieback	Stalk rot
	(oz/A)	(bu/A)	(%)	(lb/bu)	(%)	(%)	(0-5)
UTC	-	107	25	50.7	5	10	1.7
Quilt @ R1	14	109	24	51.4	15	20	2.7
Quilt Xcel @ R1	10.5	119	25	51.3	10	20	1.7
Quilt Xcel @ R1	14	93	23	52.7	13	18	2.4
Headline @ R1	6	93	25	51.6	8	10	1.2
Stratego @ R1	10	141	25	51.2	15	8	1.4
Quilt Xcel @ V6	10.5	117	26	51.1	15	15	1.3
Headline @ V6 fb Headline @ R1*	3 fb 6	117	27	51.4	8	13	1.5
Headline @ V6	3	107	23	51.4	5	18	2.8
Headline @ R1*	6	128	26	52.0	3	8	1.0
Headline @ V6 fb Headline @ R1*	6 fb 6	110	25	52.0	13	13	1.9
Headline @ V6	6	115	25	51.7	15	10	1.1
P-value		>0.5	0.23	0.2975	>0.5	>0.5	0.2975
LSD		NSD	NSD	NSD	NSD	NSD	NSD

* Treatments also had NIS mixed at 0.25% v/v. "fb" = followed-by.

** The disease intensity measure for ear rots was incidence and our assessments did not attempt to differentiate the type of ear rot; for top dieback, the disease intensity measure was also incidence; for stalk rot, the disease intensity measure was a stalk rot rating from 0 to 5 using the University of Illinois scale for five stalks per plot (destructively sampled).

MicroSPEC: A decision philosophy for managing micronutrients

Matt Ruark, Extension Soil Scientist, Department of Soil Science

Deciding when to apply micronutrients [Boron (B), Manganese (Mn), Zinc (Zn), Copper (Cu), Molybdenum (Mo), Iron (Fe), Nickel (Ni) and Chlorine (Cl)] in crop production systems is often a difficult task. Micronutrient fertilizers are sold in a variety of packages and marketed as a low-cost insurance for your cropping system. But, do you need to apply micronutrients? To answer this question, first consider your **S**oil, then your **P**lant, then your **E**xperiences, then your **C**orrective options, referred to as the **MicroSPEC** philosophy. Information on how micronutrients are affected by soil and cropping systems can be found in several University of Wisconsin-Extension (UWEX) publications. These publications include *Nutrient application rates for field, vegetable, and fruit crops in Wisconsin* (UWEX pub. A2809) and our *Understanding Plant Nutrients* series (UWEX pubs. A2522, A2526, A2527, A2528, A3554, A3555 and A3556).

Soil – Soil properties and characteristics govern plant availability of most nutrients. Soil pH, texture and organic matter all control plant available micronutrient concentrations in soil solution. For example, Zn availability decreases as soil pH increases above 6.5 and Cu availability decreases as soil pH increases above 7.5. Also, soil tests have been developed to evaluate the status of some micronutrient concentrations in soil (e.g. Boron, Zinc and Manganese) (see UWEX pub. A2809). Knowing the abundance of the micronutrient, or factors controlling its availability is the first step in evaluating micronutrient need.

Plant – Does your crop have a "high demand" for micronutrients? UWEX guidelines have indicated the relative micronutrient requirements (B, Cu, Mn, Mo and Zn) for all crops grown in Wisconsin (see table 8.3 in UWEX pub. A2809).

Experiences – What are your experiences telling you? Have you observed micronutrient deficiency symptoms on the plant? If so, this should be confirmed with both a soil and plant tissue test. Interpretation of a plant tissue test is specific to each crop and timing of sampling (http://tinyurl.com/plantsampling). Photos of micronutrient deficiency symptoms can be found at http://www.agronext.iastate.edu/soilfertility/nutrienttopics/deficiencies.html. It is also important to consider the weather conditions during the growing season. If drought or flooding occurs, this can limit the plants availability to uptake nutrients. Once soil moisture returns to adequate levels, growth and uptake will resume. How have you managed your crop rotation lately? Increasing the occurrence of high micronutrient demand crops in rotation along with increasing yield can lead to greater micronutrient export from your soil system. Have you applied manure? Applying manure to satisfy nitrogen, phosphorus, potassium or sulfur requirements of the crop also applies sufficient levels of micronutrients. Micronutrient deficiencies are extremely rare in fields receiving annual additions of manure.

Corrective options – If your soil characteristics and soil tests indicate your soil may be deficient in plant available micronutrients, you are growing a high micronutrient demand crop and plant tissue tests indicate less than sufficient levels then micronutrients should be applied. There are several forms of micronutrient fertilizers (e.g. inorganic, chelates, liquid) and methods of application (broadcast, band-applied, foliar-applied) that are available. The recommended application rates with respect to form and method of application are outlined in UWEX pub. A2809. The value of your crop may also influence whether you want to or can afford to apply micronutrients. There is little agronomic or environmental harm in applying micronutrients to high or medium demand crops at UWEX recommended rates. But little, if any, return will be seen on this investment unless a micronutrient deficiency truly exists. Also be aware of the rates that are being applied to ensure that they are below what would be toxic to the plant.

Unfortunately, there is no magic bullet for deciding when to apply micronutrients. But following the **MicroSPEC** philosophy will allow you to make a reasoned decision regarding your micronutrient applications. It is important to evaluate each micronutrient independently, as each nutrient is affected in different ways by soil, plants and weather. For further information on micronutrients, please visit www.soils.wisc.edu/extension/secondary.php.

Wisconsin Crop Manager

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Fusarium Head Blight Forecast - 27 May 2010

Shawn P. Conley, Soybean and Wheat Extension Specialist

With the warmer than normal temperatures we have experienced the past week, the winter wheat crop is rapidly progressing. In some of our research trials, we are at full heading into early flowering and now is an important time to consider the risk for Fusarium head blight. As a follow up on my earlier posting from this week, the current risk for FHB around the state is (27 May 2010): low with some small pockets of medium to high risk (highest risk along the Lake Michigan shoreline)

Over the next 1 to 3 days, the forecast risk is low for Fusarium head blight. For those fields where the winter wheat crop is a little further behind, the critical period to monitor will most likely be in the next week or so. Continue to monitor the Fusarium Head Blight Prediction Center for the most up-to-date information.

Troubleshooting Fields Using Plant Analysis

Carrie Laboski

Introduction

Plant analysis can be a useful tool for troubleshooting plant nutrition related crop production problems during the growing season. From a troubleshooting standpoint, plant analysis can confirm visual symptomology of nutrient deficiencies or toxicities, reveal early stages of nutrient deficiencies, and determine the availability of nutrients for which a reliable soil test does not exist or soil test calibration has not been completed. Plant analysis can also be used to assess a crop's response to applied nutrients, particularly where different treatments may have been applied in the same field (eg. strips with and without sulfur addition).

Over the past several years, agronomists have become increasingly interested in using plant analysis to help troubleshoot problem fields or identify slight nutrient deficiencies that might hinder a producer from achieving high yields. Therefore, the objective of this article is to describe the use and limitations of plant analysis for troubleshooting fields.

The Basics of Plant Analysis

As previously stated, plant analysis can detect nutrient deficiencies and assess a crop's response to applied nutrients. However, in order for plant analysis results to be a useful diagnostic tool a few guidelines must be followed.

First, take good notes. When visiting a field, take written notes describing any visual symptomology paying attention to where on the leaf and plant the symptoms occur. For example, yellowing of leaf margins on older leaves, new leaves appear ok. Also note where in the field the symptoms occur and if any pattern is apparent as you look across the landscape. Sketch a map of the affected area noting drainage, topography, soil color, soil texture, and other features that might affect plant growth. Photographs including close-ups and panoramas can be very useful to document how a field looked at a particular point in time. In panoramic photos, try to include a landmark (such as a house, telephone pole, grove of trees, etc.) that will be visible as the crop continues to develop. This can be useful when you go back to the field to make sure you are looking at the same areas. If possible, you could leave a flag or other marker or use GPS to mark the boundaries of the abnormal and normal areas.

In addition to assessing the plant's foliage, look at the plant's roots by carefully digging up a plant or two. If the crop is a legume, determine if nodules are present and active (inside of nodule is pink). Also look for signs of soil compaction, which include pancaked roots, overly thickened roots, roots that are gnarled, poor soil structure and/or stunted plant growth. Other information that should be noted include: weather conditions throughout the growing season along with current growing conditions; crop management practices (planting date, hybrid/variety, tillage, pest management, etc.); and field history (crop rotation, manure application, past problems, etc.). All of

this information can be helpful in interpreting plant analysis results and making a decision on what can be done to remedy the problem. Sometimes the most challenging diagnostic situations are those where background information is either incomplete or inaccurate.

Second, when troubleshooting a field, obtain plant samples from both abnormal and normal parts of the field AND take soil samples that correspond to these areas. The reason to sample normal and abnormal parts of the field is to compare the results. Nutrient concentrations for a crop may vary somewhat by hybrid/variety, soils, and local growing conditions. Thus, comparing an abnormal sample to a good sample for the same field may be more useful than using sufficiency range interpretation categories alone. Soil samples from the abnormal and normal areas are extremely helpful in assessing if the diagnosed nutrient deficiency is related to low availability of the nutrient in the soil or weather or field conditions that limited nutrient uptake. An example of this is where soil compaction has limited potassium uptake and resulted in potassium deficiency even though the soil test level is optimum throughout both the normal and abnormal areas. This is also an example of why assessing at plant roots and weather conditions are useful. Another example is where plant analysis reveals manganese toxicity and the soil test reveals that the pH is 4.8. Without the soil test, you might assume low pH is a problem, but you would not know for certain.

Third, sample the appropriate part of the plant for a given growth stage and collect an adequate number of samples. The concentration of nutrients in plant tissue generally decreases as the crop becomes more mature. Sufficiency ranges and to some extent DRIS indices were developed based on a specific plant part sampled at a specific growth stage. Sampling the incorrect plant part for a growth stage will lead to inaccurate interpretation of the plant analysis. In addition, a sample should be comprised of tissue taken from an adequate number of plants such that the sample is

Table 1. Plant part to sample and number of plants that comprise one sample for crop growth stages that have plant analysis interpretations. From UW Soil & Plant Analysis Lab's plant sample submission form.

Field Crops	Stage of Growth		Plant Part Sampled		Number of Plants
Alfalfa	1	Bud to first flower	A	Top 6 inches	30-40
Alfalfa hay	2	Harvest	B	Whole plant	15-20
Barley	12	Prior to heading	L	Newest fully developed leaf	30-40
Beans, dry lima	8	Prior to or at initial flowering	H	4th petiole and leaflet or 4th petiole only	20-25
Beans, snap	8	Prior to or at initial flowering	H	4th petiole and leaflet or 4th petiole only	20-25
Beans, soy	8	Prior to or at initial flowering	H	4th petiole and leaflet or 4th petiole only	20-25
Birdsfoot trefoil	1	Bud to first flower	A	Top 6 inches	30-40
Brome grass	12	Prior to heading	L	Newest fully developed leaf	30-40
Canary grass	12	Prior to heading	L	Newest fully developed leaf	30-40
Clover, red	1	Bud to first flower	A	Top 6 inches	30-40
Clover, red hay	2	Harvest	B	Whole plant	15-20
Crown vetch	1	Bud to first flower	A	Top 6 inches	30-40
Corn, field	3	12 inches	C	Whole plant	10-15
	4	Pre-tassel	D	Leaf below whorl	15-20
	5	Tassel to silk	E	Ear leaf	15-20
	6	Ensiled/chopped	F	Whole plant	10-15
Corn, sweet	7	Tassel to silk	G	Ear leaf	15-20
Oats	12	Prior to heading	L	Newest fully developed leaf	30-40
Orchard grass	12	Prior to heading	L	Newest fully developed leaf	30-40
Peas, canning	8	Prior to or at initial flowering	H	4th petiole and leaflet or 4th petiole only	20-25
Peas, chick	8	Prior to or at initial flowering	H	4th petiole and leaflet or 4th petiole only	20-25
Potato	9	Prior to or at initial flowering	I	4th petiole and leaflet or 4th petiole only	40-50
	10	Tuber bulking	J	4th petiole and leaflet or 4th petiole only	40-50
Rye	12	Prior to heading	L	Newest fully developed leaf	30-40
Sorghum, grain	13	Prior to heading	M	2nd fully developed leaf	15-20
Sorghum, sudan	14	Prior to heading	N	Newest fully developed leaf	15-20
Triticale	12	Prior to heading	L	Newest fully developed leaf	30-40
Wheat	11	Tillering	K	Newest fully developed leaf	30-40
Wheat	12	Prior to heading	L	Newest fully developed leaf	30-40

Fruits	Stage of Growth		Plant Part Sampled		Number of Plants
Apple	15	Current season's shoots	O	Fully developed leaf at midpoint of new shoots	10-20
Cherry	15	Current season's shoots	O	Fully developed leaf at midpoint of new shoots	10-20
Cranberry	18	Aug 15 to Sept 15	R	Current season's growth above berries	35-50
Raspberry	17	Aug 10 to Sept 4	Q	6th & 12th leaf blade and petiole from trifoliate	10-20
Strawberry	16	At renovation before mowing	P	Fully developed leaflets and petioles	10-20

Vegetables	Stage of Growth		Plant Part Sampled		Number of Plants
Cabbage	22	Midseason	V	Wrapper leaf	10-20
Cauliflower	20	Midseason	T	Youngest mature leaves	10-20
Carrots	20	Midseason	T	Youngest mature leaves	10-20
Celery	20	Midseason	T	Youngest mature leaves	10-20
Ginseng	20	Midseason	T	Youngest mature leaves	10-20
Lettuce	22	Midseason	V	Wrapper leaf	10-20
Onion	19	Midseason	S	Tops, no white	10-20
Pepper	23	Prior to or at early fruit development	W	Petiole and leaflet	10-20
Tomato	21	Midseason	U	Newest fully developed leaf	10-20

representative of the area and enough tissue is collected for the lab to analyze. Table 1 outlines the plant parts to sample at each growth stage and the number of plants that should comprise one sample. The growth stages for each crop listed in Table 1 are the only ones for which there is an interpretation of the plant analysis results. If a crop growth stage is not listed in Table 1, then a plant analysis interpretation is not available.

Fourth, place the sample in a paper envelope and send to the laboratory. Placing plant samples in a plastic bag is not acceptable. If soil has splashed onto plant tissue brush it off, but do not wash the leaves, before placing the sample in the bag. Clearly label samples and fill out sample submission forms completely. Failure to fill out a sample submission form completely or accurately can result in incorrect interpretations. Contact your laboratory in advance to obtain more information on how the lab would like samples submitted.

Fifth, review plant and soil analysis results in conjunction with field notes. Ask yourself if the plant analysis interpretations make sense based on your field assessment. If your answer to this is no or you aren't sure, then contact your local County Extension office and/or soil fertility specialist for assistance.

Limitations of Plant Analysis

Plant analysis is not without limitations. In fact many of the guidelines in the previous section are based on these limitations. The ability to remediate a nutrient deficiency identified by plant analysis is another limitation. For example, the deficiency may have already caused yield loss; the crop may not respond to additional nutrients at the growth stage tested; the crop may be too large for nutrient application; and/or the weather may be unfavorable for fertilization and/or for crop to benefit. In these situations, plant analysis can be a decision making guide for the next season's crop.

Analyzing plant analysis data from samples submitted to the UW Soil and Plant Analysis Lab from 2005 through 2009 suggests that there are a few areas for improvement in sampling for plant analysis. First, the percentage of plant samples submitted with corresponding soil samples has decreased over the past couple years. Second, the percentage of plant samples submitted as normal, as opposed to abnormal, in 2009 was 57%, 79%, and 83% for alfalfa, corn, and soybean, respectively. Without surveying everyone who submitted plant samples, the first two points suggest that agronomists are sampling fields looking for potential problems or sample submission forms were not filled out accurately. When looking for potential problems care must be taken not to over interpret nutrient concentrations that might fall just below the sufficiency range and assessing the bigger picture (economics and temporal/weather patterns effect on nutrient availability) is important in determining if remedial action is required. Third, a large percentage of soybean samples submitted in 2009 were submitted from mid-July thorough late-August. The appropriate sampling time for soybean is prior to or at initial flowering (R1). It is very likely that these soybeans were beyond R1 and thus, the interpretation of the plant analysis would be inaccurate.

Summary

Plant analysis can be a very helpful diagnostic tool when used properly. Thoroughly researching field history and assessing the present problem are just as important as taking samples properly to obtain a correct diagnosis. Failure to follow plant analysis sampling guidelines may result in inaccurate interpretation of results. Plant analysis is not a substitute for a consistent soil sampling program followed by appropriate lime and nutrient applications.

For additional information on plant analysis see:

Kelling, K.A., S.M. Combs, and J.B. Peters. 2000. Sampling for plant analysis. UW Soil and Plant Analysis Lab. http://uwlab.soils.wisc.edu/madison/index.htm?../forms.htm&contents.asp

Kelling, K.A., S.M. Combs, and J.B. Peters. 2000. Using plant analysis as a diagnostic tool. New Horizons in Soil Science. No.6-2000. Department of Soil Science, University of Wisconsin-Madison.

Schulte, E.E., K.A. Kelling, J.B. Peters, and S.M. Combs. 2000. Plant analysis interpretations used in the revised Wisconsin program. New Horizons in Soil Science. No.7-2000. Department of Soil Science, University of Wisconsin-Madison.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between May 26 and June 2, 2010:

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FORAGE			
Alfalfa	Aphanomyces Root Rot	*Aphanomyces euteiches*	Jefferson
	Crown Rot	*Fusarium* sp., *Pythium* sp., *Rhizoctonia solani*	Walworth
			Jefferson
	Phytophthora Root Rot	*Phytophthora* sp.	Walworth
FRUITS			
Elderberry	Rust	*Puccinia bolleyana*	Green
Pear	Cold Injury	None	Barron

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Refuges have more value than for IRM

Dean Volenberg, Agricultural Educator, UW Extension Door County

Since corn hybrids containing Bt traits were first introduced in 1996 for European corn borer, a refuge of non-Bt corn consisting of 20% of the acreage has been required within a half mile of the Bt corn. In 2003, with Bt corn rootworm (CRW) hybrids, the 20% refuge remained with the non-Bt CRW refuge required within or directly adjacent to the field. This season, with the addition of more Bt traits with multiple modes of action that target corn rootworm and a range of caterpillar insect pests, refuge acres have been reduced to 5% for some multi-trait Bt corn hybrids. Check with your seed dealer to confirm refuge requirements (20% or 5%) for your 2010 seed selection if you purchased Bt insect traits.

The refuge preserves insect pests that are susceptible to Bt. Should an insect pest evolve resistance to Bt corn, the resistance trait would likely not be passed on to the next generation because Bt susceptible individuals will be in much greater numbers than the Bt resistant individual. Because of this, mating would most likely occur between a Bt resistant individual and a Bt susceptible individual. The resulting offspring would be Bt susceptible since the Bt resistance trait is not dominant in insect pests. To date, the refuge strategy in corn has worked and corn pests have not evolved resistance to Bt. However, the refuge also serves as an important decision tool besides complying with the insect resistance management (IRM) requirement.

Refuges provide you the opportunity to evaluate your insect pest management plan. The question you should be asking yourself is "are the Bt traits working?" The refuge helps you answer this question by serving as a control or untreated check in which you can compare the efficacy of the Bt corn. This is not to suggest that you leave your refuge corn acres unprotected. You should consider treating refuge corn with a soil insecticide or seed treatment at planting to protect corn yield in your refuge acres, especially if you are planting corn on corn and CRW adult beetles were at or above established economic thresholds last fall. The refuge provides you the opportunity to evaluate your insect pest pressure levels during the growing season. Do not wait till harvest and compare yields between your Bt corn and your refuge corn because the information is only anecdotal and tells you nothing of insect pest pressure without in-season insect scouting observations. In insect pest management, there is more to evaluate than corn yield.

To determine the effect of Bt traits on insect pests, insect pests must be present. We can use direct or indirect methods to detect the presence of insect pests. For example, we could use traps to monitor pest populations or we could look for pest damage, root pruning on corn, ear or kernel feeding, etc. (Table 1). No matter the method, we are interested in answering this question: Are pests at economic thresholds that would result in yield loss? Pests are usually always present, but not always at levels in which yield losses will result. If pests are at economic thresholds in the refuge and not in the Bt corn, this suggests that the Bt traits are working. Next identify, what pests are present in the refuge to determine if the traits you purchased will control the pest. Bt traits are specific and target certain pests or pest complexes. Information on type and numbers of corn insect pests and crop damage estimates will allow you to make informed pest management corn hybrid selections next season.

The corn refuge is an important tool to use when monitoring corn insect pests. You bought the traits, now make sure they were worth the investment by evaluating your corn for pest damage.

Clover Coming up in Alfalfa Fields

Dan Undersander, Forage Agronomist

It is important to recognize that clover seed can lay dormant in a field for 15 or more years and then, with the right environmental conditions, will come out of dormancy. We saw this same "clover bloom" in alfalfa fields about 12 years ago.

While the source of the clover seed can be difficult to determine, there are several clues that can help determine whether or not alfalfa seed and clover were planted together. Clearly the clover was not seeded with the alfalfa if:

1) Some emerging clover plants are in between the seeded rows, if a drill was used for seeding.

2) Is any clover coming up in areas the seeder did not cover, e.g. on corners, edges or other

skip areas of the field? With either a brillion seeder or drill,

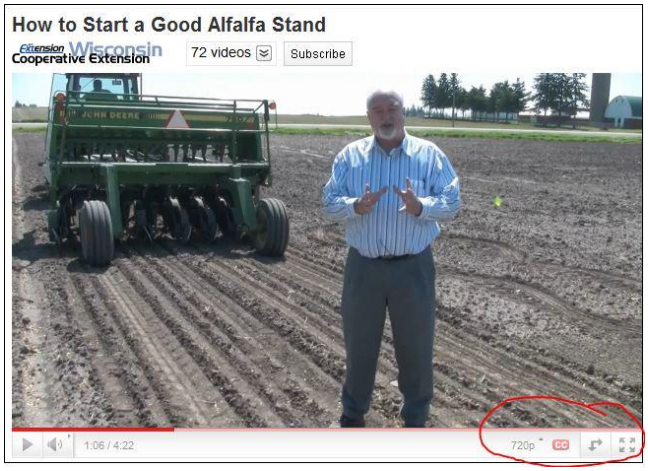
3) Is clover coming up on the edge of the field in areas not seeded?

4) If the farmer seeded more than one field, is clover coming up on all fields?

Usually one or more of the above will indicate that the clover was not seeded with the alfalfa.

Now Available: A YouTube Video on Establishing a Good Alfalfa Stand

We have made a 4.22 minute video on establishing alfalfa and grasses showing the conditions necessary for a good forage stand from drills and brillion seeders. The video ends showing what a good new seeding of alfalfa looks like. This video is available at: http://www.youtube.com/watch?v=y9EBsD1BfXQ



For the best quality playback, choose the 720p or 1080p option on YouTube. If you have a fast internet connection and a pretty good computer, it should playback smoothly and in very sharp

detail.

This video is the first in this season's series produced by the University of Wisconsin Integrated Pest Management Program. Many more topics are already on the UWEX YouTube channel for you to view.

Wisconsin Vegetable Crop Update, 2010-3

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newletter issue three is out! This marks the third newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The third issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here:
http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Pest Management Field Day on July 6 - Arlington Agricultural Research Station

Bryan Jensen, IPM Program

Please reserve July 6 for the annual Pest Management Field Day at the Arlington Agricultural Research Station. Several UW Extension, College of Agriculture and Life Sciences faculty, staff and students will be presenting information on current pest management research topics. More information on speakers, topics, times will follow in next week's Crop Manager.

Vegetable Disease Update

A.J. Gevens, Department of Plant Pathology, UW-Madison

Potatoes

Late blight update: At this time, there are no reports of late blight on tomatoes or potatoes in Wisconsin. New confirmations continue to come in from other states, with the latest from northern Kentucky. Tomato late blight was confirmed on tomato plants from a home garden by extension plant pathologist Kenny Seebold (Univ. of KY) late last week. This find brings with it a greater concern, as the tomato transplants were supposedly from a producer in southwestern Michigan that supplied Wal Mart. I am unaware of any confirmation of late blight in Michigan at this time. Additional evaluation of tomato transplants at a Wal Mart near the Univ. of KY campus, resulted in the finding of tomato plants positive for late blight - and all with the same labels ndicating the southwestern MI source. To date, confirmed late blight reports in 2010 have come from FL, LA, MD, PA, and KY. Late blight is likely present in additional geographic locations at this time, but has just not yet been confirmed.

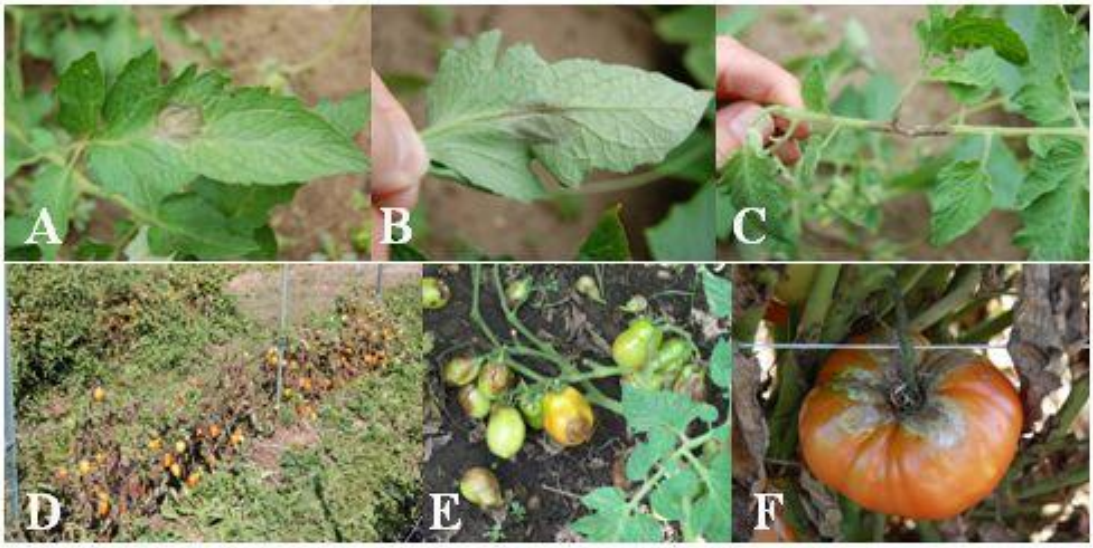
It is not yet known if the *Phytophthora infestans* of 2010 is of the new US#22 type which was most aggressive on tomatoes in 2009. However, it is concerning that late blight has been identified so far north, this early in the season. While confirmed disease reports are getting geographically closer to WI, we must also remember the potential sources right here in the state including volunteers, infected seed, cull piles, and composted tomato/potato plants that were infected in 2009 and may have survived the winter. I have been monitoring volunteers in a few fields in south and central Wisconsin and have not identified late blight on foliage or associated seed pieces at this time.

We are working hard to get the weather stations and Blitecast systems all up and running. A precursory look at weather data for Hancock indicates that since potato emergence, the duration of the relative humidity periods of >80% have been low (<10 hours), limiting the accumulation of disease severity values (DSVs) – making conditions less favorable for infection.

At this time, it is advisable to be prepared with effective fungicides for late blight protection. In potatoes, we have Tanos, Reason, Curzate, Revus Top, Gavel, Ranman, Forum, Previcur Flex and Omega. These are all specific late blight products. All should be tank mixed with a protectant such as chlorothalonil, mancozeb or metiram. A more extensive list of products can be found in the extension document entitled Commercial Vegetable Production in Wisconsin Guide A3422 (available at http://learningstore.uwex.edu/).

Tomatoes:

Septoria: Septoria leaf spot of tomato, caused by the fungus *Septoria lycopersici* has been active on tomato foliage this past week. I have also seen some early blight (*Altemaria solani*) on leaves along with Septoria. The two diseases can be distinguished, yet their management measures are similar. The symptoms of Septoria can occur at any stage of plant growth – and can already be present on greenhouse seedlings at transplanting. Once set in the field, typically, symptoms are first observed on lower, older leaves and stems. The timing of symptom appearance is associated with presence/amount of inoculum and environmental conditions (optimal at 77°F and wet). Symptoms begin as small water soaked lesions on the undersides of older leaves. The centers of the lesions are gray-tan and the edges are dark brown to black. As lesions mature, they enlarge and coalesce to form large dark brown lesions bearing the black pimple like fungal structures called pycnidia. Pycnidia are not present in early blight lesions. Septoria leaf lesions do not exhibit the target-like lesions typical of early blight. Left unmanaged under favorable weather conditions, Septoria-infected tomato foliage can turn yellow, dry up, and fall off – resulting in poor plant development and sunscalding of fruit.



Symptoms of tomato late blight on foliage and fruit. A. Brown, water-soaked lesion on surface of leaf. **B.** Brown lesion with white pathogen sporulation on leaf underside. **C.** Brown and sporulating lesion on stem. **D.** Entire row of plum tomatoes with dead foliage. **E.** Brown, firm, lesions on 'Roma' tomato fruit. **F.** Sporulating lesion on shoulders of a ripening fruit.

Septoria leaf spot

Early blight

Late Blight: See above late blight status report in potato section. At this time, it is advisable to be prepared with effective fungicides for late blight protection. For conventional tomatoes, we have Curzate, Tanos, Ranman, Forum, Presidio, Revus Top, Previcur Flex and Gavel. A more extensive list of products can be found in the extension document entitled Commercial Vegetable Production in Wisconsin Guide A3422 (available at http://learningstore.uwex.edu/

In a 2009 tomato late blight fungicide field trial carried out by Dr. Mary Hausbeck at Michigan State University, the top performing fungicides for foliar disease control included: Revus, Reason, Ranman, Ridomil Gold Bravo, Ridomil Gold MZ, Presidio, Bravo WeatherStik, Forum, and Acrobat. The best yielding fungicide treatments included: Pristine, Revus, Reason, Ranman, Ridomil Gold Bravo, Ridomil Gold MZ, Tanos, Presidio, Quadris, and Bravo WeatherStik (Vegetable Crop Advisory Team Alert, Michigan State University, June 1, 2010).

For organics, coppers applied preventatively are the only materials effective for late blight control. Coppers can only slow the epidemic and will not stop the progress of late blight. For a severely infected field, crop destruction may be the only option to limit further spread. If the strain of late blight that is currently active in 2010 is the same as in 2009, there are varieties with some resistance to infection and disease progress. Such varieties include: Mountain Magic, Plum Regal, Wapsipinicon, Matt's Wild Cherry, Legend, Pruden's Purple, and Sun Sugar.

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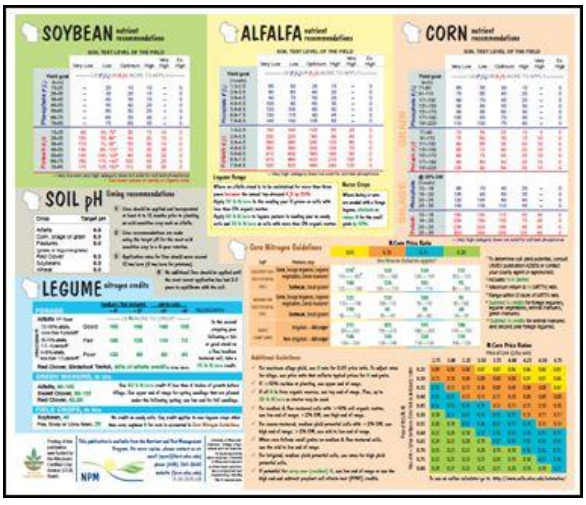
Updated Nutrient Management publications

Scott Sturgul – Nutrient & Pest Management (NPM) Program

The UW Nutrient & Pest Management (NPM) Program has revised two popular publications to reflect recent changes in the UW nitrogen application guidelines for corn. The two-page *Nutrient Management Fast Facts* publication as well as the *UW Nitrogen Guidelines for Corn* card (often referred to as the MRTN card) have both been reprinted and are available free of charge. To order copies of either or both items, contact NPM at npm@hort.wisc.edu or 608-265-2660.

For an online PDF copy:

Nutrient Management Fast Facts link



MRTN card link

For further information on the 2010 modifications to the corn nitrogen application guidelines, see the April 29, 2010 issue of the Wisconsin Crop Manager (Vol. 77, No. 7) or click here: http://ipcm.wisc.edu/LinkClick.aspx?fileticket=863pF44WDbY%3d&tabid=114&mid=669.

Pest Management Field Day, July 6

Bryan Jensen, IPM Program

Please join us for the annual Pest Management Field Day on July 6 at the Arlington Agricultural Research Station. This will be an excellent opportunity to hear results from new and ongoing research projects and to network with researchers, extension staff as well as your own colleagues.

Speakers and topics are:

Joe Lauer, Agronomy, "A Wisconsin Transgene Walkabout"

Paul Esker, Plant Pathology, "Evaluations of Fungicide Treatments for White Mold in Soybean"

Dave Hogg, Entomology "Interactions Between Host Plant Resistance and Biological Control for Soybean aphid"

Camila Botero, Entomology, "Release of a Soybean Aphid Parasitoid"

Tim Trower, Agronomy, "Fall Dandelion Control"

Branden Furseth and Shawn Conley, Agronomy, "Evaluating 2010 Soybean Seed Treatment Decisions"

Marie Schmidt, Agronomy, "Germination Timing of Pasture Weeds"

Mark Renz, Agronomy, "Switchgrass Establishment: Year Two"

Field tours will depart from the Public Events Facility at 8:30 am and return by noon. In case of rain, "field tours"

will be conducted inside. Lunch ($10) will be served after tours return.

The Public Events Facility is located on the Arlington Agricultural Research Station, N695 Hopkins Road. If traveling from the south, exit I 90/94 onto Hwy 51 North. Look for the Arlington Ag. Research Station sign north of Deforest. Turn left (west) onto Badger Lane. Travel 1 mile and turn left (south) onto Hopkins Rd. If traveling from the north, exit I 90/94 onto Hwy 60. Travel east through Arlington and turn south onto Hwy 51. For more detailed driving direction click on http://www.ars.wisc.edu/arlington/directions.html

Troubleshooting Crop Injury Checklist

Bryan Jensen, Dan Heider, IPM Program

It's the time of year when you may be receiving calls to troubleshoot crop health problems. Sometimes the diagnosis is routine because problems are commonplace or symptoms are expressed in "text book" fashion. Other times injury symptoms are more difficult to diagnose because of multiple problems, unusual weather, pest interactions,etc. Whatever the situation, accurate diagnosis is best when all the information is observed and collected during the first field visit. We have prepared a Troubleshooting Crop Injury form which we hope will assist you in that process. Not all sections on the form will be necessary to complete. However, our goal would be to remind you of what to look for and where to find it. Nothing is more frustrating than to think back and realized you may have overlooked something.

2010 Western Bean Cutworm Trapping Survey - Call for Wisconsin Cooperators

Eileen Cullen, Extension Entomologist

The Wisconsin Pest Survey Program has monitored the annual flight of western bean cutworm moths in Wisconsin since 2005. The pest survey program is part of WI Department of Agriculture, Trade and Consumer Protection (WDATCP). Krista Hamilton, WDATCP Survey Entomologist, coordinates the WBC trapping survey and publishes results weekly on the Wisconsin Pest Bulletin. UW Entomology and several UW-Extension County Offices will be participating in the 2010 survey with WDATCP. Additional cooperators are invited to participate (farmers, crop consultants, agronomists, other interested individuals).

To learn more about WBC, scouting, economic thresholds, management options, and to view pest and crop (field corn, sweet corn) damage diagnostic photos, please visit my UW Entomology WBC web page at http://www.entomology.wisc.edu/cullenlab/insects/info/wbc.html.

Objectives of the pheromone trapping survey are to determine the START, PEAK, and SIZE of the flight each season. There is one generation per year. Trapping is conducted from mid-June through mid-August, or approximately 8 weeks. Degree-day accumulation (heat units) is about 2 weeks ahead of schedule this spring, **therefore we are requesting the WBC pheromone traps be set out by June 18th**, rather than waiting until July 1.

Cooperators in the 2010 Wisconsin Western Bean Cutworm Trapping Survey should **contact Krista Hamilton, WDATCP Pest Survey Program to register their site (Name, Company/Organization, County, Phone, Nearest Town, Zip Code, GPS Coordinates for site, Lat. Long). Krista will supply cooperators with TRECE brand Western Bean Cutworm pheromone lures for each trap site at no charge.** Krista.hamilton@wisconsin.gov or **1-866-440-7523.**

Western Bean Cutworm pheromone lures are also available for purchase from Gemplers and Great Lakes IPM. Gemplers sells the TRECE lure in a pack of 25 for $61.75 (call 1-800-382-8473, ask for Tech Services). Great Lakes IPM sells the TRECE lure in a pack of 25 for $44.00, or individually for $2.00 each (call 1-989-268-5693).

Please contact Krista Hamilton ASAP if interested, to allow time for lures to reach you prior to June 18. Cooperators should complete the top portion of the attached data sheet for each trap site and submit to Krista to register the site by June 18 and begin reporting trap catch. The data sheet for recording weekly trap catch is attached to this article in PDF and Excel formats.

Establishing a pheromone trap is simple, and only one trap per site is required. After registering a trap site, cooperators simply call-in or email total WBC moth number from their trap once per week (detail below). This information can be very useful to cooperators in a local region to alert growers and consultants to the moth flight. Additional sites also help WI to obtain a good distribution of WBC flight statewide. Northeast and North-Central counties are always under-surveyed, as WDATCP staff cannot cover all regions. More traps in these areas will be helpful, but all cooperators are welcome. WBC moths have been captured as far north as Price and Marinette counties, so any county in the state is fair game for WBC moth flights and egg-laying in susceptible crops (field and sweet corn, dry beans). Soybeans are not a host plant for WBC.

To make a trap you will need:

- One-gallon plastic milk jug with lid
- Paper clip
- Western Bean Cutworm pheromone lure
- Antifreeze (propylene glycol)
- 4-foot high post
- Wire (for mounting milk jug to post)

Trap Construction and Survey Protocol:

1. **Making the trap**: Cut a 4 x 4 inch square window in two sides of a one-gallon plastic milk container. Leave at least two inches between the bottom of the window and the bottom of the jug. Antifreeze (propylene glycol, safer for people and animals) will be poured into this portion of the jug. Hang a rubber pheromone lure from the top of the jug using a paper clip, but DO NOT PUNCTURE THE LURE. Use duct tape to secure the plastic cap in place.

2. **Installation**: Locate a fence post or roadside stake near your designated trapping site and hang the milk jug trap approximately four feet off the ground using zip ties. Fill the bottom 1 1/2 to 2 inches with the antifreeze. Please note: For the 2010 growing season, degree-day accumulation (heat units) are approx. 2 weeks ahead of schedule. Therefore WBC traps should be in place by June 18, 2010.

3. **Monitoring**: Check the trap once per week (or more often if you prefer). Count, record, and remove any western bean cutworm moths in the antifreeze. Pheromone lures should be replaced after three weeks and antifreeze added as needed. Trapping is conducted from mid-June through mid-August, or approximately 8 weeks.

4. **Reporting**: PLEASE REPORT COUNTS TO KRISTA HAMILTON BY 12:00pm EACH THURSDAY at krista.hamilton@wisconsin.gov or by calling 1-866-440-7523.

5. **Weekly trap data will be posted on the following websites:**

Wisconsin Pest Bulletin at http://pestbulletin.wi.gov (Wisconsin Map)

PestWatch at http://www.pestwatch.psu.edu (National Map for Midwest and Eastern U.S. & Ontario, Canada)

Western bean cutworm adult moth

Milk jug trap with propylene glycol antifreeze (color may be green or pink, check label to make sure it is propylene glycol)

2010 Survey Protocol.pdf

2010 WBCW Datasheet.pdf

2010 WBCW Datasheet.xls

Armyworm Notice

Bryan Jensen, IPM Program

I have received a few phone calls that were text book examples of first generation armyworm feeding in seedling corn. In these cases corn was planted into a rye cover crop that was burned down with herbicides. Armyworm adults prefer lush green foliage, especially grasses, to lay eggs. During the spring migration, cover crops and spring killed alfalfa make great oviposition sites which can concentrate egg laying into a few isolated fields. These eggs may have even been deposited before the corn emerged. Larvae may, or may not, begin feeding on the cover crop before switching to corn.

Typically, second generation damage is more commonplace and we are better prepared. First generation feeding is more isolated and can easily go unnoticed…….until it is too late. Please spot check corn fields planted into cover crops, no tilled after alfalfa or those with lush weed growth for armyworm activity.

For more information on Armyworm management, please refer to Eileen Cullen's May 20, 2010 Wisconsin Crop Manager article **True Armyworm Reminders for Corn and Small Grains**

Slug Damage to Soybean

Shawn P. Conley

I have received multiple inquiries over the past few days regarding slug damage to soybean. Below please find an Extension article from Ohio State that describes symptomology and management options. Please be aware however there is no magic bullet for slug control and though this article does not mention it the application of 28% does not work.

http://ohioline.osu.edu/ent-fact/pdf/0020.pdf

Alfalfa Weevil

Bryan Jensen, IPM Program

I have received a few calls from crop consultants in the southern part of Wisconsin regarding alfalfa weevil damage to second crop alfalfa. Although tip damage has been observed in the 50-60% range, management is complicated both by crop stage and larval development. For those second crop fields which are getting close to cutting, your best option will be to cut when appropriate and monitor regrowth for signs of feeding activity. To manage those fields where cutting is still awhile off, treatment is suggested when 50% of the stems in second crop have tip feeding. However, don't base spray decision

solely on percent tip feeding. In the southern part of the state, degree day accumulations indicates that weevils should be in the process of pupating. Which means the amount of new damage will be declining. What I would suggest is to take a few sweeps to determine that weevil larvae are still present before making the spray decision. My point is that you must be concerned with "preventable" yield loss. If you are 50% tip feeding and larvae are ready to pupate you will not get an economic return from your insecticide application.

Fusarium Head Blight Update - 9 June 2010

Paul Esker

While most of the winter wheat crop is past flowering in many parts of the state, we are continuing to monitor the Fusarium head blight risk especially for later maturing wheat or spring wheat in the state. Today's risk map has shown a change in the risk of infection in pockets of state since we have seen heavier rainfall amounts the past week in many areas. There are several pockets that are in the medium to high risk of infection but it is important to pay close attention to the wheat growth stage regarding fungicide applications (see previous postings and also the Wisconsin Crop Manager for further information).

Slugs in Corn and Soybean

Eileen Cullen, Extension Entomologist

UW Extension, UW-Entomology, and UW Agronomy Soybean/Small Grains programs have been receiving reports and seen firsthand slug damage on corn and soybean. Not something we see very often. Ron Hammond, Entomologist (and slug expert), The Ohio State University, reports several North Central region states have slug activity in corn and soybean this season. Feeding damage is being found in no-till and feeding is variable depending on soil moisture and crop growth stage.

Slugs are not insects, they belong to the class Gastropoda. This is important because insecticides are not labeled for slugs, and have no control effect on slugs.

Unlike snails, slugs do not develop a shell. They can move through relatively small holes and crevices in the soil or soil surface residue. Because slugs are active at night it is rare to find them during the day.

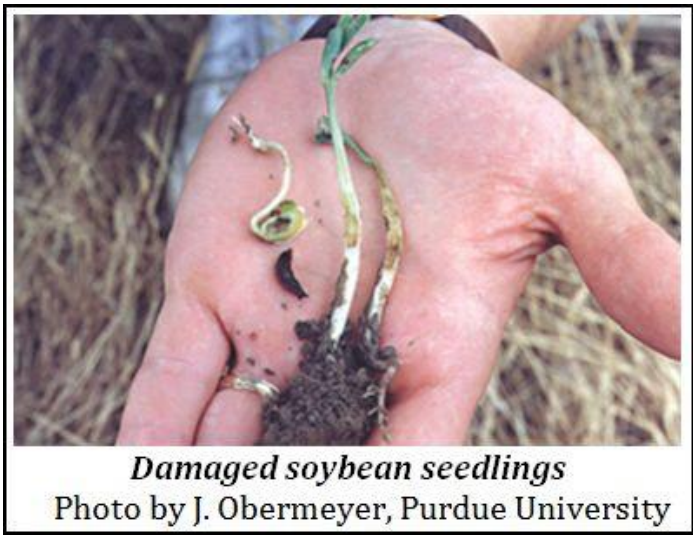
Juvenile slug Photo by R. Youngman (Virginia Tech University)

There are a few different species of slugs, most have one generation per year and overwinter in the egg stage. If winters are mild, adults can overwinter. Because field slugs can live 12 to 15 months, and eggs are laid in early spring and fall, overlapping generations of adult and juvenile stages can be present in the field. During dry, hot summer conditions, adult slugs enter a period of inactivity. Slug activity is at its peak in late spring and early summer, and again in early fall.

Cold, damp, overcast cloudy weather favors slug activity and delays crop development, extending the period of crop susceptibility to slug injury. Rainfall and saturated soils favor slug activity. When weather conditions and moist soil surface residue persist, slugs can be found in tilled fields with a normal amount of crop residue. However, no-till fields are more prone to slug damage than reduced tillage or conventional tillage fields.

Slugs feed on a wide host range, including corn and soybean. Crop injury may occur early to seeds and seedlings causing stand loss. Slug feeding can also cause defoliation in established stands. The slug mouthpart includes a tongue-like structure used to scrape its food as it eats plant foliage. Damage to corn leaves appears as streaks or holes, usually both. Damage to soybean is usually found on the lower part of the plant, eating partly or completely through the hypocotyl and cotyledons. Unifoliate leaves may be damaged before unfolding, making them appear distorted and tattered.

Slug feeding injury to corn Photo by T. Bay, UW-Extension Grant County (2008)



Damaged soybean seedlings
Photo by J. Obermeyer, Purdue University

With sunny, dry weather, as soil residue dries, established soybean and corn stands will outgrow slug defoliation from earlier in the season and treatment is not necessary. However, foliar injury by slugs to corn in the pre-whorl and early whorl stage and soybean in the early vegetative stages may delay crop development. If you've identified a field with slug damage, check to make sure new leaves are not defoliated and the plant is outgrowing damage. For example, you only see slug injury on older, lower leaves.

You will see foliar damage during the day when slugs are not active. Slime trails (dry mucus from previous movement of slugs across foliage) are a sign of recent slug presence.

Both corn in the early whorl stage and soybean in the vegetative stage can tolerate up to 40% defoliation without significant yield impact. There are no established economic thresholds for slug control in field crops. If weather conditions remain conducive for slug activity and crop development is being delayed as a result of feeding injury, treatment may be necessary.

Commercially formulated metaldehyde baits can be applied. These are slug baits, not insecticides. Treatments are expensive, typically in the range of $10 to $15 per acre. One trade name is "Deadline M-P's", and most other products have 'metaldehyde bait' in the trade name. Product information can be found in Crop Data Management System (CDMS) pesticide label database www.cdms.net/LabelsMsds/LMDefault.aspx?t

If applying baits, follow label instructions. It is important that application takes place when slugs are still active, typically during periods of cooler temperatures (63 – 68 deg. F) and wet conditions favorable to above ground slug activity. For this reason, slug baits are often applied aerially. Remember, slugs will enter a summer period of inactivity.

Reduction of slug problems, once they have become established, is difficult because bait treatment only reduces slug activity by "buying time" to enable the crop to outgrow the problem. To deal with the problem long-term, occasional use of reduced tillage can decrease development of slug problems in no-till fields. Mechanical devices on planters that remove reside over the seed furrow may reduce slug damage to seeds and emerging seedlings.

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New Online Registration for UW Crop Diagnostic Training Center Workshops

Dan Heider, UW IPM Program

Now that the growing season is well on its way, remember to take time to register for the UW Crop Diagnostic Training Center Workshops. The Diagnostic Troubleshooting Workshop is scheduled for Tuesday, July 27 and is a must for anyone who wishes to improve their crop problem troubleshooting ability. The Crop and Pest Management Workshop is scheduled for Tuesday, August 17 and features five UW-Extension Crop Specialists covering a host of field crop concerns. You won't want to miss either of these hands-on, in-field training opportunities, so don't miss your chance as registration is limited for all workshops.

To view the CDTC Workshop brochure for more details, click on the following link: Download CDTC brochure here

New this year is an opportunity for online registration and credit card payment, which can be found by clicking on the following link:
https://www.patstore.wisc.edu/ipm/register.asp

If you have any questions regarding either workshop, please contact the Training Center Coordinator, Dan Heider at 608-262-6491 or by email at djheider@wisc.edu.

2010 Agronomy/Soils Field Day

The 2010 Agronomy/Soils Field day is Wednesday, August 25, 2010 at the Arlington Agricultural Research Station. This year, the Agronomy/Soils Field day includes a variety of topics and luncheon speaker, Molly Jahn, Dean of the College of Agricultural & Life Sciences at UW-Madison. For more information, you can find the official flyer by clicking here.

High-yield agriculture slows pace of global warming, say FSE researchers

Louis Bergeron - Stanford News Service

Advances in high-yield agriculture over the latter part of the 20th century have prevented massive amounts of greenhouse gases from entering the atmosphere - the equivalent of 590 billion metric tons of carbon dioxide - according to a new study led by two Stanford Earth scientists.

The yield improvements reduced the need to convert forests to farmland, a process that typically involves burning of trees and other plants, which generates carbon dioxide and other greenhouse gases.

The researchers estimate that if not for increased yields, additional greenhouse gas emissions from clearing land for farming would have been equal to as much as a third of the world's total output of greenhouse gases since the dawn of the Industrial Revolution in 1850.

The researchers also calculated that for every dollar spent on agricultural research and development since 1961, emissions of the three principal greenhouse gases - methane, nitrous oxide and carbon dioxide - were reduced by the equivalent of about a quarter of a ton of carbon dioxide - a high rate of financial return compared to other approaches to reducing the gases.

"Our results dispel the notion that modern intensive agriculture is inherently worse for the environment than a more 'old-fashioned' way of doing things," said Jennifer Burney, lead author of a paper describing the study that will be published online by the Proceedings of the National Academy of Sciences.

Adding up the impact

The researchers calculated emissions of carbon dioxide, methane and nitrous oxide, converting the amounts of the latter two gases into the quantities of carbon dioxide that would have an equivalent impact on the atmosphere, to facilitate comparison of total greenhouse gas outputs.

Burney, a postdoctoral researcher with the Program on Food Security and the Environment at Stanford, said agriculture currently accounts for about 12 percent of human-caused greenhouse gas emissions. Although greenhouse gas emissions from the production and use of fertilizer have increased with

agricultural intensification, those emissions are far outstripped by the emissions that would have been generated in converting additional forest and grassland to farmland.

"Every time forest or shrub land is cleared for farming, the carbon that was tied up in the biomass is released and rapidly makes its way into the atmosphere - usually by being burned," she said. "Yield intensification has lessened the pressure to clear land and reduced emissions by up to 13 billion tons of carbon dioxide a year."

"When we look at the costs of the research and development that went into these improvements, we find that funding agricultural research ranks among the cheapest ways to prevent greenhouse gas emissions," said Steven Davis, a co-author of the paper and a postdoctoral researcher at the Carnegie Institution at Stanford.

To evaluate the impact of yield intensification on climate change, the researchers compared actual agricultural production between 1961 and 2005 with hypothetical scenarios in which the world's increasing food needs were met by expanding the amount of farmland rather than by the boost in yields produced by the Green Revolution.

"Even without higher yields, population and food demand would likely have climbed to levels close to what they are today," said David Lobell, also a coauthor and assistant professor of environmental Earth system science at Stanford.

"Lower yields per acre would likely have meant more starvation and death, but the population would still have increased because of much higher birth rates," he said. "People tend to have more children when survival of those children is less certain."

Avoiding the need for more farmland

The researchers found that without the advances in high-yield agriculture, several billion additional acres of cropland would have been needed.

Comparing emissions in the theoretical scenarios with real-world emissions from 1961 to 2005, the researchers estimated that the actual improvements in crop yields probably kept greenhouse gas emissions equivalent to at least 317 billion tons of carbon dioxide out of the atmosphere, and perhaps as much as 590 billion tons.

Without the emission reductions from yield improvements, the total amount of greenhouse gas pumped into the atmosphere over the preceding 155 years would have been between 18 and 34 percent greater than it has been, they said.

To calculate how much money was spent on research for each ton of avoided emissions, the researchers calculated the total amount of agricultural research funding related to yield improvements since 1961 through 2005. That produced a price between approximately $4 and $7.50 for each ton of carbon dioxide that was not emitted.

"The size and cost-effectiveness of this carbon reduction is striking when compared with proposed mitigation options in other sectors," said Lobell. "For example, strategies proposed to reduce emissions related to construction would cut emissions by a little less than half the amount that we estimate has been achieved by yield improvements and would cost close to $20 per ton."

The authors also note that raising yields alone won't guarantee lower emissions from land use change.

"It has been shown in several contexts that yield gains alone do not necessarily stop expansion of cropland," Lobell said. "That suggests that intensification must be coupled with conservation and development efforts.

"In certain cases, when yields go up in an area, it increases the profitability of farming there and gives people more incentive to expand their farm. But in general, high yields keep prices low, which reduces the incentive to expand."

The researchers concluded that improvement of crop yields should be prominent among a portfolio of strategies to reduce global greenhouse gases emissions.

"The striking thing is that all of these climate benefits were not the explicit intention of historical investments in agriculture. This was simply a side benefit of efforts to feed the world," Burney noted. "If climate policy intentionally rewarded these kinds of efforts, that could make an even bigger difference. The question going forward is how climate policy might be designed to achieve that."

David Lobell is a Center Fellow at the Freeman Spogli Institute for International Studies and at the Woods Institute for the Environment. The Program on Food Security and the Environment is a joint project of the Woods Institute and the Freeman Spogli Institute. The Precourt Institute for Energy and FSE provided funding for Jennifer Burney's research on agriculture and energy.

Wisconsin Vegetable Crop Update, 2010-5

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newletter issue five is out! This marks the fifth newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The fifth issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here: http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

More Armyworms

Bryan Jensen, IPM Program

The calls are still coming in regarding armyworm damage. However, these calls now include damage to winter wheat and corn planted using minimum tillage without a cover crop as well as the typical early season scenarios of corn planted after spring killed alfalfa or a grass cover crop.

Armyworms do not overwinter in the state. The adult moth will migrate through Wisconsin in April or May. However, the timing is not consistent and we are unable to issue alerts based on degree day accumulations. Also, the adult is a night flying moth which isn't showy and its migration often goes unnoticed unless you operate a blacklight trap. As a result, the best way to monitor their early season presence is to spot check fields, or areas of fields, where the female prefers to lay eggs. Those areas include areas with heavy grass weed pressure, cover crops or after spring killed alfalfa as mentioned above.

Armyworms will grow up to about 1 ½ inch in length and have longitudinal strips which may or may not be easily visible because of size and or color intensity of individuals. Heads are light tan and have a dark-colored netlike pattern which is easily visible on larger larvae. Undersides are a light yellowish color. Armyworms are a defoliator and will feed on the leaf margins of grasses and some legumes. Rarely will you see holes chewed in the leaves and this symptom will help separate armyworms from other early season insect pests. Armyworms infesting vegetative corn will often hide in the whorl during the daytime but feeding signs are easily visible on leaves and/or frass is noticeable within the whorl.

Armyworm Damage

Winter and spring grains can serve as hosts and initially feeding may start on lower leaves and is of minimal importance. However, defoliation on the upper leaves, especially the flag leaf, is more critical. As the plant matures, larvae may migrate out of the field or start clipping heads which is a direct yield loss and should be avoided. Check several areas of the field and pay close attention to areas with dense stands or lodging. The established threshold is to treat when the field has an average of 3 or more armyworms/sq. ft. However, consider larval development before automatically spraying. Economic return will be minimal lf larvae are close to pupating.

Thresholds established for corn are to treat if larvae are less than ¾ inch long and you find an average of one/plant on 75% of the plants or if you have an average of two/plant on 25% of the stand.

The amount of damage this spring is higher than usual. Will this translate to increased damage during the second generation? No one knows for sure. Many factors will affect damage potential including environment, predators, parasites, etc. The only way to know of sure is though field scouting.

Armyworm Larvae

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Wisconsin Vegetable Crop Update, 2010-6

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newletter issue six is out! This marks the sixth newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The sixth issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here:

http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Five More New Factsheets Available that focus on Invasive Plant Control

Brendon Panke and Mark Renz, University of Wisconsin-Madison and University of Wisconsin-Extension

Five more factsheets focusing on management of invasive plants in Wisconsin are now available (Buckthorn species, Creeping bellflower, poison hemlock, Japanese honeysuckle, and Japanese knotweed). Each factsheet summarizes important identifying characteristics for each featured species, as well as information necessary for developing a management plan. The bulk of each sheet lays out non-chemical and chemical control methods. Information highlighted includes timing of treatment for each technique, effectiveness of treatments, and remarks and cautions particular to each technique. It is our hope that these sheets will provide everyone with the information needed to manage invasive species in their specific situation. Below is a link to the second set of five sheets which are now available. We expect to create twenty factsheets over the summer of 2010. These will be announced as they become available, and will be located at (http://ipcm.wisc.edu/Publications/WeedSciencepublications/tabid/116/Default.aspx)

NEW FACTSHEETS

Buckthorn

Creeping bellflower

Poison hemlock

Japanese honeysuckle

Japanese knotweed

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between June 16 and June 22, 2010:

Table Found On Following Page

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Soybeans	Herbicide Injury	None	Dane
FORAGE CROPS			
Alfalfa	Leptosphaerulina Leaf Spot	*Leptosphaerulina briosiana*	Green Lake
	Root/Crown Rot	*Aphanomyces* sp., *Fusarium* sp., *Phytophthora* sp., *Pythium* sp., *Rhizoctonia* sp.	Jefferson, Walworth
FRUIT CROPS			
Apple	Apple Scab	*Venturia inaequalis*	Iowa
Cherry	Bacterial Canker	*Pseudomonas syringae*	Dane
	Verticillium Wilt	*Verticillium* sp.	Pierce
Cranberry	Root Rot	*Pythium* sp.	Wood
Elderberry	Rust	*Puccinia bolleyana*	Green
Strawberry	Anthracnose	*Colletotrichum* sp.	Grant
	Root/Crown Rot	*Pythium* sp., *Rhizoctonia* sp., *Fusarium* sp.	Grant
	Septoria Leaf Spot	*Septoria* sp.	Grant
VEGETABLES			
Garlic	Basal Plate Rot	*Fusarium oxysporum* f. sp. *cepiae*	Lake (IL)
Onion	Purple Blotch	*Alternaria porri*	Dane
Tomato	Bacterial Canker	*Clavibacter michiganensis* pv. *michiganensis*	Lake (IL)
	Leaf Mold	*Fulvia fulva*	Vernon

Wisconsin Crop Manager

Volume 17 Number 16 --- University of Wisconsin Crop Manager --- July 1, 2010

Pest Management Field Day, July 6

Bryan Jensen, IPM Program

Don't forget the morning of Tuesday, July 6 is the **Pest Management Field Day** at the Arlington Agricultural Research Station. Field tours depart from the Public Events Facility at 8:30 am and return by noon. In case of rain, "field tours" will be conducted inside. Lunch ($10) will be served after tours conclude by 12:30 pm. No preregistration is necessary.

Speakers and topics are:

Joe Lauer, Agronomy, "A Wisconsin Transgene Walkabout"

Paul Esker, Plant Pathology, "Evaluations of Fungicide Treatments for White Mold in Soybean"

Dave Hogg, Entomology "Interactions Between Host Plant Resistance and Biological Control for Soybean aphid"

Camila Botero, Entomology, "Release of a Soybean Aphid Parasitoid"

Tim Trower, Agronomy, "Fall Dandelion Control"

Branden Furseth and Shawn Conley, Agronomy, "Evaluating 2010 Soybean Seed Treatment Decisions"

Marie Schmidt, Agronomy, "Germination Timing of Pasture Weeds"

Mark Renz, Agronomy, "Switchgrass Establishment: Year Two"

The Public Events Facility is located on the Arlington Agricultural Research Station, N695 Hopkins Road. If traveling from the south, exit I 90/94 onto Hwy 51 North. Look for the Arlington Ag. Research Station sign north of Deforest. Turn left (west) onto Badger Lane. Travel 1 mile and turn left (south) onto Hopkins Rd. If traveling from the north, exit I 90/94 onto Hwy 60. Travel east through Arlington and turn south onto Hwy 51. For more detailed driving directions click on http://www.ars.wisc.edu/arlington/directions.html

Please contact Bryan Jensen, bmjense1@facstaff.wisc.edu, (608) 263-4073 if you have questions.

White Mold in Soybean in 2010 – Factors to Consider

Paul Esker, Angie Peltier, John Gaska, and Shawn Conley, Field Crops Extension Plant Pathologist, Postdoctoral Research Associate, Senior Outreach Specialist and State Soybean and Small Grains Specialist

We have started to receive an increase in the number of questions about the risk of white mold (syn., Sclerotinia stem rot) in soybean in 2010, especially given the yield losses we witnessed during the 2009 growing year. White mold is caused by the fungus *Sclerotinia sclerotiorum*.Weather conditions during early 2010 have been very favorable for soybean growth and development and the majority of fields are considered in the good to excellent range (Source: USDA-NASS). As we head into the early flowering period, now is an excellent time to begin to consider the factors that may influence the risk of white mold occurring in the field.

Understanding risk of white mold begins with knowledge of the field history of disease and the level of resistance in the soybean variety that was planted. Over the winter, we advised growers to ask their seed dealers questions about the level of field tolerance in varieties they are considering planting and to consult the White Mold Variety Performance Tests. Knowledge of both of these factors can help determine your baseline level of risk for white mold.

As plants move into flowering, several biotic and abiotic risk factors need to occur for white mold to be a problem in the field. Environmentally, moderate temperatures (less than 85°F, with optimal temperatures from 68 to 77°F), normal to above normal rainfall, soil moisture at or above field capacity, periods of prolonged fog and leaf wetness at or just after flowering can all increase the risk of disease. White mold is a disease of high yield potential soybeans. Agronomic practices that maximize yield potential and encourage early canopy closure, such as early planting date, higher plant populations, and narrow row spacing can also increase the risk of disease.

Scouting can also be used to determine if potential inoculum of *S. sclerotiorum* is present. As the soybean canopy closes,

scouting for apothecia is important. Apothecia are tan, cup-shaped mushrooms (0.5-2mm in diameter) that can be found on the soil surface (Figure 1). Apothecia produce the spores of *S. sclerotiorum* that infect soybean plants. Previous research has shown that apothecia production is related to soil moisture and temperature, and the timing and density of the crop canopy closure.

Figure 1. Apothecia of Sclerotinia sclerotiorum. These small (0.5-2 mm in diameter), tan fruiting structures produce spores that can infect senescing soybean flowers. Parting the soybean canopy and inspecting the soil for apothecia is an important way to determine your risk of white mold.

After considering your risk for white mold, you may decide to use a foliar fungicide or herbicide to manage disease. Several fungicides (Topsin, Domark, and Endura) are labeled for control of white mold on soybean. Consider the following before deciding to spray: 1) proper application timing is essential; applications should be made at flowering to protect senescing flowers from infection and 2) spray coverage is also essential; sprays must penetrate the canopy in order to protect flowers. Also, there has been an increase in the number of questions regarding the use of Cobra herbicide. Applications of Cobra have been shown to reduce leaf area index and to delay flowering, leading to reduced disease severity and higher yields. However, caution is recommended, as there can be a yield cost if environmental conditions for white mold are not favorable (Nelson et al. 2002). Also, there have been several questions about the use of other herbicides that may cause similar physiological response in soybean like Cobra. Please keep in mind that white mold suppression is listed on the Cobra label and a check of several labels in the diphenyl ether class of herbicides do not have the same wording regarding white mold suppression. In 2009, results from fungicide trials in WI and IL were variable, depending on location. This is similar to previous research (Mueller et al. 2002) that showed that effects of foliar fungicides are inconsistent, when the incidence of white mold was high.

For further information consult:

1) The Soyhealth Website
2) UWEX YouTube Video on White Mold in Soybean

References:

Mueller, D. S., Dorrance, A. E., Derksen, R. C., Ozkan, E., Kurle, J. E., Grau, C. R., Gaska, J. M., Hartman, G. L., Bradley, C. A., and Pedersen, W. L. 2002. Efficacy of fungicides on *Sclerotinia sclerotiorum* and their potential for control of Sclerotinia stem rot of soybean. Plant Disease 86:26-31.

Nelson, K. A., Renner, K. A., and Hammerschmidt, R. 2002. Cultivar and herbicide selection affects soybean development and the incidence of Sclerotinia stem rot. Agronomy Journal 94:1270-1281.

Wisconsin Vegetable Crop Update, 2010-7

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newletter issue seven is out! This marks the seventh newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The seventh issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here:
http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

So Far, A Great Start For Corn, But Just An Average Weather Year

Joe Lauer, *Corn Agronomist*

Weather Graphs PDF

For much of Wisconsin, the 2010 corn crop got off to a great start. Crop progress in some areas is at record pace for development. The crop is ahead of schedule because of early planting dates, rather than significantly different weather. For many farmers the crop is so tall that they are at lay-by in many of their fields. Dr. Bill Tracy indicated that sweet corn inbreds planted May 18 are ready to be shoot bagged - a record early date for him and his crew.

Figure 1 (found at the end of this issue) shows the weather data for UW-Agricultural Research Station at Arlington. Precipitation is tracking at a pace similar to the 30-yr normal. Growing degree unit (GDU) accumulation since January 1 is ahead of the 30-yr normal. But, while total GDU accumulation is ahead of schedule, the GDU accumulation for various planting dates is equivalent to the 30-yr normal for every planting date. For a May 1 planting date, GDU accumulation was slower than the 30-yr normal while the crop was emerging, but accumulation has since caught up. Uneven emergence was noted for this planting date in a study at Arlington.

Figure 2 (found at the end of this issue) shows the weather data for UW-Agricultural Research Station at Marshfield. Precipitation was tracking at a pace slower than the 30-yr normal, but it has since caught up. Growing degree unit (GDU)

accumulation since January 1 is ahead of the 30-yr normal. But, while total GDU accumulation is ahead of schedule, the GDU accumulation for various planting dates is equivalent to the 30-yr normal for every planting date, except for a May 15 planting date. For a May 1 planting date, GDU accumulation was slower than the 30-yr normal while the crop was emerging, but accumulation has since caught up.

Figure 3 (found at the end of this issue) shows the GDU and precipitation deviation of 2010 (April 1 to June 26) from the 30-yr normal. Precipitation accumulation is similar to the 30-yr normal for both Arlington and Marshfield. At both Arlington and Marshfield, GDU accumulation is higher than the 30-yr normal, but less than the four years that were greater than one standard deviation from the 30-yr normal. At Arlington, the production years of 1985, 1987, 1988, and 1991 were warmer than 2010. At Marshfield, the production years of 1987, 1988, 1991, and 1994, were warmer than 2010.

The crop is off to a good start. This is a year that reminds us of what early planting and ideal field conditions during planting can do for corn growth and development. For the most part, weather has been as ideal as it can be, but a lot of growing season is left.

Get your boots muddy at the Soil Doctors Booth at Farm Technology Days!

Matt Ruark, Dept. of Soil Science

Don't forget to stop by the Soil Doctors booth at Farm Technology Days! The booth will be staffed by Dr. Richard Wolkowski, Dr. Carrie Laboski and Dr. Matt Ruark. Collectively, these scientists and Extension Specialists are experts in nutrient management, manure management, soil testing, soil quality and water quality. Bring any and all questions you may have about your soil. Feel free to bring in your soil test results for an expert opinion. Do you know your soil's pH? If not, bring in a soil sample for a free pH analysis! This year, for the first time, we will have a soil color competition. The Soil Doctors are hosting a "darkest" soil and "lightest" soil competition. Bring in your darkest colored soil (as black as you can find) and lightest colored soil (yellow, or if you can find it, white). Soils will be colored by the Soil Doctors with a Munsell color chart. Winners will have their picture posted on our Soils Extension website! (www.soils.wisc.edu/extension). Look forward to seeing you at the Soil Doctors booth July 20th through 22nd.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

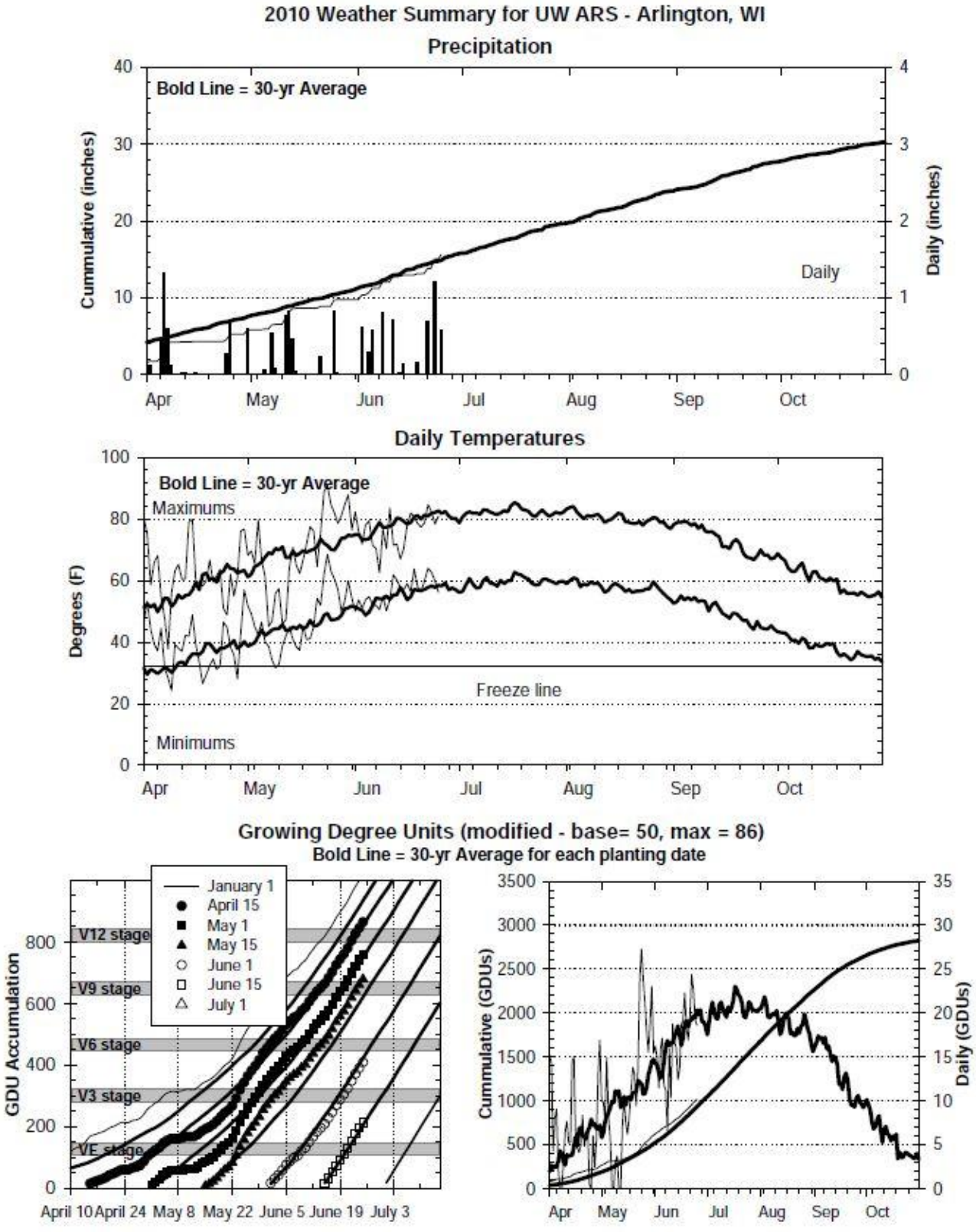
Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between June 23 and June 29, 2010.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Soybean	Root/Seed Rot	*Phytophthora* sp., *Pythium* sp.	Unknown
FRUIT CROPS			
Apple	Cytospora Canker	*Cytospora* sp.	Sheboygan
	Phomopsis Canker	*Phomopsis* sp.	Sheboygan
HERBACEOUS ORNAMENTALS			
Sweet Woodruff	Anthracnose	*Colletotrichum* sp.	Columbia
VEGETABLES			
Onion	Purple Blotch	*Alternaria porri*	Columbia
Rhubarb	Ramularia Leaf Spot	*Ramularia* sp.	St. Croix
Swiss Chard	Phoma Leaf Spot	*Phoma* sp.	St. Croix
Tomato	Bacterial Canker	*Clavibacter michiganensis* pv. *michiganensis*	Waushara
	Bacterial Speck	*Pseudomonas syringae* pv. *tomato*	Rock

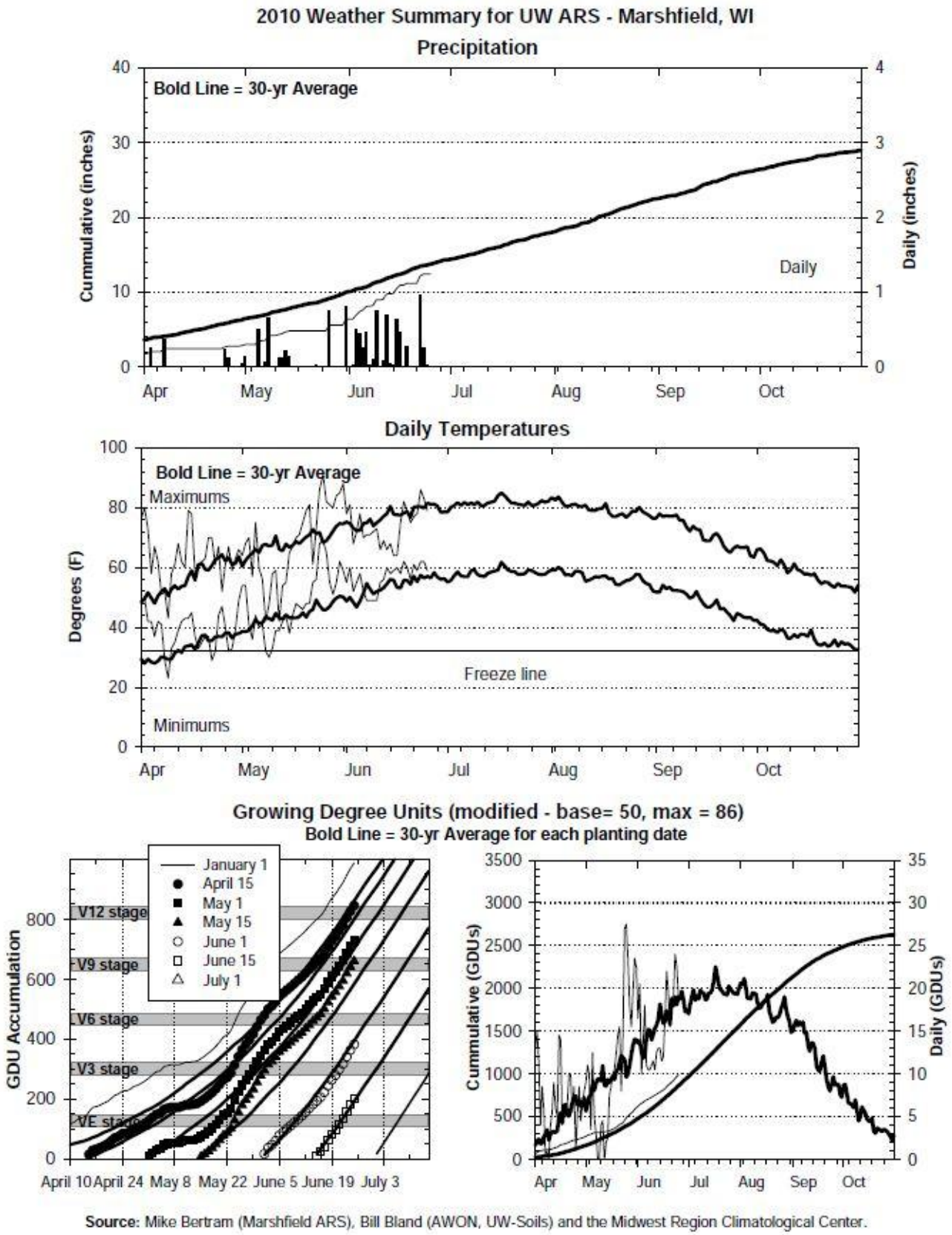
For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Figure 1. Weather summary for Arlington from April 1 to June 26, 2010



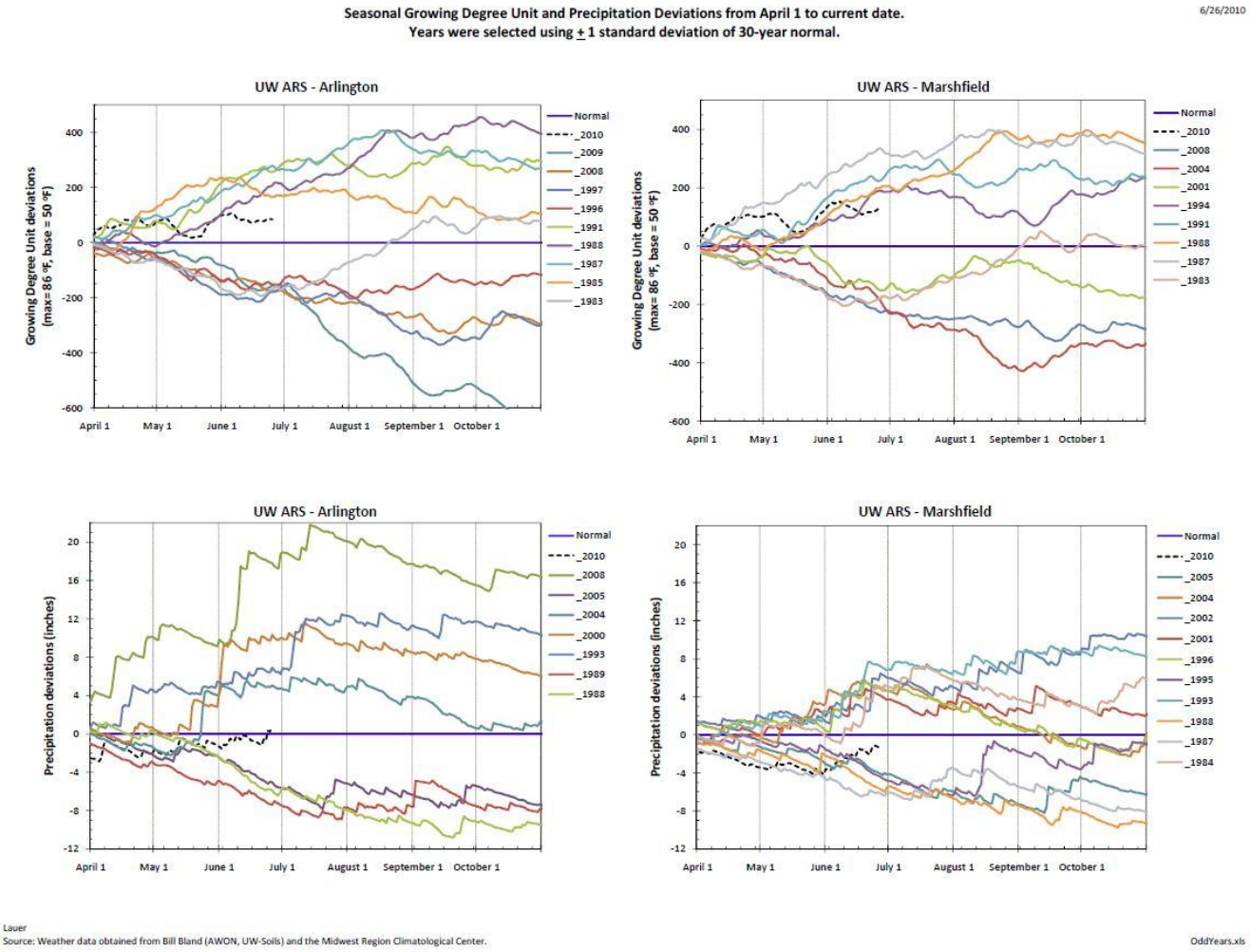
Source: Bill Bland (AWON, UW-Soils) and the Midwest Region Climatological Center.

Figure 2. Weather summary for Marshfield from April 1 to June 26, 2010



Source: Mike Bertram (Marshfield ARS), Bill Bland (AWON, UW-Soils) and the Midwest Region Climatological Center.

Figure 3. Growing degree unit and precipitation deviation of 2010 (April 1 to June 26) from the 30-yr normal. Other included years were selected using ± one standard deviation from the 30-yr normal.



Wisconsin Crop Manager

Volume 17 Number 17 --- University of Wisconsin Crop Manager --- July 8, 2010

Eyespot of Corn

Paul Esker, Extension Field Crops Plant Pathologist

In the past week, we have had an increase in the number of calls and questions about eyespot of corn (Fig. 1). In particular, the majority of these questions focus on situations where the production situation is corn on corn and in no-till. Eyespot, caused by the fungus *Aureobasidium zeae*, is a disease that we have seen with increased frequency over the past few years.

Fig. 1. Leaf showing symptoms of eyespot in the field in 2010.

Symptoms of Eyespot: Symptoms typically start as small (1/16 in), water-soaked, circular lesions that will first be observed in the lower canopy of the corn plant. Lesions can enlarge in size, becoming chlorotic and then necrotic over time. The mature lesions are tan in appearance with a darker brown or purple margin and are surrounded by a larger yellow "halo". The name "eyespot" comes from that fact that when you hold the leaf up to the light to observe the "halo", you can see the "eye" appearance more easily. When the epidemic is severe, lesions may grow together, thus leading to death of large areas of tissue. Spores are produced within the eyespot lesions and when conditions are favorable for disease development can result in further infection and disease. When early season infections are severe, this can lead to barrenness and predispose plants to stalk rots.

Risk Factors: The fungus that causes eyespot survives in corn residue, therefore management tactics that lead to increased residue (such as no-till and continuous corn) can lead to an increase in the source of primary inoculum, especially if the field has a history of eyespot. Disease development is favored by cool, wet weather and leaf wetness (dew). Corn hybrids that are susceptible to eyespot can also increase the risk of disease.

Management: Control of eyespot is focused on tactics that reduce the amount of residue like crop rotation and tillage. Also, for fields with a history of eyespot, plant resistant varieties. Foliar fungicide applications can be effective for reducing eyespot, but these are primarily most effective on high value corn (e.g., seed corn). Even in such situations, the use of foliar fungicides is best warranted only if there has been a history of eyespot in the field and the use of reduced tillage.

Potato Leafhoppers

Bryan Jensen, IPM Program

Second crop harvest is nearly complete in southern Wisconsin. Now is a good time to increase your level of potato leafhopper scouting. Populations have been low so far but are starting to rise. Although it is too early to know what their impact will be for the rest of the summer, it is unquestionably time to start sweeping fields.

Because leafhopper population densities vary from year to year and from field to field, the only way to accurately determine damage potential is by monitoring fields on a weekly schedule. To get an accurate and unbiased estimate of leafhopper populations you must use a standard 15-inch diameter insect sweep net. Walk a W-shaped pattern in the field and take twenty consecutive sweeps in each of five randomly selected areas. The economic threshold is based on the average number of leafhoppers/sweep. Keep a running total of the number of leafhoppers caught and divide by 100 (which is the total number of sweeps taken in each field). Be very careful when looking for leafhopper nymphs. Usually you will not find them at the bottom of the sweep net (as you would the adults). Instead, they are frequently found around the collar of the net.

Check net collar for nymphs

The threshold for potato leafhopper is based on plant height, the shorter the alfalfa, the fewer leafhoppers it takes to cause economic damage. If the alfalfa is 3 inches tall, spray when the average number of leafhoppers reaches 0.2/sweep. When alfalfa reaches an average height of 6 inches, the threshold is increased to 0.5 leafhoppers/sweep. When plant height is 8-11 inches or greater than 12 inches the leafhopper threshold is then 1.0/sweep and 2.0/sweep, respectively. Do not spray if you are within 7 days of your normal cutting schedule. Instead, cut the alfalfa and reassess the situation by sweeping the regrowth for leafhoppers.

Automatically spraying stubble and/or regrowth regardless of leafhopper populations is not a good idea. Harvest will usually kill nymphs and adults will leave the field. When adults recolonize each field is anybody's guess. Therefore, sweeping regrowth and spraying according to threshold can better time applications, if needed. Therefore, protecting alfalfa for a longer period of time. An exception is recently harvested direct seeding. Often green leaves will remain on the stubble providing some shelter and a food source for adults and nymphs. In this situation, new seeding can be swept almost immediately after harvest before deciding if treatments are necessary.

Western Bean Cutworm Eggs Masses and Larval Hatch Underway

Eileen Cullen, Extension Entomologist

The annual flight of western bean cutworm is occurring in southern and central Wisconsin, as far north as Portage county. Krista Hamilton, WI DATCP Pest Survey reported 1-78 moths at 21 of 144 monitoring locations for the week ending July 2nd. We expect peak flight (50% of the season's moths emerged) from July 8-15 at most sites. However, check WBC degree-day accumulation in your area. Northern locations typically experience peak flight later than southern and central reporting sites.

Below are some key points to remember for non-Bt field corn and processing sweet corn fields. Additionally, not all Bt corn hybrids contain the Cry1F trait for WBC control. Please refer to the article Keeping up with Bt Corn Insect Traits and Refuge Requirements if you need to check whether a Bt corn hybrid includes WBC protection.

Now is the time to check degree-day accumulations in your area and scout corn for egg masses and small larvae. This is the time when eggs are being laid in fields, larvae are (or will soon be hatching), and small larvae will be accessible to treatment before entering the corn ear.

Economic threshold: For field corn, foliar insecticide treatment should be considered no later than when 8% of 100 corn plants have egg masses and/or small larvae. For processing sweet corn, the threshold is 4% egg masses and/or small larvae.

Degree Days base 50°F and Scouting: Start scouting at 1,320 DD, 25% moth emergence. Peak moth emergence, 50% of the season's population occurs at 1,422 DD. From southern to central Wisconsin you should be finding eggs at this time. Calls from the field confirm this. Waushara County (Spring Lake), near the Marquette County line is one example where Mike Weiss, Syngenta Field Agronomist reported an easy collection of 50 egg masses in 30 minutes. Two of the egg masses were hatching, and some predator activity (a lady bug beetle eating one egg mass).

WBCW Pheromone Trap Network: Thanks to all the cooperators who responded to the call for pheromone trapping. Krista Hamilton, DATCP Pest Survey has 144 sites reporting for WI. Krista's weekly trap updates are available at http://pestbulletin.wi.gov/

If you have a pheromone trap near a field or set of fields, begin scouting when the first moth is captured.

For more information on WBC egg mass and small larvae identification (photos), scouting, economic thresholds, and treatment decision support, please visit my program web site insect page for WBC: http://www.entomology.wisc.edu/cullenlab/insects/info/wbc.html

A final note about corn crop phenology and WBC flight and egg-laying. Both corn crop development and moth emergence are about 1-2 weeks ahead of a typical year in most locations due to warm weather and rapid degree-day accumulation. When WBC economic threshold is reached, the recommendation is to treat after 95% tassel emergence, but before larvae enter the ears. If egg hatch has not yet occurred and plants have tasseled, treat as close to egg hatch as possible, when egg masses have reached the purple color stage indicating 12-24 hours to hatch. If the field is not yet at 95% tassel emergence but egg masses and larvae are at economic threshold keep an eye on timing of larval hatch and ear development as guiding factors. Remember, WBC not only enters ears through silks (like corn earworm), but also through the side of the ear.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between June 30 and July 6, 2010.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Corn	Root Rot	*Fusarium* sp.	Dodge, Monroe
FRUIT CROPS			
Apple ('McIntosh')	Cytospora Canker	*Cytospora* sp.	Marathon
	Phomopsis Canker	*Phomopsis* sp.	Marathon
VEGETABLES			
Spinach	Root Rot	*Phytophthora* sp., *Pythium* sp., *Fusarium* sp.	Rock
Tomato	Bacterial Canker	*Clavibacter michiganensis* subsp. *michiganensis*	Waukesha
	Septoria Leaf Spot	*Septoria lycopersici*	Rock

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Vegetable Disease Update - July 2, 2010

A.J. Gevens, Department of Plant Pathology, UW-Madison

Potato & Tomato

Late blight: A few new late blight reports have emerged over this past week and include: potato late blight in southeastern North Dakota (6/25) and tomato late blight in southern Indiana (6/30). Past reports from 2010 have include tomato late blight in NY, CT, PA, OH, LA, MD, FL, KY, and Manitoba Canada. One additional report of potato late blight came from MI. Late blight has NOT been found in Wisconsin on tomato or potato at the time of this reporting. It is not yet known what type of *Phytophthora infestans* is at work in the US this season. I have heard that this year's late blight is aggressive on potato - a feature we did not see in last year's epidemics with US#22. I will continue to provide updates to this group as things unfold.

With continual accumulation of DSVs, the presence of the late blight pathogen in nearby states, and the potential for overwintered inoculum here in WI, the application of effective, preventative fungicides for late blight control is recommended at a 7 day interval. DSVs are over the threshold of 18 for the following locations: Antigo all planting dates, Grand Marsh all planting dates, Hancock all planting dates, Plover early and mid-planting dates. Additional information regarding fungicides can be found at: http://www.plantpath.wisc.edu/wivegdis/ or the University of Wisconsin Commercial Vegetable Production Guide A3422. The past several newsletters have included specific fungicides for application. Past newsletters can also be found at the above website.

Early blight: Early blight, caused by the fungus *Alternaria solani*, has been active in potatoes (and tomatoes) in Wisconsin. As of June 30th, P-day values range from 124 (Antigo late emergence) to 372 (Hancock early emergence). Grand Marsh, Hancock, and Plover have hit the 300 P-Day threshold for all but one planting date. P-Days of 300 or greater indicate optimal temperature conditions for early blight activity. A list of commercial products and diseases they control can be found in the Commercial Vegetable Production in Wisconsin Guide A3422.

Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations

Location	Planted	50% Emergence	P-Day Cumulative	DSV Cumulative	Calculation Date
Antigo Area	Early 5/3	5/30	259	58	6/30
	Mid 5/15	6/6	194	47	6/30
	Late 5/30	6/16	124	19	6/30
Grand Marsh Area	Early 4/14	5/17	351	27	6/30
	Late 5/5	5/23	310	21	6/30

Hancock Area	Early 4/18	5/7	372	35	6/30
	Mid 4/28	5/15	358	26	6/30
	Late 5/6	5/23	309	20	6/30
Plover Area	Early 4/9	5/16	359	20	6/30
	Mid 4/28	5/25	301	15	6/30
	Late 5/28	6/13	149	7	6/30

Visit our web site at:

(http://www.plantpath.wisc.edu/wivegdis/index.htm)

where you can find updated P-Day and Severity Value information throughout the growing season. Values in red indicate a value greater than the threshold (P-Day of 300 and DSV of 18).

Cucurbits: Downy mildew on cucurbits has not been identified in Wisconsin at this time. However, there have been recent reports in OH, Ontario Canada, and NY, and spores are present in MI. Unfavorable conditions for the spread of the epidemic are expected for the sources from OH, NY, and southern Ontario. The website below: http://cdm.ipmpipe.org offers up to date reports of cucurbit downy mildew and disease forecasting information.

Wisconsin Crop Manager

Volume 17 Number 18 --- University of Wisconsin Crop Manager --- July 15, 2010

Communication Methods Survey to Help Us More Effectively Reach You

Drs. Shawn Conley (University of Wisconsin) and Vince Davis (University of Illinois) are conducting a communication methods survey and are asking for your participation. The objective of this survey is to investigate the technology that soybean growers and agronomic consultants use to find and share soybean production and marketing information. This survey is being conducted through the mail via post cards and through an on-line survey program. The research is sponsored by the Illinois and Wisconsin Soybean Marketing Boards through the soybean checkoff. The survey should take less than 10 minutes of your time but will be extremely valuable to us. This survey is completely voluntary and the information you provide will remain anonymous. Please visit www.surveymonkey.com/s/soybeangrowercommunications to take part in this research to help us serve you better.

We sincerely thank you in advance for your participation.

– Shawn P. Conley and Vince M. Davis

Wisconsin Vegetable Crop Update, 2010-9 and 2010-10

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue nine and ten are out! This marks the ninth and tenth newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

Both issues have been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here:

http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Nutrient of the month: Zinc (Zn)

Matt Ruark, Department of Soil Science

Zinc (Zn) is considered both a micronutrient and a heavy metal in soil systems. As a micronutrient and enzyme constituent, it plays an important role in plant production. It is an essential element for cellular processes of protein, carbohydrate and chlorophyll synthesis and is required for membrane integrity and activation of enzymes. But do you need to apply Zn to produce a healthy crop? To answer this question use the SPEC philosophy: first consider your Soil, then your Crop, then your Experiences, then your Corrective options.

1) Soil factors

a. Soil pH. Plant-availability of Zn is controlled by soil pH, soil texture, soil temperature and soil phosphorus. The solubility of Zn (i.e. the ability of Zn to exist in soil solution rather than bound to soil particles) decreases when pH increases. Thus, as a guideline, Zn deficiency rarely occurs below a soil pH of 6.5. Zn deficiencies are not uncommon in sensitive plants in calcareous soils of the western U.S.

b. Soil texture. Zn exists in soil solution as a divalent cation (Zn^{2+}). Sands and loamy sands are commonly deficient in Zn because these coarse-textured soils provide little in terms of supply. Organic soils also contain relatively low levels of Zn. Zinc also exists as soluble or insoluble complexes with organic matter. Soluble complexes are a supply of Zn in the plant/soil system, while insoluble complexes, like those that form in organic soils (e.g. muck soils, peat soils) reduce Zn availability.

c. Soil temperature. Lower soil temperatures reduce Zn availability. The interaction between slow root development and Zn availability during seasonally cool periods can cause visual deficiency symptoms to occur.

d. Soil phosphorus. High levels of phosphorus in soil cause greater amounts of phosphorus to be taken up by the plant, which in turn, interferes with Zn movement in the plant. Under these conditions, Zn accumulates in the root and is not translocated into the above ground biomass.

2) Crop factors

a. High demand crops: Field corn, sweet corn, onion, spinach

b. Medium demand crops: Apple, barley, kidney bean, navy bean, lima bean, table beet, canola, cucumber, lettuce, lupine, potato, sorghum, soybean, tobacco, tomato

c. Low demand crops: Most everything else

3) Experiences

a. Soil conditions. Early wet growing season conditions reduce the plants ability to uptake Zn. Plants typically grow out of deficiency symptoms as soil moisture returns to adequate levels.

b. Plant symptoms. Are you observing Zn deficiency? Zinc deficiency is often expressed as a yellowing or whitening of leaf area between leaf veins (interveinal chlorosis). Zn^{2+} is not mobile in plants and deficiency symptoms will occur on newer leaves. On corn, a classic symptom is a broad band of bleached tissues on either side of the midrib. In soybean and snap bean, Zn deficiency is expressed as shortening of leaf internodes and production of small, narrow and malformed leaves. Interveinal chlorosis may also be present. Photos of Zn deficiencies can be found at http://www.agronext.iastate.edu/soilfertility/nutrienttopics/deficiencies.html

c. Soil test. Our current UWEX guidelines rely on a measure of available soil Zn extracted using 1M hydrochloric acid and analyzed using atomic absorption. The optimum range for soil test Zn is 3.1 to 20 ppm. In soils testing in the optimum range or greater, response to Zn is unlikely. Zinc should never be applied to soils testing "excessively high" (<40 ppm). Soils testing "very low", <1.5 ppm, will require Zn and soils testing "low", 1.6 to 3.0 ppm, may require Zn for high demand crops and some bean crops. Do not collect soil in buckets that contain Zn such as rubber or galvanized steel.

d. Plant tissue test. Interpretation of Zn concentrations in plant tissue is specific to each crop and timing of sampling. Detailed information can be found at http:tinyurl.com/plantsampling. Always submit a soil sample when submitting a plant tissue sample for analysis.

4) Corrective options

a. Reduce P inputs or couple P and Zn applications. Reduction in P application may improve Zn uptake. A simple effective solution if P is the cause of Zn deficiency. Low Zn soils in Kansas have shown a benefit to applying Zn along with P in starter or in broadcast applications (Ruiz-Diaz, January 29, 2010, K-State Extension Agronomy Updates). These studies on low Zn soils also show application of P without Zn can reduce yields compared to application of Zn without P.

b. Apply manure. Although manure contains large amounts of P, it also contains enough Zn to overcome the potential negative effect of P application. If you were planning on applying manure regardless, you will be applying sufficient levels of Zn. Consider testing your manure if you are interested in knowing the exact nutrient content.

c. Apply inorganic Zn. Zinc sulfate (36% Zn) and zinc oxide (78% Zn) are two common forms of inorganic zinc fertilizer. Zinc sulfate is typically less expensive and has greater solubility. Typical applications are 2 to 4 lb/A of Zn if band applied and 4 to 8 lb/A of Zn if broadcast applied. Zinc is not very mobile in soils and thus requires greater additions if only applied to the soil surface to ensure adequate plant uptake.

d. Apply chelated Zn. Zinc chelate products typically use EDTA to create a highly soluble Zn compound. Thus, less product is required (0.5 to 1 lb/A of Zn if band applied, 1 to 2 lbs of Zn if broadcast).

e. Foliar apply. Suggested for rescue treatments only. Apply 1 lb/A of Zn if using zinc sulfate and 0.15 lb/A of Zn if using Zn chelate. Zn chelate will be a more effective source of Zn for foliar application. This option may require more than one application and chance of success is not guaranteed.

Second Generation Armyworms?

Bryan Jensen, IPM Program

After having an unusually severe first generation infestation it is time to start monitoring for second generation armyworms. I've been seeing some fresh looking moths and a few small larvae signifying the start of the second generation. However, it is anyone's guess if we will have significant injury or not. Since it is difficult to predict second generation damage potential you'll have to rely on scouting. Unfortunately, predicting fields that are likely to have damage is not as easy as first generation. Fields or field edges with grass weed pressure are certainly places to begin looking but at this stage of corn development all fields could be attractive.

If you find feeding signs, check 5 sets of 20 plants at random. Treatment is suggested if larvae are ¾ inch or shorter and you have two worms on 25% of the plants or one on 75% of the plants. Spot treatment maybe possible. Armyworms have a wide host range but prefer to feed on grass plants including sweet corn, oats, wheat, barley, pastures, etc. However, monitor other crop plants because armyworms will occasionally feed on broadleaves.

Late Blight in Potatoes

Dr. Amanda J. Gevens

Late blight has been confirmed in a potato field in Marquette County this morning. Infection was isolated to a small section of the field. Symptoms suggest that the infection occurred approximately 5-7 days ago.

It is critical that Wisconsin potatoes and tomatoes be protected with appropriate fungicides. I will provide further information and management recommendations in this week's Vegetable Update newsletter. At this time a potato/tomato fungicide list is available at my website and was presented in a previous newsletter.

http://www.plantpath.wisc.edu/wivegdis/

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between July 7 and July 13, 2010.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Corn	Eyespot	*Aureobasidium zeae*	McHenry (IL)
Corn (Red)	Stewart's Wilt	*Erwinia stewartii*	Grant
Soybean	Downy Mildew	*Peronospora manshurica*	McHenry (IL)
	Root Rot	*Pythium* sp., *Fusarium* sp.	Dane, Dodge
FRUIT CROPS			
Blueberry	Root/Crown Rot	*Phytophthora* sp.	Bayfield
Grape	Anthracnose	*Sphaceloma ampelinum*	Dane
	Black Rot	*Phyllosticta ampelicida*	Dane
VEGETABLES			
Kohlrabi	Root Rot	*Pythium* sp.	Washington
Onion	Purple Blotch	*Alternaria porri*	Waushara
Pea	Root Rot	*Fusarium* sp.	Waushara
Pepper	Bacterial Speck	*Pseudomonas syringae* pv. *tomato*	Rock
	Bacterial Spot	*Xanthomonas campestris* pv. *vesicatoria*	Rock
	Fruit Rot	*Pythium* sp.	Rock
Radish	Root Rot	*Fusarium* sp.	Kewaunee
Tomato	Bacterial Canker	*Clavibacter michiganensis* subsp. *michiganensis*	Waushara
	Septoria Leaf Spot	*Septoria lycopersici*	Outagamie

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Crop Manager

Volume 17 Number 19 - - - University of Wisconsin Crop Manager - - - July 22, 2010

Alfalfa Caterpillars and Green Cloverworms

Bryan Jensen, IPM Program

I've had several calls and questions regarding caterpillars in alfalfa. Two species have been present in higher than normal numbers. One is the green cloverworm which is light green, has faint white stripes on the side of the body and will grow up to 1 ½ in length. Green cloverworms are very active and will drop to the ground when disturbed. They are also an occasional pest on soybean. The other is the alfalfa caterpillar which are a dark velvety green color and have distinct white stripes down each side of the body. Alfalfa caterpillars also will grow up to 1 ½ inch long but are less active than green cloverworms. When disturbed they can curl up into a c-shaped pattern.

Green Cloverworm

Alfalfa Caterpillar

Both species damage alfalfa by chewing on leaves. Initially damage can be identified as holes in leaves but as larvae mature they will feed on the leaf margin. Large amounts of foliage can be consumed, however, this rarely happens. To scout, take five sets of 20 consecutive sweeps per field. Treatment may be suggested if you have an average of 10 caterpillars/sweep. Before making a treatment decision survey the field for signs of diseased larvae. Economic damage from alfalfa caterpillars is unusual because a viral disease frequently causes high mortality as populations increase. Infected larvae soon become blacked and evidence is easily found on leaves and stems.

Damaged Alfalfa Leaves

Trochanter Mealybug in Soybean?: What to Look For

Eileen Cullen, Extension Entomologist

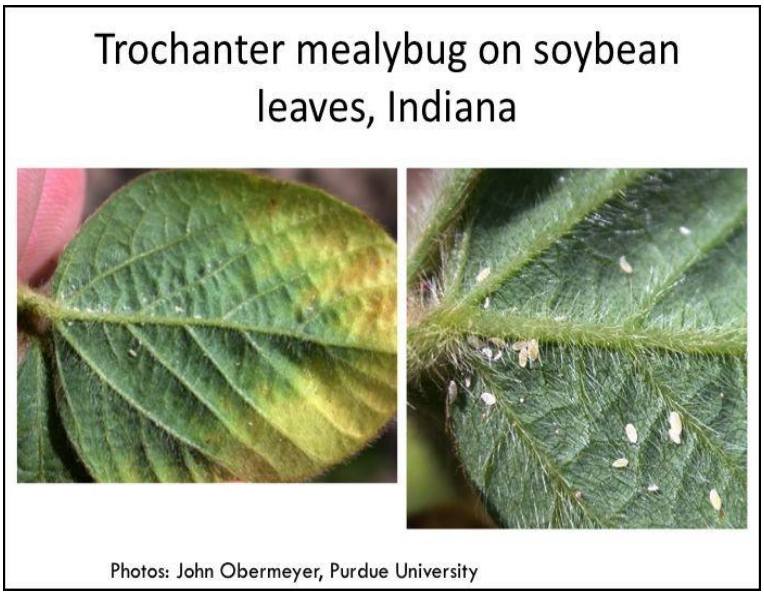
Look twice at yellow soybean fields in 2010. Trochanter mealybug (*Pseudococcus sorghiellus*) was reported by entomologists in Kentucky, Ohio and Indiana in 2008 and 2009. To date, we have had no reports of Trochanter mealybug in Wisconsin. Neither my program nor Shawn Conley's soybean program have found the mealybug in our research trial locations. Whether or not its presence in soybean causes economic yield loss remains to be seen.

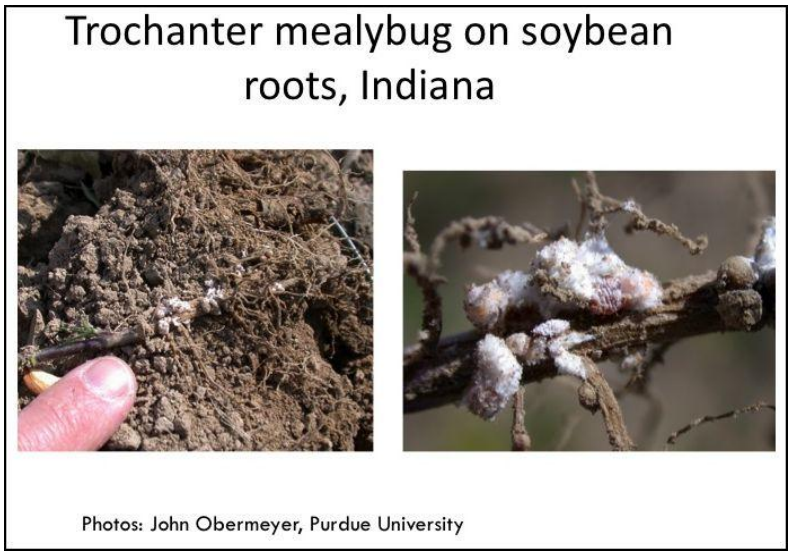
Trochanter mealybug is a tiny insect. It is a root feeder with sap-sucking traits. You can think of it as you would soybean cyst nematode in that you will need to dig up roots to look for the mealybug properly.

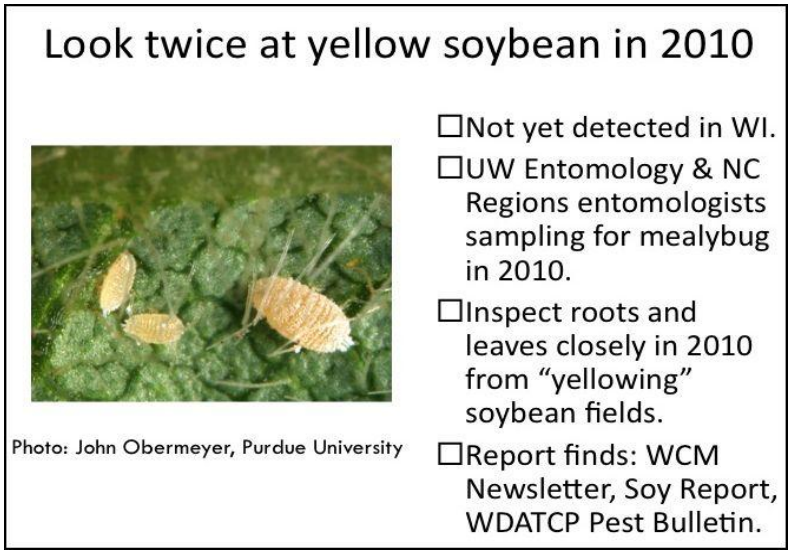
Trochanter mealybug detections in KY, OH, and IN have been associated with stressed soybean plants, most often from fields with "yellowing" foliage typical of potassium deficiency. For that reason, it could go unnoticed if you are unaware of the potential for trochanter mealybug below ground. In addition to soybean, trochanter mealybug will feed on alfalfa, red and white clover. However, in KY it has also been collected from corn, Johnson grass, and sorghum. The literature lists curly dock, milkweed, plantain, and some tree species as hosts.

In 2009, entomologist Ron Hammond, Ohio State University, confirmed trochanter mealybug egg masses on soybean roots of plants exhibiting classic yellowing foliage and stunted growth. However, soil tests where the mealybugs were found did not show K deficiency.

If you have soybean fields that exhibit yellowing foliage and stunted growth, it is a good idea to dig up some plants with roots from affected areas and look for tiny white mealybugs on the roots. Use a hand lens if you have one. This insect has a waxy or cottony appearance. You can also shake the roots onto dark paper for additional contrast. To help with potential diagnostics, I have included some slides from my winter meeting talks with excellent photos credited to John Obermeyer, Purdue University.







For now, we are just requesting that you be aware of trochanter mealybug as a potential below ground insect pest, and inspect fields with yellowing foliage. Together with entomologist colleagues in the North Central region, we are looking to assess how common the trochanter mealybug is, and what roles soybean plant stress, growth stage, soil type play in infestations and any potential yield loss damage relationships. If you have a suspect field, please contact Eileen Cullen, Bryan Jensen, or Shawn Conley at UW Madison entomology and agronomy. I will be glad to diagnose your sample and am part of a multi-state research group organizing to conduct field surveys on this potential soybean root feeding insect pest.

Green Cloverworm in Soybean

Eileen Cullen, Extension Entomologist

Green cloverworm larvae and defoliation have been observed in Darlington and Clinton in southern Wisconsin, and likely other locales. It is only an occasional pest of soybean. However, since population densities appear to be a bit higher and more noticeable this season, this post covers some basics on the insect's life cycle and soybean defoliation threshold guidelines. Bryan Jensen also has a nice article and pictures in

this Wisconsin Crop Manager issue comparing green cloverworm and alfalfa caterpillar identification and feeding in alfalfa.

An excellent fact sheet on green cloverworm in soybean for the North Central region is available at: http://wiki.bugwood.org/NPIPM:Green_cloverworm

Green cloverworm overwinters south of 41° N latitude (roughly around Omaha, NE), migrating northward in spring. Female moths lay eggs singly on the underside of soybean leaves. There are 6 larval instars. The green cloverworm typically produces two generations in northern states. Fully grown larvae are approximately 1 inch long, pale green with two horizontal stripes along each side of the body. The larvae have three pairs of legs in the middle of the body, three pairs near the head, and one pair at the hind end of the body.

When fully grown, larvae will drop to the ground and pupate in soil debris for next generation. With green clover worm larvae ranging from approx. half-inch to near an inch, we have probably just passed the 'half-way' mark for the current generation development. It generally takes about 14 days for the larvae of green cloverworm to develop through the 6 instars, with most feeding occurring between 4th and 6th instar.

Green clover worm field populations are usually well regulated by predators, parasitoids, and pathogens. In years with heavy green cloverworm populations, a fungal pathogen *Nomuraea rileyi* usually reaches an epizootic level within the green cloverworm population and induces a population collapse.

Below is a nice bit of text excerpted from Bruce Potter's 'Southwest IPM Stuff' Newsletter, July 12th 2010 issue, on green cloverworm in soybean:

An economic threshold for green cloverworm based on larvae/foot of row has been developed for 30 inch rows and the R2-3 stage (Ostlie and Pedigo). Place a sweep net or drop cloth between rows. Vigorously shake the plants from one row on to the cloth and count larvae/foot. Sample 4 spots/20 acres but do not sample field edges. Based on $10/bushel soybean and $7/acre control costs the economic threshold would be 5.2 larvae / foot.

Management action is also based on whole plant (not individual leaf) defoliation estimates. The defoliation due to green cloverworm will be considered together with the damage inflicted by other defoliating insects, wind damage, etc. to make a management decision. Management is recommended if defoliation reaches 40% in pre-bloom, 20% during bloom and pod-fill and 35% from pod-fill to harvest. A guide for estimating defoliation on an individual soybean leaflet can be found at http://www.ipm.iastate.edu/ipm/icm/2002/7-29-2002/soydefoliation.html.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between July 14 and July 20, 2010.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Corn	Root Rot	*Fusarium* sp.	Dane
FRUIT CROPS			
Raspberry	Anthracnose Fruit Rot	*Colletotrichum* sp.	Winnebago
Strawberry	Phomopsis Leaf Blight	*Phomopsis* sp.	Marathon
	Root Rot	*Pythium* sp.	Milwaukee
VEGETABLES			
Basil	Bacterial Blight	*Xanthomonas* sp.	Dane
Cabbage	Root Rot	*Pythium* sp.	Unknown
Pea	Ascochyta Blight	*Mycosphaerella pinodes/ Ascochyta pinodes*	Green Lake
	Root Rot	*Fusarium* sp., *Pythium* sp.	Green Lake
Snapbean	Ashy Stem Blight	*Macrophomina phaseolina*	Sauk
Tomato	Late Blight	*Phytophthora infestans*	Waukesha
	Septoria Leaf Spot	*Septoria lycopersici*	Outagamie

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

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Production Efficiency is featured in the 2010 PEPS Program

Joe Lauer, Corn Agronomist

2010 PEPS Entry Forms

The global climate change question, increasing regulations, and the food versus fuel debate have put unprecedented pressure on farmers. Farmers must remind society that they are good stewards, and that while growing corn they can conserve soil, improve water quality and produce adequate food, feed, fiber and fuel. The Profits through Efficient Production Systems (PEPS) program provides an outstanding opportunity to gain valuable knowledge, technical insight and demonstrate your farming skills. It provides a unique method to compare the economics of your cropping systems to others. The 2010 PEPS program features profitability through efficient production systems.

In 2009, the cost per bushel in the PEPS program ranged from $2.01 to $2.85 for corn yield levels ranging from 142 to 276 bushels per acre (Table 1). The average yield in the cash corn and dairy/livestock corn divisions was 214 and 194 bushels per acre with production costs of $531 and $428 per acre. The average cost per bushel in these divisions was $2.51 and $2.19. Using PEPS production costs for an acre and the WI USDA state average of 153 bushels per acre, the average cost per bushel was $3.47. For corn silage, it cost $734 per acre with an average cost per ton of dry matter of $81.95 ($28.68 at 65% moisture).

The intent of the PEPS program is to encourage the development of profitable new and innovative corn management practices that conserve resources and improve water quality.

Two options are available to growers in the PEPS program:

- **Contest option**: The top-participant of each district and division is recognized with a plaque and cash award at the state level.
- **Verification option**: Farmers can compare the economics of their cropping system to other farmers without entering the public contest.

The **""Green Fields – Blue Waters" award** is given to a farmer to recognize and promote stewardship and sustainable corn production practices. The 2009 awardee was Steve Kloos of Marathon county.

For previous PEPS reports and 2010 Entry forms see the website: http://corn.agronomy.wisc.edu/PEPS.

Fields entered in the PEPS program may also qualify for other contests such as the National Corn Yield Contest.

Table 1. PEPS Most Efficient corn farmers in the 2009 Cash Corn, Dairy/Livestock Corn and Silage Corn Divisions.

Division	District	County	Participant	Cost/Bu Cost/T	Cost/A	Yield bu/A	Verifier
Corn, Cash Crop	1	Waupaca	Larry Danke	$2.64	$520	197	Paul Knutzen
	2	Columbia	Daniel Padley	$2.01	$499	248	Daniel Sandwick
	3	Grant	David Gehrke	$2.35	$478	203	Steve Mueller
Corn, Dairy Livestock	1	Rusk	Rusk Rose Holsteins, Inc.	$2.01	$324	161	Gary Pomeranke
	3	Dane	Ron Dresen	$2.06	$435	212	Vernon Meinholz
Corn, Silage	1	Marathon	Steve Kloos	$66.51	$539	8.1	Philip Ely
	3	Sauk	Meadow Lane Farms	$80.71	$845	10.5	Denise Brusveen

New for 2010 are four county yield contests offered by the Wisconsin Corn Growers Association – 1) Juneau, Adams, and Marquette, 2) Columbia, 3) Dodge and Fond du Lac, and 4) Rock, Walworth and Jefferson counties. See http://www.wicorn.org for details.

If you have any questions, please call Amy Cottom at (608) 262-7702 or e-mail at: agcottom@wisc.edu. Have a

safe and profitable growing season!

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between July 21 and July 27, 2010.

Found at the end of this issue

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Vegetable Crop Update, 2010-11

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newletter issue eleven is out! This marks the eleventh newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The eleventh issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here: http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Western Bean Cutworm Moth Flight Peak and Larval Movement to Corn Ears

Eileen Cullen, Extension Entomologist

Western bean cutworm (WBC) egg hatch and larval movement on corn plants has been underway in Wisconsin for the past couple of weeks with scouting and treatment decisions recommended during the egg period. Peak emergence (50% of the season's population) occurred at 1,422 DD (Base 50°F). Check DD accumulations for your area, particularly in northern and northeastern areas of the state where DD accumulations can occur a bit later than in southern and central areas. The peak has occurred in much of WI. Krista Hamilton reported in last week's Pest Bulletin the high count for the period July 16-22 was 442 moths in the pheromone trap near Neshkoro in Waushara County. Similarly, the high count for the period of July 14-21 was 720 moths in one of our pheromone traps at Arlington Agricultural Research Station in Columbia County. That same trap registered 186 moths on my count this week for the period July 21-27.

Krista Hamilton, WI DATCP Pest Survey, reports as of this afternoon (July 29), the total pheromone trap count for WI is 9,418 moths (in 140 traps). The count last year at this time was 1,450 and the 2009 annual total was only 4,928 moths. The flight is definitely winding down, but many locations are still reporting moderate numbers.

The adult female moth is most attracted to corn just before tasseling and lays eggs on the upper leaf surface primarily on upper leaves on the corn plant and near the ear zone. Corn crop phenology (planting date) and planting type (field corn, seed corn, sweet corn) will dictate somewhat where on the plant you can find small larvae, depending upon what stage the plant was in when female moths laid eggs in the field. Larvae from the current flight are primarily in early and intermediate instars and can be detected now on corn tassels, in leaf axils, and on silks of developing ears.

The pictures below show a mature WBC egg mass. Note the purple color of the eggs. Egg masses change color from a creamy white to purple 24-48 hours prior to hatch. Also shown are early instars on silks. The most distinctive WBC larval feature is that the pronotum ("neck" area behind the head capsule) has two broad brown stripes on it.

Western bean cutworm egg mass. *Photo: E. Cullen, University of Wisconsin - Madison*

Western bean cutworm early instar larvae on corn silks. *Photos: E. Cullen, University of Wisconsin - Madison*

I've received scouting and treatment reports from central and northeast Wisconsin over the past couple of weeks. As recommended, these treatments have been targeted to economic threshold levels of 5-8% field infestation with eggs and small larvae.

It is important to be able to detect and identify these small WBC larvae before they enter the ear at which point insecticide treatment will not be effective. WBC larvae take more time to locate on the plant because they can now be in the tassel, leaf axils, and/or silks; and of course they are much smaller than the large larvae that will surely be reported from corn ears in August and September. WBC larvae enter ears through the silks or directly through the husk on the side of the ear. More than one WBC larvae can feed and develop per ear, as they are not cannibalistic.

My colleague, Dr. Christian Krupke, Extension Entomologist at Purdue University posted an excellent video clip on scouting for small WBC larvae on post-whorl corn plants, the remaining potential for insecticide efficacy if larvae are intercepted before ear entry, and biological control showing natural enemy predation on WBC eggs and larvae. Please visit the Pest & Crop Newsletter, Issue 17: July 23, 2010:

http://extension.entm.purdue.edu/pestcrop/2010/issue17/index.html#video, or link directly to the video below.

VIDEO: Scouting Western Bean Cutworm Post-Whorl, Possible But Tedious – (*Christian Krupke and John Obermeyer*)

Soybean Aphid Numbers Quite Low Overall

Eileen Cullen, Extension Entomologist

Soybean aphid population densities continue to be quite low statewide, and overall have not reached the economic threshold of 250 aphids per plant. Contributing factors to low numbers this far into the season include heavy rainfall events, heat, and natural enemy suppression. In a recent email communication, David Ragsdale, Entomologist, University of Minnesota, commented that rain has certainly led to a lot of soybean aphid mortality. Ragsdale and his research group measured "60% mortality after a single 1-inch rainfall event and have observed even greater mortality at times. Combine this with natural enemy mortality and it is hard for soybean aphid to get a leg up this year."

While numbers are low, soybean aphids are pretty evenly distributed across a high percentage of plants within individual fields. For example, in our soybean aphid research experiment at Arlington comparing population dynamics on soybean aphid resistant and susceptible lines, 80% of the experiment is infested. However, aphids have averaged 10/plant, 15/plant, and back down to 4/plant this last week.

Individual plants with several hundred aphids can be located, but field averages based on 20-30 plants from throughout the field, have been consistently below threshold. Krista Hamilton, reported last week in the Wisconsin Pest Bulletin that as of July 22, none of the fields surveyed statewide would warrant an insecticide application. All fields surveyed have remained below threshold. In the WI DATCP state soybean aphid survey (based on 20 plants examined per field) many fields are now 75-95% infested, but a very low numbers.

Although soybean aphid has not been a widespread issue to date, and other issues such ashttp://ipcm.wisc.edu/WCMNews/tabid/53/EntryId/981/Green-Cloverworm-in-Soybean.aspx have recently garnered more attention, do not give up on soybean aphid scouting. There is still potential for economic population increase in early through mid-August.

Continue to scout soybean for soybean aphids through the R5 growth stage.

To review information on soybean aphid economic threshold, scouting, biological control, and more, please visit our UW Soybean Plant Health page at: http://www.plantpath.wisc.edu/soyhealth/aglycine.htm

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PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Corn	Common Rust	*Puccinia sorghi*	Rock
	Eyespot	*Aureobasidium zeae*	Rock
	Yellow Leaf Blight	*Phyllosticta maydis*	Rock
Soybean	Growth Regulator Herbicide Damage	None	Barron
	Root Rot	*Phytophthora* sp., *Pythium* sp., *Fusarium* sp.	Dodge, Fond du Lac, Juneau, Rock
	Soybean Cyst Nematode	*Heterodera glycines*	Juneau
	Stem Blight	*Phomopsis* sp.	Dodge, Fond du Lac
FRUIT CROPS			
Blueberry	Phomopsis Canker	*Phomopsis* sp.	Eau Claire, Sauk
	Root Rot	*Phytophthora* sp.	Sauk
Raspberry	Fruit Rot/Blossom Blight	*Botrytis cinerea*	Outagamie
Strawberry	Root/Crown Rot	*Pythium* sp.	Chippewa
VEGETABLES			
Onion	Purple Blotch	*Alternaria porri*	Columbia
	Sour Skin	*Burkholderia cepacia*	Rock
Potato	Bacterial Soft Rot	*Pectobacterium carotovorum*	Fond du Lac
	Early Blight	*Alternaria solani*	Green

	Verticillium Wilt	*Verticillium* sp.	Dane, Door
Tomato	Bacterial Speck	*Pseudomonas syringae* pv. *tomato*	Langlade, Rock
	Bacterial Spot	*Xanthomonas campestris* pv. *vesicatoria*	Rock
	Blossom End Rot	None	Rock
	Early Blight	*Alternaria solani*	Dane, Green
	Septoria Leaf Spot	*Septoria lycopersici*	Barron, Dane, Langlade, Richland
MISCELLANEOUS			
Tobacco	Angular Leaf Spot	*Pseudomonas syringae* pv. *angulata*	Iowa

Wisconsin Crop Manager

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Scouting for Sudden Death Syndrome in Soybean

Paul Esker, Extension Plant Pathologist

With soybean in the R4 to R5 growth stage in many areas of the state, we are starting get reports of plants expressing symptoms that for many (given the longer history in the state) would be identified as Brown stem rot (BSR) (Figure 1). A sample received into the lab earlier this week, however, showed symptoms of Sudden death syndrome (SDS) (Figure 2) and a check of our field trials under inoculated conditions within the past day is also showing symptoms of SDS. Weather conditions in 2010 have been very favorable for the development of SDS in the state with wet soil conditions during periods of planting followed by extensive rainfall during the flowering period.

Figure 1. Soybean plants expressing symptoms of Brown stem rot.

Figure 2. Early symptoms of Sudden death syndrome observed on July 29 at the West Madison ARS. The timing of scouting in soybean can help determine if symptoms are due to SDS or BSR.

What is SDS? Sudden death syndrome is caused by the fungus, Fusarium virguliforme. Foliar symptoms of SDS are similar to BSR so careful examination of plants is needed to differentiate the two diseases. It is also possible that both can occur in a soybean plant. Symptoms of SDS include a yellow to brown discoloration of the leaves around veins. Initially, these begin as small, circular spots. Examine the roots also since SDS can lead to a root root and these may be black in color. Also, there may be evidence of the pathogen on the root if you see a blue coloration (this is growth of the fungus). SDS does not lead to a brown discoloration of the vascular and pith tissues that is typical with BSR.

What are the risk factors that lead to SDS? The pathogen overwinters in soybean debris as chlamydospores, which as resistant fungal structures. Disease is favored by high soil moisture during vegetative growth and wet and cooler conditions around flowering.

What if I have SDS...what should I do? First of all, make sure to get a proper diagnosis. If you see evidence of SDS in the field, take a sample (including roots) and send it to the Plant Disease Diagnostic Clinic. After proper identification and if yield was impacted by SDS, consider the use of cultivars with increased resistance to SDS. Also, monitor conditions at planting to avoid cool soil temperatures that are favorable for infection by the pathogen and consider tillage to help increase soil temperature and drainage.

Further information about SDS is available here.

Reports of White Mold - Soybean Too Late to Spray

Paul Esker, Extension Plant Pathologist

We are starting to receive reports of white mold in soybean. With the exception of later planted soybean, most of the soybean crop is at the R4 into R5 growth stage. As you scout the soybean crop, areas of wilted soybean plants may be indicative of white mold (Figure 1). Closer inspection of the wilted area will often lead to the "white mold" symptom that is diagnostic, which is the fluffy white mycelium (Figure 2). Seeing symptoms of white mold means that the plants were infected weeks earlier and the application of a foliar fungicide for control of white mold is not recommended. Also, as earlier stated, with most of the soybean crop past the R3 growth stage, foliar fungicides are not recommended even if scouting does not show evidence of white mold.

For further information about scouting for white mold, please consult:

White Mold of Soybean in Wisconsin

and

White Mold in Soybeans

Figure 1. Areas of soybean where plants are wilted. This is often indicative of white mold.

Figure 2. White mycelium on the soybean stem are a good diagnostic indicator of white mold.

Wisconsin Vegetable Crop Update, 2010-12

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue for July 28 is out! This marks the 12th newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The 12th issue has been posted on the IPCM website on a page titled appropriately: The **Vegetable Crop Update** page. Look for menu item under "WCM-News" to find this page or click here

Corn Earworm Alert for Upper Midwest Region

Eileen Cullen, Extension Entomologist

Please read on for a '*Corn Earworm Alert for Upper Midwest Region'* provided by Bill Hutchison, Extension Entomologist, University of Minnesota. I've added a few comments on corn earworm infestations in field corn.

Corn earworm (CEW) moth flights continue to remain very high in many southern and south-central states, including southeastern Missouri (>300/night/trap), which is one of the likely "source" regions for some of our late season CEW flights in the upper Midwest.

For silking sweet corn, an indication of a potential CEW risk is only 10 or more moths/night/trap, for at least 2 consecutive nights. By way of review, most cooperators and growers are using the CEW pheromone traps, that only catch male moths (wire-mesh or nylon mesh traps). These traps work quite well for CEW, but since they only catch males, the "ten count" should be viewed as an early warning to start watching sweet corn fields for egg-lay (on the silks); and also begin preparations to apply insecticide sprays, as the CEW pressure usually begins to build this time of year (and from silk to harvest).

With the continued hot, humid weather systems (Low pressure from the west, southwest into the Midwest; dew point >70), the Risk of continued or increasing CEW moth flights will remain very high during the coming week. See the most recent 2010 CEW moth migration forecast from Mike Sandstrom at: http://www.insectforecast.com/insectforecast/

For previous information related to timing of pyrethroid sprays in sweet corn, see: http://www.vegedge.umn.edu/MNFruit&VegNews/vol5/vol5n11.htm

To review previous work on the potential for pyrethroid resistance in CEW see previous year's monitoring data at the ZEAMAP web site: http://www.vegedge.umn.edu/ZeaMap/zeamap.htm

For current Insecticide Recommendations, see the Midwest Veg. Production Guide: http://btny.purdue.edu/Pubs/ID/ID-56/ (sweet corn section can be printed separately)

I received a report this morning of corn earworm infestation in field corn fields from NE Wisconsin, also infested with western bean cutworm. Bill Hutchison, University of Minnesota, mentioned that field corn fields in MN along the MN/IA border have been found with very high percentage field infestation of CEW larva/ear. CEW flight was earlier this year, and thus matched up well with field corn phenology of silking.

There are no economic thresholds for CEW in field corn. While even severe infestations typically damage 10% of the kernels at the ear tip, this is enough to cause serious economic impact in processing sweet corn and seed corn fields. By comparison, earworm damage can be found on commercial dent field corn, but the loss has low enough economic impact such that multiple insecticide applications, timing of which are based on intensive pheromone trap monitoring for individual fields, is not practiced or warranted. CEW are cannibalistic resulting in one larva/ear; and feeding is mostly confined to the ear tip. Western bean cutworm (WBCW) are not cannibalistic, so two or more larvae/ear are typical, and larvae feed at the ear tip entering through silks, and enter through the side of the ear.

For more information on CEW management in sweet and seed corn, and photos of CEW larvae, moths, and ear damage, please visit my Field and Forage Crop Entomology Insect page under CEW: http://www.entomology.wisc.edu/cullenlab/insects/info/cew.html

Celery leaftier moths: numerous, but not a field crop pest

Eileen Cullen, Extension Entomologist

Over the last three weeks now growers, consultants, and agronomists have called in for an ID on a small, brown moth. They notice the moths rising up in great numbers as they mow fields, cultivated soybeans, at porch lights in the evenings, walking across lawns. The little moths are "everywhere" , but do not give rise to a larval pest of soybean or corn or other field/forage crops.

Kyle Johnson, University of Wisconsin-Madison, Entomology Department, identified our first moth specimen found a few weeks ago. It is the celery leaftier moth (*Udea rubigalis*). Celery leaftier resembles European corn borer on first look, except that it is smaller and has a "snout" mouthpart appearance. Its wingspan is about 0.75 inch compared with the European corn borer's 1 to 1.25 inch wingspan.

Image Source: Copyright © 2006 Kenneth Dwain Harrelson

Larvae of the celery leaftier attack many species of cultivated flowers, weeds, and vegetables including beets, spinach, beans, and celery. This insect is not a pest of soybeans or corn. Another generation will occur in fall, closer to harvest.

Click here for additional celery leaftier moth images.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between July 28 and August 3, 2010.

PLANT/SAMPLE TYPE	DISEASE/ DISORDER	PATHOGEN	COUNTY
FRUIT CROPS			
Grape	Crown Gall	*Agrobacterium vitis*	Trempealeau
Raspberry	Raspberry Leaf Spot	*Cylindrosporium rubi*	Lafayette
	White Drupelet Disorder	None	Lafayette
VEGETABLES			
Tomato	Early Blight	*Alternaria solani*	Washburn
	Septoria Leaf Spot	*Septoria lycopersici*	Washburn
	Sunscald/Sunburn	None	Iowa

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Crop Manager

Volume 17 Number 22 - - - University of Wisconsin Crop Manager - - - August 12, 2010

Slugs in Seeding Year Alfalfa under Cover Crop

Eileen Cullen, Extension Entomologist and Dan Undersander, Extension Agronomist

We received calls late last week reporting slugs having stripped the leaves from alfalfa seedlings under an oat-pea cover of seeding year alfalfa in Marathon County. The alfalfa was seeded in April with an oat/pea companion cover crop intended for early season oatlage/legume feed. However, sustained wet field conditions and regular high rainfall amounts, have prevented harvest of the cover crop in a timely manner. Saturated soil and high level of standing cover crop over the alfalfa seeding have led to continued slug feeding on the alfalfa, stripping leaves to the stem.

For more information on slugs, please refer to the Wisconsin Crop Manager Newsletter Vol. 17, Issue No. 13, June 10, 2010 article on Slugs in Corn and Soybean. Slugs are not insects; they belong to the class Gastropoda. This is important because insecticides are not labeled for slugs, and have no control effect on slugs.

There are a few different species of slugs, most have one generation per year and overwinter in the egg stage. If winters are mild, adults can overwinter. Because field slugs can live 12 to 15 months, and eggs are laid in early spring and fall, overlapping generations of adult and juvenile stages can be present in the field. Slug activity is at its peak in late spring and early summer, and again in early fall.

Adult slugs typically enter a period of inactivity during this time of year, during dry, hot summer conditions. However, wet weather conditions this season and standing cover crop in the field over the alfalfa seeding in the call last week have maintained ideal slug habitat. Our recommendation at this point is to remove the cover crop as soon as soil conditions permit. This will alter the slug habitat in affected fields, exposing slugs to sun and heat. Then watch the alfalfa stand for regrowth to determine whether affected areas of the stand are permanently affected/killed or if regrowth is occurring. You should see new shoots beginning to grow within 5 to 7 days. Lack of visible shoots will mean either that something is still feeding on them or that the plants are dead or too weak to put out new shoots. In the latter case the plants will die. Slugs, which are nocturnal, are active in the evening and early mornings.

Commercially formulated metaldehyde baits can be applied for slugs. These are slug baits, not insecticides. Treatments are expensive, typically in the range of $15 to $20 per acre. One trade name is "Deadline M-P's", and most other products have 'metaldehyde bait' in the trade name. Product information can be found in Crop Data Management System (CDMS) pesticide label database www.cdms.net/LabelsMsds/LMDefault.aspx?t=

If applying baits, follow label instructions. It is important that application takes place when slugs are still present and active, typically during periods of cooler temperatures (63 – 68 deg. F) and wet conditions favorable to above ground slug activity. For this reason, slug baits are often applied aerially. Slugs will enter another period of activity during the fall.

Late Season Stem Diseases - Look Closely...

Paul Esker, Extension Plant Pathologist

We are receiving questions and also samples this year that are similar to fields we visited during the 2007 and 2008 growing seasons. As a reminder, the focus for many of those field visits were specifically if there was a breakdown in the Rps 1K gene for Phytophthora. A summary of that information is available here.

Similar to those two years, samples we have looked at this year have not necessarily been typical and it has not been easy to identify a primary disease of interest (i.e., the primary cause). Samples submitted to the Plant Disease Diagnostic Clinic have often yielded evidence of multiple pathogen species in a given sample. Recent results from the Wisconsin DATCP Phytophthora root rot survey of 45 fields between 16 June and 9 July indicated presence of Phytophthora in 15 fields (33%), which was an increase from the previous two years

(20% in 2008 and 18% in 2009, respectively). In spite of the increase, the results still indicate that it is important to make sure you have a proper diagnosis of suspect soybean plants. Two diseases that can often be confused during the later stages of soybean development are Northern stem canker and Phytophtora. Below are a description of the two diseases and associated symptoms/signs:

Northern stem canker (Diaporthe phaseolorum var. caulivora): reddish brown to black discoloration on stems and petioles that can first appear around flowering. Lesions originate at the nodes and appear sunken and may girdle the stem. There can be a yellow and brown discoloration of leaves around the veins and plant death is associated with petiole and leaf retention.

Phytophthora stem and root rot (focus is on symptoms after V4): brown to black lesion that extends above and below the soil surface. A root rot can be found. Leaves turn yellow and petioles will droop. Wilting where tip of the plant forms a shephard's hook. Plant death associated with petiole and leaf retention.

For further information about soybean diseases, please consult Soyhealth.

For a field diagnostic guide of common soybean diseases in Wisconsin, please click here.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between August 4 and August 10, 2010.

Table found at end of Crop Manager

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Reports of Frogeye Leaf Spot in Soybean

Paul Esker, Extension Plant Pathologist

Over the past week, we have had reports of Frogeye leaf spot in soybean. Frogeye leaf spot is caused by the fungus Cercospora sojina..DATCP noted finds of this disease in some fields in the southern part of the state. While Frogeye leaf spot has been documented in Wisconsin, it is still a disease that for many is a relative unknown. As you scout soybean fields late in the growing season, symptoms of Frogeye leaf spot can be recognized as angular, brown to reddish brown spots that are irregularly shaped and have a light brown to gray center. While lesions on stems and pod can occur later in the season they are less common and distinctive than lesions on the leaves. If there are pod infections, seeds near those lesions can be infected and develop conspcuous light to dark gray or brown areas.

Why 2010? The prolonged warmer, more humid and rainy periods we have seen this year are very favorable to development of this disease. Management recommendations for Frogeye Leaf Spot include the use of resistant soybean varieties, crop rotation that is 2 years or longer (the pathogen overwinters in soybean debris). Foliar fungicides can be effective for control of this disease, but timing of application is important.

For more information about Frogeye Leaf Spot, there are several good fact sheets like:

http://www.ces.purdue.edu/extmedia/BP/BP-131-W.pdf

http://www.soydiseases.illinois.edu/index.cfm?category=diseases&disease=119

http://www.planthealth.info/frogeye_basics.htm

Scouting for Corn Diseases Late in the Growing Season

Paul Esker, Field Crops Extension Plant Pathologist

During the 2010 growing season, weather conditions have been more favorable for the development of foliar diseases in corn than in previous years. In this article, we will discuss scouting for late season foliar diseases of corn. In a previous Wisconsin Crop Manager article we have already discussed conditions that have been favorable for eyespot (Fig. 1). We are continuing to monitor the development of eyespot as the season progresses and assessments in the field can be aided with the use of a standard area diagram.

Fig. 1. Eyespot and Northern corn leaf blight of corn.

Common rust (*Puccinia sorghi*) has been observed at fairly low levels this growing season although recent reports have indicated some increase in levels, especially in high value corn like seed production fields (Fig. 2). The symptoms of common rust include pustules that erupt through the surface of the leaf and will have a rusty brown appearance. Estimating the severity of common rust on a leaf can be helped with the use of a standard area diagram. Our foliar fungicide research over the

past few years has not shown an economic return for control of common rust.

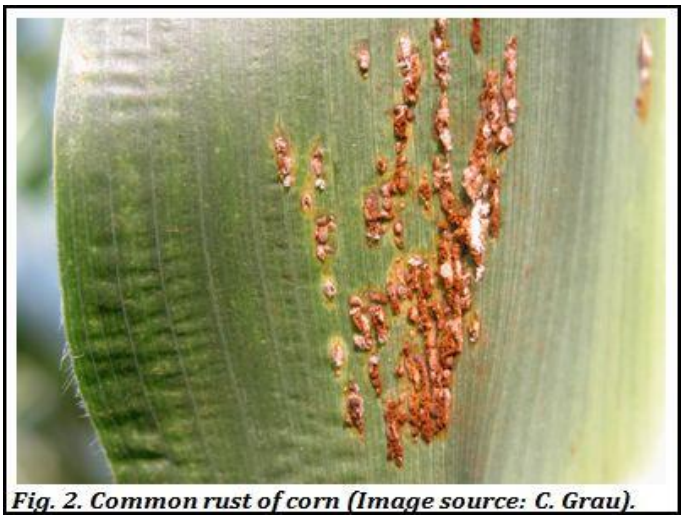

Fig. 2. Common rust of corn (Image source: C. Grau).

The longer period of warmer and humid (and rainy) weather has increased the favorability for the occurrence of Northern corn leaf blight (NCLB; *Exserohilum turcicum*) (Figs. 1 and 3) and we are starting to see this disease show up in both research plots and production fields. Symptoms of NCLB include a cigar-shaped, gray green to tan-colored lesion that is from 1-6 inches long. In susceptible hybrids, lesions can spread to all leafy structures and husks and a severe epidemic of NCLB may look like frost damage. The likelihood of yield loss increases if symptoms were found at or around the tasseling into silking period. As with common rust, estimating disease severity can be helped with the use of a standard area diagram.

Fig. 3. Northern corn leaf blight.

Furthermore, based on the weather conditions this year, there is an increased risk for gray leaf spot (GLS), caused by Cercospora zeae-maydis (Fig. 4). Initial symptoms of GLS can often be confused with several other diseases like eyespot and Northern corn leaf spot but will have a yellow to tan color with a faint watery halo. As lesions expand, they will become tan to brown, often with a rectangular appearance. Individual lesions may be from 3-4 inches long and 1/16 to 1/8 inch wide. There is a standard area diagram available to help in rating GLS.

Fig. 4. Gray leaf spot of corn (Image source: G. Munkvold).

Lastly, in several of our research trials, we are seeing evidence of anthracnose stalk rot and top dieback (Fig. 5). Symptoms of the stalk rot on the outer portion of the stalk include shiny black, linear streak and blotches. Continue to monitor fields as the season progresses using push-tests to determine early evidence of lodging. Also, consider splitting some stalks at black layer to determine how severe anthracnose may be.

Fig. 5. Symptoms associated with anthracnose stalk rot and top dieback.

One additional disease that is being noted in several states in the region is Southern corn rust, including from locations in Indiana and Illinois. Southern corn rust is caused by *Puccinia polyspora*. Symptoms of southern corn rust are orange to brown masses of spores that erupt through the upper leaf surface. The key way to differentiate southern corn rust with common rust is location of pustules. With southern corn rust, pustules are found only on the upper leaf surface and often in clusters, whereas common rust pustules can be found on both upper and lower leaf surfaces and will appear more scattered. To date, we have not observed southern corn rust in Wisconsin. To see where Southern corn rust has been detected, consult the ipmPIPE

For further information about corn disease diagnostics, consult the "Visual Quick Guide to Common Corn Diseases in Wisconsin."

NR 40 Training Sessions: Invasive Plant Identification and Management on Roadsides and Right of Ways

Mark Renz, Extension Weed Scientist and Brendon Panke, Associate Research Specialist

Do you know that the Wisconsin DNR has implemented a rule (Chapter NR 40), regulating many invasive plants? This rule lists specific species (see: http://dnr.wi.gov/invasives/plants.asp?filterBy=Classification or a complete list) and requires that these species are not knowingly spread. The rule also designates a subset of the complete list (prohibited) and requires that these species be actively managed. This is expected to have a large effect on roadsides as many restricted species are present there.

While the impact on Agriculture in Wisconsin is expected to be minimal, this is an opportunity to inform your local community of this issue and potentially reduce the spread of some of these troublesome weeds. As you look at the list you will see that many of these weeds are common weeds in our fields; for instance, Canada and plumeless thistle, multiflora rose, wild parsnip and spotted knapweed. One possible positive impact of this rule will be to motivate people who supervise roads to manage these weeds, thereby reducing their spread along roadsides AND into agricultural fields.

To help educate these individuals on being in compliance with NR 40, we are holding two FREE trainings targeting management of roadsides and other right of way areas. Besides the two trainings planned for this summer, we will be planning more for the winter.

Current trainings:

1. Green Bay: August 26th from 1-4 pm: Contact Vijai Pandian (920) 391-4611vijai.pandian@ces.uwex.edu)
2. Chippewa Falls: August 31st from 1-4 pm: Contact Jerry Clark (715 726 7955; jeromeclark@ces.uwex.edu)

Please click on this link for registration information: http://ipcm.wisc.edu/LinkClick.aspx?fileticket=XRW5sT%2byxrI%3d&tabid=114&mid=669

If you know of any particular roadsides weedy with listed species please forward this information to your local roadside managers and encourage them to attend. Our hope is to improve their understanding of how practices can be altered to improve weed management so weeds are less common on our roadsides; this is a benefit to all Wisconsin citizens.

Wisconsin winter wheat performance tests—2010

Shawn Conley, Paul Esker, Mark Martinka, John Gaska, and Karen Lackermann

The Wisconsin Winter Wheat Performance Tests are conducted each year to give growers information to select the best-performing varieties that will satisfy their specific goals. The performance tests are conducted each year at four locations in Wisconsin: Janesville, Lancaster, Chilton, and Arlington. Trials include released varieties, experimental lines from neighboring states, and lines from private seed companies. The primary objective of these trials is to quantify how varieties perform at different locations and across years. Growers can use this data to help select which varieties to plant; breeders use performance data to determine whether to release a new variety.

***Read the rest here** 2010 Wisconsin Winter Wheat Performance Test.*

Wisconsin Vegetable Crop Update, 2010-13

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue thirteen is out! This marks the thirteenth newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The thirteenth issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here: http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Oats	Crown Rust	*Puccinia coronata*	Dane
Soybean	Bacterial Blight	*Pseudomonas syringae* pv. *glycinea*	Columbia
	Brown Stem Rot	*Phialophora gregata*	Rock
	Charcoal Rot	*Macrophomina phaseolina*	Rock
	Downy Mildew	*Peronospora manshurica*	Columbia
	Fusarium Root Rot	*Fusarium* sp.	Columbia, Grant, Rock
	Phytophthora Root Rot	*Phytophthora sojae*	Ozaukee
	Pythium Root Rot	*Pythium* sp.	Columbia, Grant, Rock
	Soybean Cyst Nematode	*Heterodera glycines*	Rock
	Sudden Death Syndrome	*Fusarium solani* f. sp. *glycines*	Rock
FRUIT CROPS			
Cranberry	Red Leaf Spot	*Exobasidium rostrupii*	Sauk
Raspberry	Late Leaf Rust	*Pucciniastrum* sp.	Marathon
	Root/Crown Rot	*Pythium* sp., *Fusarium* sp.	Dane
Strawberry	Common Leaf Spot	*Ramularia brunnea*	Brown

	Leaf Blight	*Phomopsis obscurans*	Brown
VEGETABLES			
Basil	Downy Mildew	*Peronospora belbahrii*	Dane
Brussels Sprouts	Bacterial Soft Rot	*Pectobacterium carotovorum*	Dane
Cabbage	Black Rot	*Xanthomonas campestris* pv. *campestris*	Outagamie
Carrot	Cercospora Leaf Spot	*Cerospora carotae*	Kewaunee
Pepper	Bacterial Spot	*Xanthomonas campestris* pv. *vesicatoria*	Dane, Rock
	Blossom End Rot	None	Brown
	Syringae Leaf Spot	*Pseudomonas syringae* pv. *syringae*.	Rock
Potato	Bacterial Soft Rot	*Pectobacterium carotovorum*	Fond du Lac
	Black Leg	*Pectobacterium carotovorum*	Fond du Lac
	Early Blight	*Alternaria solani*	Portage
	Late Blight	*Phytophthora infestans*	Kewaunee
	Stem Rot	*Pythium* sp., *Fusarium* sp.	Fond du Lac
Pumpkin	Bacterial Leaf Spot	*Xanthomonas campestris* pv. *cucurbitae*	Columbia
Squash (Winter)	Fusarium Wilt	*Fusarium oxysporum*	Jackson
Tomato	Early Blight	*Alternaria solani*	Dane, Rock
	Late Blight	*Phytophthora infestans*	Brown, Kewaunee, Portage
	Septoria Leaf Spot	*Septoria lycopersici*	Brown, Chippewa, Dane, Rock

	Walnut Toxicity	None	Chippewa

Wisconsin Crop Manager

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Wisconsin Vegetable Crop Update, 2010-14

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue fourteen is out! This marks the fourteenth newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The fourteenth issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here: http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between August 11 and August 17, 2010.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Soybean	Soybean Cyst Nematode	*Heterodera glycines*	Richland
	Sudden Death Syndrome	*Fusarium solani* f. sp. *glycines*	Richland
FRUIT CROPS			
Blueberry	Cytospora Canker	*Cytospora* sp.	Washington (MN)
HERBACEOUS ORNAMENTALS			
Black-Eyed Susan	Growth Regulator Herbicide Injury	None	Outagamie
	Septoria Leaf Spot	*Septoria* sp.	Outagamie
Impatiens	Verticillium Wilt	*Verticillium* sp.	Dane
VEGETABLES			
Basil	Downy Mildew	*Peronospora belbahrii*	Dane
Brussels Sprouts	Black Rot	*Xanthomonas campestris* pv. *campestris*	Dane
Lettuce	Root/Crown Rot	*Pythium* sp.	St. Croix
Potato	Early Blight	*Alternaria solani*	Oconto
Pumpkin	Bacterial Soft Rot	*Pectobacterium carotovorum*	Clark
Tomato	Anthracnose Fruit Rot	*Colletotrichum* sp.	Brown, Rock
	Late Blight	*Phytophthora infestans*	Kewaunee

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Crop Manager

Volume 17 Number 24 --- University of Wisconsin Crop Manager --- August 26, 2010

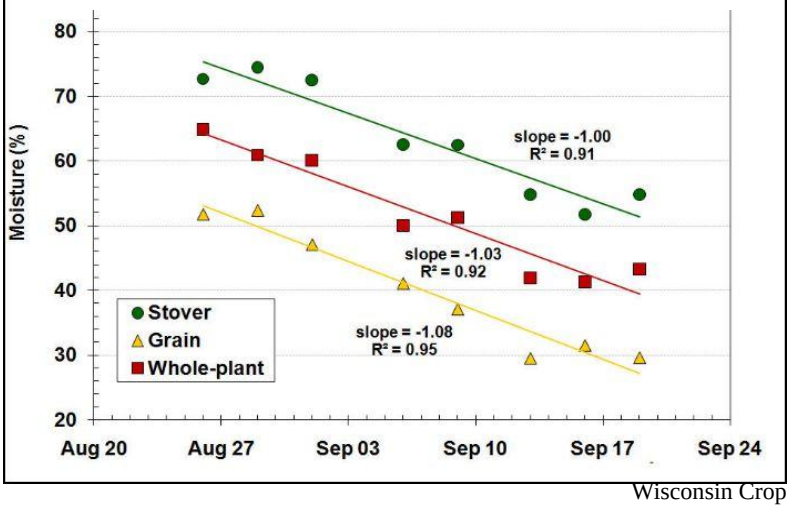
Synchrony of silage grain and stover drydown

Joe Lauer, Corn Agronomist

This year there is a lot of concern about asynchronous drydown of the corn silage crop. Farmers are concerned that the grain will get too hard and be drier than stover when harvested and placed into the storage structure. In this article I would like to examine, some of the principles behind timing the decision to begin silage harvest.

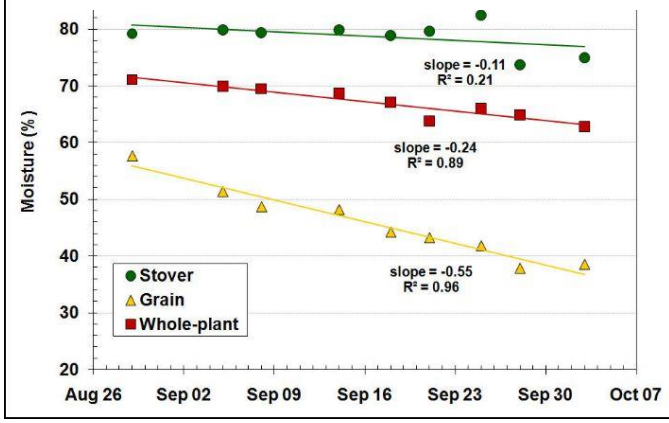
From our experience, I would be surprised if corn grain dried synchronously with corn stover. It does happen in dry years (Figure 1). But in normal and wetter years, corn stover is wetter (especially at the base of the stalk) than corn grain and stover dries at a slower rate (Figure 2). We have observed asynchronous drydown numerous years and in experiments where we adjust cutting height.

Figure 1. Moisture change of corn plant parts at Arlington during 2005.



Most corn silage choppers have kernel processors. Even though corn grain and stover may have different moistures, when these plant parts are mixed, moisture will migrate from wetter to drier parts. What is important to remember is that the whole-plant moisture must be at the recommended level for the storage structure.

Figure 2. Moisture change of corn plant parts at Arlington during 2006.



The fact that corn stover and grain plant parts drydown asynchronously offers farmers a management option. If corn silage is too wet, but the field must be chopped, then by raising the cutter bar whole-plant silage moisture will decrease. This could be especially useful when working with custom operators and timing corn silage chopping. The farmer will give up some yield although is the lowest quality part of the plant.

The following in-season guidelines can be used to predict corn silage harvest date:

1. Note hybrid maturity and planting date of fields intended for silage.
2. Note silking date. Half milk of the kernels will typically occur about 42 to 47 days after silking.
3. Once kernel milkline begins to move, measure moisture of fields intended to be harvested for silage. Use 0.5% per day to predict date when field will be ready for the storage structure.
4. Final check prior to chopping.
5. In most years corn stover is wetter than corn grain at the time of corn silage harvest. Drydown of these plant parts is usually asynchronous, except in dry years when the drydown rate is similar between stover and grain. If a custom chopper arrives on the farm and is pushing to begin chopping and the

farmer does not need all of the forage he is producing, then the cutter-bar of the chopper can be raised and silage moisture will decrease 2.0 to 3.7 percentage units of moisture. Remember though that there is a yield v. quality v. moisture trade-off that will occur as cutting height increases.

Weekly Hay Market Demand and Price Report for the Upper Midwest

Ken Barnett, University of Wisconsin Extension

From the August 12 NASS Crop Production Report:

Alfalfa and alfalfa mixtures: Farmers in *Wisconsin* anticipate harvesting 4.50 million tons of alfalfa and alfalfa mixture dry hay in 2010, up 16 percent from 2009. Yield is forecast at 2.90 tons per acre, up 0.4 ton per acre from last year. Nationwide, production is forecast at 72.5 million tons, up 2 percent from last year. Based on August 1 conditions, yields are expected to average 3.49 tons per acre, up 0.14 ton from last year. If realized, this will be the second highest yield on record, trailing only the 3.51 tons per acre in 1999. Harvested area is forecast at 20.7 million acres, unchanged from June but down 2 percent from the previous year's acreage.

Weather conditions have been mostly favorable in many of the alfalfa hay growing regions. Heavier than normal precipitation levels this year has led to greater yield expectations in most States. The largest yield increase is forecast in Indiana where a record high yield of 4.20 tons is expected. Arizona and Nebraska are also forecasting record alfalfa hay yields. Other States with notable yield increases include Minnesota, New York, and North Dakota. States that forecast lower yields than 2009 include Colorado, Idaho, Oregon, Texas, Virginia, Washington, and Wyoming.

Other hay: All other dry hay acres harvested in *Wisconsin* is expected to produce 855,000 tons in this year, an increase of 300,000 tons from 2009. *Wisconsin* farmers anticipate the all other dry hay crop to yield 1.90 tons per acre, up from 1.50 tons per acre last year.Production in the *United States* is forecast at 81.4 million tons, up 7 percent from last year, and if realized will be the second highest production level on record. Based on August 1 conditions, yields are expected to average 2.09 tons per acre, up 0.11 ton from last year. If realized, this will be a record high yield, surpassing the 2.06 tons per acre in 2004. Harvested area is forecast at 38.9 million acres, unchanged from June but up 1 percent from 2009.

Abundant moisture has led to increased yields compared with last year in the northern and southern Great Plains, the upper Great Lakes States, and most of the Pacific Coast States. Producers in California, Nebraska, Louisiana, Montana North Dakota, and South Dakota are expecting record high yields. The largest expected yield increase occurred in Texas, up 0.90 ton, where producers are trying to replenish their hay stocks after low production levels the last two years. Other hay yields are forecast to be lower primarily in the Ohio Valley, the Southeast, and along the Atlantic Coast. The largest yield reduction from last year occurred in Virginia, down 0.40 ton as hot and dry weather has reduced hay growth.

Late Summer Cutting Management of Alfalfa

Dan Undersander and Bill Bland, Extension Forage Agronomist and Climatologist

Difficult alfalfa harvesting conditions sometimes result in farmers being off schedule for late summer harvesting alfalfa. This raises the question of best management for alfalfa harvest as the end of summer approaches.

Alfalfa must either be cut early enough in the fall to regrow and replenish root carbohydrates and proteins or so late that the alfalfa does not regrow or use any root carbohydrates if we want good winter survival and rapid greenup for good yield next. This has resulted in the recommendation of a 'no-cut' window from Sept 1 to killing frost for Wisconsin. However, research in Quebec has helped define this window by indicating that alfalfa needs 500 growing degree days (GDD, base 41^{o}F accumulated until a killing frost of 25^{o}F) after the last cutting to regrow sufficiently for good winter survival and yield the next year. This means we can cut in the fall as late as 500 GDD will still accumulate without hurting the winter survival.

On the other extreme, we can also cut so late that no regrowth occurs. Calculating the 200 or less GDD level indicates when insufficient regrowth occurred to use up root carbohydrates. These plants would also have good winter survival. It is important to remember that we do not need to wait for a killing frost to take the last cutting. We must only wait until it is so cool that little or no regrowth will occur.

So we either want to take the last cutting early enough so that regrowth and root replenishment occurs or so late that little to no growth occurs. Calculating the sum of these two probabilities tells us the risk of winter injury or kill due to harvesting at different dates during September. This data was calculated for eight sites in Wisconsin where we had 30 years of weather history. In each graph, the area with diagonal lines is the probability of accumulating 500 GDD after each week. The purple area with '+'s in it is the probability of accumulating less than 200 GDD. So the top line is the probability of accumulating either 500 GDD or less than 200 GDD after the indicated date and shows the probability no injury or kill to alfalfa stands harvested on that date. We should assume that the graphs are for very winterhardy varieties (winter survival score of 2 or less) and that less winterhardy varieties would be at more risk.

We can see that, at Lancaster and Beloit, 94 and 100 percent of the time we have accumulated 500 GDD or more after September 08. Waiting one more week reduces the probability to 61 and 87%, respectively. Thus great risk is not incurred until cutting two weeks after Sept 1.

At Eau Claire, Hancock and Marshfield, 94, 94 and 91 % of the time 500 GDD was accumulated after Sept 1, respectively. Probability of 500 GDD accumulation fell to about 70% one week later. Thus, not harvesting after Sept 1 is the safe alternative but oftentimes being a week late was not detrimental. We also see that harvesting at the end of Sept, 6 to 16% of the time we had less than 200 GDD accumulation. Waiting till mid Oct will often be safe whether or not a frost has occurred.

At Plymouth, we had 100% probability of 500 GDD following a Sept 1 harvest and the potential for 500 GDD fell rapidly after that date.

At Antigo and Rhinelander the probability of 500 GDD after Sept 1 was 61 and 84%, respectively. After Sept 21 the likelihood of accumulating less than 200 GDD increased significantly indicating that a cutting could likely be taken at the end of September with good probability of no regrowth and good winter survival.

We should remember that forage quality of alfalfa changes little during September, so harvesting vs delaying should be based on likelihood of winter injury or survival if the stand is to be kept. Optimum soil test levels of potassium can also enhance winter survival. These charts give a probability of winter survival at various cutting dates in the fall so that farmers can determine the risk associated with harvesting at various dates.

Graphs Detailing the Risks of Alfalfa Harvest at Different Dates Are Found at the End of This Issue on Page 105

Get Your Wheat Seed Order in Early

Shawn Conley, Soybean and Wheat Extension Specialist

Local cash and futures prices topping $6.10 and $7.00 per bushel, respectively coupled with the strong likelihood of early corn and soybean harvest have many growers considering winter wheat in 2010. Seed availability of elite varieties will begin to tighten so it is imperative to get your seed orders in early. To date, all of the wheat seed samples that have come into the Wisconsin Crop Improvement Association have been blue tag certified (>85% germ). This is good news to growers as certain areas of the state had difficulties with harvest and sprouting. It is still premature however to fully know the total amount of certified wheat seed from the 2010 crop available for planting in 2010. I strongly caution growers from planting bin run seed in 2010 given the sprouting issues and low test weights, both of which can negatively impact germination, tillering, and overwintering.

Wisconsin Vegetable Crop Update, 2010-15

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue fifteen is out! This marks the fifteenth newsletter of the 2010 year. Weekly Updates should be available as disease, insect, weed, fertility, and crop progress changes.

The fifteenth issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here: http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Current Statewide Findings for Sudden Death Syndrome and Brown Stem Rot in Soybean

Paul Esker, Extension Plant Pathologist

With additional reports of sudden death syndrome (SDS) in soybean fields including areas of the state we have not previously detected SDS, we are receiving increased numbers of questions if we have detected brown stem rot (BSR) as well in these fields. First off, not every field will have SDS as we have seen several other diseases in 2010 that might have similar looking symptoms to SDS or BSR. One of the general things we are noting, however, is the following sort of statement: "we are seeing yellow patches in some of the fields." Given our own observations from research trials both on our UW research farms as well as our on-farm locations, when you see the yellow patch, stop and take a closer look at the symptoms.

In regards to the question about BSR, to date, the samples we have received into the Field Crops Plant Pathology lab and tested have had only SDS. We use a molecular approach to our diagnostics to differentiate SDS from BSR and the results have been very clear when examining these samples. As an additional piece of information, we are also working to isolate the respective pathogen(s). We will continue to monitor the situation for both diseases as the season progresses. Lastly, we want to emphasize that if you have a positive field for SDS take a soil sample to look for the presence of Soybean cyst nematode.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, and Amanda Zimmerman, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC between August 18 and August 24, 2010.

The table can be found at the end of this issue on page 106

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Winter Wheat Planting Date and Aphid-Vectored Barley Yellow Dwarf Virus: Use "fly-free date" to Minimize your Risk

Eileen Cullen, Extension Entomologist

One of the best ways to reduce the incidence of aphid-transmitted barley yellow dwarf virus in wheat this fall is to plant after the Hessian “fly-free date”, mid-September for Wisconsin (Figure 1). This important planting date consideration can be easily overlooked since we rarely, if ever, have Hessian fly problems in Wisconsin.

What is the “fly-free” date? Hessian fly adults emerge from wheat stubble in late summer and early fall. “Fly-free” dates occur after peak emergence and vary by region, occurring later into fall as you move north to south (Figure 1). Planting winter wheat after the peak fly emergence deprives egg-laying females of a suitable host and adult flies die before winter. This is a decades-old cultural control tactic that has importance for regions of the country where Hessian fly is more active.

Even in states south of Wisconsin, Hessian fly does not cause significant problems in wheat in most years because commercial wheat varieties are bred for Hessian fly resistance.

Fig. 1 Hessian Fly-Free Dates

Map showing approximate dates for planting wheat to avoid first generation Hessian fly

Why does it matter? Hessian fly-free dates correspond with late summer and early fall activity of several aphid vectors of wheat virus in Wisconsin and the Upper Midwest. Bird cherry-oat aphid, corn leaf aphid, English grain aphid, and green bug species transmit barley yellow dwarf virus (BYDV) and cereal yellow dwarf virus (CYDV) strains to wheat. Aphids acquire virus by feeding on infected plants, then transmit to new plants. Wheat symptoms of C/BYDV include stunted growth and leaf discoloration at the tip and margin with yellow to red color (Figure 2).

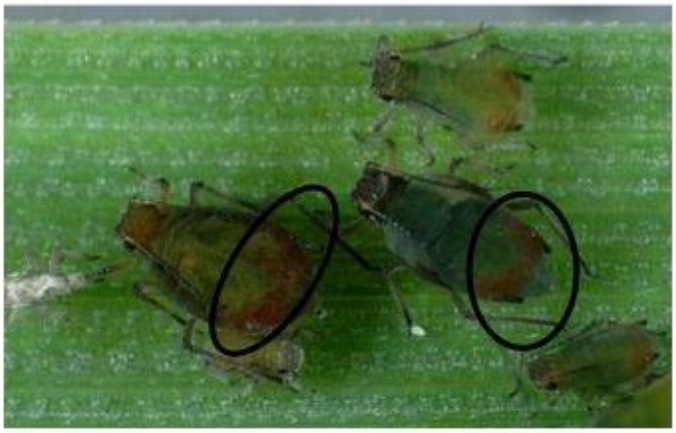
Fig. 2 Aphid B/CYDV Complex

- Stunted, rigid upright growth
- Leaf discoloration
- Leaf tip and margin in
- Prevalent in cool (50-65 F) wet weather

There is potential for both fall and spring infection. Most spring aphid infestations in wheat in the Upper Midwest result from asexual winged aphid migrants from southern U.S. overwintering sites. Only Green bug has overwintering capability with sexual morphs in the Upper Midwest. All four of the grain aphid species are present in Wisconsin in late summer and early fall, with bird cherry-oat and corn leaf aphids most abundant. Growers will minimize exposure of the winter wheat crop to fall infection by planting wheat after most of fall grain aphid activity has subsided. The Hessian "fly-free" date is a proxy for making this planting date decision.

Figure 3a. Corn leaf aphid (*Rhopalosiphum maidis*).

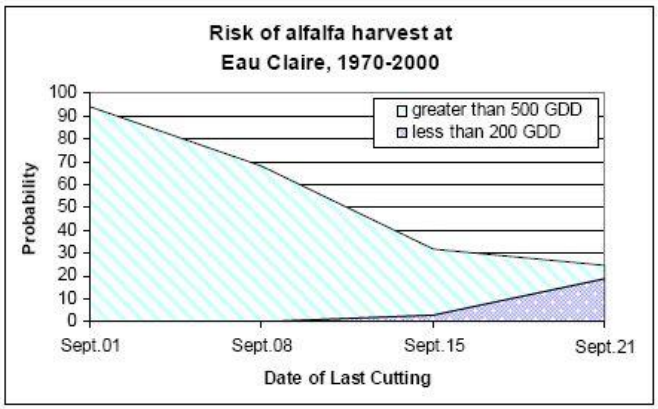
Figure 3b. Bird cherry-oat aphid (*Rhopalosiphum padi*)

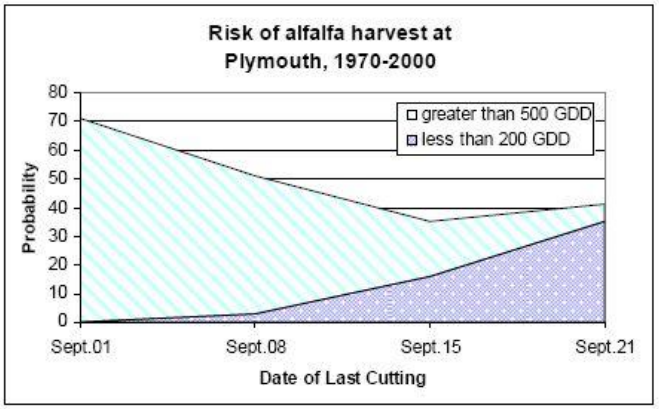


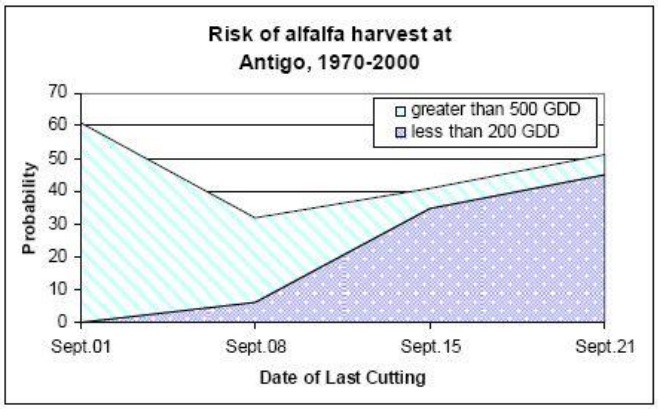
Mid-September "fly-free" dates for Wisconsin Insecticide application after appearance of symptoms of C/BYDV will not be effective. One of the best ways to reduce the incidence of virus transmission in wheat during fall is to observe the "fly-free date" - roughly September 12th across central Wisconsin and north, and September 16th for southern Wisconsin. While these dates cannot guarantee zero aphid activity, data from suction traps at 7 locations throughout Wisconsin show that

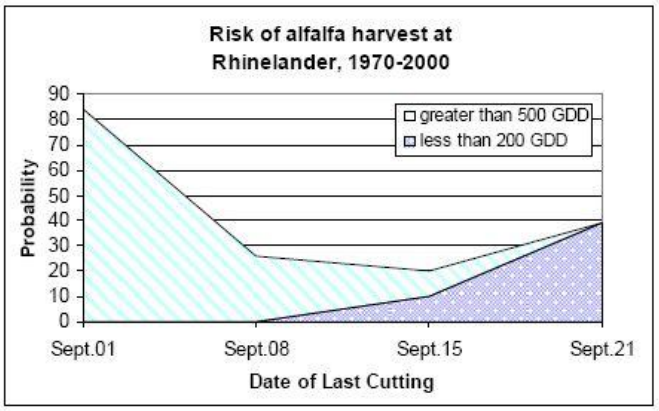
grain aphid activity drops off after late August and early September.

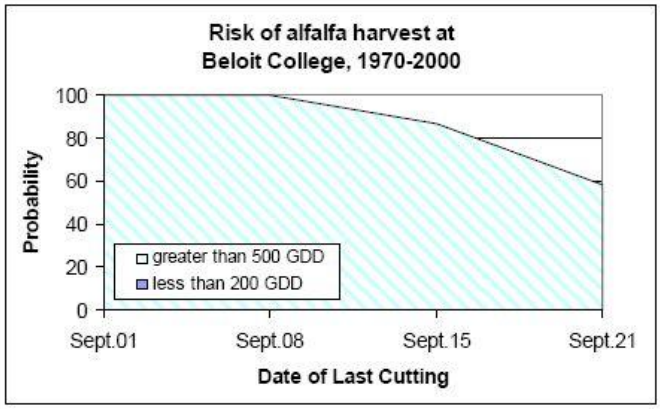
For more information on grain aphid identification, suction trap capture data throughout Wisconsin and more, please visit 2010 Winter Wheat Workshop Insect Diagnostics.


Risk of alfalfa harvest at
Eau Claire, 1970-2000
Probability
100
90
80
70
60
50
40
30
20
10
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Plymouth, 1970-2000
Probability
80
70
60
50
40
30
20
10
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Antigo, 1970-2000
Probability
70
60
50
40
30
20
10
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Rhinelander, 1970-2000
Probability
90
80
70
60
50
40
30
20
10
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Beloit College, 1970-2000
Probability
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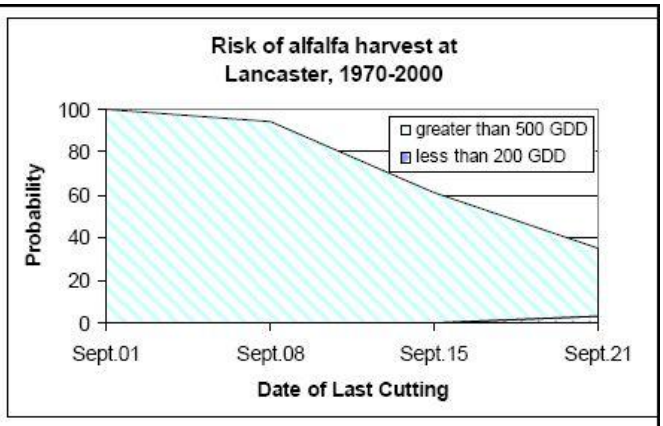
80
60
40
20
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Lancaster, 1970-2000
Probability
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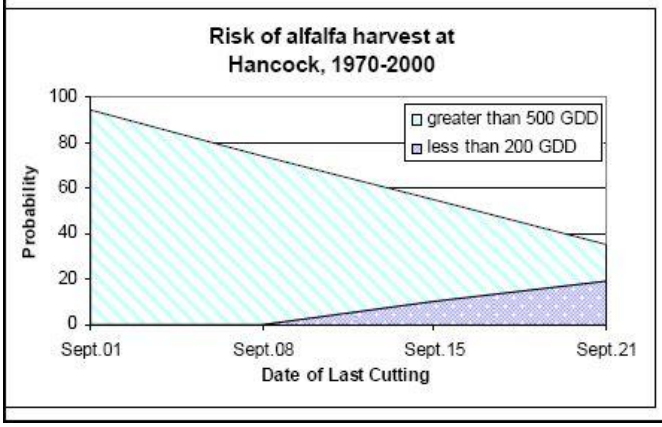
80
60
40
20
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Hancock, 1970-2000
Probability
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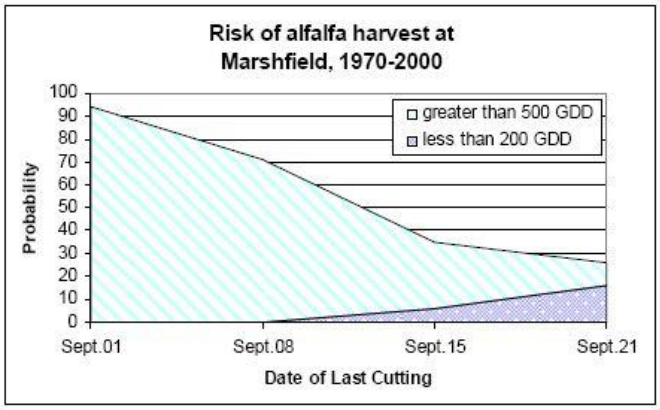
80
60
40
20
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting


Risk of alfalfa harvest at
Marshfield, 1970-2000
Probability
100
90
80
70
60
50
40
30
20
10
0
greater than 500 GDD
less than 200 GDD
Sept.01
Sept.08
Sept.15
Sept.21
Date of Last Cutting

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Soybean	Sudden Death Syndrome	*Fusarium solani* f. sp. *glycines*	Lafayette
Wheat	Scab	*Fusarium graminearum*	Calumet
FORAGE CROPS			
Raspberry	Crown Rot Phytopthora Root Rot	*Fusarium* sp., *Pythium* sp. *Phytophthora medicaginis*	Dane Dane
FRUIT CROPS			
Apple (Braeburn)	Root/Crown Rot	*Phytophthora* sp., *Pythium* sp.	Dane
Blackberry	Root/Crown Rot	*Phytophthora* sp., *Pythium* sp.	Jackson
Blueberry	Root/Crown Rot	*Pythium* sp.	Clark
Cranberry	Anthracnose Fruit Rot Blotch Rot Black Rot Shoot Dieback Upright Dieback	*Colletotrichum* sp. *Physalospora* sp. *Allantophomopsis* sp *Leptothyrium* sp., *Physalospora* sp. *Phomopsis* sp..	Wood Wood Wood Wood Wood
Grape	Anthracnose Downy Mildew	*Pucciniastrum* sp. *Plasmopara viticola*	Douglas Douglas
Plum	Brown Rot	*Monilinia fructicola*	Walworth
Raspberry	Fruit Rot Raspberry Leaf Spot Root/Crown Rot	*Botrytis* sp., *Rhizopus* sp. *Cylindrosporium rubi* *Pythium* sp., *Fusarium* sp.	Kewaunee Green Chippewa, Green
VEGETABLES			
Basil	Downy Mildew Foliar Nematode	*Peronospora belbahrii* *Aphelenchoides* sp.	Milwaukee Waukesha

Onion	Purple Blotch	*Alternaria porri*	Juneau
Tomato	Alternaria Leaf Spot/Blight	*Alternaria alternata*	Dane
	Anthracnose	*Colletotrichum* sp.	Dane
	Anthracnose Fruit Rot	*Colletotrichum* sp.	Brown
	Bacterial Canker	*Clavibacter michiganensis* subsp. *michiganensis*	Douglas
	Bacterial Speck	*Pseudomonas syringae* ps. *tomato*	Dane
	Septoria Leaf Spot	*Septoria lycopersici*	Dane, Oneida, Waushara
	Syringae Leaf Spot	*Pseudomonas syringae* ps. *syringae*	Dane,
Zucchini	Bacterial Soft Rot	*Pectobacterium carotovorum*	Vernon

Wisconsin Crop Manager

Volume 17 Number 25 --- University of Wisconsin Crop Manager --- September 2, 2010

Top 7 Recommendations for Winter Wheat Establishment in 2010

Shawn Conley, State Soybean and Small Grains Specialist,Paul Esker, Extension Field Crops Plant Pathologist, John Gaska, Outreach Specialist

Top 7 Winter wheat establishment recommendations:

1. Variety selection: please see the 2010 WI Winter Wheat Performance Test
2. Plant new seed (don't plant saved seed).
3. A fungicide seed treatment is recommended for winter wheat in WI.
4. Wheat should be planted 1 inch deep.
5. The targeted fall stand for wheat planted from September 15th to October 1st is between 30 and 35 plants per square foot (1,300,000 and 1,500,000 seeds per acre).
6. The optimal seeding rate for wheat planted after October 1st should be incrementally increased as planting date is delayed to compensate for reduced fall tillering.
7. Crop rotation matters

Variety Selection

As with any crop, variety selection is the most important factor to consider in maximizing winter wheat yield and profitability. When choosing a winter wheat variety, several factors must be considered. These include winter survival, insect and disease resistance, heading date, lodging, test weight, and most importantly, yield. Since no variety is ideal for every location, it is important to understand the crop environment and pest complex that affects your specific region to maximize yield.

Yield is based on the genetic potential and environmental conditions in which the crop is grown.

Therefore, by diversifying the genetic pool that is planted, a grower can hedge against crop failure. Select those varieties that perform well not only in your area but across experimental sites and years. This will increase the likelihood that, given next year's environment (which you cannot control), the variety you selected will perform well.

Test weight is also an important factor to consider when selecting a variety. The minimum test weight to be considered a U.S. #2 soft red winter wheat is 58 lb/bu. Wheat at lower test weights will be discounted. Both environment and pests may greatly affect test weight; therefore, selecting a variety that has a high test weight potential in your region is critical to maximizing economic gain.

Select a variety that has the specific **insect and disease resistance** characteristics that fits your needs. By selecting varieties with the appropriate level of resistance, crop yield loss may be either reduced or avoided without the need of pesticides. Careful management of resistant cultivars through crop and variety rotation, are required to ensure that these characteristics are not lost.

Crop height and **lodging potential** are also important varietal characteristics that may be affected by your cropping system. If the wheat crop is intended for grain only, it may be important to select a variety that is short in stature and has a low potential for lodging. This may decrease yield loss due to crop spoilage and harvest loss as well as increase harvesting rate.

However, if the wheat crop is to be used as silage or is to be harvested as both grain and straw, than selecting a taller variety may be warranted.

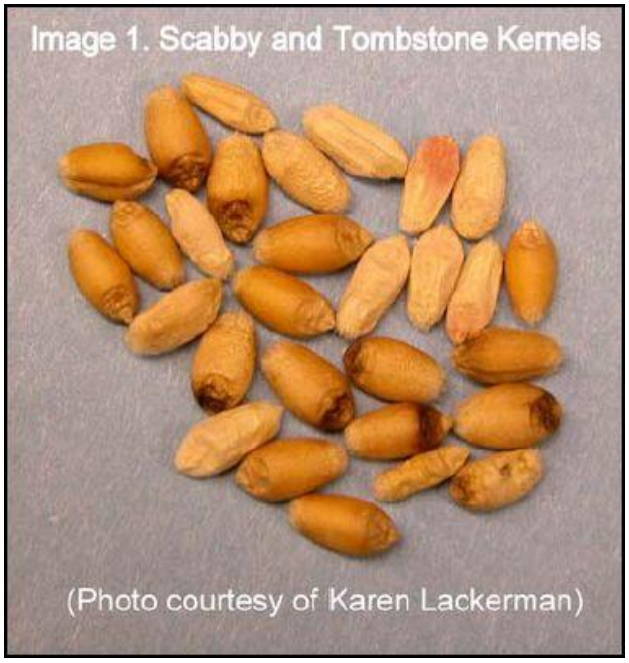
For detailed information regarding winter wheat variety performance please visit http://soybean.uwex.edu for results of the 2010 Wisconsin Winter Wheat Performance Tests.

Plant New Seed in 2010

- **To maximize wheat yields in 2010, it is imperative that growers plant certified or private (professionally prepared) seed that is true to variety, clean, and has a high germination percentage (>85%).**

One reason to avoid planting bin-run seed in 2010 is Fusarium Head Blight (FHB), also known as scab. Scab incidence and severity was not as severe in the 09/10 crop as it was in the 08/09 crop, however the presence of scab at low levels, was noted at all of our variety trial locations in 2010. Also, the incidence and severity of FHB was very high in several other soft red winter wheat production states, areas where seed may be packed and shipped.

Kernels from heads infected with scab may be shriveled or shrunken and lightweight. Some kernels may have a pink to red discoloration (Image 1). Others may be bleached or white in color.



The other reason to plant new seed in 2010 is related to the sprouting issues and low test weights growers experienced this year, both of which can negatively impact germination, tillering, and overwintering.

If growers absolutely need to plant saved seed due to availability or other economic considerations, the following steps should be taken to increase the likelihood of establishing a legal and good wheat crop.

Step One: Determine if you can legally plant the wheat seed you saved. Today many private wheat varieties now come with statements, which buyers sign at the time of purchase, stating that they understand they are not authorized to use the harvested grain for seed. Most currently used public winter wheat varieties are Plant Variety Protected (PVP) and though you may replant them on your own land you, do not have the right to trade/sell seed of those varieties to others for planting.

Step Two: Once you have determined if you can legally plant the seed you saved, the next step is to clean the wheat seed. It is important that wheat seed be cleaned to remove small and damaged seeds and to eliminate weed seeds. Removing small and damaged seeds will not only aid in crop establishment, but will also provide a more uniform wheat seedling stand. Removing small and damaged seeds will also increase the thousand-kernel weight (TKW), which serves as a measure of seed quality. Wheat seed with TKW values greater than 30 grams tend to have increased fall tiller number and seedling vigor.

Step Three: Perform a germination test. Germination tests can either be completed at home or by sending a sample to the Wisconsin Crop Improvement Association. A home test can be performed by counting out 4 sets of 100 seeds and placing each of them in a damp paper towel. Place the\ paper towel into a plastic bag to conserve moisture and store in a warm location out of direct sunlight. After five days, count the number of germinated seeds that have both an intact root and shoot. This will give the grower an estimate of % germination. It is important to choose random seeds throughout the entire seed lot and conduct at least 4 - 100 seed counts. If germination is below 85% it is important to increase the seeding rate to compensate; however, we would caution growers from seeding any wheat with a germination test below 80%.

Step Four: Assess the need for a seed treatment. A number of fungicides and insecticides are labeled for use as seed treatments on winter wheat and are listed in *Pest Management for Wisconsin Field Crops 2009* (UW-Extension A3646). Seed treatment fungicides protect germinating seed and young seedlings from seedborne and soilborne pathogens. Seed treatment fungicides will not improve germination of seed that has been injured by environmental factors and will not resurrect dead seed. Remember, seed treatment fungicides applied this fall will not protect against potential FHB infection next summer. If seed with scab must be used for planting, a seed treatment fungicide is a must.

Seeding Depth

Wheat should be planted ~1.0 inch deep depending upon soil moisture conditions. Wheat planted less than 0.5 inches deep may result in uneven germination due to seed exposure or dry soil conditions. Shallow planted wheat is also more susceptible to soil heaving. Wheat planted more than 1.5 inches deep may result in death due to pre-mature leaf opening or poor tiller development and winter survival. Uniform seed placement and seeding depth are important in promoting crop health in the fall.

Seeding rate and planting date

The targeted fall stand for wheat planted from September 15th to October 1st is between 30 and 35 plants per square foot. To achieve this goal, the seeding rate for soft red winter wheat is between 1,300,000 and 1,500,000 viable seeds per acre (Table 1). Depending upon varietal seed size, this equates to a range of between 74 and 119 pounds of seed per acre (Table 2). The optimal seeding rate for wheat planted after October 1st should be incrementally increased as planting date is delayed to compensate for reduced fall tillering (Table 1).

Table 1. Wisconsin seeding rate recommendations based on planting date.

Wisconsin Winter Wheat Seeding Rate Recommendations					
Seeds/acre Million	Seeds/sq ft	Row Width (in)			
		6	7	7.5	
		Seeds per foot row			
0.4	9.2	5	5	6	
0.5	11.5	6	7	7	
0.6	13.8	7	8	9	
0.7	16.1	8	9	10	
0.8	18.4	9	11	11	
0.9	20.7	10	12	13	Seeding Rate for Sept 1 to Sept 15
1.0	23.0	11	13	14	
1.1	25.3	13	15	16	
1.2	27.5	14	16	17	
1.3	29.8	15	17	19	
1.4	32.1	16	19	20	Seeding Rate for Sept 15 to Oct. 1
1.5	34.4	17	20	22	
1.6	36.7	18	21	23	
1.7	39.0	20	23	24	
1.8	41.3	21	24	26	
1.9	43.6	22	25	27	Seeding Rate for Oct. 1 to Oct 10
2.0	45.9	23	27	29	
2.1	48.2	24	28	30	
2.2	50.5	25	29	32	
2.3	52.8	26	31	33	
2.4	55.1	28	32	34	
2.5	57.4	29	33	36	

Table 2. Seed size and seeding rate conversion table.

Seeds/lb	Seeds per acre (x 1 million)						
	1.0	1.2	1.4	1.6	1.8	2.0	2.2
	Pounds of seed/acre						
10000	100	120	140	160	180	200	220
11000	91	109	127	145	164	182	200
12000	83	100	117	133	150	167	183
13000	77	92	108	123	138	154	169
14000	71	86	100	114	129	143	157
15000	67	80	93	107	120	133	147
16000	63	75	88	100	113	125	138
17000	59	71	82	94	106	118	129

**This table is based on 100% germination. Adjust your seeding rate by the % germ printed on your bag tag.*

Table 3. Winter wheat grain yield following winter wheat, soybean, corn for grain, and corn silage.

Rotation	2003	2004	2005	2006	Average
	----------Winter wheat grain yield bu a^{-1}----------				
Continuous **Wheat**	56.3[1]	47.0	41.8	45.0	47.5
Corn-Soybean-**Wheat**	66.3	51.0	71.8	74.0	65.8
Soybean-Corn (grain)-**Wheat**	55.7	42.0[2]	51.1	66.0	53.7
Soybean-Corn (silage)-**Wheat**	57.7	51.0	62.0	69.9	60.2

[1] *2003 marked the second year of the continuous wheat rotation treatment*

[2] *Poor stand establishment in the 2004 Soybean-Corn (grain)-Wheat rotation affected wheat yield.*

Winter wheat and crop insurance (Information courtesy of Michele Austin, Director –Insurance Services; Badgerland Financial)

The Wisconsin winter wheat final planting date varies by county, ranging from September 30th to October 10th. If the wheat is seeded after the county's final plant date (late planting period) the crop insurance guarantee is reduced by 1% per day for the first 10 days. If wheat is seeded after the late planting period, the crop insurance guarantee is reduced to 60% of the original guarantee.

Special notes regarding the 2011 crop

Winter wheat coverage is not available in all Wisconsin counties.

Air seeded (flown on by airplane) wheat is not insurable and no premium is charged.

The final day to turn in a 2010 winter wheat claim is October 31st.

The 2011 wheat price discovery on CBOT (using September '11 contract) will be determined as follows (this price will be used for both yield protection and revenue protection plans of insurance):

- The Projected Price tracks from August 15, 2010 - September 14, 2010
- The Harvest price tracks from August 1, 2011 – August 31, 2011
- There is a 200% maximum difference between the Base and Harvest Prices with no downside limit.

Crop Rotation:

Yield data from our long term rotation experiment located at Arlington, WI indicated that wheat grain yield was greatest when following soybean (Table 3) (Lauer and Gaska, 2003-2006, unpublished). Yield of second year wheat (2003 column) was similar to wheat yields following corn for grain or silage. Third (2004), fourth (2005), and fifth (2006) year continuous wheat yields were dramatically lower than the other rotational systems. Our data suggests that growers should plant wheat after soybean first, then corn silage, corn for grain, and lastly wheat.

If growers choose to plant second year wheat, several management factors should be considered to reduce risk. First plant a different wheat variety in the second year that possesses excellent resistance to residue-borne diseases. Under no circumstances should growers consider planting bin-run seed in second year wheat. By planting a different variety with strong disease resistance characteristics you can reduce the likelihood of early disease pressure and significant yield loss. Growers should use a seed treatment in wheat following wheat. Be aware that seed treatments are not a cure all for all common diseases in continuous wheat systems (e.g. take-all). Growers should also consider increasing their seeding rate to 1.8 to 2.0 million seeds per acre in wheat following wheat systems. This will aid in stand establishment and increase the likelihood of a uniform

stand going into the winter. Lastly, if using a no-till system, planting into a seedbed that is free of living volunteer wheat is important in reducing the incidence of Barley Yellow Dwarf Virus. Growers should consider a herbicide application to any living volunteer wheat prior to planting to prevent a "green bridge" for the aphids that vector this virus.

Wisconsin Vegetable Crop Update, 2010-16

Alvin J. Bussan, Potato and Vegetable Cropping Systems Specialist, UW-Madison, Department of Horticulture

Vegetable Crop Update newsletter issue sixteen is out! This marks the sixteenth newsletter of the 2010 year. Weekly updates should be available as disease, insect, weed, fertility, and crop progress changes.

The sixteenth issue has been posted on the IPCM website on a page titled appropriately: The Vegetable Crop Update page. Look for menu item under "WCM-News" to find this page or click here: http://ipcm.wisc.edu/WCMNews/VegCropUpdate/tabid/115/Default.aspx

Weed Doctor's 2010 Farm Technology Days Biggest Weed Contest Winners

Although shortened due to the rainfall, 2010 Weed Doctors Biggest Weed Contest at Farm Technology Days still resulted in some impressive weeds. We think the excellent growing conditions throughout the state resulted in some truly impressive entries. Entries included weeds like giant ragweed, yellow sweet clover, bull thistle, common mullein, and a dock species. However, once again the biennial, common burdock, captured the biggest weed present at this show with top 2 entries.

The biggest weed contest calculates weed size by multiplying a weed's height by its width. This method favors weeds that are both tall and wide, hence burdock typically beats many other taller weeds that aren't very wide. Contestants are realizing this fact as many of the samples were burdock. However, the grand prize goes to a burdock was entered by James Krings of Plum City in Pierce county which measured 8 ft tall by 6.6 ft wide. Congratulations James, you can truly grow large weeds!!! Other large entries were another burdock from Sam Nthole from River Falls (2nd) and a giant ragweed from Pat Kinney (3rd).

We will again be holding this contest next year at FTD in Marathon county, so start scouting fields this fall!

Five More Factsheets Available that focus on Invasive Plant Control

Brendon Panke and Mark Renz, University of Wisconsin-Madison and University of Wisconsin-Extension

Five more factsheets focusing on management of invasive plants in Wisconsin are now available (Black Swallow Wort, Hill Mustard, Spotted Knapweed, Teasels, and Japanese Hedge Parsley). Each factsheet summarizes important identifying characteristics for each featured species, as well as information necessary for developing a management plan. The bulk of each sheet lays out non-chemical and chemical control methods. Information highlighted includes timing of treatment for each technique, effectiveness of treatments, and remarks and cautions particular to each technique. It is our hope that these sheets will provide everyone with the information needed to manage invasive species in their specific situation. Below is a link to the five sheets which are now available and are located at (http://ipcm.wisc.edu/Publications/WeedSciencepublications/tabid/116/Default.aspx)

NEW FACTSHEETS

Black Swallow Wort

Hill Mustard

Spotted Knapweed

Teasels

Japanese Hedge Parsley

Yellow (Sulphur) Butterflies in Alfalfa

Eileen Cullen, Extension Entomologist

A few calls and emails have come in the last week asking about yellow butterflies in noticeably high populations in and around alfalfa fields. Producers and UW Extension County Agents have asked whether this is a concern for alfalfa defoliation. Existing alfalfa stands and re-growth after final summer cutting should be watched, but the Sulphur butterflies and their larvae are not typically an economic defoliator.

These butterflies are in the insect order Lepidoptera and family Pieridae (also called Whites and Sulphurs). Adults have medium to small wings that are white, yellow, or orange. Adults of all species in Pieridae visit flowers for nectar. The majority of caterpillars of North American whites and sulphurs feed on legumes or crucifers (members of the Mustard family).

We are seeing two species in the genus *Colias*, the Clouded Sulphur (*Colias philodice*) and the Orange Sulphur (*Colias eurytheme*). The orange sulphur is also known as the 'Alfalfa Caterpillar' butterfly for it's larval stage. Larvae are velvety green with a white strip on each side of the body through which runs a fine red line. Both of these species are very common in Wisconsin with overlapping generations from early spring until late fall. They are among the latest flying butterflies. Throughout Wisconsin, it is common to see open areas, hay fields (alfalfa, clover), prairies, and roadsides near these habitats teeming with hundreds of these butterflies.

Orange Sulphur (alfalfa caterpillar butterfly) female (foreground) and male Clouded Sulphur (background)

Photo: Puchyan Prairie, Green Lake Co., WI.
http://wisconsinbutterflies.org/butterfly/species/16-orange-sulphur

Alfalfa Capterpillar. **Photo:** Bryan Jensen, UW-Madison

Keep an eye on alfalfa and clover hay fields and make note of larvae and any defoliation. Treatment may be suggested if you have an average of 10 caterpillars/sweep. Bryan Jensen previously published this information in the July 22nd issue of Wisconsin Crop Manager in an article titled Alfalfa Caterpillars and Green Cloverworms. Economic damage from alfalfa caterpillars is unusual because a viral disease frequently causes high mortality as populations increase. Infected larvae soon become blackened and evidence is easily found on leaves and stems. Moreover, Sulphur butterfly larvae will soon enter the overwintering stage in fall.

Wisconsin Crop Manager

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Southern Corn Rust Found in Wisconsin

Paul Esker and Brian Hudelson UW-Madison/Extension Field Crops Plant Pathologist and Director, UW-Madison/Extension Plant Disease Diagnostics Clinic

Samples were submitted to the Plant Disease Diagnostics Clinic late last week and also early this week from the Marquette and Dodge County areas with symptoms similar to southern corn rust. Microscopic examinations of spores confirmed the presence of the pathogen (*Puccinia polyspora*) that causes this disease. This is the first report of Southern rust of corn in Wisconsin in field hybrids in approximately 15 years. Given the current growth stage for most of the corn in the state, the risk for yield loss is very low and foliar fungicides are not recommended.

For further information about the location of positive detections (on a county-scale) of Southern rust across the U.S., please check the Southern Corn Rust ipmPIPE site. For further information about southern corn rust, there are several excellent resources including:

1. University of Nebraska CropWatch
2. North Carolina State University
3. the Bulletin – University of Illinois Extension

Considerations when using the end-of-season corn stalk nitrate test

Carrie Laboski, Extension Soil Scientist, Dept. of Soil Science, Univ. of Wisconsin-Madison

Corn growers have had a recent surge of interest in taking end-of-season corn stalk samples to assess nitrogen (N) management practices. The purpose of this article is to briefly describe the end-of-season corn stalk nitrate test with regard to the intent of the test, sampling guidelines, and interpretation of test results.

Intent of the test

Many corn growers feel that their crop needs to be dark green throughout the growing season to achieve high yields and be profitable. As a result of this belief, high fertilizer N rates are often applied to maintain dark green leaves. Research in Wisconsin and throughout the Midwest has consistently shown that the most profitable rate of N fertilizer will result in plants that are less green late in the growing season. The end-of-season stalk nitrate test is intended to be tool to help corn growers determine if their N management practices were adequate or if adjustments could be made to improve profitability and/or reduce N losses to the environment.

Sampling guidelines

The following criteria should be followed to ensure that samples are properly acquired:

- Samples should be taken 1 to 3 weeks after black layer
- An 8" segment of stalk should be taken from 6 to 14 inches above the soil surface, remove leaf sheaths
- Stalk segments from 15 plants make one sample
- A sample should not represent more than 20 acres
- If soil characteristics or past management practices vary across the field, then separate samples should be collected for each area.
- Stalks severely damaged by insect or disease should not be used

Samples should be placed in paper bags and sent to a laboratory for analysis. Samples should be refrigerated (not frozen) if they are to be stored for more than one day before shipping. Most soil testing laboratories will conduct this test.

Contact your laboratory to confirm that they run the stalk nitrate test.

Interpretation of stalk nitrate test results

The interpretation of the stalk nitrate test was developed using data from 98 sites in Wisconsin collected over four years (Bundy, 1996). Results from the stalk nitrate test are reported in parts per million (ppm) of nitrate-N. Stalk nitrate test interpretations are provided in Table 1.

Table 1. Interpretation of end-of season corn stalk nitrate test.

Category	Nitrate-N concentration	Interpretation
Excessive	> 2000 ppm	High probability that N availability was greater than if fertilized according to UW-Extension guidelines
Optimal	700–2000 ppm	High probability that N availability was within the range needed to maximize profitability
Low	< 700 ppm	High probability that greater N availability would have resulted in increased yields

It is important to keep in mind that the stalk nitrate test has several limitations. First, the test identifies excessive and optimal N rates more accurately on medium yield potential soils compared to high yield potential soils (Table 2). In addition, a little more than one-third (37%) of the high yield potential soils categorized as having excess N supply actually had optimal, not excessive, rates of fertilizer. Second, research in Wisconsin has shown that the test may occasionally incorrectly indicate that excess N was supplied to fields with recent (within two years) history of manure application and/or alfalfa in the rotation; particularly on high yield potential soils. Third, the test does not provide an indication of the amount of N that was over or under supplied. Fourth, the test can be impacted by weather. In extremely dry years, the stalk nitrate values tend to be high; in contrast, test values tend to be low in an extremely wet year.

Because the adequacy of any given N rate on a field is dependent upon environmental conditions, basing future N rate decisions solely on one year's stalk nitrate values could result in poor management decisions. Stalk nitrate data collected over several years coupled with N management and growing season weather can be useful in determining if N fertilizer rates should be reduced to improve profitability.

Table 2. Accuracy of the end-of-season stalk nitrate test to categorize sites as having low, optimal, or excessive N rates on 49 medium and 49 high yield potential soils.

Soil yield potential	Stalk nitrate test category		
	Low	Optimal	Excessive
	% of sites correctly categorized		
Medium	60	92	71
High	75	56	63

References and other reading

Blackmer, A.M. and A.P. Mallarino. 1996. Cornstalk testing to evaluate nitrogen management. Iowa State University Extension Bulletin PM 1584.

Bundy, L.G. and T.W. Andraski. 1996. End-of-season soil and plant nitrate tests to evaluate nitrogen management practices for corn. Proc. Wisconsin Fertilizer, Aglime, and Pest Management Conference. 35:247-256.

New Weed ID Book Available: Weeds of the Midwestern U.S. and Central Canada

Courtesy of Rich Zollinger, Extension Weed Scientist, North Dakota State University

WEEDS OF THE MIDWESTERN UNITED STATES & CENTRAL CANADA

Edited by Charles T. Bryson and Michael S. DeFelice

Publication date: July 1, 2010

Flexibind w/ flaps, $44.95 | ISBN 978-0-8203-3506-3

440 pp.

1423 color photos | 363 maps

This weed ID book features more than 1,400 full-color photographs, 363 maps on 440 pages and this handy guide provides essential information on more than 350 of the most troublesome weedy and invasive plants found in the Midwestern United States and central Canada. Drawing on the expertise of more than forty weed scientists and botanists, the guide identifies each plant at various stages of its life and offers useful details about its origin, habitat, morphology, biology, distribution, and toxic properties.

The book also includes illustrations of the most common characteristics of plants and terms used to describe them, a key to plant families included in the book, a glossary of frequently used terms, a bibliography, and indexes of scientific and common plant names. This is an essential guide for agronomists, crop and soil

scientists, horticulturists, botanists, Cooperative Extension Service agents, farmers, gardeners, students in agriculture and biology, lawn care professionals, green industry professionals, nursery owners, government quarantine workers, and land preservationists.

Each species account includes:

- Distribution map and up to four color photographs showing seed, seedling, plant & flower
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The cheapest way is to order the book on-line through Amazon.com or you can go to your local bookstore and buy it there or they can order it for you.

Don't Forget About SURE

Paul D. Mitchell, Agricultural and Applied Economics, UW-Madison

Key Points

- Farmers have until September 30, 2010 to file SURE claims for the **2008** crop year.
- To be eligible for SURE coverage in **2011**, farmers have until September 30, 2010 to buy crop insurance coverage for their forage and fall-seeded small grains.
- Talk to your county FSA office if you have questions about SURE.

A Quick Reminder about SURE for the 2008

Remember the Floods of 2008? It was national news when Cedar Rapid, IA suffered extensive flooding, with many Wisconsin farmers also suffering crop losses. 2008 was also the year the new Farm Bill took effect and among its many changes was the SURE program, the new permanent disaster program for farmers. 2008 was the first year farmers could sign up for SURE and, with the late passage of the Farm Bill, farmers had all summer to sign up. Many Wisconsin farmers signed up and so far, about $60 million in SURE payments have been made in Wisconsin. Farmers who signed up for SURE in 2008 may still be eligible for payments. If you signed up for SURE in 2008, had a 10% production loss for at least one of your crops, and have not checked about your eligibility, contact your county FSA office and ask about your SURE payment eligibility—you may have a pleasant surprise.

Now is the Time to Decide about SURE for 2011

Farmers who want to be eligible for SURE for the 2011 cropping season may need to insure some of their crops this fall. SURE eligibility requires that any crop expected to generate at least 5% to the farm's revenue must be insured. September 30, 2010 is the deadline for purchasing crop insurance for forage crops and for fall-seeded small grains such as wheat or rye. Perennial crops such as apples, grapes, maple sap, cherries, hops and cranberries have a November 20, 2010 deadline for crop insurance. Spring planted crops like corn and soybeans have a March 15, 2011 deadline. Farmers interested in SURE coverage for 2011 should contact their county FSA office soon and determine if they need to buy crop insurance coverage for some of their crops this fall.

Based on each farm's historical production information and the USDA price for each crop, FSA will determine if each of your crops meets eligibility for SURE and thus needs to be insured. Even if a farm never sells a crop, but feeds it to livestock, the crop still counts towards expected revenue and so may need to be insured. However, exceptions apply. Land for grazing does not require insurance coverage, nor does forage in its seeding year. Also, waivers apply for socially disadvantaged, limited resource and beginning farmers. Other possibilities exist. Farmers interested in SURE should contact their county FSA office soon or risk being ineligible for 2011. Also, see the UWEX Information Bulletin "Insuring Forage for SURE" for explanations on the options for insuring forage in Wisconsin and ways to reduce insurance premiums.

Additional Resources

- USDA-FSA SURE Fact Sheets and Calculator: http://www.fsa.usda.gov/sure
- Insuring Forage for SURE: UWEX Information Bulletin by P.D. Mitchell, September 7, 2010: http://www.aae.wisc.edu/mitchell/SURE_Forage.pdf
- Contact your county FSA office for more information regarding the specifics of SURE for your operation and for help using the SURE Calculator.

Insuring Forage for SURE

Paul D. Mitchell, Agricultural and Applied Economics, UW-Madison

Key Points

- To qualify for SURE, forage crops can be insured with APH, GRP, or AGR-Lite.
- SURE does not require crop insurance for grazing land or forage in its seeding year.
- Many farmers can insure their forage acres for less than $300 in total.
- The deadline for purchasing forage crop insurance is September 30, 2010.

The Supplemental Revenue Assistance Program (SURE) program was created by the 2008 Farm Bill as a permanent disaster assistance program for farmers suffering losses from natural disasters. An important requirement of SURE is the Risk Management Purchase Requirement—farmers must buy

crop insurance for all their crops to be eligible for SURE payments. This fact sheet summarizes some of the key crop insurance deadlines, plus crop insurance options for forage crops and ways to possibly reduce insurance premiums while still qualifying for SURE.

Risk Management Purchase Requirement

To be eligible for SURE, farmers must purchase crop insurance for any crop expected to generate at least 5% to the farm's revenue. Based on a farm's historical production information and USDA prices, FSA will determine if each crop meets eligibility for SURE and thus needs to be insured. Even if a farm never sells a crop, but feeds it to livestock, the crop still counts towards expected revenue and may need to be insured. However, exceptions apply. Land for grazing does not require insurance coverage, nor does forage in its seeding year. Also, waivers apply for socially disadvantaged, limited resource and beginning farmers. Interested farmers should work with their county FSA office to determine which of their crops need crop insurance in order to be eligible for SURE. The deadline for purchasing crop insurance is September 30, 2010 for forage and fallseeded small grains, November 20, 2010 for perennial crops, but not until March 15, 2011 for spring planted crops such as corn and soybeans.

Insurance Options for Forage Crops

Forage crops are a common Wisconsin crop that many farmers may find that they need to insure in order to be eligible for SURE. Two types of crop insurance policies exist for forage production in Wisconsin—an individual APH policy and a county GRP policy. AGR-Lite insurance, a whole farm revenue policy, also qualifies farmers for SURE.

The APH policy uses a farm's actual production history to determine expected yield and the farmer selects a percentage of this average as a forage production guarantee. The farmer also chooses the price election—the price used to pay for losses below this guarantee. For example, in 2010, the available forage price elections ranged from $118 to $64.90 per ton. The FSA will use your chosen coverage level and forage production guarantee to determine your farm's SURE guarantee. The GRP policy is similar, except the yield guarantee is at the county level (not the farm level), with USDA-NASS average yields determining the guarantee. If the actual NASS county average yield is below the chosen county guarantee, the farmer receives an indemnity. Farmers choose the "protection per acre" ($/ac) and FSA uses it to determine the farm's SURE guarantee. Note that GRP does not require a farmer to keep forage production records, but FSA will require production records to determine the size of SURE payments a farm receives. An APH forage seeding crop insurance policy exists and farmers may find it useful. However,land in its first year of seeding is not eligible for SURE payments, so farmers do not need to insurethese acres to qualify for SURE. Similarly, farmers can buy crop insurance for pasture acres, which may be useful for some farmers, but these acres do not need to be insured to qualify for SURE. Also, FSA cannot sell a farmer a NAP policy (Noninsured Crop Disaster Assistance Program) for forage acres because traditional APH and GRP policies exist.

AGR-Lite is another crop insurance policy farmers can use for forage crops to qualify for SURE. With AGR-Lite, farmers insure their Schedule F income for their whole farm. AGR-Lite is cheaper if combined with crop-specific policies such as an APH or CRC for main crops such as corn and soybeans, with AGR-Lite serving as an umbrella policy over the farm providing an income guarantee. AGR-Lite is also useful for those growing specialty or organic crops, as current crop insurance policies often do not have adequate prices for such crops.

Reducing Premium Costs for Crop Insurance

Some farmers may find forage crop insurance policies useful. However, others may find them a nuisance that they will purchase just to be eligible for SURE payments on their main crops such as corn, soybeans and/or wheat. Here I outline some ways to reduce or minimize premium costs for farmers of this sort who do not expect or need forage insurance indemnities.

Both APH and GRP forage production policies have catastrophic (CAT) versions that cost $300 no matter how many acres are insured in a county. For farms with many acres of forage production, this may be the cheapest possible way to meet the requirement for forage insurance to be eligible for SURE. Note that CAT policies offer little protection (50% of average yield at 55% of the RMA price). However, regular forage policies are relatively low cost in some counties and, by choosing a lower coverage level and/or price election, farmers with fewer forage acres can qualify for SURE and spend less than $300. For example, in Grant County in 2010, the GRP premium with a 70% coverage level was $2.44/ac with a 100% price election, $1.95/ac with an 80% price election and $1.46/ac with a 60% price election. Buying a 70% GRP policy with these price elections would cost less than a $300 if a farmer has less than 110 ac, 138 ac, or 184 ac of forage production, respectively. However, the probability that a GRP policy with a 70% coverage level will actually pay an indemnity is very low—historically, several Wisconsin counties have never paid an indemnity on a GRP forage production policy, even at 90% coverage level.

Lower price elections and coverage levels also reduce premium costs for APH policies, but APH policies have higher per acre premiums. For example, a farm in Grant County with an average forage production of 4 tons/ac has a per acre premium for a basic unit of $4.04/ac with a 60% coverage level and a 100% price election; the premium falls to $3.39/ac with an 84% price election (the lowest available at a 60% coverage level). With these price elections, a 60% APH policy costs less than $300 in total if the farmer has less than 67 ac or 80 ac of forage production. Farmers should contact a crop insurance agent for premium options for their specific operation.

Additional Resources

- USDA-FSA SURE Fact Sheets and Calculator: http://www.fsa.usda.gov/sure
- USDA RMA AGR-Lite Fact Sheet: http://www.rma.usda.gov/pubs/rme/agr-lite.pdf
- Contact your county FSA office for more information regarding the specifics of SURE and for help using the SURE Calculator.

- Contact a crop insurance agent for more information about premiums for APH, GRP or AGRLite crop insurance for your forage or other crops.

Preparing For Grain Storage

Brian J. Holmes, Biological Systems Engineering Department, University of Wisconsin-Madison

Producers anticipating the grain harvest season should not only be prepared to harvest the crop, they should be prepared to dry and store it properly as well. Grain that will be stored for 6 months should be dried to 15% moisture while that to be stored for 12 months should be dried to 14% and for longer storage, plan to dry to 13% moisture. The drier the grain, the easier it is to manage in storage but the higher the drying energy cost and the longer to dry a bushel. With an early harvest season, corn can remain in the field to do more field drying, thus reducing initial moisture content which will decrease drying cost and increase dryer capacity. Match your harvest rate to dryer capacity to make sure there are not bottlenecks at the dryer.

Fines in grain interfere with air movement through the grain during drying and storage. They also contribute to mold and insect infestations during storage. Removal of wet fines will improve drying rate and reduce the energy needed to dry these fines. If possible, screen wet fines before entering the dryer. If corn is dried using high temperature followed by rapid cooling, stress cracks result. Fines will be generated as broken kernels when stress cracked corn is handled. Splits occur if soybean drying temperature is too high. Before grain is placed into storage, screen out the remaining fines. If fines accumulate in the bin, they are usually concentrated at the fill point. Running the discharge auger can help to remove the accumulated fines from the center core of a bin. Remember, precautions taken during drying and storage filling can save headaches that could develop during the storage period.

If grain temperature is more than 10°F different from daily average temperature, convection currents within the grain cause air to move within the grain and moisture to condense on cold grain surfaces. This moisture supports mold growth and insect infestations. Aeration is used to manage grain temperature during storage. Plan to cool grain in fall and warm it in spring.

To be able to aerate the grain properly, a fan and air distribution system must be installed at the bottom of the bin. A fully perforated floor allows a uniform distribution of the airflow into the grain. A duct system in or on the floor of the bin can also be used if designed properly. Plan to deliver at least 0.1 Cubic Feet per Minute per Bushel stored (CFM/Bu) of airflow to have enough capacity to change the grain temperature over a period of 1-2 weeks. Inspecting the grain once per week in warmer weather and biweekly in cold weather helps you manage the conditions in the bin and take action before the grain condition gets out of control.

Safety precautions must be taken to protect the operator against injury and/or death when entering a bin. Lock out and tag out the unloading auger before entering a bin. If molds are present, carbon dioxide levels may be elevated creating an oxygen deficient atmosphere. Turn on the aeration system before entering the bin to remove any accumulated gas from the headspace above the grain. Use an approved respirator to filter out molds and spores that may enter your respiratory tract. Safe entry requires using a harness with two ropes and two assistants outside the bin. This may seem like an excessive precaution but the forces of grain are significant if you become engulfed. Probe the surface of the grain before entering if grain has been removed from the bin to assure a crust has not formed on the surface leaving a cavity below the surface.

Weather conditions during the growing season this year may contribute to a bumper crop. This could result in storage capacity limitations. Options for storing excess dry grain include; renting space from a neighbor or an elevator, piles on the ground, in building "flat storage", silo bags and tower silos. Conventional bins with aeration systems offer the best choice for management. All other options have limitations. For more details on some of these options see the publications available through the UW Extension Responds website:

http://www.uwex.edu/ces/ag/feedandcommoditystorage.html

Another option is to harvest grain as high moisture and market it locally to a dairy or beef producer who has storage facilities for high moisture corn. In this case, oxygen limiting tower silos, top unloading tower silos, bunker silos and bag silos are viable options.

Increasing Corn Production Costs Cut Into Profits

Joe Lauer, *Corn Agronomist*

PDF version

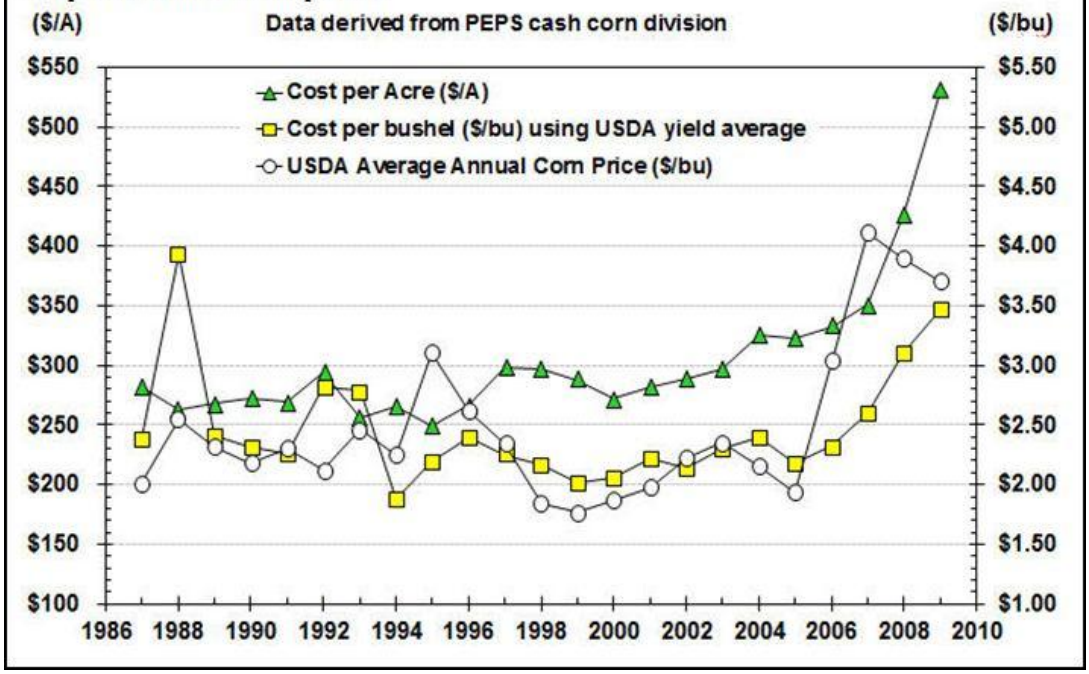
As harvest draws near, growers are encouraged by record projected yields and the strong corn prices available right now. But, a strong corn price does not guarantee profitability unless production costs are under control. Even though prices are strong, grower return (profitability) for 2010 is likely going to be similar to previous years because of increasing productions costs and a strong basis.

Figure 1 describes the average cost per bushel and cost per acre of participants in the Cash Corn division of the PEPS program (Profits through Efficient Production Systems). For more information regarding the PEPS program see the website at http://corn.agronomy.wisc.edu/PEPS. Production costs between high and low yielding fields do not change dramatically. There is approximately $13-$24 per acre difference between high and low producing fields (Lauer, 2002). Since 2003, production costs have been steadily increasing from approximately $2.30 per bushel and $300 per acre to $3.47 per bushel and $531 per acre in 2009.

With the exception of chemical costs, nearly all production cost categories (seed, fertilizer, harvesting, equipment and land) have increased since 2003 (Figure 2). The most dramatic increases have been with seed and fertilizer. Both productions

costs were similar in 2003 (approximately $40-$42) with seed doubling and fertilizer tripling by 2009. Harvesting costs include grain drying, which varies by year and is usually expensive in cool years like 2009.

Figure 1. **Average production costs for corn grown in Wisconsin. The cost per bushel is calculated using the PEPS cost per acre and dividing by the USDA average grain yield for Wisconsin. The USDA average annual corn price is included for comparison.**



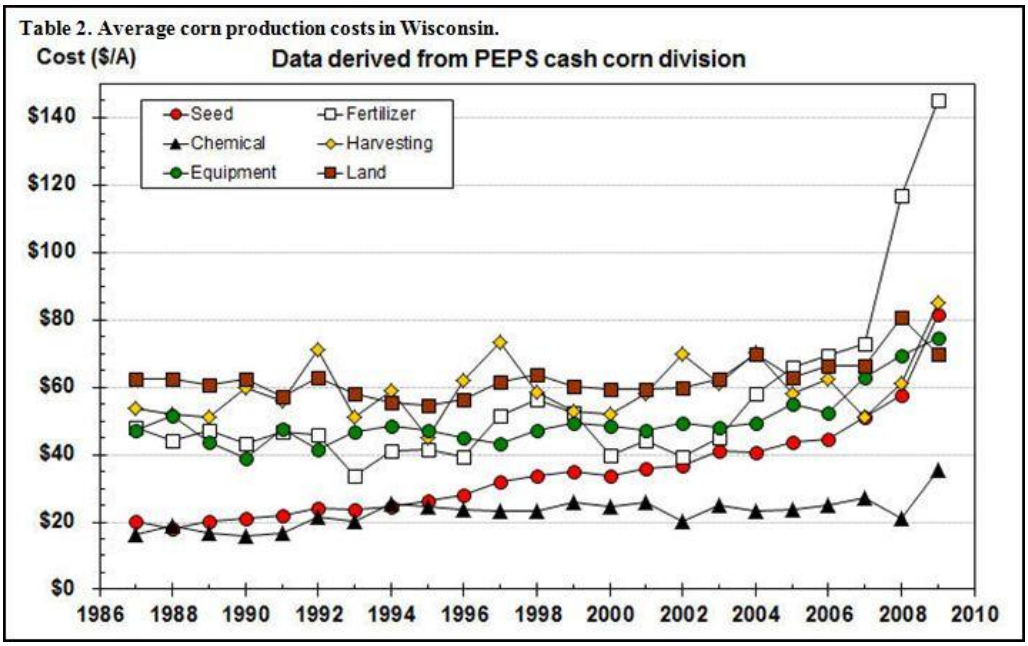
Although the PEPS program does not capture all of the production costs associated with raising corn, it does give some feel for the kind of production costs we are dealing with. PEPS costs include actual figures provided by contestants in the program. These costs do not include all costs of production. For example, overhead or miscellaneous costs associated with operating a farm (i.e. field tiling, outfitting a shop, plowing snow, maintaining fences, taxes, desktop work related to management, etc.), are difficult to determine among farms, and is not accounted for in the PEPS program. Typical overhead rates range from 18-46% of production costs.

Best of the Best aptly describes the farmers participating in the PEPS program. Results reflect the efforts and costs of some of the best farmers growing corn on the best land available using their best management practices. Lower yielding fields are often not entered into the contest. Thus, real world costs are probably higher for most farmers and that is why Wisconsin USDA yield averages were used for calculating cost per bushel in this article.

Literature Cited

Lauer, J. 2002. Practices Used By Wisconsin Top-Profit Corn and Soybean Farmers. Field Crops 28.6-34 PDF

Table 2. Average corn production costs in Wisconsin.



Stored Grain Insect Management

Phil Pellitteri, *UW Madison Entomology Insect Diagnostic Lab*

There are over 40 different insects and mites found infesting stored grain in Wisconsin, and non of these come in with the crop from the field. Grain that is not properly stored will become moldy and attract fungus beetles. The quickest way to infest clean, dry grain is to mix old grain with the new crop. Even if a bin is empty small numbers of insects can hide in residue and dust within the bin. Residual bin sprays are used on walls, ceilings, roof and floors of clean bins prior to harvest. All grain debris should be swept up or vacuumed and all cracks and crevices sprayed with a residual insecticide. The area under perforated floors will need to be cleaned out or fumigated.

You must read the label carefully as some products can only be used in empty bins and others are labeled as grain protectants which can be spayed directly on grain. Products labeled for empty bins include cyflytrhin (Tempo), diatomaceous earth (Insecto dust), and Storicide (chlorpyrifos-methyl plus cyfluthrin). For grain that is already infested the grain can be fumigated or insecticides can be used as a surface treatment or applied uniformly as grain is being loaded or transferred depending on the situation. Insects will not be active if grain temperatures are held below 50^0F. For a more details on treating stored grain insects see Chapter 7 Stored Grain Insect Management in University of Wisconsin-Extension Publication A3636-Pest Management in Wisconsin Field Crops.

Cover Crops and Crop Insurance

Kevin B. Shelley, Nutrient and Pest Management Program

Paul D. Mitchell, Agricultural and Applied Economics, UW-Madison

Cover Crop Pracices

Cover crops – planted after harvesting one crop and before planting another crop such as grains or vegetables – help protect soil, scavenge and recycle nutrients, and improve soil quality by adding organic matter. Cover crops are often mechanically or chemically terminated, but may be harvested as supplemental forage. UW Extension and the Nutrient and Pest Management Program have been providing information on two cover cropping practices: 1) frost seeding red clover into winter wheat and 2) drill-planting winter (cereal) rye following harvest of corn as silage. This bulletin examines how cover cropping can affect eligibility of some crops for crop insurance coverage and suggests crop insurance options for farmers using cover crops.

Crop Insurance and Cover Crops

The USDA Risk Management Agency (RMA) offers several crop insurance policies that are sold by private crop insurance agents. The RMA sets specific rules for these policies governing the insurability of crops when planted with or following a cover crop.

Red clover is used as a cover crop by broadcast seeding into fall planted winter wheat in early spring (March-April) when freezing-thawing conditions cause soil cracking (frost seeding). The clover seed falling into soil cracks eventually germinates and then begins to grow under the fast developing wheat canopy. When the wheat is managed for high yield, the clover generally stays small and sparse until after the wheat is harvested (mid-late July in southern Wisconsin). After the wheat harvest, the clover cover crop continues to grow, providing a dense, nitrogen fixing, soil covering, and weed suppressing biomass that benefits the following year's corn crop.

RMA rules do not permit crop insurance coverage for small grain crops planted for harvest that are inter-planted with another crop. This inter-planting rule specifically prohibits use of a grain drill or other tillage-based planting of the cover crop seed. However, broadcast seeding of red clover or a similar cover crop, the typical frost seeding practice, is acceptable as the seed is not technically inter-planted according to RMA definitions. RMA rules also state that damage to the wheat as a result of the frost seeding is not an insurable cause of loss. Thus growers who later file an insurance claim may have indemnities slightly reduced if it is determined that some of the yield loss was due to driving on the wheat during broadcast seeding. The key is that farmers who want to insure wheat and use frost seeding of a clover cover crop should carefully and clearly explain their intended cover cropping practices to their crop insurance agent when buying their policy, to prevent loss of insurance coverage due to a misunderstanding of the rules.

Harvesting corn for silage is a common practice in Wisconsin, with manure commonly applied to fields after silage harvest. Removing almost all the plant biomass for silage leaves little crop residue for soil protection, contributing to soil erosion and nutrient runoff from applied manure. Drill-planting winter (cereal) rye in late September or early October in southern Wisconsin after harvesting corn silage provides an over-winter cover crop to help reduce soil loss and nutrient runoff. The rye grows quickly the following spring and can be chemically or mechanically terminated in late April or early May before planting the main crop. This practice will not affect insurability of the following crop. However, the rye may be harvested as an early season forage crop, around mid-to-late May in southern Wisconsin, when the rye reaches boot stage. This practice may create a problem for farmers desiring to insure the crop planted after the rye forage, as RMA double cropping rules do not permit insuring some crops following the rye forage.

For most crops, crop insurance policies such as Yield Protection and Revenue Protection (the old APH and CRC policies) state that "any acreage following another crop that has reached the headed (or budded) stage and/or that has been harvested in the same calendar year is not insurable." This rule implies that, when following rye harvested as forage in the same year, corn and soybeans will not be insurable under a Yield Protection and Revenue Protection policy, while some vegetable crops (sweet corn) will not be insurable under an APH policy, but others will be (green/snap beans). However, this rule does not apply to forage seeding crops, so that a farmer could follow corn silage with a rye cover crop, harvest the rye for forage the next spring, and then seed alfalfa after the rye and insure the alfalfa seeding under a forage seeding policy.

Other Crop Insurance Options with Cover Crops

After harvesting a crop for forage, whether a cover crop or an established alfalfa stand, farmers cannot plant and insure crops such as corn and soybeans with Yield Protection and Revenue Protection (the new APH and CRC policies) or vegetable crops with an APH policy. However, farmers can use GRP and GRIP policies for corn, soybeans, hybrid seed corn and processing sweet corn to insure crops planted after harvesting cover crops. GRP and GRIP are similar to Yield Protection (APH) and Revenue Protection (CRC), but use the NASS county average crop yield, not the farmer's individual yield, to determine payments. All of a farm's corn or soybean acres have to be insured under the GRP/GRIP policy, not just part of them, and fields have no coverage for individual losses, so some farmers buy a separate hail policy. AGR-Lite crop insurance also insures a crop planted after harvesting a cover crop. AGR-Lite insures a farm's Schedule F income from all crops and is more useful when combined with separate crop policies, with AGR-Lite serving as an umbrella policy over the farm to provide an income guarantee. For example, a farm could use Revenue Protection for soybeans, GRIP for corn, and AGR-Lite to have coverage for their forage and vegetable crops. Also, GRP, GRIP, and AGR-Lite satisfy insurance requirements for farmers who want to qualify for SURE, the new federal disaster assistance program that provides an additional income guarantee for farms.

Conclusion

Wisconsin farmers have been exploring cover crops and other crop diversification strategies to help protect and improve soil, provide supplemental feed and aid nutrient management, but some cover cropping practices can conflict with crop insurance rules. Fall planting small grains and frost seeding a legume cover crop in the early spring is acceptable, if the farmer submits a request in the fall and receives approval. Revenue Protection and Yield Protection do not allow farmers to insure a crop planted after harvesting a cover crop for forage, but GRP, GRIP and AGR-Lite do. Farmers who want to combine cover crops and crop insurance should carefully and clearly explain their intended cover cropping practices to their crop insurance agent when buying their policy, to prevent loss of insurance coverage due to a misunderstanding of the rules.

Additional Resources

Frost Seeding Red Clover in Winter Wheat: http://tinyurl.com/aqpn6o

Planting Winter Rye after Corn Silage: http://tinyurl.com/25csrhj

Insuring Forage for SURE: http://www.aae.wisc.edu/mitchell/SURE_Forage.pdf

Grain Storage Resources

Eileen Cullen, Extension Entomologist

Two articles in this issue of the Wisconsin Crop Manager newsletter address Preparing Grain for Storage, and Stored Grain Insect Management. UW Extension Specialists Brian Holmes, Biological Systems Engineering, and David Kammel, Center for Dairy Profitability maintain a UW Extension feed and commodity storage resource webpage. Projected grain crop harvest for 2010 warrants a second look at Grain Storage and Management resources. Links excerpted below from the UW Extension website http://www.uwex.edu/ces/ag/feedandcommoditystorage.html.

Grain Storage

Grain Drying, Handling and Storage Handbook (MWPS-13)- provides design information for grain drying and bin storage.

Dry Grain Aeration Systems Design Handbook (MWPS-29) – provides design information for grain aeration systems for bins and flat storage.

Low Temperature and Solar Grain Drying Handbook (MWPS-22)-Provides design and management information about low temperature (natural air) grain drying with solar options.

Temporary Grain Storage – compendium of sources on the subject.

Temporary Grain Storage – Article on facilities and techniques used to store grain temporarily to prevent grain quality loss from weather, wind, moisture, rodents, birds.

Temporary Grain Storage Considerations - Fact sheet discusses considerations when selecting temporary grain storage.

Temporary Grain Storage Considerations - Fact sheet discusses considerations when selecting temporary grain storage.

Emergency Storage of Grain : Outside piling information.

Adapting Silage Silos for Dry Grain Storage – Purdue University article.Storage Capacity of Grain Structures – IA state site with online spreadsheet tool.

Grain Management

Managing Dry Grain in Storage (AED-20) – provides design and management information for preserving grain quality while in storage.

Purdue University Grain Storage & Management – Vast array of information at this site. Also references other sites on the subject.

University of Nebraska-Lancaster County – Array of grain storage info.

University of Minnesota Post Harvest - Vast array of information at this site.

University of Minnesota Extension Grain Drying, Storage & Handling -Array of grain storage info.

North Dakota State Grain Storage & Management – vast array of grain storage and management.

Wisconsin Crop Manager

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Nitrogen management is the highlight of the 40th North Central Extension-Industry Soil Fertility Conference

Carrie Laboski, Extension Soil Scientist, Dept. of Soil Science, Univ. of Wisconsin-Madison

The 40th North Central Extension-Industry Soil Fertility Conference is being held in Des Moines, Iowa on November 17th and 18th. As usual there is a great line up of speakers and posters. If nitrogen management has been on your mind lately, then this conference will provide some answers. Topics related to nitrogen include: extended activity and fertilizer additives; canopy sensing; cover crops; and tillage. Nitrogen is not the only game in town; phosphorus, micronutrients, carbon will also be covered. The full program and registration information can be found at:
http://www.ipni.net/ipniweb/conference/ncsfc2010.nsf/

2010 Pest Management Update Meetings

Eileen Cullen, Extension Entomologist

We are pleased to announce the schedule and topics for the 2010 Pest Management Update Meetings. See the table with this article for the schedule. Please check the dates and locations and reserve a date on your calendar. Registration details are listed at the top of the schedule. **Please pre-register** with the host agent, as they have to make the meal reservations. As such, please note that when you have registered for a particular location the registration is firm. It is not possible for host agents to switch attendees and meal counts between locations on the day of the meeting, each location in the series is a separate event for registration and local arrangements purposes. Most agents add an additional "walk-in" fee for those who have not pre-registered.

Topics and issues at the meeting will review the 2010 crop year and forecast for next year. The speakers will be Mark Renz, weed scientist, perennial cropping systems; Larry Binning, Tim Trower, Richard Proost and Joe Bollman (varies by location), UW-Madison and UW-Extension weed science program areas with respect to weed management in annual crops; Eileen Cullen, field crop entomologist, and Paul Esker, field crop plant pathologist.

We hope to see you this fall at the meetings and wish you a good harvest in the mean time.

2010 Pest Management Update Topics will cover:

Weed Management: *Annual Crops*: 1) herbicide updates; 2) glyphosate resistance in Wisconsin-not a simple answer; 3) summary of perennial weed management in fall/spring with burndown treatments; *Perennial Crops*: 4) controlling winter annual weeds in alfalfa; 5) herbicide carryover in manure-should we be concerned?; 6) problematic pasture weeds of 2010 and what to expect in 2011; 7) the latest on NR40 (new invasive plant rule from DNR) and what to expect in 2011; 8) things to remember when managing perennial weeds in Wisconsin.

Insect Management: 1) western bean cutworm in corn-getting a handle on scouting and treatment timing; 2) keeping up with Bt corn insect traits and refuge requirements-what's new for 2011?; 3) slug biology and management for corn and soybean; 4) Lepidoptera (moths and caterpillars) in alfalfa, corn, and soybean-what you need to know about major Lep pests and which ones have limited impact; 5) insecticide label updates; 6) what happened to soybean aphid in 2010?

Disease Management: *Corn Disease Management*: 1) what did the increase in leaf diseases in 2010 mean in terms of production? 2) learning from you – new directions in corn disease extension? *Soybean Disease Management*: 3) sudden death syndrome-diagnosis and management; *Wheat Disease Management*: 4) variety selection as a function of multiple diseases and yield; *Alfalfa Disease Management*: 5) update on Aphanomyces race testing.

The schedule is attached at the end of this issue of the PDF print version of The Wisconsin Crop Manager

Assessing hail damage in mature soybeans

Shawn Conley

Significant yield loss can occur when hail events strike mature soybeans (Image 1). One such event occurred this past week in Dane County. Though the damage was relatively isolated to a few fields we measured yield losses nearing 7.5 bushels per acre. If you run into similar hail events this fall below is an equation to help you estimate the possible damage to your field. If you believe significant yield loss did occur to your field remember to **call your hail adjuster before you combine**.

Image 1. Shattered soybeans.

To estimate soybean yield losses from seed that has fallen on the ground:

1. Select several random areas of the field
2. Use a hoop or other device of known size to delineate an area and count the number of seeds in that have fallen to the ground in that area
3. After counting the seeds that have fallen, use the following formula to calculate the yield loss:

Estimated yield loss (bu/a) = ((#of seeds on ground/average seed number per pound)/60 lbs. per bu)/((3.14 x radius x radius of hoop in ft.)/43,560 sq. ft per acre)

For example:

A 3' diameter hoop was used to determine soybean losses after a hailstorm (Image 2). An average of 220 seeds were counted inside the hoop:

((220 seeds/3000 seeds per pound)/60 lbs. per bu)/((3.14 x 1.5' x 1.5')/43,560 sq. ft per acre) = ~7.5 bushel per acre yield loss

Image 2. 3' Diameter Hula Hoop

This will determine your pre-harvest losses. Any losses from the harvesting operation will be in addition to this.

Muck and mold impacting your harvest?

Cheryl Skjolass, Extension Agricultural Safety Specialist

Heavy rains flowed over hundreds of acres of crops ready for harvest. As clear weather dries out the soil and the crops, questions surface on what to do with soil, crops, building and machinery that were in the flow of flood waters. Flood waters leaves behind muck (debris, dirt and slit) and conditions ripe for molds, creating new hazards and concerns in fields and farm yards.

UW Extension is a part of two national web based resources that have information on recovering from floods and flooding.

Extension (http://www.extension.org/pages/Extension_Disaster_Education_Network_Floods) has a section on flood recovery. Three articles that may be of particular interest to those in the agricultural sector are: "Managing Flooded Grain Bins", "Returning to the Farm after a Flood" and "Salvaging Flood Damaged Agricultural Buildings".

The **Extension Disaster Education Network (EDEN)** has a web page on "Agricultural Issues after the Flood" that can be accessed at http://eden.lsu.edu/Topics/Hazards/Floods/Pages/AgricultureIssuesAfterFlood.aspx=

If you have specific questions on flood recovery related to agricultural issues, please contact your local county UW Extension office or use the "contact us" form on the UW Center for Agricultural Safety and Health website (http://fyi.uwex.edu/agsafety).

We know that flood recovery takes time and with the harvest season being here, time is limited. However, taking time to clean up machinery and buildings and harvesting flood damaged crops properly may prevent further losses and damage.

Nutrient of the month: Nitrogen (N)

Matt Ruark, Department of Soil Science

With the intense rainfall that has occurred this summer, many growers had large areas of their fields under saturated conditions for extended periods of time. This undoubtedly led to yellow, stunted corn. The yellowing may reflect nitrogen (N) or other nutrient deficiencies in the corn, but the soil is not necessarily N deficient. The real culprit is oxygen deficiency in the soil. There is little, if anything, you can do in terms of management to relieve this crop stress. As Dr. Emerson Nafzinger, corn agronomist at the University of Illinois, reminds us "Applying foliar forms of nitrogen or dry forms such as urea will not do much good until the water goes away and the roots start to take up oxygen" (Nafzinger, 2010). If the water subsides or drains without causing too much delay in corn growth, yields may not be overly suppressed. During periods of soil saturation, not only is plant growth is inhibited but the applied N fertilizer is susceptible to loss via leaching or denitrification. So when corn growth resumes, less N is available in the soil system. If these conditions occur, as they have this year, past the point where conventional sidedress application equipment can enter a field, there may not be many additional corrective options growers have at their disposal. So, what can we learn from the 2010 growing season? From a nutrient management perspective, we can learn where the areas of the field are where application of fertilizer technologies may be beneficial.

There are two fertilizer technology products that can be beneficial on periodically saturated soils: poly-coated urea (PCU) and nitrification inhibitors. The PCU is beneficial because the urea is not exposed to the soil environment where it can be hydrolyzed into ammonium and nitrified into nitrate. In seasonally wet soils in Missouri, Noellsch et al. (2009) determined that there was an economic advantage to applying PCU over urea in parts of the landscape that are subject to saturation. Nitrification inhibitors work because the inhibitor product will kill off or interfere with the metabolism of soil bacteria (*Nitrosomonas*) responsible for the first step in the nitrification process in the area around the urea granual. A few weeks ago at the Crop and Pest Management Workshop at the Arlington Agricultural Research Station, I hosted a demonstration trial where no-till corn was fertilized with ammonium nitrate, urea, urea+Agrotain® (urease inhibitor) and SuperU® (urease and nitrification inhibitor). The corn plots that were fertilized with a nitrification inhibitor exhibited less N deficiency symptoms (yellowing of lower leaves) compared to corn fertilized with urea or ammonium nitrate. Whether or not this will lead to improved yields remains to be seen, but these visual observations suggest that N was conserved in the soil system.

Overall, I would encourage growers to experiment with PCU and nitrification inhibitors on parts of the field most prone to saturated conditions. Consider both agronomic and economic incentives when deciding to utilize these technologies on your fields. Remember - the benefit of these products may not be realized in every year and only realized when N is not over-applied.

References:

Nafzinger, E. Can Flooded Corn Be Salvaged? The Bulletin, Issue 12, Article5/June 25, 2010. University of Illinois Extension.

Noellsch, A.J., P.P. Motavalli, K.A. Nelson and N.R. Kitchen. 2009. Corn response to conventional and slow-release nitrogen fertilizers across a claypan landscape. Agron. J. 101:607-614.

Could oil sampling save you money?

Matthew Digman, Assistant Professor and Machinery Systems Extension Specialist UW-Madison

Oil sampling isn't widely practiced in the agricultural equipment sector compared to sampling on industrial equipment, but there is some opportunity for that to change as our equipment fleets grow in size and sophistication.

An oil sample costs between $11 and $35 to analyze, depending on the dealership, laboratory and types of tests done. This cost is potentially small when considering the ways these data can be utilize to manage your equipment. For example, when purchasing a used piece of equipment, oil testing, especially those that determine where metal is wearing and what types of contaminants are in fluids, can tell you the condition of the equipment. Oil sampling may also be able to predict failures or equipment malfunction before field operations. Harvest downtime can lead to increased labor cost, loss in crop quality, as well as the cost to rent or hire the remaining harvest done.

Engine oil, hydraulic oil or any fluid in a tractor can be sent to a laboratory for comparative analysis. The types of analyses that can be performed are numerous and depend on the system being sampled (e.g., engine, transmission). I'd like to limit this discussion to a few common tests including: viscosity, metal contaminants and water. Each test leads to a diagnosis depending on the situation and equipment involved.

First, viscosity tests exploit the fact that different fluids such as oil and water have different viscosities. So, measuring viscosity of your oil can reveal if your equipment has a mixture of oil and coolant, two types of oils, or simply the wrong oil.

Next, metal contamination is usually split into two categories: wear metals and metal contaminants. High level of metal contaminants could indicate that a filter is not performing adequately or has been bypassed because it is plugged. Oil filters always have a valve that allows oil to bypass the filter so your equipment never is starved for oil should the filter become plugged.

Understanding the specific metals found in the oil can help predict future trouble or need for management changes. For example, high levels of silicon (Si) in a hydraulic reservoir could indicate soil contamination from dirty couplers or poor service practices. Wear metal contaminants can also pinpoint failures to the component. This is because each component (e.g., bushings, shafts, gears) is composed of unique alloys. However, the usefulness of wear metal data is somewhat limited to the dealer or laboratory's experience and knowledge of the specific alloys for each component of your machine.

Finally, water or crackle test will determine the amount of water contamination of the oil.

Figure 1. Dirt contamination from hydraulic couplers can degrade performance and service life.

The best way to utilize oil sampling data is to sample several times per year so that a trend can be developed for your specific machine. Trends will allow you to see how the machine's samples are changing with age, enabling prediction of component failures before they happen. What's the difference between replacing a component before it fails compared to replacing one that has failed? Well, first we can all agree that failures don't usually occur at a convenient time and thus adds timeliness, labor and potentially rental costs to your field operation. Secondly, I bet you've also replaced other components in an engine or transmission that were the result of a cascading failure or a failure that caused damage to other components in the system. Replacing parts before they fail can prevent such secondary damage. Finally, today's sophisticated hydraulic systems need clean oil. The clearance between components in many new hydraulic valves is a few thousands of an inch, so even small contaminants can cause major hydraulic problems. Operating a machine with a high level of metal, dirt or other fluid contaminants can degrade performance and can be detrimental to the wear life of the whole system.

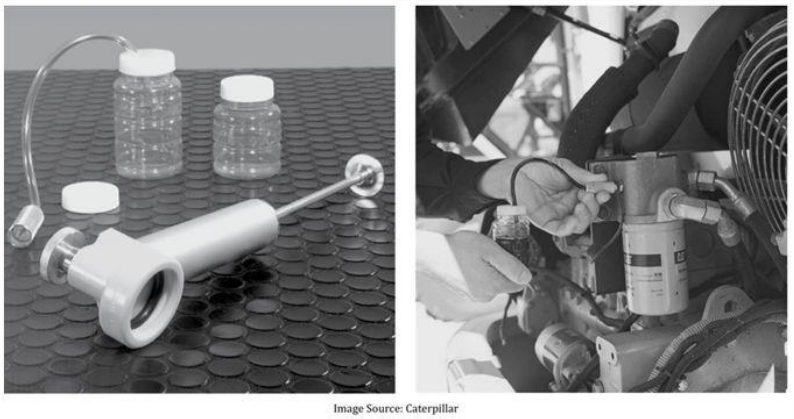

Image Source: Caterpillar

Figure 2. Sample kit and pump (right). Sampling oil from an engine by way of a sampling port (left).

The best place to take an oil sample is at a sampling port provided by the manufacturer (Figure 1). Consult your operator's manual or dealer about sampling locations on your machine. Samples from these ports are taken with the machine running and the system under pressure. For machines without ports or for systems (e.g., gearboxes) that don't have ports, a manual pump should be used to draw oil out of a dipstick or filling point.

Here is a general procedure for sampling oil on agricultural equipment:

1. Purchase a sample kit and/or pump from your dealer or lab
2. Run equipment to warm and circulate fluids, mixing and suspending contaminants
3. Park machine on level surface, engage parking gear and/or brake
4. If using a sampling port, leave tractor running and follow manufacturer's safety precautions when capturing sample
5. If using a pump, stop engine and draw sample from a dipstick or filling point
6. Draw an initial sample to rinse container – this will clean container of debris, which even though sealed can give an incorrect lab result
7. Draw a second sample and cap container immediately
8. Record which machine the sample was taken from including where the sample was pulled from and when the last oil change occurred
9. Send sample to laboratory for analysis
10. Work with your dealer or laboratory to interpret results
11. If analysis indicates trouble, take an additional sample to be sure

Closed systems on combines, forage harvesters and sprayers can be easily sampled without concern about contamination by implement use like on a tractor or skid-steer loader. Additionally, some modern tractor transmissions have a separate fluid reservoir that would also be good candidates for oil sampling. Hydraulic, gearbox and engine oil can also be sampled. For example, on a forage harvester, one may consider sampling the engine or hydraulic reservoir as well as key gearboxes such as the length of cut gearbox. Some understanding of the machine's systems will be necessary to collect meaningful data.

Open systems such as a tractor transmission that also serves as the hydraulic reservoir should also be sampled as contamination can be detected there as well. However, metal analysis will be more challenging to interpret, as external sources of oil shared among implements could be the cause of contamination.

Hopefully this discussion peaks your interest to further investigate the potential for oil sampling to save money and downtime in your equipment fleet. For a small investment,

you may investigate its potential for yourself.

2010 CCA Pre-Test Training

Byran Jensen, IPM Program

This training session, held December 14 -15, is designed to help participants understand the state CCA performance objectives and assist with preparation for the state CCA exam. It is NOT a crash course designed to cover specific information necessary to pass the exam.

The CCA Training Session will be held at the Crowne Plaza Hotel, 4402 East Washington Ave., Madison, WI 53704. The hotel is located approximately ½ mile west of the intersection of Washington Ave. (also Hwy. 151) and Hwys. 90 & 94. Use exit 135A if traveling on Hwys 90 & 94.

A brochure containing more information can be found under the "WCM Downloads" page or click here.

2010 Wisconsin Pest Management Update Meetings

The schedule for the Wisconsin Pest Management Update meeting series is listed below. Presentations will include pest management and biology information for Wisconsin field and forage crops. Speakers will include Mark Renz, and Larry Binning, Joe Bollman, Richard Proost or Tim Trower, weed scientists, Eileen Cullen, entomologist, and Paul Esker, plant pathologist.

All meetings will start with check-in registration and coffee at 9:30 a.m. Presentations start promptly at 10 a.m. and will conclude by 3:00 p.m. Four hours of Certified Crop Advisor CEU credits in pest management are requested for each session. The $30 registration fee per participant includes a noon meal and information packet. Extra packets of materials can be purchased for $15 each.

Make your reservation with host agent one week prior to the scheduled meeting date.

DATE	LOCATION	HOST AGENT
Wednesday November 10	**Chippewa Falls** Eagles Club (2588 Hallie Road) Business Hwy 53 south of Hwy 29 between Eau Claire and Chippewa Falls (across from Farm & Fleet)	**Jerry Clark** Chippewa County Extension 711 N. Bridge Street Chippewa Falls, WI 54729 (715) 726-7950
Thursday November 11	**Marshfield** Marshfield Ag Research Station 1 mile north of Hwy 10 on Hwy 13 (old Cty A), east on A, then immediate right onto Yellowstone Drive	**Matt Lippert** Wood County Extension P.O. Box 8095 Wisconsin Rapids, WI 54495 715-421-8440
Friday November 12	**Green Bay** Rock Garden (Comfort Suites Hotel) Hwy 41, take Hwy 29 (Shawano) exit, east tofrontage road and north one block	**Mark Hagedorn** Ag & Extension Service Center 1150 Bellevue St Green Bay, WI 54302 (920) 391-4612
Monday November 15	**Fond du Lac** Rm 113 University Center, UW-Fond du Lac Hwy 41, exit east on Hwy 23 for 3 miles, north on University Drive, continue right when entering campus	**Mike Rankin** Fond du Lac County Extension 227 Admin/Extension Bldg. 400 University Dr. Fond du Lac, WI 54935 (920) 929-3170
Tuesday November 16	**Arlington** Public Events Building Turn west at sign for Ag Research Station on Hwy 51, about 2 miles north of DeForest	**Joe Bollman** Columbia County Extension P.O. Box 567 Portage, WI 53901-0567 (608) 742-9682
Wednesday November 17	**Belmont** Baymont Inn North of Hwy 151 at exit 26	**Ted Bay** Grant County Extension P.O. Box 31 Lancaster, WI 53813 (608) 723-2125
Thursday November 18	**Sparta** Jake's Northwoods Northeast edge of Sparta on Hwy 21	**Bill Halfman** Monroe County Extension 14345 County Hwy B Sparta, WI 54656 (608) 269-8722
Friday November 19	**Janesville** Best Western Hwy 26 just north of I-90 at Janesville	**Jim Stute** Rock County Extension 51 S. Main Street Janesville, WI 53545 (608) 757-5696

Wisconsin Crop Manager

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Atrazine Restrictions Proposed for More Acres in Columbia and Sauk Counties

Contact: Jane Larson (608) 224-5005

MADISON—The Department of Agriculture, Trade and Consumer Protection is holding public hearings on a proposal to expand areas in Columbia and Sauk counties where atrazine cannot be used. Currently, the herbicide is banned on 1.2 million acres in Wisconsin due to groundwater concerns.

The state agriculture department proposes adding 8,140 restricted acres in northern Columbia County which would connect two existing atrazine prohibition areas in the Towns of Marcellon and Wyocena. The proposal also adds a new atrazine prohibition area in southeastern Sauk County in the Town of Prairie du Sac which is adjacent to the existing Lower Wisconsin River Valley prohibition area. This would add 1,430 acres in Sauk County where atrazine use is prohibited.

A prohibition area is a location where atrazine, a popular corn herbicide, or products that contain atrazine, cannot be applied.

Test results from drinking water wells in the area and a follow-up environmental investigation prompted the proposed prohibition areas. "The investigation determined that continued use of atrazine on area fields will likely contribute to additional groundwater contamination," explained Stan Senger, Environmental Quality section chief. "This will affect 20 to 30 farmers in those two counties who may currently rely on atrazine for weed control, but it should not be completely unexpected as the additional acres are next to existing areas where the use of atrazine is already prohibited."

Farmers, area residents and other interested people are encouraged to attend either of two public hearings. The hearings will be 3–5 p.m. then 6–8 p.m. at each location.

- **Prairie du Sac**: Tues., Oct. 26, Town Hall, S9903 Hwy. 12
- **Pardeeville**: Wed., Oct. 27, Angie W. Cox Public Library, 119 North Main St.

For those unable to attend the hearing, the department will also accept written comments until Fri., Nov. 12, 2010. Send comments to Rick Graham, DATCP, P.O. Box 8911, Madison, WI 53708-8911 or rick.graham@wisconsin.gov. For a copy of the rule, contact Rick Graham at (608) 224-4502, send an e-mail or go to the Administrative Rules home page at https://health.wisconsin.gov/admrules/public/Home, and search on 'ATCP 30,' then look for the heading 'permanent rules under promulgation.'

If approved, the proposed expansion will likely take effect prior to the 2011 growing season. The number of atrazine prohibition areas in Wisconsin would remain at 101.

Pest Management Update Meeting Reminder

Eileen Cullen, Extension Entomologist

Please remember to register for the 2010 Pest Management Update meetings coming in November. The full schedule, meeting locations, and directions were announced in the September 30 issue of the Wisconsin Crop Manager, but here is a quick recap. **Please register 1 week before the meeting with the county agent listed on the next page.**

Please note that the location sequence changes a bit from year to year based on location logistics. Be sure to look at the table above when selecting your preferred location and date for 2010. Please attend the meeting location at which you register. Each meeting in the series is a separate county-based event and host agents cannot interchange registrant fees or meal counts.

A recap of many topics to be covered is listed below. We hope to see you next month.

Weed Management: *Annual Crops*: 1) herbicide updates; 2) glyphosate resistance in Wisconsin-not a simple answer; 3) summary of perennial weed management in fall/spring with burndown treatments; *Perennial Crops*: 4) controlling winter annual weeds in alfalfa; 5) herbicide carryover in manure-should we be concerned?; 6) problematic pasture weeds of 2010 and what to expect in 2011; 7) the latest on NR40 (new invasive plant rule from DNR) and what to expect in 2011; 8) things to remember when managing perennial weeds in Wisconsin.

Date	Location	Contact	Phone
Nov. 10	Chippewa Falls	Jerry Clark	715-726-7950
Nov. 11	Marshfield	Matt Lippert	715-421-8440
Nov. 12	Green Bay	Mark Hagedorn	920-391-4612
Nov. 15	Fond du Lac	Mike Rankin	920-929-3170
Nov. 16	Arlington	Joe Bollman	608-742-9682
Nov. 17	Belmont	Ted Bay	608-723-2125
Nov. 18	Sparta	Bill Halfman	608-269-8722
Nov. 19	Janesville	Jim Stute	608-757-5696

Insect Management: 1) western bean cutworm in corn-getting a handle on scouting and treatment timing; 2) keeping up with Bt corn insect traits and refuge requirements-what's new for 2011?; 3) slug biology and management for corn and soybean; 4) Lepidoptera (moths and caterpillars) in alfalfa, corn, and soybean-what you need to know about major Lep pests and which ones have limited impact; 5) insecticide label updates; 6) what happened to soybean aphid in 2010? and Outlook for 2011.

Disease Management: Corn Disease Management: 1) what did the increase in leaf diseases in 2010 mean in terms of production? 2) learning from you – new directions in corn disease extension? Soybean Disease Management: 3) sudden death syndrome-diagnosis and management; Wheat Disease Management: 4) variety selection as a function of multiple diseases and yield; Alfalfa Disease Management: 5) update on Aphanomyces race testing.

2010 Soil, Water, & Nutrient Management Meetings scheduled

CONTACT: Matt Ruark, mdruark@wisc.edu, 608-263-2889

The Department of Soil Science, in conjunction with University of Wisconsin-Cooperative Extension will host eight Soil, Water, & Nutrient Management Meetings around the state, starting November 30 through December 9. The purpose of these meetings is to provide research updates in the field of soil fertility, nutrient management, soil and water conservation, and water quality.

Discussion topics will include research updates on nitrogen recommendations for corn, soil sampling and soil test K interpretations, uses for flue-gas desulfurization (FGD) gypsum, what we know and don't know about growing biofuels in Wisconsin, improvements to nutrient management and conservation planning and a new approach to removing sediment and P loss from cropland. In addition, a statewide soil test summary (2005-2009) will be presented along with a statewide manure analysis summary. An overview of municipal and industrial waste land application rules, and limitations of plant analysis and stalk nitrate testing will be presented.

Speakers include and Matt Ruark, Dick Wolkowski, Carrie Laboski, John Peters, and Fred Madison from UW-Madison Department of Soil Science as well as Sue Porter from Wis. DATCP.

The following CEU=s for Certified Crop Advisers have been requested: 2 CEUs in soil & water management and 2 CEUs in nutrient management.

Each meeting will begin at 10:00 am and end at 3:00 pm, with the exception of the Fitchburg meeting that will be from 9 am to 2 pm. A $35.00 registration fee (which includes lunch) will be charged for the meeting. Noon meal reservations should be made with the host agent. The information packet will contain PowerPoint summaries of talks and other useful reference materials.

Organizers request participants to pre-register with the host agent at least 1 week before the meeting they wish to attend.

The schedule for the 2010 Soil, Water, & Nutrient Management Meetings is:

Nov. 30, Fitchburg, contact David Fischer, 608-224-3716

Dec. 1, Sparta, contact Bill Halfman, 608-269-8722

Dec. 2, Eau Claire, contact Mahlon Peterson, 715-839-4712

Dec. 3, Marshfield, contact Don Genrich, 608-339-4237

Dec. 6, Juneau, contact Matt Hanson, 920-386-3790

Dec. 7, Kiel, contact Mike Ballweg, 920-459-5904

Dec. 8, Shawano, contact Katie Behnke, 715-526-6136

Dec. 9, Dodgeville, contact Gene Schriefer, 608-935-0391

Pressured to Place that Corn Seed Order? Remember the Basics

Joe Lauer, *Corn Agronomist*

This time of year growers are under a lot of pressure to buy seed. Seed salesmen pursue seed commitments through volume pricing and early purchase incentives often before the current year's yield trial results are available. Growers often respond by putting a "hold" on seed orders, but not committing to specific hybrids until yield results are published. This time of year is difficult because seed salesman must balance supply with demand.

Do not be "sold" hybrids through commercial advertising (radio, TV, magazines, and newspapers), sales literature, sales pitches from seed dealers, testimonials, or simply because it is "cheap" or "new" or "transgenic" or "available" or "different."

Choose hybrids wisely by using comparative yield performance data. Remember the basic principles of hybrid selection:

1. Use multi-location averages to compare hybrids
2. Evaluate consistency of performance
3. Buy the traits you need
4. Every hybrid must stand on it own
5. Pay attention to seed costs

Use multi-location averages to compare hybrids

Use multi-location information to evaluate grain yield, grain moisture, and standability. Today, most universities compile hybrid yield data over multiple locations. They do this by testing the same set of hybrids at numerous locations. Begin with trials that are nearest to you. Compare hybrids with similar maturities (harvest grain moisture) usually within about a 2% range in grain moisture. To ensure genetic diversity on your farm, divide the trials into two or three groups based upon grain moisture.

Consider single location results (even if the trial was conducted on your farm) with extreme caution. Use single location information (your own on-farm trial) to evaluate test weight, dry-down rate, grain quality and ease of combine-shelling or picking. The way you approach the hybrid selection decision, e.g. single-location versus multiple-locations, makes all of the difference in subsequent profitability. For more information regarding selection strategies and predicted yield increase (see http://corn.agronomy.wisc.edu/AA/A012.aspx). There are many possible sources of comparative yield performance data including strip-trials (seed company and independent) and replicated-trials (F.I.R.S.T. and university). Each source of data has it's own strengths and weaknesses.

What criteria should you select for?

In Wisconsin the two major uses of corn are grain and silage. There has been enough breeding progress, especially in corn silage, that the criteria for grain versus silage are different. The most important consideration regardless of use is yield. For grain, moisture at harvest can often mean the difference between profit and loss in the northern Corn Belt. For corn silage hybrids, large differences exist for quality parameters such as starch content and NDFD.

Criteria for Grain Hybrids	Criteria for Silage Hybrids
Grain yield	Forage yield
Grain moisture	Forage quality (i.e. Starch content, NDFD, and NDF)
Plant lodging	Insect resistance
Insect resistance	Disease resistance
Disease resistance	Plant lodging
Grain quality (i.e. Test weight, kernel breakage susceptibility)	Forage moisture
Other factors	Other factors

Evaluate consistency of performance

Look for hybrids that yield consistently across a diverse set of conditions. Be wary of any hybrids that finish in the bottom half of any trial. Seed companies benefit greatly from all those on-farm trials that farmers participate in (numerous weather patterns and pest situations per year). So if you concentrate on your on farm results (or the local area results), you miss out on the benefits of all the testing that goes on nationally. Corn breeders define hybrids as "stable" when they have a minimum of interaction with environments. Most hybrids are stable, but a few get reputations as "racehorse" or "workhorse" hybrids. These are difficult to characterize because it takes numerous environments to determine.

Buy the traits you need

Remember that transgenic "traits do not increase yield, they protect yield." There are pros (safety, efficacy, and insurance discounts) and cons (expense and resistance potential) to using transgenic traits. Wisconsin is fortunate in that our landscape often includes alfalfa and pasture as part of our crop rotations. We can use these crops to help control pest outbreaks and slow

development of resistance to transgenic events. Unfortunately up to this time, it was often difficult to buy the specific traits that you need. However, this is changing and in the near future there will be more opportunity to purchase specific traits.

Every hybrid must stand on its own

Every hybrid must "stand on its own" for performance. You don't know what weather conditions (rainfall, temperature) will be like next year. Just because it is transgenic and you pay extra for traits does not mean it will be high performing. We see transgenic hybrids ranked at the top and bottom of a hybrid trial. Therefore, the most reliable way to predict hybrid performance next year on your farm is to consider past performance of individual hybrids over a wide range of locations and climatic conditions. We see large difference among hybrids within a family (see Table 5 of http://corn.agronomy.wisc.edu/AA/A060.aspx).

Pay attention to seed price

A major change in extension recommendations has occurred recently due to corn seed costs that have dramatically increased. It is not unheard of for seed of high-performing premium hybrids with transgenic traits to cost over $250 per bag, whereas 10 years ago, premium seed would cost about $80-$100. It is important to compare the "difference" between any two hybrids. A price that is different by more than $50-$100 per bag must be carefully considered because it is difficult to make up the bag price difference with increased yield. For a further discussion of this principle, please see http://corn.agronomy.wisc.edu/AA/pdfs/A073.pdf. Also a seed cost calculator is available at http://corn.agronomy.wisc.edu/Season/DSS.aspx.

Key References

Lauer, J. 2009. Getting a Handle on Corn Seed Costs. Field Crops 28.424 - 73.

Lauer, J. 2008. Corn Hybrid Selection Field Crops 28.31-60 PDF.

Lauer, J., and K. Hudelson. 1997. The University of Wisconsin Corn Hybrid Trials -- Selecting the Top Performers. Field Crops 28.31-12.

Federal Disaster Assistance for Farmers Affected by the Recent Floods - September 30, 2010

Paul D. Mitchell, Agricultural and Applied Economics, UW-Madison

(reprinted from **http://www.aae.wisc.edu/mitchell/2010_Floods.pdf**)

This bulletin summarizes federal disaster assistance programs that may be able to help Wisconsin farmers suffering crop and livestock losses and damage from the recent flooding. **Farmers should contact their county FSA office to report crop losses and damage to conservation structures and to determine potential eligibility for disaster assistance.**

Supplemental Revenue Assistant Program (SURE)

The Supplemental Revenue Assistant Program (SURE) is the permanent disaster assistance program for farmers suffering crop losses from natural disasters, such as the recent floods. To be eligible for SURE payments for crop losses in 2010, farmers had to sign up for SURE by June 1, 2010 and farm in a county officially declared a disaster county, or suffer at least 50% crop loss.

An important requirement of SURE is that farmers must purchase crop insurance for any crop expected to generate at least 5% to the farm's revenue. Thus, farmers with crop losses from floods should not only contact their crop insurance agent, but also their county FSA office, because farmers may receive SURE payments, even if their losses do not trigger crop insurance payments.

If you have crop losses, contact your county FSA now to file a notice of loss within 15 days of the loss becoming apparent, even if you are not signed up for SURE. Also, note that SURE payments for 2010 losses will not occur until fall 2011, after the 2010 marketing year average prices have been officially determined.

Other Federal Disaster Programs

The FSA's Emergency Conservation Program provides emergency funding and technical assistance to farmers to rehabilitate farmland damaged by natural disasters. ***For farmers affected by recent floods, funding may be available to remove debris and to restore fences and conservation structures (terraces, dams, waterways, and manure pits).*** Eligibility requirements must be met and payment limits exist.

The FSA provides Emergency Farm Loans to help farms recover from natural disasters, but only if an official disaster is designated. These loans can be used for a variety of recovery purposes, such as to restore/replace essential property, pay part or all of production costs during a disaster year, pay family living expenses, reorganize the farm operation, and refinance some debts. These loans are generally short term (less than seven years) and have competitive interest rates. Eligibility and collateral requirements apply. Loan recipients must keep acceptable farm records and may be required to participate in financial management training and to purchase crop insurance.

FSA administers three disaster programs for livestock losses (including honey bees) suffered from natural disaster, plus the Tree Assistance Program for losses to trees, bushes, and vines damaged by natural disasters. Farms with livestock or perennial crop losses should contact their county FSA office to determine if they are eligible for disaster payments to help with recovery.

The main message is that farmers with crop losses and flood damage to their land should contact their county FSA to officially report these losses. This information will be used to determine if an official disaster has occurred and potential eligibility for disaster assistance.

Can Herbicide Persistence Damage Cover Crops?

By Nick Schneider, Winnebago County Agriculture Agent, and Mark Renz, University of Wisconsin Weed Scientist

In recent years, cover crops have gained considerably more popularity as new crop species and practices have been identified that fit into Wisconsin crop rotations. Most of the early cover crop research has focused on basic agronomic principles such as what species to select, when to plant, how to establish a good stand, and nutrient credit benefits. Here are a few examples of popular cover crops scenarios being used across Wisconsin:

Winter rye and winter triticale planted after corn silage or soybeans for spring forage.

Oats or barley planted after winter wheat for fall forage. Summer seeded small grains also provide a place to spread manure when the soil series has fall nitrogen restrictions.

Frost seed red clover into winter wheat to provide late summer erosions control, weed suppression, nitrogen credits, and potentially forage.

Forage radish planted in late summer to early fall to help loosen soil and alleviate compaction.

Early adopters learned through trial and error what complications come with using cover crops. Herbicide use in the previous crop(s) is one common complication to establishing cover crops as some herbicides persist in the soil and can injure and even prevent establishment. Glyphosate tolerant crops have reduced the occurrence of cover crop injury as glyphosate has no residual soil activity, but some herbicides that have soil activity are still commonly utilized in Wisconsin. These herbicides offer several advantages to our production systems by providing longer periods of weed management. While this is a tremendous advantage in the crop, it can present difficulty when cover crops are to be utilized in the rotation as often cover crops are not listed on herbicide labels, can be sensitive to herbicides that originated in crops planted more than one year prior to the cover crop, and grow over a short timeframe that make recovering from injury difficult. While agrichemical companies refer growers to the herbicide label for rotational crop planting intervals, many of these cover crops are not listed specifically on the label, therefore requiring the grower to observe the interval listed for a crop not labeled.

Let's look at a hypothetical scenario. Lumax® is a corn herbicide that contains metolachlor, atrazine, and mesotrione. An application is made May 1st pre-emergence to silage corn. Then silage corn is harvested in early September and winter wheat is planted at the end of month. The rotational interval for planting winter wheat, barley or rye is 4 ½ months, so enough time has passed for successful planting of a small grain. However, the following April, the grower decides to frost seed red clover into the wheat stand. According to the label, eighteen months need to pass for "other" crops (red clover is not specifically listed on the label) to be planted. While the tolerance of red clover to Lumax® is not known, the label didn't specifically list red clover on the label thus this planting was not in compliance with the label.

In the case of forage radish, no labels we are aware of address rotation intervals because it is so new to commercial production. Producers may look at related crops or weeds on the label to try to make an educated guess at the planting interval. While this can work, often herbicide tolerance is species specific, therefore it is not recommended.

A scenario involving forage radish would be a grower wishes to plant it after canning peas that have been treated with Pursuit® (imazethapyr) earlier in the year. While no information on forage radish is on the label, people often look at the plant-back interval for related crops (e.g. cauliflower) on the label which state 18 months is required. Others may look at efficacy on related weed species like wild mustard. Although these may offer some advice, it would still not be in compliance with the label. Since forage radish is not listed, the official plant-back interval is 40 months. This appears to be exceedingly long, especially if some injury can be tolerated since the cover crop will not be harvested.

More research is needed to understand the potential for herbicide persistence to damage cover crops. While this should not be a deterrent from trying cover crops, field observations are indicating this is an issue growers need to think about when they use residual herbicides. As research is conducted with respect to plant-back intervals with cover crops and communicated to agrichemical companies, we hope it will be incorporated into the label, but until this is done we recommend always following the product label, as the label is the law.

Saving Time and Fuel During Fall Tillage

Matthew Digman, Assistant Professor and Machinery Systems Extension Specialist, UW-Madison

There are many ways to save fuel in the field this fall: not tilling, choosing a minimum tillage operation over a heavier one, and ensuring your tractor and implement are set up properly.

As with any farm operation, the value of tillage must be weighed against its cost. The first costs to consider are labor, fuel and machinery. These costs are estimated to range from $9 to $19 per acre, depending on the field operation and equipment used [1]. Additionally, tillage can increase costs of subsequent field operations as loose soil reduces tractive efficiency adding further cost to operations such as planting. Finally, some tillage costs are harder to quantify, including the risk of soil erosion and nutrient loss. Conversely, tillage can have many positive impacts on crop production. These impacts can include remediating soil compaction, managing crop residues and providing favorable spring planting conditions.

Tillage is one of the least fuel-efficient field operations. It's estimated that only 20% of the energy in diesel fuel is available at the tractor's drawbar depending on engine and transmission setup [2]. Furthermore, only 2% of that energy is converted into turning the soil. Combining those two efficiencies tells us that only .4% of the energy in diesel fuel is actually converted into breaking up the ground! Therefore it is important to

properly manage your tractor and implement setup to get the most out of tillage operations.

The first step to improving your tractor's efficiency starts before heading out to the field. Proper ballasting and tire pressure are critical to ensure your tractor is efficiently transferring power to your implement. First, start with ballast (weight). Over-ballasting a tractor increases rolling resistance, drive train wear and soil compaction. Rolling resistance is increased as the tractor sinks into the ground and consequently must use more energy to climb out of its tracks. Under-ballasting leads to excessive tire slip as the tractor struggles to grip the soil. The amount of ballast needed depends on the draft requirement of the field operation, but a general rule is 120, 145 and 180 lb per hp for light (greater than 6 mph), moderate (5-6 mph) and heavy (less than 4 mph) draft loads, respectively for two-wheel drive (2WD) or mechanical-front-wheel-drive tractors (MFWD). This rule of thumb is logical because increased field speed generally means the operation you are conducting requires less weight [4]. Additionally, at higher speeds soil mechanical properties can withstand only so much force before giving way, leading to wheel slip.

The second part of ballasting is to have the weight distributed on the tractor properly. Each tractor design (2WD, MFWD, FWD) and implement hitch point (mounted, semi-mounted, towed) requires a different weight split between the front and rear axle. Your tractor's operator's manual will provide the split needed to get the most out of your setup [4].

After the tractor is completely ballasted and hooked up, it's time to check tire pressures. Lower pressures can increase tractive efficiency but can also lower the load rating of the tire. Follow the load and inflation tables provided by your tire manufacturer to ensure you meet their specifications. If you're considering running on the minimum pressure, weigh each axle and divide by the number of tires to be sure the actual weight per tire is what you expect.

Wheel slip is a good measure of how well your tractor is set up for tillage conditions. Optimal wheel slip ranges from 10 to 15% depending on soil conditions [5]. The optimal slip is on the low end of that range for firm soils and higher for tilled and sandy soils. For a quick check in the field, observe that a properly-ballasted tractor will show deformation in the center of the lug track.

Fuel can be also conserved by matching the power output of the tractor's engine to the power needed by the tillage operation. This is known as the "gear up throttle down" practice [3]. The idea is to select the gear and throttle position that will load the engine sufficiently while maintaining the desired speed for the field operation. This technique is useful where the implement doesn't demand too much power from the tractor, such as disking or situations where the tillage tool is undersized for the tractor. One must take care not to overload the engine when practicing this technique. Most diesel engines can operate efficiently at 20 to 30% of their rated engine RPM, but consult the operator's manual for your specific machine. Black smoke and poor engine response to changes in throttle position are common signs of an overloaded engine.

The final strategy for conserving fuel is to minimize overlapping passes. Strategies for minimizing overlap can range from taking breaks so that you can be more attentive as an operator or employing a guidance (e.g., lightbar, automatic steering) system.

I hope these strategies, (1) only till when necessary, (2) optimize ballast and tire pressure, (3) gear-up throttle down, and (4) stop covering the same ground, can save you time and fuel this fall!

References

1. Lazarus, W.F. *Machinery Cost Estimates*. 2010.
2. Bowers, W., *Energy in Farm Production*, in *Energy in World Agriculture*, R.C. Fluck, Editor 1992, Elsevier: New York, NY. p. 117-129.
3. Grisso, R. and R. Pitman, *Gear Up and Throttle Down — Saving Fuel*, 2009, Virgina Cooperative Extension.
4. Hanna, M. and M. Al-Kaisi, *Saving Fuel in Field Operations*, 2005, Iowa State University Extension.
5. Goering, C.E. and A.C. Hansen, *Engine and Tractor Power*. 4 ed. 2004, St. Joseph, MI: American Society of Agricultural Engineers.

Ideal Conditions for Perennial Weed Management

Mark Renz Extension Weed Scientist and Tim Trower Senior Outreach Specialist

With the early harvest, this fall offers a great opportunity to tackle fields with perennial weed issues in no-till fields. Control of our common perennial weeds like dandelions with our standard practice of spring burndown treatments of glyphosate and 2,4-D has been poor this year. While results were much worse this year compared to others, we have observed many of these spring treated fields increasing in perennial weed pressure. Even though suppression is adequate in some years to establish crops with a spring burndown treatment, we have shown that these perennials can survive and believe this has resulted in larger, more difficult to control perennial weeds in our no-till fields.

So what can you do? Fortunately several affordable options exist. You may not be able to implement these in all of your fields this fall, therefore we recommend targeting fields that are badly infested with perennial weeds first. A summary of the main options for management are below.

FALL BURNDOWN:

Results from over 3 years of research have shown that the fall is the best timing to manage these perennial weeds with glyphosate, 2,4-D as well as other common herbicides that have significant residual activity (e.g. Canopy EX). Previous data has shown that control of dandelions can be increased by up to 60% if herbicides are applied in the fall versus the spring. An added benefit of using herbicides with a residual is improved suppression of winter annuals and spring emerging weeds, so consult the label to see what herbicides may offer additional control on which weeds. Clearly the biggest hurdle

to utilizing this timing is trying to fit in the application with all the other activities in the fall. Control can be effective if applied anytime in the fall as long as plants are actively growing. With dandelions this timing can be confusing to identify as leaves often turn purple after the first frost. Results from our research and others indicate herbicides have good uptake and control on dandelions when applied to leaves that are green to purple, as long as leaves do not show severe freeze damage. Residual herbicides tend to have better control when applied later in the season when foliar uptake is limited. While it is unrealistic for all no-till acres to be sprayed every year, targeting fields that have historically high populations of these weeds will be the most beneficial.

SPRING BURNDOWN:

With our northern proximity spring burndown treatments for perennial weeds will continue to be utilized. Realize that these applications can have reduced suppression and control in some years like 2010. If using glyphosate and 2,4-D it may benefit to wait as long as possible before applications, as warmer conditions will result in quicker burndown. Several herbicides with residual activity can also be utilized with glyphosate and 2,4-D that can extend control. Applications often take 2-3 weeks before symptoms of herbicide damage become apparent. Our results have shown Canopy EX, Enlite, and Synchrony can provide extended control into the summer. Make sure to follow planting restrictions for these herbicides as some of these herbicides have plant-back restrictions that exceed 30 days. Another benefit of these herbicides is a delay in annual weed emergence, which can extend the timing needed for post applications of glyphosate similar to using a PRE herbicide at planting.

TILLAGE

Although often tillage is not desirable in these fields it is an incredibly effective means of managing dandelions and other simple perennials. Use of a moldboard plow will ensure effectiveness, but with proper use of a chisel plow excellent reductions in simple perennial weeds can be accomplished.

SUMMARY OF TWO YEARS OF RESEARCH WITH DANDELIONS:

Table 1 (found on the following page) summarizes results on burndown control of dandelions at the Arlington Research Station. The field we conducted this study in has a large, dense stand of dandelions, with the majority being 2-3 years old perennial plants. Fall treatments were applied around the first of November. Due to space and crop rotation restrictions, not all treatments applied in the fall were repeated in the spring. We repeated typical treatments as well as treatments that had < 30 day plant-back restrictions on corn and soybeans. Spring treatments were applied near the 1st of May. Results are summarized over 2009 and 2010 and indicate several key points.

1. While fall applications of 2,4-D and glyphosate can provide good control by the time that corn is planted, control quickly drops by the end of May when soybeans are planted. In 2010 control from fall applications was essentially zero by the following fall even after an in-crop glyphosate application. This suggests that addition measures need to be taken to reduce weed populations.
2. Delaying applications of glyphosate and 2,4-D into spring can provide some decent suppression for 1-2 months as table 1 shows, but dandelions recovered by mid season and perennial plants are often not killed. This can result in an increase in old plants which will be more difficult to control.
3. Application of residual herbicides can extend control into mid-summer, and sometimes even for one year. We observed Canopy EX, Enlite, and Synchrony all provided good suppression of seedling and perennial dandelions through mid-summer unlike other treatments.

Clearly perennial weeds like dandelions are here to stay in our no-till fields and will need to be managed to maintain low populations and prevent economic loss from competition. Herbicides are our best tool, but consult the label as plant-back restrictions do exist and can be greater than 30 days for some of these combinations for some crops. Specifically Canopy EX CANNOT BE APPLIED TO FIELDS NORTH of I-90 BETWEEN LACROSSE AND MADISON and FIELDS NORTH OF I-94 NORTH OF MADISON AND MILWAUKEE. Plant-back restrictions can be reduced or even eliminated with some crops by eliminating a herbicide from the tank mix. We will continue to evaluate burndown options as this looks to be an increasing problem in our no-till fields.

TABLE 1: Control of dandelions with common fall and spring burndown applications

Treatment[b]	Rate	Percent Dandelion Control[a]					Plant-back restrictions	
		Fall Applied			Spring Applied			
	(unit/A)	Evaluation Timing					corn	soybeans
		Early May[c]	Late May[d]	Oct[e]	Early June	Oct[e]	(days)	
2,4-D LVE + Roundup PowerMax	16 fl oz + 21 fl oz	82	42	3	72	40	7	14
2,4-D LVE + Roundup Original	32 fl oz + 24 fl oz	76	44	15	Not applied		14	14
Distinct + Roundup Original + 2,4-D LVE	2 oz + 21 fl oz + 16 fl oz	73	57	48	Not applied		14	30
Valor + Roundup PowerMax + 2,4-D LVE	2 oz + 21 fl oz + 16 fl oz	82	39	20	Not applied		30	14
Canopy EX + 2,4-D LVE	1.1 oz + 16 fl oz	95	87	93	70	53	9 months	14
Autumn + Roundup PowerMax	0.3 oz 21 fl oz	91	75	48	Not applied		30	90
Synchrony + Roundup PowerMax + 2,4-D LVE	0.375 oz 21 fl oz 16 fl oz	90	40	28	81	66	9 months	14
Enlite + Roundup PowerMax	2.8 oz + 21 fl oz	91	43	5	86	71	9 months	0
Express + Roundup PowerMax + 2,4-D LVE	0.25 oz + 21 fl oz + 16 fl oz	93	65	51	Not applied		14	14

[a]-Data average from 2009 and 2010 results at Arlington, WI

[b]- Recommended adjuvants were added to all treatments

[c]- Coincides with corn planting

[d]- Coincides with soybean planting

[e]- Data from 2010 only; All plots received a broadcast treatment of glyphosate in June. Typical when growing glyphosate resistant crops.

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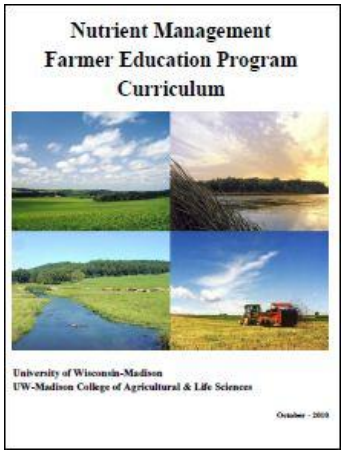
Nutrient Management Farmer Education Curriculum Updated



A revised *Nutrient Management Farmer Education Curriculum* was released in October of 2010. This popular teaching tool has been improved based on feedback from those who have used it in previous years. Revisions include:

1. Restructured introduction module broken into three separate, shorter presentations: i) introduction & concepts, ii) soil testing and conservation planning, iii) mechanics of nutrient management planning;
2. Updated nitrogen fertilizer recommendations and prices;
3. Updated information from WDATCP, WDNR and USDA-NRCS on their nutrient management programs;
4. Revised pre- and post-workshop evaluations;
5. More optional modules including Discovery Farms on-farm research/monitoring findings, cover crops, grazing, tile, and karst presentations.

The curriculum is contained on a CD and includes core and optional presentations, speaker notes, associated publications and worksheets, a suggested program evaluation procedure, and a pdf version of the user's manual.

If you have not yet received a 2010 version of the curriculum or would like additional copies, please contact Scott Sturgul by e-mail at ssturgul@wisc.edu or by phone at 608-262-7486.

Nominations Sought for 2011 WI CCA of the Year

Bryan Jensen, IPM Program

The Wisconsin CCA Board is currently accepting nominations for the 2011 Wisconsin CCA of the Year Award. The award is given annually and will be awarded at the CCA Luncheon prior to the start of the Wisconsin Crop Management Conference. The winner of this Award is automatically nominated by the Wisconsin CCA Board for the International Certified Crop Adviser of the Year Award. The nomination form consists of 5 questions and must be completed in full for the Committee to review. Two letters of reference are also required. An individual may only receive the award once. For more information view the nomination criteria and the nomination form.

Deadline for application submission is March 1, 2011. Electronic applications are preferred; however, applications can be faxed or mailed. Unsuccessful applications will not automatically be reconsidered the following year. For more information contact Bryan Jensen, Dept. of Entomology,

1630 Linden Dr., Madison, WI 53706, Fax: 608-262-3322, bmjense1@facstaff.wisc.edu.

The nomination process does take a little time but the rewards are significant. Knowing that you took the time to recognize a colleague for a job well done is priceless.

2011 UW Madison, IPM Field Scout Training Class

Bryan Jensen, IPM Program

The Madison Field Scout Training Class will be held on the UW Madison Campus January 3-7, 2011. This course is designed to provide the skills necessary for proper pest identification, crop scouting techniques as well as other basic information (growth and development, pest life cycle, pest damage symptoms and economic thresholds) that is necessary for field scouting activities. It will also provide useful baseline information for individuals preparing for the Wisconsin CCA exam. Pest control recommendations, although discussed, will not be highlighted during this course. Crops covered will include, corn, alfalfa, soybean and wheat. Click here for the course schedule.

Non-student registration fee is $200/person. To register for the IPM Scout School, make checks payable to University of Wisconsin-Madison and send to CALS Conference Services, 620 Babcock Dr., Madison, WI 53706.

For registration information please contact the CALS Conference Services Office at 263-1672. To register online go to http://www.peopleware.net/2723/index.cfm?siteId=358&eventDisp=1-43-02

For more information on this course please contact Bryan Jensen at:

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Managing Rutted Fields

Dick Wolkowski, Extension Soil Scientist

My travels around the state in the past couple of weeks confirmed that many producers ventured into their fields to chop silage and in some cases harvest soybeans in fields that were extremely wet from the rains of late September. Many fields now show significant rutting and are likely compacted to a variable degree. While it would have seemed best to wait for the soil to dry, I'm sure many were pressed to harvest because of work load and concerns with optimizing crop yield and quality. One must now speculate the best method of addressing the situation so that yield loss because of compromised soil quality is diminished for 2011 and future years.

These fields are suffering from a "double whammy", that is compaction that has developed well below the plow zone and the destruction of the structure or "puddling" near the surface. Compaction from heavy equipment on soils at or near field capacity has been measured to nearly two feet and structure once destroyed can take years to recover. Consideration should be given to deeper tillage which could include the use of a chisel plow with straight points run as deeply as possible or subsoiling. Wisconsin research has shown subsoiling with straight vs. parabolic shanks to be more effective. Implements that totally disrupt the soil remove natural channels and decrease the soil strength needed for future operations.

Of course the best solution would have been to avoid the operations that caused the rutting. Care should be exercised to making a bad situation worse. The current dry weather has allowed for some drying, but it should not be assumed that the rutted areas have dried enough to be tilled. Inspect these sites and if they are wet and the soil is plastic, tillage operations should be delayed. Recognize that freezing/thawing will only minimally improve the soil condition. If possible incorporate organic amendments such as manure or biosolids to encourage the redevelopment of the soil tilth. Future management should incorporate several common sense practices such as staying off wet soils, controlling traffic to minimize the field area affected, and limiting load when soils are wet.

Such a thing as too dry? Conditions may be deceiving…

Aaron Wunderlin, UW-Discovery Farms Program

Here in Northeastern Wisconsin, conditions for spreading manure have been very good. There has been very little precipitation in the forecast, and the ground has been dry. Harvesting of corn and beans has allowed open ground for manure application. However, conditions still require extra caution while applying manure.

The clayey soils of Northeastern Wisconsin have been wet most of this past growing season, but with no rain for over a month prior to this past weekend's rain, things have been very dry. This situation has caused the soil to crack. Cracks in the soil as large as an inch wide and several feet long have been observed in several fields and pastures in the past month. In a field demonstration in past years, cracks such as these were seen as deep as 17+ feet below the surface. Earthworm burrows are also abundant, especially in no-till fields or where tile lines are present. The earthworms use soil to cover their burrows to preserve moisture during dry conditions and remove the soil over the hole when moisture is introduced into the system. Large openings in the ground caused by the previously discussed situations are known collectively as macropores. Field demonstrations in the past showed that these macropores can connect the tile drainage to the surface. During these very dry conditions, macropores in fields with drainage tiles or shallow depth to bedrock remain open and can move liquid manure from the surface quickly through the soil profile. So how do we deal with this? Breaking up the surface with tillage prior to manure application will break down these macropores to prevent liquid manure from taking one of these preferential flow paths. A quick pass or two with a tillage device may save time and headaches in the long run by preventing a spill situation.

Livestock Manure: Is it Liquid or is it Solid?

Kevan Klingberg

According to WI-NRCS, WI-DATCP, and WI-DNR:

Liquid manure has less than 12 % solids; Solid manure has 12 % solids or more.

There are times, within nutrient management rules and regulations, when manure applications are more carefully defined, depending on whether it is a solid manure or liquid manure.

The NRCS Nutrient Management Standard (590) limits unincorporated liquid manure application rates when applied in Surface Water Quality Management Areas (SWQMA). Defined rates are based on soil texture and prior season crop residue, ranging from 3,000 – 10,000 gallons / acre. The lower rates are defined for fine texture soils with minimal surface residue.

WI NR 243 also has sections devoted to "solid manure winter restrictions" and "liquid manure winter restrictions" within the nutrient management section of that rule.

Some livestock producers have housing & facility designs and / or manure handling & storage conditions that create manure right at 12 % solids. Those producers should double check with regulating agencies involved with their farm to reconfirm the acceptable applications of manure, relative to its definition as either liquid manure or solid manure.

References

WI-NRCS 590, Sept 05. Nutrient Management Standard.

http://www.datcp.state.wi.us/arm/regulation/pdf/590_final.pdf.

V.A.3.a. "...liquid manure applications (less than 12 % solids)..."

WI Chapter ATCP 51, Apr 09. Livestock Facility Siting.

http://www.datcp.state.wi.us/arm/agriculture/land-water/livestock_siting/siting.jsp.

Appendix B is the WI-NRCS 590, Sept 05.

WI NR 243, April 07. Animal Feeding Operations.

http://www.legis.state.wi.us/rsb/code/nr/nr243.pdf

NR 243.03. Definitions. (32) Liquid manure means manure with a solids content of less than 12 %. (58) Solid manure means manure with a solids content of 12 % or more.

Soil Sampling for Nematodes in Corn and Soybean – Recommendations Available in New Fact Sheet

Paul Esker, Field Crops Extension Plant Pathologist

With corn and soybean harvest rapidly moving along, many are or will be preparing to take fall soil samples. Do not forget to include a soil sample for nematodes of corn and soybean. To help provide a general set of recommendations for soil sampling for nematodes, a new fact sheet was developed. Co-authored by Richard Proost (NPM Program) and Ann MacGuidwin (UW Nematologist), this fact sheet provides general guidelines and recommendations for taking an appropriate soil sample for nematodes that affect both corn and soybean. At this time of year, taking soil samples can help to determine the effect of treatments that were applied during 2010 growing season as well as plan ahead for possible management tactics needed for the 2011 growing season. The fact sheet is available on the publications page of the UW Integrated Pest and Crop Management website. Click here to find it.

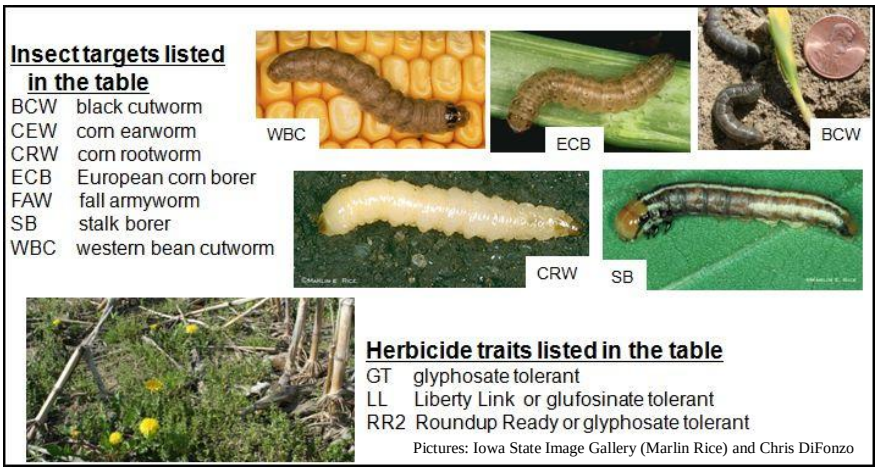
Handy Bt Trait Table

Chris DiFonzo, Michigan State University and Eileen Cullen, University of Wisconsin

updated BT Table link >> Click to download PDF <<

With increasing complexity comes the risk of ordering unnecessary traits, forgetting what hybrids were ordered back in the fall, forgetting which seed lot was planted where, planting an incorrect refuge, and expecting too much (or something different) from a particular trait. To add another wrinkle, the price of seed has steadily risen over the last few years - $300 or more per bag is not unheard of for transgenic hybrids with seed treatments. Planting the right stack for a particular farm, with the correct refuge, becomes even more important. The table in the link above summarizes the products and traits currently available, along with the spectrum of control. The table also lists refuge requirements and location. In previous seasons, the requirement for Bt corn in the Midwest was a 20% 'structured' refuge for both European corn borer and corn rootworm. As highlighted in the table, several products are now approved for a either a reduced refuge or a Refuge-In-Bag (RIB), where the seed company mixes non-Bt seed in with the transgenic corn prior to bagging.

>> Click to download BT table PDF <<



Resistance to Strobiliurin Fungicides

Paul Esker, Extension Plant Pathologist

Today (20 October), a report out of the University of Illinois confirmed that a field in Tennessee where frogeye leaf spot was found and sprayed twice with a strobilurin fungicide but still had high levels of the disease was because the pathogen that causes the disease (*Cercospora sojina*) was resistant to the fungicide. This finding was based on laboratory assays that examined the sensitivity of the isolate obtained from the field in Tennessee with baseline isolates and compared against active ingredients like azoyxstrobin, pyraclostrobin, and trifloxystrobin. These are the active ingredients that are found in fungicides such as Quadris, Headline, and Stratego.

What does this mean for Wisconsin? Most importantly, this serves as a very important reminder that the use of fungicides should be done based on several factors, including knowledge of the variety planted and if there is resistance to the targeted diseases of interest, followed by active scouting during the growing season to assess if conditions would warrant a fungicide application. Misuse or overuse of a foliar fungicide can increase the risk for resistance. Specifically for frogeye leaf spot in 2010, we did see symptoms in many fields, but severity was low on average. However, this is the sort of information that should be used to build a working knowledge of the specific diseases that may affect production fields in order to most effectively build a long-term management program. Based on our data from Wisconsin over the past several years, in the majority of situations a foliar fungicide was not found to be needed and would have been an additional cost to production.

Wisconsin Crop Manager

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Wisconsin Crop Management Conference and Tradeshow Turns 50!

Carrie Laboski, Extension Soil Scientist, Dept. of Soil Science, Univ. of Wisconsin-Madison

The new year is just around the corner and that means it's time to start making plans to attend the 2011 Wisconsin Crop Management Conference and Tradeshow on January 11-13.

2011 marks the 50th anniversary of the Wisconsin Crop Production Association and that milestone will be celebrated at the Conference and Tradeshow. Vendors are being asked to bring their memorabilia to the tradeshow. This is sure to bring back a few memories. There will also be presentations highlighting advances in the science of soil and crop management over the years.

Dr. Jay Lehr will provide the keynote presentation on Tuesday afternoon titled: "What's so great about U.S. agriculture? Just about everything." Dr. Lehr is an excellent speaker who will inspire you to be excited about the opportunities and challenges facing our industry. On the technical side, we have a stellar line up of presentations to help you deal with nitrogen, crop residues, all kinds of pesky pests, traits, and more. Wednesday special sessions will include SNAP-Plus update and beginner sessions along with a review and recertifying exam for pesticide applicators. Once again the CCA Board will host a luncheon on Tuesday and the WAPAC breakfast will be held on Thursday.

You can view the complete program and registration information at:

http://wicrops.org/program/2011_advance_program_COLOR.pdf

I look forward to seeing you in January!

2011 Agronomy Crop Production and Management Meetings

Joe Lauer

The Department of Agronomy will offer Crop Production and Management Meetings at eight locations during January of 2011. Joe Lauer, Dan Undersander and Shawn Conley will present the latest information on hybrid/variety performance, an analysis and discussion of last year's growing season, and updated recommendations for field crop production.

The registration fee includes a meal and materials. Please pre-register with the Host Agent. A $5.00 "walk-in" fee will be charged to those who have not preregistered. Additional information packets will be available for $17.00 each.

Certified Crop Advisor CEU credits have been requested (2.5 hours in Crop Management).

To learn more click here:

http://ipcm.wisc.edu/LinkClick.aspx?fileticket=YiHE3JXnxJM%3d&tabid=114&mid=669

Thank-you for responding to the "Communication Methods" survey

Vince M. Davis and Shawn P. Conley

In the July 15th issue I wrote an article promoting a survey that Dr. Vince Davis (University of Illinois) and I were conducting on communication methods. In July we mailed 47,000 post cards to soybean growers in Illinois, and 10,000 post cards to growers in Wisconsin. In addition, we advertised an on-line survey developed in SurveyMonkey. This was conducted in conjunction with, and sponsored by, the soybean checkoff program through the Illinois and Wisconsin Soybean Operating Boards.

The objective of the survey was to investigate the technology that soybean growers and agronomic consultants use to find and share soybean production and marketing information. We conducted the survey because we were/are very interested in how to best adapt methods to meet the demands of our growers to continually increase our effectiveness. Several of you responded by completing the survey, and I wanted to thank you all very much, and perhaps share a few interesting results.

There were 1663 total direct-mail surveys and 203 on-line surveys completed. The direct-mail survey indicated that 85% of soybean growers use cell phones, 11% use cell phones with Internet, 70% use computers, 57% use high-speed Internet, 56% use email, and 3% use an iPod (Table 1). In contrast, soybean growers that responded to the on-line survey all used cell phones (98%), computers (100%), email (99%) and high-speed Internet (97%) at greater frequency than television (83%), radio (88%), yield monitors (58%) and Global Positioning Satellite (GPS) guidance (58%). Moreover, soybean growers that responded to the on-line version used cell phones with internet at nearly three times the frequency (31%) compared to soybean growers that responded to the direct-mail survey. Print material was rated as the most important method of communication for all sized growers; however, the value of the Internet was equally high for the largest growers. Extension was valued as an important information source, but slightly less important than seed and crop input dealers (Table 2).

Table 2. Importance of various sources of information for soybean growers in Illinois and Wisconsin collected from a direct-mail survey conducted in July 2010. Respondents rated each method on a scale of 1 to 5 where 1 = very important and 5 = not important.

	Farm size (acres of soybean)					
Sources	1-500	501-1000	1001-1500	1501-2000	> 2000	Growers
	Rating (1 to 5 scale)					n
University Extension	2.1	2.0	2.1	2.2	2.2	1503
Crop input manufacturers	2.4	2.3	2.3	2.3	2.0	1475
Your crop scout	2.3	2.1	2.1	2.2	1.8	1381
Your seed and crop input dealer	1.8	1.7	1.7	1.8	1.7	1504
State or local newspapers	2.6	2.9	3.0	3.0	3.0	1482
Local radio stations	2.8	3.1	3.2	3.6	3.1	1480
Trade magazines	2.4	2.5	2.7	2.5	2.3	1499
LSD = 0.05	0.10	0.18	0.38	0.66	0.7	—

While Extension is usually rated lower than crop and input suppliers as an information source, one can hypothesize that it is not necessarily a bad thing; rather, it just confirms the conclusions of Licht and Martin (2007). Those authors also conducted a survey of corn and soybean growers in Iowa and found that growers don't look to Extension for information, rather they look to Extension for help evaluating the information they already received from other sources. These findings help us understand we need to continue steadfast development of high-quality Internet materials, consider materials that may need to be Smartphone accessible, and be aware of the rise in social media to remain relevant to our changing clientele.

Table 1. Percent of growers that used different types of technology categorized by size of soybean acres farmed in Illinois or Wisconsin. Data were collected from a mail survey in July 2010.

	Farm size (acres of soybean)							
Technologies used	1-500	501-1000	1001-1500	1501-2000	> 2000	Total	No. of growers	Chi-square
	Percent of growers							
Television	83	82	84	74	90	83	1547	0.6692
Radio	80	81	83	83	95	80	1547	0.4407
Fax machine	28	49	59	78	90	36	1547	<0.0001
Cell phone	81	94	100	96	95	85	1547	<0.0001
Cell phone w/Internet	9	14	22	35	45	12	1547	<0.0001
Computer	65	81	84	91	90	70	1547	<0.0001
Dial-up Internet	10	12	1.5	0.4	0.3	11	1543	0.0067
High-speed Internet	56	71	78	83	85	57	1547	<0.0001
Email	50	70	74	83	75	56	1547	<0.0001
iPod	2.4	5	7.3	0	20	3.4	1547	<0.0001
Yield monitor	36	78	87	96	85	48	1547	<0.0001
GPS guidance	26	64	88	83	90	38	1546	<0.0001
Total respondents	*72*	*21*	*4*	*2*	*1*	—	1551	—

One last piece of information I wanted to share, is that our on-line survey was anonymous. We asked growers interested in receiving more information to state that in an email directly sent to myself or Vince Davis. A number of respondents indicated they would like to receive more information in the comments section of the survey. Unfortunately, we have no way of knowing who those respondents were; therefore, while we know many people would like more information via email, we do not have their names or email so we were not able to make that connection.

Again, we sincerely thank you for your participation.

Literature Cited

Licht, M. A. R., and R. A. Martin. 2007. Communication channel preferences of corn and soybean producers. J. Extension 45(6) Article 6RIB2. Available online at: http://www.joe.org/joe/2007december/rb2.php

2010 WISCONSIN CORN HYBRID PERFORMANCE TRIALS
Grain - Silage - Specialty - Organic

Joe Lauer, Kent Kohn, and Thierno Diallo

PDF Format
Excel Format

Every year, the University of Wisconsin Extension-Madison and College of Agricultural and Life Sciences conduct a corn evaluation program, in cooperation with the Wisconsin Crop Improvement Association. The purpose of this program is to provide unbiased performance comparisons of hybrid seed corn available in Wisconsin . These trials evaluate corn hybrids for both grain and silage production performance.

In 2010, grain and silage performance trials were planted at thirteen locations in four production zones. Both seed companies and university researchers submitted hybrids. Companies with hybrids included in the 2010 trials are listed in Table 1. Specific hybrids and where they were tested are shown in Table 2. In the back of the report, hybrids previously tested over the past three years are listed (Table 24). At most locations trials were divided into early and late maturity trials, based on the hybrid Relative Maturities **provided by the companies**. The specific relative maturities separating early and late trials are listed in the tables.

GROWING CONDITIONS FOR 2010

Seasonal precipitation and temperature at the trial sites are shown in Table 4. Spring planting and fall harvest were ideal for farm work. Planting progress was one of the fastest seasons ever recorded. Over the entire growing season, precipitation and growing degree day accumulation were normal to slightly above average. In northern Wisconsin, precipitation was above normal for much of the growing season. Little insect or disease pressure was observed in most trials. High winds caused above average plant lodging conditions at some locations. Due to early planting, ideal growing conditions, beautiful fall weather, and an average killing frost date, harvest grain moisture was lower than normal in all trials, while yields were above average at most sites.

The seedbed at each location was prepared by either conventional or conservation tillage methods. Seed treatments of hybrids entered into the trials are described in Table 3. Fertilizer was applied as recommended by soil tests. Herbicides were applied for weed control and supplemented with cultivation when necessary. Corn rootworm insecticide was applied when the previous crop was corn. Information for each location is summarized in Table 5.

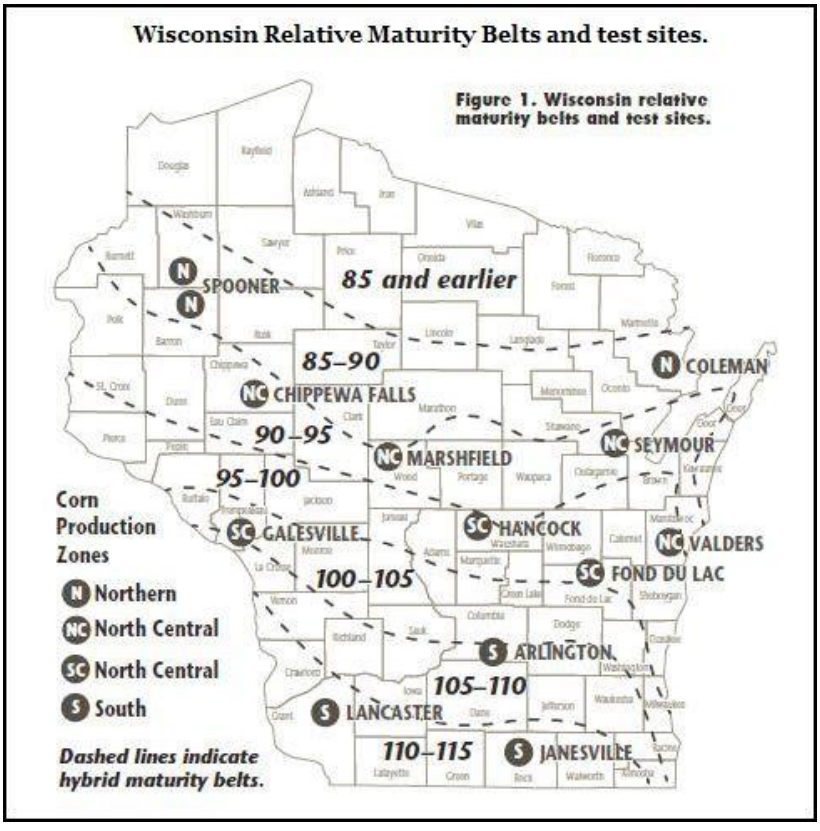
PLANTING

A precision vacuum corn planter was used at all locations, except Spooner. Two-row plots, twenty-five foot long, were planted at all locations. Plot were not hand-thinned. Each hybrid was grown in at least three separate plots (replicates) at each location to account for field variability.

HARVESTING

Grain: Two-row plots were harvested with a self-propelled corn combine. Lodged plants and/or broken stalks were counted, plot grain weights and moisture contents were measured and yields were calculated and adjusted to 15.5% moisture. Test weight was measured on each plot.

Silage: Whole-plant (silage) plots were harvested using a tractor driven, three-point mounted one-row chopper. One row was analyzed for whole plant yield and quality. Plot weight and moisture content were measured, and yields were adjusted to tons dry matter / acre. A sub-sample was collected and analyzed using near infra-red spectroscopy.



Grain		
Southern Zone Arlington, Janesville, Lancaster	Early Maturity Trial: 105-day or earlier Late Maturity Trial: later than 105-day	Table 6 Table 7
South Central Zone Fond du Lac, Galesville, Hancock (irrigated)	Early Maturity Trial: 100-day or earlier Late Maturity Trial: later than 100-day	Table 8 Table 9
North Central Zone Chippewa Falls, Marshfield, Seymour, Valders	Early Maturity Trial: 90-day or earlier Late Maturity Trial: later than 90-day	Table 10 Table 11
Northern Zone Spooner (three sites), Coleman		Table 12
Silage		
Southern Zone Arlington and Lancaster	Early Maturity Trial: 109-day or earlier Late Maturity Trial: later than 110-day	Table 13 Table 14 Graph
South Central Zone Fond du Lac and Galesville	Early Maturity Trial: 104-day or earlier Late Maturity Trial: later than 104-day	Table 15 Table 16 Graph
North Central Zone Chippewa Falls, Marshfield, Valders	Early Maturity Trial: 99-day or earlier Late Maturity Trial: later than 99-day	Table 17 Table 18 Graph
Northern Zone Spooner (two sites), Coleman		Table 19 Graph
Specialty		
Southern Conventional (Refuge) Arlington, Janesville, Lancaster		Table 20
Southern Central Conventional (Refuge) Fond du Lac, Galesville, Hancock		Table 21
Organic		
Southern Zone Arlington, Janesville, Lancaster		Table 22
South Central Zone Fond du Lac, Galesville, Hancock		Table 23

Please go to http://corn.agronomy.wisc.edu/HT/2010/2010Text.aspx to follow the links in the table above.

PRESENTATION OF DATA

Yield results for individual location trials and for multi-location averages are listed in Tables 6 through 23. Within each trial, hybrids are ranked by moisture, averaged over all trials conducted in that zone during 2010. Yield data for both 2009 and 2010 are provided if the hybrid was entered previously in the 2009 trials. Starting in 2009, a nearest neighbor analysis of variance for all trials as described by Yang et al. (2004, Crop Science 44:49-55) and Smith and Casler (2004, Crop Science 44:56-62) is calculated. A hybrid index (Table 2) lists relative maturity ratings, specialty traits, seed treatments and production zones tested for each hybrid.

RELATIVE MATURITY

Seed companies use different methods and standards to classify or rate the maturity of corn hybrids. To provide corn producers a "standard" maturity comparison for the hybrids evaluated, the average grain or silage moisture of all hybrids rated by the company relative maturity rating system are shown in each table as shaded rows. In these Wisconsin results tables, hybrids with **lower** moisture than a particular relative maturity average are likely to be **earlier** than that relative maturity, while those with **higher** grain moisture are most likely **later** in relative maturity. Company relative maturity ratings are rounded to 5-day increments. The Wisconsin Relative Maturity rating system for grain and silage (GRM and SRM) compares harvest moisture of a grain or silage hybrid to the average moisture of company ratings using linear regression. Each hybrid is rated within the trial and averaged over all trials in a zone. Maturity ratings (Company, GRM and SRM) can be found in Table 2.

GRAIN PERFORMANCE INDEX

Three factors-yield, moisture, and standability-are of primary importance in evaluating and selecting corn hybrids. A **performance index (P.I.)**, which combines these factors in one number, was calculated for multi-location averages for grain trials. This performance index evaluates yield, moisture, and lodged stalks at a 50 (yield): 35 (moisture): 15 (lodged stalks) ratio.The performance index was computed by converting the yield, dry matter, and upright stalk values of each hybrid to a percentage of the test average. Then the performance index for each hybrid that appears in the tables was calculated as follows:**Performance Index (P.I.)** = [(Yield x 0.50) + (Dry matter x 0.35) + (Upright stalks x 0.15)] / 100

SILAGE PERFORMANCE INDEX

Corn silage quality was analyzed using near infra-red spectroscopy equations derived from previous work. Plot samples were dried, ground, and analyzed for crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), in vitro cell wall digestibility (NDFD), in vitro digestibility (IVD), and starch. Spectral groups and outliers were checked using wet chemistry analysis. The **MILK2006** silage performance indices, milk per ton and milk per acre, were calculated using an adaptation by Randy Shaver (UW-Madison Dairy Science Department) of the MILK91 model (Undersander, Howard and Shaver; Journal Production Agriculture 6:231-235). In MILK2006, the energy content of corn silage was estimated using a modification of a published summative energy equation (Weiss and co-workers, 1992; Animal Feed Science Technology 39:95-110). In the modified summative equation, CP, fat, NDF, starch, and sugar plus organic acid fractions were included along with their corresponding total-tract digestibility coefficients for estimating the energy content of corn silage. Whole-plant dry matter content was normalized to 35% for all hybrids. The sample lab measure of NDFD was used for the NDF digestibility coefficient. Digestibility coefficients used for the CP, fat, and sugar plus organic acid fractions were constants. Dry matter intake was estimated using NDF and NDFD content assuming a 1350 lb. cow consuming a 30% NDF diet. Using National Research Council (NRC, 2001) energy requirements, the intake of energy from corn silage was converted to

expected **milk per ton**. **Milk per acre** was calculated using milk per ton and dry matter yield per acre estimates.

LEAST SIGNIFICANT DIFFERENCE

Variations in yield and other characteristics occur because of variations in soil and growing conditions that lower the precision of the results. Statistical analysis makes it possible to determine, with known probabilities of error, whether a difference is real or whether it might have occurred by chance. Use the appropriate LSD (least significant difference) value at the bottom of the tables to determine true differences.

Least significant differences (LSD's) at the 10% level of probability are shown. Where the difference between two selected hybrids within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure in nine out of ten chances that there is a real difference between the two hybrid averages. If the difference is less than the LSD value, the difference may still be real, but the experiment has produced no evidence of real differences. Hybrids that were not significantly lower in performance than the highest hybrid in a particular test are indicated with an asterisk (*).

HOW TO USE THESE RESULTS TO SELECT TOP-PERFORMING HYBRIDS

The results can be used to provide producers with an independent, objective evaluation of performance of unfamiliar hybrids, promoted by seed company sales representatives, compared to competitive hybrids.

Below are suggested steps to follow for selecting top-performing hybrids for next year using these trial results:

1. **Use multi-location average data in shaded areas.** Consider single location results with extreme caution.
2. Begin with trials in the zone(s) nearest you.
3. Compare hybrids with similar maturities within a trial. You will need to divide most trials into at least two and sometimes three groups with similar average harvest moisture-within about 2% range in moisture.
4. Make a list of 5 to 10 hybrids with highest 2010 Performance Index within each maturity group within a trial.
5. **Evaluate consistency of performance** of the hybrids on your list over years and other zones.
    a. Scan 2009 results. **Be wary** of any hybrids on your list that had a 2009 Performance Index of 100 or lower. Choose two or three of the remaining hybrids that have relatively high Performance Indexes for **both** 2009 and 2010.
    b. Check to see if the hybrids you have chosen were **entered in other zones**. (For example, some hybrids entered in the Southern Zone Trials, Tables 6 and 7, are also entered in the South Central Zone Trials, Tables 8 and 9).
    c. **Be wary** of any hybrids with a Performance Index of 100 or lower for 2009 or 2010 in any other zones.
6. Repeat this procedure with about three maturity groups to select top-performing hybrids with a range in maturity, to spread weather risks and harvest time.
7. Observe relative performance of the hybrids you have chosen based on these trial results in several **other reliable, unbiased trials** and **be wary** of any with inconsistent performance.
8. You might consider including the hybrids you have chosen in your own test plot, primarily to evaluate the way hybrids stand after maturity, dry-down rate, grain quality, or ease of combine-shelling or picking.
9. Remember that you don't know what weather conditions (rainfall, temperature) will be like next year. Therefore, the most reliable way to choose hybrids with greatest chance to perform best next year on your farm is to consider performance in 2009 and 2010 over a wide range of locations and climatic conditions.

You are taking a tremendous gamble if you make hybrid selection decisions based on 2010 yield comparisons in only one or two local test plots.

OBTAINING DATA ELECTRONICALLY

This report is available in Microsoft Excel and Acrobat PDF formats at the Wisconsin Corn Agronomy website: http://corn.agronomy.wisc.edu. The most current version of the report is also available to download or purchase at the UWExtension Learning Store: http://learningstore.uwex.edu. For more information on the Wisconsin Crop Improvement Association, visit: http://wcia.wisc.edu.

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WISCONSIN HYBRID CORN PERFORMANCE TRIALS—2010 (A3653) R-11-2010-1.3M

2010 Wisconsin Soybean Variety Test Results

S.P. Conley, M. J. Martinka, J. M. Gaska, P. Esker, and N. C. Koval, Departments of Agronomy and Plant Pathology, University of Wisconsin, Madison

The Wisconsin Soybean Variety Test is conducted each year with the producer's needs in mind. Our objective is to give producers the information to select varieties that will satisfy their specific goals and are most likely to perform best under their management practices.

Please visit http://www.coolbean.info to view information on: 2010 Wisconsin Soybean Variety Performance Results

2011 Wisconsin Oats and Barley Performance Tests

John Mochon, Shawn Conley, and Kevin Pixley

The Wisconsin oats and barley performance trials are conducted each year with the producer's needs in mind. Trials include released varieties, experimental lines from Wisconsin and neighboring states, and lines from private seed companies. The primary objective of these trials is to obtain data on how varieties perform in different locations and years. Growers use these data to help choose the best varieties to plant, and breeders use performance data to determine whether or not to release a new variety.

Please visit http://www.coolbean.info to view more information on: 2011 Wisconsin Oat and Barley Performance Test.

Are you using N-Serve or Instinct? New WDATCP interpretations will require custom applicators to become certified commercial pesticide applicators

Roger Flashinski, Pesticide Applicator Training Program, University of Wisconsin-Madison

The Products

N-Serve and Instinct are nitrogen stabilizers to inhibit the bacteria that naturally convert N from the ammonium form to the mobile nitrate form. Although both allow similar application methods and which nitrogen products they can be applied with, in Wisconsin N-Serve is typically mixed with anhydrous ammonia or UAN and injected in the soil whereas Instinct is typically mixed with liquid manure or UAN and either injected in the soil or surface applied. Instinct has an advantage in that it is a microencapsulated formulation that remains stable on the soil surface for up to 10 days, allowing growers flexibility in manure application and incorporation. Both N-Serve and Instinct are registered as pesticides by the EPA.

The Past

In past WCM newsletter articles, I have reiterated WDATCP's stance that a fertilizer treated with either N-Serve or Instinct is for the purpose of protecting the fertilizer. The treated fertilizer, then, is applied to the crop or crop site. For this reason, the fertilizer with N-Serve or Instinct is considered a "treated article", exempt from further EPA regulation. Thus, a person making a commercial application (e.g., custom applicator, custom manure hauler, cooperative employee, etc.) of a fertilizer treated with N-Serve or Instinct is not required to obtain an individual commercial pesticide applicator certification and license. Likewise, the employer of this individual is not required to obtain a commercial pesticide application business license.

The New

Due to the extensive amount of N-Serve treated fertilizer and Instinct treated manure being applied in Wisconsin, WDATCP completed a more extensive review of the N-Serve product label and Instinct - manure mixture pesticide applications. They also consulted with the Registration Division at EPA Headquarters. The response from EPA is that neither N-Serve treated fertilizer nor Instinct treated manure is an application of a pesticide treated article but, rather, is a traditional fertilizer-pesticide mixture application. In other words, EPA considers a fertilizer treated with N-Serve or Instinct no differently than a dry fertilizer impregnated with a herbicide for simultaneous application.

The Future

Based on their review and EPA's interpretation, WDATCP has determined that all commercial applicators that inject or make applications of a fertilizer or manure mixture containing N-Serve or Instinct are now considered commercial applicators for hire. Therefore, such persons must be certified and licensed as commercial applicators in the Field & Vegetable Crops category (1.1). Additionally, their employer must hold an active commercial pesticide application business license.

The Net Effect

The new pesticide certification requirements only affect commercial applicators who apply N-Serve or Instinct on a custom basis. Because neither product is a restricted-use pesticide, a farmer may make either application of the pesticide

– fertilizer mixture on his/her own land without becoming a certified applicator.

Being that specialized equipment is needed in the filling of anhydrous ammonia tanks, the mixing and/or application of an N-serve – fertilizer mixture is normally performed by employees of an agricultural supplier who already are certified and licensed to make other types of for-hire pesticide applications. Thus, WDATCP's new interpretation that an N-Serve treated fertilizer is no longer considered a treated article will have little effect within this segment of the industry.

However, custom manure haulers generally only deal with one product – manure – and generally only mixed and applied a single pesticide product in manure – Instinct. Thus, as a treated article, they have not been required up to this point to become certified and licensed pesticide applicators to apply this mixture. It is this segment of the industry that will be the hardest hit by these new interpretations.

Use Web Soil Survey to Create a USDA-NRCS Soil Map for Your Farm

Kevan Klingberg – UW Discovery Farms

Soil maps provide farmers, crop consultants and conservation planners with important information for crop nutrition, soil fertility and soil and water conservation activities.

Do you need a soil map for farm land you operate, or for land you provide technical assistance to an agricultural producer on? The Natural Resources Conservation Service (NRCS) has an on-line tool called Web Soil Survey - - http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Web Soil Survey provides an electronic computerized method to create, print and save soil maps. To use Web Soil Survey you need a computer and internet access.

Click here http://fyi.uwex.edu/discoveryfarms/2010/12/use-web-soil-survey-to-create-a-usda-nrcs-soil-map-for-your-farm/ to see an example of how to create a soil map.

The basic soils map is just the beginning. You can explore and experiment with other features and tools within Web Soil Survey. You will find a lot of additional soil information, capabilities, limitations, land features, and ultimately the ability to create and save a custom soil resource report.

Soil maps provide farmers, crop consultants and conservation planners with important information for crop nutrition, soil fertility and soil and water conservation activities.

Using SNAP-Plus as a Teaching Tool

Nancy Drummy – UW Discovery Farms

SNAP-Plus is a great way to track nutrient applications, crop rotations, soil test levels, and phosphorus indexes on all farm fields. However, for some producers, using the software can quickly become overwhelming. Preparing a nutrient management plan using SNAP-Plus can be a valuable tool only if the producer understands what is going into the program, and why. Soil tests are the foundation of a nutrient management plan. One component of SNAP-Plus that is a great teaching tool is the soil test report.

By printing out the soil test report, the producer can look at the "big picture" in regards to fertility across his entire farming operation. Soil tests are not meant to be a definitive value, but a benchmark for tracking fertility. With all the soil tests on one page, the producer can easily see the fields where fertility levels are falling, as well as fields that are excessively high, and begin to understand which fertility management practices need to be adjusted. By looking at the soil test report, it becomes clear why one fertilizer rate across the farm is not an effective management practice. Producers can see for themselves how applying manure to the same fields every year (usually those fields closest to the barn) affects phosphorus values. The soil test report can quickly define which fields should receive manure applications. Fields that require lime can easily be identified, and dealt with in a timely manner.

This is all important information to a producer that will help improve his bottom line. Take some time to study the soil test report before attempting to write a nutrient management plan. It is a great way to help producers understand the value of nutrient management planning to their operation.