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**Vegetable Crop update**

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2015 Agronomy Update Meetings
Joe Lauer, Corn Agronomist

The Department of Agronomy will offer Crop Production and Management Meetings at eight locations during January of 2015. 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 “walk-in” fee will be charged to those who have not preregistered. Additional information packets will be available for $18.00 each.

Certified Crop Advisor CEU credits have been requested (3.0 hours in Crop Management). Below is a list of topics, meeting sites, dates and times. Please join us at meeting in your area.

2014 Wisconsin Hybrid Corn Performance Trials – Grain and Silage (A3653)
2014 Wisconsin Soybean Variety Test Results (A3654)
2014 Perennial Forage Variety Update for Wisconsin (A1525)
Winter wheat varieties for grain in Wisconsin – 2014 (A3868)
Oat and Barley Variety Performance (A3874)
NCSRP SCN Sampling Publication
Extension publications

Agronomy Advice articles
Wisconsin Crop Improvement Association updates

Forages

Alfalfa stand changes stand over time.
Performance of GM alfalfa varieties and potential for gene transfer to non GMO fields
When to use alfalfa-grass mixtures

Corn

Corn Response to Seeding Rate: The Implications for Variable Rate Seeding
Is the corn-soybean rotation sustainable? Evidence from long-term cropping system trials

Soybeans and Small Grains

WI Soybean and Winter Wheat Year in Review
Multi-State High Yield Soybean Project Results: a First Look
Should we consider in-furrow applications in soybean?

Location, date and time

Janesville Monday, Jan. 5 at noon
Madison Tuesday, Jan. 6 at 7:30 am
Fond du Lac Tuesday, Jan. 6 at noon
Kimberly Wednesday, Jan. 7 at 7:30 am
Wausau Wednesday, Jan. 7 at noon
Eau Claire Thursday, Jan. 8 at 7:30 am
Sparta Thursday, Jan. 8 at noon
Belmont Friday, Jan. 9 at noon

Midwest Forage Association Forage Production and Use Symposium

Wisconsin Crop Management Conference
January 13-15, 2015, Alliant Energy Center, Madison
New Manure and Legume Credits app for iPhone

Farmers can save money and protect the environment by taking credit for the fertilizer value of manure and legume crops. The value of these credits are subtracted from the base (unadjusted) fertilizer recommendations for a field. This reduces the money spent on purchased fertilizer applications and helps prevent over application.

There are formulas and math involved in determining the credit values. This app includes three calculators that have these formulas built in and do all the math for you.

The new NPK Credits app is free and available now for iPhone and iPad. This app was developed by the University of Wisconsin Nutrient and Pest Management Program and uses research from University Extension specialists. For more information and for screen shots, visit the app page on our site.

Check this app out at the Apple App Store. It’s free! Android version coming soon.


UW-River Falls Field Scout Training Class: March 18-19, 2015
Bryan Jensen, IPM Program

The University of Wisconsin-River Falls, UW-Extension and the Integrated Pest Management Program are co-sponsoring the IPM Field Scout Training Class which will be held March 18-19, 2015 on the UW-River Falls campus. This training session will provide classroom and laboratory instruction for several pest and nutrient management topics (pest identification, life cycle, damage symptoms, economic thresholds and scouting techniques for insects, weeds, plant pathogens, herbicide injury and nutrient deficiency symptoms for corn, alfalfa, soybean and wheat, soil sampling, plant tissue testing, etc). Click here for the complete schedule. CEU’S will be applied for.

Non-student registration fee is $100/person and covers the cost of the training and the Field Crop Scout Training Manual. To register online please go to https://www.patstore.wisc.edu/ipm/register.asp

To register by check, send name, phone number, address and email address with a check payable to UW-Extension to:
Bryan Jensen
Dept. of Entomology
1630 Linden Drive
Madison, WI 53706.

For more information call Bryan Jensen at (608) 263-4073 or email at bmjense1@facstaff.wisc.edu

Vegetable Crop Update 12/19/14
The 25th issue of the Vegetable Crop Update is now available. This issue contains highlighted agendas and details of the upcoming potato and vegetable grower education meetings. Click here to view this update.

Agronomic Management and Fungicide Effects on Oat Yield and Quality in Wisconsin
Spyridon Mourtzinis, Shawn P. Conley, and John M. Gaska
Department of Agronomy, University of Wisconsin-Madison

Introduction

Oat cultivation in Wisconsin has declined considerably in the last eight decades; nevertheless, it continues to be an important crop in the north central states where 65% of the oats harvested for grain in the United States each year are produced. Oats planted in Wisconsin totaled 255,000 acres in 2013 and grain production accounted for approximately 11% of the total oat production in the U.S. Planted acres in the 1930s to the 1960s exceeded 1.98 million in Wisconsin alone and 3.95 million nationwide (NASS, 2013).
Plant Disease Diagnostic Clinic (PDDC) Update
Brian Hudelson, Sean Toporek and Joyce Wu, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from December 20, 2014 through December 26, 2014.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**VEGETABLES,**
Potato, Bacterial Soft Rot, Pectobacterium carotovora, Portage
Potato, Fusarium Dry Rot, Fusarium sp., Portage

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from December 27, 2014 through December 31, 2014.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**FRUIT CROPS,**
Raspberry, Cane Blight, Coniothyrium fuckelii, Columbia

**SOIL,**
Soybean Soil, Soybean Cyst Nematode, Heterodera glycines, Buffalo, Outagamie

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

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2015 Wisconsin CCA of the Year: Nominations open until March 6

Bryan Jensen, NPM Program

A Reminder! Nominations for the 2015 Wisconsin CCA of the Year will remain open until March 6.

Please take the time to consider a nomination. The process is simple and won’t take a lot of time. More importantly the satisfaction you will get from recognizing a colleague is priceless.

The nomination criteria, helpful hints and nomination form are available online at https://uwmadison.box.com/s/5i2rcaolfl0bvymibt

Electronic submissions are preferred but hardcopies are OK. For more information, please contact Bryan Jensen, IPM Program, bmjense1@wisc.edu, 608-263-4073.

Wisconsin Dairy and Beef Well-Being Conference, April, 30 2015

Aerica Bjurstrom, Agriculture Agent, UW Extension-Kewaunee County

The Wisconsin Dairy and Beef Well-Being Conference will be held at Liberty Hall in Kimberly on April 30th. We are again pleased to welcome Dr. Temple Grandin as our keynote speaker. She’s not the only top quality speaker on the agenda though! We have the Dee Griffin, a pioneer in the Beef Quality Assurance program, Jan Shearer, a leader in animal welfare from Iowa State University, Kurt Voegel from UW-River Falls, and our own Amy Stanton on the agenda. We are also welcoming Bruce Feinberg from McDonalds and Lily Edwards-Callaway from JBS.

This will be an excellent meeting and worth the travel for producers. The meeting focus in on beef and dairy, but poultry and pork producers will find value in this meeting as well. For more information click on the link below:


Winners of the 2014 Wisconsin Soybean Contest are Announced

Shawn Conley, Soybean and Wheat Extension Specialist

The 1st place winner in Division 4, Bahr Farms Inc. of Darlington, grew Channel 2402R2 Brand and harvested 84.99 bu/a. In second place, McComish Family Farms of Shullsburg grew Channel 2402R2 Brand and harvested 79.62 bu/a. In Division 3, Ellis Farms Inc. of Walworth won 1st place with Jung 1250RR2 at 73.80 bu/a, and in 2nd place, Caliber Custom Services of Kaukauna harvested 63.32 bu/a with DuPont Pioneer P22T69R. Also in Division 3, the Wisconsin Bean Team of UW Graduate students
Adam Gaspar, David Marburger, and Ethan Smidt grew Pioneer P28T33R and harvested 89.58 bu/a. The WI Bean Team is ineligible for official prizes as they are grad students of Dr. Conley; however their efforts are still unofficially recognized. In Division 2, Stetzer Brothers LLC of Melrose achieved 81.78 bu/a from NK Brand 17G8 for first place. In 2nd place, Kloos Acres of Stratford harvested 60.60 bu/a from DuPont Pioneer 91Y90 soybeans. In Division 1 at 54.72 bu/a was Jerry Koser from Almena who planted Pioneer 91M10. 2nd place winner in Division 1 was Paul Graf Farms LLC from Sturgeon Bay. They harvested 38.45 bu/a from Pioneer 90Y90.

The contest is sponsored by the WI Soybean Program and 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.

For more information please contact Shawn Conley, WI State Soybean Specialist at 608-262-7975 or spconley@wisc.edu

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**Video series focuses on field crop management**

What are the six most critical stages in the life of a corn plant? Why is variety selection important to soybean yield? During what growth stage are crops most susceptible to disease? What is in a routine soil test? How can I manage weed and insect resistance issues? Can a sponge be used to demonstrate soil moisture?

Everyone agrees that the more you know about farming, the more successful you will be. Growers combine both experience and science to make management decisions. But who has the time to read textbooks or long journal articles? Wouldn’t it be more efficient if someone just took the time to carefully explain the University of Wisconsin research and science related to field crop management in a video I can watch or listen to? Wouldn’t it be great if you could access this information on a smartphone or a tablet?

Well, University of Wisconsin Extension specialists in agronomy, entomology, plant pathology and soil science have just done that! They have recorded the most up-to-date presentations explaining the fundamentals of crop production, pest management, soil and water conservation and nutrient management. The videos present over 18 hours of valuable information. You can watch a little or watch a lot. It’s your choice!

Bryan Jensen of the UW Integrated Pest Management program (IPM) helped organize the recordings and says the videos should be useful to anyone involved in field crop production. As it relates to IPM, he says, “This content can help build or bolster a strong integrated pest management program on a farm or in a crop advisory’s career. While just being posted on the internet in January, the videos have already been used by dozens of agronomists to help with self-study for the Wisconsin CCA (Certified Crop Advisers) exam.”

Look for the videos on YouTube at: https://www.youtube.com/user/uwipm/playlists

You can also use the free UW IPM Toolkit app to access the videos: http://ipcm.wisc.edu/apps/ipmtoolkit/

The new crop science series is organized into three playlists.

**WI - Soil science fundamentals for field crops** 22 videos

**WI - Field crop and forage fundamentals** 10 videos

**WI - Weed, insect, disease IPM for field crops** 20 videos

Please feel free to contact Bryan Jensen with any questions or comments. bryan.jensen@wisc.edu
Glyphosate resistance confirmed in two Wisconsin common waterhemp populations

Recently, Thomas Butts, a graduate research assistant, and Vince Davis confirmed two herbicide-resistant common waterhemp populations in Wisconsin. Two Wisconsin common waterhemp populations from Eau Claire and Pierce Counties clearly exhibited resistance to glyphosate. Progeny plants from the Eau Claire County collection were sprayed at the 0.87 kg ae ha$^{-1}$ (22 fl. oz. ac$^{-1}$) rate. All plants survived and grew to an average of six times their spray date height at that rate. At the 1.74 kg ae ha$^{-1}$ (44 fl. oz. ac$^{-1}$) rate, 95% survived and grew to an average of five times their spray date height at that rate. The glyphosate ED90 for the Eau Claire County and susceptible populations was 3.91 and 0.40 kg ae ha$^{-1}$, respectively. This indicated a 10-fold level of glyphosate resistance in the Eau Claire County population.

The full report is now available. For more information, please visit the WCWS documents page.

Palmer amaranth confirmed glyphosate-resistant in Dane County, Wisconsin

Thomas Butts, a graduate research assistant, and Vince Davis report a new confirmation of a glyphosate-resistant weed in Wisconsin. The Dane County Palmer amaranth population clearly exhibited herbicide resistance to glyphosate. This was determined by two efforts. First, leaf tissue samples were sent to Dr. Patrick Tranel at the University of Illinois where a polymerase chain reaction (PCR) technique detected a 3- to 20-fold amplification of the EPSPS gene indicating high likelihood of glyphosate resistance.

To confirm those results, a whole plant glyphosate dose response bioassay was conducted. Progeny plants from the Dane County collection were sprayed with a 0.87 kg ae ha$^{-1}$ (22 fl. oz. ac$^{-1}$) rate. All plants survived and grew to an average of two times their spray date height at that rate.

Their full report is available here. For more information, please visit the WCWS documents page.

Managing Corn Rootworm in 2015

Bryan Jensen, UW Extension and IPM Program

You are probably aware that Bt CRW hybrid field performance issues are occurring. Several states in the Midwest, including Wisconsin, have experienced control problems for several of the Bt proteins. Although my impression is that Wisconsin’s situation lags behind that of some other corn producing states, it is nevertheless a valid concern. There are several monitoring techniques and management options that are available which can slow resistance. However, it is unlikely you will be able to reverse resistance to a Bt protein once it occurs. Therefore, 2015 will be the time to start implementing these practices.

Field monitoring has been, and always will be, an important IPM practice. Scouting beetles during the egg laying period (mid-August to early September) will give you an estimate of control needs in continuous corn. Additionally, that information can also be used to prioritize control practices that include insecticide seed treatments, soil applied insecticides as well as proper selection of Bt CRW proteins.

Evaluating corn roots for signs of feeding during mid-July to early August will also be useful. This information will verify the efficacy of your control practice. Don’t assume straight standing corn does not have significant rootworm feeding and do not assume that all lodged corn is a result of rootworm feeding. Dig and document. Evaluating root damage in Bt CRW hybrids will give you advanced warning regarding early levels of resistance. In first year corn it will give you information on presence (or absence) of rotation resistant rootworm.

Continue to plant refuges. Until we know different, refuges are a source of susceptible adults which could mate with resistant beetles. Although planting refuges is getting easier because of seed blends, block refuges may be difficult to understand especially when combined with lepidopteran Bt proteins. When in doubt, read the tag and/or consult with your seed sales representative.

Using multiple modes of action and diversifying management practices will also be important components to a resistance management program. Topping that list of practices is crop rotation. Assuming you are not in an area where damage from rotation resistance corn rootworms is possible (your root assessments will tell you for sure!) crop rotation is an excellent method of rootworm management.

The high rates of insecticide seed treatments on conventional hybrids may be useful, but only if beetle counts are low. Beetle counts from the previous growing season will indicate which fields are possible candidates for this practice. Fields with moderate or
high beetle numbers maybe a good choice for conventional hybrids planted with a soil applied insecticide. If Bt resistance is not an issue in your fields then traited corn remains an option, especially for those fields with higher beetle populations. However, make sure you rotate your Bt modes of action. If you have been using the same Bt protein for two years (or more!) switch proteins. Cross resistance is a potential issue in the family of Cry3 proteins (YieldGard, Agrisure, Duracade). Make sure you know what protein you have been planting and rotate to a viable option or switch to a soil applied insecticide. All proteins have had field performance issues so there is no silver bullet.

Hybrids with pyramid proteins MAY be a good alternative provided you do not have initial levels of resistance building up in your field. Pyramid hybrids have two modes of action for the same insect and can be a good resistance management tool provided both proteins are effective. If not, you essentially are using a single mode of action. That is, you will continue to select for resistance to the compromised protein while increasing selection pressure on the other. In that situation, you will be painting yourself into a corner without realizing. Just another reason to evaluate roots for damage.

Layering a soil applied insecticides with a Bt CRW hybrid has been a practice adopted by some growers. A soil insecticide with a Bt hybrid can be a valuable management tool ONLY IF beetle populations are high enough that control might be compromised when using a Bt hybrid by itself. Fortunately, Wisconsin had lower beetle populations in 2014 than 2013 in all districts except west central and southwest Wisconsin according to the Wisconsin Department of Agriculture, Trade and Consumer Protection’s (DATCP) Pest Bulletin. The southwest district reported a higher average than 2013 primarily because of one exceptionally high field. For more information on 2014 beetle counts go to the Pest Bulletin https://datcpservices.wisconsin.gov/pb/

Do not use a soil insecticide to mitigate performance issues with Bt hybrids. It won’t work. Soil insecticides are not designed to control beetle populations. Rather they protect a localized area of the root mass. Surviving beetles will continued to put selection pressure on the Bt protein.

In conclusion, diversifying corn rootworm management practices will help prolong all management options not just Bt hybrids. If you notice lodged corn, please don’t assume resistance to the Bt protein. Dig and evaluate roots for damage. Other factors including compaction, high winds and rain may also cause corn to lodge. Also, don’t assume that high beetle numbers in a field means Bt performance has been compromised. If you do see significant damage, in addition to calling the seed sales representative, PLEASE contact the local county extension agent. It will be important for us to know if, and how widespread these performance complains are.

References
Pest Management YouTube videos: http://ipcm.wisc.edu/video/
Bt Trait table: http://www.msuent.com/assets/pdf/28BtTraitTable2014.pdf
CRW webinar http://www.plantmanagementnetwork.org/edcenter/seminars/CRWSeminar/

Webinar series on irrigation and water management

UW Extension is setting up a Professional Development opportunity on Irrigation systems and Irrigation water management to help us all increase our knowledge about how to use water efficiently. Irrigation has been a hot topic in some parts of Wisconsin from a combination of some dry years and increased ground water usage. This webinar series will give you the knowledge to help growers use water more wisely and still grow a quality crop.

The series of five webinars will start with Irrigation 101 for those who may not be as familiar with the equipment side or want to look at the consideration that should be taken when deciding to invest in an irrigation system. The second webinar will look at soil water management for crop production and how checkbook irrigation scheduling is done. The third webinar will introduce participants to the WISP-2102 on-line irrigation scheduling program and step people through how to set it up. One of the assignments will be to use it during 2015 to determine when to irrigate a field (or your lawn) for practice. The fourth webinar will cover testing, energy use and maintenance to keep systems operating and using water efficiently as the systems age. The last webinar in the series will look at drip or micro irrigation systems and how to do scheduling.
There will also be a summer field workshop where we will install and use soil moisture sensors, setup a simple drip irrigation system, setup a uniformity test on a center pivot and possibly do a pump test. The dates for the workshop will be scheduled later.

See the attached brochure for more information.

To Register go to: https://uwmadison.qualtrics.com/SE/?SID=SV_eXxhvC6nydtxzf

If you have questions, please contact Scott Sanford, Biological Systems Engineering sasanford@wisc.edu

Plant Disease Diagnostic Clinic (PDDC) Update, Feb 6

Brian Hudelson, Sean Toporek and Joyce Wu, UW-Madison/Extension

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from January 31, 2015 through February 6, 2015.

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</tr>
<tr>
<td>Carrot</td>
<td>Bacterial Soft Rot</td>
<td><em>Pectobacterium carotovora</em></td>
<td>Fillmore (MN)</td>
</tr>
<tr>
<td>Lettuce</td>
<td>Root Rot</td>
<td><em>Pythium sp.</em></td>
<td>Ozaukee</td>
</tr>
</tbody>
</table>

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
Do We Grow Another Bushel or Save a Buck?

Joe Lauer, Corn Agronomist

The obvious answer is, "Yes!" Most of us try to do both. However, the predictions for the 2015 cropping season are for lower corn prices. Farmers wonder whether they should continue trying to increase production on their farms or should they cut costs and try to save a buck by not going after the most expensive yield. This article reviews some of the important decisions that growers need to make as plans are made for lower corn prices in 2015.

As farmers consider the impact of the most yield limiting factors, it isn't always about inputs and cutting costs. The most important management decision is hybrid selection. The choice of hybrid increasingly dictates management decisions farmers make during a growing season. After the hybrid is selected the main management objective is to reduce stress on corn plants during the growing season.

In many ways we are "back to the future." Corn prices are not as bad as the 1990s and early 2000s, but they are projected to decrease nearly 50% from recent prices. Frugal innovation may be required. When corn prices are low farmers must: 1) know their cost of production for corn, 2) concentrate on the basics, 3) realize that timing of operations is everything, and 4) question every input in their production practices. An increased reliance on scouting for in-season decisions and corrections will increase efficiencies during years of low corn prices.

It is very difficult to get a handle on the cost of production of a crop enterprise. We do know from PEPS data that two inputs that have increased dramatically over the last 25 years. From the 1987 to 2011 seed cost has increased 4 to 5 times. Fertilizer inputs have increased 2 to 3 times. Chemical and equipment costs have remained relatively flat. Harvesting costs fluctuate with the year, becoming higher in cold, wet seasons due to higher drying costs. The cost of land has increased dramatically in the last five years. Using PEPS and USDA data the cost of production of corn in Wisconsin is around $550 to $700 per acre.

Crop production decisions can be divided into categorical and continuous decisions. Examples of categorical decisions are hybrid selection, seed treatment, rotation, tillage, weed control, harvest timing, land, marketing, drainage, and equipment. Examples of continuous decisions are plant density, planting date, soil fertility (N, P, K, micronutrients, and lime), irrigation and scouting (effort). Many other minor decisions must be made that often interact with other decisions.

An example of a continuous input cost is plant density (Figure 1). Like most continuous decisions, plant density costs increase in a linear fashion as the amount of seed planted increases. The yield response of corn to plant density is typically curvilinear. The point on the yield curve where yield is greatest is called maximum yield (MY). The plant density where the distance between input cost and the yield curve is greatest is called the economic optimum (EO). The plant density where yield equals input cost is the equilibrium (EQ) yield where farmers make no profit. Where the yield response intercepts the y-axis is the yield (Y0) level with no input. In the example using plant density, zero plants equal zero yield. Often some grain yield results with no input. For example, nitrogen is continuously mineralized from the soil so even though no nitrogen fertilizer may be applied, some yield can still be achieved. Other decisions like fungicide, tillage and row spacing have little impact on the yield curve.

Figure 1. Determining Maximum Yield v. Economic Optimum Yield.
In corn production, the most important variable with the least management control is weather. We have to accept the fact that Mother Nature has the upper hand. Management decisions and timing are continuously impacted by weather. Drainage is critical in the spring. Crops in the Midwest are challenged by 1) cool, wet springs that often result in lack of root surface area, and 2) dry, hot summer conditions during pollination, kernel set and grain filling. The corn crop grows best in a spring dry enough for early planting, but wet enough to activate herbicides and promote good stands with uniform emergence. Summers should have timely rain of about 1 inch per week, lots of sunshine, and temperatures in the mid-80s during the day and low-60s during the night. Falls should have sunny dry weather to speed dry down and allow harvest of grain at 22% moisture by November 1.

Figure 2 shows data from Lancaster in plots where no nitrogen has been applied since 1966. The average yield of these continuous corn plots is around 50 bu/A. In other rotations involving corn-soybean and corn-soybean-oats-alfalfa yield is at a higher level with zero nitrogen. For the most extended rotation yield has been increasing over time.

**Figure 2.** Corn Yield at 0 lb N/A for continuous corn, corn-soybean, and corn-soybean-corn-oat-alfalfa rotation at Lancaster, WI. Plots were established in 1966.

Corn hybrid selection is arguably the most important management decision a farmer makes because increasingly the choice of hybrid dictates management. The principles of hybrid selection include: 1) using independent yield trial data and multi-location averages, 2) evaluate consistency of performance, 3) pay attention to seed costs, 4) recognize that every hybrid must stand on its own for performance, and 5) buy the traits you need. Remember that traits do not add to yield, traits protect yield. The UW hybrid evaluation program has conducted 939 corn hybrid trials since 1973. The average yield of these trials is 165 bushels per acre. The difference between the top yielding hybrid and the bottom yielding hybrid in a trial is 70 bushels per acre. If you divide 70 into 165 the average yield swing for a hybrid selection decision is 42%.

In the UW corn hybrid trials, the average yield of conventional hybrids is currently equal to the trial average. There was a period of time between 2001 and 2009 where the average yield of conventional hybrids was up to 10 bushels per acre below the trial average. Since 2010 conventional hybrids have yielded similar to the trial average in four of five years; the only exception being the drought year of 2012.
For corn production in Wisconsin a **seed treatment** is needed and should be applied to the seed of the hybrid selected. Untreated check seed typically has 20 to 25% seed death. Use of seed treatments decrease the amount of seed death to 5 to 10%. There are many options available to farmers.

The **crop rotation** decision provides the easiest yield a farmer can get. In our UW trials corn yield increases 10 to 19% when rotated was citing. The rotation effect last at most two years and depends upon the length of the break between the crops of interest. If you have two or more break years then yield of the second year of the continuous crop will be greater than the yield of continuous crops. If only one break year is grown then the yield of the second year equals that of continuous cropping. The rotation effect is even more dramatic and stressful years. In figure the rotation effect lasts two years increasing corn grain yield 15 to 17% for rotated according first-year corn following five users arriving in 6% for second-year corn. Conventional tillage increases corn yields about 4% however there is an interaction that occurs which we will come back to later.

**Figure 3. The rotation effect of corn following soybean in Conventional-(CT) and No-Tillage (NT) at Arlington during 1994-2013.**

**Planting date** is a "priceless" decision because it sets up management timing for other inputs during the season. If a farmer is forced to plant late, then a "double whammy" results with lower yield and higher grain moisture. To begin planting, growers need to focus on seedbed conditions and calendar date rather than on soil temperature. Follow local extension recommendations especially as they relate to crop insurance requirements. Disadvantages of early planting including increased seedling diseases, soil crusting, late spring frosts, and European corn borer problems. At Arlington the planting date that produces maximum grain yield is April 28 (Figure 4). The planting date when maximum yield is achieved ranges from April 10 to May 3 depending upon the year. Yield is still at 95% of the maximum yield as late as May 12-19. Grain yield decreases 0.9 bushels per acre per day on May 10 and accelerates to 2.6 bushels per acre per day on June 1.

**Figure 4. Corn response to planting date during 2003 to 2012 at Arlington, WI.**

Fertilizer, especially **nitrogen**, is not the place to cut costs. Farmers should soil test and efficiently apply needed nutrients using the cheapest form of fertilizer per unit of nitrogen, phosphorus, potassium. Using manure and
Legume credits can help reduce purchased fertilizer costs. Don't cut back on overall nitrogen supplied unless you have been over applying. Do not use micronutrients unless soil test recommendations encourage it. The most economical approach to this decision is the maximum return to nitrogen (MRTN) approach. This approach accounts for corn price and nitrogen cost. The amount of nutrients removed by corn at harvest is 67 pounds phosphate per acre and 51 pounds potash per acre for a 175 bushel yield. For a silage yield of 24 tons per acre, 86 pounds phosphate per acre and 199 pounds potash per acre is removed. These nutrients eventually need to be replaced.

Plant distribution in the field is determined by plant density and row spacing. **Plant density** has the most potential to move a farmer from their current yield levels. Maximum yield plant densities are increasing over time as newer hybrids are commercialized. For most farms in Wisconsin narrower row spacing (15- to 20- inches) is better than row spacings of 36- to 38-inches, however, this decision has relatively low impact on yield.

The effect of plant density on corn grain and forage yield is shown in Figure 5. The response is fairly "broad-shouldered" in that 95% of the maximum for these measurements can be achieved at 26,000 to 32,000 plants per acre. The plant density that maximizes grain yield is 39,000 plants per acre. The economic optimum plant density is about 4000 plants per acre less at 35,000 plants per acre. The economic optimum is calculated using a partial budget approach where yield is multiplied by a corn price determined using the PEPS method and costs are subtracted (handling= $0.02/bu, hauling= $0.04/bu, trucking= $0.11/bu, storage= $0.02 per month/bu, drying= $0.02 per point/bu > 15.5% moisture, and seed cost = $250 per 80K bag).

Forage yield continues to increase up to about 48,000 plants per acre. However there is a yield and quality trade-off. As plant density increases forage quality, as measured by Milk per ton decreases. So the economic optimum for silage, as measured by Milk per acre, is about 6000 plants per acre greater than the grain maximum yield plant density.

**Figure 5. Relationship between corn plant density and grain maximum yield, grain economic optimum, forage yield, Milk/Ton, and Milk/Acre. Data are derived from studies conducted between 2005 and 2014 at Arlington, WI.**

Pest control is an important series of decisions in corn production. For most major corn pests, economic injury levels and economic threshold levels are known. In corn weeds are considered more of a problem than insects, and insects are more of a problem than diseases. Plant breeders have done a good job of developing corn hybrids resistant to insect and disease pressure.

We have a number of emerging pest resistance issues in Wisconsin. In southeast Wisconsin corn rootworm resistance has developed to Bt treated corn. In 2014, glyphosate (Roundup) resistance in waterhemp and Palmer amaranth. Finally, there is an increased awareness of nematode issues.

Early-season weed competition can significantly reduce yield in high-yield environments. In a Nebraska study, delaying weed control reduced yield if weeds were not controlled by V5.

For insect management it's all about scouting and timing. Insects are adapting to our cropping practices and they will likely continue to evolve.

For disease management the goal is to improve the corn canopy leading to yield increase and disease decrease. Genetic resistance is the cheapest form of control. Scout for these diseases in particular: anthracnose, northern corn leaf blight, diplodia, and Fusarium/ Gibberella. Recently, foliar fungicides have become more widely used. However, in our research only 2 of 32 studies significantly increased corn yield with fungicide use.
Tillage used to be about controlling weeds and seedbed preparation. Now it is all about stand establishment. We have excellent herbicides. We have had numerous planter technology developments. The tillage response is more often measured in the northern Corn Belt. Conventional tillage increases grain yield 5 to 7% over no-tillage. There is less difference observed between tillage systems when using Roundup ready crops. However, there is an interaction in that tillage does not affect corn yield in rotated corn and first-year corn following five years of soybean, but improves yield in second-year corn 5%. So tillage is not necessary in rotated corn, but becomes increasingly important as the number of years of continuous corn increase. So don't throw away your chisel plow. There may be years where the economics favor continuous corn production.

Figure 6. The interaction between conventional tillage and notill at Arlington during 1994 to 2013.

Finally harvest and store your crop carefully. There's a trade-off between field losses and drying costs. The recommend harvest moisture range is between 20 and 25% moisture. Large field losses can occur with lodging and ear droppage. For safe storage corn must be dried below 15% moisture, so some drying is often needed after harvest. We still have about 20-25% of the acres in NE Wisconsin still standing in the field. By November 1 most of the corn grain drydown has occurred (Figure 7).

Figure 7. Grain moisture drydown of corn left standing in the field at Arlington.

Success with precision farming (PF) is proving elusive. Technology used in PF is available and affordable, but the agronomy is lacking. A new exciting PF technology that is unmanned aerial vehicles (UAVs). UAVs with appropriate sensors have the potential to allow detection of in-season field problems early enough to be corrected.

In conclusion, the relative impact of corn management decisions on grain yield in Wisconsin varies the decision being made. Weather as the largest impact, but we can do little about it. The hybrid that you choose for your fields can have anywhere from a zero to almost 42% yield swing (70 bushels per acre for grain and 12,000 pounds of
Do We Grow Another Bushel or Save a Buck? - Wisconsin Corn Agronomy

milk per acre for silage). The presence or absence of genetic traits can swing yield 0 to 100%. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change. With pest control, timeliness of pesticide application is everything. In corn, weeds are more important than insects, and insects are more important than diseases. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change. With pest control, timeliness of pesticide application is everything. In corn, weeds are more important than insects, and insects are more important than diseases. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change. With pest control, timeliness of pesticide application is everything. In corn, weeds are more important than insects, and insects are more important than diseases. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change. With pest control, timeliness of pesticide application is everything. In corn, weeds are more important than insects, and insects are more important than diseases. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change. With pest control, timeliness of pesticide application is everything. In corn, weeds are more important than insects, and insects are more important than diseases. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change. With pest control, timeliness of pesticide application is everything. In corn, weeds are more important than insects, and insects are more important than diseases. Crop rotation can impact grain yield from 0 to 30%. A May 1 versus June 1 planting date affect yield from 0 to 30% plus you would need to add the moisture penalty. Soil fertility can change yield by about a 20 to 50%. Plant densities of 39,000 versus 18,000 plants per acre represent a 0 to 22% yield change.

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How Much Yield Loss Occurs with Corn Hybrids Sold as "Organic"?

Joe Lauer, Corn Agronomist

Farmers growing corn for the organic market often get a premium and rightly so. Organic farmers are required to go through a certification process that requires a fee and extra effort and time for paperwork. They have more expenses due to increased pest control, especially weeds. Organic farmers have also expressed some concern about the genetic yield potential of the commercial hybrids used in organic corn production.

Since 2004, the UW Corn Hybrid Evaluation program has been testing corn hybrids sold for the organic market. A total of 55 organic hybrid trials have been conducted at 10 locations in Wisconsin (see http://corn.agronomy.wisc.edu/HT/). The average yield of the commercial organic hybrids in these trials was 174 bu/A. The average range between the top- and bottom-ranked hybrids was 73 bu/A. These trials are planted early and managed aggressively for pests. All pests are controlled to the best of our ability. Differences among hybrids are likely due to genetic differences, rather than management interaction differences.

In 53 of the trials, a high-performing conventional hybrid check (nontransgenic) was included. Two treatments were applied to the check conventional hybrid. In one treatment the check hybrid was treated exactly the same as the other organic commercial hybrids in the trial. In the other treatment the check hybrid was hand weeded up to 3x during the growing season. No difference was found between the control and hand weeded conventional check hybrids, so data from these treatments were pooled together. Organic hybrids yielded 7% (14 bu/A) less than the conventional hybrids in these trials (Table 1).

<table>
<thead>
<tr>
<th>Hybrid</th>
<th>Grain yield (bu/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial organic</td>
<td>174</td>
</tr>
<tr>
<td>Conventional</td>
<td>188</td>
</tr>
<tr>
<td>LSD(0.05)</td>
<td>3</td>
</tr>
</tbody>
</table>

The organic trials are almost always planted adjacent to the public trials. An estimate of relative performance can be made between these adjacent trials by calculating an average for each trial and treating each environment as a replication. In this analysis, the conventional check hybrid included in the commercial organic trial was dropped so that the mean from the organic trials only represent commercial organic hybrids. Hybrids in the public trials include both conventional and transgenic hybrids.

A total of 48 environments had both organic and public trials planted adjacent to each other. The hybrids in the organic trials yielded 12% (24 bu/A) less than hybrids in the public trials (Table 2).

Table 2. Analysis of average yield for organic and public hybrid trials in the UW Corn Hybrid Evaluation program.
program. Data are derived from 48 environments where both trials were grown.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Grain yield (bu/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>175</td>
</tr>
<tr>
<td>Public</td>
<td>199</td>
</tr>
<tr>
<td>LSD(0.05)</td>
<td>9</td>
</tr>
</tbody>
</table>

In both analyses, organic hybrids yielded less than modern hybrids. In the organic trials, the conventional check hybrid was consistently the top performing hybrid in the trial. However, the commercial organic hybrids were not far behind (7-12% on average). Again, in these trials, all interactions are minimized to the best of our ability, so the trials represent potential genetic differences. As plant stresses increase in organic systems due to management constraints for certification and pest pressure versus the relative ease of controlling some of those same pests in conventional systems, the relative differences between modern organic and conventional systems would also likely increase.
5 Free apps for Wisconsin crop production

These five free apps help Wisconsin farmers and crop consultants quickly do calculations and find answers concerning crop and pest management. The apps all use University of Wisconsin science and researched-based information sources. By using a smartphone or tablet, a person is no longer tied to their desk looking through piles of papers or webpages, and does not have to do complicated math in their heads.

**Wisconsin’s Corn Nitrogen Rate Calculator**

This app is designed to assist producers in selecting a nitrogen (N) fertilizer rate that improves profitability when N and corn prices fluctuate. The app does the calculations needed to give you the university recommended N rates for your specific operations and economics.


**Nitrogen Price Calculator**

This app converts the tonnage price of each fertilizer product you enter into a price per pound of nitrogen — allowing for “apples to apples” price comparisons. By comparing the price per pound of nitrogen from multiple fertilizer sources, the cheapest source of nitrogen can be identified on the personal price list you create.

iPhone and iPad: [https://itunes.apple.com/app/n-price-calculator/id455090088?mt=8](https://itunes.apple.com/app/n-price-calculator/id455090088?mt=8)


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**Corn Crop Calculators**

This article presents a quick summary of what each of these five apps can do for growers in the state and some wider regions. The apps are available for both Apple and Android mobile devices.

- *Wisconsin’s Corn Nitrogen Rate Calculator*
- *Nitrogen Price Calculator*
- *IPM Toolkit news and media reader*
- *Corn Crop Calculators*
- *NPK Manure and Legume Credit Calculator*
IPM Toolkit, news & media app

This app allows a smartphone or tablet user to read news articles, view videos, download publications, and access pictures related to agricultural operations. The information is constantly updated from UWEX specialists’ blog and Twitter posts. There are playlists of over 90 crop and pest management videos. There is a search function that connects to an internet database of over 250,000 crop and pest management pictures.

There is a video demonstration of the app here >>
https://www.youtube.com/watch?v=8dC3MpSlyeg

iPhone and iPad: http://itunes.apple.com/us/app/ipm-toolkit/id504685615?mt=8

Crop Calculators for Corn

Crop Calculators is an app that lets corn growers calculate corn grain yields, corn maturity dates in relation to predicted frost, and corn silage price adjustments in relation to moisture content using their smartphones.

iPhone and iPad: https://itunes.apple.com/us/app/crop-calculators/id692861569?mt=8

NPK Credits – Manure & Legume Nutrient Credit Calculator

This app includes three calculators that do the NPK credits math for you. Farmers can save money and protect the environment by taking credit for the fertilizer value of manure and legume crops. The value of these credits are subtracted from the base (unadjusted) fertilizer recommendations for a field.

iPhone and iPad: https://itunes.apple.com/us/app/npk-credits-manure-legume/id954888966?mt=8

Mobile device and internet use is changing how global and local agriculture operates and expands their businesses. Farmers in Wisconsin, like the rest of society, are increasing their use of smartphones and other related handheld devices for communication and information gathering. Those who invest in serving farmers’ mobile needs help agricultural businesses move forward.

http://ipcm.wisc.edu/apps/

Vegetable Crop Update 2/9/15

The first issue of the Vegetable Crop Update is now available. This issue contains agendas and details of upcoming vegetable grower education meetings. Click here to view this update

New and Revised Disease Fact Sheet

Damon Smith, Extension Field Crops Plant Pathologist

A new UW Extension disease fact sheet on Aphanomyces root rot has recently been developed and ready for download. The fact sheet describes symptoms of Aphanomyces root rot, gives details about the pathogen that causes the disease, and gives some management ideas. You can download the fact sheet by visiting the ‘Fact Sheet’ section of the UW-Madison Field Crops Pathology website or CLICK HERE.
Revisions to fact sheets describing symptoms and management of Ergot of small grains and Fusarium head blight of wheat are also now available for download. To access these fact sheet, visit the ‘Fact Sheet’ section of the Field Crops Pathology website or CLICK HERE FOR THE ERGOT FACT SHEET or CLICK HERE FOR THE FUSARIUM HEAD BLIGHT FACT SHEET. Scroll down to the end of this newsletter to view the PDF version of this fact sheet.

New Sclerotinia Stem Rot Fact Sheet
Damon Smith, Extension Field Crops Plant Pathologist

A new fact sheet concerning Sclerotinia stem rot (white mold) on soybean has recently been published. The fact sheet describes symptoms of the disease and how to best manage it. To obtain a PDF version of the fact sheet, visit the ‘fact sheet’ section of the UW-Madison Field Crops Pathology website or CLICK HERE TO DOWNLOAD. Scroll down to the end of this newsletter to view the PDF version of this fact sheet.

Plant Disease Diagnostic Clinic (PDDC) Update
Brian Hudelson, Sean Toporek and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from February 14, 2015 through February 20, 2015.

<table>
<thead>
<tr>
<th>PLANT/SAMPLE TYPE</th>
<th>DISEASE/DISORDER</th>
<th>PATHOGEN</th>
<th>COUNTY</th>
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<tbody>
<tr>
<td>FIELD CROPS</td>
<td>Cladosporium rot</td>
<td>Cladosporium sp.</td>
<td>Sheboygan</td>
</tr>
</tbody>
</table>

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

Follow us on

[Social media icons for Facebook and Twitter]
As the snow begins to melt and we finally put the 2014/15 winter behind us, many growers and consultants alike are beginning to venture out to their winter wheat fields to assess winter injury and nitrogen timings. Though it is premature to make any rash decisions here are a few considerations for assessing your spring 2015 winter wheat stands.

1. As you look across your wheat landscape vibrant green patches will be interspersed with drab brown areas. The brown areas do not necessarily indicate those plants are dead.
2015 Planting Depth and Tiller Assessment

Growers and consultants can either reassess in a week or pull plants from the field and place in warm environments. Milk houses and kitchens work perfect. Root regrowth will appear from the crown and will appear as vibrant white roots as shown below.
If plants do not recover our critical threshold for turning over a field is 12 to 15 live plants per square foot. Below this threshold is an automatic replant. For more detailed information on assessing winterkill please view Wheat Stand Assessment, Winterkill Yield loss, and Nitrogen Application.

2. Evaluate tiller number and make the N timing decisions. It is important to remember that the functional purpose of spring N is to 1. stimulate tillering and 2. provide crop nutrition. If ample tillering (> 70 tillers per square foot) has occurred growers can delay N applications up to pre-joint (Feekes 4-5; Zadoks 30). This practice will aid in minimizing early spring N loss. Applications of N made after this growth stage may lead to wheel track damage. If growers have < 70 tillers per square foot it is important to get across those fields as soon as possible to minimize yield loss due to low tiller/head counts. For more information on tiller counts and spring N timing please view my YouTube video entitled: Wheat Stand Assessment and Nitrogen Timing.

3. Lastly remember that wheat grain in itself is only part of the revenue you capture with winter wheat. The price of winter wheat straw remains strong so please consider that revenue stream before any replant decisions are made.

Common Ragweed Confirmed ALS Inhibitor-Resistant in Brown County, Wisconsin

Recently, Thomas Butts, a graduate research assistant, Vince Davis, and Dave Stoltenberg confirmed that a common ragweed population in Wisconsin is resistant to an ALS inhibitor. The full report is now available. For more information, please visit the WCWS documents page.

Plant Disease Diagnostic Clinic (PDDC) Updates

Brian Hudelson, Sean Toporek and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from February 28, 2015 through March 6, 2015.

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<td>FRUIT CROPS</td>
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<td>Cherry</td>
<td>Bacterial Canker</td>
<td>Pseudomonas sp.</td>
<td>Dane</td>
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<td></td>
<td>Brown Rot</td>
<td>Monilinia fructicola</td>
<td>Dane</td>
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The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from March 7, 2015 through March 13, 2015.

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<td>VEGETABLES</td>
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<tr>
<td>Spinach</td>
<td>Cladosporium Leaf</td>
<td>Cladosporium variabile</td>
<td>Dane</td>
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<tr>
<td></td>
<td>Spot</td>
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</tbody>
</table>

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu
Soybean Management Strategies to Facilitate Timely Winter Wheat Establishment

Shawn Conley, Soybean and Wheat Extension Specialist

Winter wheat acres across WI have declined over the past few years due to high corn and soybean prices and late grain harvests. As farmers get ready to kick off the 2015 growing season here are a few suggestions to help get your 2016 winter wheat crop established on time.

- **Plant early** If weather and soil conditions allow for it plant the acreage you intend to go to winter wheat first. This is regardless of which crop you plan to follow (soybean, corn silage or field corn). Remember the optimal planting date window for most of our WI winter wheat acres is the last week of September through the first week in October. In Figure 1 below you will notice a 17 day delay in planting (May 5 to May 22) led to an average 7-10 day delay in when the soybean varieties hit R7. For a majority of the varieties examined (80%) this equates to roughly 21-28 days for that soybean crop to progress to the harvest ripe growth stage so we can establish our wheat crop on time.

Table 1. Calendar date for reaching R5 (beginning seed fill) and R7 (beginning maturity) growth stage (G.S.) by planting date and maturity group (M.G.) for the 2014 growing season at Hancock WI.

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>M.G.</th>
<th>Timing of G.S. Initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-May</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.9</td>
<td>29-Jul</td>
</tr>
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</tr>
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Crops

Soybean Management Strategies to Facilitate Timely Winter Wheat Establishment

Wisconsin Soybean Marketing Board Continues Free Nematode Testing Program for 2015

Plant Disease

Plant Disease Diagnostic Clinic (PDDC) Update

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- **Crop rotation matters.** Our long-term rotation data suggests winter wheat yields are greatest following soybean, followed by corn silage and lastly corn for grain. Therefore plan your rotation accordingly to maximize yield and system efficiency.

- **Consider an earlier maturity group soybean.** Plant a high yielding, earlier maturity group soybean to help get that soybean crop harvested on time. Though later maturing varieties "on-average" produce the greatest yields, data from our 2014 WI Soybean Variety Test Results show the maturity group range that included a starred variety (starred varieties do not differ from the highest yield variety in that test) was 1.9-2.8, 1.1-2.4, and 0.9-2.0 in our southern, central and north central regions respectively. This suggests that the "relative" maturity group rating is trumped by individual cultivar genetic yield potential. Therefore growers have options to plant an early maturity group soybean that will be harvested on time and not sacrifice yield.

- **Manage for the system not necessarily the crop.** If you are serious about maximizing wheat grain and straw yield on your farm one of the biggest contributing factors for both of these in WI is timely wheat planting. Make management decisions to facilitate that. *We all know what inputs can extend maturity that don't necessarily guarantee greater yields. So instead of listing them and fielding angry emails all weekend I am being strategically vague here* As a producer is it better to sacrifice 0-2 bushels of soybean yield or 10-20 bushels of wheat grain yield and 0.5 tons of straw?

As we all know mother nature holds the ultimate trump card on whether we will get our winter wheat crop established in that optimal window. These aforementioned strategies are relatively low risk to the farmer and regardless of what weather patterns we run into are agronomically sound.
Wisconsin Soybean Marketing Board Continues Free Nematode Testing Program for 2015

Shawn Conley, Soybean and Wheat Extension Specialist

Four out of every five animals on earth today is a nematode so it is not surprising that agricultural fields are home to many nematode species. Fortunately, most nematodes are beneficial to crop growth and soil health because their activities help decompose crop residues and cycle nitrogen and other nutrients. Pest nematodes do not threaten yield if their numbers remain low. The key to avoiding population explosions of nematode pests is to be proactive – know what the situation is and take appropriate measures when nematode numbers indicate a problem is brewing.

The WSMB sponsors free nematode testing to help producers stay ahead of the most important nematode pest of soybean, the soybean cyst nematode (SCN) (Figure 1). Eggs of SCN persist in the soil between soybean crops so a sample can be submitted any time that is convenient. The soil test report indicates the number of eggs in the sample and is useful for selecting the right variety for the next soybean crop. Retests of fields planted with SCN-resistant varieties over multiple years shows how the nematode population is responding to variety resistance and provides an early warning should the nematode population adapt to host genetics.

In 2015, the WSMB is again offering the expanded nematode testing program to include other pest nematodes in addition to SCN. These nematodes are less damaging to soybean than SCN but can cause enough yield loss to warrant treatment. As is the case for SCN, there are no rescue treatments for nematodes so the primary purpose of this year’s soil test is to plan for next year’s crop. Soil samples collected in corn for nematode analysis have predictive value for explaining yield if they are collected before the corn V6 growth stage. Sampling early in the season will provide information about the risk potential for the current corn crop AND the next soybean crop.

The assays used to recover nematode pests other than SCN in soil require that the nematodes are alive. So, it is important to keep the samples moist and at least room temperature cool. Collecting a sample that includes multiple cores ensures that there will be plenty of root pieces to assay. It is not necessary to include live plants in the sample. The soil test report will indicate which pest nematodes are present and at what quantities and their damage potential to soybean and corn based on the numbers recovered.

Free soil sample test kits are available now and can be requested at (freescntest@mailplus.wisc.edu).

For more information on SCN testing and management practices to help reduce the losses from this pest, please contact: Shawn Conley: spconley@wisc.edu; 608-262-7975 or visit www.coolbean.info.
The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from March 14, 2015 through March 20, 2015

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<thead>
<tr>
<th>PLANT/SAMPLE TYPE</th>
<th>DISEASE/DISORDER</th>
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<tr>
<td>FRUIT CROPS</td>
<td></td>
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<tr>
<td>Apple</td>
<td>Phomopsis Canker</td>
<td>Phomopsis sp.</td>
<td>Eau Claire</td>
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<td>SOIL</td>
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<tr>
<td>Alfalfa Soil</td>
<td>Aphanomyces Seedling Blight</td>
<td>Aphanomyces euteiches race 1 and race 2</td>
<td>Dodge (MN)</td>
</tr>
</tbody>
</table>

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).
What's New

Updated Handy Bt Trait Table .............................................. 19

Crops

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Notes from the ARS Cover Crop Plots................................. 19

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Plant Disease Diagnostic Clinic (PDDC) Update................. 21

Updated Handy Bt Trait Table

Bryan Jensen, UW Extension and IPM Program

Dr. Chris DiFonzo, Field Crop Entomologist from Michigan State University, has updated her Handy Bt Trait Table. I’m sure most of you will find keeping track of Bt traits and their spectrum of control to be confusing at best. Chris has updated two tables that will help considerably. The first table identifies the event name, specific protein(s) expressed and general control spectrum for each trade name. She also breaks down each trait family and identifies specific Bt proteins express, insects controlled or suppressed as well as refuge requirements.

Assessing Alfalfa Stands

Dan Undersander, Forage Agronomist

Hopefully, most alfalfa will come through the winter in good shape. However, there are some areas where alfalfa will show signs of injury or winterkill due to the lack of snow cover over winter. We expect that winterkill will be spotty and likely occur to a greater extent in fields with low soil pH, low potassium and sulfur and in older stands. So it is important to check individual fields for winter injury and kill to make planting decisions early. Identifying injury without kill will also indicate reduced yield for 2015 and allow consideration of any management changes in the future.

To read the full article click on the link below or scroll down to the end of this newsletter:


Vegetable Crop Update 4/3/15

The 2nd issue of the Vegetable Crop Update is now available. This issue contains information on fungicide registration and potato and hop updates. Click here to view this update.

Notes from the ARS Cover Crop Plots

Liz Bosak, Outreach Specialist, University of Wisconsin-Madison

This past week at Arlington Agricultural Research Station, the pre-season activities increased with fields starting to dry out, deliveries of seed and supplies, and a rush to finish any winter equipment maintenance. A cereal rye cover crop, seeded the first week of September 2014, had shifted from the purple leaf color indicative of winter to the green leaf color of spring (Fig. 1). The next set of photos shows what an oat cover crop, seeded at the same time, looks like after winterkill in early spring (Fig. 2). For more information about cover crops that winterkill and termination methods for those that will survive the winter, see the “Cover Crop Termination” fact sheet at http://wcws.cals.wisc.edu/documents. If you are planning on using cereal rye for forage, please consult the “Cereal Rye Silage after Corn Silage” fact sheet at http://wcws.cals.wisc.edu/documents. To determine whether the rotational restrictions for your herbicide program have been satisfied. There is also a fact sheet discussing herbicide rotational restrictions for spring-seeded forages after corn silage. For a complete listing of University of Wisconsin-Extension resources, please visit the Wisconsin Cover Crops website at http://fyi.uwex.edu/covercrop.
Figure 1. Cereal (winter) rye, *Secale cereale*, cover crop on April 3, 2015 at Arlington Agricultural Research station.

Figure 2. Oat, *Avena sativa*, cover crop on April 3, 2015 at Arlington Agricultural Research station.
Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Sean Toporek and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from March 28, 2015 through April 3, 2015.

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<td>FRUIT CROPS</td>
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</tr>
<tr>
<td>Pear</td>
<td>Sphaeropsis Canker</td>
<td>Sphaeropsis sp.</td>
<td>Waupaca</td>
</tr>
<tr>
<td>VEGETABLES</td>
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<tr>
<td>Potatoes</td>
<td>Common Scab</td>
<td>Streptomyces scabies</td>
<td>Oneida</td>
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<tr>
<td>Spinach</td>
<td>Fusarium Wilt</td>
<td>Fusarium oxysporum</td>
<td>Dane</td>
</tr>
<tr>
<td></td>
<td>Root Rot</td>
<td>Pythium sp.</td>
<td>Dane</td>
</tr>
</tbody>
</table>

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
Mark Weihing is the 2015 Wisconsin CCA of the Year

Bryan Jensen, UW Extension and IPM Program

The Wisconsin CCA Board would like to congratulate Mark Weihing as the 2015 Wisconsin CCA of the Year! Mark’s crop advising experience totals more than 34 years and included positions as a Dairy Farm Manager, Farm Supply Manager, UW Extension Agricultural Agent as well as positions with DuPont Pioneer. Mark currently serves a combined appointment with Bob’s Crop Center and Tri County Seeds and Chemicals.

Mark’s career has seen several new production initiatives including precision agriculture, biotechnology and nutrient management. Mark has mentored clients and colleagues on ways to adopt these practices in a way that best suits their needs. As one of his clients stated in his support letter “Mark has a very good grasp on the different types of technology that is out there and is able to give us recommendations on what he thing would benefit our operation”.

Mark’s service to the agricultural industry included 8 years on the WI CCA board, 5 years as chair and 6 years representing Wisconsin on the ICCA Board. His service to his community also deserves mention. He is chair of the church council, an active fire and EMS responder (including 25 years as EMS captain) and Training Officer/Chief of the Rock Springs Fire Department. He also has had an active career in the Jaycees including president of the Marinette Chapter. While in Reedsburg he continued to serve the community as District Director, Outstanding Young Farmer Program Chair, Secondary Advisor to the president of the Wisconsin Jaycees, Senator and recognition as Wisconsin Jaycee Statesman.

So please make it a point to congratulate Mark as the 2015 Wisconsin Certified Crop Advisor of the Year.

Congratulations Mark!

UW Soil & Plant/Forage Analysis Labs Consolidation Update

Robert Florence, Laboratory Director

I would first like to introduce myself. My name is Robert Florence and I am the new Director of the UW Soil & Plant Analysis Lab at Madison (SPAL) and Soil & Forage Analysis Lab at Marshfield (SFAL). I recently arrived at Marshfield after earning my Ph.D. from Kansas State University and working as the manager of K-State’s soil testing lab. I look forward to meeting all of you and listening to your comments about how the laboratory may continue to serve you.

You may be aware that SPAL and SFAL are consolidating operations at Marshfield. This change will allow us to maintain service to all of our clients. Consolidation will mean that samples will eventually have to be shipped or delivered to Marshfield. The Madison laboratory will continue processing samples for now, but analyses will be incrementally transitioned to Marshfield over time. We anticipate that nearly all tests only run at Madison will be offered at Marshfield with the exception of some little requested analyses.
and/or analyses for which we cannot recover costs. We are in the process of purchasing an instrument for Marshfield so that we can continue to offer plant and elemental analysis. Analyses currently offered at Marshfield will be unaffected by this consolidation. Before sending samples to Madison, please call Jodie (715-387-2523) to determine where your samples should be sent.

We want to make this change as easy as possible for you. We understand that you may have concerns about how to send samples to Marshfield and how you will interact with lab staff if you never see them in person. If at any time you have questions about how to fill out sample submission forms, where to send your sample, need assistance in selecting analysis, need to know how much sample is required, or have shipping questions, please feel welcome to call us (715-387-2523). Our website (www.uwlab.soils.wisc.edu) has sample submission forms and periodic updates on the status of the laboratory consolidation. When shipping samples be sure to send a completed sample submission form including your contact information. The lab staff will contact you if they have questions about your samples.

I am very much interested in learning about your analytical needs and how we can serve you better. Please feel free to call (715-387-2523 x 13) or email (rflorence@wisc.edu) me. I look forward to working with you.

**Vegetable Crop Update 4/10/15**

The 3rd issue of the Vegetable Crop Update is now available. This issue contains information on early season disease in vegetable crops, an introduction to disease forecasting tools which will be offered in 2015, and resources for irrigation scheduling. Click [here](#) to view this issue.

The 1st Disease Supplement of the Vegetable Corp Update is also available. This supplement contains information on the status of Blocker 4F for potato common scab. Click [here](#) to view this supplement.

**The Relationship Between the Causal Agent of SDS and and SCN in Wisconsin**

David Marburger, Shawn Conley, John Gaska and Laurie Gerber, Department of Agronomy, UW-Madison; Ann MacGuidwin and Damon Smith, Department of Plant Pathology, UW-Madison

**Introduction**

Soybean Cyst Nematode (SCN) is an economically important disease of soybean in Wisconsin. It was first discovered in the southeastern part of the state in 1981 and now is found in counties representing over 90% of the state’s soybean acres (Figure 1). It is caused by the soybean cyst nematode, a non-segmented roundworm that inhabits the soil. More recently, another economically important disease of soybean, Sudden Death Syndrome (SDS), was first found in southeastern WI in 2006. A fungus found in the soil called *Fusarium virguliforme* is the causal agent of SDS.

To read the full article click on the link below or scroll down to the end of this newsletter:


**Monitor Seedcorn Maggot Degree Days for Successful Planting of Untreated Soybean Seed**

Kevin Shelley, UW Nutrient and Pest Management Program

In this year of predicted tight margins for producing field crops, farmers are asking which expenses they might be able to cut—treated soybean seed might be an option. Soybeans are often planted with seed treatments, however, integrated pest management (IPM) practices can be used for successful planting of untreated soybean seeds. The insect pest causing greatest concern for untreated soybean seed is the seedcorn maggot (SCM). SCM larvae create damage by burrowing into soybean seeds and feeding on cotyledons and the hypocotyl of developing seedlings, thus causing possible decay and death. SCM overwinters as a pupae and develops through the adult, egg and larval stages very predictably according to heat unit, or insect degree day, accumulation. Tracking SCM degree days, available on the UW-Extension Ag Weather website (http://agwx.soils.wisc.edu/), can help soybean and other crop growers avoid planting during the most vulnerable times for SCM feeding, thus providing an IPM tool for cultural (non-chemical) control of SCM.

In upper Midwestern states, SCM undergoes three generations within a season. Female adults (flies) are attracted to freshly tilled fields with decaying organic material—incorporated legumes and green cover crops are most attractive. No-till and minimum till fields with no green vegetation are the least attractive but may have some vulnerability during times of peak SCM activity. Peak emergence of adults (peak flight times) are when the greatest egg laying in soil occurs. Eggs hatch within 2-4 days, at which time untreated seeds and seedlings are vulnerable to larval feeding damage. Avoiding the peak flights and planting near the time where SCM is entering its non-feeding pupal stage can be accomplished by monitoring SCM degree day accumulation.

The UW-Extension Ag Weather website uses data from weather stations to calculate daily accumulations of degree days for several crop insect pests, including SCM. In the Thermal Models section of the website, choose Seedcorn Maggot to view a map showing
current accumulated SCM degree days for regions across Wisconsin and Minnesota. Or, choose the Generic Degree Day Calculator to input specific latitude and longitude information for your field/farm to calculate degree day accumulations for SCM or 17 other pest categories.

The following table shows the SCM Fahrenheit degree day (DD) accumulations associated with peak flights for each of the SCM population’s three generations. An additional 450 Fahrenheit degrees days are required for development to progress through the egg, larval and beginning pupal stage. Again, planting between peak flights and more near onset of the pupal stage is the goal.

### Seedcorn Maggot Fahrenheit Degree Day Accumulations from the January 1 Biofix Date Required for Adult Peak Flight and Pupal Development Stages:

<table>
<thead>
<tr>
<th></th>
<th>1st generation</th>
<th>2nd generation</th>
<th>3rd generation</th>
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<tr>
<td>SCM DD to peak flight</td>
<td>360</td>
<td>1080</td>
<td>1800</td>
</tr>
<tr>
<td>SCM DD to pupal stage</td>
<td>810</td>
<td>1530</td>
<td>2250</td>
</tr>
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</table>

More detailed information on cultural control methods for SCM in soybeans, corn and vegetable crops, including identification, lifecycle and using SCM degree days to time plantings when using untreated seed, can be found in UWEX Publication A3972 *Insect IPM in Organic Field Crops: Seedcorn Maggot*. The publication is available at the UWEX Learning Store website: [http://learningstore.uwex.edu/Assets/pdfs/A3972-01.pdf](http://learningstore.uwex.edu/Assets/pdfs/A3972-01.pdf). The information provided is not limited to organic production.

### Wisconsin Winter Wheat Disease Update – April 15, 2015

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin–Madison

This week I scouted winter wheat in research trials located at the Arlington Agricultural research station and also some commercial fields in southern Wisconsin. Wheat in these locations has greened up and is beginning to tiller (Fig. 1). I have observed very little winterkill on winter wheat in the fields I have looked at. Overall the winter wheat crop is looking good at these early stages with stands looking strong for the most part (Fig. 2).

Unlike the last couple of years, I have not observed any wheat diseases yet. Sometimes, Septoria leaf blotch can be observed very early in Wisconsin. We should begin to scout for diseases during these early tillering periods. If you find that Septoria leaf blotch is already present in wheat fields, then the base is set to build disease quickly if conditions are cool and wet this spring. If the spring turns to being cool and wet and a susceptible variety present, then this disease will increase and can cause enough damage to limit grain yield. To learn more about leaf blotch disease on wheat, consult [THIS FACT SHEET](http://learningstore.uwex.edu/Assets/pdfs/A3972-01.pdf).

Another disease to scout for at these early stages of wheat development is powdery mildew. This disease starts out as a white fluffy growth on the surface of the leaves and can progress quickly when humidity is high and temperatures fluctuate from warm days to cool nights. As the disease progresses, it can continue to cover more leaves, and the white growth may become more gray or brown in appearance. Like Septoria, if you notice early infections of powdery mildew, you have a susceptible variety planted, and conditions are conducive for the disease, then careful monitoring will be critical for making decisions about in-season control. To learn more about powdery mildew on wheat, consult [THIS FACT SHEET](http://learningstore.uwex.edu/Assets/pdfs/A3972-01.pdf).

![Figure 1. Winter wheat plants in a field in Southern Wisconsin](image)
Spraying fungicide when plants are very young (prior to jointing) isn’t generally recommended in Wisconsin. However, spraying to protect the flag leaf and later growth stages during heading can help preserve yield when this disease is a problem. In 2013 we conducted a fungicide trial on wheat where Septoria leaf blotch was the main disease of concern. In that trial we found that applications of fungicide at the early flag leaf emergence stage (Feekes 8) gave us good control of Septoria leaf blotch, which translated into giving us a yield increase over not spraying or spraying prior to jointing (Feekes 5). To read more about the results of this fungicide trial, you can visit THIS WEBPAGE.

In 2014, conditions were not very favorable for leaf diseases on winter wheat. However, Fusarium head scab was prevalent throughout much of Wisconsin. In our 2014 fungicide efficacy trials, we found that spraying at flag leaf emergence (Feekes 8) did not offer much yield advantage. However, spraying at anthesis (first flower; Feekes 10.5.1) did provide a significant increase in yield and significantly reduced the level of vomitoxin in grain samples. To read more about the results of the 2014 fungicide trial, you can visit THIS WEBPAGE.

The 2013 and 2014 field trials demonstrate the importance of frequent scouting of wheat to determine the right timing of fungicide application. In some years, you might need to spray at Feekes 8, in others at Feekes 10.5.1, while in some years at both timings.

In addition to the results of our field trials, you might also consult the 2015 Small Grains Fungicide Efficacy Table that was recently updated. This table offers unbiased, university research-based ratings of fungicides used on small grains. It is compiled by university research and extension pathologists from all over the country. You can find the latest table by CLICKING HERE.

It is a good idea to begin scouting now to determine what diseases are already present in wheat. Continue to watch weather forecasts as the crop matures and make plans for disease intervention measures (such as fungicide) if conducive disease conditions are present near flag leaf emergence and/or heading later this season. SCOUT, SCOUT, SCOUT!

**Fungicide Efficacy Tables Updated for 2015!**

Damon Smith, Extension Field Crops Plant Pathologist

The corn, soybean, and small grains fungicide efficacy tables have been updated for the 2015 field season. The efficacy tables reflect efficacy ratings from a group of land grant extension pathologists from around the country. These ratings are based on unbiased, university efficacy trials over multiple years and locations. Not all products labeled for a particular crop are included on the table. This is because some products are relatively new and not enough data is available for the scientists to make a reliable rating. These tables do not reflect any advertising or endorsement of any product. These data are merely for your information as you work on developing your disease management plans for the 2015 grain cropping season. The tables can be found and downloaded as a PDF by clicking on the FUNGICIDE INFORMATION page and scrolling down. Or you can click here for the CORN table, SOYBEAN table, or SMALL GRAINS table.

To view the table, click on the link below or scroll down to the end of this newsletter:

http://fyi.uwex.edu/fieldcroppathology/files/2015/04/2015-Corn-Fung-Table.png

**New Wheat Powdery Mildew Fact Sheet**

Damon Smith, Extension Field Crops Plant Pathologist

A new fact sheet concerning powdery mildew of wheat has recently been published. The fact sheet describes symptoms of the disease and how to best manage it. To obtain a PDF version of the fact sheet, visit the fact sheet section of the UW-Madison Field Crops Pathology website or CLICK HERE TO DOWNLOAD.

To view this factsheet click on the link below or scroll down to the end of this newsletter:

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from April 4, 2015 through April 10, 2015.

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<tr>
<td>Watermelon</td>
<td>Seed Rot</td>
<td><em>Rhizopus stolonifera</em></td>
<td>Winneshiek (IA)</td>
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<td>SOIL</td>
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<tr>
<td>Soybean Soil</td>
<td>Soybean Cyst</td>
<td><em>Heterodera glycines</em></td>
<td>Dane</td>
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</table>

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).
**Soybean Planting Date by Maturity Group Considerations for 2015**

Article coauthored by Dr. Shawn P. Conley and Adam Gaspar

Early May planting in Wisconsin has been documented to increase soybean seed yield due to increased light interception (Gaspar and Conley, 2015). In theory, earlier planting can potentially intercept greater amounts of solar radiation due to a longer growing season and therefore longer maturity group (MG) soybean varieties may be better suited to maximize yield if they can mature before a hard fall frost. Unlike 2013 and 2014, 2015 may provide growers with an opportunity to plant their soybean crop earlier than ever before. Yet, in some instances (weather or logistical problems) planting will be delayed or replanting may be needed. Therefore, investigating the effect of different MG’s at multiple planting dates across the state would provide WI growers with BMP’s for soybean establishment regardless of planting timing.

To answer this question field trials were initiated at Arlington, Hancock, and Spooner, WI in spring of 2014. The five planting dates at each location were planting roughly on: (1) May 7th, (2) May 20th, (3) June 1st, (4) June 10th, and (5) June 20th. Planting after June 20th is not recommended in WI. Two varieties within each MG from a 2.5 all the way down to a 00.5 were tested depending upon the location and planting date and are displayed in Table 1.

| Table 1. Maturity Group’s tested within each location and planting date. |
|------------------------|---------------|-------------|---------------|
| **Planting Date**      | **Arlington** | **Hancock** | **Spooner**   |
| 1 (May 7th)            | 2.5, 2.0, 1.5 | 2.5, 2.0, 1.5 | 1.5, 1.0, 0.5 |
| 2 (May 20th)           | 2.5, 2.0, 1.5 | 2.5, 2.0, 1.5 | 1.5, 1.0, 0.5 |
| 3 (June 1st)           | 2.0, 1.5, 1.0 | 2.0, 1.5, 1.0 | 1.0, 0.5, 0.0 |
| 4 (June 10th)          | 2.0, 1.5, 1.0 | 2.0, 1.5, 1.0 | 1.0, 0.5, 0.0 |
| 5 (June 20th)          | 1.5, 1.0, 0.5 | 1.5, 1.0, 0.5 | 0.5, 0.0, 00.5 |
Let's start with the easy and redundant part, get your soybeans in the ground ASAP to maximize yield. This is evident again in this trial, where Figure 1 shows the effect of planting date across all MG’s (varieties) tested in 2014. If the soil is fit, soil temps are near 50 °F, and the forecast is favorable…. get the planter rolling!

![Yield graph](image)

Figure 1. Dots represent the mean yield within each planting date for each location. The average yield loss per day for delaying planting past May 7th is presented in the legend.

However, the question still remains for many producers, should I use a longer maturity variety in early planting situations (very possible in 2015) and should I switch to an earlier maturing variety when planting is delayed?

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Arlington</th>
<th>Hancock</th>
<th>Spooner</th>
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</thead>
<tbody>
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<tr>
<td>2 (May 20th)</td>
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<td>3 (May 30th)</td>
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</tr>
<tr>
<td>4 (June 10th)</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>5 (June 20th)</td>
<td>**</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

** MG had a significant effect on yield at the $P < 0.05$ level
Based upon the 2014 data, only 2 out of 15 location x planting date combinations displayed a significant effect of MG on yield (Table 2). So the moral of the story is that within a realistic MG range for your region and planting date, variety selection should be based heavily upon the varieties past local and regional performance, disease package, and etc. Variety selection heavily based upon the MG is not a silver bullet to frequently increasing yields.

However, there are always caveats…… Growers may consider trying a slightly longer maturing soybean on a portion of their acres because there is a “potential”, but not guarantee, for higher yields with no additional dollars spent. Within planting date 1, there was no significant MG effect, but MG 2.5 did yield the highest numerically in Arlington and Hancock with no fall frost damage, while the same is true for MG 1.5 in Spooner. The longest MG tested within each planting date in our study numerically yielded the highest through June 10th (planting date 4).

On the back end of the planting season, the inverse was seen. Within planting date 5 at Arlington and Hancock, MG 1.5 did not mature before the first fall frost and was the lowest yielding. Therefore, growers may consider switching to an earlier maturing variety as planting is delayed into June. If switching to an earlier maturing variety, don’t use a variety less than 0.5 MG earlier than a full season variety (2.5 in southern WI) in early June. However, if planting is delayed into mid to late June then a variety that is greater than or equal to a full MG earlier should be considered.

Acknowledgements: The authors would like to thank the Wisconsin Soybean Marketing Board and DuPont Pioneer for supporting this research.

References:

Vegetable Crop Update 4/17/15
The 4th issue of the Vegetable Crop Update is now available. This issue contains late blight updates and reminders and updates on management of basil downy mildew. Click here to view this update.

2015 Wisconsin Soybean Yield Contest
Shawn Conley, Soybean and Wheat Extension Specialist
Wisconsin growers are producing soybeans more efficiently than they were 30 years ago, and we want to recognize the efforts and achievements of Wisconsin’s top soybean producers.

- 2015 Wisconsin Soybean Yield Contest Brochure
- 2015 Wisconsin Soybean Yield Contest Rules
- 2015 Wisconsin Soybean Yield Contest Entry Form

Scout your fields for weed seedlings this spring
Liz Bosak, Outreach Specialist, Department of Agronomy
The fields may look cold, wet, and dormant this week but weeds were germinating in some fields in Janesville and Arlington last week. On April 17 at Janesville, common lambsquarters, giant ragweed, and horseweed were emerging (Fig. 1A-D). At Arlington in a plowed area, velvetleaf was emerging (Fig. 2). If you are leasing new land this year or want to get a head start on weed management, then scouting for weeds at the seedling stage before tillage can be a good way to assess density, the number of weeds in a given area, and for which weed species will likely be an issue around planting time. The Weedometer, developed by University of Wisconsin, can predict when weed species will likely be emerging for your location at http://weedecology.wisc.edu/weedometer/. A guide to identifying the “Common Weed Seedlings of the North Central States” is available in pdf and print formats at Cooperative Extension’s Learning Store, http://learningstore.uwex.edu/Common-Weed-Seedlings-of-the-North-Central-States-P161.aspx or on the WCWS Weed info page, http://wcws.cals.wisc.edu/weed-info/.
Figure 1. A) Common lambsquarters, Chenopodium album; a soil sampler, one inch diameter, is in the foreground B) Horseweed (marestail), Conyza canadensis; C) Giant ragweed, Ambrosia trifida, with seed capsule attached; D) Giant ragweed seedlings.

Figure 2. Velvetleaf, Abutilon theophrasti, seedling.
Knowledge of weed emergence is very important as it help in the selection and optimization of early season weed control. While typically weed emergence is consistent from year to year, the last two years have not followed this trend. During the 2012 growing season we saw weeds emerging 2-4 weeks earlier than typical. But in 2013, many species emerged 2-3 weeks late. So we can’t assume that weed emergence will be the same every year.

So what is happening in 2015? I visited the Arlington Weed Garden last week to determine what has emerged and it appears most species are on target for typical germination/emergence in 2015. Of the 100+ species at the Arlington weed garden 40% of the common Wisconsin weeds have emerged. Of these 41 species, all of the biennial weeds have emerged, while 40% of the perennial and 29% of the annual weeds have broken through the soil surface.

Henbit

Winter annuals (shepherd’s purse, fleabane, chickweed, downy brome, Field pennycress, prairie pepperweed, pineapple weed, henbit) are well developed and some are beginning to flower as you can see from this picture of henbit.

Most early emerging summer annuals have just germinated and are at the cotyledon to first true leaf stage (Russian thistle, knotweed, kochia, common ragweed, and giant ragweed). These are close to historical average emergence times for these species. For example common and giant ragweeds typically emerge on April 5th or 6th respectively and I viewed cotyledons present on my visit to the weed garden on 4/16 indicating that they emerged the prior week (see pictures below). Common lambsquarter is the only exception to the list, but I have noticed it emerged elsewhere.
We are still waiting for pigweeds and foxtails to emerge, which typically around May 1st. With the current and projected weather for the next couple of weeks I expect their emergence to be on time as well.

A summary of average emergence along with the ability to create a graphic that estimates emergence and flowering time can be found at this link (weedometer):

http://weedecology.wisc.edu/weedometer/

This tool allows you to even change the location and estimate emergence at other locations throughout the state (and United States). A common rule of thumb however, is that what we observe at Arlington is occurs 2-4 weeks later in northern Wisconsin, and 1-2 weeks earlier in southern Wisconsin.

New Forecasting System for Fusarium Head Blight Now Available

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

Fusarium head blight (FHB or scab) was a very damaging disease for many winter wheat growers in Wisconsin in 2014. This disease is caused by a fungus called *Fusarium graminearum* and infects the heads when the wheat flowers are open. Not only does the colonization of the fungus into the grain cause a reduction in kernel size and overall development, but also the fungus can produce a toxin called deoxynivalenol or vomitoxin. Vomitoxin can be extremely toxic to not only humans, but also livestock. For more information about the specific biology and management of FHB, CLICK HERE to download a fact sheet.

One of the primary methods of controlling FHB in-season is to spray fungicide. Much work has been done by university extension pathologists to determine the best time to spray fungicide to control the disease. It turns out that fungicides targeted at the anthesis (beginning flowering stage or Feekes 10.5.1) period do a good job of protecting the plants and controlling FHB. Additionally, we now know that fungicide applications up to 5 days after anthesis can also be effective in controlling FHB. Application of fungicide 7-10 days after anthesis will offer minimal control based on university research trials sponsored by the US Wheat and Barley Scab Initiative. For a list of products with efficacy on FHB, consult the 2015 Small Grains Fungicide Efficacy Table BY CLICKING HERE.

As you can tell, the timing of application of fungicide is critical for controlling FHB. You can apply the best product available, but if it goes on too early or too late, the application will be wasted. Furthermore, in some years, weather conditions will not be conducive for onset of FHB. This means that if it is really dry during the anthesis (flowering) period, infection by the FHB fungus will be low and little disease will develop. An application during dry weather at flowering will mostly be unnecessary. In order to assist growers and consultants on making fungicide application decisions to control FHB, an online FHB forecasting tool was developed. The tool can be found here: http://www.wheatscab.psu.edu.
In previous years, the tool has tended to under-predict FHB infection events and under-represent the amount of FHB in Wisconsin. After more data was collected and new models were assembled, a new version of the FHB forecasting system has just been released to try to improve the accuracy of the FHB forecasting system. This new 2015 release is now active and functions automatically when you visit the link above. An additional change for 2015 in the winter wheat model is the addition of susceptibility levels for the winter wheat variety you are growing. Previously, the ‘susceptibility’ choice was not available for winter wheat. Consult your seed guide to determine the level of susceptibility for your variety in order to make this input. If you can’t find this rating, then simply choose ‘susceptible. After reviewing the model and the new forecasting system at our annual wheat disease workers meeting, I think that this system is a good improvement over the other forecasting system. I believe that this system has a model with better predictive accuracy. Of course, this does not mean that it can’t fail, but should be a good tool for decision-making purposes. Remember, that your working knowledge and previous experiences are still good predictors of FHB. So even if the model is saying that risk is low and your gut says it is high, go with the ‘boots-on-the-ground’ observations and your gut.

The best time to consult the FHB forecasting system is prior to heading, and through the anthesis period. Begin consulting the model when wheat is in the boot to get a feel for the risk conditions that lead up to the flowering period in your area. Once heads have emerged and flowers are beginning to open, daily consultation of the model can assist in making that decision to spray during that critical Feekes 10.5.1 timing.

You should find the model fairly easy to use. After clicking on http://www.wheatscab.psu.edu you will be brought to the main page (Fig. 1). Enter your state (step 1) and then choose the wheat class (winter or spring) in step 2 (Fig 2). The model will update in real-time, giving you color coded risk levels. You can also choose a forecast (up to 72 hours ahead) in step 3 (Fig. 2). Additionally, your state wheat pathologist will have most likely written a commentary in the text box at the top of the page, once you have chosen your state. In Wisconsin, I try to update this weekly, especially during the critical time for controlling FHB. Remember to keep scouting and paying attention to the weather, in addition to consulting the FHB forecasting system. Here’s to an FHB-free season!

Safe rates of seed placed starter fertilizer

Carrie Laboski, Professor and Extension Soil Fertility/Nutrient Management Specialist

Without fail every year after planting, questions start popping up about pop-up fertilizer. The questions always occur when there are emergence or germination issues. So before planting gets into full swing, let’s think about seed placed starter. For the purpose of this article I will use seed placed, pop-up, and in-furrow interchangeably.

Why are fertilizer salts a problem?

Excessive concentrations of fertilizer salts near a germinating seed or seedling root causes injury. The injury is caused when the concentration of ions in the soil is greater than the concentration of ions within the plant cells. The high osmotic pressure created by the fertilizer salts causes water to move out of the plant cells and into the soil. As water moves out of the plant cells, the tissue dessicates and becomes blackened; hence the term fertilizer burn. The result is the eventual death of the plant tissue.

Some nitrogen fertilizers may cause more seedling and germination injury than expected based on their salt content alone if they liberate ammonia when applied to the soil. Free ammonia is toxic and can move freely through the plant cell wall (Havlin et al., 1999). Urea, UAN, ammonium thiosulfate and DAP can cause more damage from ammonia toxicity than MAP, ammonium sulfate, and ammonium nitrate (Havlin et al., 1999; Reid, 2006; Mortvedt, 2001). Moderate alkaline soil conditions, either in the bulk soil or caused by reaction of the fertilizer, will promote ammonia production.

Factors affecting fertilizer burn

Crops vary in their tolerance to salts. A list of common crops and their relative sensitivity to salts is given in Table 1. Reid (2006) suggests that no fertilizer be placed with the seed of super sweet hybrids of sweet corn, soybean, edible beans, and peas because of their sensitivity to salts.
Table 1. Relative sensitivity of common crops to fertilizer salts.*

<table>
<thead>
<tr>
<th>Crop</th>
<th>Relative sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>Least sensitive†</td>
</tr>
<tr>
<td>Corn</td>
<td>↓</td>
</tr>
<tr>
<td>Forage legumes</td>
<td></td>
</tr>
<tr>
<td>Soybean and Edible bean (dry or snap)</td>
<td></td>
</tr>
<tr>
<td>Vegetables including sweet corn</td>
<td>Most sensitive</td>
</tr>
</tbody>
</table>

* Reproduced from Reid (2006).
† Least sensitive does not mean that the crop is not sensitive to salt.

Soil conditions are important for determining why injury may occur in one year and not another. Fertilizer salts diffuse away from the band in moist soils and becomes diluted, reducing the osmotic pressure. Little diffusion takes place in dry soils and the fertilizer remains concentrated with a high osmotic pressure presenting a greater risk to plant injury. Soils with low cation exchange capacity (CEC) (coarse-textured with low organic matter content) have a lesser ability to react with the fertilizer compared to high CEC soils (fine-textured) meaning that the concentration of fertilizer salts in the soil solution remains high (Reid, 2006). Thus, fertilizer burn is a bigger issue on sandy, low organic matter soils particularly in dry springs. Soil temperature also plays a role. Roots grow slowly in cold soils; thus, the root is exposed to the higher concentration of fertilizer for a longer period of time.

Concentration of fertilizer salts is another factor that determines whether or not fertilizer burn occurs. Broadcast fertilizer applications do not often injury seedlings because the fertilizer is dispersed through a large volume of soil. Banded starter fertilizers placed two inches to the side and two inches below the seed are more likely to cause injury than broadcast applications because banded applications are much more concentrated in a small area near the seed. However, at typical starter fertilizer application rates, fertilizer burn from banded starter fertilizer is unlikely. In-furrow (pop up or seed row) placed fertilizers are typically applied at low rates but their very close proximity to the seed means that they are more likely to cause injury than 2x2 banded applications because there is little opportunity for the root to grow out of the zone of concentrated fertilizer salts before it dies. In general to avoid stand loss from fertilizer injury, no more than 10 lb/a of N + K2O should be applied in-furrow regardless of soil texture. The most suitable fertilizers for in-furrow applications will have: 1) low salt index, 2) high water solubility, 3) no compounds that liberate NH3, and 4) use potassium phosphate instead of KCl as the K source (Mortvedt, 2001).

Safe rates of in-furrow fertilizer

Salt index (SI) of a fertilizer is a measure of the salt concentration that fertilizer induces in the soil solution (Mortvedt, 2001). However, there are many steps in calculating salt index and it can be a bit confusing. South Dakota State University developed a Fertilizer Seed Decision Aid spreadsheet and web calculator based on field and greenhouse research. The Fertilizer Seed Decision Aid requires users to select the crop to be grown, fertilizer type, seed furrow width, row spacing, tolerated stand loss, soil texture and soil moisture at planting. The tool will then output a maximum rate of fertilizer to apply with the seed. The tool is really handy in assessing scenarios. For example, what if the soil was wetter or drier; what if I can accept more or less stand loss. Using the tool you will find that some relatively common practices may be a little riskier than you think. A good example of this is using ammonium thiosulfate in seed placed starters. You can access the Fertilizer Seed Decision Aid here: [http://www.sdstate.edu/ps/extension/soil-fert/fertapp.cfm](http://www.sdstate.edu/ps/extension/soil-fert/fertapp.cfm)

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**Report on 2014 Wisconsin Agricultural Land Prices**

A.J. Brannstrom, University of Wisconsin Center for Dairy Profitability

(A link to the full report is at the end of this brief summary.)

Ag land values up 5% in 2014. High milk prices and low interest rates combined to drive Wisconsin agricultural land prices higher again in 2014. While there is great variation in valuation from one sale to another, the WI Department of Revenue transfer return data confirms that agricultural land values have increased in most of the state.

The average price of agricultural land sold in Wisconsin in 2014 reached $3,935. This was a 5% increase from 2013. The total acres sold declined by 5% and the number of sales were down by 8%. Strong dairy prices and low interest rates helped to create new record highs. Prospects for 2015 are less clear.

Farmland is the most valuable asset on any farmers’ balance sheet. However, estimating land values is always difficult. There is nothing more unique than an individual parcel of land. While many thousand homes are sold each year, only a small fraction of the state’s agricultural land changes hands on the open market in any given year.

Surveys of farmers, bankers, realtors and appraisers are sometimes used to estimate changes in land values. While easy to conduct, these opinion surveys can be hard to interpret. News of high priced sales travels quickly – but these sales are often the exceptions and not reflective of the market.

Fortunately, the Wisconsin Department of Revenue (DOR) collects an alternative source of agricultural land sales data. A transfer return tax is collected each time a property is sold, and a transfer return form is collected with the tax. Information from these transfer return forms is the source for this paper.

Wisconsin’s agricultural land values are low compared to some of our highly productive neighboring states – but a larger portion of our land is not suitable for continuous row crop farming and more of our land is used for forage production, woodlots and pasture. The shorter growing season in northern Wisconsin also limits the potential agricultural value of the land. **Continue to read the full article, click below...**

Click here to view the full report, *Wisconsin Agricultural Land Prices 2009-2014*

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**Wisconsin Pest Bulletin 4/23/15**

A new issue of the Wisconsin Pest Bulletin from the Wisconsin Department of Agriculture, Trade and Consumer Protection is now available. The Wisconsin Pest Bulletin provides up-to-date pest population estimates, pest distribution and development data, pest survey and inspection results, alerts to new pest finds in the state, and forecasts for Wisconsin’s most damaging plant pests.

Issue No. 1 of the Wisconsin Pest Bulletin is now available at:

[http://datcpservices.wisconsin.gov/pb/index.jsp](http://datcpservices.wisconsin.gov/pb/index.jsp)


**Herbicide Injury Diagnosis for Corn Seedlings at Emergence**

Liz Bosak, Outreach Specialist, Department of Agronomy

Depending upon the herbicide, injury can occur after a pre-emergence application when corn is germinating in cool, wet soils. This year, if corn was planted in mid-April then you may observe some injury. However, it is important to remember that other environmental factors can mimic herbicide injury symptoms such as corn emerging in crusted or compacted soil. For this spring, WCWS has a re-designed online diagnostic tool, available at [http://wcws.cals.wisc.edu/herbicide-injury-diagnostic-tool](http://wcws.cals.wisc.edu/herbicide-injury-diagnostic-tool) or from the main page [http://wcws.cals.wisc.edu](http://wcws.cals.wisc.edu) go to ‘Resources’ and then to ‘Tools’. The diagnostic tool asks three basic questions: 1) When do injury symptoms appear? 2) Are both broadleaves and grasses affected or just one group? and 3) What are the symptoms and where do they occur? The original web-based tool was developed by Tim Trower and Chris Boerboom to accompany a handy two-page guide available at [http://ipcm.wisc.edu/download/pubsPM/herbicideinjury_new.pdf](http://ipcm.wisc.edu/download/pubsPM/herbicideinjury_new.pdf). The following changes were made to the new version:

1. Each page shows your previous answers.
2. A ‘Start over’ button is located at the bottom of each page.
3. For each herbicide mode-of-action, an herbicide chart from the TakeAction poster available at [http://takeactiononweeds.com/wp-content/uploads/2014/01/herbicide-classification-chart.pdf](http://takeactiononweeds.com/wp-content/uploads/2014/01/herbicide-classification-chart.pdf) or on the WCWS website under ‘Resources’, ‘Documents’ (Fig. 1).
4. Simplified guides to symptoms that mimic herbicide injury during and after emergence are included on each mode-of-action page (Fig. 2).
5. Photo galleries for both corn and soybean injury symptoms are located on the same page (Fig. 3).

---

**Figure 1.** Herbicide site-of-action groups, chemical families, active ingredients, and product examples for the seedling shoot growth inhibitor mode-of-action. Specific sections of the larger TakeAction chart are on each mode-of-action page.
Table 1. Mimics of Herbicide Injury to Corn

<table>
<thead>
<tr>
<th>GROUP #</th>
<th>HERBICIDE SITE OF ACTION</th>
<th>SYMPTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>ALS INHIBITORS</td>
<td>Improper starter fertilizer placement</td>
</tr>
<tr>
<td>4 19</td>
<td>GROWTH REGULATORS</td>
<td>Crusted soil</td>
</tr>
<tr>
<td>5 6 7</td>
<td>PHOTOSYNTHESIS INHIBITORS</td>
<td>Frost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sandblasting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun scald</td>
</tr>
<tr>
<td>13 27</td>
<td>PIGMENT INHIBITORS</td>
<td>Nitrogen deficiency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Genetic mutations</td>
</tr>
<tr>
<td>14</td>
<td>PPO INHIBITORS</td>
<td>Urea application into corn whorl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Varietal differences</td>
</tr>
<tr>
<td>8 15 16</td>
<td>SEEDLING SHOOT GROWTH INHIBITORS</td>
<td>Crusted soil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compacted soil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shallow planting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damage- Nematode</td>
</tr>
</tbody>
</table>

Figure 2. Mimics of herbicide injury to corn during or at emergence.

Figure 3. Example of a photo gallery for corn and soybean herbicide injury symptoms.

For pre-emergence applications in corn, the seedling shoot growth inhibitors, particularly the chloroacetamides, may injure seedlings when soils are cool and wet. Injury will not always be apparent aboveground. For example, corn plants with seedling root growth inhibitor damage will display clubbed root tips and grasses will be more affected than broadleaves. To get an idea of injury risk, check out the herbicide tables in “Pest Management in Wisconsin Field Crops” available in pdf and print formats at Cooperative Extension’s Learning Store, [http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2015-P155.aspx](http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2015-P155.aspx).
Plant Disease Diagnostic Clinic (PDDC) Update

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from April 18, 2015 through April 24, 2015.

<table>
<thead>
<tr>
<th>PLANT/SAMPLE TYPE</th>
<th>DISEASE/DISORDER</th>
<th>PATHOGEN</th>
<th>COUNTY</th>
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</thead>
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<tr>
<td>FORAGE CROPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Fusarium Root/Crown Rot</td>
<td>Fusarium sp.</td>
<td>Ogle (IL)</td>
</tr>
<tr>
<td></td>
<td>Phytophthora Root Rot</td>
<td>Phytophthora sp.</td>
<td>Ogle (IL)</td>
</tr>
<tr>
<td></td>
<td>Pythium Root Rot</td>
<td>Pythium sp.</td>
<td>Ogle (IL)</td>
</tr>
<tr>
<td>FRUIT CROPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>Sapwood Rot</td>
<td>Schizophyllum commune</td>
<td>Jefferson</td>
</tr>
<tr>
<td>Blueberry</td>
<td>Gloeosporium Canker</td>
<td>Gloeosporium sp.</td>
<td>Pierce</td>
</tr>
<tr>
<td></td>
<td>Phomopsis Canker</td>
<td>Phomopsis sp.</td>
<td>Pierce</td>
</tr>
<tr>
<td>SOIL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soybean Soil</td>
<td>Soybean Cyst Nematode</td>
<td>Heterodera glycines</td>
<td>Dane</td>
</tr>
</tbody>
</table>

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).

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Follow us on

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What data layers are important for variable rate soybean seeding prescriptions?

Ethan Smidt, John Gaska and Shawn Conley, Department of Agronomy; Jun Zhu, Department of Statistics and Department of Entomology; University of Wisconsin-Madison

Introduction

Growers are collecting many forms of spatial data for their fields, including yield, elevation and soils data. Highly accurate GPS systems along with advances in variable rate technology (VRT) are allowing growers to create and use variable rate planting prescriptions to optimize soybean yields and seed placement (Hoeft et al., 2000). As soybean seed prices continue to rise (USDA-ERS, 2014), growers are looking for ways to optimize seeding rates across their fields (Hoeft et al., 2000). However, growers and researchers alike feel there is an abundance of raw data but a shortage of methods and knowledge on how to use the data for advancements in precision agriculture (Bullock et al., 2007). Therefore, the objectives of this research were:

- Find the key measurable predictors determining soybean seed yield in Wisconsin
- Use those predictors to create accurate, data-based future VRT prescriptions

This study was conducted on a total of 22 sites between 2013 and 2014 as shown in Figure 1. Seeding rate prescriptions containing three unique rates were created prior to planting for each site as shown in Figure 2. The middle seeding rate was equivalent to the single rate each individual grower would have used in their respective field without VRT capabilities and the high and low rates were targeted at ±30% from the medium rate. After planting, soil samples were taken at geo-referenced points and submitted for pH, organic matter, phosphorus and potassium levels. Soil survey and satellite imagery data were also obtained during the growing season to determine any possible relationships with soybean yield.

To read the full article click on the link below:

Recently new fungicides have been labeled for use on alfalfa for dairy production systems. Interest in using these products has increased among farmers in the state of Wisconsin. Data from the 1980s suggested that fungicides applied to alfalfa controlled foliar diseases and increased yield. However, alfalfa varieties, management practices, and disease control products have changed dramatically since this research was conducted. Therefore, new research was conducted to evaluate modern fungicide products on alfalfa grown under 21st century management practices. This new fact sheet is now available, which summarizes this research to evaluate the efficacy and economics of applying fungicide to alfalfa in Wisconsin. CLICK HERE TO DOWNLOAD A PDF VERSION OF THIS FACT SHEET.

Cover Crop Termination Before Planting Soybean

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin-Madison

Tough, cold Wisconsin winters translate into fewer cover crop species requiring spring termination before planting. For a quick chart of cover crop species that tend to winterkill, download the “Cover Crop Termination” fact sheet at https://host.cals.wisc.edu/wcws/wp-content/uploads/sites/4/2013/03/WCWS_204_cover_crop_termination_WEB.pdf. Here is a short list of the cover crops that will need to be terminated in the spring: winter (cereal) rye, winter barley, winter wheat, winter triticale, red clover, sweet clover, and hairy vetch. There are a few cover crops that may or may not winterkill depending on the severity of winter and degree of snow cover; these include canola, winter pea, and annual ryegrass. If cereal rye will be harvested for forage, then consult the herbicide rotational restrictions fact sheet, http://wcws.cals.wisc.edu/wp-content/uploads/sites/4/2013/03/WCWS_201_Herbicide_Rotation_Restrictions_WEB.pdf. For overwintering cover crops sown after winter wheat, some may prefer to terminate in the fall to simplify their spring planting schedule.

At Arlington Agricultural Research Station, cereal rye, planted during the first week of September, is ready to be terminated prior to planting soybean (Fig. 1). A general rule of thumb for termination of cereal rye with herbicides is to target the application before it reaches 18 inches in height. In another field trial, cereal rye planted in October can definitely be given some time to grow before termination (Fig. 2). There are a few termination methods for cereal rye outlined in the fact sheet including rolling-crimping, mowing, and applying herbicides. For the no-till soybean research fields planted with a cereal rye cover crop, typically we use glyphosate and 2,4-D ester (0.5 lb ai/A) seven days before planting to terminate the rye. Otherwise, glyphosate (4.5 lb ae per gal, 22 fl oz/A) will terminate the winter grasses: rye, barley, triticale, and wheat. Recommendations for red clover, sweet clover, and hairy vetch are in the fact sheet.
Figure 1. Cereal (winter) rye, Secale cereale, seeded in early September, nearing twelve inches in height on May 4, 2015.

Figure 2. Cereal (winter) rye, S. cereale, seeded in late October 2014, about five inches in height on May 4, 2015.
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![Figure 3. A) Cereal (winter rye), S. cereale, on the left, and annual ryegrass, Lolium multiflorum, on the right, showing partial winterkill especially in the foreground. B) Annual ryegrass with partial winterkill.](image)

**Managing Nutrients on Wisconsin Soils**

Scott Sturgul – NPM Program

*Managing Nutrients on Wisconsin Soils* is a self-paced seven hour online video workshop designed for agency and industry personnel who desire to have a more in depth knowledge of intermediate to advanced topics in soil fertility and soil management. The learning objectives are to provide individuals with a fundamental understanding of Wisconsin’s nutrient application guidelines, advanced soil fertility management tools, and soil management practices to reduce nutrient loss.

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Topics include:

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- Understanding soil groups and soil yield potential
- Phosphorus (P) and potassium (K) recommendations & management
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### Black Cutworms in WI Corn

Bryan Jensen, UW Extension

Several states to our south have reported relatively high catches of black cutworm moths in their trapping networks. To date, DATCP’s WI Pest Bulletin has not reported high catches. However, recent low nighttime temperatures may (or may not) explain the lower catches. What I do suggest is to begin spot-checking those seedling corn fields which are most likely to attract egg laying moths. They are;

- Fields with significant broadleaf weed populations. Especially low growing perennials and winter annuals
- Low lying areas of fields
- Fields with soybean residue
- Later planted corn

Black cutworm larvae are grayish-black and lack obvious identifying characteristics. As a result, they may be confused with other non-pest insects found in corn fields, e.g. crane fly larvae and dingy cutworms. Crane fly larvae are similar in color and are found in
many habitats including corn fields. Depending on the specie, crane fly larvae are tapered at each end. Dingy cutworms usually feed on corn leaves but are rarely considered a pest unless they are present in extremely high numbers. Dingy cutworm larvae are very similar in color, shape and size to black cutworms. However, proper identification can be made by looking at the tubercles (black dots) on their backs. Each of these cutworm species will have 4 prominent tubercles/segment. The rear tubercles on black cutworms will be slightly larger (see picture below) than the front pair. Tubercles on dingy cutworm will all be similar in size. Feeding habits also can help with identification. Crane fly larvae do not feed on corn, dingy cutworm are primarily foliar feeders.

Size and tubercle arrangement on black cutworm larvae

Black cutworm damage is variable and dependent on crop and insect size. First through third instar (< ½ inch) black cutworm larvae are usually not capable of cutting plants but will feed on leaves. This serves as an early warning when larger larvae can start cutting plants and/or burrowing into the stem below ground. Setting a treatment threshold can be difficult because many factors affect economical control including weather, crop and cutworm growth stage. Typically, treatment for black cutworm is suggested when 3-5% of the plants show cutting activity. Spot spraying can be effective if infestations are localized. If organophosphate (IRAC group 1) rescue treatments are to be used there may be interactions with certain herbicides. Read and follow label recommendations closely.

What about armyworms? They do migrate at approximately the same time as black cutworm adults and there have been scattered reports of high trap catches. Start spot checking seedling corn and wheat fields. Unlike black cutworm, armyworm females have a strong attraction to grasses when laying eggs. There is an exception. Corn that is not tilled into fall or spring killed alfalfa can be quite attractive. In wheat, they may not be good clues to use when spot checking. However, scouting areas with higher stand density may help. Later in the growing season pay special attention to lodged areas.

Stripe Rust on Wheat: Stay Alert!

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

I recently visited some wheat plots in southern Wisconsin. As in previous weeks, wheat is looking good and tillering well and nearing the jointing stage. Few disease issues have yet to be identified. In states to our south and west, such as Kansas and Nebraska, this has not been the case. Stripe rust has been identified in some of these areas and has been classified as moderate to severe depending on the variety of wheat. While, not yet a concern on wheat in Wisconsin, wheat farmers and crop consultants need to be paying attention to this potential threat. Typically in years where stripe rust is an issue in the southern wheat belt, Wisconsin will also see the disease.
Figure 1. Stripe rust on winter wheat leaves.

Stripe rust or yellow rust (Fig. 1) of wheat is caused by the fungus *Puccinia striiformis*. This fungus is in the same group of organisms that cause other rust diseases of wheat such as leaf rust and also the famed stem rust, which put the importance of wheat breeding on the map. Stripe rust can be identified readily by the bright yellow pustules that typically occur in a striped pattern on the surface of the wheat leaf (Fig. 2). The color of the bright yellow stripe rust pustules is very different from the brick-red pustules that are common with leaf rust (Fig. 3) or stem rust.

The stripe rust pathogen survives on wheat debris as spores or mycelium (fungal threads) in areas where the temperatures don’t get above 90 F or below 20 F. It is thought that stripe rust cannot overwinter in the far northern areas of the U.S. such as Wisconsin. Little is known if the stripe rust fungus can survive the summers in Wisconsin, once the wheat crop has been harvested. We have a graduate student who will be working to address this and other questions about stripe rust on winter wheat in Wisconsin.

Figure 2. Yellow pustules indicative of stripe rust on a wheat leaf.

Because survival of the fungus might be limited in Wisconsin, the stripe rust pathogen most likely has to be windblown from the southern states into our wheat production area. This is why we need to pay close attention to stripe rust reports from the southern states. These reports are indicating that we will likely see stripe rust in wheat in Wisconsin this season and we may see it earlier than usual.

Management of stripe rust includes using resistant cultivars and applying fungicide, along with using some cultural practices such as avoiding excessive fertilizer applications and eliminating volunteer wheat plants. Obviously, winter wheat is already in the ground, so you can’t make a decision on resistance for the current crop, but familiarize yourself with the stripe rust resistance rating for your wheat varieties. Knowing that certain fields might be more susceptible than others will help you determine where you should be scouting first.
Fungicide applications can also be useful for controlling stripe rust when properly timed with the onset of the epidemic. Frequent scouting of fields will help you to determine when stripe rust shows up and if an application of fungicide is needed to control it. Wheat will be most susceptible to yield loss if stripe rust infects plants prior to heading. The later that stripe rust infects, the less the impact on grain yield will be. Scouting at or near the flag-leaf emergence growth stage (Feekes 8) can help with making the decision to apply a fungicide at this critical time period. Although, scouting wheat now can’t hurt either. Continued scouting through heading and anthesis (flowering; Feekes 10.5.1) can also help with making a decision to apply fungicide for leaf diseases and head diseases. For information on fungicides effective for controlling stripe rust, consult the Small Grains Fungicide Efficacy Table found here.

For more information about stripe rust, check out the USDA Cereal Disease Laboratory Website. They have a stripe rust informational page, which can be viewed by CLICKING HERE.

Remember to SCOUT, SCOUT, SCOUT!
What data layers are important for variable rate soybean seeding prescriptions?

Ethan Smidt, John Gaska and Shawn Conley, Department of Agronomy; Jun Zhu, Department of Statistics and Department of Entomology; University of Wisconsin-Madison

Introduction

Growers are collecting many forms of spatial data for their fields, including yield, elevation and soils data. Highly accurate GPS systems along with advances in variable rate technology (VRT) are allowing growers to create and use variable rate planting prescriptions to optimize soybean yields and seed placement (Hoeft et al., 2000). As soybean seed prices continue to rise (USDA-ERS, 2014), growers are looking for ways to optimize seeding rates across their fields (Hoeft et al., 2000). However, growers and researchers alike feel there is an abundance of raw data but a shortage of methods and knowledge on how to use the data for advancements in precision agriculture (Bullock et al., 2007). Therefore, the objectives of this research were:

- Find the key measureable predictors determining soybean seed yield in Wisconsin
- Use those predictors to create accurate, data-based future VRT prescriptions

This study was conducted on a total of 22 sites between 2013 and 2014 as shown in Figure 1. Seeding rate prescriptions containing three unique rates were created prior to planting for each site as shown in Figure 2. The middle seeding rate was equivalent to the single rate each individual grower would have used in their respective field without VRT capabilities and the high and low rates were targeted at ±30% from the medium rate. After planting, soil samples were taken at geo-referenced points and submitted for pH, organic matter, phosphorus and potassium levels. Soil survey and satellite imagery data were also obtained during the growing season to determine any possible relationships with soybean yield.

To read the full article click on the link below:


Vegetable Crop Update 5-8-15

The 7th issue of the Vegetable Crop Update is now available. This issue contains late blight updates, early season diseases of potato, vegetable insect updates, and spotted wing drosophila updates for fruit crop. Click here to view this issue.
Using Fungicides on Alfalfa for Dairy Production in Wisconsin

Damon Smith, Assistant Professor and Extension Field Crops Plant Pathologist, UW-Madison; Scott Chapman, Researcher, Departments of Plant Pathology and Entomology, UW-Madison; Bryan Jensen, Outreach Program Manager, Integrated Pest Management Program, UW-Madison; Greg Blonde, Agricultural Agent, UW-Extension, UW-Madison; Bill Halfman, Agricultural Agent, UW-Extension, UW-Madison; and Dan Undersander, Professor, Department of Agronomy, UW-Madison

Recently new fungicides have been labeled for use on alfalfa for dairy production systems. Interest in using these products has increased among farmers in the state of Wisconsin. Data from the 1980s suggested that fungicides applied to alfalfa controlled foliar diseases and increased yield. However, alfalfa varieties, management practices, and disease control products have changed dramatically since this research was conducted. Therefore, new research was conducted to evaluate modern fungicide products on alfalfa grown under 21st century management practices. This new fact sheet is now available, which summarizes this research to evaluate the efficacy and economics of applying fungicide to alfalfa in Wisconsin. CLICK HERE TO DOWNLOAD A PDF VERSION OF THIS FACT SHEET.

Cover Crop Termination Before Planting Soybean

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin-Madison

Tough, cold Wisconsin winters translate into fewer cover crop species requiring spring termination before planting. For a quick chart of cover crop species that tend to winterkill, download the “Cover Crop Termination” fact sheet at https://host.cals.wisc.edu/wcws/wp-content/uploads/sites/4/2013/03/WCWS_204_cover_crop_termination_WEB.pdf. Here is a short list of the cover crops that will need to be terminated in the spring: winter (cereal) rye, winter barley, winter wheat, winter triticale, red clover, sweet clover, and hairy vetch. There are a few cover crops that may or may not winterkill depending on the severity of winter and degree of snow cover; these include canola, winter pea, and annual ryegrass. If cereal rye will be harvested for forage, then consult the herbicide rotational restrictions fact sheet, http://wcws.cals.wisc.edu/wp-content/uploads/sites/4/2013/03/WCWS_201_Herbicide_Rotation_Restrictions_WEB.pdf. For overwintering cover crops sown after winter wheat, some may prefer to terminate in the fall to simplify their spring planting schedule.

At Arlington Agricultural Research Station, cereal rye, planted during the first week of September, is ready to be terminated prior to planting soybean (Fig. 1). A general rule of thumb for termination of cereal rye with herbicides is to target the application before it reaches 18 inches in height. In another field trial, cereal rye planted in October can definitely be given some time to grow before termination (Fig. 2). There are a few termination methods for cereal rye outlined in the fact sheet including rolling-crimping, mowing, and applying herbicides. For the no-till soybean research fields planted with a cereal rye cover crop, typically we use glyphosate and 2,4-D ester (0.5 lb ai/A) seven days before planting to terminate the rye. Otherwise, glyphosate (4.5 lb ae per gal, 22 fl oz/A) will terminate the winter grasses: rye, barley, triticale, and wheat. Recommendations for red clover, sweet clover, and hairy vetch are in the fact sheet.
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Annual ryegrass or Italian ryegrass can be a concern for spring termination because it can be challenging to predict winterkill and to terminate, if necessary. In the 2014 field season, annual ryegrass overwintered in all of the field research plots at Arlington. However,
this year annual ryegrass experienced partial winterkill (Fig. 3). To ensure termination success, plan on applying glyphosate at the full labeled rate before the ryegrass reaches 6 inches in height with the understanding that two applications may be necessary, see page two of the factsheet, https://host.cals.wisc.edu/wcws/wpcontent/uploads/sites/4/2013/03/WCWS_204_cover_crop_termination_WEB.pdf. Also, be aware that annual ryegrass has shown resistance to five different herbicide sites-of-action and is one of the eleven weeds that weed scientists have identified as a serious resistance threat, http://takeactiononweeds.com/wp-content/uploads/2014/01/Weed_Chart_Poster.pdf. The United Soybean Board and its TakeAction campaign worked with university weed scientists to develop a fact sheet specific to managing ryegrass, available here http://takeactiononweeds.com/wp-content/uploads/FactSheet_ItalianRyegrass.pdf. For more information on terminating annual ryegrass, Purdue University has a great fact sheet, https://www.extension.purdue.edu/extmedia/ws/ws50w.pdf. More cover crop resources, on an array of topics, are available at Cooperative Extension’s cover crop website, http://fyi.uwex.edu/covercrop.

Figure 3. A) Cereal (winter rye), S. cereale, on the left, and annual ryegrass, Lolium multiflorum, on the right, showing partial winterkill especially in the foreground. B) Annual ryegrass with partial winterkill.

Think Twice Before Replanting Soybean- Research Results

Adam P. Gaspar, Shawn P. Conley, & John M. Gaska Department of Agronomy, University of Wisconsin-Madison

Read the full report here >>> http://www.coolbean.info/library/documents/SoybeanReplant_2014_FINAL.pdf

The first step in deciding if replanting is required is to determine the initial plant stand. This study demonstrated that replanting soybean stands below the threshold (100,000 plants/a) by filling in the existing stand, increased yields regardless of the date (May-June 20th) and seed treatment use. Below threshold plant stands should be filled in with enough seed to bring the final stand above 100,000 plants/a. Using tillage and replanting the entire stand greatly limited yield potential, even at replant seeding rates of 220,000 seeds/a. This is due to the entire plant stand being replanted or essentially planted later, which reduces yields by 0.32 bu/a/day on average.

These replant recommendations are applicable through June 20th in southern WI, where replanting after this date is not advised. Traditionally, the notion of adequate weed control has led producers to desire higher plant stands to quickly shade out competing weeds. However, pre-herbicide use and modern post herbicide technology has essentially eliminated this concern. This study only evaluated soybean replanting in terms of yield and did not take into account the economics of a replant decision, which include additional seed, fuel, labor, and machinery costs; along with potential crop insurance replant payments. Producers should consult their crop insurance agent before making any replant decisions. Ultimately, the producer’s efforts should be placed on using this data in conjunction with their own finances to determine if replanting will increase economic return.

Recent Cold Temps Have Little Impact on Soybean or Winter Wheat Crop

Coauthored by Dr. Shawn P. Conley and Dr. Jim Specht

Last nights cold temperature has led to an influx of questions regarding the potential impact on either the wheat crop or emerged soybean seedlings. In short there is nothing to worry about in either crop. In the case of wheat, which is still in the jointing growth stage, cold temperature would need to reach 24 degrees F or less for 2 plus hours before injury occurred.

With cold temperatures predicted over the next few days (May 15-17) there are some questions regarding the potential impact on this year’s winter wheat crop. Based on the predicted temperatures reported, widespread significant crop injury is unlikely. The winter wheat crop is several weeks behind “normal” and remains in the tiller (Feekes 2) to jointing (Feekes 6) growth stages. At these growth stages the wheat crop can withstand temperature down to 24 degree F for up to 2 hours before crop injury occurs (Table 1). For more detailed information I have attached a link to a publication entitled Spring Freeze Injury to Kansas Wheat. For ease I have also removed a table from that publication to stress the importance of growth stage on damage potential (Table 1).

Lastly, growers may also be questioning the impact of temporary flooding within fields. Though crop injury from this flooding may occur that damage will likely be limited due to cool temperatures and slowed crop respiration. Any crop injury that does occur will directly be related to the duration of the flooding event.

Table 1. Wheat Resistance to Freeze Injury (From: Spring Freeze Injury to Kansas Wheat)
In the case of soybean I was fortunate enough to be copied on this email from Dr. James Specht (please see below) which saved me a few hours of library time today so thank you Jim.

First of all 34F will not impact above-ground tissue. Second, tissue freezing does not even take place at 32F because cell cytoplasm has solutes in it – like a modest anti-freeze, which depresses freezing point of the tissue a degree or two less than 32F – thus air temps surrounding the tissue have to get to below 31 or 30F before tissue freezing can occur. Third, the soil surface is typically warmer than the air temp (particularly when the soil is wet) and does not give up heat acquired during a sunny day as fast as the air does after sunset. In actuality, the interface between soil surface temp and the air temp near that soil surface will be closer to the air temp than to the air temp which most people measure on thermometers viewable at their height (not at ground level). Biophysically, control of the soil temp over the air temp this is called the “boundary layer effect”). So don’t trust air temperatures read on thermometers unless you know what the air temperature near the soil surface was (put a thermomter on the soil surface tonight where the coryledons are and check it just before dawn (when the soil surface temp reaches its nadir for a 24-hour temperature cycle) and send out an e-mail blog to your producer colleagues early the next day. Fourth, the coryledons are a huge mass of tissue that are about 95% water. That big amount of water-filled tissue is hard to freeze unless the exposure to temps of 30F at the soil-air interface is many, many hours. Coryledons will freeze faster (in fewer hours) but only if the soil surface temps get well below 30F (say 25F). The only concern I would have is when coryledons are no longer closed and protecting the young stem tip. However, if that is in fact frozen off, the nodes to which the coryledons are attached will regenerate TWO main stem tips. Not an ideal way to start the growing season, but better than having to replant (0.5 bu/ac loss per each day that soybeans are NOT in the ground on May 1).

Pre-EMergence Herbicides for Weed Management in Soybean

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin-Madison

Pre-emergence herbicides can lower the risk of developing herbicide resistance and add flexibility to the post-emergence application timing. For an excellent discussion of how a two-pass herbicide program can reduce resistance risk, please read Boerboom et al.’s “An Equation for Trouble? Glyphosate x Weeds = Resistance” article, http://fyi.uwex.edu/grain/files/2015/03/Boerboom_An_Equation_for_Trouble.pdf . To see the utility of a residual herbicide applied at planting in less than 90 seconds, watch Purdue University’s time lapse video of Palmer amaranth growth in two plots, with and without a pre-emergence herbicide application, https://youtu.be/VDvh0hhHNEE . When choosing a pre-emergence herbicide, there are a few factors to consider in the decision making process:


Remember to apply the full labeled rate at the appropriate time. Once the application has been made, scout the field after crop emergence to determine the effectiveness of the pre-emergence application and to plan for the post-emergence application. For more information on herbicide resistance management, please consult the following fact sheet http://wcws.cals.wisc.edu/wp-content/uploads/sites/4/2013/03/WCWS_205_herbicide_resistance_management_WEB.pdf .

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Alfalfa Weevils

Bryan Jensen
UW Extension

It is time (or soon will be!) to start scouting for alfalfa weevil damage in established alfalfa stands. We suggest spot-checking for early signs of damage when 300 weevil degrees have accumulated. This degree day map supplied by UW Extension Ag Weather will give you near real-time degree day accumulations for your area. Click on “Thermal Models” then select the model for alfalfa weevil. While you are at the UW Extension Ag Weather site check out the other degree day models. It is a great resource!

Adult weevils overwinter in plant debris along fence rows, grassy waterways, woodlands, etc. During the first warm spring days adults become active and females start to lay eggs. At 300 weevil degree days (Base 48°F) eggs start hatching and early signs of tip feeding should start to be noticeable. Alfalfa weevils go through 4 larval instars. Maximum feeding should occur between 600 and 800 weevil degree days. Scouting at 300 degree days will give you a heads up on damage potential and allow more time to reach a control decision if needed. Although weevil populations have been spotty the past two decades, I always hear about someone getting caught off guard. If you initiate spot checks at 300 degree days you can avoid a surprise.

A treatment threshold of 40% tip feeding is suggested. This is not to advocate treating at 40% defoliation but rather when 40% of the stems have signs of weevil feeding. If you are over the suggested threshold consider harvest if the timing is correct. Timely cutting is still our best control option. For those fields with heavy first crop weevil feeding, plan to check second crop regrowth for feeding. Larvae and/or adults can survive harvest and cause significant damage to regrowth.

Stripe Rust on Wheat: Stay Alert!

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

I recently visited some wheat plots in southern Wisconsin. As in previous weeks, wheat is looking good and tillering well and nearing the jointing stage. Few disease issues have yet to be identified. In states to our south and west, such as Kansas and Nebraska, this has not been the case. Stripe rust has been identified in some of these areas and has been classified as moderate to severe depending on the variety of wheat. While, not yet a concern on wheat in Wisconsin, wheat farmers and crop consultants need to be paying attention to this potential threat. Typically in years where stripe rust is an issue in the southern wheat belt, Wisconsin will also see the disease.
Figure 1. Stripe rust on winter wheat leaves.

Stripe rust or yellow rust (Fig. 1) of wheat is caused by the fungus *Puccinia striiformis*. This fungus is in the same group of organisms that cause other rust diseases of wheat such as leaf rust and also the famed stem rust, which put the importance of wheat breeding on the map. Stripe rust can be identified readily by the bright yellow pustules that typically occur in a striped pattern on the surface of the wheat leaf (Fig. 2). The color of the bright yellow stripe rust pustules is very different from the brick-red pustules that are common with leaf rust (Fig. 3) or stem rust.

The stripe rust pathogen survives on wheat debris as spores or mycelium (fungal threads) in areas where the temperatures don’t get above 90 F or below 20 F. It is thought that stripe rust cannot overwinter in the far northern areas of the U.S. such as Wisconsin. Little is know if the stripe rust fungus can survive the Summers in Wisconsin, once the wheat crop has been harvested. We have a graduate student who will be working to address this and other questions about stripe rust on winter wheat in Wisconsin.

Because survival of the fungus might be limited in Wisconsin, the stripe rust pathogen most likely has to be windblown from the southern states into our wheat production area. This is why we need to pay close attention to stripe rust reports from the southern states. These reports are indicating that we will likely see stripe rust in wheat in Wisconsin this season and we may see it earlier than usual.

Management of stripe rust includes using resistant cultivars and applying fungicide, along with using some cultural practices such as avoiding excessive fertilizer applications and eliminating volunteer wheat plants. Obviously, winter wheat is already in the ground, so you can’t make a decision on resistance for the current crop, but familiarize yourself with the stripe rust resistance rating for your wheat varieties. Knowing that certain fields might be more susceptible than others will help you determine where you should be scouting first.
Figure 3. Brick-red Leaf rust pustules on a winter wheat leaf.

Fungicide applications can also be useful for controlling stripe rust when properly timed with the onset of the epidemic. Frequent scouting of fields will help you to determine when stripe rust shows up and if an application of fungicide is needed to control it. Wheat will be most susceptible to yield loss if stripe rust infects plants prior to heading. The later that stripe rust infects, the less the impact on grain yield will be. Scouting at or near the flag-leaf emergence growth stage (Feekes 8) can help with making the decision to apply a fungicide at this critical time period. Although, scouting wheat now can’t hurt either. Continued scouting through heading and anthesis (flowering; Feekes 10.5.1) can also help with making a decision to apply fungicide for leaf diseases and head diseases. For information on fungicides effective for controlling stripe rust, consult the Small Grains Fungicide Efficacy Table found here.

For more information about stripe rust, check out the USDA Cereal Disease Laboratory Website. They have a stripe rust informational page, which can be viewed by CLICKING HERE.

Remember to SCOUT, SCOUT, SCOUT

**Plant Disease and Diagnostic Clinic Update 5/8/15**

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from May 2, 2015 through May 8, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit Crops</strong></td>
</tr>
<tr>
<td>Grape, Black Rot, <em>Guignardia bidwellii</em>, Dane</td>
</tr>
<tr>
<td>Pear, Sphaeropsis Canker, <em>Sphaeropsis sp.</em>, Milwaukee</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
</tr>
<tr>
<td>Tomato, <em>White Mold</em>, <em>Sclerotinia sclerotiorum</em>, Grant</td>
</tr>
<tr>
<td><strong>Soil</strong></td>
</tr>
<tr>
<td>Soybean Soil, Soybean Cyst, <em>Heterodera glycines</em>, Rock</td>
</tr>
</tbody>
</table>

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

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**Weeds**
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We have created a table (below) that compares common traits to help with identification. We also have videos of plumeless thistle and Canada thistle available at (fyi.uwex.edu/weedsci ; click on the video tab or search by thistle name).

For control, all biennial thistles behave similarly to control tactics. Mowing when plants just begin to flower prevents seed production, but herbicides are best applied to rosettes in the fall or spring. While herbicides that contain aminopyralid (e.g. milestone, forefront) have the best control, a broad range of herbicides will suppress above ground growth enough to prevent forage loss. See our factsheet for detailed information on biennial thistle control.

Mark Renz Extension Weed Specialist; University of Wisconsin-Madison & Extension

Thistles are all up and actively growing. While we have a variety of thistles, typically pastures have one of 5 common weedy thistles in Wisconsin. Not sure which one? The first step is to determine if it is a perennial or biennial thistle.

Biennial thistles appear as individual plants and when dug do not have roots connected to multiple shoots (taproot only).

Examples of common biennial thistles include plumeless, bull, and musk. Wisconsin is also seeing more and more of Eurasian marsh thistle (common in northern WI, but spreading south).
Below are pictures of rosettes taken in mid-May. Also included is a picture of a Canada thistle shoot. Canada thistle should not be as developed as the biennial thistles and are currently more upright compared to biennial thistles. This will persist only for 2-3 more weeks. Remember Canada thistle is a creeping perennial plant and therefore will have a suite of different management techniques/timings associated with this species compared to the biennial thistles.

**Which Thistle is in my Pasture and How to Control it**
For Canada thistle, control is more challenging. Please consult this factsheet for more information on control of this problematic species in pastures.

Table 1. Summary of how to differentiate between common thistles found in Wisconsin.

<table>
<thead>
<tr>
<th></th>
<th>Canada thistle</th>
<th>Musk thistle</th>
<th>Plumeless thistle</th>
<th>Bull thistle</th>
<th>European marsh thistle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair on Leaves</td>
<td>None.</td>
<td>None.</td>
<td>Bottom of leaf and petiole hairy.</td>
<td>Coarse hair on top of leaf, soft hair on bottom of leaf.</td>
<td>Sticky hairs.</td>
</tr>
</tbody>
</table>

**Diagnosing Early Season Below Ground Insect Damage**

Bryan Jensen- IPM Program

A lot of corn and soybeans has been planted over the past few weeks and emergence has begun. Now, and over the next few weeks, is a good time to evaluate these stand for emergence problems cause by early season below ground insects. Knowing the exact cause of poor emergence can be helpful to explain low yields and for preparing future pest management plans. Below are some troubleshooting observations.

Keep in mind that crop growth stage can affect damage symptoms and that fields symptoms are not always “classical” in appearance. Look at a range of plant symptoms and try to locate the insect causing the problem. Finally, look at injury patterns within the field and determine if these patterns match your diagnosis.

**Seedcorn Maggot**: Larvae are small, white, legless and cigar-shaped. Feeding occurs below ground and larvae can feed on either the seed and/or emerging shoot. Remember,

there are other similar looking saprophytic maggots which can feed on decaying seed previously killed by other insects and/or pathogens. These are not considered pests, but more precisely opportunistic organic matter feeders. If seedcorn maggots are causing the injury, you should also notice above ground symptoms that include small holes in either the first and/or second leaf in corn. Damage to soybean includes scarred cotyledons, holes in the unifoliate leaves or severed hypocotyls. Seedcorn maggot damage is usually uniform across fields and more severe under cool/wet growing conditions. Damage may also be more severe when corn/soybeans are planted into recently tilled fields, fields with a green manure or in fields with heavy applications of livestock manure. Still unsure? Try using degree days to “back calculate” if corn or soybeans were planted during a peak adult flight. There are several generations of seedcorn maggots, however, the first two adult flight periods cause the most damage. These peak flight periods occur at 360 and 1080 DD (Base 39°F). To calculate seed corn maggot degree day accumulations at the time of planting, navigate to the Degree Day Calculator at the UW Extension Ag Weather website http://agwx.soils.wisc.edu/uwex_agwx/thermal_models/degree_days The calculator will ask you for your Latitude/Longitude, type of degree day model to use (sine), biofix date (January 1), end date (planting date), lower threshold (39 degrees) and upper threshold (84 degrees). Your last prompt is for the type of report you would like.
If the damage is severe and you are still in doubt, please send the maggots to the UW Extension Insect Diagnostic Laboratory, c/o PJ Liesch, Dept. of Entomology, 1630 Linden Dr, Madison, WI 53706.

**Wireworms:** Larvae feed below ground and injury can occur to the corn seed or to the emerging shoot. Injury to the seed will reduce plant stand. Shoot feeding results in the newly emerging leaves showing signs of wilting if the feeding site is at or below the growing point or as holes in the newly emerging leaves if feeding site is above the growing point. Wireworms are somewhat easy to find around damaged plants. However, larvae will migrate deeper into the soil profile as soils warm. Therefore a quick response to complaints is helpful. Damage is more common in corn planted after sod and distribution maybe spotty. Injury may also correspond with soil types. Wireworms have an extended life cycle. Depending on species present, they may take 1-5 years to mature. This information is an important predictor of damage potential if corn is to be planted next year.

**True White Grub:** Damage by larvae is always below ground. White grubs will not injure corn seed, however, larvae feed on corn roots or underground stems causing stunted or wilted plants, respectively. Larvae require two growing seasons to complete their development. As a result, both large and small larvae may be present. Damage is usually clumped within a field and is more common in corn planted after sod or after any crop that had grassy weed problems. Grubs can be relatively easy to find around most, but not all, damaged plants.

![Figure 1 Wireworm larvae. Photo Credit: Frank Peairs, Colorado State University, Bugwood.org](image1)

![Figure 1 Above ground seedcorn maggot injury symptoms](image2)

![Figure 2 White grubs and injury](image3)
Save the Date – Agronomy/Soils Field Day at Arlington Ag Research Station on August 19th

The Departments of Agronomy and Soil Science in conjunction with the Arlington Agricultural Research Station will host their annual field day on August 19, 2015. The field day will highlight UW-Madison research on all facets of crop production and soil management. More details coming in June.

Managing Nutrients on Wisconsin Soils Online Video Workshop – 2015

Scott Sturgul – NPM Program

Managing Nutrients on Wisconsin Soils is a self-paced seven hour online video workshop designed for agency and industry personnel who desire to have a more in depth knowledge of intermediate to advanced topics in soil fertility and soil management. The learning objectives are to provide individuals with a fundamental understanding of Wisconsin’s nutrient application guidelines, advanced soil fertility management tools, and soil management practices to reduce nutrient loss.

This online video series is available for viewing from May 4 to July 31, 2015. It is presented by the UW-Madison Department of Soil Science and UW-Extension’s Nutrient & Pest Management Program. Featured speakers include: Carrie Laboski, Robert Florence, Matt Ruark, Francisco Arriaga, Kevin McSweeney, Laura Ward Good, Haily Henderson, and Scott Sturgul.

Topics include:

- Soils and landscapes of Wis. and their influence on nutrient loss
- Understanding soil groups and soil yield potential
- Phosphorus (P) and potassium (K) recommendations & management
- Manure and legume nutrient credits
- Liming: keystone to soil fertility
- Nitrogen (N) rate guidelines for profitable crop production
- Soil nitrate testing
- Understanding N stabilizers/ extenders
- Crop canopy reflectance as an in-season N management tool
- Assessing potential for N loss after exercise rainfall
- Secondary and micronutrients
- Starter fertilizers as part of a nutrient management plan
- Uses and limitations of plant analysis
- Use and limitations of the end-of-season stalk nitrate test
- Soil management practices and their impact on nutrient loss
- Soil management practices in RUSLE2
- Using the Wisconsin phosphorus index
- Cover crops & nutrient management
- Tile drainage & nutrient management

A brochure for Managing Nutrients on Wisconsin Soils can be found here: http://ipcm.wisc.edu/download/ManagingWISoilsWebinar_2015.pdf.

Registration for viewing the video series is required for each participant and the fee is $100 per person. Registration is open now and will close on July 1. Interested participants can register at: https://patstore.wisc.edu/npm/register.aspx. A credit card is the only acceptable form of payment on this website. A confirmation email that will include viewing instructions will be sent to each participant. For questions on registration contact Scott Sturgul (ssturgul@wisc.edu, 608-262-7486). For questions about program content contact Carrie Laboski (laboski@wisc.edu, 608-263-2795). Please note: You must be able to access YouTube in order to view these presentations!

CCA CEUs
Certified Crop Advisor (CCA) continuing education units (CEU’s) for this workshop have been approved by the Wisconsin CCA Board. The workshop contains 9.5 credits in nutrient management and 4 credits in soil and water management.

Vegetable Crop Update 5-19-15
The 8th issue of the Vegetable Crop Update is now available. This issue contains late blight updates and disease forecasting information (PDays/DSVs are now being posted). Click here to view this issue.

Soybean Emergence and Germination Common Issues
Shawn Conley
Please click to view a YouTube video on Soybean Emergence and Germination Common Issues

UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update
Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu
The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from May 9, 2015 through May 15, 2015.

Plant/Sample Type, Disease/Disorder, Pathogen, County

Fruit Crops
Apple, Cytospora Canker, Cytospora sp., Florence
For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Pest Bulletin 5-21-15
A new issue of the Wisconsin Pest Bulletin from the Wisconsin Department of Agriculture, Trade and Consumer Protection is now available. The Wisconsin Pest Bulletin provides up-to-date pest population estimates, pest distribution and development data, pest survey and inspection results, alerts to new pest finds in the state, and forecasts for Wisconsin’s most damaging plant pests.

Issue No. 5 of the Wisconsin Pest Bulletin is now available at:

Alfalfa Weevil Update

Bryan Jensen
UW Extension

I have been getting some questions regarding alfalfa weevil damage. First the good news. Harvest is well underway in southern Wisconsin and this is practice usually kills weevil larvae. The bad news is that it usually kills weevil larvae.

For those fields with higher than expected first crop damage be sure to inspect fields 3-4 days after harvest. Weevil larvae can feed on both crown and stem buds which delays regrowth and can reduce yield if feeding is severe. Make sure to inspect first crop closely. This year, temperatures have been cool which slows weevil development compared to alfalfa. Early instar weevil feeding can be difficult to detect and may require unfolding of the upper leaflets to expose damage.

In second crop stubble, look for signs of new stem or crown bud formation. Dry weather can slow bud development. In the absence of regrowth, look under leaf litter, in soil cracks and the juncture between crown and the soil to confirm presence of larvae. You may find larval survival higher under the old windrow. A treatment threshold is not available for stubble regrowth. However, confirm the presence of larvae before spraying.

This year, because of the difference in alfalfa and weevil development, larvae may continue to feed on regrowth for a period of time. Although difficult to predict how long, typically, by the time second crop regrowth is 10” tall larval feeding is over for that generation. In this situation, consider an insecticidal treatment if tip feeding is greater than 50%.

Pigweed Identification

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin-Madison

Weed identification at the seedling and immature stages can be difficult but is often necessary because scouting should occur before weeds reach 4 inches in height. At emergence before a full set of true leaves appear, pigweeds can be confused with other weed species such as wild buckwheat, eastern black nightshade, and ladythumb. In addition, the pigweeds: Palmer amaranth, waterhemp, redroot pigweed, Powell amaranth, and smooth pigweed, are not easily separated by species at the immature stages. The first step is to look at the leaves and stems because Palmer amaranth and waterhemp do not have any hairs compared to Powell, redroot, and smooth pigweed, which do have hairs but they may not be obvious at the immature stage. If the plant looks like it may be Palmer amaranth or waterhemp, then the next step is to look at the leaf shape and petiole. Palmer amaranth has a more rounded leaf shape and a petiole that is longer than the leaf itself, https://youtu.be/NLGEwizXj-M?t=9m15s . For a list of resources available by species, guides for the most common weed seedlings, and links to the WeedID smartphone apps, take a look at the Weed Info page on the WCWS website (http://wcws.cals.wisc.edu/weed-info/). There are several Extension resources available to help with pigweed identification including:


* “Identifying Palmer amaranth in the field,” Purdue University, 4 minute video, https://youtu.be/aVbgPGg0GQ0

* “Palmer amaranth seedling identification,” Purdue University, 7.5 minute video, https://youtu.be/wNgRvvnPQJ8

New Fact Sheets on Stem Canker and Pod and Stem Blight

Damon Smith, Extension Field Crops Plant Pathologist

During the 2014 season, two diseases appeared to be quite widespread across the midwest on soybean. These disease were stem canker and also pod and stem blight. Next to white mold, these diseases were common in many Wisconsin fields last year. In an effort to provide background and management information about these diseases, two fact sheets were recently developed by extension specialists in the North Central region. This effort was supported by the North Central Soybean Research Association and also the United Soybean Board.

You can download the stem canker fact sheet by clicking below >>>
Stem canker fact sheet

You can download the pod and stem blight fact sheet by clicking here >>>
Pod and stem blight fact sheet

Be prepared for the 2015 season by reading these fact sheets and scouting often. Happy Planting!

Wisconsin Winter Wheat Disease Update – May 20

Damon Smith, Extension Field Crops Plant Pathologist

Winter wheat plots were examined this week by my graduate student, Brian Mueller, near Sharon, WI (far southern Wisconsin). Flag leaves had recently emerged and wheat looked very good in this good in this location. No rust or other diseases were observed in this part of the state. Further north, we examined winter wheat fields near Arlington, WI. No rust or other diseases were observed here either. Many varieties had fully emerged flag leaves and will soon be in the ‘boot’ stage.

Now is the time to consider fungicide applications for protecting flag leaves. Also, growers in the southern and south central portion of Wisconsin, should start watching the weather and checking the Fusarium head blight (scab) Prediction Center frequently to make a decision about applying fungicides to protect wheat against scab. Remember, the best time to apply fungicide to control scab is at anthesis and up to 5-7 days after anthesis. However, weather conditions prior to anthesis can affect the level of risk for scab, so start making weighing your options now. Remember, to scout, scout, scout!

Wisconsin Pest Bulletin 5/21/15

A new issue of the Wisconsin Pest Bulletin from the Wisconsin Department of Agriculture, Trade and Consumer Protection is now available. The Wisconsin Pest Bulletin provides up-to-date pest population estimates, pest distribution and development data, pest survey and inspection results, alerts to new pest finds in the state, and forecasts for Wisconsin’s most damaging plant pests.

Issue No. 5 of the Wisconsin Pest Bulletin is now available at:

http://datcpservices.wisconsin.gov/pb/index.jsp

LOOKING AHEAD: Black cutworm primary damage period to begin May 27
FORAGES & GRAINS: Counts of alfalfa weevil larvae remain low
CORN: Another significant flight of armyworm moths reported from Janesville
SOYBEAN: Soybean aphids could begin colonizing soybeans by late May
FRUITS: Codling moth flight underway, biofix expected next week
VEGETABLES: Imported cabbageworm larvae emerging in southern WI
NURSERY & FOREST: Emerald ash borer trapping planned for 41 counties
DEGREE DAYS: Growing degree day accumulations through May 20, 2015
Troubleshooting Early Season Corn Insect Damage 101: What to look for

Bryan Jensen, UW Extension

Troubleshooting early season corn insect damage can be difficult. There are several potential insect pests and some cause similar symptoms. Also, there is the possibility that if environmental and field conditions match up, new or unexpected insect damage may occur. Getting a complete “picture” of the situation will improve your diagnosis or provide more answers to questions if you seek outside help. Sometimes the answers is obvious. Other times, your diagnosis may be complete when several, but not all, clues point to one (or more?) insect.

It goes without saying, but try to find the insect causing the damage. Sometimes that is easier said than done. Look in the soil around the root zone, in the soil immediately surrounding the seedling, on the soil surface, under crop residue and in soil cracks. Take your time and be methodical. Early instar black cutworms are small and difficult to locate because they are the same color as many soil types. If you find an unknown insect take samples (best option) and/or digital pictures. Bring them to your local county extension crops and soils agents for identification or verification. Agents have access to several resources including the UW Entomology Insect Diagnostic Lab. Don’t assume that if you find an insect in high numbers it is the culprit. There is a lot of “guilt by association” going on in the insect world.

Dissect the corn seedling. If an insect is found in the plant, make note of where it was located (above/below ground, in the whorl?). Is there an entry hole and it located below or above ground? This information can help separate below ground insects (wireworms, white grubs, hop vine borer) from some of the above ground insects (stalk borer, billbug). Look to see if the damage is current. That is, are the newly emerging leaves showing symptoms.

Determine if the damage is uniform across the field or if it is spotty. Very few insects will have a completely random distribution. However, damage patterns can tell a story. Hop vine and stalk borer damage can almost exclusively be found along ditches, grassy waterways, fence row and terraces. Some pests, like slugs, are more pronounced in areas with a lot of crop residue. Others may be found in association with broadleaf weeds (black cutworms), yellow nutsedge (billbug) and grassy weeds (armyworms, wireworms).

Injury symptoms can, at best, be used to sort insects into groups but are
often not descriptive enough to choose one insect over the other. Rather, plant injury symptoms can be used to rule out certain insects or used to help support diagnosis of others. Feeding on the leaf margin can often point to armyworm, grasshoppers and early instar black cutworms. Plant injury symptoms described as “wilted whorl” or “dead-heart” can include white grub, black cutworm, hop vine borer, stalk borer and wireworm. If symptoms include holes in the newly emerging leaves it might lead you to a stalk borer or billbug diagnosis. One exception is slug injury. Slugs have a very distinctive injury symptom which includes elongated feeding scars that may or may not have the leaf cuticle intact.

One final point. We occasionally get insects, which for some reason, flare up on either a local or landscape level. Some may be known corn pests and others not. Remember the variegated cutworm outbreak in 2012? Very extreme weather fronts brought this insect to Wisconsin at unprecedented levels. On a local scale, insects such as sandhill, glassy, spotted and dingy cutworms can be found in individual fields or even isolated areas of fields. Bring unknown insects and damage in for diagnosis. The benefits are many and will include accurate diagnosis, appropriate management decisions and data for field histories. Additionally, it gives us (UW Extension) a better feel for trends and we can get the word out.

**Post Emergence herbicides for corn and soybean**

Liz Bosak, Outreach Specialist, Department of Agronomy


Weed photo of the week

![Pigweed, common lambsquarters, and ladysthumb seedlings in a small research plot with no pre-emergence herbicide. The corn was planted on May 1, 2015 at the Arlington Agricultural Research station.](image)

**All 2014 Crop Manager Articles compiled in one PDF**

The complete 2014 Wisconsin Crop Manager Volume 21 is now available on our website as a single PDF. The first four pages are a Table of Contents listing every article and the page number it can be found on.

To view or download all the articles from the 2014 Wisconsin Crop Manager in one PDF file, complete with a table of contents, click on the link below

NOW is the time to start thinking about Pre-sideress Soil Nitrate Test Sampling

The corn has been planted and is starting to grow. Now is the time to consider using the pre-sideress soil nitrate test (PSNT) to help you adjust your sidedress nitrogen fertilizer rates. To learn how and why to take PSNT samples, view this informative video featuring Dr. Carrie Laboski, Extension Soil Scientist at the University of Wisconsin-Madison:

https://www.youtube.com/watch?v=oSlpTL0oKog

Save the Date – Agronomy/Soils Field Day at Arlington Ag Research Station on August 19th

The Departments of Agronomy and Soil Science in conjunction with the Arlington Agricultural Research Station will host their annual field day on August 19, 2015. The field day will highlight UW-Madison research on all facets of crop production and soil management. More details coming in June.

Vegetable Crop Update 5-22-15

The 9th issue of the Vegetable Crop Update is now available. This issue contains late blight updates and disease forecasting information (PDays/DSVs are now being posted). Click here to view this issue.

Vegetable Crop Update 5-28-15

The 10th issue of the Vegetable Crop Update is now available. This issue contains late blight updates and disease forecasting information (PDays/DSVs are now being posted).

We are nearing DSV 18 for early emerging potato fields in southern/central Wisconsin at this time. Weather conditions have been favorable for the development of late blight from time of ~50% potato crop emergence to 5/27 (date of last DSV calculation). I attached an updated document which includes fungicides registered for potato late blight control in Wisconsin as of April 2015.

Click here to view this issue.

Irrigation Management in Wisconsin

The Wisconsin Irrigation Scheduling Program (WISP) (A3600-01)
Scott Sanford and John Panuska

Successful irrigation management uses a combination of rainfall and applied water to conserve energy, reduce cost and protect groundwater. Most of the areas in Wisconsin that are under sprinkler irrigation have sandy soils with groundwater that is close to the surface, so the potential for groundwater contamination by nitrates and pesticides is high. The Wisconsin Irrigation Scheduling Program (WISP) is a research-based program that uses a water budget approach to irrigation scheduling much like balancing a checkbook. It is available online at [wisp.cals.wisc.edu] (2015, 16 pages).

You can view, download, or order this publication on the Learning Store at: Irrigation Management in Wisconsin

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from May 16, 2015 through May 22, 2015.

Plant/Sample Type, Disease/Disorder, Pathogen, County

Fruit Crops

Apple, Monochaetia Twig Blight, Monochaetia sp., Jackson
Currant, Antracnose, Gloeosporium sp., Calumet

Vegetables

Asparagus, Fusarium Stem Rot, Fusarium sp., Adams
Asparagus, Phoma Stem Blight, Phoma sp., Adams

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
Wisconsin Winter Wheat Disease Update 5/26

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

Winter wheat in the south and south-central portions of Wisconsin is quickly approaching heading. Most wheat we have looked at recently is at boot stage with some beginning to head. Anthesis (flowering) will be occurring very soon if it hasn’t already happened in these fields. Now is the time to consider Fusarium head blight (FHB or scab) risk and consider your control options in at-risk fields. With anthesis occurring this week in some fields, and the prolonged wet weather forecast for this week, growers and consultants should pay close attention to this situation. The risk for FHB will likely be high this week especially on susceptible varieties. To learn more about FHB on wheat you can download a fact sheet by CLICKING HERE.

In addition to considering the weather conditions, you can consult the FHB Prediction Center. I recently wrote a post about the FHB Risk Tool and how to best use it. You can read more about the tool BY CLICKING HERE. Currently, the risk tool is predicting medium to high risk only along the Lake Michigan shore. However, I think this will change as we proceed through the week. With the extended chances of rain and high humidity, coupled with moderate to warm temperatures, risk for FHB on susceptible and moderately susceptible cultivars will be medium to high across a wider portion of the state. This will be especially true along the southern portions of Wisconsin where wheat is beginning to flower this week. Caramba and Prosaro have proven to be the best products for FHB control (see the Small Grains Fungicide Efficacy Table), however, timing of application is critical. These products must be applied at first flower with good efficacy achievable up to 5-7 days after the start of anthesis. Fungicide application after 7 days post-anthesis is not recommended. Pay close attention to the FHB situation this week.

Other wheat diseases in Wisconsin have been fairly minimal. My graduate students managed to find and identify low levels of spot blotch on some plants at our Sharon, WI and Arlington, WI locations last Friday (May 22). The severity was relatively low. Rust and other diseases have not been identified in wheat fields we have traveled to. We will continue to scout and monitor the wheat disease situation as we head toward anthesis.

UPDATED for 2015! Pest Management Fast Facts 4 page information sheet

The popular publication Pest Management Fast Facts produced by the Nutrient & Pest Management (NPM) and the Integrated Pest Management (IPM) Programs has been revised. This useful four-page publication contains pest management thresholds and management options for corn, soybean, alfalfa, wheat and small grains. Updated information includes: 1) the herbicide resistance weed list, 2) the field crop insect treatment thresholds, 3) wheat pesticide application periods, and 5) other general management information.

The publication can be viewed at http://ipcm.wisc.edu/download/pubsPM/Pest-FastFacts.pdf. Copies are available free of charge from the NPM Program. Contact us at npm@hort.wisc.edu or 608-265-2660 to place your order.
A new issue of the Wisconsin Pest Bulletin from the Wisconsin Department of Agriculture, Trade and Consumer Protection is now available. The Wisconsin Pest Bulletin provides up-to-date pest population estimates, pest distribution and development data, pest survey and inspection results, alerts to new pest finds in the state, and forecasts for Wisconsin’s most damaging plant pests.


Inside This Issue

LOOKING AHEAD: Black cutworm primary damage window now open

FORAGES & GRAINS: Significant increase in alfalfa weevil counts this week

CORN: European corn borer egg laying has started in southern WI

SOYBEAN: Minor bean leaf beetle defoliation noted in Columbia and Dane Cos.

FRUITS: Codling moth biofix set at several orchards from May 22-27

VEGETABLES: Striped cucumber beetle emergence under way

NURSERY & FOREST: Euonymus caterpillar infestation reported in the Appleton area

DEGREE DAYS: Growing degree day accumulations through May 27, 2015
Summer CCA Exam Registration Deadline

Bryan Jensen
UW Extension

The registration deadline for the August 7 CCA exam deadline is rapidly approaching. You must register no later than June 26, 2015 to be able to take the summer exam(s). Online registration is available at https://www.certifiedcropadviser.org/exams/registration and instructions can be found at https://www.certifiedcropadviser.org/files/certifiedcropadviser/online-cca-reg-directions.pdf

You are not required to take both the International and State exam on the same date. Although passing both exams, signing a code of ethics and acquiring the minimum level of experience is required to become certified, you may obtain the experience after you pass the exams.

Exam dates are only schedule for the first Friday in August and February. For more information please contact the American Society of Agronomy, certification@agronomy.org (P) 608-273-8085.

True Armyworm

Bryan Jensen
UW Extension

Survey staff for DATCP’s Wisconsin Pest Bulletin have reported significant flights of true armyworm adults in several Wisconsin locations. What should we be doing?

First let’s review some basic information. True armyworm is the approved common name. However in Wisconsin we usually refer to them as “armyworms” because we rarely have other species of armyworms causing damage to field crops. Armyworm larvae may grow up to 1½ inch long. Coloration is variable, but commonly they have a lighter colored underside, orange stripes with white borders on each side and darker striping on their “backs”. Armyworm heads are tan w/ a network of veins that are easily recognizable. Especially on older instars.

Armyworm do not overwinter in Wisconsin. Instead, they migrate to the Midwest on spring weather fronts. Blacklight traps are an important monitoring tool because the timing and intensity of flights.
Armyworm Larvae are unpredictable. High trap catches do not always correlate with field activity but they do give us enough forewarning to prepare for field scouting.

We usually have 2 generations/growing season. Larval damage resulting from the migrating adults will often be spotty and locally severe as compared to the summer generation which tends to be more widespread. Understanding insect behavior can help fine-tune our field scouting activities. But please keep in mind we have a difficult time understanding human behavior let alone insect behavior. Adult females are attracted to grasses to deposit small white eggs which are usually laid in rows or clusters. Therefore concentrate your early scouting efforts in corn fields planted into grass cover crops or those with early season grassy weeds. Another helpful hint to focus on, are those corn fields no-tilled into alfalfa. Whether the alfalfa was fall or spring killed, both situations can have significant armyworm damage. Small grains are also attractive egg laying sites. Particularly those fields with high plant density or in areas that are lodged. Soybean and alfalfa, both broadleaf crops, generally escape damage, although larvae may feed on grassy weeds within a field.

Armyworm larvae do not like to feed during daylight hours. You commonly find them feeding nocturnally and/or in shaded areas like corn whorls. Look for frass (fecal material) in the whorls, ragged leaf feeding on the leaf margin or occasional ragged holes in the emerged leaf.

Consider treating wheat or other small grains when you find more than 3 larvae/square foot and you have significant leaf feeding. Be aware that larvae can also switch from leaf feeding to head clipping as plants mature. Feeding injury in wheat (and corn) may be variable, sometimes making spot treating and/or edge treatments practical.

In corn, treatment can be suggested when 25% of the plants have two or more larvae/plant or when 75% of the plants have one larva/plant. Small larvae are much easier to kill than the later instars. Treatment may not be suggested if larvae are greater than 1 ¼ inch in length because of reduced mortality and the fact that the majority of defoliation has already occurred.

**Vegetable Crop Update 6-1-15**

The 11th issue of the Vegetable Crop Update is now available.

I’m sending out a newsletter early this week as we’ve reached/exceeded Blitecast (late blight forecasting tool) threshold of 18 DSVs at multiple locations for potatoes in Wisconsin. Preventive fungicide applications are warranted at this time. I know that this seems very early (~one month earlier than typical early blight fungicide recommendations), however, Blitecast tells us that weather conditions have been favorable for late blight development. While no late blight has yet been detected on seed potatoes or on tomato transplants, the pathogen can be harbored in volunteers, seed potatoes, cull piles, and compost piles.

Additionally, we have had important updates on spotted wing drosophila and irrigation & conservation practices in WI vegetable production that are timely and ready for release.

Topics in this newsletter include:

disease forecasting updates
spotted wing drosophila updates in fruit crops
irrigation and conservation practices in WI vegetable production – summary

Click [here](#) to view this issue.
A Tank Full of Sugar Helps the Profits Go Down

While in attendance at the 2015 Commodity Classic I was a bit dismayed at the number of featured speakers expounding upon the incredible in-season benefits of applying sugar to field crops. I have been sitting on this article for a few months now waiting for the right time to relaunch the below article originally entitled “Do Foliar Applications of Sugar Improve Soybean Yield”. I waited a bit too long as my colleagues at the University of Nebraska beat me to the punch with their articles linked here “Sugar Applications to Crops – Nebraska On-Farm Research Network Results” and “Research Results: Sugar Applications to Crops”. I guess I shouldn’t feel too bad though as this is the first time the Corn Huskers have beat the Badgers in anything for a long time….

***UNL article spoiler alert*** In short the University of Nebraska team did not find a consistent yield increase in corn or sorghum and averaged 0.8 bu per acre in soybean (FY1: average cost of ground application in $7.55 and aerial is $10.60; 2015 Iowa Farm Custom Rate Survey and the average yield loss caused by sprayer wheel track damage in soybean in rows less than 20 inches is 1.9 or 1.3% with a 90 or 120 foot boom, respectively).

I also want to give credit to my colleague Chad Lee also wrote a nice article entitled “Could Sugar Help Drought Stressed Corn?” that discusses sugar rates, biological activity and actual costs of product.

I am certain this article will stir up severe indignation, however when the local cash bids are averaging $8.88 ROI is more important than ever.

Do Foliar Applications of Sugar Improve Soybean Yield
(Originally published: June 14th, 2011)

High commodity prices have led growers to consider many novel soybean inputs. One input that has garnered considerable attention is the foliar application of sugar products to increase soybean yield. The objective of this research was to evaluate soybean yield in response to various sources of foliar-applied sugar across four states in the Midwest. Field research studies were conducted at Arlington, Wisconsin; Urbana, Illinois; St. Paul, Minnesota; and West Lafayette, Indiana in 2010. The four sources of sugar evaluated in this study were:

1. granulated cane sugar
2. high fructose corn syrup
3. molasses
4. blackstrap molasses.

All treatments were applied at the equivalent rate of 3 lb sugar a⁻¹ and applied at 15 to 20 gal a⁻¹. The treatments consisted of an untreated check, all four sources of sugar applied at V4, granulated cane sugar and blackstrap molasses applied at R1, granulated cane sugar applied at V4 and R1, and blackstrap molasses applied at V4 and R1.

No positive or negative (phytotoxic) effects were visually observed on the soybean foliage at any location within 10 days following foliar applications (data not shown). Furthermore, sugar did not increase soybean yield within location (data no shown) or across locations [P = 0.60 (Figure 1)], regardless of source. While this study cannot conclusively prove foliar applications of sugar will not increase soybean yield, the authors conclude that other management strategies to improve soybean yield should take precedence over applying sugar.

The source of this data is:
UW Crop Diagnostic Training Center workshops for 2015

Registration is open for UW-Madison Integrated Pest Management Program’s two Crop Diagnostic Training Center workshops for 2015. The Diagnostic Troubleshooting Workshop will be held July 30, 2015. The Crop & Pest Management Workshop will be held August 13, 2015.

**FAST and easy ONLINE registration by credit card:**

https://www.patstore.wisc.edu/ipm/register.aspx

Both workshops will be hosted at the Arlington Agricultural Research Station. Be aware that this is not a “traditional” field day. These training sessions are designed to be primarily in-field and hands-on. We advise that attendees come prepared to be in the field and ready for all types of weather. CCA CEU’s are available as listed, but are subject to change pending approval from the Certified Crop Advisor Program.

Contact Dan Heider at 608-262-6491, or email djheider@wisc.edu

### Diagnostic Troubleshooting Workshop

**Date:** July 30, 2015  
**Location:** Arlington Ag Research Station  
**CCA CEU’s:** 4.0  
**Fee:** $75 (Tiered fee: $90 after 7/15/15)

Topics covered: For this workshop, small groups will rotate through field problems with UW Specialists role playing as farmers. Through digging up plants, asking questions and consulting references, participants will make a diagnosis of the problem being observed and a recommendation for correction. Each participant will experience eight separate diagnostic scenarios. Year after year, participants tell us this is one of the most challenging, useful and fun workshops they have ever attended!

**Thursday – July 30, 2015**

9:00 – 9:30 registration / introduction & orientation  
9:30 – 12:00 sessions 1-5  
12:00 – 12:45 lunch (provided)  
12:45 – 2:55 sessions 6-8

### Crop & Pest Management Workshop

**Date:** August 13, 2014  
**Location:** Arlington Ag Research Station  
**CCA CEU’s:** 1.0 Crop Management, 1.0 Nutrient Management, 2.0 Pest management  
**Fee:** $75 (Tiered fee: $90 after 8/1/15)

This workshop takes a multi-disciplinary and in-depth approach covering agronomic concerns ranging from identification of crop and pest production problems to management options within production systems.

**Thursday – August 13, 2015**

9:30 – 10:00 registration / introduction & orientation  
10:00 – 12:00 sessions 1-2  
12:00 – 12:45 lunch (provided)
Congratulations! Twenty year anniversary for CCA’s and CPAg’s

Bryan Jensen
UW Extension

Please join the Wisconsin CCA Board in congratulating several CCA’s and CPAg’s who have recently completed 20 years of certification. As impressive as this list is, so is the time commitment and impact they have had on Wisconsin agriculture. Take a moment to read through the lists and congratulate them when you see them or call/email them when you get a chance. This is a very impressive milestone in their professional career!

Wisconsin CPAg’s Achieving Their 20 Year Anniversary in 2015

Steven Hanvold, Wausau
Thomas Perllick, Sarona
John Sudbrink, Cascade

Wisconsin CCA’s Achieving Their 20 Year Anniversary in 2015

Chris Allen, Lodi
Steven Almich, Chippewa Falls
Bruce Andersen, Cedar Grove
Eric Anderson, Suring
Byron Aspenson, Viroqua
Dennis Ball, Columbus
Gary Brandt, Darlington
Joseph Brown, Milton
Timothy Brussow, Loyal
David Buss, Waterloo
Randall Cherney, Stevens Point
Scott Christensen, Wisconsin Dells
Kevin Erb, Green Bay
Jon Erickson, Eau Claire
Shawn Esser, Black Earth
Jeffrey Frase, Osseo
Donald Genrich, Adams
Kevin Giese, Elk Mound
Douglas Gray, Marshfield
Jim Gulke, Oostburg
Michael Haedt, Green Bay
Joel Hagen, Fall Creek
Jeremy Hanson, Appleton
Steven Hanvold, Wausau
Carl Harpstead, Plymouth
Perry Hickey, Waupaca
Kenneth Jahnke, Prairie du Chien
Scott Jerabek, New Richmond
Joseph Kapral, Wild Rose
Joey Kenicker, Cuba City
Allen Klug, Cottage Grove
Kevin Knudtson, Juda
Jeffrey Kopp, Juda
Benjamin Koss, Kewaunee
Kirk Langfoss, Wausau
Daniel Langkamp, Darlington
George Leroux, Malone
Terrance Licht, Cadott
Edward Liegel, Loganville
Donald Lininger, Twin Lakes
Duane Marty, Neillsville
Christine Mason, Whitewater

Frank Masters, Janesville
Mark Matthias, Chilton
Gary Mayne, Bloomington
Mike McClyman, Friendship
Steve McElroy, Dalton
Alan McGuire, Brodhead
Dennis McGuire, Brodhead
Vernon Meinholtz, Loganville
Paul Merry, Antigo
Robert Mickelson, Fall River
Bradley Mikelson, Nelson
Steve Miller, Beaver Dam
Michael Mleziva, Shawano
Thomas Murphy, Neshkoro
Bryan Nugent, Muscatine
Bruce Ostenson, Barron
Diane Ott, Brilllon
Thomas Overby, Durand
Warren Pickar, West Salem
Jeffrey Plenty, Delavan
Stephen Prouty, Hillpoint
Linda Rather, Ripon
Steven Rosenthal, Plover
Stuart Rymph, Mazomanie
Timothy Sanders, Clinton
Kevin Shelley, Deerfield
Paul Simon, Stitzer
Mark Stangel, Kewaunee
Phillip Stern, Bonduel
Paul Sturgis, Vesper
David Sumnicht, Bonduel
Joseph Terando, Burlington
Lori Vogeltanz, Kewaunee
Gary Vondrachek, Kiel
Dale Walz, Granto
William Weisensel, Evansville
Jamie Wetzel, Gillett
Kevin Williams, Beaver Dam
Glen Zierl, Arkansaw
Allen Zirk, Waunakee
Jeff Zutz, Valders
UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update
Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from May 13, 2015 through May 29, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Forage Crops**
Alfalfa, Root Rot, *Fusarium sp.*, Richland

**Fruit Crops**
Apple, Cytospora Canker, *Cytospora sp.*, Lafayette
Apple, Nectria/Tubercularia Canker, *Tubercularia sp.*, LaFayette
Apple, Sphaeropsis Canker, *Sphaeropsis sp.*, Marquette

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

Wisconsin Winter Wheat Disease Update 6/3
Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin–Madison

We have scouted wheat from South of Madison, Wisconsin up through to near Fond du Lac this week. Most winter wheat we have looked at has headed and quickly approaching anthesis. The winter wheat variety ‘Kaskaskia’ was at early anthesis today. Now is the time to make a decision on spraying for Fusarium head blight (FHB). The Fusarium Head Blight Prediction Center ([http://www.wheatscab.psu.edu](http://www.wheatscab.psu.edu)) has the majority of Wisconsin listed at low risk for a susceptible winter wheat variety. However, clicking the box to run the prediction for a ‘very susceptible’ winter wheat variety changes much of the state to medium risk and some areas at ‘high risk’ for FHB (Fig 1).

With the warm and dry weather this week, the question has been “Should I spray for FHB?” In short, I think the answer to this question is ‘yes’ especially for farms and fields that have had a history of FHB.

If we consider the biology of the fungus and the epidemiology of FHB, the past, present, and future weather patterns are all important. Weather over the past couple of weeks has been rainy and wet. This has served to ‘prime’ the FHB fungus to make spores. Even with the dry weather this week, there is bound to be spores of the FHB fungus present and blowing around. Now if we consider the weather over the next few days, it looks like a pretty good chance for on-and-off rain with warm conditions; weather just ripe for FHB. Considering the conditions and the fact that anthesis is occurring this week, I think spraying is a good decision. Additionally, the fungicide applications at this stage will protect flag leaves from foliar diseases like rust, Septoria leaf blotch, or powdery mildew, should they move in over the next few weeks during grain fill.

Caramba and Prosaro have proven to be the best products for FHB control, however, timing of application is critical. These products must be applied at the beginning of anthesis with good efficacy achievable up to 5-7 days after the start of this growth stage. Fungicide application after 7 days post-anthesis is not recommended. You can watch a video of Dr. Shawn Conley describing how to identify this important growth stage by clicking here.

We continue to look for other wheat diseases around the state. We have not observed any rust on winter wheat in Wisconsin. Additionally, no powdery mildew and no Septoria leaf blotch have been observed on our scouting trips. We will continue to monitor the winter wheat disease situation as we move into grain fill.
Wisconsin Pest Bulletin 6-4-15
Krista Hamilton, Entomologist

A new issue of the Wisconsin Pest Bulletin from the Wisconsin Department of Agriculture, Trade and Consumer Protection is now available. The Wisconsin Pest Bulletin provides up-to-date pest population estimates, pest distribution and development data, pest survey and inspection results, alerts to new pest finds in the state, and forecasts for Wisconsin’s most damaging plant pests. Issue No. 7 of the Wisconsin Pest Bulletin is now available at:
http://datcpservices.wisconsin.gov/pb/index.jsp

INSIDE THIS ISSUE
LOOKING AHEAD: First soybean aphids of the year found in western WI
FORAGES & GRAINS: Potato leafhopper migrants widespread, counts remain low
CORN: True armyworms and stalk borers appearing in corn fields
SOYBEAN: Bean leaf beetle defoliation noted in 47% of fields surveyed
FRUITS: Variable codling moth flight under way in parts of the state
VEGETABLES: Low numbers of variegated cutworm larvae noted in Richland County
NURSERY & FOREST: Basil downy mildew confirmed in a Milwaukee County greenhouse
DEGREE DAYS: Growing degree day accumulations through June 3, 2015

Follow us on
Considerations for Switching Soybean Maturity Groups for Delayed Plantings

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

Delayed corn planting coupled with frequent rainfall events and poor planting conditions have postponed soybean planting across many parts of WI. Since we are rapidly approaching the hybrid maturity switch date for corn in southern WI (May 20th, given 2014 costs and prices) three common questions have arisen regarding soybean plantings. These are:

1. When during the planting season should a producer switch to an earlier maturing soybean variety?

In southern Wisconsin, full season soybean varieties (>1.8RM) out yielded earlier maturing varieties (<1.8RM) by 15 bu per acre at early May planting dates compared to only 2 to 5 bu per acre at late May planting dates. In northern Wisconsin, late maturing varieties (1.7 to 1.9RM) also out yielded early maturing varieties (<1.7RM), however the difference was not as great. Switching to an earlier maturing variety when planting after the first week of June will reduce the chance of damage from an early fall frost (Fig. 1.). Unfortunately growers will realize a yield penalty if they choose to move to an earlier maturity group and lowered seeding rates (Table 1.). It is also important to note that if you do choose to switch to an earlier maturity group soybean, do not use a variety that is more than 0.5 RM earlier than you normally would plant.

2. When is the latest soybeans can be planted in Wisconsin and still expect a grain yield?

Research from the 1990’s in southern Wisconsin indicates that in two out of three years, grain can be harvested from soybeans planted as late as June 26, although the yields are usually minimal and not generally economically feasible. The frequency of harvesting grain from soybeans planted this late can be increased by using early maturing varieties (<1.8RM) in southern Wisconsin, and <1.0RM in northern production areas. A planting date of June 20 in southern Wisconsin and June 15 in northern Wisconsin, using early maturing varieties, was considered to be the latest practical date. However today’s grain prices coupled with opportunities for late-season discounted treated soybean seed may entice growers to push the planting date window in 2014.

3. What should my target plant population be in my late planted soybeans?

To maximize yield potential in late planted soybean, growers should target a stand of 180,000 plants per acre in row spacing’s ≤ 20inches. Wider row spacings and reduced plant stands will lead to reduced yield potential due to decreased canopy development. Planting too few seeds can also lead to...
a lower physical pod set and harvest issues. To achieve 180,000 plants per acre a grower may have to plant up to 200,000 seeds per acre (assuming 90% germ).

Soybean Planting Date by Maturity Group Considerations for 2015

Article coauthored by Dr. Shawn P. Conley and Adam Gaspar

Early May planting in Wisconsin has been documented to increase soybean seed yield due to increased light interception (Gaspar and Conley, 2015). In theory, earlier planting can potentially intercept greater amounts of solar radiation due to a longer growing season and therefore longer maturity group (MG) soybean varieties may be better suited to maximize yield if they can mature before a hard fall frost. Unlike 2013 and 2014, 2015 may provide growers with an opportunity to plant their soybean crop earlier than ever before. Yet, in some instances (weather or logistical problems) planting will be delayed or replanting may be needed. Therefore, investigating the effect of different MG’s at multiple planting dates across the state would provide WI growers with BMP’s for soybean establishment regardless of planting timing.

To answer this question field trials were initiated at Arlington, Hancock, and Spooner, WI in spring of 2014. The five planting dates at each location were planting roughly on: (1) May 7th, (2) May 20th, (3) June 1st, (4) June 10th, and (5) June 20th. Planting after June 20th is not recommended in WI. Two varieties within each MG from a 2.5 all the way down to a 00.5 were tested depending upon the location and planting date and are displayed in Table 1.
Let’s start with the easy and redundant part, get your soybeans in the ground ASAP to maximize yield. This is evident again in this trial, where Figure 1 shows the effect of planting date across all MG’s (varieties) tested in 2014. If the soil is fit, soil temps are near 50 °F, and the forecast is favorable… get the planter rolling!

![Figure 1. Dots represent the mean yield within each planting date for each location. The average yield loss per day for delaying planting past May 7th is presented in the legend.](image)

However, the question still remains for many producers, should I use a longer maturity variety in early planting situations (very possible in 2015) and should I switch to an earlier maturing variety when planting is delayed?

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Arlington</th>
<th>Hancock</th>
<th>Spooner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (May 7th)</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>2 (May 20th)</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>3 (May 30th)</td>
<td>NS</td>
<td>**</td>
<td>NS</td>
</tr>
<tr>
<td>4 (June 10th)</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>5 (June 20th)</td>
<td>**</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

**MG had a significant effect on yield at the P ≤ 0.05 level**

Based upon the 2014 data, only 2 out of 15 location x planting date combinations displayed a significant effect of MG on yield (Table 2). So the moral of the story is that within a realistic MG range for your region and planting date, variety selection should be based heavily upon the varieties past local and regional performance, disease package, and etc. Variety selection heavily based upon the MG is not a silver bullet to frequently increasing yields.

However, there are always caveats…… Growers may consider trying a slightly longer maturing soybean on a portion of their acres because there is a “potential”, but not guarantee, for higher yields with no additional dollars spent. Within planting date 1, there was no significant MG effect, but MG 2.5 did yield the highest numerically in Arlington and Hancock with no fall frost damage, while the same is true for MG 1.5 in Spooner. The longest MG tested within each planting date in our study numerically yielded the highest through June 10th (planting date 4).

On the back end of the planting season, the inverse was seen. Within planting date 5 at Arlington and Hancock, MG 1.5 did not mature before the first fall frost and was the lowest yielding. Therefore, growers may consider switching to an earlier maturing variety as planting is delayed into June. If switching to an earlier maturing variety, don’t use a variety less than 0.5 MG earlier than a full season variety (2.5 in southern WI) in early June. However, if planting is delayed into mid to late June then a variety that is greater than or equal to a full MG earlier should be considered.

**Acknowledgements:** The authors would like to thank the Wisconsin Soybean Marketing Board and DuPont Pioneer for supporting this research.

Herbicide Resistance Management for Giant and Common Ragweed

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin

Weed scientists across the Midwest and Mid-south have identified eleven species of weeds that are of most concern for herbicide resistance because of their ability to compete with crops and to develop resistance to different herbicide sites of action (SOA). They are common waterhemp, Palmer amaranth, horseweed (marestail), giant ragweed, common ragweed, common lambsquarters, kochia, Italian ryegrass, barnyard grass, johnsongrass, and giant foxtail. All of the species have shown resistance to between two and nine herbicide sites of action.

Herbicides are typically classified in two ways by (1) mode of action or (2) site of action. The mode of action is generally how the herbicide inhibits plant growth and development. The site of action is specifically which biochemical pathway in the plant that the herbicide disrupts. Each site of action is associated with a number and the number is located on the first page of most herbicide labels. The TakeAction herbicide classification chart clearly displays the herbicides and premixes by sites of action, [http://wcws.cals.wisc.edu/wp-content/uploads/sites/4/2013/03/FactSheet_TakeAction_HerbicideClass_2013.pdf](http://wcws.cals.wisc.edu/wp-content/uploads/sites/4/2013/03/FactSheet_TakeAction_HerbicideClass_2013.pdf)

A successful resistance management plan will include multiple effective sites of action applied at the full rate to weeds less than four inches in height.


At this point in the season, the most important task for herbicide resistance management is to scout fields several times before and after an herbicide application. Scouting after pre-emergence applications, prior to a post-emergence timing, can ensure that the post application is on target for weed species and size. It is important to pay attention to any weed species that is becoming more abundant across the field and then to double-check that your planned herbicide program is effective at controlling that species. Also, factoring in current weed size with weather forecasts is important for scheduling that next application. After applying herbicides, the next task is to follow-up with scouting at 14 days after the post application to verify adequate control. For more information about effective scouting, please visit the TakeAction website, [http://takeactiononweeds.com/manage-your-fields/scouting/](http://takeactiononweeds.com/manage-your-fields/scouting/).


Jeff Polenske, International CCA of the Year!

Bryan Jensen
UW Extension

The American Society of Agronomy and the International Certified Crop Advisers Program have recently selected Jeff Polenske, Tilth Agronomy, as the 2015 ICCA of the Year.

Jeff has over 27 years of Wisconsin crop advising experience and currently works with more than 50 clients on 50,000 acres of corn, soybean, alfalfa and wheat in Northeast Wisconsin.

You would expect if someone receives this high of an honor that they would be an asset to clients, colleagues and a leader in the agricultural community. Jeff certainly has a long list of similar accomplishments which include (but not limited to!):

- 2014 Wisconsin CCA of the Year
• Active membership with several local, state and national organizations. Including terms on executive boards, as officers and involvement with several committees.
• Co-chair for the University of Wisconsin Integrated Crop and Pest Management Program’s Advisory Committee.
• Technical Service Provider including certification for writing CNMP’s and Conservations Plans
• Participation in several applied research projects
• Member of nutrient management rewrite committees

Despite all the accomplishments, the one which Jeff seems to be most proud of is his mentorship to colleagues, staff and students. He continues to lay the groundwork for the next generation of crop consultants!

When you get a chance, please congratulate Jeff on a great career.

Congratulations Jeff!

June 2015 Grain and Livestock Market Outlook

Brenda Boetel – Department of Agricultural Economics, University of Wisconsin-River Falls
715-425-3176

Corn
• Corn rated as good or excellent is at 74%, compared to 76% last year.
• Dollar has been down and lower against the dollar index, which has boosted corn and soybean prices.
• Traders tend to focus on value of the dollar when there is little supply and demand information.
• Export shipments have been lower than needed to meet current USDA forecasts of 1.825 BB.
  Commitments are also lagging.
• Price has rallied the first week of June and may break the two-month downtrend.
• Market is still oversold.
• RFS for ethanol was cut and will require 3.75 billion fewer gallons of corn-based ethanol, which would be
• 1.3 billion bushels of corn. The mandate hasn’t been binding recently as US has produced above it.
  For 2014 to 13.25 billion gallons from 14.4 billion
  For 2015 to 13.4 billion gallons from 15 billion
  For 2016 to 14 billion gallons from 16 billion
• December 2015 corn price on June 4, 2015 of $3.80 is down approximately 18% from last year’s June 4 price of $4.6175 and will likely continue downward till harvest.

Soybean
• Rain has been affecting western Midwest and there may be a decrease from the forecasted 87 Million acres projected plantings.
• Export demand for soybeans and meal is strong and continuing. Exports are on track to be 10 million higher than current USDA forecasts.
• USDA may drop carry by 10 million to 340 million bushels due to strong demand.
• Quarterly stocks report is due June 30 and will give direction for soy prices.
• RFS was bullish for soy oil as proposed levels for biodiesel were increased.
  • For 2014 to 1.63 billion gallons from 1.28 billion
  • For 2015 to 1.7 billion gallons from 1.28 billion
• November 2015 soybean price on June 4, 2015 of $9.1875 is down approximately 23% from last year’s June 4 price of $11.9475 and will likely continue to drop. This week’s increase has been due to weather concerns regarding planting, but even with a small decrease in acreage likely see prices continue to drop long-term.
• November futures prices will likely dip as low as $8.75.
• Market wants beans sooner rather than later as seen in the spread and farmers are light sellers. Tiete-Parana waterway in Brazil, which typically transports 2.5 MMT of soybeans and corn, will reopen in second half of 2015. The reopening will cut transportation costs by approximately 10-15%.

**Wheat**

• Heavy rains may bring about yield losses.
• Likely see small increase in USDA ending stocks for 2014/2015 and 2015/2016 marketing years.
• New crop began on June 1.
• HRS spring wheat is at 69% good to excellent rating as of May 24.

**Poultry**

• Avian Influenza continues to impact turkey flocks in Minnesota and Wisconsin, and laying hens in Iowa.
  ▪ Over 43.4 million birds have been affected
  ▪ Expectations are for epidemic to be over by August.
• Chicken production has increased by 7.9% in 2015 over 2014 levels.
• Poultry stocks were up 21% from 2014.

**Pork**

• Pork production has increased by 6.8% in 2015 over 2014 levels.
• Pork stocks were up 19.8% from 2014.
• Pork exports are up 4% from 2014, but value was down 14% from 2014.
• West coast port congestion is past and the situation is returning to normal.

**Beef**

• Beef production has decreased by 3.7% in 2015 over 2014 levels.
• April beef exports were the largest since December but down 7% from 2014. Value is up 3% from 2014.
• Australia has not seen decrease in beef production and it is gaining a second tariff advantage in Japan.
• Packer margins have improved with higher wholesale beef prices. Feedlots continue to bid up calf prices higher than the feeder cattle index.

Beef cutout values remain high although down slightly to a recent $248.48. Tight supplies though and continued strong demand may bring more record prices in June.

**Vegetable Crop Update 6-5-15**

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 12th issue of the Vegetable Crop Update is now available which addresses the following topics:

• disease forecast updates (PDays and DSVs)
• importance of managing volunteer potatoes
• considering fungicides for late blight control in conventional potato of WI

Click [here](#) to view this issue.

**Vegetable Crop Update 6-10-15**

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 13th issue of the Vegetable Crop Update is now available which addresses the following topics:

• disease forecast updates (PDays and DSVs)
• season limits for mancozeb and chlorothalonil usage
• information resources for fungicide info for late blight control in potato

Click [here](#) to view this issue.
Stalk Borer Management

Bryan Jensen
UW Extension

Insecticides is effective, timing is critical. Stalk borers overwinter as eggs laid on perennial grasses such as quackgrass and wirestem muhly during late August and September. Use your fall weed surveys to locate these area and/or concentrate your scouting efforts along fencerows, ditch banks, terraces, etc. After hatch, larvae will begin feeding inside grassy weeds as well as some broadleaf weeds. Soon those larvae will leave these early hosts and migrate into the first few rows of corn.

Stalk borers damage corn by feeding within the whorl then moving down into the stalk or by entering the plant directly into the stalk above ground. Initial feeding symptoms include light scarring of leaf tissue, holes in leaves and eventually wilted whorls. Treatments are best timed during the migration to corn but prior to larvae burrowing into the corn stalk. Larvae cannot be controlled once they have burrowed into the stalk and treatment after V7 is not suggested.

Treatment thresholds have been developed by Iowa State University and available for your review in Pest Management Fast Facts, http://ipcm.wisc.edu/download/pubsPM/Pest-FastFacts.pdf Insecticide treatment options are available by navigating to Pest Management Mobile http://pmm.uwex.edu/ or UW Extension Publication A3646, Pest Management in Wisconsin Field Crops http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2008-P155C37.aspx

![Early symptoms of stalk borer feeding](image1)

![Stalk borer larvae](image2)

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from May 30, 2015 through June 5, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Vegetables**

Tomato, Gray Mold (*Botrytis Blight), *Botrytis cinerea*, Dane
Tomato, Tomato spotted wilt, *Tomato spotted wilt virus*, Dane”
Tomato, White Mold, *Sclerotinia sclerotiorum*, Dane

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu
Wisconsin Pest Bulletin 6-11-15
Krista Hamilton, Entomologist

A new issue of the Wisconsin Pest Bulletin from the Wisconsin Department of Agriculture, Trade and Consumer Protection is now available. The Wisconsin Pest Bulletin provides up-to-date pest population estimates, pest distribution and development data, pest survey and inspection results, alerts to new pest finds in the state, and forecasts for Wisconsin’s most damaging plant pests. Issue No. 8 of the Wisconsin Pest Bulletin is now available at: https://datcp_services.wisconsin.gov/pb/pdf/06-11-15.pdf

INSIDE THIS ISSUE
LOOKING AHEAD: Continue scouting for true armyworm larvae
FORAGES & GRAINS: Potato leafhopper nymphs appearing in alfalfa
CORN: Stalk borer damage expected to increase by late June
SOYBEAN: Soybean aphids found in only four of 67 fields surveyed this week
FRUITS: Peak first flight of lesser peachtree registered in many orchards
VEGETABLES: Squash vine borer moths could begin emerging by June 16
NURSERY & FOREST: Scotch pines in Burnett County heavily infested with pine spittlebug
DEGREE DAYS: Growing degree day accumulations through June 10, 2015

Wisconsin Winter Wheat Disease Update 6/10
Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

Winter wheat in much of southern and central Wisconsin is now in active anthesis or past anthesis. Spraying for Fusarium head blight (FHB) is not recommended once wheat has progressed past 7 days after anthesis. Wheat from the east central to northeast is likely approaching or at anthesis. Spraying for FHB on winter wheat in these areas is recommended. Caramba and Prosaro have proven to be the best products for FHB control, however, timing of application is critical. These products must be applied at the beginning of anthesis with good efficacy achievable up to 5-7 days after the start of this growth stage. The FHB Prediction Center is forecasting moderate to severe FHB from Fond du Lac up through Door County for ‘very susceptible’ winter wheat varieties (Fig. 1). Wheat at the susceptible growth stage is at risk and spraying in these areas is recommended. Additionally, sprays at this time will also help manage foliar diseases such as rust that may move in and reduce yield during grain fill.

Brian Mueller, graduate student in my program, observed the first pustules of stripe rust on winter wheat in Wisconsin in 2015 (Fig. 2). These pustules were found in Sharon, WI in the UW wheat variety trial on June 4. This location is west of Janesville, near the Illinois border. Pustules were located in just one plot on a single variety during that first visit. Scouting was conducted again on June 10 in wheat not treated with fungicide next to the UW variety trial at this same location. Additional stripe rust infections were observed, however, severity remains low. I suspect stripe rust will continue to increase in this area and areas to the north. Cool wet weather is predicted for the next 5-7 days. This weather pattern will be conducive for stripe rust spread.

Cephalosporium stripe (Fig. 3) has also been identified in several fields around the state. Cephalosporium stripe has been identified in winter wheat fields in Wisconsin over the last several years. Typically the disease has occurred in localized areas of the field, but in some cases it has been identified in wider areas depending on the varieties. No in-season management is available for Cephalosporium stripe. However, noting which fields and locations in fields that have symptoms will help for future decisions about winter wheat management in those areas. Varieties with genetic resistance are available. Also longer
rotations and better grassy-weed control can help reduce the severity of Cephalosporium stripe. For more information about Cephalosporium stripe CLICK HERE AND SCROLL DOWN TO THE CEPHALOSPORIUM STRIPE SECTION.

No other disease have been observed on winter wheat in Wisconsin this week. We will be scouting variety trials in the northeast later this week. We will continue to report any diseases we observe.

Registration is open for UW-Madison Integrated Pest Management Program’s two Crop Diagnostic Training Center workshops for 2015. The Diagnostic Troubleshooting Workshop will be held July 30, 2015. The Crop & Pest Management Workshop will be held August 13, 2015.

FAST and easy ONLINE registration by credit card:
https://www.patstore.wisc.edu/ipm/register.aspx

To view the full schedule with times and location:
http://ipcm.wisc.edu/downlo…/misc/2015CDTCworkshopsflyer.pdf
After looking at a few alfalfa fields on the Arlington Agricultural Research Station and talking with PJ Liesch, UW Entomology, it appears that some aphid species have been doing quite well this spring. Pea aphid populations in both the established stands and new seedings were elevated but not to the point where rescue treatments were needed. However, as pea aphid populations start to increase they become very conspicuous and can get people’s attention.

Pea aphids can be either green or rose colored, winged or unwinged and large or small depending whether they are nymphs or adults. You will also find dead individuals that are light tan and attached to leaves. Either this can be the result of a fungal pathogen or aphids kill by parasitoids.

The economic threshold is listed as a field average of 100 pea aphids/sweep. Under good growing conditions I doubt you would see an economic benefit to spraying, especially in established stands. But if the alfalfa is under stress then a foliar application may be needed. Unless you are close to cutting. Harvesting alfalfa is an excellent cultural control method and few aphids will survive.
Initiate scouting for slugs in fields with a history of slug feeding or in fields with significant residue. Economic thresholds based on % defoliation or slug numbers have not been developed.

Water conservation is extremely important for slug survival. Conditions that lead to greater slug survival include cool/wet weather, excessive crop residue and high weed pressure. Prevention is important and controlling residue is probably the most effective cultural control practice. However, many growers are committed to reduce or no-till systems and are unable to change the amount of residue.

Other cultural practices may, or may not provide adequate levels of prevention. Use of row cleaners/trash whippers when planting may help under low to moderate slug populations. Also, early planting may give corn and soybeans a head start and allow them to outgrow damage. Planting corn instead of soybean into suspected slug hotspots may also be an option because corn's growing point is below ground for a period of time. However, make sure the seed furrow is completely closed during planting. Open seed furrows allow slugs to feed on the emerging plant and consume the growing point. Open seed furrows also serves as another protected site to hide during daytime hours.

Chemical control using baits in corn can a rescue option. Baits using the active ingredient methadehyde can be an effective treatment but they should not be considered a "silver bullet". Bait formulations have gotten better in recent years. Both in terms of higher % active ingredient and their persistence. A ballpark cost estimate is $1.90-$2.00/lb of product. However, that price is dependent on several factors including availability, incentives, amount purchased, etc. Your costs will vary. Per acre costs will of course vary depending on use rates. Accurate distribution of product is very important. Read and follow label directions for assistance with timing, application type(s), rates and product distribution.

I have heard anecdotal evidence of people using liquid fertilizers in an attempt to control slugs. However, results have not repeatable. Furthermore, I would have concerns over crop injury at rates necessary to get adequate coverage to control slugs.

Essentially, winged pea aphids will have to recolonize the field.

So how might this weather relate to Soybean Aphids? While this type of weather can be conducive, it is much too early to tell for sure. Proper and timely scouting will give you the information needed.

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**Slugs**

Bryan Jensen
UW Extension

I have been getting some calls and emails regarding slug damage in corn and soybean. With the way the weather has been going it was only a question of when, not if.

Slugs are herbivorous and will feed on a variety of broadleaf and grass plants. Both soybean and corn are attractive hosts. Slugs are be also found feeding in small grains and alfalfa, however, their damage rarely is of economic importance.

Slugs have a “rasp-like” mouthpart and damage seedling plants by scraping off leaf tissue. These feeding scares are usually longitudinal (especially in corn) and may initially leave the wax-like cuticle intact. This symptom is often call “window paneing”. Eventually the cuticle will weather and drop off. Slugs may be difficult to find because they are nocturnal. However, they may be active on cool, cloudy days. During daylight hours, they hide under soil clods and plant debris. Slug injury is often so characteristic that finding slugs to confirm their damage (vs. other insects) may not be needed.
**Vegetable Crop Update June 13, 2015**

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 14th issue of the Vegetable Crop Update is now available which addresses the following topics:

- disease forecast updates (PDays and DSVs)
- national late blight updates

Click [here](#) to view this issue.

**Vegetable Crop Update June 17, 2015**

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 14th issue of the Vegetable Crop Update is now available which addresses the following topics:

- disease forecast updates - all regions and plantings of potatoes in WI (but for late planted in Antigo area) have exceeded DSV18 threshold
- late blight updates
- considerations for shortage of chlorothalonil in 2015
- downy mildew updates for cucurbits, basil, and onion

Click [here](#) to view this issue.

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from June 6, 2015 through June 12, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**
- Corn, Seedling Blight, Fusarium sp., Sauk
- Soybean, Seedling Blight/ Root Rot, Pythium sp., Rhizoc-tonia sp., Fusarium sp., Brown, Grant, Marathon
- Wheat, Cephalosporium Stripe, Cephalosporium gramineum, Vernon

**Forage Crops**
- Alfalfa, Crown Rot, Phomo sp., Fusarium sp., Jefferson

**Fruit Crops**
- Blueberry, Sphaeropsis Canker, Sphaeropsis sp., Jefferson

**Vegetables**
- Cucumber, Unspecified Potyvirus Disease, Unspecified potyvirus, Columbia
- Onion, Seedling Blight, Pythium sp., Fusarium sp., Colum-bia
- Onion, Stemphylium Leaf Blight, Stemphylium sp., Co-lumbia
- Tomato, Root Rot, Pythium sp., Fusarium sp., Dane
- Tomato, Septoria Leaf Spot, Septoria lycopersici, Sauk

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).

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**Vegetable Crop Update June 13, 2015**

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

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

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- Wheat, Cephalosporium Stripe, Cephalosporium gramineum, Vernon

**Forage Crops**
- Alfalfa, Crown Rot, Phomo sp., Fusarium sp., Jefferson

**Fruit Crops**
- Blueberry, Sphaeropsis Canker, Sphaeropsis sp., Jefferson

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- Onion, Stemphylium Leaf Blight, Stemphylium sp., Co-lumbia
- Tomato, Root Rot, Pythium sp., Fusarium sp., Dane
- Tomato, Septoria Leaf Spot, Septoria lycopersici, Sauk

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).
Herbicide injury during and after emergence in soybean

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin

Pre-emergence and post-emergence herbicides can injure soybean plants. This year, soybean injury symptoms following pre-emergence applications have been relatively slight for May 13 and May 19 planting dates. In the herbicide evaluation program, soybean injury symptoms that we typically observe are stunting, drawstring (puckering), chlorosis (yellowing), and necrosis. However, it is important to keep in mind that injury symptoms may be due to weather, soil conditions, or disease (Fig. 1).


After emergence, PPO inhibitor injury tends to appear on the leaves that receive the application but younger leaves will not show any injury symptoms. Typical damage includes yellowing (chlorosis) and browning of the leaf surface in spots (necrosis) (Fig. 2A). Researchers at Purdue University have a five minute video discussing PPO inhibitor and fluopyram (ILeVO) seed treatment injury, [https://youtu.be/GQwJodB7E_M](https://youtu.be/GQwJodB7E_M). It is important to remember that despite the damage, in most cases yield is not affected. Also, PPO inhibitors add another site of action to your resistance management plan and effectively control a variety of broadleaf weed species. Growth regulators cause leaf cupping or epinasty (downward growth habit) (Fig. 2B). The leaves of soybean plants with ALS inhibitor injury show chlorosis and distinctive reddish leaf veins (Fig. 2C).

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**Figure 1.** Mimics of herbicide injury to soybean during or after emergence.

**Figure 2.** A) PPO inhibitor damage, B) Growth regulator induced leaf cupping, C) ALS inhibitor injury.
Injury symptoms typically appear seven to fourteen days after application and will gradually decrease through the season when the plants resume normal growth. Phytotoxicity data are available in the WCWS research reports at http://wcws.cals.wisc.edu/research/herbicide-evaluation-program/. Each trial contains a summary section that will mention if any phytotoxicity symptoms were observed. If the injury differed by treatment and exceeded five percent then a bar graph is included. Crop injury resulting from an application made according to the label instructions usually does not cause a reduction in yield. “Pest Management in Wisconsin Field Crops” shows the relative risk of soybean injury from different herbicides on pages 143 and 144, available at Cooperative Extension’s Learning Store, http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2015-P155.aspx.

2015 Agronomy/Soils Field Day on August 19th

The Departments of Agronomy and Soil Science in conjunction with the Arlington Agricultural Research Station will host their annual field day on August 19, 2015. The field day will highlight UW-Madison research on emerging technologies and relevant crop production issues. The field day will begin at 8:00 am and run until 2:30 pm. Lunch will be provided by the Badger Crops Club ($5 donation).

Program

8:30- Registration & coffee; Pest Management, Soil Fertility & Management, & Bioenergy Cropping Systems tours
10:30- Grain & Forage Production Systems, Pest Management, & Bioenergy Cropping Systems tours
12:00- Lunch provided by Badger Crops Club ($5 donation).

Rick Klemme, Dean and Director of UW Cooperative Extension, will present “Re-booting UW-Extension: Transforming Today’s Extension for Tomorrow’s Possibilities”

1:00- Grain & Forage Production Systems, Soil Fertility & Management, and Organic Cropping Systems Tours

Note: Tours depart promptly as scheduled.

Tours

Grain and Forage Production Systems (tours at 10:30 and 1:00)

- When is yield “determined for corn grain production (Joe Lauer)
- Revamping outdated soybean nutrient uptake models: Results from a high input systems model (Dave Marburger & Adam Gaspar)
- Other CoolBean stuff! (Shawn Conley)
- Forage harvest logistics image based kernel processing score & applied UAV research (Brian Luck)

Pest Management (tours at 8:30 and 10:30)

- A Wisconsin perspective on corn rootworm resistance to Bt hybrids: Detection, avoidance, and management (Bryan Jensen)
- Herbicide resistance management in corn and soybean (Liz Bozak & Devin Hammer)
- Can we manage weeds without roundup ready crops when we plant corn & alfalfa? (Mark Renz)
- Soybean disease & insect management research results & recommendation (Jaime Willbur & Chris Bloomingdale)

Soil Fertility and Management (tours at 8:30 and 1:00)

- Response of no-till corn & soybean to P & K (Carrie Laboski)
- Management impacts on soil organic matter & productivity of continuous corn (Francisco Arriaga)
- Untangling the rotation effect on soil resilience (Bill Bland)
- Cover crops as a trap crop for soil nitrate (Matt Ruark)
- Introduction of new Soil & Forage Analysis Lab Director at Marshfield (Robert Florence)

Bioenergy Cropping Systems (tours at 8:30 and 10:30)

- Exploiting available genetic variability for biomass-based biofuel production: The example of corn (Natalie de Leon)
- Developing sustainable perennial bioenergy crops (Mike Casler)
- What have we learned growing eight bioenergy cropping systems over eight years (Randy Jackson)
- Integrating information from breeding tools for biofuel crop development (Shawn Kaeppler)
Organic Cropping Systems (tour at 1:00)

- Managing organic cropping systems for carbon stabilization and accrual (Gregg Sanford)
- Pasture & soil quality surveys from organic dairy farms across Wisconsin (Geoff Brink, Chelsea Zegler, & Anders Gurda)
- Cover crop-based no-till systems: Options for Wisconsin’s organic farmers (Erin Silva)
- Breeding for organic sweet corn: The case of “Who Gets Kissed” (Bill Tracey)

Visit the exhibits between tours and during lunch: Apps for Ag; Nutrient & Pest Management Program; Integrated Pest Management Program; SnapPlus; and more!!

The Arlington Research Station is located on Hwy. 51, about 5 miles south of Arlington. Watch for Field Day signs. GPS coordinates: 43.300467, -89.345534

For more information contact the Dept. of Agronomy 608/262-1390 or the Dept. of Soil Science 608/262-0485.

In the event of rain, presentations will be held inside.

For more information click here.

Time to Start Looking for Corn Diseases in Wisconsin

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

The 2014 field season was a bit of a challenge for corn growers in Wisconsin, to say the least. We had poor growing conditions, which made for a lot of challenges including diseases. On the top of that list in Wisconsin was Northern Corn Leaf blight (NCLB). A close second was Goss’s Wilt. Already in 2015, states like Iowa and Nebraska have already reported both diseases on corn. This is among the earliest reports of both diseases in many years. In Wisconsin, we haven’t seen either of these yet, but given the weather patterns recently, I think it is only a matter of time.

For many folks, identification of these two diseases can be challenging. Many are confused by the subtleties of each disease “signature.” Diagnosis is critical in making your management decisions properly. Obviously, the best way to properly diagnose any plant disease problem is to send a sample to the Plant Disease Diagnostic Clinic. A sample can be sent by following their helpful sam-

ple guidelines, which can be found by clicking here. In addition to sending a diagnostic sample, there are some signs and symptoms that can be identified in the field, to help get you closer to diagnosing the right disease. Here are some helpful details for each disease.

Northern Corn Leaf Blight (NCLB): NCLB is caused by a fungus called Exserohilum turcicum. The most diagnostic symptom of NCLB is the long, slender, cigar-shaped, gray-green to tan lesions that develop on leaves (Fig. 1). Disease often begins on the lower leaves and works it way to the top leaves. This disease is favored by cool, wet, rainy weather, which has seemed to dominate lately. Higher levels of disease might be expected in fields with a previous history of NCLB and/or fields that have been in continuous and no-till corn production. The pathogen over-winters in corn residue, therefore, the more residue on the soil surface the higher the risk for NCLB. Management should focus on using resistant hybrids and residue management. In-season management is available in the form of several fungicides that are labeled for NCLB. However, these fungicides should be applied at the early onset of the disease and only if the epidemic is expected to get worse. Often the best time to apply fungicides to field corn to maximize the benefits is near the VT/R1

Figure 1. NCLB Lesions on a corn leaf

Figure 2. Foliar symptoms of Goss’s wilt on a corn leaf. Photo Credit: Larry Osborne, Bugwood.org.
growth stage. However, if NCLB is visible on leaves earlier than this time, a fungicide might be beneficial at those earlier stages. The only way to determine this is to scout frequently and keep an eye on the disease situation in your corn crop.

If you elect to control NCLB with fungicides, you might consider taking a look at my page on FUNGICIDE INFORMATION. This page talks about fungicide use in general and also includes the 2015 Corn Fungicide Efficacy Table. You will find products listed with good efficacy toward NCLB on this table.

Additional NCLB Information

Purdue University – https://www.extension.purdue.edu/extmedia/BP/BP-84-W.pdf

Iowa State University – http://www.extension.iastate.edu/CropNews/2014/0714Robertson.htm

Goss's Wilt: Goss's wilt is caused by the bacterium Clavibacter michiganensis subsp. nebraskensis. First visual symptoms usually appear as gray or yellow stripes on leaves that tend to follow the leaf veins (Fig. 2). Often “freckles”, or brown or green irregular spots, can be observed within the leaf lesions (Fig. 3). Freckles are an excellent diagnostic symptom to confirm Goss's wilt. Vascular tissue, husks, and kernels can sometimes take on an orange hue. Occasionally, bacterial ooze or dried ooze can be observed on symptomatic leaves. **Fungicides do not work for Goss's wilt, because this is caused by a bacterium, not a fungus.** Management is preventative for Goss's wilt. Choose hybrids with the best possible resistance, manage excessive amounts of corn surface residue, and rotate crops. The longer the rotation between corn crops, the better. There are some foliar products being marketed for the control of Goss's wilt, but no efficacy data are currently available.

Additional Goss's Wilt Information

University of Nebraska – http://pdc.unl.edu/agriculture-crops/corn/gosswilt

Purdue University – https://www.extension.purdue.edu/extmedia/bp/BP-81-W.pdf

Corn Diagnostics Quick Guide: Many of you likely attended the 2014 Pest Management Update Series and obtained the corn diagnostics quick guide sheet to help differentiate between Goss's wilt and NCLB. **I have again attached it to this post for download as a PDF.** This is a quick guide to help you differentiate the diseases in the field. Remember, the only way to definitively differentiate the diseases is to send a sample to the diagnostic clinic. Get out there and SCOUT, SCOUT, SCOUT!

Wisconsin Pest Bulletin 6-18-15

Krista Hamilton, Entomologist


**INSIDE THIS ISSUE**

LOOKING AHEAD: Japanese beetles emerging in Dane County

FORAGES & GRAINS: Potato leafhopper counts low but increasing

CORN: Slug damage to corn common in west-central WI

SOYBEAN: Soybean aphids remain scarce

FRUITS: Codling moth treatments under way in most orchards

VEGETABLES: Striped cucumber beetles abundant in the southeast

NURSERY & FOREST: Latest finds from this week's nursery inspections

DEGREE DAYS: Growing degree day accumulations through June 17, 2015

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Follow us on

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Figure 3. “Freckles” on a corn leaf with Goss's wilt. Photo credit: Larry Osborne, Bugwood.org.
Soybean Flowers, Glyphosate Label, and Wheel Track Damage…Oh My!


Given the quick start to our soybean growing season we will begin to see many soybean fields begin to flower (R1) next week (6/21/15). As we enter the soybean reproductive growth phase there are a few things to keep in mind. The first is that soybean will produce flowers for ~3 to five weeks, depending upon planting date and environment. During that time soybean will abort anywhere from 20 to 80% of the flowers that they produce. Generally it is the first and last flush of flowers produced that are most likely to be aborted.

Next, the timing window for glyphosate applications in our early planted soybean is quickly closing. Glyphosate labels indicate that applications can be made through R2 or full flower. The R3 growth stage begins when one of the four top nodes with a fully developed leaf has a 3/16 inch long pod. Applications made after the R3 stage begins are off-label applications. On average it takes ~4 days to move from R1 (beginning flower) to R2 (full flower) and ~10 days from R2 to the start of R3 (beginning pod).

Last but not least, wheel track damage made from ground applications may start to reduce yield. Sprayer wheel traffic from first flower (R1) through harvest can damage soybean plants and reduce yield (Hanna et al. 2008). Our research suggests that an adequate soybean.
Vegetable Crop Update June 23, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 16th issue of the Vegetable Crop Update is now available which addresses the following topics:

- disease forecast updates (early planted/emerged fields in Gr. Marsh now surpassing threshold of 300 P-Days/DSVs surpassing 18 threshold for all but late planted Antigo)
- late blight updates (no new reports)
- cucurbit downy mildew (first reports in MI and Ontario Canada today)
- Phytophthora crown and fruit rot
- Aim herbicide 24c special use registration for WI hops
- hop downy mildew update

Click here to view this issue.

Cereal Leaf Beetle

Bryan Jensen, UW Extension

Chris Allen just contacted me about some suspected cereal leaf beetle damage in wheat. I’ve talked to a few more people and they also mentioned similar damage. Damage, although mostly on the flag leaf, doesn’t appear to be of economic concern.

Cereal leaf beetles are not an insect that we have a lot of experience with. At least not in recent history. Perhaps there was some economic damage when they were first introduced to the Midwest in the early 1960’s, but I suspect several predators and/or parasitoids have kept their numbers low. Matter of fact, I’m not sure I can ever recall someone having to control them in the past. However, knowing what causes the damage may be useful itself.

The adult cereal leaf beetle is approximately ¼ inch long and slender. They have a brightly colored orange head and thorax and dark bluish (almost metallic) wing covers. The larvae are yellowish to brown in color and can be slimy because they will cover their body with fecal material. This can give them a slug-like appearance. However, you will see a distinct head, no antennae and 3 sets of legs on cereal leaf beetle larvae.

Cereal leaf beetles overwinter as adults and are limited to one generation/year. Their host range includes most small grains as well as other grasses. Damage is very clear-cut.

New findings on soybeans, climate, and yields

Shawn P. Conley, Soybean and Wheat Extension Specialist

Global annual temperatures have increased by 0.4°C since 1980 with several regions exhibiting even greater increases. Climate change appears to have affected crop yields in some countries, and these effects are expected to continue. Crop management strategies could help to mitigate the potential negative impacts of climate change on crop yields. Strategies include the development of new cultivars and hybrids, altered maturity groups, changes in planting dates, the use of cover crops, and greater management of previous crop residues. However, it is important to understand in-season weather variability before any specific adaptation strategies are proposed.

To read more, click the link below.

and diagnostic. Both adults and larvae will feed on the same plant and leave long narrow feeding scars often with the cuticle intact. This “window paneing” may coalesce if damage is severe.

Published economic thresholds vary. To give you a perspective, Penn State suggests 1 larvae/4 tillers, North Dakota State suggest three larvae/plant and Michigan State suggests 1 larvae/flag leaf. Having different economic is not that unusual as researchers use the natural population available. All states, however, stress the importance of protecting the flag leaf from significant damage.

Herbicide resistance management for common lambsquarters and horseweed

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin

In the June 13th issue of the Wisconsin Crop Manager, I discussed herbicide resistance management for giant and common ragweed, http://wcws.cals.wisc.edu/herbicide-resistance-management-for-giant-and-common-ragweed/. This week’s featured herbicide resistance threats are common lambsquarters, Chenopodium album, and horseweed, Conyza canadensis. Weed scientists across the Midwest and Midsouth have identified eleven species of weeds that are of most concern for herbicide resistance because of their ability to compete with crops and to develop resistance to different herbicide sites of action. In 1979, University of Wisconsin weed scientists identified a population of common lambsquarters resistant to atrazine, a photosystem II inhibitor (www.weedscience.org). Lambsquarters populations in Michigan and Ohio have been found resistant to ALS inhibitors. In 2013, University of Wisconsin researchers identified horseweed plants resistant to glyphosate, http://wcws.cals.wisc.edu/late-season-weed-escape-survey-in-wisconsin-identifies-a-second-county-with-a-glyphosate-resistant-horseweed-population/. Ohio and Delaware have horseweed populations resistant to both ALS inhibitors and glyphosate. Resistance to a single site of action has occurred in over twenty states.

Now is the time to start thinking about fall horseweed management. Emergence typically occurs in the early spring and again in the fall. Long-term no-till systems tend to harbor significant horseweed populations. Scouting in mid to late summer to locate any escapes from spring herbicide applications is important for herbicide resistance management and to decide whether to switch to a horseweed management program that includes both spring and fall control measures. Fall herbicide applications can help to reduce horseweed populations in problem fields. Also, if dandelion is an issue, then there are two reasons to consider fall herbicide applications. University of Wisconsin researchers found that fall dandelion control is best prior to next year’s corn crop. Their results are available as a slide presentation at http://www.slideshare.net/weedscience/ag-lime. Kevin Bradley at the University of Missouri has a video, less than five minutes, discussing the importance of application timing for horseweed control, https://youtu.be/mbs9cJKMCsk. Ohio State and Purdue University have a great fact sheet on horseweed management at https://ag.purdue.edu/btny/weedscience/Documents/marestail%20fact%202014%20latest.pdf. Also, the TakeAction website has a fact sheet with spring and fall herbicide recommendations at http://takeactiononweeds.com/wp-content/uploads/2014/06/management-of-herbicide-resistant-horseweed-marestail-in-no-till-soybeans.pdf.

Common lambsquarters can be difficult to manage because of an early and sustained emergence period, long seed persistence, and competitive ability. A 50 percent reduction of seed in the soil seedbank requires about 12 years and 78 years for a 99 percent reduction. Management goals should include: starting with a clean field, using a pre-emergence residual herbicide, scouting, and applying a post-emergence herbicide if necessary. For
specific management recommendations, please consult
com/wp-content/uploads/2014/06/common-lambsquar-
ters-management-in-soybeans.pdf

Time to Consider Your White Mold In-Season Management Plan

Damon Smith, Extension Field Crops Pathologist,
Department of Plant Pathology, University of Wisconsin-
Madison

Many early planted soybeans in Wisconsin are
nearing the R1 (beginning flower) growth stage. This means
that soybean growers should consider their in-season white
mold management plan and if they are going to implement
it. Research has shown that this is the best time to apply
fungicides for control of this lethal soybean disease, if
conditions are conducive for infection. Before we consider
the in-season control options, let’s review some basic
information from our white mold (Sclerotinia stem rot or
SSR) fact sheet. You can also download a PDF version of the
fact sheet by CLICKING HERE.

What is Sclerotinia stem rot? Sclerotinia stem rot (SSR),
also known as white mold, is a serious and often lethal
fungal disease that affects a wide range of agricultural crops
in the U.S. including many broadleaf vegetable crops (e.g.,
carrots, cruciferous plants, peas, potatoes, snap beans)
and field crops, especially soybean. SSR is most severe on
soybeans in high-yielding environments that have dense,
fast-growing canopies (Fig. 1).

What does Sclerotinia stem rot look like? SSR causes
sudden wilting of soybean leaves and rapid plant death.
Lower stems of affected plants become bleached and
under moist conditions (e.g., high humidity, frequent
rain), become covered with a cottony white fungal
growth. Small, black structures that look like rat or
mouse droppings (called sclerotia) form on and inside
the stems and pods of affected plants (Fig. 2).

Where does Sclerotinia stem rot come from? Sclero-
tinia stem rot is caused by the fungus Sclerotinia sclero-
tiorum which survives as sclerotia in dead plant tissue.
Sclerotia can survive for five years or more in soil. A cool,
moist environment favors Sclerotinia stem rot develop-
ment. Under these conditions, sclerotia germinate to
produce small, mushroom-like structures (called apothe-
cia) that produce spores. These spores can be spread by
wind, insects, or rain splash. In soybeans, most infections
occur via open or senescing (i.e., withering) flowers. Oc-
casionally, the fungus will spread from plant-to-plant via
direct contact of roots or other plant parts.

How can I save plants with Sclerotinia stem rot? SSR
is difficult to control once the disease has occurred. If af-
fected plants are limited to a small area in a field, remov-
al and destruction of plants may help to limit production
of sclerotia that can further contaminate and cause
long-term problems in the field; however, this strategy
usually is not feasible on a large scale. If affected plants
are removed, they should be burned. DO NOT compost
plants or till them into the soil.
**How can I avoid problems with Sclerotinia stem rot in the future?**

To prevent introduction of the SSR fungus into soybean fields, be sure to plant sclerotia-free soybean seed. Also, harvest fields with SSR last to avoid spreading sclerotia of the SSR fungus from field to field on combines. In fields with a history of SSR, grow soybean cultivars that have been bred for SSR resistance. This is the most economical and successful long-term strategy for SSR control. In addition, consider using no-till production for three to four years as this will reduce the number of viable sclerotia near the soil surface. Rotate soybeans with small grain crops that are not susceptible to SSR (e.g., wheat, barley, oats) to further reduce the number of viable sclerotia in the soil. Increase row spacing and reduce soybean seeding rates to promote a more open canopy that will have better air circulation and thus dry more rapidly. Also, make sure fields are well drained and avoid excessive irrigation especially during flowering. Remember that the SSR fungus prefers wetter conditions; under drier conditions the fungus is less likely to infect. Maintain good broadleaf weed control. Weeds not only decrease air circulation and promote wetter conditions, but can also be hosts for the SSR fungus. Finally, there are fungicides and biological control products available for SSR management. Several biocontrol agents (the most effective being one that contains a fungus called Coniothyrium minitans) have been shown to be effective in controlling SSR.

**What are my In-Season Control Options?**

Fungicides containing an active ingredient that is a succinate dehydrogenase inhibitor (SDHI), such as bosalid, are often effective in SSR control. The active ingredient picoxystrobin (a type of strobilurin fungicide) has also been shown to be effective in SSR control in university research trials. Applications rates are very important for these products. Research in Wisconsin and surrounding states has indicated that Endura (active ingredient is bosalid) should be applied at the 8 oz/acre rate while Aproach (active ingredient is picoxystrobin) should be applied at the 9 fl oz/acre rate. Timing of fungicide applications is critical. Fungicides should be applied during early flowering (R1) to early pod development (R3) growth stages. Research has shown that Endura is best used when applied in a single application at R1. Aproach should be applied twice with the first application at R1, while the second application should be applied at the R3 growth stage with both applications at the rate indicated above. Fungicide applications made at the full pod (R4) growth stage or later will NOT be effective. In addition, applying fungicide treatments after symptoms are visible will not be effective.

In 2014, we conducted a trial using both Endura and Aproach fungicides applied at the R5 growth stage. Details of the trial can be found by clicking HERE and scrolling down to page 12. Prior to fungicide application we rated the plots for disease using the SSR disease severity index or DSI. We then rated the plots again 2 weeks later at the R6 growth stage to see if the disease progression slowed. We also harvested plots to determine yield. Initial DSI levels were fairly high, but uniform among all plots (Table 1). DSI ratings at R6 revealed that neither fungicide slowed the disease or reduced the levels of disease compared to the non-treated controls. Yield for all treatments was around 40 bu/acre for all treatments, and was not statistically significant. These results indicate that even the best fungicide products won't work well on white mold if they are applied at the wrong time. These products have increased yield substantially in research trials where white mold pressure was high, when they were applied at the correct growth stage. In 2013, both programs were among the best in a trial located at the Arlington Agricultural Research Station. Results of that trial can be viewed by clicking here at scrolling down to pages 6 and 7. Timing and preventative application are very important if you choose to use fungicides to control white mold.

Finally, be sure to read and follow all label instructions of the fungicide/biological control product(s) that you select to ensure that you use the materials in the safest and most effective manner possible.

If you would like to learn more about white mold, you can click here to download a PDF copy of a newly revised fact sheet developed by extension soybean pathologists in the North Central region. You can also get more information about white mold by clicking here to watch a short video.

Table 1. Sclerotinia stem rot severity and yield after applications of Endura and Aproach fungicides at R5.
Wisconsin Pest Bulletin 6-25-15

Krista Hamilton, Entomologist


INSIDE THIS ISSUE

LOOKING AHEAD: Japanese beetles emerging across southern WI

FORAGES & GRAINS: Potato leafhopper counts remain low

CORN: Corn borer and stalk borer treatment windows closing soon

SOYBEAN: Very few soybean aphids found so far this season

FRUITS: Apple maggot emergence anticipated by early July

VEGETABLES: Squash vine borer moths appearing around home gardens

NURSERY & FOREST: Latest finds from this week’s nursery inspections

DEGREE DAYS: Growing degree day accumulations through June 24, 2015

Late Blight Supplement

Amanda Gevens, Potato & Vegetable Pathologist

I am receiving many questions on late blight symptoms associated with seed sources vs. aerial spore deposition (from external sources). I’ve included a nice review on this topic from Dennis Johnson, link below. In short, it is tough to identify, with certainty, the source of late blight inoculum in an epidemic. We know potential sources are multiple and include volunteers, cull piles, compost piles, seed, and infected transplants (tomato). We don’t have any evidence at this time that the pathogen is persisting in the soil outside of plant tissues.

Can we associate symptoms with inoculum source? Late blight is very dependent upon the environmental condition and thus, there have been conflicting past reports on the mechanism of disease transmission from seed to foliage. Seedborne late blight inoculum can result in poor stand/emergence. And, at times seedborne sources can create hot spots or disease foci in fields. However, seedborne sources can also infect shoots internally via mycelia and lesions may not be evident on lower stems. In this scenario, sporadic lower stem sporulation can occur ‘under the radar’ creating spores which then infect foliage giving the appearance of a ‘top down’ or ‘spore shower’ inoculation event. While the incidence of this happening is probably very low (as referenced in Johnson’s work below), just a few infected/sporulating plants are still very biologically relevant in initiating an epidemic. Past research has shown that variable symptoms and field signatures can result from infected seed depending upon timing of infection/inoculation, environmental conditions, and strain of the pathogen. Further complicating things are field factors like soil type, planting depth, whole vs. cut seed status, and pesticide inputs. In sum, we can try to piece together a story of how the late blight pathogen got into a production field – and this is a useful exercise to better manage the disease within that field and others – but we may not come to a certain conclusion. http://www.potatogrower.com/uploads/6244.pdf

We are working on characterizing the strain/genotype of the late blight pathogen in partnership with Dr. Bill Fry of Cornell Univ. I will keep our growers informed of this information as we learn more.

Previously shared info on fungicide selections for conventional and organic systems can be found at my website at: http://www.plantpath.wisc.edu/wivegdis/

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Fusarium Head Blight a Significant Issue in Wisconsin in 2015

Shawn P. Conley, Extension Soybean and Small Grains Agronomist, University of Wisconsin-Madison

The 2015 growing season has been fairly challenging for managing winter wheat diseases. Many fields we have observed have some level of disease. Fusarium head blight (FHB or scab) is the primary disease observed in all locations from the southern portion of the state on up through Fond du Lac. In locations near Janesville, some varieties of winter wheat not sprayed with a fungicide have FHB incidence and severity levels close to 50%. Significant yield loss and quality issues, including high levels of deoxynivalenol (also known as DON or vomitoxin) will be a problem as farmers begin to harvest grain in a couple of weeks. Fields should be assessed now for damage by FHB to understand how much DON might be expected in grain at harvest.

What does scab look like? Diseased spikelets on an infected grain head die and bleach prematurely (Fig. 1). Healthy spikelets on the same head retain their normal green color. Over time, premature bleaching of spikelets may progress throughout the entire grain head. If infections occur on the stem immediately below the head, the entire head may die. As symptoms progress, developing grains are colonized causing them to shrink and wrinkle. Often, infected kernels have a rough, sunken appearance, and range in color from pink or soft gray, to light brown. As wheat dries down, visual inspection of heads for scab will become more difficult.

Why is identifying scab important? Scab identification is important, not only because it reduces yield, but also because it reduces the quality and feeding value of grain. In addition, the FHB fungus may produce mycotoxins, including DON or vomitoxin, that when ingested, can adversely affect livestock and human health. The U.S. Food and Drug Administration has set maximum allowable levels of DON in feed for various animal systems, these are as follows: beef and feedlot cattle and poultry...
Rust has also been an issue on winter wheat this season. Both stripe and leaf rust were observed at high levels near Arlington Wisconsin recently. Near Janesville, rust was observed to be more intermittent in occurrence. Stripe rust was present, however, incidence and severity of leaf rust was a bit higher on some varieties. Stagonospora/Septoria leaf blotch can be found in most locations. However, the disease has been present mostly in the lower canopy and has not made its way to the flag leaf. Powdery mildew has been nearly non-existent for the third year in a row in the state.

References


Vegetable Crop Update June 26, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 18th issue of the Vegetable Crop Update is now available which addresses the following topics:

• Disease forecasting values for early blight and late blight
• Late blight updates
• Potato blackleg
• Cucurbit downy mildew updates
• Hop updates
• Spotted wing drosophila – first WI detection

Update 6/29: The late blight that was detected in Adams County WI is of the US-23 genotype/strain. This means that phenylamidine fungicides such as metalaxyl and mefenoxam (ie: Ridomil) are effective in managing late blight. Other traits of US-23 include, A1 mating type, host range includes tomatoes, produces many relatively smaller sporangia (spores). This was the predominant type in the US last year.

Other Wheat Diseases in Wisconsin

< 10ppm; Swine and all other animals < 5ppm.

What should I do to prepare for wheat harvest?

1. Scout your fields now to assess risk. Wheat is beginning to mature. As maturity progresses over the next couple of weeks, it will be increasingly difficult to assess the incidence and severity of the infection. Understanding a field’s risk will help growers either field blend or avoid highly infected areas so entire loads are not rejected.

2. DO NOT spray fungicide now. Research has demonstrated that the window of opportunity to manage FHB with fungicides is at the beginning of anthesis and only lasts about 7 days. Applications later than 7 days after the start of anthesis are not effective in controlling FHB. In addition, most fungicide labels do not allow a pre-harvest interval (PHI) suitable for a late application on wheat. Any application now would be off-label.

3. Adjust combine settings to blow out lighter seeds and chaff. Salgado et al. 2011 indicated that adjusting a combine’s fan speed between 1,375 and 1,475 rpms and shutter opening to 90 mm (3.5 inches) resulted in the lowest discounts that would have been received at the elevator due to low test weight, % damaged kernels, and level of the mycotoxin deoxynivalenol (DON; vomitoxin) present in the harvested grain.

4. Know your elevator’s inspection and dockage procedure (each elevator can have a different procedure).

5. Scabby kernels does not necessarily mean high DON levels and vice versa.

6. DON can be present in the straw so there is concern regarding feeding or using scab infected wheat straw. DO NOT use straw for bedding or feed from fields with high levels of scab (Cowger and Arellano, 2013). If in doubt, have the straw tested for DON levels.

7. Do not save seed from a scab-infected field. Fusarium graminearum can be transmitted via seed. Infected seeds will have decreased growth and tillering capacity as well as increased risk for winterkill.

8. Do not store grain from fields with high levels of scab. DON and other mycotoxins can continue to increase in stored grain.

9. For more information on Fusarium head blight click here.

Other Wheat Diseases in Wisconsin
Vegetable Crop Update July 2, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 19th issue of the Vegetable Crop Update is now available which addresses the following topics:

- disease forecasting for early and late blight
- late blight updates for WI and the US
- Cucurbit diseases and their control
- Cucurbit downy mildew updates from the US

Click here to view this issue

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from June 20, 2015 through June 26, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field Crops</strong></td>
</tr>
<tr>
<td>Corn, Anthracnose Leaf Blight, <em>Colletotrichum graminicolae</em>, Iowa</td>
</tr>
<tr>
<td><strong>Fruit Crops</strong></td>
</tr>
<tr>
<td>Apple, <em>Cedar-Apple Rust</em>, <em>Gymnosporangium juniper-virginianae</em>, Iowa</td>
</tr>
<tr>
<td>Apple, Frogeye Leaf Spot, <em>Diplodia seriata</em>, Iowa</td>
</tr>
<tr>
<td>Apple, Fruit Rot, <em>Gloeosporium sp.</em>, Houston (MN)</td>
</tr>
<tr>
<td>Cherry, <em>Root Rot</em>, <em>Pythium sp.</em>, Dane, Door</td>
</tr>
<tr>
<td>Cherry, <em>Root Rot</em>, <em>Cylindrocarpon sp.</em>, Dane, Door</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
</tr>
<tr>
<td>Tomato, Bacterial Canker, <em>Clavibacter michiganensis subsp. michiganensis</em>, Richland</td>
</tr>
<tr>
<td>Tomato, Cucumber Mosaic, <em>Cucumber mosaic virus</em>, Dane</td>
</tr>
<tr>
<td>Tomato, Tobacco Mosaic, <em>Tobacco mosaic virus</em>, Dane</td>
</tr>
<tr>
<td>Tomato, <em>Walnut Toxicity</em>, None, Richland</td>
</tr>
</tbody>
</table>

**Soil**

Soybean Soil, Soybean Cyst, *Heterodera glycines*, Outagamie

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

New Fact Sheet on Soybean Seedling Diseases

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

Hot off the press! New information and fact sheet on soybean seedling diseases and management. This document was developed in cooperation with the North Central Soybean Research Program, United Soybean Board, Grain Farmers of Ontario, and the Crop Protection Network. It was written and edited by extension soybean pathologists. To download a PDF version of the fact sheet, CLICK HERE.

Wisconsin Pest Bulletin for 7-2-15

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 11 of the Wisconsin Pest Bulletin is now available at:


LOOKING AHEAD: First spotted wing drosophila flies collected on June 22

FORAGES & GRAINS: Cereal leaf beetle defoliating wheat in southern and eastern WI

CORN: True armyworms reach economic levels in Sheboygan County
SOYBEAN: Soybean aphids densities low but increasing
FRUITS: Japanese beetles appearing in vineyards
VEGETABLES: Squash vine borer, squash bug and striped cucumber beetle updates
NURSERY & FOREST: Latest finds from this week's nursery inspections
DEGREE DAYS: Growing degree days are not available at this time
Clover root curculio damage is being observed in several parts of Wisconsin this year. It is an occasional insect pest on alfalfa, clovers and other legumes. Damage can be serious but usually is infrequent and localized. 

Adults are a blunt-snouted weevil, approximately 1/8 inch long and grayish in color. Larvae are small, grow up to ¼ inch long, have a whitish to cream color grublike body and a tan head.

Clover root curculios overwinter as adults and complete one generation per year. Peak egg laying occurs in early to mid-June and eggs will hatch within 1-2 weeks.

Young larvae will begin chewing on small roots and/or nodules. As larvae mature, they begin feeding on the main taproot. This feeding appears as scars which may be described as “furrows” or “galleries”. When severe, the damage may completely girdle the taproot. Damaged areas of the root system can look similar to damage caused by plant pathogenic fungi in the group *Rhizoctonia*. Damage to root systems caused by *Rhizoctonia* will appear as circular/elliptical lesions with defined margins on taproots or lateral roots or longer expanding cankers depending on the species. These brown and sunken symptoms differ from the distinctive chewing scars caused by clover root curculio.

Larval damage can reduce the longevity of a stand and serve as entry points for pathogens. As many as 30 different plant pathogens have been associated with curculio feeding sites, including *Rhizoctonia* spp. mentioned above. However, the primary plant pathogenic organisms associated with these sites are Fusarium fungi, including the organisms that cause *Fusarium* root rot and Fusarium wilt. Larvae have also been implicated in carrying plant pathogenic fungi to non-infected areas of root systems.

Adult clover root curculio begin to appear 5-6 weeks after egg hatch. Adults may feed on foliage of young seedlings or mature plants by chewing round notches on the margins of leaves. However, this feeding is usually not an economic concern unless populations are extremely high. Although adults are capable of flying, most migrate by walking from field to field. During hot summer days, adults remain relatively inactive.
Damage from the summer generation of armyworm is often more difficult to predict and/or find. The migrating (spring) generation is somewhat easier because damage is often associated corn planted after a rye cover crop or no-tilled in to alfalfa. The summer generation is not typically attracted to a specific field or cropping history and the height of corn makes them difficult to find.

What I would suggest is to do some spot-checking in corn fields over the next few weeks. Try to catch armyworm feeding when the larvae are still relatively small and before damage is wide spread. Field populations of the summer generation can be quite high, and in extreme situations, can nearly defoliate corn.

Wheat and other small grains are at risk as well. Especially over the next few weeks and prior to harvest when larvae can switch from leaf feeding to head clipping. Economic thresholds and guidelines for corn is to treat when either 75% of the plants have one armyworm/plant or 25% of the plants have two or more larvae AND the larvae are ¾ -1 inch or less in length. Treating in small grains is suggested if there are 3 or more armyworm/sq ft. But be careful of head clipping.

To be clear there have been no reports of damage from the summer generation to date. It is just the time to start spot-checking.

**Armyworm Heads Up**

Bryan Jensen; UW Extension

It is about that time that we could be seeing problems from the summer generation of true armyworms. I bring this up because of the elevated number of corn fields which had significant feeding this spring and because of a particularly high late-June black light trap count reported by the WI DATCP in Rock County.
To quantify root damage use the Nodal Injury Scale developed by J. Oleson, Y. Park, T. Nowatzki and J. Tollefson at Iowa State University. This is an excellent rating system and more information is available at http://www.ent.iastate.edu/pest/rootworm/nodeinjury/nodeinjury.html. Essentially, the injury scale uses a decimal system. The number to the left of the decimal indicates the number of complete nodes (or equivalent number of nodes) of roots pruned back to within 1 ½ of the stalk. The number to the right of the decimal indicates the % of the next node of roots pruned. A root rating of 1.2 indicates the equivalent on one complete nodes of roots is pruned and 20% of the next.

Information gain from continuous corn fields will of course tell you how well your rootworm management practice worked. Relating injury to yield loss can be difficult because of several variables which include, weather, hybrid, etc. Typically, a field rating of greater than 0.75 indicates economic yields loss. Ratings less than 0.25 will probably not have economic loss. Injury between 0.25 and 0.75 is a gray area. Economic loss will be dependent on the factors mentioned above as well as compaction, general plant health and future environmental conditions.

Surveying roots on first year corn will give you information regarding the prevalence and/or severity of damage from the rotation resistant western corn rootworm. Although damage to first year corn was originally diagnosed in Wisconsin during the 2002 growing season, its incidence seems to have diminished (for now?). Also, there have been no reports of first year corn injury outside of southern Wisconsin. As we stress the need to revive IPM practices for corn rootworm, this information can give corn growers and crop consultants information needed to make an informed decision in rotated corn.

One of the first tools needed for resistance management is identification of the problem. Making a practice of evaluating Bt CRW hybrid performance by assessing roots will give you the information needed to make appropriate management decisions that will help delay resistance. It is unlikely we can “turn the clock back” on resistance to individual Bt CRW proteins so early detection will be important. Resistance could be expected if you have a field average NIS of 1.0 and you have been using a single Bt toxin for two consecutive years or more. Or, if a field average, NIS rating of 0.5 or higher is noticed in a field that has used a pyramid Bt CRW toxin for at least two consecutive years. If resistance is expected, please contact your county extension agent as well as your seed dealer.

A frequently asked question I get is how reliable is lodging as a predictor of larval feeding? The short answer is that it is a very poor indicator of rootworm damage. Corn can lodge because of several causes. Rootworm feeding can be a reason but you still have to dig/wash roots to verify. Incidentally, you may have corn that is standing straight yet have significant rootworm feeding.

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from June 27, 2015 through July 3, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**
- Soybean, Bacterial Blight, Pseudomonas syringae pv. glycinea, Grant
- Alfalfa, Common Leaf Spot, Pseudopeziza medicaginis, Marathon
- Alfalfa, Root Rot, Phytophthora sp., Pythium sp, Marathon
- Alfalfa, Spring Black Stem, Phoma medicaginis, Marathon
- Alfalfa, Stemphylium Leaf Spot, Stemphylium sp., Marathon

**Forage Crops**
- Apple, Cedar-Apple Rust, Gymnosporangium juniper-vir-
ginianae, Iowa
Blueberry, Gloeosporium Leaf Spot, Gloeosporium sp., Dakota (MN)
Cherry, Bacterial Canker, Pseudomonas syringae, Iowa, Walworth
Cherry, Brown Rot, Monilinia fructicola, Walworth
Cherry, Root/Crown Rot, Phytophthora sp., Fusarium sp., Door
Grape, Downy Mildew, Plasmopara viticola, Vemon

Vegetables
Cucumber, Angular Leaf Spot, Pseudomonas syringae pv. lachrymans, Jefferson
Garlic, Unidentified Viral Disease, Unidentified virus, Rock Green Bean, Bacterial Brown Spot, Pseudomonas syringeae pv. syringae, Jefferson
Spinach, Fusarium Wilt, Fusarium oxysporum, Milwaukee
Spinach, Root Rot, Pythium sp., Milwaukee
Squash, Angular Leaf Spot, Pseudomonas syringeae pv. lachrymans, Dane
Tomato, Early Blight, Alternaria solani, Milwaukee
Tomato, Septoria Leaf Spot, Septoria lycopersici, Sauk
Watermelon, Angular Leaf Spot, Pseudomonas syringeae pv. lachrymans, Jefferson

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

Vegetable Crop Update 7/8/15
Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 20th issue of the Vegetable Crop Update is now available which addresses the following topics:

- Disease forecasting for early and late blight
- Potato early blight preventive management
- Late blight updates for WI and the US
- Cucurbit downy mildew updates

Click here to view this issue

Vegetable Crop Update 7/9/15
Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 21st issue of the Vegetable Crop Update is now available which addresses the following topics:

- Late blight updates for WI and the US
- WI potato late blight fungicides
- Table for potato late blight fungicides registered for WI, 2015

Click here to view this issue

Wisconsin Pest Bulletin for 7-9-15
Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 12 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: Western bean cutworm flight continues, very few moths captured so far
FORAGES & GRAINS: Potato leafhopper counts still below-threshold in second and third crops
CORN: First corn rootworm beetles observed in south-central Wisconsin this week
SOYBEAN: Japanese beetles appearing in soybeans, corn and other crops
FRUITS: Apple maggot flies emergence increasing in some orchards
VEGETABLES: Tomato hornworm moths and eggs observed in the last two weeks
NURSERY & FOREST: Latest finds from this week’s nursery inspections
DEGREE DAYS: Growing degree day accumulations through July 8, 2015

Follow us on
Recently, I have been noticing an increase in adult Japanese beetle activity on garden and other ornamentals. What does this mean for corn and soybean production? It is too early to tell but activity could be picking up in soybeans soon. Japanese beetles feed on soybean leaves and present a lace-like appearance. Economic thresholds for vegetative soybean are 30% defoliation and 20% defoliation for soybean in the reproductive stages. That threshold is based on % defoliation for the entire plant, not just the upper leaves.

We have observed soybean defoliation for a number of years. However, significant silk clipping in corn has been observed the past few years. When corn starts to pollinate, check fields for adult Japanese beetle activity and signs of silk clipping.

Treatment may be required if there are more than 2-3 beetles/plant, silks are being clipped to ½ inch of the ear tip and pollination is less than 50% complete.

In both crops, adult Japanese beetles tend to be very clumped in their distribution. Be sure to use a field average when scouting so as not to overestimate the potential for damage. Consider spot treating those areas which are over threshold.


Expect adults to survive for the rest of the summer. An interesting observation regarding Japanese beetles (and other invasive insect pests) is that populations tend to peak as they become established in new areas. Once established, populations tend to stabilize.

Japanese beetle adults: ½ inch in length, metallic green thorax and bronze elytra (wing covers), and 6 white tufts of hair on each side of the abdomen below the elytra.
Corn Diseases of 2015 and Should I Spray Fungicide?

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin

The phone has been ringing a lot lately and the primary questions are:

- What corn diseases should I be concerned with this year in Wisconsin?
- Should I spray a fungicide? And if so, what product and timing?

Let's start with the first question. As far as foliar disease issue, I think we need to scout closely for northern corn leaf blight (NCLB) in Wisconsin. The Midwest is already seeing high levels of this disease and it is showing up in the lower canopy in corn fields in southern Wisconsin. Remember, that this disease can be easily confused with Goss's wilt. Earlier this season I wrote a post about differentiating these two diseases. I encourage you to revisit that post as a refresher. In addition to NCLB, our scouting has revealed a second foliar disease present in the lower and mid-canopy of the corn crop. That second disease is eyespot. Let's talk about NCLB and eyespot in a little greater detail.

Northern Corn Leaf Blight (NCLB): The most diagnostic symptom of NCLB is the long, slender, cigar-shaped, gray-green to tan lesions that develop on leaves (Fig. 1). Disease often begins on the lower leaves and works its way to the top leaves. This disease is favored by cool, wet, rainy weather, which has seemed to dominate lately. Higher levels of disease might be expected in fields with a previous history of NCLB and/or fields that have been in continuous and no-till corn production. The pathogen over-winters in corn residue, therefore, the more residue on the soil surface the higher the risk for NCLB. Management should focus on using resistant hybrids and residue management. In-season management is available in the form of several fungicides that are labeled for NCLB. However, these fungicides should be applied at the early onset of the disease and only if the epidemic is expected to get worse.

While I hate talking about threshold levels for managing disease, it can be helpful in your decision making process to know what might be severe. While scouting look in the lower portion of the canopy. If some symptoms are present in the lower canopy, make a visual estimation of how frequent (percentage of plants with lesions) NCLB...
is in a particular area and how severe (how much leaf area is covered by NCLB lesions. The lower leaves aren’t responsible for much yield accumulation in corn, but spores produced in NCLB lesions on these leaves can be splashed up to the ear leaves where disease can be very impactful. So by scouting the lower canopy and getting an idea of how much disease is present, you can “predict” what might happen later on the ear leaves to make an informed spray decision. The other consideration you should make while scouting is the resistance rating that the hybrid has for NCLB. If it is rated as resistant, then NCLB severity might not be predicted to get very severe, while in a susceptible hybrid, NCLB might be present on 50% or more of plants at high severity levels. Note however, that even if a hybrid is rated as resistant, it can still get some disease. Resistance isn’t immunity! If NCLB is present on at least half the plants and severity is at least 5-10% and weather is forecast to be rainy and cool, a fungicide application will likely be needed to manage the disease. So what does 5% leaf severity look like? Figure 2 is a computer generated image that shows 5% of the corn leaf with NCLB lesions. You can use this image to train your brain to visually estimate how severe the disease might be on a particular leaf. As for fungicide choice and timing, I consider that further below.

Eyespot: Eyespot typically first develops as very small pen-tipped sized lesions that appear water-soaked. As the lesions mature they become larger (¼ inch in diameter) become tan in the center and have a yellow halo (Fig. 3). Lesions can be numerous and spread from the lower leaves to upper leaves. In severe cases, lesions may grow together and can cause defoliation and/or yield reduction. Eyespot is also favored by cool, wet, and frequently rainy conditions. No-till and continuous corn production systems can also increase the risk for eyespot, as the pathogen is borne on corn residue on the soil sur-
Figure 4. Break-even scenarios for corn when foliar fungicide was applied.

The suggested application rate for Headline® Fungicide is 6 to 12 fl oz/acre. My latest cost sheets indicate that at the 6 fl oz/acre rate, the cost of the product alone would be about $20/acre. Note that this does not include the custom applicator cost. This is a variable expense that would need to be added in to get an accurate ROI for your operation. Today we can estimate that we might sell corn grain somewhere between $4 and $5 per bushel. We can then use the cost of the fungicide product and the price of grain to figure out how many bushels of corn we need to make in the crop that would be treated with pyraclostrobin vs. non-treating. Figure 4 is a table with various corn prices along the vertical axis and fungicide costs per acre along the horizontal axis. The cells indicate the bushels of corn per acre needed to break even when using a fungicide at the corresponding cost and corn grain sale price. Using the above scenario, we see that with corn priced between $4 and $5 per bushel, the average yield gain when using fungicide at V5-V8 alone was 1.4 bu/acre, while that at the VT-R2 timing was 4.4 bu/acre, and 4.7 bu/acre for the two pass program. In Wisconsin in 2013, the best gain in yield when using fungicide was at the VT application timing with almost 10 bu/acre over the non-treated. In 2014, we saw the opposite, with an average loss of grain yield at the VT timing of around 10 bu/acre. In Wisconsin, we see that yield gain in fungicide trials is highly variable and depends on the hybrid and weather for that particular season. You can check out results of the fungicide trials and the performance of various products over the last two years by visiting my Fungicide Test Summaries page and viewing the results in the 2013 and 2014 reports.

What are the odds of getting that 4 to 5 bushel per acre yield gain when using Headline® Fungicide? Paul et al. went further and calculated the probability of return at various corn prices and fungicide costs. They did separate analyses for foliar disease severity less than 5% and greater than 5%. In our current corn market with around $4/bu corn prices and a cost of Headline® Fungicide at $20/acre, Paul et al. found that at low foliar disease levels (<5% severity) the odds of a positive ROI using the fungicide would be around 50%.

The odds of a positive ROI improve if disease severity is greater than 5%. In their calculations with higher levels of disease (>5% severity), the odds of a positive ROI would be between 60% and 70%. The morale of this story is that if you are going to use fungicides on corn, they should be targeted toward fields that will have, or are at risk, for disease!

So what about fungicide application timing? Over the last several years corn pathologists in the U.S. corn belt have conducted fungicide application timing trials on corn for grain. Programs included various products, but applications focused on an early (V5-V8) timing, a VT-R2 timing, or a combination of V5-V8 plus a VT-R2 application. Over a 5 year period and nearly 1,500 observations, the average yield gain when using fungicide at V5-V8 alone was 1.4 bu/acre, while that at the VT-R2 timing was 4.4 bu/acre, and 4.7 bu/acre for the two pass program. In Wisconsin in 2013, the best gain in yield when using fungicide was at the VT application timing with almost 10 bu/acre over the non-treated. In 2014, we saw the opposite, with an average loss of grain yield at the VT timing of around 10 bu/acre. In Wisconsin, we see that yield gain in fungicide trials is highly variable and depends on the hybrid and weather for that particular season. You can check out results of the fungicide trials and the performance of various products over the last two years by visiting my Fungicide Test Summaries page and viewing the results in the 2013 and 2014 reports.

Finally, be aware that in some cases, application of fungicide in combination with nonionic surfactant (NIS) at growth stages between V8 and VT in hybrid field corn can result in a phenomenon known as arrested ear development. The damage is thought to be caused by the combination of NIS and fungicide and not by the fungicide alone. To learn more about this issue, you can CLICK HERE and download a fact sheet from Purdue Extension that covers the topic nicely. Considering that the best response out of a fungicide application seems to be between VT-R2, and the issues with fungicide plus NIS application between V8 and VT, I would suggest holding off for any fungicide applications until at least VT.

Summary

As we approach the critical time to make decisions about in-season disease management on corn, it is important to consider all factors at play while trying to determine if a fungicide is right for your corn operation in 2015. Here is what you should consider:

1. Corn hybrid disease resistance score – Resistant hybrids may not have high levels of disease which impact yield.
2. Get out of the truck and SCOUT, SCOUT, SCOUT – Consider how much disease and the level of severity of disease present in the lower canopy prior to tassel.

3. Consider weather conditions prior to, and during, the VT-R2 growth stages – if it is cool and wet, disease may continue to increase in corn and a fungicide application might be necessary. If it turns out to be hot and dry, disease development will stop and a fungicide application would not be recommended.

4. Consider your costs to apply a fungicide and the price you can sell your corn grain – Will you gain enough out of the fungicide application to cover its cost?

5. Hold off with making your fungicide application in Wisconsin until corn has reached the VT-R2 growth stages – The best foliar disease control and highest likelihood of a positive ROI will occur when fungicide is applied during this timing when high levels of disease are likely.

6. Be aware that every time you use a fungicide you are likely selecting for corn pathogen populations that will become resistant to a future fungicide application – Make sure your fungicide application is worth this long-term risk. To learn more about fungicide resistance, you can CLICK HERE to download a UW Extension fact sheet.

Other Resources

Wisconsin Field Crops Fungicide Information Page

Diseases Showing up in Iowa Corn, 2015

UNL CropWatch: Worn Disease Update

References


**Forage Crops**
Alfalfa, Root Rot, *Rhizoctonia sp.*, *Pythium sp.*, *Fusarium sp.*, Chippewa

**Specialty Crops**
Hops, Root/Crown Rot, *Fusarium sp.*, *Pythium sp.*, Dane

**Vegetables**
Pepper, Syringae Leaf Spot, *Pseudomonas syringae*, Rock Squash (Butternut), Angular Leaf Spot, *Pseudomonas syringae pv. lachrymans*, Dane
Tomato, Bacterial Canker, *Clavibacter michiganensis* sub-sp. *michiganensis*, Outagamie
Tomato, Bacterial Speck, *Pseudomonas syringae pv. Tomato*, Rock, Waukesha
Tomato, Bacterial Spot, *Xanthomonas sp.*, Waukesha
Tomato, *Root Rot*, *Rhizoctonia sp.*, *Pythium sp.*, *Fusarium sp.*, Outagamie
Tomato, *Septoria Leaf Spot*, *Septoria lycopersici*, Dane

**Weeds**
Shepherd's-Purse, *Downy Mildew*, *Hyaloperonospora parasitica*, Marinette
Shepherd's-Purse, White Rust, *Albugo candida*, Marinette

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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## Vegetable Crop Update 7/14/15

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 22nd issue of the Vegetable Crop Update is now available which addresses the following topics:

- Disease forecasting values for early blight and late blight
- Late blight updates – First report in Marquette Co. on potato Cucurbit downy mildew updates Hancock Field Day Agenda

[Click here to view this issue](http://pddc.wisc.edu)
Corn Rootworm Beetles and Potential for Silk Clipping

Bryan Jensen, UW Extension

In Wisconsin, corn rootworm beetles have started emerging. Fields out of sequence (early or late pollinating) with surrounding corn fields may be prone to silk clipping. Corn pollen and fresh silks are very strong attractants and may bring in large number of beetles. This year, because of our early planting conditions, many fields will be pollinating at the same time. This should spread the beetles over a larger area and silk clipping may not be much of an issue. However, late-planted fields may entice large number of beetles because of the fresh pollen and silk.

Treat fields if silks are being clipped to within ½ inch of the ear tip but prior to 50% pollination. This usually requires 5-6 beetles/plant.

Potato leafhoppers

Bryan Jensen, UW Extension

Potato leafhoppers populations, to date, have been relatively low. Cool, wet weather has certainly not been conducive but warmer, drier weather could change that in a hurry. So far, I have not had a single call/email regarding leafhopper populations in established stands. However, I would strongly suggest monitoring new seedings. New seedings present a unique problem compared to established stands. After harvest, there is usually enough green foliage available for some nymphs to survive and either for adults to remain within the field or for a new flight to immediately migrate in. In established stands, nymphal mortality is extremely high because of the lack of food and and cover. Adults migrate out of the field for similar reasons. As a result, adult potato leafhoppers must recolonize each field after regrowth has started.
I’m not suggesting we will no longer have problems with potato leafhoppers in established stands but once we reach mid-July the probably of high populations is greatly reduced. However, now is an important time to scout new seedings.

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**The Nebulous of Non-Nodulating Soybean in 2015**

Shawn P. Conley, Soybean and Wheat Extension Specialist

Every year I get an occasional phone call, email or text regarding issues surrounding soybean nodulation concerns. This year it has been non-stop for several weeks! Here are the top four questions and my responses for your consideration.

1. Why is nodulation such a problem this year? Abiotic stress such as low pH (≤ 6.0), saturated or droughty soils and cool soil temperatures can negatively impact nodulation (Valentine et al. 2011). Duzan et al. (2004) reported that root hair deformations (a physiological precursor to rhizobia infection and nodulation) was 64 and 82% of the control when rhizosphere (root zone) temperatures were 59 and 63 degree F when compared to 77 degrees F. This suggests that the cool soil temperatures we have been experiencing have likely limited the infection sites available for nodulation to occur. This effect has likely been exacerbated in no-till or compacted conditions in 2015. In short less nodulation sites on the roots means increased likelihood for less nodules.

2. I double inoculated my soybeans on virgin ground and my nodule count is really low? First, please refer to #1 above regarding abiotic stress on soybean nodulation. Secondly remember to read and follow the application, compatibility, and planting timing of inoculants. In reading through various inoculant labels today, I saw everything from ‘not tested’ to ‘not compatible to plant within hours to weeks to months of application’. Lastly remember there is a poor correlation between nodule number and N2 fixation, so don’t get overly concerned about nodule count; it is nodule efficiency that matters and you can’t measure that by counting. In short, read the labels and make sure everything is compatible and your application and planting window is adequate prior to purchasing the product.

3. How long will soybeans continue to put on new nodules? Dr. Purcell indicated that they can measure very active N2 fixation almost until the end of seedfill (personal communication). Given the normal life span of an active nodule is 4-5 weeks, this would suggest that soybean will continue to put on new nodules (if the environment is conducive and rhizobia are present) until R6 soybean (late pod fill).

4. Should I apply nitrogen to these poorly nodulating soybeans, and if so, how much? My general an-

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**Corn rootworm: How to validate your management decision**

Mid to late July in Wisconsin is the time you can validate your corn rootworm management decisions by checking for root damage. This is the time period just after feeding damage would have occurred, and just before regrowth would start to mask the damage.

Bryan Jensen with the University of Wisconsin Integrated Pest Management Program takes you into a corn field to show you how to dig corn roots to use for rating damage.

You may also be interested in this root damage scoring tutorial.
swer is no and none. First of all, the application of nitrogen to soybean beyond a “starter” rate (≤~30 pounds) will lead to a rapid and dramatic inhibition of N fixation (Sinclair, 2004). Though it does not appear that the applied nitrogen is directly damaging to the N fixation machinery (nodules), it will reduce or stop fixation. If the soil NO3 levels drop, then N fixation can resume in about a week (Sinclair, 2004). Over-application of N will shut down whatever rhizobia is actively working. Furthermore, our 2014 data shows that a soybean plant takes up 3.56 pounds of N in above-ground tissue per bushel of grain. So a 73 bu/a crop removed 267 pounds of N/a. This does not account for below-ground uptake or nitrogen loss and efficiency from the applied nitrogen. In short, that is tough math to get a positive ROI on.

Literature cited:

Dr. Larry Purcell (personal communication 7/16/15)


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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from July 11, 2015 through July 17, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field crops**

Corn, Eyespot, *Kabatiella zeae*, Marinette

Soybean, *Brown Spot*, *Septoria glycines*, Wood

Soybean, Frogeye Leaf Spot, *Cercospora sojina*, Waushara

Soybean, Root Rot, *Pythium* sp., *Fusarium* sp., Wood

Soybean, Target Spot, *Corynespora cassiicola*, Waushara

Wheat, Cephalosporium Stripe, *Cephalosporium gramineum*, Dodge

**Fruit crops**

Blueberry, Gloeosporium Leaf Spot, *Gloeosporium sp.*, Washburn

Grape, Black Rot, *Phylllosticta ampelicida*, Green

Pear, Black Rot, *Sphaeropsis* sp., Dane, Waukesha

Pear, Cytospora Canker, *Cytospora* sp., Dane

Pear, Frogeye Leaf Spot, *Sphaeropsis* sp., Waukesha

Pear, Phomopsis Canker, *Phomopsis* sp., Dane

Strawberry, Angular Leaf Spot, *Xanthomonas fragariae*, Columbia

Strawberry, Common Leaf Spot, *Mycosphaerella fragariae*, Columbia

**Specialty crops**

Ginseng, Disappearing Root Rot, *Cylindrocarpon destructans*, Portage

Ginseng, Rusty (Rusted) Root, *Rhizoctonia solani*, Portage

Garlic, Cucumber Mosaic, *Cucumber mosaic virus*, Waukesha

Garlic, Leek Yellow Strip (Suspected), *Leek yellow stripe virus*, Waukesha

Garlic, Stem and Bulb (Bloat) Nematode, *Ditylenchus dipsaci*, Waukesha

Garlic, Tobacco Mosaic, *Tobacco mosaic virus*, Waukesha

Onion, *Downy Mildew*, *Peronospora destructor*, Fillmore (MN)

Corn, Yellow Leaf Blight, *Phylosticta maydis*, Marinette

Soybean, *Brown Spot*, *Septoria glycines*, Wood

Soybean, Frogeye Leaf Spot, *Cercospora sojina*, Waushara

Soybean, Root Rot, *Pythium* sp., *Fusarium* sp., Wood

Soybean, Target Spot, *Corynespora cassiicola*, Waushara

Wheat, Cephalosporium Stripe, *Cephalosporium gramineum*, Dodge

**Vegetables**


Cucumber, Angular Leaf Spot, *Pseudomonas syringae pv. lachrymans*, Portage

Garlic, Cucumber Mosaic, *Cucumber mosaic virus*, Waukesha

Garlic, Leek Yellow Strip (Suspected), *Leek yellow stripe virus*, Waukesha

Garlic, Stem and Bulb (Bloat) Nematode, *Ditylenchus dipsaci*, Waukesha

Garlic, Tobacco Mosaic, *Tobacco mosaic virus*, Waukesha

Onion, *Downy Mildew*, *Peronospora destructor*, Fillmore (MN)
Onion, Stephylium Leaf Blight, *Stemphylium sp.*, Fillmore (MN)

Pepper, Bacterial Spot, *Xanthomonas sp.*, Washington

Pepper, Syringae Leaf Spot, *Pseudomonas syringae*, Washington

Pumpkin, Cucumber Mosaic, *Cucumber mosaic virus*, Jefferson

Squash, Cucumber Mosaic, *Cucumber mosaic virus*, Jefferson

Tomato, Bacterial Canker, *Clavibacter michiganensis subsp. michiganensis*, Sheboygan, Waushara

Tomato, Cucumber Mosaic, *Cucumber mosaic virus*, Green, Oconto, Sheboygan

Tomato, Fusarium Wilt, *Fusarium oxysporum*, Waushara

Tomato, *Root Rot*, *Pythium sp.*, Sheboygan

Tomato, Tobacco Mosaic, *Tobacco mosaic virus*, Green, Oconto, Sheboygan, Walworth

Tomato, Tomato Spotted Wilt, *Tomato spotted wilt virus*, Iowa, Oconto

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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**Wisconsin Pest Bulletin 7-23-15**

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 14 of the Wisconsin Pest Bulletin is now available at:


**Inside This Issue**

**Looking Ahead:** Western bean cutworm flight expected to peak next week

**Forages & Grains:** Potato leafhopper counts near-threshold in a few alfalfa fields

**Corn:** Corn rootworm beetle emergence gradually escalating

**Soybean:** Soybean root rot survey finds Phytophthora sojae in 38% of sampled fields

FRUITS: Sharp increase in spotted wing drosophila flies noted last week

VEGETABLES: Cucurbit downy mildew confirmed in Dane Co.

**Nursery & Forest:** Reports from this week’s nursery inspections

**Degree Days:** Growing degree day accumulations through July 22, 2015

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**Vegetable Crop Update July 18, 2015 with disease supplement #3**

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 23rd issue of the Vegetable Crop Update is now available which includes the following topics:

- early blight updates
- late blight DSVs and updates (all late blight is US23 so far)
- cucurbit downy mildew updates

Disease supplement #3 is offered to alert growers of the positive detection of downy mildew on cucumber and cantaloupe from Dane County. This is the first detection of cucurbit downy mildew in WI wwf for 2015. Disease was in a very low level and in small acreage, relatively. Fungicides had been applied in this crop for the past 2 weeks.

[Click here to view this update.](https://datcpservices.wisconsin.gov/pb/pdf/07-23-15.pdf)

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**Advances using the roller-crimper for organic no-till in Wisconsin**

Erin Silva, Organic and Sustainable Cropping Systems Specialist, UW-Madison

This video demonstrates some basic components to integrate cover crop-based no-till on Wisconsin farms, as well as some specific equipment modifications to make the technique more successful.
Interest in organic no-till production continues to grow, not only among organic farmers but also among conventional farmers wanting to integrate cover crops and alternative weed management strategies into their farming strategies.

What is an Agronomist?

Shawn Conley, WI State Soybean and Wheat Extension Specialist

Agronomists ROCK! As a member of the agricultural community, you probably already know this. But do all our high school and higher education students know this as well? Do they know what it would like to be an agronomist, and why we need agronomists in our future?

This video shows some of the activities that University of Wisconsin-Madison students Adam Gaspar and Marian Lund take part in as they prepare for agronomy related careers. Adam describes why agronomy is an exciting and fulfilling field of study.

This video was developed to create awareness of agronomy related career opportunities for high school and college students. If you would like to become an agronomy student at UW-Madison, or for more general agronomy related information, follow the links below the video on YouTube.
Mid-Season Soybean Issues in Wisconsin

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin

The 2015 season has again been an interesting adventure. We managed to plant soybeans early or on-time in much of the state and then the rains started and have kept things fairly wet. Combined with cooler temperatures, this moisture has brought about the risk for several disease on soybean in Wisconsin. Of course the most notable disease is WHITE MOLD, but I already have written about this disease and discussed management strategies. If you would like to revisit this topic, CLICK HERE. You can also watch a short video on the subject HERE.

Other diseases to watch out for during the mid-season include Septoria brown spot, brown stem rot (BSR), sudden death syndrome (SDS), stem canker and pod and stem blight, and soybean vein necrosis disease (SVND). I will consider each one of these diseases below.

Septoria brown spot

Septoria brown spot is a common disease occurring on soybean each year. The spores of this fungus are typically rain splashed from old soybean debris, to the growing plants. Septoria brown spot is usually not considered a yield limiting disease, but in certain cases, it has been attributed to significant yield loss. This is usually the case where a susceptible variety is grown in a location conducive to the disease and rain is frequent and heavy. In a situation like this, fungicides might be required during the reproductive phase of growth to preserve yield. However, most of the time, Septoria brown spot is observed early in the season and again late in the season during periods of heavy rainfall and does not affect yield.

Symptoms include dark brown spots on both upper and lower leaf surfaces. Adjacent lesions frequently merge to form irregularly shaped blotches. Leaves become rusty brown. Symptoms of Septoria leaf spot can also develop on stems and pods of plants approaching maturity. Stem and pod lesions have indefinite margins, are dark in appearance and range in size from flecks to lesions several inches in length, but they are not distinct enough to be diagnostic. Seed are infected but symptoms are not conspicuous.

The onset of Septoria leaf spot symptoms is influenced by the relative maturity of the soybean variety, and symptoms appear earlier in the season on an early-maturing variety. Complete resistance has not been identi-
Foliar symptoms of BSR can be confused with those of sudden death syndrome (see description below). However, in the case of sudden death syndrome (SDS), the pith of affected soybean plants will remain white or cream-colored. In addition, roots and lower stems of plants suffering from SDS (but not those suffering from BSR) often have light blue patches indicative of spore masses of the fungus that causes SDS.

BSR is caused by the soilborne fungus *Phialophora gregata*. There are two distinct types (or genotypes) of the fungus, denoted Type A and Type B. Type A is the more aggressive strain and causes more internal damage and plant defoliation than Type B. *P. gregata* Type A also is associated with higher yield loss. *P. gregata* survives in soybean residue, with survival time directly related to the length of time that it takes for soybean residue to decay. Thus, *P. gregata* survives longer when soybean residue is left on the soil surface (e.g., in no till settings) where the rate of residue decay is slow. *P. gregata* infects soybean roots early in the growing season. It then moves up into the stems, invading the vascular system (i.e., the water-conducting tissue) and interfering with the movement of water and nutrients.

Several factors can influence BSR severity. Research from the University of Wisconsin has shown that the incidence and severity of BSR is greatest in soils with low levels of phosphorus and potassium, and a soil pH below 6.3. In addition, *P. gregata* and soybean cyst nematode (*Heterodera glycines*) frequently occur in fields together, and there is evidence that BSR is more severe in the presence of this nematode.

BSR cannot be controlled once plants have been infected. **Foliar fungicides and fungicide seed treatments have NO effect on the disease.** Use crop rotations of two to three years away from soybean with a non-host crop (e.g., small grains, corn, or vegetable crops), as well as tillage methods that incorporate plant residue into the soil. Both of these techniques will help reduce pathogen populations by promoting decomposition of soybean residue. Also, make sure that soil fertility and pH are optimized for soybean production to avoid overly low phosphorus and potassium levels, as well as overly low soil pH. Finally, grow soybean varieties with resistance to BSR. Complete resistance to BSR is not available in commercial varieties. However several sources of partial resistance that provide moderate to excellent BSR control are available. Also, some, but not all, varieties of soybean cyst nematode (SCN) resistant soybeans also are resistant to BSR. Most soybean varieties with SCN resistance derived from PI 88788 express resistance to BSR. However, the same is not true of varieties with SCN resistance derived from Peking. Therefore growers should consult...
seed company representatives about BSR resistance when selecting a variety with SCN resistance derived from this source. You can download a full color fact sheet on BSR by clicking here. You can also CLICK HERE to view a short video on BSR.

**Sudden Death Syndrome (SDS)**

The first noticeable symptoms of SDS are chlorotic (i.e., yellow) blotches that form between the veins of soybean leaflets. These blotches expand into large, irregular, chlorotic patches (also between the veins), and this chlorotic tissue later dies and turns brown. Soon thereafter entire leaflets will die and shrivel. In severe cases, leaflets will drop off leaving the petioles attached. Taproots and below-ground portions of the stems of plants suffering from SDS, when split open, will exhibit a slightly tan to light brown discoloration of the vascular (i.e., water-conducting) tissue. The pith will remain white or cream-colored. In plants with advanced foliar symptoms of SDS, small, light blue patches will form on taproots and stems below the soil line. These patches are spore masses of the fungus that causes the disease.

Foliar symptoms of SDS can be confused with those of brown stem rot (see description above). However, in the case of brown stem rot (BSR), the pith of affected soybean plants will be brown. In addition, roots and lower stems of plants suffering from BSR will not have light blue spore masses.

SDS cannot be controlled once plants have been infected. **Foliar fungicides have NO effect on the disease.** Recently a new seed treatment has been identified that has efficacy against SDS. A multi-state university-based research team has demonstrated that ILevo seed treatment can reduce the effect of SDS and increase yields in fields where SDS is a problem. Other methods of control include using SDS-resistant varieties whenever possible in fields with a history of the disease; however, keep in mind that SDS-resistant varieties with maturity groups suitable for Wisconsin and other northern regions (groups I and II) are somewhat scarce at this time. If SDS and SCN are both problems in the same field, planting an SCN-resistant soybean variety may also be beneficial in managing SDS. Avoid planting too early. Wisconsin growers typically prefer to plant soybeans before May 10 to extend the length of the growing season and maximize yields. However, planting when soils are cool and wet makes plants more vulnerable to infection by *F. virguliforme*. Improve soil drainage by using tillage practices that reduce compaction problems. Rotation, while useful in managing other soybean diseases, does not appear to significantly reduce the severity of SDS. Even after several years of continuous production of corn, *F. virguliforme* populations typically are not reduced substantially. Research from Iowa State University has shown that corn (especially corn kernels) can harbor the SDS pathogen.

For more information CLICK HERE to download a full color fact sheet on SDS. A short video on SDS can also be viewed by CLICKING HERE.

**Stem Canker**

There are actually two different types of stem canker caused by related, but different fungi. The fungus *Diaporthe caulivora* causes northern stem canker, while southern stem canker is caused by *Diaporthe meridionalis*. These two pathogens are part of the larger Diaporthe-Phomopsis complex, which consists of Phomopsis seed decay, pod and stem blight (see link to fact sheet below), and stem canker. In Wisconsin, northern stem canker is the most common stem canker disease, however, southern stem canker has been found.

Cool, wet conditions in the spring and early summer favor infection by the northern stem canker fungus. The symptoms of the disease become apparent later in the season. Considering the cool and rainy weather that has
been prevalent over much of the state this season, it isn’t surprising that northern stem canker is prevalent.

Initially symptoms of northern stem canker appear as small reddish-brown lesions near nodes. As lesions expand, they can become more brown or gray, but the red border will remain. Eventually lesions of northern stem canker will get large enough to girdle the stems and may be confused with Phytophthora root and stem rot. The best way to tell these two diseases apart is to look for the location of the lesion. Generally with northern stem canker, lesions begin at nodes away from the soil line on the main stem and move upward. Phytophthora stem lesions will progress upward from the soil line. Northern stem canker can also occur in patches and damage plants in wide swaths. Northern stem canker can also be confused with white mold when diagnosing above the canopy. Because the lesions can girdle stems, leaf flagging and death can resemble that of white mold damage. Therefore, careful scouting and inspection of the lower canopy and stems in necessary to tell the difference between white mold and northern stem canker.

Spores of the stem canker pathogen originate mostly from soybean debris from the previous crop. Therefore, severity of northern stem canker can be higher in fields with minimal tillage. Burying debris can help reduce the severity of the disease. Stem canker can also be more prevalent in fields with high fertility and high organic matter. Stem canker-resistant varieties are also available. Choose varieties with the highest resistance rating possible within the appropriate maturity group for your area. Soybeans rotated with alfalfa may also have a higher incidence of the disease, because alfalfa is an alternate host of Diaporthe. Fungicide application is not recommended for this disease.

You can download a new full color stem canker fact sheet by clicking here and for pod and stem blight by clicking here.

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**Soybean Vein Necrosis Disease (SVND)**

Soybean plants with SVND exhibit vein clearing (i.e., lightening of vein color) and chlorosis (i.e., yellowing), as well as mosaic patterns (i.e., blotchy light and dark areas) on affected leaves. Initially, symptoms develop around the veins of leaves and eventually expand outward. As the disease progresses, vein and leaf browning and necrosis (i.e., death) occur.

SVND is caused by soybean vein necrosis virus (SVNV). SVNV is in the viral genus Tospovirus. This group of viruses includes common vegetable viruses [e.g., Tomato spotted wilt virus (TSWV) and Iris yellow spot virus (IYSV)] and ornamental viruses [e.g., Impatiens necrotic spot virus (INSV)] that can cause severe damage and substantial loss of yield and crop quality. Tospoviruses tend to have wide host ranges and are transmitted by several species of thrips. SVNV is also thought to be thrips-transmitted, but this has yet to be confirmed. SVNV may have been introduced to Wisconsin via thrips moving north on wind currents from the southern United States.

Currently very little is known about SVND. Thus there are no specific management practices recommended for SVND at this time. No specific control recommendations are in place. Researchers at universities across the country are attempting to determine what impact SVNV will have. Additional research is needed to determine how SVNV affects soybeans, how it is transmitted, how it overwinters, and what can be done to slow its spread.

To learn more about SVND you can download a fact sheet assembled by a multi-state working group of soybean pathologists and also view a short video.
Arlington Weed Garden in “Full Bloom”

Mark Renz, Associate Professor and Extension Weed Specialist, University of Wisconsin-Madison

I would like to officially invite people to view the weed garden at the Arlington Agricultural Research Station this summer (N695 Hopkins Road, Arlington WI 53911). This “garden” has over 90 common weeds found in Wisconsin agronomic crops emerged and available for viewing. Specimens consist of perennials, biennials, and annual weeds that grow throughout Wisconsin.

While it may appear easy to grow weeds, it is incredibly challenging to get weeds to grow exactly where you want them to. I would like to thank my staff, undergraduate and graduate students for helping to weed, transplant and mow the area. I think it is in the best shape in years. For a video tour of the garden please view this video.

While many of the summer annual weeds have not flowered, this is an excellent time to work on weed identification while many are in the vegetative stage. If you live near the Arlington Research Station (N695 Hopkins Road, Arlington WI 53911), or are travelling near this facility, please stop by.

The weed garden is located on the south side of the public events parking lot. This garden will remain open through September, so weeds can be viewed at various stages of growth. For a list (and map) of species in the weed garden, check the mailbox in the northeast corner.

For more weed information, visit http://fyi.uwex.edu/weedscl

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from July 18, 2015 through July 24, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**

Soybean, Potassium Deficiency, none, Sauk

**Fruit Crops**

Apple, Black Rot, *Sphaeropsis sp.*, Oneida

Apple, Cedar Apple Rust, *Gymnosporangium juniperi-virginianae*, Iowa

Apple, Fire Blight, *Erwinia amylovora*, Oneida

Apple, Root/Crown Rot, *Phytophthora sp.*, *Pythium sp*, Kenosha, Sawyer

Cranberry, Tobacco Streak, *Tobacco Streak Virus*, Monroe

Cherry, Cheery Leaf Spot, *Blumeriella jaapii*, Rock

Grape, Black Rot, *Phyllosticta ampelicida*, Dane, Polk

Honeyberry, Powdery Mildew, *Microsphaera sp.*, Dane

Strawberry, Angular Leaf Spot, *Xanthomonas fragariae*, Iowa

Strawberry, Root/Crown Rot, *Fusarium sp.*, Iowa

**Vegetables**

Onion, Downy Mildew, *Peronospora destructor*, Rock

Onion, Purple Blotch, *Alternaria porri*, Rock

Onion, Stemphylium Leaf Blight, *Stemphylium sp*, Rock, Columbia

Potato, Early Blight, *Alternaria solani*, Portage

Snap Beans, Ashy Stem Blight, *Macrophomina phaseolina*, Waushara

Snap Beans, Root/Crown Rot, *Fusarium spp.*, Waushara
Soybean (Edible), Root/Crown Rot, *Fusarium sp.*, Chippewa

Soybean (Edible), Target Spot, *Corynespora cassiicola*, Chippewa

Tomato, Catfacing, none, Iowa

Tomato, Cucumber Mosaic, *Cucumber Mosaic Virus*, Iowa, Grant, Winnebago

Tomato, Septoria Leaf Spot, *Septoria lycopersici*, Iowa, Portage

Tomato, Tobacco Mosaic, *Tobacco Mosaic Virus*, Iowa, Grant, St. Croix, Winnebago

Tomato, Tomato Spotted Wilt, *Tomato Spotted Wilt Virus*, Grant, St. Croix

**Soil**

Alfalfa Soil, *Aphanomyces* Seedling Blight, *Aphanomyces euteiches* race 2, Houston (MN)

Alfalfa Soil, Phytophthora Seeding Blight, *Phytophthora medicaginis*, Houston (MN)

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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### Vegetable Crop Update July 24, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 24th issue of the Vegetable Crop Update is now available which includes:

- early blight updates
- late blight DSVs and updates (all late blight is US23 so far)
- onion downy mildew in WI (Rock Co. first report)
- cucurbit downy mildew updates (Dane Co. first report)
- diseases of snap beans (bac brown spot and white mold)

[Click here to view this issue.](http://pddc.wisc.edu)

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### Wisconsin Pest Bulletin 7-30-15

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 14 of the Wisconsin Pest Bulletin is now available at:


**INSIDE THIS ISSUE**

LOOKING AHEAD: Peak flight of western bean cutworm occurring in southern WI

FORAGES & GRAINS: Alfalfa pest pressure remains low

CORN: Japanese beetles observed feeding on corn silks

SOYBEAN: Soybean aphid survey continues to find low densities

FRUITS: Apple maggot counts variable this season

VEGETABLES: More cases of late blight confirmed in the past week

NURSERY & FOREST: Results of annual survey of viruses in ornamentals

DEGREE DAYS: Growing degree day accumulations through July 29, 2015

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[Follow us on](http://pddc.wisc.edu)

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Bring your biggest weed to Farm Technology Days

Mark Renz; Extension Weed Specialist

Mild temperatures and ample rainfall have resulted in another year of rampant weed growth in Wisconsin fields. Did some of the weeds on your farm not get controlled? Are they now big? If so bring them to the Weed Doctor’s Booth at Farm Technology Days on August 25-27 in Dane County.

At FTD we will be holding a contest for the Biggest Weed in Wisconsin. This annual event asks participants to bring no more than two plants (stems only please) of non-woody, non-poisonous plants cut at the soil surface.

Samples will be donated to the Weed Doctor Booth and placed on display throughout Farm Technology.

Weed Specialists will award a daily winner as well as a winner for the entire event. Past winners (plumeless thistle and common burdock) emphasize that to win weeds typically need to be both tall and wide. Tall weeds shouldn’t be a problem in our corn fields this year, but looking for ones that are also wide may be a challenge in 2015!

This year you will have a chance to compete against UW Extension Weed Specialists as well as the UW Madison Weed Science and Crop Science teams. We have been cultivating plants all summer and have some good entries ready for harvest. See if you can beat our entries, and win a free copy of the 2015 Pest Management in Wisconsin Field Crops.

To enter the contest, bring your weeds to the UW-Extension Weed Experts booth in the Progress Pavilion before 3 p.m. on Tuesday, Wednesday, or Thursday during Farm Technology Days.

UW-Extension Weed Specialists and county faculty will also be available to help identify your weed species as well as give you management options for any weed problems you may have.
New this year we will be highlighting the importance of herbicide resistant weeds in Wisconsin. Graduate students will have live plants of weed species of high concern for development of herbicide resistance in Wisconsin. They will ask that you test your knowledge of herbicide resistance, by taking a weed id quiz. Participants who get at least 50% correct will also receive a free copy of the 2015 Pest Management in Wisconsin Field Crops.

Goss’s Wilt Confirmed in Wisconsin in 2015

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

Goss’s wilt on field corn was confirmed for the first time in the 2015 season in Wisconsin this week in Grant County. Goss’s wilt has been confirmed in past years in Wisconsin, including the 2014 field season.

Symptoms and Signs

Goss’s wilt is caused by the bacterium *Clavibacter michiganensis* subsp. *nebraskensis*. First visual symptoms usually appear as gray or yellow stripes on leaves that tend to follow the leaf veins (Fig. 1). Often “freckles”, or brown or green irregular spots, can be observed within the leaf lesions (Fig. 2). Freckles are an excellent diagnostic symptom to confirm Goss’s wilt. Vascular tissue (Fig. 3), husks, and kernels can sometimes take on an orange hue. Occasionally, bacterial ooze or dried ooze can be observed on symptomatic leaves. This disease is often confused with northern corn leaf blight (NCLB), which is a fungal disease. Earlier this season I wrote an article on differentiating between NCLB and Goss’s wilt. You can visit that article by CLICKING HERE.

Factors that Cause Disease Development

The Goss’s wilt bacterium overwinters in old corn residue. The bacterium enters the plant through wounds or natural openings. Yield losses will depend on the susceptibility of the hybrid being grown. Factors that put corn fields at higher risk include:

1. Reduced Tillage
2. Continuous corn rotation
3. Planting a susceptible hybrid
4. Poor grassy weed control
5. Hail, wind, or severe weather events causing injury on corn plants

Storms with hail and wind were prominent this past weekend in areas of Wisconsin. Fields with wind and hail damage should also be monitored closely for Goss’s wilt. This type of damage creates excellent entry points for the Goss’s wilt pathogen.

Management

There is currently no research-based method of in-season management of Goss’s wilt. There are some foliar products being marketed for the control of Goss’s wilt, but university-based research has indicated that these products have little efficacy on Goss’s wilt in the field. Because this disease is caused by a bacterium, the application of fungicide WILL NOT control Goss’s wilt.

Planting resistant hybrids in fields with a history of Goss’ wilt is recommended. Residue management and crop rotations should also be implemented in at-risk areas.

![Figure 1. Foliar symptoms of Goss’s wilt on a corn leaf. Photo Credit: Larry Osborne, Bugwood.org.](image)

![Figure 2. “Freckles” on a corn leaf with Goss’s wilt. Photo credit: Larry Osborne, Bugwood.org.](image)

![Figure 3. Orange vascular tissue of a corn plant with Goss’s wilt. Photo credit: Howard F. Schwartz, Colorado State University, Bugwood.org.](image)
fields. Some grassy weed hosts can be alternative hosts for the Goss’s wilt pathogen. Therefore, a sound weed management program in and around corn fields can be useful in managing Goss’s wilt. Colleagues at Purdue University have developed an excellent fact sheet covering alternative grassy weed hosts of Goss’s wilt. They also include some recommendations for controlling these weedy hosts. You can download a PDF version of the fact sheet by CLICKING HERE.

Additional Goss’s Wilt Information

University of Nebraska – http://pdc.unl.edu/agriculture-crops/corn/gosswilt

Purdue University – https://www.extension.purdue.edu/extmedia/bp/BP-81-W.pdf

References

Article modified from original version posted in 2014


Soybean Insects (and mites): Looking ahead

Bryan Jensen; UW Extension

Soybean Aphid: The most common question I’ve had lately is “Where are the soybean aphids?” What started out being a good year for several species of aphids has certainly done an about-face. Based on reports from DATCP’s Wisconsin Pest Bulletin, conversations with crop consultants and county agents, soybean aphid numbers are down but not necessarily out. What we have in our favor is both time of the year and advanced crop stage. What we have working against us is temperature. A welcome return to cooler temperatures may positively affect aphid build up. Continue to scout fields over the next few weeks. The economic threshold is described as 250 aphids/plant on 80% of the plants AND the population is increasing. Increasing populations is an important concept of this economic threshold. It implies that a population that has plateaued at 250/plant for a period of time is not at an immediate risk for economic yield loss. To date, I have not heard of any field close to the economic threshold. Resist the temptation to prophylactically spray or to treat sub threshold populations. You may unintentionally flare twospotted spider mite populations and create a bigger problem than you had originally.

Twospotted Spider Mites: A comment that Kevin Jarek, UWEX Outagamie County, recently made regarding the dry conditions in northeast Wisconsin made me think about spider mites. Spider mites may become an economic concern after periods of hot/dry weather. Spot-check for mite activity on field edges, sandy knolls as well as other field areas that are drought stressed. Tap leaves over a white sheet of paper and use magnification to verify the presence of mites. Also, scout for initial signs of mite damage which are small white/yellowish specks on leaves which is often described as “stippling”. Don’t be overly alarmed if mites are present. Low numbers are common during most growing seasons and natural enemies (predatory insects/mites and pathogens) often aid with control. However, twospotted spider mite populations can increase quickly if field conditions remain dry and temperatures high. Also consider that unnecessary insecticide applications will control these natural enemies and lead to mite resurgence. Which is why care and thought needs to be given to spider mite and soybean aphid control programs.

There are no established spider mite economic thresholds for soybean. Treatment may be needed if:

- Mites are present between bloom (R1) and pod fill (R5)
- 15% or more leaf area on soybean plants are discolored or stippled
- Live mites are present and actively increasing noted by presence of adult, immatures and eggs
- Hot, dry weather is expected to continue

Japanese Beetles: Continue to check for adult feeding over the next 2-3 weeks. Adults are mobile and feeding may be isolated within a field. The economic threshold is to treat reproductive soybeans when 20% defoliation occurs.
Vegetable Crop Update July 31, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 25th issue of the Vegetable Crop Update is now available which includes:

• early blight updates
• late blight DSVs and updates (still - all late blight tested is US-23 in WI)
• cucurbit downy mildew updates
• basil downy mildew detected in WI
• report from the UWEX Plant Disease Diagnostic Clinic

Click here to view this issue.

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disseases have been identified at the PDDC from July 11, 2015 through July 17, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
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<td>Field Crops</td>
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<tr>
<td>Corn, Red Root Rot, Phoma terrestris, Dunn</td>
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<td>Corn, Yellow Leaf Blight, Phylosticta maydis, Dunn</td>
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<td>arum, Fond du Lac</td>
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<td>Alfalfa, Stemphylium Leaf Spot, Stemphylium Sp, Colum</td>
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<td>Tomato, Bacterial Spot, Xanthomonas sp., Dane</td>
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<tr>
<td>Tomato, Late Blight, Phytophthora infestans, Wood, Washburn</td>
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<tr>
<td>Tomato, Septoria Leaf Spot, Septoria lycopersici, Gree</td>
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For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu

2015 Wisconsin Winter Wheat Performance Trials

Shawn Conley, Adam Roth, John Gaska, and Damon Smith; Departments of Agronomy and Plant Pathology

The Wisconsin Winter Wheat Performance Trials are conducted each year to give growers information to select the best-performing varieties that will satisfy their specific goals. The performance trials are conducted each year at four locations in Wisconsin: Arlington, Chilton, Fond du Lac, and Sharon. Trials include released varieties, experimental lines from University breeding programs, 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 can use performance data to determine whether to release a new variety.

To read more, click here.
Remember Crop Diagnostic Training Center Crop and Pest Management Workshop!

Registration is open for UW-Madison Integrated Pest Management Program’s Crop & Pest Management Workshop and will be held August 13, 2015.

**FAST and easy ONLINE registration by credit card:**
https://www.patstore.wisc.edu/ipm/register.aspx

The workshop will be hosted at the Arlington Agricultural Research Station. Be aware that this is not a “traditional” field day. The training session is designed to be primarily in-field and hands-on. We advise that attendees come prepared to be in the field and ready for all types of weather. CCA CEU’s are available as listed, but are subject to change pending approval from the Certified Crop Advisor Program.

Contact Dan Heider at 608-262-6491, or email djheider@wisc.edu

**Crop & Pest Management Workshop**
Date: August 13, 2014
Location: Arlington Ag Research Station
CCA CEU’s: 1.0 Crop Management, 1.0 Nutrient Management, 2.0 Pest management
Fee: $90

This workshop takes a multi-disciplinary and in-depth approach covering agronomic concerns ranging from identification of crop and pest production problems to management options within production systems.

Thursday – August 13, 2015
9:30 – 10:00 registration / introduction & orientation
10:00 – 12:00 sessions 1-2
12:00 – 12:45 lunch (provided)
12:45 – 2:45 sessions 3-4

**Topics Covered:**

**Sampling for and interpreting plant nutrient analysis** – Carrie Laboski, Extension Soils Specialist
- Learn proper sampling techniques and how/why they change with crop maturity
- You have the test results, now what? Learn the uses and limitations of in-season plant nutrient testing results

**Impacts of Hybrid Selection** – Joe Lauer, Extension Corn Agronomist
- Seed costs have skyrocketed and seed traits have become increasingly complex and confusing. Making sense of it all
- will help you or your customers maximize their return on investment
- This session will help you to critically evaluate hybrids to make the best informed choice for your location

**The trait game II** – Bryan Jensen, UW Integrated Pest Management Specialist
- You know all the traits and their impact – or do you? This session begins with a brief but in-depth discussion on corn rootworm Bt traits, beetle scouting, root rating and more
- Much of this session will concentrate on the management decision process of when and how to incorporate Bt traits and soil applied insecticides.

**Dandelion biology and control** – Mark Renz, Extension Weed Science Specialist
- Taraxacum officinale, lions-tooth, blow-ball, dandelion – you know it by many names, but how well do you really know it?
- An in-depth discussion on the biology and growth/development of this difficult to control weed
- This session will look at control options in several crops and let you decide what works and what doesn’t

To view the flyer for the workshops click here.

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**Wisconsin Pest Bulletin 8-6-15**

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 16 of the Wisconsin Pest Bulletin is now available at:
INSIDE THIS ISSUE

LOOKING AHEAD: Spotted wing drosophila problems increasing

FORAGES & GRAINS: Potato leafhopper counts still low to moderate

CORN: Western bean cutworm flight expected to subside soon

SOYBEAN: Soybean aphid densities remain below-threshold

FRUITS: Sharp increase in codling moth counts reported this week

VEGETABLES: UW reports first confirmed basil downy mildew case of the season

NURSERY & FOREST: Potato leafhoppers and dusky birch sawfly noted during nursery inspections

DEGREE DAYS: Growing degree day accumulations through August 5, 2015

New Pest Management Network Focus on Soybean Seminar: SVN

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin

A new Pest Management Network Focus on Soybean Seminar has been recently posted covering Soybean vein necrosis virus. There is a 5 min 29 sec executive summary or a full length presentation to choose from. To listen to the webinar, visit the PMN page by CLICKING HERE.
Soybean Aphids

Bryan Jensen; UW Extension

I have been getting a few phone calls regarding increasing soybean aphid populations. Nothing extreme but some fields have been slightly over or under thresholds. Treatment decisions at this time of the year are very difficult to make, especially when populations hover around the economic threshold. I’ll offer a few thoughts and comments.

First a comment on crop stage. The economic threshold for soybean aphids on R1-R5 soybeans is 250 aphids on 80% of the plants and the population is increasing. Soybeans at R6 are very unlikely to suffer significant yield loss unless that field is under drought stress. In a short conversation with Shawn Conley, many fields are in the R4-R5.5 stage of development. Therefore, the window for treatment will be closing soon.

When scouting, look for “white dwarf” soybean aphids which are, of course, soybean aphids but do not live as long (50%) or reproduce as fast (70%) as the yellow-green form. White dwarfs are smaller in size and cream colored. Other species of aphids will produce these morphs in response to environment conditions. For soybean aphids, it is possible that high temperature, humidity and/or shorter day length may bring about a higher percentage of white dwarfs. Count the white dwarfs and include them in your total plant counts. However consider their presence when you are on the fence and deciding to spray or not. One might expect the percentage of white dwarfs to increase because the forecast calls for high temperatures through the weekend.

Also, consider if you plan ground application of insecticides that wheel tracks will reduce yield. That reduction is dependent on the boom width. Research by Dr. Conley and others at Purdue indicate that reduction can be as high as 4.9% (30 ft boom) to as little as 1.3% (120 ft. boom).

Predators and parasitoids can negatively influence aphid populations if timing and conditions are right. We are all familiar with the adult and larval stage of lady beetles. Both life stages will feed on aphids and can rapidly reduce aphid populations if numbers are high. When scouting, observe relative numbers of lady beetle life stages (adults, larvae and pupae) over time. This observation will also indicate if their numbers are decreasing, increasing or are stabilized. If lady beetle numbers are increasing faster than aphids it may be a good sign that treatment may not be needed for the time being. Parasitoids, indicated by the presence of aphid mummies, can also negatively affect aphid populations. Their effect, however, tends to take place over a longer period of time.

Our typical mid to late-August weather patterns favor entomopathogenic fungi. If environmental conditions (cool/humid) are expected, you may see a reduction in soybean aphids. Early symptoms of this fungus are aphids that are rose colored.

One final comment on soybean aphid management. Some areas of Wisconsin have been dry if not very dry. While scouting for aphids look for twospotted spider...
mites and/or signs of their damage. Choose insecticides wisely if mites are present. Use of synthetic pyrethroid insecticides will have limited effects on spider mites but will kill beneficial mites and insects leading to higher mite populations. Insecticides with the active ingredients chlorpyrifos and dimethoate can control both aphids and spider mites. However, plan on revisiting sprayed fields to verify control and check on possible aphids and mite resurgence.

### Pasture walk highlights research results on organic pastures

Mark Renz, Associate Professor and Extension Weed Specialist, University of Wisconsin-Madison

Forage from pastures is critical for organic milk production, however many farms are not maximizing the potential of their pastures. Researchers from the University of Wisconsin-Madison, UW-Extension, and USDA ARS Dairy Forage set out to identify common factors associated with high and low milk production on forty paddocks across twenty farms throughout Wisconsin.

Initial results of the study will be presented during a pasture walk at Don and Sam Frei’s farm (N3808 Duncan Hill Rd Argyle, WI 53504) on Aug. 12 from 10:30 a.m.-3 p.m. Pasture walk attendees will also learn how to apply this information to improve pasture performance. The host farmers will share some of their experiences on grazing sorghum during the summer slump as well as benefits from new lane construction.

“We wanted to focus broadly across Wisconsin to try to identify common issues found across the state,” said Mark Renz, UW-Extension weed scientist at UW-Madison and the project leader. “Results will allow us to not only identify problems but allow farmers to prioritize which should be resolved first and have the largest return on investment.”

With funding from CERES Trust this team of researchers have been collecting data from forty paddocks over the last two years.

“Support from Organic Valley has been crucial in helping to identify farms that were willing to be involved in this project”, said Erin Silva, assistant professor and UW-Extension organic specialist at UW-Madison.

Attendees are invited to a lunch which is provided through a generous donation from Organic Valley.

Contact: Mark Renz, 608-263-7437, mrenz@wisc.edu

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

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from August 1, 2015 through August 7, 2015.

### Plant/Sample Type, Disease/Disorder, Pathogen, County

#### Field Crops

- **Corn**, Anthracnose Stalk Rot, *Colletotrichum graminicola*, Iowa
- **Corn**, Common Rust, *Puccinia sorghi*, Iowa
- **Corn**, Eyespot, *Kabatiella zeae*, Iowa
- **Corn**, Goss’ Wilt, *Clavibacter michiganensis subsp. nebraskensis*, Grant
- **Corn**, Gray Leaf Spot, *Cercospora sp.*, Iowa
- **Corn**, Northern Corn Leaf Blight, *Exserohilum turcicum*, Grant
- **Corn**, Northern Corn Leaf Spot, *Bipolaris zeicola*, Iowa
- **Soybean**, Downy Mildew, *Peronospora manshurica*, Sauk, Walworth

#### Fruit Crops


#### Vegetables

- **Squash**, Blossom End Rot, None, Dane
- **Tomato**, Bacterial Speck, *Pseudomonas syringae pv. tomato*, Dane
- **Tomato**, Septoria Leaf Spot, *Septoria lycopersici*, Burnett, Dane, Dunn, Jackson
- **Tomato**, Zippering, None, Dunn

#### Soil

- **Soybean**, Soybean Cyst Nematode, *Heterodera glycines*, Dane

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)
Vegetable Crop Update August 7, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 26th issue of the Vegetable Crop Update is now available which includes the following topics:

- early blight updates
- late blight DSV accumulations and updates (Polk Co. first report)
- cucurbit downy mildew updates
- hop grower workshop agenda/directions
- Langlade Co. Field Day agenda

Click here to view this update.

Wisconsin Pest Bulletin 8-13-15

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 17 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: Western bean cutworm flight subsiding across Wisconsin

FORAGES & GRAINS: Grasshopper populations increasing in alfalfa and other crops

CORN: Moderate corn earworm flights registered in Dodge and Green Lake Cos.

SOYBEAN: Soybean aphid densities unlikely to reach threshold in most fields this season

FRUITS: Apple maggot flies continue to emerge in orchards

VEGETABLES: Potato and tomato crops remain at risk of late blight infection

NURSERY & FOREST: Redbud trees in Dane County diagnosed with Verticillium wilt

DEGREE DAYS: Growing degree day accumulations through August 12, 2015
As we head into the 2015/16 Wisconsin winter wheat field season, I have received a lot of questions on Fusarium head blight (scab) management due to the heavy pressure from that disease in the 2014 and 2015 wheat crops. Along with those questions, always come inquiries about fungicide programs, specifically fungicide timing and fungicide products effective for controlling the disease. We have already addressed timing of application in this article: [Start Managing for Fusarium Head Blight Now Before You Plant the 2015/16 Crop](#). But what about efficacy of products and fungicide programs? Previous results from 2013 and 2014 Wisconsin Winter Wheat Fungicide evaluations can be found by [clicking here](#). In addition, you will find the 2015 fungicide evaluation results below.

The 2015 trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The soft red winter wheat cultivar ‘Kaskaskia’ was chosen for this study. Wheat was planted on 24 Sep 2014. Treatments consisted of a non-treated control and 9 fungicide treatments. All fungicide treatments contained the non-ionic surfactant Induce 90% SL at 0.125% v/v. Fungicides were applied using a CO2 pressurized backpack sprayer calibrated to deliver 20 GPA. Fungicides were used to target general wheat disease in the area. Fungicides were applied either just before jointing (Feekes 5), at emerging flag leaf (Feekes 8), at anthesis (Feekes 10.5.1), or using two sprays with the first occurring just prior to jointing (8 May) or at emerging flag leaf (21 May) and the second spray being applied at anthesis (3 Jun). Natural sources of pathogen inoculum were relied upon for disease and
plots were also inoculated with Fusarium graminearum (the head blight pathogen). Fusarium head blight was the primary disease in the trial and was evaluated by estimating average incidence in each plot. Level of deoxynivalenol (DON) will also be evaluated but results are not yet in.

Weather in spring 2015 was cool and rainy before transitioning to warmer and wet near wheat head emergence. Leaf disease incidence and severity was low in this trial. No powdery mildew was observed. Visible levels of Fusarium head blight were moderate in the non-treated control (see table below). All plots that received fungicide had significantly less Fusarium head blight than the non-treated control. Plots that received Prosaro or Caramba fungicide at the Feekes 10.5.1 application timing typically had lower levels of disease. Plots where fungicide was applied at Feekes 8 only typically had higher levels of Fusarium head blight compared to plots that received an application at Feekes 10.5.1. Plots with the lowest levels of Fusarium head blight receive either Quilt Xcel @ 10.5 fl oz/a or Stratego YLD @ 5.0 fl oz/a at Feekes 8 followed by Prosaro @ 6.5 fl oz/a at Feekes 10.5.1. Although, yield was highest in plots that received Stratego YLD @2.0 fl oz/a at Feekes 5 followed by Prosaro @ 6.5 fl oz/a applied at Feekes 10.5.1. Application of fungicide at the Feekes 10.5.1 timing reduced visible disease and often improved yield at this research location in 2015. Phytotoxicity was not observed for any treatment.

### Start Managing for Fusarium Head Blight Now Before You Plant the 2015/16 Crop

Shawn Conley, State Soybean and Small Grains Specialist
Damon Smith, State Field Crops Pathology Specialist

The 2014 and 2015 WI winter wheat crops both endured significant Fusarium head blight (FHB or scab) incidence as well as mycotoxin (vomitoxin) dockage and outright rejections. Here are a few considerations for managing FHB before the 2015/16 crop even goes into the ground.

1. Crop rotation matters. Data from our long-term rotation studies indicate that wheat following soybean provides the greatest yields. The next best options are wheat following corn silage (6.5% less) then corn for grain (21% less). Wheat following alfalfa or another leguminous crop are also good options, though the N credits following alfalfa may best be served going to corn. Furthermore, background fungal pressure (residue on and in soil) from the FHB fungus will be greater following corn then soybean or another legume, however know that spores that infect your wheat crop can arrive from outside the field. Please click to see more information on the Top 8 Recommendations for Winter Wheat Establishment in 2015.

2. Variety selection matters. Data from our 2015 WI Winter Wheat Performance Test shows variable yield and disease performance among the varieties listed. Select those varieties that have both good to excellent FHB resistance and high yield. When evaluating FHB resistance, low numbers for both FHB incidence and severity can be helpful, but the major focus should be placed on FHB incidence (measure of the number of FHB-symptomatic plants in a stand).

3. Application timing matters. One of the biggest challenges year in and year out is improper fungicide application timing. Our data suggests that on susceptible (Hopewell) or moderately susceptible varieties (Kaskaskia) equal efficacy of the fungicide Prosaro at a rate of 6.5 fl oz/acre can be achieved when applied between Feekes 10.5.1 (anthesis) and 5 days after anthesis. Given the variability of head emergence and anthesis across a landscape it may prove best to wait a few days until the whole field is flowering than to apply too soon. If the extruded anthers have turned from yellow to white across the whole field then you are likely too late. Remember it roughly takes a wheat head 7 days to completely self-pollinate.

<table>
<thead>
<tr>
<th>Non-treated Control</th>
<th>FHB Disease Incidence (%)</th>
<th>Yield (bu/a)</th>
<th>Test Weight (lbs/bu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0 a</td>
<td>90.6 d</td>
<td>57.6</td>
<td></td>
</tr>
<tr>
<td>Quilt Xcel @ 10.5 fl oz/a (Feekes 8)</td>
<td>12.8 b</td>
<td>95.8 ad</td>
<td>56.8</td>
</tr>
<tr>
<td>Stratego YLD @ 5.0 fl oz/a (Feekes 8)</td>
<td>12.5 b</td>
<td>99.2 ab</td>
<td>56.9</td>
</tr>
<tr>
<td>Prosaro SC @ 6.5 fl oz/a (Feekes 8)</td>
<td>11.3 bc</td>
<td>98.1 ac</td>
<td>57.6</td>
</tr>
<tr>
<td>Trivapro @ 14.6 fl oz/a (Feekes 8)</td>
<td>11.3 bc</td>
<td>93.0 bcd</td>
<td>58.1</td>
</tr>
<tr>
<td>Stratego YLD @ 2.0 fl oz/a (Feekes 8) + Prosaro SC @ 6.5 fl oz/a (Feekes 10.5.1)</td>
<td>6.3 cd</td>
<td>102.5 a</td>
<td>57.8</td>
</tr>
<tr>
<td>Prosaro SC @ 6.5 fl oz/a (Feekes 10.5.1)</td>
<td>6.3 cd</td>
<td>98.4 ab</td>
<td>58.6</td>
</tr>
<tr>
<td>Priaxor @ 2.0 fl oz/a (Feekes 8) + Caramba @ 13.5 fl oz/a (Feekes 10.5.1)</td>
<td>4.7 d</td>
<td>91.4 cd</td>
<td>57.7</td>
</tr>
<tr>
<td>Stratego YLD @ 5.0 fl oz/a (Feekes 8) + Prosaro SC @ 6.5 fl oz/a (Feekes 10.5.1)</td>
<td>3.3 d</td>
<td>98 ac</td>
<td>58.5</td>
</tr>
<tr>
<td>Quilt Xcel @ 10.5 fl oz/a (Feekes 8) + Prosaro SC @ 6.5 fl oz/a (Feekes 10.5.1)</td>
<td>3.0 d</td>
<td>92.7 bcd</td>
<td>57.1</td>
</tr>
</tbody>
</table>

LSD 5.58

0.09 ns
4. Choose the right fungicide class. Make sure you use the appropriate fungicide product and class to manage FHB. The label for products containing strobilurin active ingredients (FRAC group 11) ends prior to flowering. Late application can actually lead to increased mycotoxin levels. Triazole containing products (FRAC group 3) are recommended for FHB control. For a list of products and efficacy ratings, visit the Field Crops Fungicide Information Page.

5. Harvest timing and flash drying. The word on the street is that in 2016 elevators will push growers to harvest early (18% moisture or higher) and subsequently dry grain to mitigate mycotoxin levels. While drying grain to 13% or less moisture is a good storage practice, know this process may kill the pathogen but any mycotoxin levels already in the grain will not dissipate. Vomitoxin is a very stable molecule and IS NOT degraded by heat, freezing, or drying.

### Top 8 Recommendations for Winter Wheat Establishment in 2015

Shawn Conley, State Soybean and Small Grains Specialist  
John Gaska, Outreach Specialist  
David Marburger, Graduate Student  
Damon Smith, State Field Crops Pathology Specialist

<table>
<thead>
<tr>
<th>Variety Selection</th>
<th>Test Weight</th>
<th>Lodging</th>
<th>Yield</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hopewell (Susceptible)</td>
<td>9.5b</td>
<td>2b</td>
<td>0.5</td>
<td>4</td>
</tr>
<tr>
<td>Kaskaskia (Moderately Susceptible)</td>
<td>7.5b</td>
<td>5.25b</td>
<td>2.75</td>
<td>2.75</td>
</tr>
<tr>
<td>Pro 200 (Moderately Resistant)</td>
<td>6.44</td>
<td>6.44</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Sunburst (Moderately Resistant)</td>
<td>6.44</td>
<td>6.44</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

**Top 8 winter wheat establishment recommendations:**

1. Variety selection: please see the [2015 WI Winter Wheat Performance Test](#).
2. Plant new seed (DO NOT plant saved seed).
3. A fungicide seed treatment is recommended for winter wheat in WI, especially for seed damaged by Fusarium head blight (FHB).
4. Wheat should be planted 1 inch deep.
5. The target seeding rate for wheat planted from September 15th to October 1st is 1,300,000 to 1,750,000 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.
8. Plant between September 20 and October 5

### 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, 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 and diseases 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.

In 2015 FHB was a significant issue in Wisconsin. The 2015 WI Winter Wheat Performance Test report lists two FHB ratings for each variety. One is FHB incidence (the number of plants that had symptoms of FHB) and FHB severity (how much average head area was symptomatic for FHB). While both ratings can be useful for choosing an FHB-resistant variety, focus should be placed on choosing varieties that have a low FHB incidence rating. This will help to reduce the overall number of plants that are infected with FHB. When considering varieties to plant, choose a variety with the best balance between yield, test weight, and FHB incidence rating.

Plant 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, then selecting a taller variety may be warranted.

For detailed information regarding winter wheat variety performance please visit www.coolbean.info for results of the 2015 WI Winter Wheat Performance Test.

**Plant New Seed in 2015**

To maximize wheat yields in 2016, 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%).

Many wheat fields received a glyphosate application as a harvest-aid. Due NOT save seed from those fields as germination rate can be adversely affected.

Many WI wheat fields also experienced Fusarium Head Blight (FHB), also known as scab in 2015. 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 kernels may be bleached or white in color.

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 current 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%, consider increasing 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 2015 (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. If seed with scab must be used for planting, a seed treatment fungicide is a must to improve germination and protect stand. Note that planting scabby seed won’t increase the risk of FHB next spring. Also remember that seed treatment fungicides applied this fall will not protect against potential FHB infection next summer. You may still need to apply a foliar fungicide during anthesis to control FHB.
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 winterkill. 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

The targeted fall stand for wheat planted from September 15th to October 1st is between 30 and 40 plants per square foot. This is about 25 seeds per foot in 7.5” rows. To achieve this goal, the seeding rate for soft red winter wheat is between 1,300,000 and 1,750,000 viable seeds per acre (Table 1, 2). Depending upon varietal seed size, this equates to 74 to 175 pounds of seed per acre (Table 3). Our data from the 2012/13 and 2013/14 growing seasons indicate a significant yield increase when increasing your seeding rate from 1.5 and 1.75 million seeds per acre; however that marginal yield increase is likely offset by the increased seed cost. 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).

Planting Date

Winter wheat in WI should be seeded between September 20th and October 5th. Planting wheat too early can lead to more incidence of barley yellow dwarf virus (BYDV) due to feeding and disease transmission by aphids. Aphids such as the bird cherry oat aphid can vector BYDV to wheat in the fall. Their ability to feed on wheat and transmit the disease is limited when temperatures are cooler. Waiting to plant wheat until later September shortens the potential aphid feeding time. Planting too early can also lead to excessive fall growth and potential smothering of the crop. There are also increased risks of planting too late. If air and soil temperatures get too cold, wheat will not germinate and emerge well in the fall.

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.

Table 1. Wisconsin seeding rate recommendations based on planting date. (Click table to see in greater detail.)

Special notes regarding the 2016 crop

The 2014 Farm Bill offers additional coverage on your winter wheat. You must sign up for the optional SCO (Supplemental Coverage Option) insurance with your crop insurance agent by September 30th for your winter wheat crop. This does not/cannot take the place of your traditional crop insurance policy. Contact your crop insurance agent for details.

- The Trend Adjustment and Yield Exclusions options are available for some Wisconsin counties on Wheat. Talk to your crop insurance agent for more details.
- 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 2015 winter wheat claim is October 31st.
- The 2016 wheat price discovery on CBOT (using September ’15 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, 2015 – September 14, 2015
  - The Harvest Price tracks from August 1, 2016 – August 31, 2016
  - 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 4) (Marburger, D., S.P. Conley, P.D. Esker, J.G. Lauer, and J.M. Ané. 2015. Yield Response to Crop/Genotype Rotations and Fungicide Use to Manage Fusarium-Related Diseases. Crop Sci. 55:1-10. doi: 10.2135/cropsci2014.03.0201). 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 destroy any living volunteer wheat prior to planting to prevent a “green bridge” for the aphids that vector this virus.

### Interseeding cover crops into V5 corn

Daniel H. Smith and Mark Renz, Department of Agronomy
Matt Ruark and Francisco Arriaga, Department of Soil Science

Wisconsin growers are increasingly interested in utilizing cover crops. While cover crop establishment is relatively easy following corn silage, small grains, and processing vegetables, establishing cover crops successfully following corn or soybean has been more difficult. Aerial seeding or over-the-canopy seeding late in the growing season can be done with moderate success. An alternative approach is to interseed cover crops into a standing corn crop early in the growing season. This management practice requires special or at least modified equipment, but can improve cover crop establishment by drilling seed rather than broadcast. Ideally, the cover crop will establish prior to canopy closure, but then survive to the end of the growing season without creating too much competition for resources (nutrients and water) for the corn crop. Little experimentation has occurred in Wisconsin to evaluate cover crop growth when interseeded into standing corn and the impact of interseeding cover crops on corn grain yield.

### Wisconsin research trial

A research study was conducted during the 2014 growing season at the Arlington Agricultural Research Station. The field was planted with soybean in 2013 and chisel plowed post-harvest. Corn was planted in early June. Five cover crops treatments were planted into corn: (1) radish, (2) red clover, (3) winter rye, (4) oat/pea mixture (70% oats, 30% pea), and (5) no cover crop. Table 1 shows seeding depth and rates. Cover crops were drill seeded when corn was at the V5 growth stage (July 14) using a modified no-till grain drill (Fig. 1). The drill had four row units removed, leaving 6 row units to allow the drill to go through the crop rows and plant three rows of cover crops between each corn row (Fig. 2). The no-till disks and supporting hardware were also removed to prevent damage to the corn.

<table>
<thead>
<tr>
<th>Cover Crop</th>
<th>Seeding Rate (lb/ac)</th>
<th>Depth (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Rye</td>
<td>120</td>
<td>1</td>
</tr>
<tr>
<td>Red Clover</td>
<td>12</td>
<td>0.25</td>
</tr>
<tr>
<td>Radish</td>
<td>12</td>
<td>0.25</td>
</tr>
<tr>
<td>Oat/Pea Mix</td>
<td>90 / 10</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1. Cover crop seeding rate and seed depth placement.

![Figure 1. Modified grain drill to allow seeding into corn.](image1)

![Figure 2. Interseeding (drilling) of cover crops on July 14, 2014.](image2)
Preliminary results:

- All cover crops were successfully established. Within four weeks of seeding all cover crops had germinated, had consistent growth during the growing season, and had good vigor up until two weeks of grain harvest.
- The corn never showed any visible symptoms of stress and the cover crops did not significantly reduce corn yields.
- Radish had the most above ground biomass at harvest.
- Radish and oat/pea all winterkilled.
- Red clover did not survive the winter. The red clover looked very poor at the time of corn harvest; the late corn harvest stressed the red clover too much for it to survive the winter.
- All cover crops were completely buried by the corn residue after harvest, but winter rye still survived the winter.

Conclusions and Future Work

This research trial is being replicated in 2015 to evaluate the effect of interseeded cover crops on corn yield across multiple growing seasons. If no yield losses occur, future research will focus on evaluating the soil conservation, soil carbon building, and potential N credits obtained with interseeding these cover crops.

Vegetable Crop Update August 16, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 27th issue of the Vegetable Crop Update is now available which includes:

- early blight updates
- late blight DSV accumulations and updates (St. Croix Co. first report)
- downy mildew updates
- onion stempthylium
- spotted wing drosophila updates
- Langlade Co. Field Day agenda

Click here to view this update.

Vegetable Crop Update August 21, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 28th issue of the Vegetable Crop Update is now available which includes:

- early blight updates
late blight DSV accumulations and updates (first reports in La Crosse, Marathon, and Walworth Counties)
downy mildew updates (another report from Dane Co. on winter squash)

Click here to view this update.

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from August 8, 2015 through August 14, 2015.

### Plant/Sample Type, Disease/Disorder, Pathogen, County

#### Field Crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>Disease/Disorder</th>
<th>Pathogen</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>Anthracnose Stalk Rot</td>
<td><em>Colletotrichum graminicola</em></td>
<td>Grant</td>
</tr>
<tr>
<td>Corn</td>
<td>Eyespot</td>
<td><em>Kabatiella zeae</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Corn</td>
<td>Northern Corn Leaf Blight</td>
<td><em>Exserohilum turcicum</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Soybean</td>
<td>Downy Mildew</td>
<td><em>Peronospora manshurica</em></td>
<td>Sauk</td>
</tr>
<tr>
<td>Soybean</td>
<td>Root Rot</td>
<td><em>Fusarium sp.</em></td>
<td>Waupaca, Waukesha</td>
</tr>
<tr>
<td>Soybean</td>
<td>Sclerotinia Stem Rot</td>
<td><em>Sclerotinia sclerotiorum</em></td>
<td>Columbia</td>
</tr>
<tr>
<td>Soybean</td>
<td>Sudden Death Syndrome</td>
<td><em>Fusarium virguliforme</em></td>
<td>Dodge</td>
</tr>
<tr>
<td>Soybean</td>
<td>Target Spot</td>
<td><em>Corynespora cassicola</em></td>
<td>Waukesha</td>
</tr>
</tbody>
</table>

#### Fruit Crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>Disease/Disorder</th>
<th>Pathogen</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>Black Rot</td>
<td><em>Sphaeropsis sp.</em></td>
<td>Green</td>
</tr>
<tr>
<td>Apple</td>
<td>Fire Blight</td>
<td><em>Erwinia amylovora</em></td>
<td>Green</td>
</tr>
<tr>
<td>Apple</td>
<td>Root/Crown Rot</td>
<td><em>Phytophthora sp.</em>, <em>Pythium sp.</em></td>
<td>Sawyer</td>
</tr>
<tr>
<td>Apricot</td>
<td>Scab</td>
<td><em>Cladosporium sp.</em></td>
<td>Waukesha</td>
</tr>
<tr>
<td>Blueberry</td>
<td>Gloeosporium Leaf Spot</td>
<td><em>Gloeosporium sp.</em></td>
<td></td>
</tr>
</tbody>
</table>

#### Vegetables

<table>
<thead>
<tr>
<th>Crop</th>
<th>Disease/Disorder</th>
<th>Pathogen</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basil</td>
<td>Downy Mildew</td>
<td><em>Peronospora belbahrii</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Broccoli</td>
<td>Crown Gall</td>
<td><em>Agrobacterium tumefaciens</em></td>
<td>Kenosha</td>
</tr>
<tr>
<td>Cucumber</td>
<td>Anthracnose</td>
<td><em>Colletotrichum orbiculare</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Cucumber</td>
<td>Powdery Mildew</td>
<td><em>Oidium sp.</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Garlic</td>
<td>Fusarium Stem Rot</td>
<td><em>Fusarium oxysporum</em></td>
<td>Walworth</td>
</tr>
<tr>
<td>Onion</td>
<td>Fusarium Basal Rot</td>
<td><em>Fusarium oxysporum</em></td>
<td>Marquette</td>
</tr>
<tr>
<td>Potato</td>
<td>Late Blight</td>
<td><em>Phytophthora infestans</em></td>
<td>Polk</td>
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<tr>
<td>Tomato</td>
<td>Late Blight</td>
<td><em>Phytophthora infestans</em></td>
<td>Polk, St. Croix</td>
</tr>
<tr>
<td>Tomato</td>
<td>Septoria Leaf Spot</td>
<td><em>Septoria lycopersici</em></td>
<td>Rock, Kenosha</td>
</tr>
<tr>
<td>Tomato</td>
<td>Tobacco Mosaic</td>
<td><em>Tobacco Mosaic virus</em></td>
<td>Walworth</td>
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</table>

#### Specialty Crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>Disease/Disorder</th>
<th>Pathogen</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hop</td>
<td>Carlavirus</td>
<td><em>Unidentified carlavirus</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Hop</td>
<td>Downy Mildew</td>
<td><em>Pseudoperonospora humili</em></td>
<td>Dane</td>
</tr>
</tbody>
</table>

#### Soil

<table>
<thead>
<tr>
<th>Crop</th>
<th>Disease/Disorder</th>
<th>Pathogen</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>Aphanomyces Seedling Blight</td>
<td>Aphanomyces euteiches race 2, Houston (MN)</td>
<td></td>
</tr>
</tbody>
</table>

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)
**UW Madison/ Extension Plant Disease Diagnostic Clinic (PDDC) Update**

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from August 15, 2015 through August 21, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**
- Corn, Anthracnose Stalk Rot, *Colletotrichum graminicola*, Columbia
- Corn, Fusarium Stalk Rot, *Fusarium sp.*, Lafayette
- Corn, Goss' Wilt, *Clavibacter michiganensis subsp. nebraskensis*, Columbia
- Corn, Gray Leaf Spot, *Cercospora sp.*, Dane
- Corn, Northern Corn Leaf Blight, *Exserohilum turcicum*, Dane
- Soybean, Root Rot, *Pythium sp.*, *Fusarium sp.*, Dane, Marquette, Monroe
- Soybean, Stem Canker, *Phomopsis sp.*, Dodge

**Fruit Crops**
- Apple, Bitter Pit/Cork Spot, None, Polk
- Apple, Russeting, None, Polk
- Grape, Downy Mildew, *Plasmopara viticola*, Dane

**Vegetables**
- Potato, Cercospora Leaf Blotch, *Cercospora sp.*, Dane
- Potato, Early Blight, *Alternaria solani*, Dane
- Potato, Late Blight, *Phytophthora infestans*, La Crosse, Portage
- Sweet Corn, Antracnose Stalk Rot, *Colletotrichum graminicola*, Rock
- Sweet Corn, Gibberella Stalk Rot, *Fusarium graminearum*, Rock
- Tomato, Bacterial Speck, *Pseudomonas syringae pv. tomato*, Dunn

**Soil**
- Alfalfa Soil, Aphanomyces Seedling Blight, *Aphanomyces euteiches race 2*, Wood

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

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**Wisconsin Pest Bulletin 8-20-15**

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 18 of the Wisconsin Pest Bulletin is now available at:


**INSIDE THIS ISSUE**

**LOOKING AHEAD:** European corn borer treatment window closing

**FORAGES & GRAINS:** Alfalfa caterpillar butterflies common across southern and central WI

**CORN:** Corn rootworm beetle populations comparable to last year

**SOYBEAN:** Soybean aphid densities remain below-threshold in surveyed fields

**FRUITS:** Spotted wing drosophila confirmed in 15 counties to date

**VEGETABLES:** Tomato late blight found in St. Croix County

**NURSERY & FOREST:** Reports from this week’s nursery inspections

**DEGREE DAYS:** Growing degree day accumulations through August 19, 2015

**Follow us on**

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Brown Stem Rot in Soybean ........................................ 134
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Vegetable Crop Update August 28, 2015 .............. 134
Vegetable Crop Update with Organic Late Blight Control September 5, 2015 ............................. 135
UW Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update ................................. 135
UW Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update .................................... 136


Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison
Shawn Conley, Extension Soybean and Small Grains Specialist, Department of Agronomy, University of Wisconsin-Madison

Hot off the press is the new Wisconsin Soybean Marketing Board and Soy Checkoff sponsored publication “Wisconsin Best Management Practices Guide”. The publication covers everything from agronomy 101 to pest management and soil sampling, which is all tailored to Wisconsin soybean production. Look for a copy in your next Beyond the Bean Publication or download a PDF version by CLICKING HERE!

Soil Sampling Season Just Around the Corner

Fall is the ideal time of year to conduct routine soil sampling of your cropland. Not only are there typically more favorable weather conditions for soil sampling as compared to the spring season, but it will also give you the winter months to think about upcoming management decisions based on the soil analysis.

The University of Wisconsin Nutrient and Pest Management Program has a short how-to video on soil sampling basics. The video provides viewers a quick guide on how to prepare for soil sampling, how to soil sample, and how to fill out the soil sample submission sheet to take to the soil testing laboratory. The video ‘Basic Soil Sampling for Wisconsin Agriculture’ can be viewed from the Integrated Pest and Crop Management YouTube channel at https://
When sampling soils for testing and obtaining fertilizer and lime recommendations, it is important to obtain samples that accurately represent the field from which they were taken. Accurate soil sampling will ensure that the estimated amount of nutrients that should be applied to the field provide the greatest economic return to the farmer. They will also provide information on the variation that exists in the field and show how nutrients are distributed across the farm, as well as provide a basis for monitoring the change in farm fertility over time.

Also available from the University of Wisconsin Extension is publication A2100, ‘Sampling Soils for Testing’. This publication addresses various soil sampling strategies, sampling procedures, as well as other considerations when practicing no-till or various tillage systems. The publication A2100 can be downloaded for free at [http://learningstore.uwex.edu](http://learningstore.uwex.edu). The publication is available in the ‘Farming’ category, under ‘Soils’, and ‘Soil Fertility’. Contact your County Agriculture Extension Agent with questions.

Brown Stem Rot in Soybean

This short video from Damon Smith and UW-Madison IPM, shows how to tell BSR from SDS in soybean fields.

Brown Stem Rot in Soybean

Wisconsin Pest Bulletin 8-27-15

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Issue No. 19 of the Wisconsin Pest Bulletin is now available at:


PLEASE NOTE: This is the last regularly scheduled bulletin of 2015. A final summary issue will be published in November upon completion of the fall pest surveys. THANK YOU to the many cooperators, farmers, county agents and consultants who contributed their time and expertise to the survey program again this season. Best wishes for a safe and successful fall harvest.

INSIDE THIS ISSUE

LOOKING AHEAD: First significant corn earworm migration documented from Aug 20-26

FORAGES & GRAINS: Potato leafhopper counts remain below-threshold

CORN: Preliminary results of the annual corn rootworm beetle survey

SOYBEAN: Soybean aphid survey finds mostly low or moderate populations

FRUITS: Apple growers advised to lookout for brown marmorated stink bug this fall

VEGETABLES: Late blight confirmed in 12 Wisconsin counties to date

NURSERY & FOREST: Reports from this week’s nursery inspections

DEGREE DAYS: Growing degree day accumulations through August 26, 2015

Vegetable Crop Update August 28, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 29th issue of the Vegetable Crop Update is now available which includes the following topics:

- early blight and late blight forecasts
Vegetable Crop Update with Organic Late Blight Control September 5, 2015

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 30th issue of the Vegetable Crop Update is now available which includes the following topics:

- early blight and late blight forecasts
- late blight updates for tomato and potato
- downy mildew updates for cucurbits

Also Included is the organic late blight management document that includes symptom info as well as Frequently Asked Questions about late blight including how to destroy plants, safety of consumption, etc… This is appropriate for organic, small, and home garden producers. Click here to view this update.

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from August 22, 2015 through August 28, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field Crop</strong></td>
</tr>
<tr>
<td>Corn, Eyespot, Kabatiella zeae, Iowa, Rusk</td>
</tr>
<tr>
<td>Corn, Fusarium Root Rot, Fusarium oxysporum, Rusk, Jo Daviess</td>
</tr>
<tr>
<td>Corn, Gray Leaf Spot, Cercospora sp., Iowa</td>
</tr>
<tr>
<td>Corn, Northern Corn Leaf Blight, Exserohilum turcicum, Rusk</td>
</tr>
<tr>
<td>Corn, Purple Leaf Sheath, None, Rusk</td>
</tr>
<tr>
<td>Soybean, Bacterial Blight, Pseudomonas syringae pv. glycinea, Sauk</td>
</tr>
<tr>
<td>Soybean, Downy Mildew, Peronospora manshurica, Sauk</td>
</tr>
<tr>
<td>Soybean, Root Rot, Fusarium sp., Sauk</td>
</tr>
<tr>
<td>Soybean, Sclerotinia Stem Rot, Sclerotinia sclerotiorum, Dane</td>
</tr>
<tr>
<td>Soybean, Stem Canker, Phomopsis sp., Dane</td>
</tr>
<tr>
<td>Soybean, Sudden Death Syndrome, Fusarium virguliforme, Buffalo</td>
</tr>
<tr>
<td><strong>Fruit Crops</strong></td>
</tr>
<tr>
<td>Blueberry, Chlorosis, None, Milwaukee</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
</tr>
<tr>
<td>Celery, Cucumber Mosaic, Cucumber mosaic virus, Dane</td>
</tr>
<tr>
<td>Celery, Tobacco Mosaic, Tobacco mosaic virus, Dane</td>
</tr>
<tr>
<td>Potato, Bacterial Soft Rot, Miscellaneous soft rot bacteria, Portage</td>
</tr>
<tr>
<td>Potato, Verticillium Wilt, Pseudoperonospora cubensis, Dane</td>
</tr>
<tr>
<td>Squash (Winter), Powdery Mildew, Oidium sp., Dane</td>
</tr>
<tr>
<td>Squash (Winter), Downy Mildew, Pseudoperonospora cubensis, Dane</td>
</tr>
<tr>
<td>Tomato, Cucumber Mosaic, Cucumber mosaic virus, Outagamie</td>
</tr>
<tr>
<td>Tomato, Late Blight, Phytophthora infestans, Kenosha, Wood</td>
</tr>
<tr>
<td>Tomato, Septoria Leaf Spot, Septoria lycopersici, Dane</td>
</tr>
<tr>
<td>Tomato, Tobacco Mosaic, Tobacco mosaic virus, Outagamie</td>
</tr>
<tr>
<td><strong>Soil</strong></td>
</tr>
<tr>
<td>Alfalfa Soil, Aphanomyces Seedling Blight, Aphanomyces euteiches race 2, Wood</td>
</tr>
<tr>
<td>Soybean Soil, Soybean Cyst Nematode, Heterodera gly-</td>
</tr>
</tbody>
</table>
For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from August 29, 2015 through September 4, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field Crop</strong></td>
</tr>
<tr>
<td>Corn, Anthracnose Stalk Rot, <em>Colletotrichum graminicola</em>, Outagamie</td>
</tr>
<tr>
<td>Corn, Fusarium Root Rot, <em>Fusarium</em> <em>sp.</em>, Outagamie</td>
</tr>
<tr>
<td>Corn, Gray Leaf Spot, <em>Cercospora</em> <em>sp.</em>, Sheboygan</td>
</tr>
<tr>
<td>Corn, Pythium Root Rot, <em>Pythium</em> <em>sp.</em>, Outagamie</td>
</tr>
<tr>
<td>Soybean, Fusarium Root Rot, <em>Fusarium</em> <em>sp.</em>, Calumet, Outagamie</td>
</tr>
<tr>
<td>Soybean, Pythium Root Rot, <em>Pythium</em> <em>sp.</em>, Calumet</td>
</tr>
<tr>
<td>Soybean, Stem Canker, <em>Phomopsis</em> <em>sp.</em>, Calumet, Dane, Dodge, Outagamie, Sheboygan</td>
</tr>
<tr>
<td>Soybean, Sudden Death Syndrome, <em>Fusarium virguliforme</em>, Columbia</td>
</tr>
<tr>
<td><strong>Forage Crops</strong></td>
</tr>
<tr>
<td>Alfalfa, Spring Black Stem, <em>Phoma medicaginis</em>, Pepin</td>
</tr>
<tr>
<td>Alfalfa, Stemphylium Leaf Spot, <em>Stemphylium</em> <em>sp.</em>, Pepin</td>
</tr>
<tr>
<td>Alfalfa, Summer Black Spot, <em>Cercospora</em> <em>sp.</em>, Pepin</td>
</tr>
<tr>
<td>Forage Grasses (Miscellaneous), Anthracnose, <em>Colletotrichum</em> <em>sp.</em>, Dane</td>
</tr>
<tr>
<td>Forage Grasses (Miscellaneous), Rust, <em>Puccinia</em> <em>sp.</em>, Dane</td>
</tr>
<tr>
<td>Forage Grasses (Miscellaneous), Stagnospora Leaf Blotch, <em>Stagnospora</em> <em>sp.</em>, Dane</td>
</tr>
<tr>
<td><strong>Fruit Crops</strong></td>
</tr>
<tr>
<td>Apple, Apple Scab, <em>Venturia inaequalis</em>, Dane, Oneida</td>
</tr>
<tr>
<td>Apple, Black Rot, <em>Sphaeropsis</em> <em>sp.</em>, Dane</td>
</tr>
<tr>
<td>Cherry, Bacterial Canker, <em>Pseudomonas syringae</em>, Adams</td>
</tr>
<tr>
<td>Grape, Downy Mildew, <em>Plasmopara viticola</em>, Dane</td>
</tr>
<tr>
<td>Pear, Pear Scab, <em>Venturia pirina</em>, Oneida</td>
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<tr>
<td>Raspberry, Raspberry Leaf Spot, <em>Cylindrosporum rubi</em>, St. Croix</td>
</tr>
<tr>
<td>Strawberry, Common Leaf Spot, <em>Mycosphaerella fragariae</em>, Dane</td>
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<tr>
<td>Strawberry, Phomopsis Leaf Blight, <em>Phomopsis obscurans</em>, Dane</td>
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<tr>
<td>Strawberry, Root/Crown Rot, <em>Phytophthora</em> <em>sp.</em>, <em>Pythium</em> <em>sp.</em>, <em>Rhizoctonia</em> <em>sp.</em>, Vilas</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
</tr>
<tr>
<td>Basil, Downy Mildew, <em>Peronospora belbahrii</em>, Milwaukee</td>
</tr>
<tr>
<td>Carrot, Cercospora Leaf Blight, <em>Cercospora</em> <em>sp.</em>, Dane</td>
</tr>
<tr>
<td>Cucumber, Altemaria Leaf Blight, <em>Alternaria cucumerina</em>, Portage</td>
</tr>
<tr>
<td>Cucumber, Angular Leaf Blight, <em>Pseudomonas syringae pv. lachrymans</em>, Portage</td>
</tr>
<tr>
<td>Cucumber, Helminthosporium Leaf Spot, <em>Helminthosporium</em> <em>sp.</em>., Portage</td>
</tr>
<tr>
<td>Garlic, Clove Rot, <em>Fusarium</em> <em>sp.</em>, Barron</td>
</tr>
<tr>
<td>Garlic, Embellisia Skin Blotch, <em>Embellisia allii</em>, Waukesha</td>
</tr>
<tr>
<td>Melon, Powdery Mildew, <em>Oidium</em> <em>sp.</em>, Dane</td>
</tr>
<tr>
<td>Melon, Downy Mildew, <em>Pseudoperonospora cubensis</em>, Dane</td>
</tr>
<tr>
<td>Pepper, Bacterial Spot, <em>Xanthomonas</em> <em>sp.</em>, La Crosse</td>
</tr>
<tr>
<td>Pepper, Syringae Leaf Spot, <em>Pseudomonas syringae pv.</em>, La Crosse</td>
</tr>
<tr>
<td>Tomato, Black Mold, <em>Alternaria alternata</em>, Vernon</td>
</tr>
<tr>
<td>Tomato, Late Blight, <em>Phytophthora infestans</em>, Brown, Dodge, Portage, Wood</td>
</tr>
<tr>
<td>Tomato, Septoria Leaf Spot, <em>Septoria lycopersici</em>, Portage, Racine, Vernon, Washburn</td>
</tr>
<tr>
<td>Tomato, Sunscald, None, Portage</td>
</tr>
</tbody>
</table>
Soil

Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Grant, Jefferson, Marquette, Monroe, Richland, Rock

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

Joe Lauer, Wisconsin Corn Agronomist

The August and September USDA-NASS yield estimates indicate that Wisconsin corn farmers are on-track to produce a record yielding corn crop. We are starting to see lodging issues at Arlington as silage harvest begins. Some lodging is due to an earlier wind event occurring around V10 to V12 that flattened plants and caused them to ‘snake’ back up. However, high yields in and of themselves can cause lodging issues.

For a corn plant to remain healthy and free of stalk rot, the plant must produce enough carbohydrates by photosynthesis to keep root cells and pith cells in the stalk alive and enough to meet demands for grain fill. When corn is subjected to stress during grainfill, photosynthetic activity is reduced. As a result, the carbohydrate levels available for the developing ear are insufficient. The corn plant responds to this situation by removing carbohydrates from the leaves, stalk, and roots to the developing ear. While this “cannibalization” process ensures a supply of carbohydrates for the developing ear, the removal of carbohydrates results in premature death of pith cells in the stalk and root tissues, which predisposes plants to root and stalk infection by fungi. As plants near maturity, this removal of nutrients from the stalk to the developing grain results in a rapid deterioration of the lower portion of corn plants in drought stressed fields with lower leaves appearing to be nitrogen stressed, brown, and/or dead.

Other plant stresses which increase the likelihood of stalk rot problems include: loss of leaf tissue due to foliar diseases (such as gray leaf spot or northern corn leaf blight), insects, or hail; injury to the root system by insects or chemicals; high levels of nitrogen in relation to potassium; compacted or saturated soils restricting root growth; and high plant populations.

For some ideas on how to handle down corn, click here.

Further Reading

What Should You Know about Corn and Soybean Diseases as You Prepare for Harvest?

Damon L. Smith – Extension Field Crops Pathologist, University of Wisconsin

As the fall is approaching and crop harvest plans are being made, it is important to continue to assess disease issues in corn and soybean. These assessments aren’t being made in order to make plans for in-field management, but to improve the quality of grain that is harvested and allow for some educated decision-making for 2016.

Some Diseases to Consider in Corn at Harvest

Now is the best time to begin scouting corn for stalk rot issues and also fungal ear rot potential. Diseases such as Anthracnose stalk rot and Gibberella stalk rot are becoming apparent in corn. Inspect the stalks integrity on the outside. Be sure to squeeze the outside of the stalk to gauge the potential severity of the rot on the inside of the stalk. Cut a few stalks from diverse areas of the field to see how rotted stalks might be. In figure 1, the stalk on the left has a severe case of Gibberella stalk rot, while the stalk on the right is far less rotted. Fields that had high levels of norther corn leaf blight (NCLB) this season, are going to be more prone to stalk rot due to the added stress of the foliar disease. The more severely rotted stalks are, the more likely they will lodge. Therefore timely harvest is important. Growers should target harvesting of fields with severe stalk rot before fields that have less stalk rot, in order to minimize harvest losses due to lodging.

Ear rots can also be an issue at harvest time. Fusarium ear rot, Gibberella ear rot, and Diplodia ear rot (Fig. 2) are just a few that can damage corn in Wisconsin. It will be critical to check fields in the next several weeks in order to make decisions on what fields to harvest first. Harvest priority should be placed on fields with a high level of ear rot. As corn stands late into the fall, certain ear rot fungi can continue to grow, damage ears, and cause increases in mycotoxins in grain. The quicker these fields dry and can be harvested, the more likely the losses due to ear rot and mycotoxin accumulation can be minimized.

Soybean White Mold Management at Harvest

In Wisconsin, the main disease to consider when making harvest plans in soybean is white mold. White mold is present in some soybean fields in the state and has caused considerable damage in a few of those fields. Remember that the white mold fungus not only causes stem blight and damage, but also causes the formation of sclerotia (fungal survival structures that look like rat droppings) on and in soybean stems (Fig. 3). These sclerotia serve as the primary source of fungal inoculum for the next soybean crop. They also get caught in combines during harvest. These sclerotia can then be spread in combines to other fields that might not be infested with the white mold fungus. Therefore, it is important to harvest non-infested soybean fields first, followed by white mold-infested fields, to be sure the combine does not deposit any residual sclerotia in the non-infested fields. If this is not an option and you must...
harvest white mold infested fields before non-infested fields, be sure to clean the combine thoroughly between fields.

For more information about white mold management in soybean you can click here and scroll down to “white mold” or watch a video by clicking here.

Identify Corn and Soybean Diseases Now to Make Decisions for 2016

While most of the focus during this time of season is on equipment and calibrating yield monitors, it is important to get an accurate diagnosis on any soybean and corn diseases you are seeing now. This information will help this winter as you review variety and hybrid trials and make decisions about what you are going to plant in 2016. Have knowledge of the primary disease issues in your fields. This will allow you to choose varieties and hybrids with the best disease resistance package to combat those diseases. Finally, now is a great time to sample for soybean cyst nematode (SCN). For more information on sampling for SCN in Wisconsin, CLICK HERE.

Beautiful Weather for Drying Corn

Joe Lauer, Wisconsin Corn Agronomist

The recent high pressure ridge that has settled over Wisconsin has meant millions of dollars to farmers in reduced drying costs. The favorable weather of sunny, warm days with little rain has allowed the 2015 corn crop to dry faster than normal. Last week farmers in northern Wisconsin had corn below 25% moisture.

There is a trade-off though. With high fuel prices and/or low grain prices, it is important to let corn grain dry in the field as much as possible, yet hold harvest losses at a reasonable level. Most corn hybrids mature when the grain has about 30% moisture. Ideally harvest should begin around 25% kernel moisture and be complete by the time grain reaches 20%. Corn ears that are too dry can break from the plant and drop to the ground. Also, kernels can shatter off the ear as they are stripped from the plant by the combine head.

Kernel Moisture Ranges (%) for Harvesting Corn for Various Uses

33-40% Kernel moisture = Silage harvest
29-32% Kernel moisture = High Moisture Corn (ensiled)
25-26% Kernel moisture = Ideal for combining
20-23% Kernel moisture = Ideal for picking
< 20% Kernel moisture = field losses increase, but cost of drying shell corn is reduced

Once the kernel is mature (black layered) the drydown of corn grain is a simple drying process subject to weather conditions and most consistently associated with degree-days (Hallauer and Russell, 1961). Factors that have been shown to speed the rate of drying include premature death (Troyer and Ambrose, 1971), physical structure of the seed coat or pericarp (Purdy and Crane, 1967), a low number off loose, short husks (Troyer and Ambrose, 1971), and ear angle and date of husk death (Cavalieri and Smith, 1985). Factors not associated with faster drydown were husk and shank characteristics and the shape or size of ears (Crane et al., 1959)

This year it will be even more important because of high yields and the potential for lodging, especially for growers with a long harvest season due to acreage demands. In years past, European corn borer caused increased lodging and ear drop. All are reasons to pay attention to corn harvesting. As harvest is delayed from October to December, losses can increase 5 to 18%. Of course there is always a risk of 100% loss due to a storm or some other bad weather event.
Harvest decisions are affected by the kind of drying and storage facilities available and depends upon the use of the grain. Grain stored for a long period of time (> 1 year) must be dried to less than 14% which is not likely in a field situation, so some artificial drying must occur. Corn stored above 15% moisture is subject to heating from the natural respiration of the grain and molds present. As temperatures rise so does humidity which causes molds, insects and bacteria to grow and decreasing the amount of time that the grain can be stored before it goes out of condition. Regardless of the moisture in stored grain, aeration is needed to control moisture migration.

**Further Reading**

Wisconsin Corn Agronomy – Grain Harvesting


**Literature Cited**


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**High Moisture Corn and By-Products**

Joe Lauer, Wisconsin Corn Agronomist

As we move into the 2015 harvest season, many growers harvest high moisture corn for feed. The following is a summary of a publication on High Moisture Grain and Grain By-Products,

High moisture corn is, as the name implies, corn harvested before the kernels dry down, usually processed by a roller mill or hammer mill, packed into an appropriate structure and allowed to ferment. High moisture ear corn is similar to high moisture corn but it includes some portion of the cob. Snaplage includes the grain, cob, and shuck (husk leaves and shank).

Preservation of high moisture grains and grain by-products is a common practice for feeding livestock in most temperate regions of the world. High moisture storage of grain has been driven by the savings of not having to dry grain at harvest. The moisture content of most high moisture grain is within the range of 20 to 35%, and the storage time required is usually no more than the time interval between harvests, or up to 12 months. For grain by-products, where the moisture content is much greater, the pressure for high moisture storage is also driven by cost savings. However, storage of by-products is usually for short periods of time only.

As with forages, the anaerobic fermentation during ensiling of these products is based primarily on lactic acid, but amounts produced are variable both between batches of ensiled high moisture grain and even during the storage of any given batch. Not surprisingly, ethanol is found in ensiled grain. Differences in pattern of acid and ethanol production in grain may be attributed to moisture content and form of the grain. Ensiled high moisture grains and grain by-products are prone to considerable aerobic deterioration with post-storage exposure to air. Of the potential additives to facilitate storage, propionic acid is the most successful, although it is used only when the material stands a risk of significant exposure to air during storage. Results from inoculation of high moisture grains and by-products with bacteria are inconclusive, but recent studies with bacteria producing propionic acid show promise. Recovery of dry matter and nutrients after ensiling grain and by-products is usually more than 90% and for grains is usually optimized by storing the grain in sealed structures and at a moisture content between 25 and 30%.

High moisture grains usually contain the same amount of available energy for pigs and ruminants as the corresponding dry grain. In a recent comprehensive review of...
feeding grains to beef cattle, it was found that high moisture corn and sorghum were not as efficiently utilized as the corresponding steam rolled dry grain. For lactating dairy cows, however, high moisture grain is used as efficiently, if not more efficiently, than the corresponding dry grain. High moisture storage of grains and by-products does not usually affect food intake.

For Further Reading:


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**Soybean Yield Contest**

Shawn Conley, WI State Soybean and Wheat Extension Specialist

There are some record soybean yields sitting out in the fields this year. Don't forget you have until October 15th to enter the WI Soybean Marketing Board and WI Soybean Association 2015 WI Soybean Yield Contest. Below please find direct links to the yield contest brochure, rules, and entry forms. Also please note a few minor changes to the rules.

- [2015 Wisconsin Soybean Yield Contest Brochure](#)
- [2015 Wisconsin Soybean Yield Contest Rules](#)
- [2015 Wisconsin Soybean Yield Contest Entry Form](#)

2015 WI Soybean Yield Contest rule changes:

1. The minimum field acreage has been reduced to 5 acres.
2. The entry date has been extended until October 15.
3. Division county borders have changed based on 10 year rolling yield averages. Please check map in brochure.

Please visit [http://www.coolbean.info](http://www.coolbean.info) or click to view the [2015 WI Soybean Yield Contest rules](#) and entry form.

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from September 26, 2015 through October 2, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**

- Corn, Anthracnose, *Colletotrichum graminicola*, Buffalo
- Corn, Gray Leaf Spot, *Cercospora sp.*, Buffalo
- Corn, Northern Corn Leaf Blight, *Exserohilum turcicum*, Buffalo
- Soybean, Charcoal Rot, *Macrophomina phaseolina*, McHenry (IL)
- Soybean, Sudden Death Syndrome, *Fusarium virguliforme*, McHenry (IL)

**Fruit Crops**

- Apple, Flyspeck/ Sooty Blotch, *Flysepck/Sooty blotch fungal complex*, Dane
- Apple, Frogeye Leaf Spot, *Botryosphaeria obtusa*, Dane
- Apple, Fruit Russet, None, Dane
- Apple, Phoma Leaf Spot, *Phoma sp.*, Dane
- Apple, Phomopsis Leaf Spot, *Phomopsis sp.*, Dane
- Raspberry, Root/Crown Rot, *Phytophthora sp.*, Dane

**Specialty Crops**

- Mint, Root Rot, Rhizoctonia sp., *Fusarium sp.*, Rock

**Vegetables**

- Basil, Root Rot, *Fusarium sp.*, Sauk
- Corn (Sweet), Maize White Spot Disease, *Pantoea ananatis*, Waushara
- Cucumber, Downy Mildew, *Pseudoperonospora cubensis*, Dane
- Kale, Alternaria Leaf Spot, *Alternaria sp.*, Fillmore (MN)
Kale, Black Rot, *Xanthomonas sp.*, Fillmore (MN)

Potato, Pink Eye, *Pseudomonas fluorescens*, Oneida

Squash, Powdery Mildew, *Oidium sp.*, Rock

Squash, Downy Mildew, *Pseudoperonospora cubensis*, Rock

Tomato, Late Blight, *Phytophthora infestans*, Washington, Waukesha

Tomato, Septoria Leaf Spot, *Septoria lycopersici*, Marathon

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

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**2015 UW Extension Pest Management Update Meeting Series**

Damon Smith, Extension Plant Pathology Specialist

Mark your calendars as the UW Extension’s Pest Management Update meetings are just around the corner (November 9-19). This year’s program will follow the new format established in the 2014 series, with more interaction between presenters and the audience, and participation by Bryan Jensen and Dan Heider with the University of Wisconsin Integrated Pest and Crop Management Program.

We will focus the entire morning (10-noon) on integrated pest management updates by crop (corn, soybean, alfalfa, and small grains). This session will be streamlined to focus on new pesticide registrations, pest updates, and highlight important issues from 2015. After lunch, topics will be more focused on specific updates and diagnostic training. These topics will include:

- Herbicide resistance update and identification
- Managing corn rootworms
- Soybean stem disease identification

These diagnostic and focused trainings were a big hit in 2014 so don’t miss out in 2015!

The full schedule with dates, meeting locations, topics and registration contact information are highlighted below. **Please register with the host agent at least 1 week prior to the meeting at the location you wish to attend.**

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**Note that due to low turnout in past years, the Arlington location has been dropped from the rotation in 2015.** There will only be 7 locations to attend the update meetings, rather than 8 locations as in previous years. Be sure to look at the 2015 schedule included with this article when selecting your preferred date and location.

Please attend the meeting location at which you registered. Each meeting in the series is a separate county-based event and host agents cannot interchange registrant fees or meal counts.

Four hours of CCA CEU pest management credits are requested and available at each location.

The speakers will be extension specialists Mark Renz, weed scientist, perennial cropping systems; Dan Heider, IPM outreach specialist, Bryan Jensen, entomologist, and Damon Smith, field crop plant pathologist.

2015 Pest Management Update Topics:

Integrated Pest Management Updates in corn, soybeans, alfalfa, and small grains: Update on new products and/or use of existing products as well as brief highlights of the 2015 pest situations in each crop.

Herbicide resistance update and identification: Dan Heider and Mark Renz discuss the herbicide resistant weed situation in Wisconsin and how to identify problematic situations.

Managing corn rootworms: Bryan Jensen will take you through identifying corn rootworm problems and how to manage them in field corn.

Soybean stem disease identification: Damon Smith will discuss the 2015 soybean stem disease situation in Wisconsin. He will offer tips on how to identify and manage the various stem diseases that cause problems in Wisconsin.

[Check out the full meeting schedule click here.]

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**2016 Wisconsin CCA of the Year**

Bryan Jensen UW Extension

The Wisconsin CCA Board is now accepting nominations for the 2016 Wisconsin CCA of the Year Award. This award is designed to recognize a CCA who is highly innovative, delivers exceptional customer service, has shown that they are a leader in their field, and have
contributed to the exchange of ideas and the transfer of agronomic knowledge to the Wisconsin agriculture industry.

Customers, employees, colleagues or others associates may nominate a candidate. The selection committee is comprised of current WI CCA Board and nominees will be evaluated solely on the information provided in the nomination form and accompanying letters of recommendation.

To be considered, the [2016 Nomination Form](#) must be completed and 3 letters of reference provided. [Nomination Criteria](#) will help with the nomination process.

Deadline for submission is March 4, 2016. The 2016 recipient will receive a commemorative plaque and $500 cash award at the January 2017 CCA Luncheon. Contact Bryan Jensen (bmjense1@wisc.edu, 608-263-4073) if you have questions.
Interseeding cover crops into corn in Wisconsin: Can it work?

Matt Ruark, Associate Professor, Dept. of Soil Science, Dan Smith, Graduate Student, Dept. of Agronomy

The short answer is yes. Recent research at the Arlington Agricultural Research Station has demonstrated that interseeding rye, red clover, or radish into V5 corn led to successful stand establishment of the cover crop with no detrimental effects on yield. Details about the practice of interseeding and preliminary results are presented in a short University of Wisconsin-Extension YouTube video by Matt Ruark and Dan Smith (http://go.wisc.edu/x93818)

Now – will this practice work everywhere and all the time? This remains to be seen. But there is a lot to be optimistic about in-terms of cover crop establishment, which of course is the first step in obtaining the benefits in erosion reduction, nitrogen retention, and carbon building offered by the cover crops.

Click the video below to watch.
CCA Exam Preparation

Bryan Jensen
UW Extension

The registration period is now open for the February 5, 2016 CCA exam(s). The first step, other than registering for the exam, would be to review the International and/or Wisconsin Performance Objectives. Performance Objectives outline all the potential subject matter areas that could be on an exam. Performance objectives are located on the CCA website under the Exam tab. You can also find information about an online international exam preparation course that starts Monday, October 19.

If you are interested in taking the WI CCA exam, UW Extension has developed several resources that will help with preparation. To view these resources, navigate to the Integrated Pest and Crop Management Website. Electronic publications that focus on nutrient, pest and crop management are located under the Publications tab. Additionally, over 70 YouTube instructional videos are available by clicking on the Video tab. Included under the “Crop Consultant Training Videos” playlist are over 50 videos created specifically for the Wisconsin CCA exam.

Click on the video below to start watching.

Additional resources are available at these websites.

Wisconsin Corn Agronomy
http://corn.agronomy.wisc.edu/

Wisconsin Soybean Agronomy
http://www.coolbean.info

University of Wisconsin Extension, Soil Science
http://www.soils.wisc.edu/extension/

University of Wisconsin Forage Research and Extension
http://www.uwex.edu/ces/forage/

University of Wisconsin Field Crop Plant Pathology
http://fyi.uwex.edu/fieldcroppathology/

University of Wisconsin Weed Science
http://wcws.cals.wisc.edu/

UW Vegetable Pathology
http://www.plantpath.wisc.edu/wivegdis/

University of Wisconsin Vegetable Crop Entomology
http://www.entomology.wisc.edu/vegento/

University of Wisconsin Extension, Team Forage
http://www.uwex.edu/ces/crops/teamforage/index.html

University of Wisconsin Extension, Nutrient Management Team
http://www.uwex.edu/ces/ag/teams/nutrient/

Wisconsin Pesticide Applicator Training Program
http://ipcm.wisc.edu/pat/

University of Wisconsin Integrated Crop and Pest Management Programs
http://ipcm.wisc.edu/

Wisconsin Crop Manager
http://ipcm.wisc.edu/wcm/

Wisconsin Pest Bulletin
http://datcpservices.wisconsin.gov/pb/index.jsp

2015 Soil, Water, & Nutrient Management Meetings scheduled

CONTACT: Francisco Arriaga, farriaga@wisc.edu, 608-263-3913

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 December 1 through December 10. 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: Importance of K for crop production in Wisconsin; Wheat N management research update; Starter fertilizer and high yield management impacts on corn production; Wisconsin soil nutrient testing level trends and summary from 2010 to 2014; Nitrogen credits from green manures; Grass covers after corn tillage; Cover crops in soybean production systems; Tillage,
soil organic matter, and nutrient stratification; Soil and tillage management medley; Nutrient management update: Farm-land preservation and SnapPlus15

Speakers include Wis. DATCP staff and Matt Ruark, Robert Florence, Francisco Arriaga, and Carrie Laboski from UW-Madison Department of Soil Science.

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. A $40.00 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 2015 Soil, Water, & Nutrient Management Meetings is:

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Contact Person(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues., Dec. 1</td>
<td>Fitchburg</td>
<td>Heidi Johnson, dane.uwex.edu</td>
</tr>
<tr>
<td>Wed., Dec. 2</td>
<td>Eau Claire</td>
<td>Mark Hagedorn, 715-839-4712</td>
</tr>
<tr>
<td>Thurs., Dec. 3</td>
<td>Sparta</td>
<td>Bill Halfman, 608-269-8722</td>
</tr>
<tr>
<td>Fri., Dec. 4</td>
<td>Marshfield</td>
<td>Ken Cleveland, 608-339-4237</td>
</tr>
<tr>
<td>Mon., Dec. 7</td>
<td>Juneau</td>
<td>Deb Struve, 920-386-3790</td>
</tr>
<tr>
<td>Tues., Dec. 8</td>
<td>Kiel</td>
<td>Mike Ballweg, 920-459-5904</td>
</tr>
<tr>
<td>Wed., Dec. 9</td>
<td>Cecil</td>
<td>Jamie Patton, 715-526-6136</td>
</tr>
<tr>
<td>Thurs., Dec. 10</td>
<td>Dodgeville</td>
<td>Gene Schriever, 608-930-9850</td>
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Click here for the meeting tri-fold.

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Damon Smith, Extension Plant Pathology Specialist

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Click here to check out the full meeting schedule.

Discovery Farms Conference December 15

On December 15, 2015 in Wisconsin Dells, Discovery Farms will continue the tradition of offering feasible farm management strategies that benefit both the farm and water quality. The 4th Annual UW Discovery Farms Conference offers something for every farmer and farm advisor: practical water quality information and implementable management solutions that are farmer-tested and environment approved.

The 2015 conference titled, Farmer-tested, environment approved: Develop a winning cropping strategy, will feature two farmer panels and talks related to solving water quality challenges and addressing areas vulnerable to losses. Farmer panelists will share their experiences with manure incorporation equipment and assessing nitrogen use efficiency. Experts from Minnesota, Pennsylvania and Wisconsin will offer insight into regulations, technology, and resources available for farmers. There will be ample opportunity to engage with experts and farmer panelists. No matter the crop type or management system, this conference offers something for every farmer, as is evident by the support it receives from 10 of the major agricultural groups in the state.

The conference will be held on December 15th from 9:00 a.m. to 3:30 p.m. at the Glacier Canyon Conference Center in Wisconsin Dells. Registration is $40 dollars for members of sponsoring organizations, $50 for non-members, and includes a noon meal. CEUs will be available. Registration will open November 1st. To view the agenda visit www.uwdiscoveryfarms.org. For more information email callie.herron@ces.uwex.edu or call 715.983.5668.

2016 IPM Field Scout Training Class

Bryan Jensen, UW Extension and IPM Program

The Madison Field Scout Training Classes will be held on the UW Madison Campus from January 4-8, 2016 (Friday, January 8th is an exam date and non-students are not required to attend that day). The course is designed to provide the skills necessary for proper pest identification, crop scouting techniques as well as provide complimentary baseline information for people preparing for the state CCA exam. Additional information such as crop growth and development, pest life cycle, pest damage symptoms and economic thresholds will be covered. Pest control recommendations, although discussed, will not be highlighted in detail during this course. Crops covered will include, corn, alfalfa, soybean and wheat. Click here for the course syllabus.

Non-student registration fee is $225/person. To register for the IPM Scout School, make checks payable to University of Wisconsin-Madison and send to Bryan Jensen, Dept. of Entomology, 1630 Linden Dr., Madison, WI 53706. Online registration can be made at: https://patstore.wisc.edu/ipm/register.aspx

Here is a PDF of the class schedule.

Recap of Corn Agronomy blog during October

Joe Lauer, Wisconsin Corn Agronomist

Here are the most recent corn articles.

Temporary Corn Grain Storage Tips

October 23: Due to high yields in some areas of Wisconsin, farmers are searching for temporary grain storage options this year. Picking sites that are elevated and have good drainage is the key to storing grain on the ground. The risk of crop loss is higher when grain is stored on the…

What Can We Learn From the 2015 Season?

October 12: The 2015 growing season is rapidly coming to a close. A killing frost has not occurred yet, but it is only a matter of time. Weather during 2015 has been similar to the 30-yr normal (click here and select year under “Weather Graphs” on left side). So 2015 will…
Corn Harvesting Losses

October 5: Grain has been drying exceptionally well during 2015, so many growers will be in the thick of grain harvest this week. All your hard work during the growing season can quickly be lost if your combine is not set correctly during harvest season. Taking some time to thoroughly read...

November 2015 Corn and Soybean Market Outlook

Brenda Boetel – Department of Agricultural Economics, University of Wisconsin-River Falls
715-425-3176

Corn

Corn has traded lower this last week in anticipation of the USDA WASDE report. The report was even more bearish than most analysts expected. USDA increased the average yield per harvested acre from 168 to 169.3. Harvested acres remained the same. Production increased to 13.654 billion bushels, up 0.7% from last month’s estimates. In addition to supply changes, the USDA increased the estimated usage for feed and residual 0.5%, but reduced ethanol usage by 1.4% and exports by 2.7%. Carryover increased then by 199 Million bushels, 12.7%, giving a stocks to use ratio of 12.9%.

The weekly progress report showed corn harvest 93% complete vs. 88% on average. Basis remains strong in parts of Wisconsin, but some areas have experienced significant variability. Ethanol margins are finding some support from the firmer energy trade and ethanol production increased last week. While Brazilian corn exports of 5.55 million tonnes were a record in October.

On the December chart support is at the $3.57 contract low. Upside resistance is at the $3.77 20-day moving average. The seasonal trend is for corn prices to continue lower throughout November, and then increase into April 2016. As a producer if you have unpriced corn in storage you will want to monitor basis levels. The stronger than expected basis will provide some pricing opportunities. Remember that storage should be a basis decision, not a price decision, as the market trend is for prices to increase throughout the spring. If basis is strong and you want to take advantage price increases throughout the spring, store on paper. Producers can do this by marketing their corn and buying back March futures to take advantage of the currently weak spread between December and March. Another option would be to consider selling call options. This will limit upside potential, but will provide revenue to add to crop sales later.

Soybean

Soybeans have also traded lower the last few weeks. The USDA WASDE increased the average yield per harvested acre from 47.2 to 48.3 bushels. Harvested acres remained the same. Production increased to 3.981 billion bushels, up 2.3% from last month’s estimates. Analysts anticipated a 0.6%. USDA increased the estimated crushings at 1.890 billion bushels, up 0.5%, and exports at 1.715 billion bushels, up 2.4%. Carryover increased by 465 million bushels, up 1.4%.

The weekly progress report showed harvest 95% complete vs. 93% on average. On the January chart support is down at the $8.57 contract low which we came within a penny of this yesterday. First resistance is at the 10-day at $8.75 then the 20-day at $8.87. The seasonal trend is for price to increase from now into May 2016, but there is very limited long-term upside potential for soybeans based on current supply and demand factors. Remember that when a market has no new news it tends to move lower. It will take significant bullish news to move soybean prices higher. Likely producers have very little unpriced soybeans in storage. If you are storing unpriced beans, look for short-term pricing opportunities.

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from October 3, 2015 through October 9, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**

Corn, Eyespot, *Kabatiella zeae*, Grant

Corn, Gray Leaf Spot, *Cercospora sp.*, Grant

Corn, Northern Corn Leaf Blight, *Exserohilum turcicum*, Grant
Oats, Crown Rust, *Puccinia coronata*, Dane

Soybean, Antracnose, *Colletotrichum sp.*, Washington, McHenry (IL)

Soybean, Brown Stem Rot, *Phialophora gregata*, Washington

Soybean, Cercospora Leaf Spot, *Cercospora kunkelii*, Marquette

Soybean, Charcoal Rot, *Macrophomina phaseolina*, Dane, Washington, McHenry (IL)

Soybean, Downy Mildew, *Peronospora manshurica*, Marquette

Soybean, Pod and Stem Blight, *Diaporthe phaseolorum*, McHenry (IL)

Soybean, Powdery Mildew, *Oidium sp.*, Marquette

Soybean, Root Rot, *Fusarium oxysporum*, *Pythium sp.*, McHenry (IL)

Soybean, Stem Canker, *Diaporthe phaseolorum*, Dane

**Fruit Crops**

Blueberry, Root/Crown Rot, *Pythium sp.*, Eau Claire

**Specialty Crops**

Ginseng, Phytophthora Root Rot, *Phytophthora sp.*, Sauk

Hop, Carlavirus, *Unidentified carlavirus*, Dane

Hop, Downy Mildew, *Pseudoperonospora humili*, Dane

**Vegetables**

Bean (Kidney), Root Rot, *Aphanomyces sp.*, *Pythium sp.*, *Fusarium sp.*, *Rhizoctonia sp.*, Dunn

Bean (Pinto), Rust, *Uromyces appendiculatus*, Dane

Cabbage, Black Rot, *Xanthomonas sp.*, Outagamie

Potato, Late Blight, *Phytophthora infestans*, Adams

Tomato, Late Blight, *Phytophthora infestans*, Sheboygan

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from October 10, 2015 through October 16, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**

Soybean, Charcoal Rot, *Macrophomina phaseolina*, Buffalo

Soybean, Root Rot, *Fusarium oxysporum*, Buffalo

**Fruit Crops**

Cherry, Cherry Leaf Spot, *Phloeospora padi*, Walworth

**Vegetables**

Eggplant, Septoria Leaf Spot, *Septoria sp.*, Sheboygan

Tomato, Late Blight, *Phytophthora infestans*, Portage, Sheboygan

**Soil**

Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Buffalo, Iowa

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from October 17, 2015 through October 23, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**

**Fruit Crops**

Cherry, Cherry Leaf Spot, *Phloeospora padi*, Walworth

**Vegetables**

Eggplant, Septoria Leaf Spot, *Septoria sp.*, Sheboygan

Tomato, Late Blight, *Phytophthora infestans*, Portage, Sheboygan

**Soil**

Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Buffalo, Iowa

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)
Field Crops
Corn, Anthracnose Stalk Rot, *Colletotrichum graminicola*, Lafayette
Corn, Gibberella Stalk Rot, *Gibberella zeae*, Lafayette
Soybean, Root Rot, Rhizoctonia sp., *Pythium sp.*, *Fusarium sp.*, Monroe

Forage Crops
Alfalfa, Crown Rot, *Fusarium sp.*, Columbia

Fruit Crops
Apple, Cedar-Apple Rust, *Gymnosporangium sp.*, Portage
Apple, Root/Crown Rot, *Pythium sp.*, Fond du Lac
Plum, Anthracnose, *Gloeosporium sp.*, Portage
Plum, Bacterial Canker, *Pseudomonas syringae*, Portage

Vegetables
Tomato, Late Blight, *Phytophthora infestans*, Waukesha
Tomato, Septoria Leaf Spot, *Septoria lycopersici*, Jefferson, Juneau

Soil
Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Dane, Green, Rock

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from October 31, 2015 through November 5, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Vegetables**
Tomato, Late Blight, *Phytophthora infestans*, Dodge

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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

Brian Hudelson, Sean Toporek, Catherine Wendt, Claire Wisniewski, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from October 24, 2015 through October 30, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Field Crops**
Soybean, Anthracnose, *Colletotrichum sp.*, Walworth

Soybean, Charcoal Rot, *Macrophomina phaseolina*, Walworth
Soybean, Root Rot, *Phytophthora sp.*, *Fusarium sp.*, Walworth
Soybean, Sclerotinia Stem Rot, *Sclerotina sclerotiorum*, Walworth
Soybean, Stem Canker, *Diaporthe phaseolorum*, Walworth

**Fruit Crops**
Cherry, Cherry Leaf Spot, *Phloeospora padi*, Walworth

**Vegetables**
Tomato, Late Blight, *Phytophthora infestans*, Milwaukee

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)
The following diseases/disorders have been identified at the PDDC from November 7, 2015 through November 13, 2015.

**Plant/Sample Type, Disease/Disorder, Pathogen, County**

**Vegetables**

Carrot, Bacterial Soft Rot, *Pectobacterium carotovorum*, Dane

Carrot, Cavity Spot, *Pythium sp.*, Dane

Carrot, Cottony Rot/White Mold, *Sclerotia sclerotiorum*, Dane

Carrot, Crown Rot, *Rhizoctonia sp.*, Dane, Waushara

Carrot, Fusarium Dry Rot, *Fusarium sp.*, Dane

Crucifers (Miscellaneous), Black Rot, *Xanthomonas campesstris*, Iowa

Rutabaga, Crown Gall, *Agrobacterium tumefaciens*, Winneshiek (IA)

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu)

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**Vegetable Crop Update October 9, 2015**

Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 31st issue of the Vegetable Crop Update is now available. This issue includes late blight updates and potato pink eye. [Click here to view this update.](http://pddc.wisc.edu)

Shawn Conley (@badgerbean)

The 2016 @WISoybean @WICornpro Corn Soy Expo Program and Registration just went live! Register today at [cornsoyexpo.org](http://cornsoyexpo.org)