Wisconsin Crop Manager

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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 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:

http://www.coolbean.info/library/documents/Soybean_VR_2015_FINAL_web.pdf

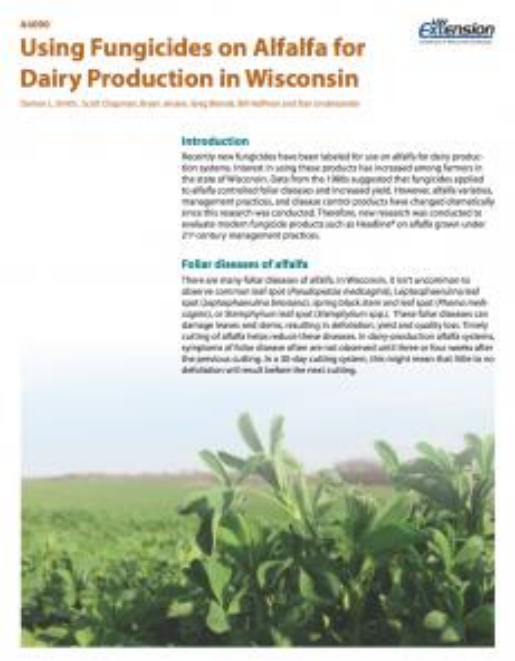
## Vegetable Crop Update 5-1-15

The 6th 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.ed/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.

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/ws-50-w.pdf . More cover crop resources, on an array of topics, are available at Cooperative Extension's cover crop website, http://fyi.uwex.edu/covercrop .

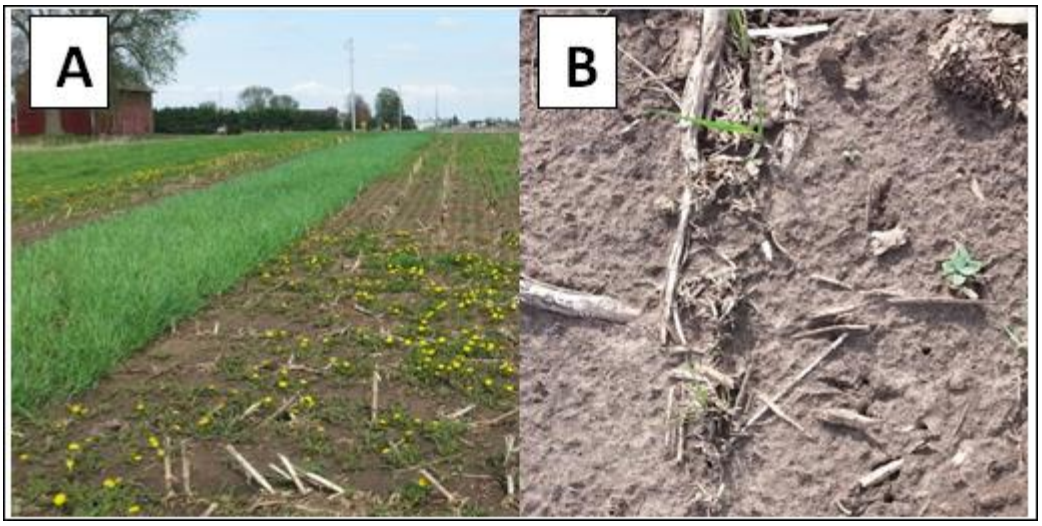



Figure 3. A) Cereal (winter rye), S. cereale, on the left, and annual ryegrass, Lolium multiflorum, on the right, showing partial winterkill especially in the foreground. B) Annual ryegrass with partial winterkill.

## 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.

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.

## Wisconsin Pest Bulletin 4-30-15

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. 2 of the Wisconsin Pest Bulletin is now available at:

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

https://datcpservices.wisconsin.gov/pb/pdf/04-30-15.pdf

## 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 no 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 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.

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 cant 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!

## Follow us on

# *Managing Nutrients on Wisconsin Soils*

# Online Video Workshop - 2015

### Program Information

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### Registration Information

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### Course Materials

After registering, participants will be sent a confirmation email with instructions for viewing the online presentations and a list of supplemental resources. Please note: **You must be able to access YouTube in order to view these presentations!** All videos will be available for registered participants to view until July 31st, 2015. Basic principles of soil fertility will not be covered in these webinars, but will be part of the supplemental materials. Participants may wish to purchase or download (for free) UWEX publications A2809 *Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin and A3588 Management of Wisconsin Soils* from the Learning Store at: http://learningstore.uwex.edu.

### CCA CEUs

An application has been made for Certified Crop Advisor (CCA) continuing education unit (CEU's) with 9.5 credits in nutrient management and 4 credits in soil and water management (13.5 credits total). Those seeking CCA CEU's will be required to respond to several quiz questions following each presentation in order to track participation. Further instructions for receiving CEUs will be sent with the registration confirmation.

## Videos available for viewing from **May 4th - July 31st, 2015**

| Video Topic | Speaker |
|---|---|
| Introduction & series overview | Carrie Laboski |
| Soils-landscapes of Wis. and their influence on nutrient loss | Kevin McSweeney |
| Understanding soil groups and soil yield potential | Robert Florence |
| Phosphorus (P) and potassium (K) recommendations & mgmt. | Carrie Laboski |
| Manure P & K credits | Robert Florence |
| Liming: A keystone to soil fertility | Robert Florence |
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| Soil management practices in RUSLE2 | Laura Good |
| Using the Wisconsin phosphorus index | Laura Good |
| Cover crops & nutrient management | Matt Ruark |
| Tile drainage & nutrient management | Matt Ruark |
| Workshop wrap-up | Carrie Laboski |

*Presented by: UW-Madison Department of Soil Science and UW-Extension Nutrient & Pest Management Program*

College of Agricultural & Life Sciences, University of Wisconsin–Madison · NPM · UW Extension, University of Wisconsin-Extension