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Chuck Bolte: 2016 WI CCA of the Year
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*Wisconsin Crop Manager*
Seminar offered on organic grain production and marketing

Organic grain is a fast-growing sector of today’s agricultural economy. Are you or someone you know interested in learning more about organic grain production and marketing? Do you want to benefit from organic grain prices but don’t know how to navigate the transition process and manage a farm organically? Are you a beginning farmer who wants to grow organic grain, for feed or for food, but don’t know where to begin? We have a good place for you to start.

A three-week, 14-installment seminar on organic grain production and marketing will be offered through the newly-formed Organic Grain Resources And Information Network (OGRAIN) at the University of Wisconsin-Madison. We will meet January 11-29, Monday through Friday, from 2:25-3:15 PM. The seminar will meet on campus, in collaboration with the Farm and Industry Short Course (FISC), but will be available remotely through a live, interactive streaming service. Access to recorded talks will also be available to registered participants who can’t join the live stream.

Through lectures and discussions led by farmers, researchers, agency personnel, and industry representatives, various topics will be covered including:

- Organic corn, soybean, and small grain production
- Fertility and pest management in organic systems
- Marketing and contracting
- Food-grade grain production, processing, and marketing
- Organic transition, certification, and coexistence

The seminar is available to anyone in the Upper Midwest with an interest in learning more about organic grain production. However, there is particular emphasis on recruiting beginning farmers with less than 10 years experience. Whether you’re a curious conventional farmer, a livestock or produce grower interested in adding grain to your system, or a new farmer wanting to start with organic grain production, you’ll find much of value in the OGRAIN seminar.

Cost for non-FISC participants is $50. This covers either in-person or on-line participation as well as access to all classroom materials (readings, recorded presentations,
useful links and resources, activities etc.). If you're unable to cover the cost of the course, there are scholarships available. Please inquire for more information. Also, if participants need assistance gaining access to an internet connection with sufficient speed, we can help identify a location capable of streaming the class.

To register, please send an email with your name, phone #, home address, and whether you'll be joining us in the classroom or online. Payment will need to be received (check or cash, made out to UW Madison) before January 11th.

Registration information, payment, and questions can be directed to:

Anders Gurda, Seminar coordinator, agurda@wisc.edu
612-868-1208, 1630 Linden Dr., Madison, WI 53706

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**2016 Wisconsin Agronomy Update Meetings**

The Department of Agronomy will offer Crop Production and Management Meetings at eight locations during 2016. 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” (Late) 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). Our discussion topics will include forages, corn, soybeans and small grains. Please join us at meeting in your area.

**Location, date and time**

- **Janesville** Monday, Jan. 4 at 12:30 pm
- **DeForest** Tuesday, Jan. 5 at 7:30 am
- **Fond du Lac** Tuesday, Jan. 5 at 12:30 pm
- **Kimberly** Wednesday, Jan. 6 at 7:30 am
- **Wausau** Wednesday, Jan. 6 at 12:30 pm
- **Eau Claire** Thursday, Jan. 7 at 7:30 am
- **Sparta** Thursday, Jan. 7 at 12:30 pm
- **Belmont** Friday, Jan. 8 at 12:30 pm

**Wisconsin Crop Management Conference**
January 12-14, 2016 Alliant Energy Center, Madison

**Midwest Forage Association Forage Production and Use Symposium**
January 25-27, 2016 Chula Vista, Wisconsin Dells

**Wisconsin Corn Growers Association, Wisconsin Soybean Association, CORN / SOY EXPO**
February 4-5, 2016 Kalahari Resort, Wisconsin Dells

Click here for further information.

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**In-furrow Product Evaluation in Soybean in 2015**

Shawn P. Conley, State Soybean and Wheat Extension Specialist

John Gaska, Outreach Specialist
University of Wisconsin, Madison

To evaluate the effectiveness and compatibility of various in-furrow products for soybean, field research trials were conducted at 2 locations in Wisconsin in 2015. These trials were conducted in a randomized complete block design with 18 in-furrow soybean treatments and a non-treated control that was replicated 4 times. The plots were planted in 15” rows at 140,000 seeds/a using soybean variety Asgrow 2035 treated with Acceleron® insecticide and fungicide seed treatments.

To read more click here.

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**Finalists for the 2015 WI Soybean Yield Contest are Announced**

The 2015 growing season proved to be a unique challenge for many WI soybean growers. Given these widespread challenges however, we again experienced great interest in the 2015 WSA/WSMB Soybean Yield Contest. The top two entries in each division (in no particular order) were:

**Division 4:**
- Jon Riley, Darlington (planted Asgrow AG2433)
- Dale and Kevin Bahr, Belmont (planted Asgrow AG2535)
Division 3:
- David Wilkens, Random Lake (planted NK S20-T6 Brand)
- Derek Yanke, Loganville (planted NK S20-T6 Brand)

Division 2:
- Jim Salentine, Luxemburg (planted Steyer 1140L)
- Craig Oehmichen, Abbotsford (planted Asgrow AG1431)

Division 1:
- David Lundgren, Amery (planted Cropland R2C1494)
- Jerry Koser, Almena (planted DuPont Pioneer 91M10)

The final ranking and awards will be presented at the 2016 Corn Soy Expo to be held at the Kalahari Convention Center, Wisconsin Dells on Thursday February 4th during the WSA/WSMB annual meeting.

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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**2015 Wisconsin Corn Hybrid Performance Trials**

**Grain – Silage – Specialty – Organic**

Every year, the University of Wisconsin Extension-Madison and College of Agricultural and Life Sciences conduct a corn evaluation program, in cooperation with the Wisconsin Crop Improvement Association. The purpose of this program is to provide unbiased performance comparisons of hybrid seed corn available in Wisconsin. These trials evaluate corn hybrids for both grain and silage production performance. In 2015, grain and silage performance trials were planted at fourteen locations. Links to the full results reports follow.

PDF Format

Go to the UW Hybrid Trial website

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Situation: A one bushel increase by Wisconsin corn farmers increases farm income $8 to $32 million dollars depending upon corn price.

Objective: To provide unbiased performance comparisons of hybrid seed corn available in Wisconsin.

These results are a “Consumer Report” for commercial corn hybrids. The trials evaluate grain, silage, and systems including organic, transgenic and refugia systems.

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**2016 Wisconsin Crop Management Conference, January 12-14**

Geoff Siemering, UW-Soil Science

Register now for the 2016 Wisconsin Crop Management Conference (January 12-14)

On January 12 – 14, 2016 the agribusiness industries of Wisconsin will come together at the Alliant Energy Center in Madison for the Wisconsin Crop Management Conference and Agri-Industry Showcase. With over 40 educational sessions, 100,000 square feet of agricultural equipment and services exhibits, and approximately 1200 agricultural industry employees in attendance, the WCMC is the largest agri-industry conference of its kind in the State of Wisconsin.

**Craig Culver**, co-founder and chairman of the board of Culver's Restaurants, and **Mark Tauscher**, former Wisconsin Badger and Green Bay Packer football player, will kick off the event with keynote speeches on day one. According to Shawn Conley, UW soybean extension specialist and WCMC faculty co-director, “We know Mark plans to stick around and sign autographs for a while on Tuesday, so bring your footballs.”

Days two and three feature educational sessions on a range of topics including weed, plant disease, nitrogen and nutrients, and soil and water management; seeds and traits, forages and cover crops, manure, and pollinators. Dr. Chad Hart, Iowa State University, will be the final speaker of the conference, presenting on the Useful to Useable tools (aka U2U). “Make sure to stick around to the end on Thursday," said Dr. Matt Ruark, UW soils extension specialist and WCMC faculty co-director. "The climate tools that U2U offers have the potential to be quite valuable for farmers and crop consultants." The U2U program is a USDA National Institute for Food and Agriculture-funded research and extension project designed to improve the resilience and profitability of farms in the
Corn Belt amid a variable and changing climate.

Feed, grain, and agribusiness sessions will highlight GMO’s, staff recruiting and retention, and the Food Safety Modernization Act. Also available will be both basic and advanced SnapPlus training sessions. The conference is co-sponsored by the Wisconsin Agri-Business Association, UW College of Agricultural and Life Sciences, and UW Extension.

To register, go to [http://go.wisc.edu/w51b57](http://go.wisc.edu/w51b57).

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**2015 Wisconsin Crop Manager Volume 22**

The complete 2015 Wisconsin Crop Manager Volume 22 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 2015 Wisconsin Crop Manager in one PDF file, complete with a table of contents, click here.](http://go.wisc.edu/w51b57)

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**Wisconsin Pest Bulletin 12-3-15**

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

Issue No. 20 of the Wisconsin Pest Bulletin is now available at:


PLEASE NOTE: This final Wisconsin Pest Bulletin of 2015 provides a post-growing season summary of prevailing insect and plant disease conditions and related weather. Once again, our sincerest thanks to the many cooperators, farmers, county agents and consultants who contributed their time and valuable information to the survey program this year.

**INSIDE THIS ISSUE**

PEST HIGHLIGHTS OF 2015: European corn borer population declines to 74-year low

FORAGES & GRAINS: Potato leafhopper counts remain low all season long

CORN: Corn rootworm beetle survey finds higher populations in eastern Wisconsin

SOYBEAN: Phytophthora root rot a common problem again this season

FRUITS: Spotted wing drosophila confirmed by UW in 42 counties in 2015

VEGETABLES: Basil downy mildew, late blight and striped cucumber beetle summaries

NURSERY & FOREST: Emerald ash borer survey results in 39 new detections

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**Vegetable Crop Update January 4, 2016**

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

The 1st 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://www.extension.wisc.edu/plant/pathology/updates)

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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 November 14, 2015 through November 20, 2015.

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

**Forage crops**

Alfalfa, Root/Crown rot, *Pythium sp.*, *Fusarium sp.*, Fon du Lac

**Fruit crops**

Apple, Cytospora Canker, *Cytospora sp.*, Bayfield

Apple, *Fire Blight*, *Erwinia amylovora*, Bayfield
### Vegetables

Cabbage, Grey leaf spot, *Alternaria brassicicola*, Outagamie
Carrot, *Cotony Rot/White Mold*, *Sclerotia sclerotiorum*, Dane
Carrot, Crown Rot, *Rhizoctonia sp.*, Dane
Carrot, Fusarium Dry Rot, *Fusarium sp.*, Dane

### Soil

Soybean cyst nematode, *Heterodera glycines*, Kenosha, Lafayette, Outagamie, Pepin, Racine

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 November 21, 2015 through November 27, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
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</thead>
<tbody>
<tr>
<td><strong>Vegetables</strong></td>
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<tr>
<td>Pepper, Bacterial Spot, <em>Xanthomonas</em>, Racine</td>
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<tr>
<td><strong>Soil</strong></td>
</tr>
<tr>
<td>Soybean Soil, Soybean Cyst Nematode, <em>Heterodera glycines</em>, Marquette, Outagamie, Sheboygan</td>
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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 November 28, 2015 through December 4, 2015.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
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</thead>
<tbody>
<tr>
<td><strong>Vegetables</strong></td>
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<td>Pepper, Bacterial Spot, <em>Xanthomonas</em>, Racine</td>
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<tr>
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<td>Soybean Soil, Soybean Cyst Nematode, <em>Heterodera glycines</em>, Marquette, Outagamie, Sheboygan</td>
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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 November 28, 2015 through December 4, 2015.
NPM Program Announces New Southwest Wisconsin Regional Specialist

Dan Smith is the new University of Wisconsin-Madison & Extension Southwest Regional Outreach Specialist for the Nutrient and Pest Management (NPM) Program. The goal of his position is to work with county partners in the Southwest region to deliver educational programs that promote farm management practices which protect water quality while maintaining or improving farm profitability. He recently earned a master’s degree in Agroecology from UW-Madison where he researched cover crop establishment issues following commonly applied corn, soybean, and wheat herbicides, cover crop termination, and cover crop interseeding. Dan is originally from Walnut, IL and earned BS degrees in Soil & Crop Science and Agriculture Business from University of Wisconsin-Platteville. Dan is here to help in the Southwest region with any nutrient and pest management educational programming. His phone number is 608-219-5170 and e-mail address is dhsmith@wisc.edu.

Winners of the 2015 WSA WI Soybean Contest are Announced

The 1st place winner in Division 4, Bahr Farms Inc. of Bel- mont, grew Asgrow AG2535 and harvested 89.23 bu/a. In second place, Riley Bros. Farms of Darlington grew Asgrow AG2433 and harvested 88.85 bu/a. In Division 3, David and Karen Wilkens of Random Lake won 1st place with NK S20-T6 Brand at 77.15 bu/a, and in 2nd place, Echo-Y Inc. of Loganville harvested 75.93 bu/a with NK S20-T6 Brand. In Division 2, Oeh My Farm of Abbotsford achieved 79.72 bu/a from Asgrow AG1431 for first place. In 2nd place, J-Mar Hillside Acres of Luxemburg harvest-
ed 74.17 bu/a from Steyer 1140L soybeans. In Division 1 at 75.67 bu/a was David Lundgren from Amery who planted Croplan R2C1494. 2nd place winner in Division 1 was Jerry Koser from Almena. He harvested 60.27 bu/a from DuPont Pioneer 91M10.

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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**Nominations are still being accepted for the 2016 Wisconsin CCA of the Year Award**

A quick reminder that the Wisconsin CCA Board has been 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 [click here to view form] must be completed and 3 letters of reference provided. Nomination criteria will help with the nomination process and are also linked below this article.

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.

To view the 2016 CCA Nomination Criteria, [click here](#).

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**UW-River Falls Field Scout Training Class March 16-17, 2016**

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 16-17, 2016 at 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://patstore.wisc.edu/ipm/register.aspx](https://patstore.wisc.edu/ipm/register.aspx)

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.

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**Training for Nutrient Management Planners Online Video Workshop - 2016**

Scott Sturgul – NPM Program

*Training for Nutrient Management Planners* is a self-paced seven hour online video series and a one day face-to-face, follow-up workshop. The program is designed for current and potential nutrient management plan writers.
in Wisconsin – particularly production agronomists and county-based conservation staff. The intent of this workshop is to provide in-depth training on the preparation of quality nutrient management plans.

This online video series is available for viewing from February 1 to April 15, 2016. It is presented by the University of Wisconsin-Madison & Extension Nutrient & Pest Management Program, UW-Madison Department of Soil Science, UW-Platteville School of Agriculture, WI Dept. Agriculture, Trade & Consumer Protection, USDA-Natural Resources Conservation Service, and WI Dept. Natural Resources. Featured speakers include: Chris Baxter, Judy Derricks, Robert Florence, Laura Ward Good, Paul Kivlin, Carrie Laboski, Sue Porter, Stephanie Schneider, and Scott Sturgul.

Topics include:

- Wisconsin's USDA-NRCS 590 Nutrient Management Standard
- How and Why Conservation Plans are Linked to NM plans
- Components of Conservation Plans Needed for NM Plan Development
- MMAS: Maps for Determination of 590 Set-backs & Restrictions
- Concepts of Soil Series and Soil Map Units
- Changes to the NRCS Soil Database
- Understanding Soil Properties that Affect Soil Fertility Guidelines
- Soil Sampling
- Nutrient Application Rate Guidelines for N, P, & K
- Soil Nitrate Testing
- Plant Analysis
- Understanding a Soil Test Report
- Legume Nitrogen Credits
- Manure & Biosolids Nutrient Crediting
- Manure Sampling & Reporting
- Manure Spreader Calibration
- Manure Production Calculations: Variations & Compensations
- Phosphorus Management Planning for Water Quality
- Nitrogen Management for Water Quality Protection
- Mechanics of Creating a Nutrient Management Plan

The follow-up workshop will feature extensive training on the use of the SnapPlus nutrient management planning software. Participants will prepare a functional plan for a real Wisconsin farm. Dates and locations for the follow-up workshops are: March 31 at the UW Agricultural Research Station in Marshfield, WI and April 4 at the Crowne Plaza Hotel in Madison, WI. Participants are strongly encouraged to bring laptop computers to the workshop with the latest version of the SnapPlus software installed. SnapPlus can be downloaded for free at: http://snapplus.wisc.edu/download-15-1.

A brochure for the Training for Nutrient Management Planners workshop can be found here.

Registration for viewing the video series and attending one of two follow-up workshops is required. The total fee is $100 per person. Registration is open now and will close on March 15. Interested participants can register at: https://patstore.wisc.edu/npm/register.aspx. You must choose the follow-up workshop you wish to attend during the registration process. A credit card is the only acceptable form of payment on this website. A confirmation email will be sent to each participant. For questions on registration contact Scott Sturgul (ssturgul@wisc.edu, 608-262-7486). Please note: You must be able to access YouTube in order to view these presentations!

Certified Crop Advisor (CCA) continuing education units (CEU's) for this workshop has been approved by the Wisconsin CCA Board. The workshop contains 10 credits in nutrient management and 3 credits in soil and water management.

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**Webinar: Climate and Corn-based Cropping Systems - Findings and Recommendations for Corn Belt Farmers**

Dick Wolkowski
Project Extension Educator
rpwolkow@wisc.edu

Results of a five-year multi-state project that examined the impact of weather variability on corn production systems will be discussed at a webinar to be held Feb-
The webinar will originate from the University of Minnesota, Southwest Research and Outreach Center in Lamberton, but you can log in from your location. The program will include the following presentations:

- Eileen Klavidko, Purdue University – Cover Crops
- Rick Cruse, Iowa State University – Tillage Management
- Jeff Stock, University of Minnesota – Drainage Water Management
- Joe Lauer, University of Wisconsin – Extended Crop Rotations
- J. Arbuckle, Iowa State University – Farmer Adaptation and Conservation Practice Adoption

One CCA CEU credit each for soil and water, and crop management will be offered. More information on the webinar program, connection details, and sign-up for CCA CEU’s will be posted on the project’s website.

Go to:

http://www.sustainablecorn.org/Findings-and-Recommendations-for-the-Corn-Belt.html

The Effectiveness of Neonicotinoid Seed Treatments in Soybean

This publication from the Purdue Extension Entomology website reviews the current research regarding the efficacy of these neonicotinoid seed treatments, their non-target effects, and the potential role for neonicotinoid seed treatments in soybean production.

To view the full publication, follow the link below:


New Video: Relative Importance of P and K for corn and soybean in Wisconsin

Phosphorus and potassium are important for crop production. But is one nutrient more important than the other? To learn the answer to this question, watch a new video titled: “Relative Importance of P and K for corn and soybean in Wisconsin”. This video highlights on-going research conducted at the Arlington Ag Research Station.

New Video: Strategies to Maximize Return on Fertilizer in 2016

There are numerous economic challenges for crop production in 2016. Tips for maximizing your economic return on fertilizer are provided in the video titled: “Strategies to Maximize Return on Fertilizer in 2016”. Click the video below to watch:

Calculating the Soybean Yield Gap for WI Soybean Farmers

Shawn P. Conley
Soybean and Wheat Extension Specialist

Shawn Conley is embarking on a State-Wide Project aimed at generating baseline producer data on current soybean management practices in Wisconsin’s produc-
tion systems. This project is funded by the Wisconsin Soybean Marketing Board and the North Central Soybean Research Program (NCSRP). The project goal is to identify the key factors that preclude the State’s Soybean Producers from obtaining yields that should be potentially possible on their respective individual farms. The term used for the difference between what yield is possible on your farm each year and what you yield you actually achieve is called a “Yield Gap”.

The project is asking Crop Producers in Wisconsin to provide yield and other agronomic data specific to their soybean production fields. With that data, the project will conduct an in-depth analysis of what on-farm factors might be causing a Yield Gap on producer farms. They intend to provide annual reports to all crop producers informing them of what factors they may have identified that, based on their analysis of the data collected from farms, are likely limiting them from achieving soybean yields closer to yield potential that is likely possible on their farms!

Below are links that can also be found on Shawn Conley’s webpage describing the process, guidelines for data collection, as well as the data collection form. Please know that this data will not be shared individually and your information will be held strictly confidential. Feel free to notify Shawn if you have any questions or concerns regarding this request. Please return all completed forms to his address below!

Yield Gap: Letter to WI Soybean Producers
Yield Gap: Guidelines for Data Collection
Yield Gap: Data Collection Form

Coolbeans!

Shawn P. Conley
Department of Agronomy
University of Wisconsin, Madison
1575 Linden Drive
Madison, WI 53706

30, 2016 through February 5, 2016.

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

Vegetables
Carrot, Bacterial Soft Rot, Pectobacterium carotovorum, Waupaca

Soil
Pea Soil, Pea Root Rot, Miscellaneous pea root rot pathogens, Waubasha (MN)

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, 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 January 9, 2016 through January 15, 2016.

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

Vegetables
Kale, Black Spot, Alternaria brassicicola, Flagler (FL)

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 January 30, 2016 through February 5, 2016.

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

Vegetables
Carrot, Bacterial Soft Rot, Pectobacterium carotovorum, Waupaca

Soil
Pea Soil, Pea Root Rot, Miscellaneous pea root rot pathogens, Waubasha (MN)

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
Looking ahead to 2016: The Weather

At nearly every farmer production meeting this winter, speakers have been addressing the unprecedented El Niño event occurring in the Pacific Ocean. Data for El Niño and La Niña events have been collected by the National Oceanic and Atmospheric Administration since 1950 and can be found at the science & information for a climate-smart nation website linked in the full article. To view the full article, follow the link below:

http://wisccorn.blogspot.com/2016/02/B065.html

Wisconsin Agricultural Land Prices 2015

By Arlin Brannstrom, Faculty Associate
UW Center for Dairy Profitability

Lower milk prices and low grain prices combined to drive Wisconsin agricultural land prices lower again in 2015. Average land values declined 3% over all – but varied widely in different parts of the state. The WI Department of Revenue transfer return data confirms that agricultural land values have declined in most of the state. (To view the full article, refer to the end of the newsletter.)

UW-River Falls Field Scout Training Class March 16-17, 2016

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 16-17, 2016 at 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). Refer to the last two pages of the newsletter for the complete schedule. 13 PM and 3 NM CEU’S have been pre-approved.

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://patstore.
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

First Seed-to-Plant Spread of Harmful Soybean Virus Proven by UW-Madison

For the first time, a UW-Madison study has proven a crop-injuring Tospovirus can be passed from soybean seeds to plants, a finding with significant implications for soybean production around the world.

The landmark study shows the virus can spread from an infected seed lot to seedlings at a rate of 6%, which affects seed quality and reduces total oil content. Until now, Tospovirus transmission in this manner was unproven and thought unlikely.

Unchecked, the virus—called Soybean vein necrosis virus (SVNV)—could reduce the production of high quality, pathogen-free seed and soybean oil yields. To view the full article, please follow the link below:


Vegetable Crop Update
February 18, 2016

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

The 2nd issue of the Vegetable Crop Update is now available. Click here to view this update.
Wisconsin Agricultural Land Prices 2015

Lower milk prices and low grain prices combined to drive Wisconsin agricultural land prices lower again in 2015. The WI Department of Revenue transfer return data confirms that agricultural land values have declined in most of the state.

Ag land values down 3% in 2015.
The weighted average price of agricultural land sold in Wisconsin in 2015 was $3,833 per acre. This is a 3% decrease from 2014. The acres sold declined by 5% and the number of sales dropped by 8%. Weaker dairy and crop prices helped to dampen demand. With low commodity prices expected in 2016, producer competition for land will likely soften again in 2016.

Farmland is the most valuable asset on most farmer’s 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 are subjective and 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.

The Wisconsin Department of Revenue (DOR) collects an alternative source of agricultural land sales data. A transfer return tax is collected when a property is sold, and a transfer return form is collected with the tax payment. 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.

Figure 1. State-wide Ag Land Value Trends 2010-2015

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1 Arlin Brannstrom is a Faculty Associate at the UW-Madison Center for Dairy Profitability and Secretary/Treasurer for the Wisconsin Chapter of the American Society of Farm Managers and Rural Appraisers.

2 This paper was reviewed by Dr. Simon Jette Nantel, Assistant Professor - UW Center for Dairy Profitability, and Mr. Tom Kriegl, UWEX Professor Emeritus.
While the state average decreased slightly in 2015, there were wide variations in sale price per acre. 18% of the sales were less than $2000/acre and only 17% of sales had prices above $6,000/acre. While the high priced sales make good headlines, there were very few sales above $10,000/acre.

Another way to emphasize the large range in the prices paid for bare land is illustrated in Appendix II. It reports the minimum and maximum sales price/acre for each county and NASS district between 2010–2015.

Methodology

This report is based upon sales of bare land between non-related parties in Wisconsin townships. All parcels were between 35 acres and 2,000 acres. The land was assessed for agricultural use at the time of the sale. Properties with water frontage or more than 30% in managed forest acreage were excluded. There were no retained property rights. In addition, returns with miscellaneous use note references to forestry or mining were excluded. All sales of partial interests in property were excluded from consideration. Finally, land purchased by municipalities or religious groups was removed from the dataset.

The Department of Revenue’s transfer return data is an objective and relatively timely data source for measuring changes in agricultural land values over time. Each year the Wisconsin Agricultural Statistics Service also produces a summary of agricultural land sales – both bare land and improved properties. Because the NASS information has been verified by the state’s equalization assessors, more information is available to separate sales that are being diverted from agricultural uses. The confirmed sales are used for property assessment adjustments.

There are a few differences in our approaches. The NASS summary is not limited to parcels 35 acres and above and includes properties in cities and villages. Land markets can change quickly. Using only the transfer return data enables us to make an earlier assessment of the direction of land values. The NASS reports (which typically are updated in late summer) are another good alternative with more information about tillable land and land diverted from agriculture. The link to obtain the most current land summary is: http://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/Land_Sales/.
Between 2010 and 2015, nearly eight thousand bare agricultural land transfer returns were used to compute weighted average sale prices per acre.

All reported sale prices are weighted averages. Weighted averages reduce the influence of sales with unusually high or low sale prices. Weighted averages are computed by summing the dollars paid for all sales and the total acres sold in the county or NASS unit and then dividing the totals. For example, if four 100-acre tracts sold for $2000/acre and a 5th sold for $4000, but was only 50 acres - the weighted average would be \((400\times2,000) + (50\times4,000)) / 450\) or $2,222/acre as opposed to the simple average of $2,400.

Location is an important determinant of value. In addition to the state-wide averages, land prices are reported using National Agricultural Statistics Service districts. The adjacent map displays the borders of the various National Agricultural Statistics Service (NASS) districts.

### Table 1. Weighted Average Wisconsin Bare Ag Land Sales 2010-2015.

<table>
<thead>
<tr>
<th>NASS District</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales</td>
<td>Acres</td>
<td>Wt $/Ac</td>
</tr>
<tr>
<td>1 NW District</td>
<td>102</td>
<td>7,040</td>
<td>$1,746</td>
</tr>
<tr>
<td>2 NC District</td>
<td>119</td>
<td>8,169</td>
<td>$1,858</td>
</tr>
<tr>
<td>3 NE District</td>
<td>65</td>
<td>5,154</td>
<td>$2,549</td>
</tr>
<tr>
<td>4 WC District</td>
<td>220</td>
<td>16,415</td>
<td>$2,854</td>
</tr>
<tr>
<td>5 C District</td>
<td>128</td>
<td>10,567</td>
<td>$2,549</td>
</tr>
<tr>
<td>6 EC District</td>
<td>156</td>
<td>10,499</td>
<td>$3,960</td>
</tr>
<tr>
<td>7 SW District</td>
<td>195</td>
<td>17,194</td>
<td>$3,215</td>
</tr>
<tr>
<td>8 SC District</td>
<td>187</td>
<td>18,356</td>
<td>$4,442</td>
</tr>
<tr>
<td>9 SE District</td>
<td>48</td>
<td>3,942</td>
<td>$5,200</td>
</tr>
<tr>
<td>Grand Total</td>
<td>1220</td>
<td>97,336</td>
<td>$3,251</td>
</tr>
</tbody>
</table>

### Table 1. Weighted Average Wisconsin Bare Ag Land Sales 2010-2015.

<table>
<thead>
<tr>
<th>NASS District</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales</td>
<td>Acres</td>
<td>Wt $/Ac</td>
</tr>
<tr>
<td>1 NW District</td>
<td>139</td>
<td>11,001</td>
<td>$2,434</td>
</tr>
<tr>
<td>2 NC District</td>
<td>138</td>
<td>9,585</td>
<td>$2,353</td>
</tr>
<tr>
<td>3 NE District</td>
<td>57</td>
<td>3,728</td>
<td>$2,946</td>
</tr>
<tr>
<td>4 WC District</td>
<td>252</td>
<td>19,483</td>
<td>$3,561</td>
</tr>
<tr>
<td>5 C District</td>
<td>145</td>
<td>11,103</td>
<td>$2,858</td>
</tr>
<tr>
<td>6 EC District</td>
<td>164</td>
<td>12,350</td>
<td>$5,367</td>
</tr>
<tr>
<td>7 SW District</td>
<td>188</td>
<td>14,018</td>
<td>$3,600</td>
</tr>
<tr>
<td>8 SC District</td>
<td>177</td>
<td>13,761</td>
<td>$5,429</td>
</tr>
<tr>
<td>9 SE District</td>
<td>67</td>
<td>5,309</td>
<td>$6,410</td>
</tr>
<tr>
<td>Grand Total</td>
<td>1327</td>
<td>100,338</td>
<td>$3,856</td>
</tr>
</tbody>
</table>

Table 1 reports the number of sales, the number of acres sold and the average price ($/acre) in each of the nine NASS reporting districts. (Complete county details are included in Appendix I.) In 2015, there were fewer acres transferred in 6 out of the 9 NASS districts. Be aware that even within districts or even counties with mostly homogeneous soil types and topography there are wide variations in the value of individual parcels.
Figure 3 displays the percentage of total land area sales by NASS District. Southeast and Northeast districts have had the least agricultural land sold over recent years. Southeast WI is influenced by urban pressures of Milwaukee, Racine and Kenosha. The small acreage in Northeast Wisconsin reflects the large amount of forest and recreation land in that district. The three districts with the largest farm land sales have been the West Central, Southwest and South Central. The total acres sold in 2015 declined approximately 3% from 2014 and nearly 35% from the peak in 2012.

Figure 4 represents the changes in the weighted average sale price/acre within each of the nine statistical reporting districts over the six-year span. Average land values declined in six of the nine reported areas. The three exceptions were the Northwest, East Central, and Central Districts. The highest average prices paid for ag land were in East Central and Southeastern Wisconsin. There have been very few bare land sales in Southeastern Wisconsin in recent years - which makes it difficult to gauge market value trends. East Central sales saw the largest weighted average price increase in 2015 as a strong dairy industry and land auctions in this case helped to drive up sales prices.
The average price per acre for bare land in the northern districts was nearly unchanged in 2015. East Central Wisconsin continued to see the fastest percentage increase in land values over the past six years. This is also the fastest growing milk production region in the state. The Southwest, South Central and West Central districts experienced declines in average sale prices in 2015. The West Central district sold the most acres and the Northeast district sold the fewest acres.

**Land Values vs Rental Rates**

State-wide land rental rates are reported annually by NASS. Figure 5 on page six combines the state average land values with reported average rental rates. Even within a county, rental rates are highly variable. Some of the factors which affect rental rates are soil quality, field size, social contracts and demand for nutrient management. The 2015 NASS average rental rate was $130/acre which is about 3.5% of the state-wide average sale price.

There has been a high demand for additional rented land in recent years and tenants bid up rental rates as a result. The following Wisconsin corn budget for 2016 illustrates the tight profit margins that are likely to exist this year if yields and harvest time prices are typical.

Table 2 is an example of the anticipated input costs associated with producing an acre of corn in 2016. Note that nearly 45% of these costs are inputs and purchased seed, fertilizer and chemicals and another 34% are machinery related expenses like fuel, repairs and depreciation costs which may be hard to estimate for a given year. In the short run these fixed costs can be ignored – but they must be covered in the longer run.

<table>
<thead>
<tr>
<th>2016 Corn Budget Variable Costs</th>
<th>Units</th>
<th>Cost</th>
<th>Cost/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH3</td>
<td>140</td>
<td>$670 Tons</td>
<td>$46.90</td>
</tr>
<tr>
<td>AMS</td>
<td>125</td>
<td>$356 Tons</td>
<td>$22.25</td>
</tr>
<tr>
<td>K2O</td>
<td>100</td>
<td>$400 Tons</td>
<td>$20.00</td>
</tr>
<tr>
<td>Starter</td>
<td>100</td>
<td>$573 Tons</td>
<td>$28.65</td>
</tr>
<tr>
<td>Lime</td>
<td>0.5</td>
<td>$15 Tons</td>
<td>$7.50</td>
</tr>
<tr>
<td>Seed</td>
<td>30000</td>
<td>$250 Bags</td>
<td>$93.75</td>
</tr>
<tr>
<td>Chemicals</td>
<td></td>
<td>$35</td>
<td>$35.00</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td>$20</td>
<td>$20.00</td>
</tr>
<tr>
<td>Testing &amp; Scouting</td>
<td></td>
<td>$10</td>
<td>$10.00</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>$284.05</td>
<td>45.16%</td>
</tr>
<tr>
<td><strong>Field Operations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen Application</td>
<td></td>
<td>$15</td>
<td>$15.00</td>
</tr>
<tr>
<td>Spreading Fertilizer</td>
<td></td>
<td>$5</td>
<td>$5.00</td>
</tr>
<tr>
<td>Primary Tillage</td>
<td></td>
<td>$15</td>
<td>$15.00</td>
</tr>
<tr>
<td>Secondary Tillage</td>
<td></td>
<td>$15</td>
<td>$15.00</td>
</tr>
<tr>
<td>Planting</td>
<td></td>
<td>$25</td>
<td>$25.00</td>
</tr>
<tr>
<td>Spraying</td>
<td></td>
<td>$15</td>
<td>$15.00</td>
</tr>
<tr>
<td>Combining</td>
<td></td>
<td>$35</td>
<td>$35.00</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>$125.00</td>
<td>19.87%</td>
</tr>
<tr>
<td><strong>Trucking, Drying and Storage Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trucking</td>
<td></td>
<td>$30</td>
<td>$30.00</td>
</tr>
<tr>
<td>Drying</td>
<td></td>
<td>$30</td>
<td>$30.00</td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td>$30</td>
<td>$30.00</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>$90.00</td>
<td>14.31%</td>
</tr>
<tr>
<td><strong>Rent</strong></td>
<td></td>
<td>$130.00</td>
<td>20.67%</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td></td>
<td>$629.05</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 2. 2016 Wisconsin Corn Budget

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3 This budget was developed by Mr. Jim Leverich, UWEX On-Farm Research Coordinator.
The returns to labor and management with different yield and corn price assumptions are in table 3. As
an example, with these revenue and cost projections (including the state average $130/acre for rent) an
operator would lose $69 /acre with a yield of 160 bu. and average corn price of $3.50/bu. In this case
renters are not able to cover their full cost of production and must hope for above average yields or
improved commodity prices or both. The outlook for 2016 is not encouraging.

<table>
<thead>
<tr>
<th>Corn Price</th>
<th>Yield/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3.00</td>
<td>-$299</td>
</tr>
<tr>
<td>$3.25</td>
<td>-$272</td>
</tr>
<tr>
<td>$3.50</td>
<td>-$244</td>
</tr>
<tr>
<td>$3.75</td>
<td>-$217</td>
</tr>
<tr>
<td>$4.00</td>
<td>-$189</td>
</tr>
</tbody>
</table>

Table 3. Projected net revenue per acre with various yield and price assumptions

In recent years NASS rental rates have averaged between 2.4 and 3.4% of the average state-wide ag
land sales prices. Many more acres are rented than sold each year. With narrowing profitability going
forward, there has been an increased use of flex lease contracts in the Midwest. Flex leases allow the
owner and tenant to share the risks and rewards in good years and bad. (Examples of several types of
agricultural leases can be found at [http://www.aglease101.org](http://www.aglease101.org).)

![Figure 5 LAND VALUES & NASS REPORTED RENTAL RATES](image)

Figure 5 Land Values & NASS Reported Rental Rates

When the average cash rents are combined with land value appreciation, the returns to owning land
look better than many other investment alternatives. Rents tend to be “sticky” when commodity prices
soften – as we’ve seen in 2014 and 2015. With lower commodity prices experienced in 2015,
competition for rental land – especially poor quality rental acres - will soften in 2016.

**Types of Agricultural Land Sellers**

Ag land ownership structures are changing rapidly in many parts of Wisconsin. Up until the last decade,
most property was bought and sold between individual owners or as tenants in common. Table 4
shows the changing percent of agricultural land which has been bought by corporations, limited liability
companies (LLC) and limited liability partnerships (LLP).
Table 4. WI Percent of Transactions sold by various ownership entities.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporation</td>
<td>71</td>
<td>6%</td>
<td>67</td>
<td>5%</td>
<td>77</td>
<td>4%</td>
<td>49</td>
<td>4%</td>
<td>41</td>
<td>3%</td>
<td>48</td>
<td>4%</td>
</tr>
<tr>
<td>Individual</td>
<td>846</td>
<td>69%</td>
<td>922</td>
<td>69%</td>
<td>1223</td>
<td>70%</td>
<td>906</td>
<td>68%</td>
<td>829</td>
<td>69%</td>
<td>792</td>
<td>67%</td>
</tr>
<tr>
<td>Limited liability co, trust, other</td>
<td>280</td>
<td>23%</td>
<td>323</td>
<td>24%</td>
<td>425</td>
<td>24%</td>
<td>355</td>
<td>27%</td>
<td>307</td>
<td>26%</td>
<td>324</td>
<td>28%</td>
</tr>
<tr>
<td>Partnership</td>
<td>23</td>
<td>2%</td>
<td>19</td>
<td>1%</td>
<td>25</td>
<td>1%</td>
<td>17</td>
<td>1%</td>
<td>17</td>
<td>1%</td>
<td>12</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>1220</strong></td>
<td>100%</td>
<td><strong>1331</strong></td>
<td>100%</td>
<td><strong>1750</strong></td>
<td>100%</td>
<td><strong>1327</strong></td>
<td>100%</td>
<td><strong>1194</strong></td>
<td>100%</td>
<td><strong>1176</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

Individuals are still the most common sellers although the percentage of acreage sold by LLCs and trusts has increased from 23% to 28% between 2010 and 2015. Land sold by corporations and general partnerships is only a small percentage of the total. As farming operations become larger and real estate ownership interests more dispersed, it is expected that sole proprietorships will become less prevalent.

**Implications for Farmers**

Rising land values are a mixed blessing for established farmers. The appreciation in land value is only realized when the assets are sold. In most cases the ongoing business is neither directly responsible for nor directly benefited by changes in land values. High land values provide the retirement cushion for “last generation” farm businesses. However, high land prices make it more difficult for new entrants to get started without significant help from family members or other benefactors.

Dairy farming in Southeastern, East Central and South Central Wisconsin is under great pressure from competing land uses. If the trend continues, dairy production will continue to shift away from these parts of Wisconsin.

Dairy farming is a capital intensive business. A typical dairy cow and her replacement consumes approximately 7.5 tons of forage dry matter and 100 bushels of grain each year. Manure management and nutrient balancing are a growing challenge. The typical Wisconsin dairy farm requires 2-3 acres of cropland to grow the forages and grain consumed by each dairy cow. In recent years the demands for agricultural land have made dairy farm acquisition and expansion very difficult.

Wisconsin’s farmland use value assessment has greatly reduced the costs of holding agricultural real estate. The real estate taxes for ag land base much lower than they once were. Record low interest rates and changing population demographics have also increased demands for open space. Expanding dairy businesses may need to rely on long term leases or manure trading arrangements to assure compliance with environmental regulations and land use constraints.

Although dairy farming is well suited to the climate, topography and infrastructure of Wisconsin, the continued survival of a viable dairy industry depends upon access to affordable land resources.

Few things are as illiquid as land. Unlike stocks, bonds and commodities, one can only estimate the value of real estate until a willing buyer and seller consummate a sale. At least in recent years, agricultural land has been a much better investment than many other alternatives. However, past performance is not always a good predictor of the future!

Appendix I on the following page contains a more detailed breakdown of real estate sale prices on a county by district basis for 2010 - 2015. The reader is cautioned that limited numbers of sales in each county can cause wide variations from year to year, and the weighted average prices reported may not truly represent the local market. These figures should not substitute for an independent appraisal by a qualified professional. For this reason Appendix II reports the maximum and minimum sales price per acre during this same period.
<table>
<thead>
<tr>
<th>WI NASS Districts</th>
<th>2010 Sales</th>
<th>2011 Sales</th>
<th>2012 Sales</th>
<th>2013 Sales</th>
<th>2014 Sales</th>
<th>2015 Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$1,640</td>
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</tbody>
</table>

**Appendix 1. Detailed County Ag Land Sales 2010-2015**
<table>
<thead>
<tr>
<th>WI/MS Districts</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NW Districts</td>
<td>102</td>
<td>$532</td>
<td>$4,150</td>
<td>120</td>
<td>$500</td>
<td>$16,620</td>
</tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>119</td>
<td>$550</td>
<td>$3,881</td>
<td>167</td>
<td>$474</td>
<td>$7,875</td>
</tr>
<tr>
<td>2 NC Districts</td>
<td>48</td>
<td>$1,818</td>
<td>9,320</td>
<td>48</td>
<td>$909</td>
<td>$13,333</td>
</tr>
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<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>65</td>
<td>$1,000</td>
<td>$4,210</td>
<td>68</td>
<td>$500</td>
<td>$5,000</td>
</tr>
<tr>
<td>3 NE Districts</td>
<td>27</td>
<td>$625</td>
<td>$1,818</td>
<td>36</td>
<td>$1,240</td>
<td>$7,159</td>
</tr>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>4 WC Districts</td>
<td>26</td>
<td>$1,750</td>
<td>$5,374</td>
<td>10</td>
<td>$911</td>
<td>$9,945</td>
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<td></td>
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</tr>
<tr>
<td>5 EC Districts</td>
<td>156</td>
<td>$450</td>
<td>$3,998</td>
<td>186</td>
<td>$567</td>
<td>$9,666</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6 SW Districts</td>
<td>187</td>
<td>$724</td>
<td>$11,845</td>
<td>235</td>
<td>$754</td>
<td>$17,912</td>
</tr>
</tbody>
</table>

### Appendix II - Minimum & Maximum $/acre

- **2010**: $532 - $550
- **2011**: $4,150 - $3,881
- **2012**: $1,818 - $1,000
- **2013**: $909 - $1,000
- **2014**: $500 - $1,000
- **2015**: $16,620 - $5,000
# 2016 UW River Falls Field Scout Training Class

<table>
<thead>
<tr>
<th>Time</th>
<th>Wednesday, March 16, 2016</th>
<th>Thursday, March 17, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:45</td>
<td>Registration -outside Rm. 211, Agricultural Sciences Building</td>
<td>8:00 Introduction to Nutrient Management Planning Scott Sturgul, NPM Program</td>
</tr>
<tr>
<td>8:00</td>
<td>Introduction Bryan Jensen Integrated Pest Management Program, UW-Madison</td>
<td>9:15 Break</td>
</tr>
<tr>
<td>8:15</td>
<td>Insect Pests of Corn, Alfalfa and Soybeans Bryan Jensen UW-Madison</td>
<td>9:30 Grass and Sedge Weed Identification Dan Heider, Integrated Pest Management Program</td>
</tr>
<tr>
<td>10:30</td>
<td>Break</td>
<td>10:45 Annual Broadleaf Weed Identification Dan Heider</td>
</tr>
<tr>
<td>10:40</td>
<td>Field Crop Insect Lab Rm. 221 Bryan Jensen</td>
<td>12:00 Lunch (on your own)</td>
</tr>
<tr>
<td>12:15</td>
<td>Lunch (on your own)</td>
<td>12:45 Biennial and Perennial Weed Identification Dan Heider</td>
</tr>
<tr>
<td>1:00</td>
<td>Diseases of Corn, Alfalfa, Wheat and Soybeans Dr. Brian Hudelson Dept. of Plant Pathology,</td>
<td>1:45 Weed Identification Lab, Rm. 221 Dan Heider</td>
</tr>
<tr>
<td>3:00</td>
<td>Break</td>
<td>3:15 Herbicide Mode of Action Dan Heider</td>
</tr>
<tr>
<td>3:10</td>
<td>Field Crop Disease Lab Rm. 221 Dr. Brian Hudelson</td>
<td>4:30 Identification Test (optional for non-students)</td>
</tr>
<tr>
<td>4:45</td>
<td>Dinner on your own</td>
<td></td>
</tr>
<tr>
<td>6:00</td>
<td>-Soil and Plant Tissue Sampling -Nutrient Deficiency Symptoms -Introduction to Nutrient Management Scott Sturgul Nutrient and Pest Management Program</td>
<td></td>
</tr>
<tr>
<td>8:00</td>
<td>Quiz</td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td>Adjourn</td>
<td></td>
</tr>
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</table>
Grading Policy

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90%+</td>
</tr>
<tr>
<td>A-</td>
<td>88-89%</td>
</tr>
<tr>
<td>B+</td>
<td>85-87%</td>
</tr>
<tr>
<td>B</td>
<td>80-84%</td>
</tr>
<tr>
<td>B-</td>
<td>78-79%</td>
</tr>
<tr>
<td>C+</td>
<td>75-77%</td>
</tr>
<tr>
<td>C</td>
<td>70-74%</td>
</tr>
<tr>
<td>C-</td>
<td>68-69%</td>
</tr>
<tr>
<td>D+</td>
<td>66-67%</td>
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<tr>
<td>D</td>
<td>60-65%</td>
</tr>
<tr>
<td>F</td>
<td>59% &amp; BELOW</td>
</tr>
</tbody>
</table>

Your final grade will be based on the following:

- Identification Test 50%
- Take-home exam 40%
- Quiz 10%

All exams and quizzes are open book.

The ID test will use “slides” from PowerPoint. Graded ID exams can be picked up from Dr DeBroux by Monday, March 21.

The take-home exam can be pickup during the ID exam and should be turned to Dr. DeBroux’s Office (AGS 308) by Friday, March 25, no later than 3:00 p.m.

Final grades will be available from Dr. DeBroux
Factors to Consider While Assessing Your 2016 Winter Wheat Crop Stand and Spring Nitrogen Timing

Shawn P. Conley
Soybean and Wheat Extension Specialist

As the snow begins to melt and we finally put the 2015/16 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 a bit premature to make any rash decisions regarding crop destruction, here are a few considerations for assessing your spring 2016 winter wheat stands. To view the full report, please follow the link below:

http://thesoyreport.blogspot.com

Cover Cropping: Avoid Clover Competition When Frost Seeding Medium Red Clover Into Winter Wheat

Kevin Shelley, UW-Madison Nutrient and Pest Management Program

One cover cropping practice used by winter wheat growers involves frost seeding medium red clover seed into the wheat during freeze-thaw periods, usually in March or early April. The clover seed is broadcast over the fall-planted wheat, allowing the seed to fall into cracks and crevices on the soil surface. Freezing and thawing at the soil surface helps achieve adequate soil to seed contact for eventual germination and emergence of the clover during spring warm-up.

Typically, the established clover doesn’t grow much beyond the seedling stage under the rapidly developing wheat canopy. After the wheat is harvested, the clover has access to sunlight and will grow to provide a nitrogen-fixing, weed smothering, soil improving cover crop. UW Extension guidelines suggest 60-80 pounds of nitrogen can be credited for a following year’s corn crop. The red clover may also be harvested as a forage crop, possibly providing up to two tons of forage dry matter per-acre.

Success with this practice is dependent on a number of management and weather-related factors. See http://ipcm.wisc.edu/download/pubsnm/redclover_0109.pdf for management guidelines. Also, certain herbicides used in previous crops may inhibit clover establishment and may have implications for using the clover as feed
Post-harvest stem counts were higher at this farm than at the first. But they were lower in the dense clover areas (64 stems/ft²) than in the clover-sparse areas (76 stems/ft²). Wheat grain yield averaged 20 bushels per-acre less, as measured by the yield monitor, in the strips where clover was heavily competitive with the wheat.

There may also have been weather-related factors favoring rapid establishment of frost seeded clover relative to wheat growth in the fall and spring of 2014/15. However, these observations point out the importance of managing each of the components in a cropping system such as this. Winter wheat managed with the correct seeding rate, planting time and fertility is likely necessary.
for the companion frost seeded red clover to work. If a wheat stand is determined to be light, perhaps due to winter kill, or is behind in growth at spring green-up due to late planting and slow growth, forgoing the frost seeding may be advisable. Although, no threshold has been established specifically for this purpose, the 70 stems/ft² may be a guide.

Perhaps more importantly for 2016, these observations also suggest care is needed when broadcast seeding to ensure the clover seed is distributed evenly across the field and at a rate that is not excessive. Whether seeding with a broadcast seeder or a drill, it should be calibrated such that the rate and distribution pattern is known and adjusted as needed. Guidelines for calibrating seeders can be found in a publication from the University of Arkansas at http://www.uaex.edu/publications/pdf/fsa-3111.pdf. With clover seed cost at about $3.00 per pound this year, avoiding over-application makes economic as well as agronomic sense.

Thanks to Jeff Gaska, Farmer, Beaver Dam, WI for assistance with this article.

**Excess clover seeding rate may create competition with wheat**

**Pub: Frost Seeding Red Clover in Winter Wheat**

Grow your own nitrogen! If you plant winter wheat, you have an opportunity to “grow” your own nitrogen (N) to help manage input costs and accrue soil quality benefits. The age-old practice of green manuring, especially in conjunction with wheat, can produce significant creditable N for corn the next year. It also protects the soil and may be eligible for cost share under local and Federal conservation programs.

Usually, ideal conditions for frost seeding occur in mid to late March. Low overnight temperatures cause the surface to freeze and crack. Warm daytime temperatures thaw the surface, sealing the cracks. If daytime thawing occurs, the daily “window” for seeding lasts only a few hours, beginning at dawn. Driving on thawing soil later in the day may compact it and injure the wheat.

This publication gives an overview of research results and offers advice on how to best manage the cropping system for good wheat and nitrogen yields. To view the publication, please follow the link below:

http://ipcm.wisc.edu/download/pubsNM/RedClover_0109.pdf

**Video: Field Corn Disease Management Update**

Damon Smith, Ph.D., Assistant Professor, Field Crops Pathology, Extension Field Crops Plant Pathologist

In this 25 minute presentation, Dr. Smith talks about scouting for and managing Goss’s wilt and northern corn leaf blight of field corn in Wisconsin. Smith also presents research results from field trials, including a discussion on application timing and chances of recovering costs of fungicide applications.

If you would like to view this presentation, please click
Time Your Spring Nitrogen Applications to Maximize Winter Wheat Yield

Carrie A.M. Laboski, Professor and Soil Fertility/Nutrient Management Specialist

Proper timing of spring N application can significantly increase winter wheat yield. To maximize yields, growers should try to apply N as soon as possible in the spring, taking into consideration soil physical conditions. Applying N when the ground is barely traffickable will likely result in rutting, compaction, and possibly yield loss if plants are damaged. One tactic to accomplish early N application might be to apply N in the morning before the top few inches of soil have re-thawed. Care should be taken to ensure that N does not run off the field before it has a chance to move into the soil.

To see a brief overview of the research pertaining to wheat fertility, please follow the link below:

http://www.npketc.info/?p=325

UW Discovery Farms Publishes Practical On-Farm Conservation Tool

UW Discovery Farms

The walkover guide is a culmination of 60 farm walkovers on 15,000 acres in Wisconsin conducted by the program. Information gathered during the walkovers was used to identify field-specific areas of concern. During a follow-up farm visit, areas in need of improvement were identified and prioritized, and farmers were offered simple solutions for improving problem areas. The guide is based on common themes and feedback from these on-farm walkovers, as well as the 200 site years of data collected from Discovery Farms water quality monitoring.

“It’s about layering information,” explained Amber Radatz, co-director of the UW Discovery Farms program. “Our research on private Wisconsin farms has shown us that the months with the most runoff and soil loss are April through June. Combine that with the walkover information and you’ve got both the critical times for loss and the conditions that increase erosion risk during those times.”

“We hope this is a simple tool farmers can use when they’re out doing field work. We know that time and money are limiting factors and with that in mind we made sure our guide focused on solutions and assessments that wouldn’t take too much of either,” Radatz commented.

The document includes:

- Two decision trees to guide assessments of concentrated flow areas and in-field erosion
- Lessons learned from walkovers and 15 years of water quality monitoring
- What to consider when conducting your own field walkover
- Practical strategies for minimizing erosion risk

Find the Field Walkover Guide as an insert in upcoming issues of Agri-View, Wisconsin State Farmer, and The Country Today. It is also available online at www.uwdiscoveryfarms.org. If you would like a copy mailed to you contact Discovery Farms at 715.983.5668.

Crop Budget Analyzer

Ken Williams – UW-Extension-Waushara County

The decline in grain prices makes it essential for producers to accurately project the potential profitability of the crops they will plant in 2016. Production costs currently are around $500 to $550 per acre for unirrigated corn.
and up to $700 per acre for irrigated corn. Production costs for soybeans and winter wheat run around $300 to $350 per acre. The cost to seed an acre of alfalfa will tally up to around $600 per acre. These costs include a land charge of $75 per acre.

Enterprise budgets for grain crop production are increasingly important as the market price for grain crops and the cost for inputs to grow these crops continue to increase. While working with area grain producers there was a need expressed for a simple and concise way to compare the potential production costs and returns for various crops. These spreadsheets enable anyone to easily see the production cost and the potential return for corn, soybeans, winter wheat, seeding alfalfa and established alfalfa. Each spreadsheet is concise enough to print on a standard 8½ x 11 page of paper. How to use instructions are included. The producer is able to enter the cost per ton for the fertilizer he uses as well as the amount applied per acre. Seed cost is calculated by entering the cost per bag and the population being planted. There are pop up directions as the cursor is moved from cell to cell. Tillage costs are covered by using custom rates for each operation. The grower may change these rates and simply enter a 0 or a 1 or 2 to indicate which tillage he is using and how many passes. For harvest there is a harvest, drying and trucking charge included. A line is included for land cost whether it is owned or rented land. At the bottom of the spreadsheet the grower can enter his expected yield and the expected selling price. The corn and soybean sheets have a sensitivity analysis table which provides the producer with net returns for changes in costs of production and selling price for 10 and 20 percent above and below the indicated cost of production and the expected market returns. The key goal of this spreadsheet was to develop an understandable, easy to use spreadsheet to collect the major expenses in a crop production system. Producers have stated that they are concerned with covering their major costs while still being able to compare the potential returns from alternative crops.

This spreadsheet is posted and available for download from the UW-Extension, Waushara County website, http://waushara.uwex.edu/agriculture. Click on “Crop-Budget-Analyzer Feb 16_2016”. This spreadsheet has been used by producers, bankers, co-operatives, newspapers, technical school instructors and land conservation personnel from Wisconsin, Minnesota, Indiana, Arkansas and other neighboring states. For additional information or questions contact Ken Williams at ken.williams@ces.uwex.edu or 920-787-0416.
Controlling Rootworms Using Traits Plus Soil Applied Insecticides

Bryan Jensen
Entomology and IPM Program, UW Extension

I have been getting a few questions regarding the practice of controlling rootworms with a CRW traited hybrid plus a soil applied insecticide. First, I would like to suggest that this tactic would not be considered a resistance management tool. In general, using two effective modes of action can be a good way to manage resistance. However, in this situation, the soil applied insecticide is only an effective mode of action in a limited area at the base of the corn plant. It does not provide protection for roots that have grown outside the area influenced by the soil insecticide. Therefore, larvae feeding on those roots are exposed to a single mode of action and repeated use of the same, or similar protein, will continue to select for resistance.

Using CRW traited corn plus a soil insecticide may have economic value if you are planting into a field with verified high populations of rootworm adults in 2015. By “verified” I mean that detailed count(s) of adult beetles were completed during the 2015 egg-laying period and you had reason to believe excessively high beetle populations warranted a combination of control methods. While high beetle populations may be the case in a few fields around the state, it is definitely not the norm and certainly not consistent from field to field. This comment is supported by examining Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) whole plant count beetle surveys, Figure 1, and by reviewing the raw data graciously supplied by Krista Hamilton and her colleagues at WDATCP.

First, let me summarize the map. Overall, 229 fields were sampled. Only 58 of those fields had populations greater than the economic threshold of 0.75 beetles/plant, indicated by red dots on the map. Of those 58 fields, only 8 fields were higher than 3.0 beetles/plant. I am not implying that fields with greater than 3.0 beetles/plant are considered high, but just trying to indicate the distribution of field averages within that category are at the lower end of WDATCP’s scale. Furthermore, 12 fields had an average between 2.0-2.9 beetles/plant, 15 fields were between 1.0-1.9 beetles/plant and the remaining 23 fields were between 0.8-0.9. Of the remaining 171 fields with sub economic populations, 25 fields were in the 0.5-0.7 beetles/plant (yellow dots), 78 fields were in the 0.1-0.4 beetles/plant (green dots) and the remaining 68 fields (black dots) did not observe any corn rootworm beetles.

WDATCP’s data offers a unique snapshot of 2015 beetle populations in Wisconsin.
counts across the state and is not intended to provide field level control recommendations. However, it does demonstrations the variability of rootworm counts and that a routine recommendation of traited hybrids plus a soil-applied insecticides is not always justified. If you are unsure of the validity of individual field recommendation this growing season, please consider leaving random check strips of either 1) CRW traited corn only or 2) CRW traited corn + soil applied insecticide depending on your decision. Follow up with assessment of root damage in July/early August. For help in assessing root damage, please click the YouTube video link below:

For 2016, the best option to accurately identify management options in continuous corn is to count beetles and base your recommendations on those counts. This field level data will help you choose appropriate recommendation for individual fields. For help scouting beetles, again please click the YouTube video link below:

To view a map of the 2015 Corn Rootworm Beetle Survey Results, please refer to Figure 1.

**Figure 1:**

Source:

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**Chuck Bolte: 2016 WI CCA of the Year**

Bryan Jensen
UW IPM Program

Please join the WI CCA Board in welcoming Chuck Bolte as the 2016 Wisconsin CCA of the Year! Chuck is currently working for AgSource Laboratories, Bonduel, WI and has over 20 years of agricultural work experience. Including 15 years of CCA status from Minnesota or Wisconsin. He also holds the 4R NPM specialty certification.

Chuck’s background includes internships with Pest Pro’s and Jefferson County Land Conservation, a degree from UW Stevens Point which led to fulltime employment at the Richland County Land Conservation Office. A one-
year tour of duty in Iraq ended with a job switch to the Frito Lay Research Station at Rhinelander, WI where he was involved with several areas of research including potato breeding and field trials for chipping potential. Chuck has work for AgSource since 1996 and is currently the manager for the precision agriculture and nutrient management division.

In addition to his normal workload which includes, but certainly not limited to, nutrient management, cover crops and the use of aerial imagery to plan management zones and to write VRT recs for lime and potash, he has been actively involved with writing grants and working with farmer led watershed projects.

Chuck’s volunteer service includes the Langlade County Breakfast on the Farm, Women in the Outdoors, mentoring youth hunts, high school career day speaker, membership and committee service with the Wisconsin Association of Professional Agricultural Consultants and a Farm Bureau Member.

Many thanks to Steve Peterson for initiating Chuck’s nomination as well as Bill Page, Tim Boerner, Mary Fronek and Paul Sturgis for their letters of support.

Congratulations Chuck!

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**2015 Corn Herbicide Evaluation Program Results**

Mark Renz, Agronomy Department, University of Wisconsin-Madison, University of Wisconsin Extension

Dave Stoltenberg, Agronomy Department, University of Wisconsin-Madison

Evaluation of new and existing herbicides for use in corn has annually occurred in Wisconsin for over 30 years. This program continues to compare effectiveness of weed control of herbicides applied at a range of timings and rates. In many cases crop safety and yield are also evaluated. 2015 corn herbicide results are now summarized and available (see below for details).

Research was conducted at Arlington Agricultural Research Station (2 trials) and Rock County farms in Janesville Wisconsin (4 trials). Please click on the Trial ID link for a pdf of the application information and summarized results. Note that values are an average of four replications. Standard deviations are also provided as often responses (e.g. weed control, crop yield) to any treatment can vary within a trial. Consider this variability in addition to average values when comparing treatments.

**Location (Trial ID link): Herbicides Evaluated**

Arlington (15-ARL-CN01): Anthem Maxx, Hornet, Durango, Dual II Magnum, Roundup, Sharpen, Solstice, Surestart, Zemax, Verdict

Arlington (15-ARL-CN02): Anthem Maxx, Armezon, Cadet, Capreno, Diflexx, Durango, GF-3471, Harness, Impact, Laudis, Liberty, Outlook, Roundup, Sharpen, Solstice, Status, Surestart II, Verdict, Zemax, Zidua

Janesville (15-ROK-CN03): A20540, Acuron, Atrazine, Capreno, Instigate, Mesotrione, Parallel, Rimsulfuron, Surestart II, Verdict

Janesville (15-ROK-CN04): Acuron, Anthem ATZ, Atrazine, BAS 67703H, Harness XTRA, Lexar EZ, Lumax EZ, Roundup, Verdict, Sharpen, Surestart II, Zemax, Zidua

Janesville (15-ROK-CN05): Anthem ATZ, Armezon, Atrazine, BAS 67703H, Callisto XTRA, Caprino, Dual II Magnum, Halex GT, Laudis, Outlook, Roundup, Status, Verdict, Zidua

Janesville (15-ROK-CN06): Aatrex, Halex GT, Harness, Impact, Roundup, Status

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**NOTE:** Any information presented here is NOT an endorsement or recommendation of any one product over another. Some treatments may not be legal for use in parts of Wisconsin or beyond. Please read the label carefully and follow the directions provided on the label.
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 19, 2016 through March 25, 2016.

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

**Specialty Crops**
- Hop, Carlavirus, *Unidentified carlavirus*, Dane/Polk

**Soil**
- Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Dane

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

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**Wisconsin Soybean Marketing Board Continues Free Nematode Testing Program for 2016**

Shawn P. Conley, Soybean and Wheat Extension Specialist, Department of Agronomy

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](mailto:freescntest@mailplus.wisc.edu) 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 2016, 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](mailto:freescntest@mailplus.wisc.edu).

For more information on [SCN testing and management practices](mailto:spconley@wisc.edu) to help reduce the losses from this pest, please contact: Shawn Conley: [spconley@wisc.edu](mailto:spconley@wisc.edu); 608-262-
Remember: The first step in fixing a nematode problem is to know if you have one! The WSMB sponsored nematode testing program provides you that opportunity.
Soybean Planting Date and Maturity Group Considerations for 2016

Shawn P. Conley, Soybean and Wheat Extension Specialist, Department of Agronomy

Early May planting in Wisconsin has been documented to increase 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. 2015 provided many WI growers with a longer than normal growing season due to favorable early spring planting condition and a later than normal fall frost. Yet, in some instances (weather or logistical problems) planting can be delayed or replanting may be needed. Therefore, investigating the effect of different MG's at multiple planting dates across the state would be useful. Thus, DuPont Pioneer and the Wisconsin Soybean Marketing Board have funded a 3-year study to examine proper MG selection at 5 different planting dates across the state to maximize yield. To read more about this study, please click the link below:

http://thesoyreport.blogspot.com

2015 Soybeans Herbicide Evaluation Program Results Now Available

Mark Renz and Dave Stoltenberg
Agronomy Department, University of Wisconsin-Madison; University of Wisconsin Extension

Evaluation of new and existing herbicides for use in soybeans has annually occurred in Wisconsin for over 30 years. This program continues to compare effectiveness of weed control of herbicides applied at a range of timings and rates. In many cases crop safety and yield are also evaluated. 2015 soybean herbicide results are now summarized and available (see below for details).

Research was conducted at Arlington Agricultural Research Station (2 trials). Please click on the Trial ID link for a pdf of the application information and summarized results. Note that values are an average of four replications. Standard deviations are also provided as often responses (e.g. weed control, crop yield) to any treatment can vary within a trial. Consider this variability in addition to average values when comparing treatments.
Slugs have a “rasp-like” mouthpart and damage plants by scraping off leaf tissue. On corn, feed scars are usually linear in appearance. The upper or lower cuticle may remain intact causing a “window-pane” effect. Eventually the cuticle will weather away and leave linear holes in the leaf. Feeding on soybean can be more severe because slugs will feed completely through the cotyledon and/or hypocotyl causing severe stand reduction.

Slugs require a cool, moist habitat to survive which is why they are primarily a pest in no-till conditions. Prevention, in the form of habitat disruption, can significantly control slugs and manage future populations. During the 2016 planting season, anything you can do to bury residue will help...assuming it is compliant with conservation plans and other erosion concerns. People have also had success using strip-till but effective residue within the row is important.

Planting date can also impact slug damage. Early planting into areas of known slug activity can give the crop a head start because older plants are less susceptible to slug feeding. If the cropping rotation allows, switching to corn may provide added benefits because corn’s growing point is located below ground until V6. The growing point of soybean is above ground after emergence and therefore significantly more susceptible to early season feeding. Regardless of crop, make sure the seed furrow is completely closed or slug feeding may result in higher stand loss, even in corn. Additionally, an open seed furrow provides additional habitat beneficial for slug survival.

Insecticides will not control slugs. Either they are non-toxic if ingested or because of the slug’s ability to produce slime making the contact insecticides ineffective. Attempting to try insecticides is likely to increase slug damage because those products kill non-target beneficial insects like ground beetles. Anecdotal information suggests that high salt fertilizer applied at night may work. However, this control tactic is not based on sound science, is not always effective and these fertilizers may be phytotoxic to plants.

Mollusicides applied as a bait can be an effective rescue treatment but should not be relied on as the only control tactic. Because of the low commodity prices in 2016, economics will be a primary concern. Spot applying to problem area may make baits more feasible. Products that include the active ingredients metaldehyde (corn only), sodium ferric EDTA and iron phosphate are labeled. Follow labeled use rates and make sure the product is distributed evenly throughout the treated area.
Corn Agronomy: Do farmer acreage intentions predict actual planted acres?

Last Thursday USDA-NASS came out with crop plating intentions for the U.S. This report along with the ending stocks report dramatically influences markets. Last week was no exception with market prices decreasing with the news that 2016 corn acreage intentions were up 6% and soybean acreage intentions were down 1% from 2015 planted acres. Nationally, ending stocks were up 1% for corn and up 15% for soybean.

The acreage intentions report can influence the crop rotation decision for a field, especially for corn. I was curious as to how well the acreage intentions report reflected actual planted acres, so I collected data back to 1975 for every state that produces corn and compared acreage intentions with planted acres for the year. The results are shown in Figure 1.

![Figure 1. Spring Acreage Intentions, Planted Acreage and the Relative difference (%) for Corn and Soybean in the US and WI.](image)

With the exception of 1983 and to some extent, 1993 and 1995, acreage intentions have accurately predicted planted acres within 5%. There are as many years over-predicted as under-predicted. For the 40-year period, there was a 3% standard deviation between intended and planted acres for corn and soybeans. In WI, which is typical of northern Corn Belt states, there was wider standard deviation (corn = 5%, while soybean = 11%) indicating weather impacts on acreage decisions as the planting season progresses.

Corn Agronomy: Looking ahead to 2016: The Economics

This spring farmers have been slow to make decisions on a number of inputs. Reluctance has largely been due to weather concerns and economics. The acreage intentions report last week did not help. Corn and soybean prices immediately decreased.

The USDA-ERS has been collecting cost of production (COP) data since 1975. These costs are based on the actual costs incurred by producers. A base survey is conducted every five years. The annual Agricultural Resource Management Survey (ARMS) has been used to modify the survey base since 1996. These costs of production excludes costs for marketing and storage. ARMS data collection starts during the fall when production practice and cost data are collected, and finishes in the spring when a follow-up interview collects data about whole-farm costs like overhead, interest, and taxes. New data becomes available every May. Each farm sampled in the ARMS represents a known number of farms with similar attributes so that weighting the data for each farm by the number of farms it represents provides a basis for calculating estimates. The country is divided into 9 regions. Wisconsin is part of the Northern Crescent region. Many of the Corn Belt states are in the Heartland region. To read the full article, please follow the link below:

http://wisccorn.blogspot.com/2016/04/B067.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+blogspot%2FmbfLa+%28Corn+Agronomy%29

Soybean Management Strategies to Facilitate Timely Winter Wheat Establishment in 2016

Shawn P. Conley
Soybean and Wheat Extension Specialist, Department of Agronomy

Winter wheat acres across WI have declined over the past few years due to high corn and soybean prices and late grain harvests, however current economic realities suggest an opportunity for increased wheat acres moving forward. As farmers get ready to kick off the 2016 growing season, please follow the link below to read about a few suggestions to help get your 2016/17 winter wheat
crop established on time.


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

Brian Hudelson, Sean Toporek, 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 March 26, 2016 through April 1, 2016.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialty Crops</td>
</tr>
<tr>
<td>Hop, Apple mosaic, <em>Apple mosaic virus</em>, Dane</td>
</tr>
<tr>
<td>Hop, Carlavirus, <em>Unidentified carlavirus</em>, Dane</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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**No Silver Bullets in Crop Production**

Richard Halopka, CCA
Clark County UW-Extension Crops & Soils Agent

Media has dramatized the quick solution to any ailment you may have. If you have a pain, a condition, are overweight, etc. there is a pill or remedy that has cured thousands of people. The interesting fact is that during the few moments you view an advertisement you never see any true non-biased research supporting the product. People provide a testimonial of how their lives improved since using the product. Remember, there are no silver bullets to solve any problem. Silver bullets are only useful if you fear werewolves.

Both high and low commodity prices will provide an upswing in the promotion of silver bullet products for crop production. How can a farmer wade through information to determine if a product will provide a return on investment? Remember, if you invest in a product, it must be worth the investment.

As the farm’s manager you must ask questions. There are many agronomist and salespersons traveling the side roads selling products. First, what is the definition of an agronomist? A certified crop advisor (CCA) is an agronomist with formal education in agronomy. CCAs are required to pass an exam, then sign a code of ethics, much like a doctor or lawyer and attend classes for continuing education credits each year. Agronomy salespeople may have agronomy training or they are simply given products and sent out to sell.

An agronomist’s approach to a problem will begin by asking questions and then determining if a product may provide benefits. A salesperson may not ask questions and will promote a product that may or may not be of interest to the farmer.

Farmers must weigh recommended best management practices (BMP), versus the quick fix of applying a product to correct a problem in a field. In weight loss, the tried and true methods are the best option: reduced calorie intake and increased physical activity, despite many fad claims. The same concept can be applied in a field: while continuing BMP requires a greater period of time, BMP also provide benefits into the future.

How can a farmer distinguish the difference between BMP or a silver bullet product? First ask questions. Agronomist will be able to provide answers and point out reasons why they recommended a product or management practice on your farm. A salesperson interested in selling a product may respond with reasons why you must purchase the product. The agronomist will provide research evidence why a practice or product is recommended. A sales rep will provide testimonials from farmers who made an investment in the product with no research evidence that the product provided a return on investment.

Testimonials are comments from farmers who purchased the product. They testify the product was effective. Remember, research is done by a non-biased third party, who has no reward from the outcome of the research. Testimonials are not research. They are opinion, with no data to support the claim of how a product will improve the farmer’s finances.

So how can a farmer evaluate what is research proven compared to a testimonial product? Read the label, ask the agronomist or sales rep questions, and call your county Extension agent, and ask, “How will the product improve the problem in the field?”

Frustration, on the farmer’s part, will set in when you hear that the cost is only $5.00 per acre and the sales rep assures you the product works without providing supporting data. A check is written out, the product is applied and the farmer is not satisfied.

Remember, once the check leaves your farm the product...
must perform. Salespeople, promoting silver bullet products, may not be looking for repeat sales. As the farm’s manager, you MUST ask questions and understand what the product is and how it improves crop production.

Bottom line, in today’s world there are many sources to gather research evidence. If a product is worth considering it has been researched at multiple locations and printed data will be available. The summary of the research will prove if a product was effective and if it provided a return on investment. Remember, if it sounds too good to be true it probably is. Quick fixes are generally not long term solutions, and a product used in a field will not replace best management practices.

From research, silver bullets are only effective if you fear and want to control werewolves. If you want to be profitable in crop production, focus on best management practices, know your cost of production; focus on the basics that will provide the greatest return, short and long term, scout your fields during the growing season, and implement a practice when it is economical.

Richard Halopka contact information: richard.halopka@ces.uwex.edu
Introducing the Wisconsin Fruit Website and Newsletter

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

We are very excited to announce that we have just launched our updated Wisconsin Fruit website, which you can find at http://fruit.wisc.edu! This site is divided into sections focusing on berry crops, cranberries, grapes, and tree fruit, and offers a one-stop spot where commercial fruit growers and home gardeners can access links to the most recent management recommendations, pest alerts, and research findings from UW faculties. In this way, it is meant to provide a first step toward finding the answer to any questions you might have about Wisconsin fruit production. In order to make the website more convenient for you to use, we’re working on making it easily accessible through your mobile devices. Over the next couple of months, we will be making the website friendlier to view on smartphones and tablets.

Along with the Wisconsin Fruit website, we are also starting up the Wisconsin Fruit News, a newsletter on fruit production, with the first issue to come out on April 18th. The Wisconsin Fruit News will be issued every other week during the summer, and will contain scouting reports, plant development reports, pest and disease management research updates, and other information pertaining to Wisconsin fruit production. Each issue will be divided into six sections: General Information, Berry Crops, Cranberries, Grapes, Tree Fruits, and an Upcoming Events Calendar.

If you would like a pdf of the newsletter to be delivered directly to your email inbox every other week, you can subscribe on our website! Simply go to http://fruit.wisc.edu and enter your email address on the right hand bar where it says “Sign up for our newsletter!”

In addition, you are now able to link the Wisconsin Fruit updates and newsletters to the IPM Toolkit application, which was created through the University of Wisconsin’s Integrated Pest and Crop Management program (http://ipcm.wisc.edu/apps/ipmtoolkit/). Just download the app, then enter our RSS newsfeed URL (http://fruit.wisc.28
edufeed), and you will be able to immediately see our most recent posts and to access the newsletters on your phone.

These are screenshots of the IPM Toolkit mobile app being used to add this newsletter feed. On the News Feed screen we started by tapping on the “+” in the upper right area. Then we added in the URL as seen below.

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**New CCA’s!!**

Bryan Jensen
UW Extension

On behalf of the WI CCA Board, let’s welcome and congratulate the new CCAs certified in 2015. Please take a minute to review the list and call or send your compliments on a job well done.

Cheers!

**Wisconsin CCA’s Achieving Certification in 2015:**

- Eric Bechel (Durand)
- Ross Bender (Cleveland)
- Eric Bertram (Appleton)
- Jon Biermeier (Rio)
- Mimi Broeske (Madison)
- Tyler Bushmaker (Green Bay)
- Jason Cavadini (Marshfield)
- Troy Christenson (Hustisford)
- Alexander Clark (Mazomanie)
- Cheryl Cornell (Lost Nation, IA)
- Paul Davidson (Watertown)
- Laura Good (Madison)
- Corey Haas (Belmont)
- Craig Harmann (Algoma)
- Clint Hodorff (Iola)
- Brian Huiras (West Bend)
- Bekka Lee (Belmont)
- Parker Ludeking (Oconomowoc)
- David Marburger (Madison)
- Nicholas Peltier (Denmark)
- Daniel Peterson (West Bend)
- Nicholas Peterson (Clear Lake, MN)
- Matthew Repking (Wausau)
- Jeremy Richards (Mazomanie)
- Abby Rotering (Arcadia)
- Jacob Standal (Elkhorn)
- Joseph Szczepanski (Merrill)
- Tricia Verville (Wautoma)
- Albert Vogt (Hazel Green)
- Gregg Weaver (Verona)
- Matthew Wichman (Manawa)
- Jody Wilhelm (Fall Creek)
- Miranda Yoose (Plover)
- Kellie Zahn (Marion)

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**20 Year Milestone for Wisconsin CCA’s**

Bryan Jensen
UW Extension

While time may fly, 20 years is still a very important achievement for these WI CCA’s. Please take time to review the list of WI CCA’s who have recently reached their 20 year anniversary. Give them a call or send an email congratulating them on their 20 year commitment to Wisconsin agriculture and the CCA Program.
Wisconsin CCA’s Achieving Their 20 Year Anniversary in 2016:

Steven Austin (Belmont)
Jeffry Breuer (Arlington)
Eric Clark (Madison)
Dennis Deitelhoff (Galesville)
Dennis Gunderson (Independence)
Scott Hendrickson (Manitowoc)
Kevin Hoyer (West Salem)
Bradley Dean Hurda (Cashton)
Robert Klink (Arlington)
Matthew Luther (Marshfield)
John Swehla (Sumner)
James Turner (Waunakee)
Mike Vollrath (Fitchburg)

Do Crop Rotation and Tillage Influence Seed-applied Inoculant Decisions?

David Marburger, Spyridon Mourtzinis, John Gaska, & Shawn Conley, Department of Agronomy, UW-Madison

Soybean has the unique ability to form a symbiotic relationship with a soil bacterium, Bradyrhizobium japonicum. This relationship results in biological nitrogen fixation, a process in which atmospheric nitrogen (N) is converted to plant-available N in exchange for photosynthetically derived carbon. Because of this symbiotic relationship, soybean growers typically do not apply N fertilizer, but will apply inoculants containing B. japonicum on or near the seed to ensure that adequate bacterial infection and subsequent biological nitrogen fixation can occur (Schulz and Thelen, 2008). Current university recommendations suggest using inoculants when planting in fields with no previous history of soybean, where soybean has not been planted in the last 3 to 5 years, for soils with pH <6.0, and for sandy texture soils (i.e., low organic matter soils) (Pedersen, 2004; Abdurrah et al., 2006). Although much work has examined soybean yield response to inoculant use in fields with or without a previous history of soybean, there is a general lack of information examining inoculant use under different crop rotations and tillage systems. Our objective was to measure soybean yield response to seed-applied inoculants as influenced by crop rotation and tillage system.

Field trials were conducted from 2009 through 2011 within a long-term corn-soybean rotation study established in 1983 near Arlington, WI. This study contains two tillage systems: conventional and no-till. Conventional tillage was accomplished with one pass of a chisel plow in the fall and two passes with a field cultivator in the spring before planting. Within each tillage system, there are seven crop rotations containing soybean: continuous soybean (SS); soybean rotated annually with corn (SC); first-year soybean after 5 consecutive years of corn (1S); and two (2S), three (3S), four (4S), and 5 years (5S) of continuous soybean after 5 years of corn. Finally, within each crop rotation, there were three seed-applied rhizobia inoculant treatments: a non-treated control; Optimize Soybean (contains B. japonicum); and Excalibre (contains B. japonicum and B. elkanii). To view the results of the study and read the full article, please follow the link below:


Wisconsin Winter Wheat Disease Update – April 13, 2016

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Brian D. Mueller, Graduate Research Assistant, University of Wisconsin-Madison

Winter wheat in southern and south central Wisconsin was scouted on April 7 and 8, 2016 by the Wisconsin Field Crops Pathology research and extension crew. Locations of scouting included Sharon, Wisconsin near the Illinois border and Arlington, Wisconsin north of Madison. At both locations Septoria leaf blotch was observed on young, tillering winter wheat plants (Fig. 1). Septoria leaf blotch is caused by the fungus Septoria tritici. Typically this pathogen isn’t identified on wheat in Wisconsin until closer to flag leaf emergence. The presence of the pathogen this early in the season is likely due to the mild, wet conditions we have had this spring. Other common leaf blotch disease can be caused by other fungi such as Stagnospora nodorum or Stagnospora avenae f. sp. tritici. However, in Wisconsin the most common causal agent of leaf blotch is Septoria tritici. Septoria leaf blotch can often be diagnosed based on the presence of darkly pigmented fruiting bodies (Fig. 2) that exude gelatinous spore masses when incubated in a humidity chamber (Fig. 3). To definitely differentiate this fungus from Stag-
nospora nodorum, however, spores need to be examined microscopically in the UW Diagnostic Clinic. For information on how to submit samples, [CLICK HERE](#). For more information on leaf blotch diseases of winter wheat in Wisconsin and management of these diseases, [CLICK HERE TO DOWNLOAD AN EXTENSION FACT SHEET](#).

Figure 1. Septoria leaf blotch on a young winter wheat plant.

Figure 2. Fruiting bodies of the Septoria fungus on winter wheat leaves.

Under the current conditions this season, a fungicide application **IS NOT** recommended as the pressure is low and little yield loss would be expected from a light epidemic early in the season. However, growers and consultants should scout fields and monitor the situation carefully. Should conditions continue to be mild and wet, disease may increase and require the application of fungicide to manage the disease. Past research in Wisconsin has demonstrated little need for application of fungicide prior to flag leaf emergence (Feekes 8 growth stage). In 2013, a significant epidemic of Septoria leaf blotch was present in a fungicide trial on winter wheat located in Arlington, Wisconsin. In that trial, the fungus that causes Septoria leaf blotch was active around the same time as noted this season. Application of fungicide at the Feekes 5 growth stage resulted in just marginal control of Septoria leaf blotch. To review the results of this trial, [CLICK ON THIS LINK](#), and scroll to down to pages 9 and 10.

Figure 3. Gelatinous spore masses exuding from fruiting bodies of the Septoria fungus.

At all locations no stripe rust was observed. However, given recent reports of stripe rust occurring in locations in the Southern and central U.S., winter wheat growers should pay close attention to this disease. For more information about stripe rust and stripe rust management please check out our previous post from 2015 located by [CLICKING HERE](#).

Be sure to check back to the blog frequently for winter wheat disease updates in 2016!
UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Sean Toporek, 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 April 2, 2016 through April 8, 2016.

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

**Soil**
Soybean Soil, 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).
Using High-Input Systems for Soybean Management Increases Yield but Not Profitability

Shawn P. Conley, Department of Agronomy, University of Wisconsin-Madison

Increased soybean commodity prices in the last 10 years have generated interest in developing high-input systems to increase yield. However, little peer-reviewed information exists about the effects of input-intensive, high-yield management on soybean yield and profitability, as well as their interactions with basic agronomic practices.

In 2009, the United Soybean Board funded a study called the “Kitchen Sink Project” to begin examining some of these questions. The research was conducted in six states (Arkansas, Iowa, Kentucky, Louisiana, Michigan, and Minnesota) from 2009 to 2011. While there were several projects within this study, one of the main projects focused on row spacing and a “kitchen sink” approach to input use. The “kitchen sink” treatment included additional soil-applied fertilizer, seed treatment fungicides and insecticide, seed-applied inoculant, foliar fertilizer, and foliar fungicide. To read more about the “kitchen sink” project and others, please follow the link below:


Winter Wheat and Alfalfa Disease Management Videos

Damon Smith, Wisconsin Extension Field Crops Plant Pathologist

If you would like to view the winter wheat and alfalfa disease management videos, please click the videos below:

Damon Smith, Wisconsin Extension Field Crops Plant Pathologist, talks about in-season fungicide use on winter wheat. He also talks about the three key crop development stages for scouting wheat fields:
Wisconsin Fruit News: Volume 1 Issue 1 – April 18, 2016

Introducing the Wisconsin Fruit Newsletter

Janet van Zoeren, Christelle Guédot, and Amaya Atucha

Welcome to the first installment of the Wisconsin Fruit News! This bi-weekly installment will allow us to highlight research regarding our state’s fruit crops, inform you of worrisome new pest alerts, and discuss upcoming events and opportunities. Each issue will be divided into six main sections: General Information, Berry Crops, Cranberries, Grapes, Tree Fruits, and a Calendar of Upcoming Events. The General Information section will contain pest alerts and other information pertinent to all fruit crop growers. For example, in two weeks there will be an article reminding everyone how to calculate and use growing degree days on your farm. The sections pertaining to each of our key fruit crops in Wisconsin (Berry Crops, Cranberries, Grapes, and Tree Fruits) will report more in-depth on plant development, insect pests and diseases, recent research and other information relevant specifically to each of these fruit crop groups. The last section of each newsletter will be a Calendar of Events for the upcoming months. Be sure to check that out and stay informed of upcoming workshops, grower meetings, conferences, and other opportunities.

The newsletter will also be posted onto our Wisconsin Fruit website, available at www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day. Additionally, you will also able to view our newsletter through the IPM Toolkit application, which was created through the University of Wisconsin’s Integrated Pest and Crop Management program (http://ipcm.wisc.edu/apps/ipmtoolkit/). Simply download the app, and enter our RSS newsfeed URL (http://fruit.wisc.edu/feed).

To view the full newsletter, please follow the link below: https://fruit.wisc.edu/wp-content/uploads/sites/36/2016/04/WFN-v1i1-April18-2016.pdf

Enjoy!

Corn Agronomy – Looking ahead to 2016: Plant density decisions

I have been receiving many questions this year regarding the “correct” plant density for corn. Growers are concerned about 2016 production economics and one input they are looking at is seeding costs related to plant density in the field. The optimum plant density is influenced by both seed cost and grain price. As seed costs increase and/or grain price decreases the “correct” plant density shifts lower.

Every year since 1982, plant densities have been increasing by about 300 plants/A. Seed costs during the 1980s were about $20/A and plant densities were a little over 20,000 plants/A. Today seed costs are over $100/A with USDA-NASS plant densities around 30,000 plants/A. Today a typical 80,000 (80K) count bag of seed costs $300/bag, so each 1000 plant/A adjustment means $3.75/A.

The best way to approach the decision to determine the “correct” plant density for a field is to find the plant density where the maximum yield (MYPD) occurs. Figure 1 shows 10-yrs of data from Arlington experiments that tested corn grain and silage response to harvested plant density. In this example, the grain MYPD occurs at about 39K. The economic optimum (EOPD) is about 4K to 5K less than the MYPD. However, you can be within 95% of MY at about 29K indicating how “broad shouldered” the plant density response is (a 10K swing = $37.50/A at $300/80K bag). When the cost of production and ultimate economics are not favorable like this year, you may want to think hard about going after MY, but make sure you are above 29K.

On the silage side it is more difficult to find the EOPD. I have always approached the silage EOPD from the Milk per Acre measure, but that does not take into account seed costs. So in the attached example, Milk per Acre is maximized at 45K. I would think that you need to sub-
tract 4K to 5K to get at the silage EOPD. It will fluctuate widely with milk price and given the outlook for this year you may want to lower the plant density 8K to 10K. Again you are still within 95% of maximum Milk per Acre above 29K.

Figure 1. Relationship between corn plant density and grain yield, economic optimum, forage yield, Milk/Ton, and Milk/Acre. Data are derived from Arlington during 2005 to 2014.

Every hybrid and every field likely has different MYPD and EOPD values. Breeders are constantly improving standability of corn hybrids, so the MYPD has been increasing every year by about 400 plants/A. In addition, environment and management style will influence these values (i.e. drought versus a normal year). This relationship indicates the ability of the corn plant to compensate for discrepancies in plant density, but it is highly influenced by grain/silage/milk prices and input costs. It also says a few things about the implications of variable rate seeding.

**Corn Agronomy – Looking ahead to 2016: Planting date decisions**

We started planting corn on April 14. Recent planting progress statistics from USDA-NASS indicate that corn planting is progressing slowly in the northern Corn Belt. Only 1% of corn acres had been planted in Wisconsin as of April 17.

The date that produces maximum corn grain yield varies by field, tillage practice, hybrid and latitude. Every year since 1991 we have established a planting date experiment at Arlington, WI. On this farm, if you could plant all of your corn on one date and wanted to maximize yield, then the best date would be May 1 (Figure 1). As expected, we have observed a step increase for yield every decade. However, the maximum yield planting date has not shifted much (April 28 to May 4). The economic optimum is going to be earlier than these dates, because typically earlier planted corn is drier at harvest. The planting date “window” when we can be within 95% of the maximum yield is between April 18 and May 16. Grain yield decreases 0.5 bu/A per day on May 15 and accelerates to 2.5 bu/A per day on June 1.

For southern Wisconsin we typically recommend to begin planting anytime after April 20 as long as field conditions are fit. For northern Wisconsin anytime after April 30 is appropriate. Soil temperature is not a consideration after these dates. However, we do pay attention to the short-term weather forecast. If cold, wet conditions within 48 to 72 hours of planting are predicted, it is prudent to wait until weather is more favorable. We lost trials at Seymour and Fond du Lac in 2006 when we planted ahead of a snow storm; the only corn that survived was over the drain field. This phenomenon is called imbibitional chilling. There is not a lot of field data to support this practice and it has only happened to us twice over the last 20 years. The challenge as to when to begin planting, is what to do between April 10 when insurance coverage starts and the typical April 20 (southern) and April 30 (northern) start dates. Soil temperature is a good guide during this period. Corn doesn’t grow much when temperatures fall below 50 degrees F.

Vegetable Crop Update April 15, 2016

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

The 3rd issue of the Vegetable Crop Update is now available. Click on the link below to view this update.


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

Brian Hudelson, Sean Toporek, 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 April 9, 2016 through April 15, 2016.

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

Soil
Alfalfa Soil, Aphanomyces Seedling Blight, *Aphanomyces euteiches race 2*, Lafayette
Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Dane

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

Follow us on

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WCM-36
Termination of Winter Rye and Annual Ryegrass Using Glyphosate

Daniel H. Smith, Nutrient and Pest Management Program
Mark Renz, Weed Science Extension Specialist, Department of Agronomy,
University of Wisconsin-Madison

Termination of winter rye and annual ryegrass using glyphosate can be a challenge. A recent study at Arlington Agriculture Research Station evaluated glyphosate rates and timings for terminating winter rye and annual ryegrass. A second study was done to evaluate termination using forage harvest techniques. As farmers and agronomists terminate these cover crops, please refer to the end of the newsletter to read the full article detailing the study with termination recommendations.

Considerations for Downy Mildew Control in Wisconsin Hop Production, 2016

Amanda J. Gevens, Extension Plant Pathologist, University of Wisconsin-Madison
Contact info: gevens@wisc.edu, cell phone: 608-575-3029; and Michelle E. Marks, Graduate Research Assistant, University of Wisconsin-Madison Plant Pathology.

Downy mildew has been detected in Pepin County on April 20, 2016. Pale green, malformed spikes were observed with pathogen sporulation on leaf undersides in a commercial hop yards. This pathogen is likely systemic in many hop yards, meaning that the pathogen is inside the rhizomes and can ‘awaken’ when spikes emerge in the spring. As such, fungicides are important for early season control of this pathogen so as to limit the amount of initial inoculum that can become available to the developing crop as the season progresses. To view the full article about downy mildew control, please follow the link below:


Vegetable Crop Update April 22, 2016

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

The 4th issue of the Vegetable Crop Update is now available. Click on the link below to view this update:

WCM-38

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

Brian Hudelson, Sean Toporek, 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 April 16, 2016 through April 22, 2016.

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

**Soil**

Soybean Soil, 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).

Wisconsin Pest Bulletin: Volume 61 Number 1 April 28, 2016

**This Week’s Weather & Pests**

Wisconsin Department of Agriculture, Trade & Consumer Protection

Brisk, showery weather prevailed across the state during the final week of April. After last week’s warm spell, temperatures on April 25 declined abruptly and chilly conditions persisted throughout the week. Highs ranged from the lower 40s to upper 50s, about 5-10 degrees below normal for this time of year. Lows were in the upper 20s to lower 40s. Seasonal showers provided timely precipitation for corn planting and maintained mostly adequate soil moisture levels, but fieldwork stalled as the cold snap and periods of light rain slowed planting progress made last week. Corn planting was 10% complete by April 24, three days ahead of last year, and four days ahead of the five-year average. Despite the unfavorable weather, Wisconsin growers are optimistic about prospects for the 2016 growing season after a mild winter and an unusually warm March. Significant planting of corn, oats and potatoes is expected once spring temperatures moderate next week. To view the full issue, please follow the link below:

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

Follow us on
Termination of winter rye and annual ryegrass using glyphosate

Daniel H. Smith, Nutrient and Pest Management Program and Mark Renz, Weed Science Extension Specialist, Department of Agronomy, University of Wisconsin-Madison

Farmers and agronomists agree that terminating cover crops with glyphosate can be challenging. When termination fails, the cover crop becomes a weed that can reduce quality and yield in the following crop. Due to these concerns, experiments were established to evaluate the termination of the most common cover crops — annual ryegrass and winter rye — using two glyphosate rates and three timings.

Wisconsin dairy farms also use winter rye and annual ryegrass as a forage crop and terminate with glyphosate following harvest. See the other side of this page for a second study that evaluates the termination of winter rye and annual ryegrass utilized as a spring forage crop.

Wisconsin research trial

Field experiments were conducted at the University of Wisconsin Arlington Agricultural Research Station from 2013-15. Plots were planted into corn after silage harvest in early September. The cover crops were no-till seeded perpendicular to the harvested corn rows in the second week of September. In the spring, percent cover estimates and dry biomass weights were collected two weeks after treatments were applied.

Cover crop varieties planted

- ‘Guardian’ winter rye — seeding rate of 120 lb/acre @ 1” deep
- ‘Gulf’ annual ryegrass
- ‘Bruiser’ annual ryegrass — seeding rate 32 lb/acre @ 1” deep
- ‘King’ annual ryegrass

Termination timing

- mid-May ..........ryegrass (9 inches) .............winter rye (Feekes 9) 8 days
- late May ...........ryegrass (12 inches) ..........winter rye (Feekes 10) 6 days
- early June .........ryegrass (22 inches) ..........winter rye (Feekes 10.5.2)

Termination treatments

All applications occurred under dry, active growing conditions in the mid- to late afternoon, with mid- to full sun, 70-86°F air temperatures and 1-7.5 mph wind speeds.

- glyphosate 16 fl oz @ 4.5 lb acid equivalent per gallon of glyphosate with ammonium sulfate @ 17 lb /100 gallons of spray solution applied @ 15 gallons/acre
- glyphosate 32 fl oz
- non-treated control
Results

annual ryegrass

2013 plantings results are reported, the 2014's planting winter-killed.

- All three timings had successful termination on the three varieties.
  Although differences were detected among varieties, they were all considered successfully terminated (>95% reduction in green cover).

- Both glyphosate rates resulted in termination.

  Table 1 shows that both treatments had greater than 95% reductions, indicating successful termination two weeks after treatment. Visual assessment three weeks after applications confirmed successful termination (100% reduction in green cover) of all annual ryegrass populations.

winter rye

- Termination in late May (Feekes 10) and early June (Feekes 10.5.2) were both successful two weeks following treatment.

- Mid-May (Feekes 9) termination did not occur two weeks after application. However, visual assessment three weeks after application confirmed 100% termination, indicating there may be a delay in termination for this timing.

  Table 2 shows results over two years for termination. Mid-May termination takes more time for 100% results when compared to late May and early June, respectively.

Take home message

- Recommended glyphosate rates (16 or 32 fl oz/ gallon @ 4.5 lb acid equivalent per gallon) were effective in terminating both cover crop species at all timings.

- Application timing and glyphosate rate should both be considered when estimating crop planting date.

  Note that in these trials, all herbicide applications were conducted under optimal conditions — sub-optimal conditions may influence results.

- *Always consult herbicide labels for rotation restrictions and crop insurance guidelines prior to termination. The label is the law.*

Table 1: winter rye annual ryegrass

<table>
<thead>
<tr>
<th>Glyphosate rate</th>
<th>winter rye</th>
<th>annual ryegrass</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 fl oz/acre</td>
<td>78%*</td>
<td>97%</td>
</tr>
<tr>
<td>32 fl oz/acre</td>
<td>80%*</td>
<td>99%</td>
</tr>
</tbody>
</table>

p-values for winter rye (NS) and annual ryegrass (0.0031)

* Visual assessment determined 100% termination after 3 weeks.

Winter rye two weeks after termination with glyphosate.

Winter rye three weeks after mid-May termination.

Winter rye three weeks after mid-May termination.

Table 2: winter rye annual ryegrass

<table>
<thead>
<tr>
<th>Termination timing</th>
<th>winter rye</th>
<th>annual ryegrass</th>
</tr>
</thead>
<tbody>
<tr>
<td>mid-May</td>
<td>54%*</td>
<td>98%</td>
</tr>
<tr>
<td>late May</td>
<td>87%*</td>
<td>98%</td>
</tr>
<tr>
<td>early June</td>
<td>96%</td>
<td>99%</td>
</tr>
</tbody>
</table>

p-values for winter rye (<0.0001) and annual ryegrass (NS)

* Visual assessment determined 100% termination after 3 weeks.

Results

- Glyphosate provided successful termination of both species in both mid-May and early June.

- Harvesting followed by glyphosate (same day) provides successful termination of both species.

- Harvesting only:

  For winter rye, the harvesting only treatment was effective, however, the winter rye did slowly regrow but was not competitive.

  Annual ryegrass regrew quickly from the harvesting only treatment, suggesting that additional management is needed for termination.

Termination of winter rye and annual ryegrass utilized as a spring forage crop

A similar experiment was also conducted to assess termination methods for these crops when used as spring forages.

Two varieties:

- 'King' annual ryegrass
- 'Guardian' winter rye

Three termination treatments:

- glyphosate only*
- harvesting only
- harvesting followed by glyphosate (same day)

Two termination timings [applied 13 days apart in 2014 and 8 days apart in 2015]:

- mid-May .......ryegrass (9 inches) .......winter rye (Feekes 9)
- early June .......ryegrass (22 inches) .... winter rye (Feekes 10.5.2)

* Treatment used for comparison purposes only, glyphosate application prior to forage harvest is illegal.
2016 Wisconsin Soybean Yield and Quality Contest Rules

Shawn P. Conley, Soybean and Wheat Extension Specialist, Department of Agronomy

Entry Deadline: October 15, 2016 Cost: $75 per Entry

The WSA Soybean Yield Contest has been organized to encourage the development of new and innovative management practices and to show the importance of using sound cultural practices in Wisconsin soybean production. Please read the rules carefully.

Contest contact: Dr. Shawn Conley 608.262.7975
Contest webpage: www.coolbean.info

To view the full list of rules for the Wisconsin Soybean Yield and Quality Contest, please follow the link below:


Additionally, if you would like to view an informational brochure on the 2016 Wisconsin Soybean Yield Contest, please follow the link below:


It’s Time to #Spillthebeans About Wisconsin Agriculture!

Alissa L. Grenawalt, Extension Outreach Specialist, Department of Animal Sciences

Members of Wisconsin 4-H and FFA grades 3-13 (as of January 1, 2016) are encouraged to participate in a new video contest opportunity highlighting the importance of soybeans in livestock projects. Winners can earn cash awards and be recognized at the 2016 Wisconsin State Fair!

Get your smartphone, video camera or tablet ready and enter a two – minute (or less) video that addresses one of the following topics that revolve on the importance of soybeans in Wisconsin.

Four video categories include:

(grade is based as of 1/1/2016)

1. Youth grades 3-6: Talk about your livestock (dairy, poultry, swine, beef, sheep or goat projects) and what you have learned?

2. Older youth, grades 7-13: Talk about soybeans and the nutritional importance with livestock (dairy, poultry, swine, beef, sheep, and goats).
3. Older youth, grades 7-13: Talk about how your livestock or crop experiences in 4-H/FFA may impact your future career choices (i.e. animal science, agronomy)

4. Video Production Awards (grades 3-13): An award will be given to the video that has the highest production quality.

Cash prizes will be awarded to our winners as follows:
1st prize in each category: $300
2nd prize in each category: $150
3rd prize in each category: $75

In addition, four lucky urban youth will get the chance to spend a day on the farm with our winners. These winners will also be recognized and have their videos played at the 2016 Wisconsin State Fair!

Video entries can be submitted the following ways:
- YouTube—(Email link to agrenawalt@wisc.edu and set privacy level to private.)
- Dropbox or Google Drive: —(Email link to agrenawalt@wisc.edu and check privacy settings)
- Mail on a Flash Drive or DVD

Videos can be mailed to: Spill the Beans Video Contest
Attn: Alissa Grenawalt
1675 Observatory Drive, Room 287
Madison, WI 53706
Email: agrenawalt@wisc.edu

This new opportunity to share these agriculture stories with our consumers is made possible by a number of key sponsors:
-Wisconsin Soybean Marketing Board
-Pam Jahnke, Fabulous Farm Babe
-Wisconsin Beef Council
-Wisconsin Pork Association
-Wisconsin 4-H, UW-Extension
-Wisconsin FFA
-Wisconsin Department of Animal Sciences
-Wisconsin State Fair

For further questions, please contact Linda Funk, WI Soybean Marketing Board atlfunk@flavorfulinsight.com or Alissa Grenawalt, Extension Outreach Specialist atagrenawalt@wisc.edu or check out the Wisconsin Youth Livestock web site at http://fyi.uwex.edu/youthlivestock/spillthebeans-video-contest/.

Thanks in advance!
ApriMaxx RFC and CruisMaxx (Syngenta Crop Protection) seed treatments were used to achieve these objectives because they differ in their components and relative cost per unit. This study was conducted in 2012 and 2013 at nine Wisconsin locations. All locations were planted in 15 inch rows within the first 3 weeks of May. To view the full study, please follow the link below:


Wisconsin Pest Bulletin: Volume 61 Number 2 May 05, 2016

Wisconsin Department of Agriculture, Trade & Consumer Protection

Drier weather with milder temperatures returned to Wisconsin, allowing spring fieldwork to proceed. Afternoon highs ranged from the 50s to 70s and were near or slightly above seasonal averages, while nighttime temperatures fell below freezing in some locations. Planting of corn, oats, potatoes and early soybeans advanced in the southern and western areas, though light to moderate rainfall and low soil temperatures continued to hamper full-scale fieldwork in eastern and northern Wisconsin. The latest USDA NASS Wisconsin Crop Progress report shows pronounced disparity in planting progress between the state’s crop districts at the start of May. Corn producers in southwestern Wisconsin have planted more than 50% of this year’s acreage, while only 2-10% of the corn crop has been planted in the east-central and northern areas. Planting conditions should improve statewide with the warming trend beginning May 6. To view the full issue, please follow the link below:


Vegetable Crop Update April 29, 2016

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

The 5th issue of the Vegetable Crop Update is now available. Click on the link below to view this update:

http://ipcm.wisc.edu/download/vgu/April-29-2016.pdf
BeanCam: Soybean Replant App Ends the Guesswork

Shawn P. Conley, Soybean and Wheat Extension Specialist, Department of Agronomy

A new Soybean Replant App for iPhones and Android devices helps growers make a data-driven decision to replant or stick with the current crop.

The app calculates plant stand (population) by averaging five plant count samples taken randomly within a soybean field during the VC, V1 or V2 growth stage. The app then provides expected yield percent at harvest with or without replanting.

You simply snap five photos and the app does the rest.

The calculated values give growers the hard data needed to decide if replanting makes economic sense.

The app also provides the historical median frost date for the closest township within Wisconsin. So growers will know if a replanted crop should mature before the median frost date.

This way, growers can know if it’s worth the time, money and risk to replant before committing to that plan.

This powerful, easy-to-use app is the result of a joint effort between the University of Wisconsin College of Agriculture and Life Sciences (UW CALS) and the Wisconsin Soybean Marketing Board (WSMB).

Click here to get the iPhone app.
Click here to get the app for Android devices.

Figure 1. The Soybean Replant App is easy to use and reliable. Just take five photos in random spots in your field and the calculator will do the rest.
Think Twice About Replanting Soybeans

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

Soybean planting date trends have steadily shifted earlier within the Northern Corn Belt while inclement weather, insect pressure, and disease pressure associated with spring planting can require replanting some years (USDA-NASS, 2011). Furthermore, recent studies have reported similar yields among reduced plant stands due to the soybean plants compensatory ability (Carpenter and Board, 1997) and diminished yield potential of replanted or essentially later planted soybeans (Conley et al., 2012; De Bruin and Pedersen, 2008). Ultimately, producers would like to know the potential yield gain or loss from replanting sub-optimal plant stands to help determine if replanting is economical. Therefore the objectives of this study were to:

- determine the threshold for replanting soybean plants
- evaluate replanting options
- quantify the effect of seed treatments and planting date on replant decisions

This study was conducted in 2012 and 2013 at the Arlington Agricultural Research Station, Arlington, WI. Twelve different replant scenarios were planted in 15 inch rows during early May, late May, and mid-June. The replanted portions of the plots were interseeded between the rows of the initial soybean stand. ApronMaxx RFC and Cruiser-Maxx (Syngenta Crop Protection) seed treatments were used to compare a fungicide only seed treatment with one that also contains an insecticide. To view the full study, please follow the link below:


Alfalfa Weevil

Bryan Jensen
UW Extension and IPM Program

Based on May 9th degree day accumulations (map below), the southern Mississippi River valley area of Wisconsin has reached 300 Weevil Degree Days (base 48°F). Now is the time scouting for alfalfa weevils within that zone. The rest of Wisconsin will eventually follow. For near real-time degree day accumulations, please navigate to the UW Extension Ag Weather Site and click on “Thermal Models”.

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 hatch and early signs of tip feeding should start to be noticeable. 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.

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 an early 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.

Figure 1. Alfalfa Weevil D.D. from 1 Jan to 9 May 2016

Figure 2. Alfalfa weevil larvae
DATCP’s Pest Bulletin has been reporting some substantial black cutworm moth flights the last couple weeks from their pheromone trap network and have predicted an anticipated cutting date of May 20th. Although migrating adult populations may not always correlate with field damage, it does provide an excellent warning system and gives us plenty of time to prepare.

Black cutworm is the most common cutworm pest species in Midwest corn, especially in late planted fields. However, incidence and severity varies greatly from year to year and field to field. This year it will be well worth your time and effort to spot check corn fields for cutworm activity. Knowing which fields to concentrate on can save time. Although black cutworms can be active in any corn field, they do tend to key on certain field characteristics to lay eggs. Those keys include an attractiveness to soybean residue, significant broadleaf weed growth (especially winter annuals like the chickweed species) and low lying/wet fields.

Although DATCP has suggested a May 20th cutting date, you will see signs of cutworm leaf feeding prior to that date. Damage to corn varies according to the cutworm size and the corn growth stage. Small cutworms (first to third instars) can only feeding on foliage. This damage is not considered economic at this point but can be a sign of future stand loss. Mid-sized larvae can start cutting small (V1-V2) corn. If cut above the growing point these plants can survive. Late instar larvae have a difficult time cutting larger corn (V3-V4 +), instead they will burrow into the base of the stalk below ground. Above ground symptoms are often called “wilted whorl” or “dead heart”. That is, the newly emerging leaves are wilted and/or dying while the older leaves remain green for a while. These plants are unlikely to survive.

To get an accurate assessment of black cutworm damage, count the number of cut plants in 50 consecutive plants in each of 5 areas of a field and collect 10 larvae. Treatment is suggested when 2-5% of the plants are cut and before the later instars (roughly 1 inch) are present. Although some seed treatments and Bt hybrids may control/suppress black cutworms, when population reach these levels they are not working and foliar controls would be suggested. Knowing the size of larvae is important. Late instar larvae will not feed much longer, and as a result, will not cause significant economic injury. If damage is spotty, spot treatments may be a good option.

Black cutworm larvae are grayish-black and lack obvious identifying characteristics. As a result, they may be confused with other insects found in corn fields. Crane fly larvae do not feed on corn but are similar in color. Depending on the specie, crane fly larvae are tapered at each end. Dingy cutworms are foliar feeders and are only a pest when numbers are unusually high. Dingy cutworms overwinter as larvae and these individuals may appear more developed than black cutworms because of their size. However, proper identification can be made by looking at the tubercles (black dots) on their backs. Black and dingy cutworms will each have 4 prominent tubercles (raised black dots)/segment. The tubercles of black cutworms which are closest to the top center of the body of will be 1/2 to 1/3 the size (see picture below) of the other pair. The four tubercles on dingy cutworms we be similar in size.

Figure 1. Size/orientation of tubercles on black cutworms
Farmers are faced with replanting decisions every year. Cold temperatures, wet or crusted soils, and/or pesticide or fertilizer injury may reduce seed germination and seedling emergence. After emergence, stands may be further reduced from insects, diseases, wind, frost, hail, and/or flooding. Stands too dense or non-uniform because of planter malfunctions or variable seeding depth may warrant replanting.

The major decision facing a farmer is whether it is more profitable to keep the original stand using a full-season hybrid or replant. Replanting may result in an optimum stand, but it would be planted at a later than desired date using a shorter season hybrid.

To minimize losses, information must be collected and evaluated quickly. You’ll first need to estimate three factors: stand population, plant health, and evenness of spacing. Then compare the yield potential of the existing stand to the yield potential of a late-planted stand. When deciding whether to replant, you’ll also need to consider replanting costs, seed availability, rotation restrictions from previous herbicide applications, and possible alternative crops. Base your replant decision on proven agronomic facts rather than emotion.

**Steps in the process:**

1.) Determine plant population
2.) Evaluate plant health
3.) Assess the unevenness of stands
4.) Compare the yield of a reduced stand to that of a replanted stand
5.) Calculate replanting costs
6.) Factor in risks of replanting
**Corn Agronomy: What is happening in the corn plant during the month of May?**

Good progress has been made planting corn in Wisconsin. Corn planted was at 56 percent complete, one day behind last year, but 10 days ahead of the five-year average. Corn emerged was at 6 percent, the same as last year, and 4 days ahead of the five-year average. There was some concern that corn planted before April 20 might have experienced some imbibitional chilling due to cool weather towards the end of April. However, the crop has emerged well and there is currently more concern about black cutworm damage. To view the full blog post, please follow the link below:

http://wisccorn.blogspot.com/2016/05/B070.html?utm_source=feedburner&utmcampaign=Feed%3A+blogspot%2FmbfLa+%28Corn+Agronomy%29

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**Wisconsin Winter Wheat Disease Update – May 6, 2016**

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

Brian D. Mueller, Graduate Research Assistant, University of Wisconsin-Madison

Winter wheat in research plots, and also adjacent production fields, was scouted in southern and south central Wisconsin during the week of May 2. Wheat at these locations ranges from Feekes 5 to Feekes 7. Wheat in general looks very good. Weather in the major wheat production area of Wisconsin has been generally dry this spring. This has resulted in very little disease pressure. We have been actively scouting for stripe rust considering reports from other states and have been unable to find any trace of rust, even in susceptible cultivars. As mentioned in a previous post, Septoria leaf blotch has been identified in low levels at some locations, however, the dry weather has lead to little progress of this disease. Powdery mildew has also been nearly nonexistent at this point.

Weather forecasts for the week of May 9 look to include some rain events. This may result in increased risk of disease onset, so this situation should be monitored carefully. We will continue to scout research plots, variety trials, and production fields for wheat diseases. As we move closer to the Feekes 8 growth stage (emerging flag leaf) the decision to spray fungicides will need to be made at that time. Remember that protecting the flag leaf from active foliar disease can be important, as that single leaf can be responsible for the majority of the grain yield of that plant. In Wisconsin, in years where leaf disease like Septoria leaf blotch or stripe rust have been active at the Feekes 8 growth stage, we have observed a significant increase in grain yield with fungicide applications at this time. However, if conditions remain dry during this growth stage, fungicide application may not be necessary. Weather over the next several weeks will guide this decision-making process. If you are interested in learning more about effective fungicides and fungicide application timing for wheat, please visit the Fungicide Information webpage or also check out fungicide efficacy trial summaries from past years on the Summaries webpage.

After the Feekes 8 growth stage, the next critical growth stage for making a fungicide application decision will be at Feekes 10.5.1 growth stage or the start of anthesis. This application of fungicide will be applied to target Fusarium had blight (FHB or scab). The field Crops Pathology laboratory will continue to monitor the Wisconsin wheat disease situation. Please be sure to check back periodically for any new updates.

*Figure 1. Winter Wheat Grown in Wisconsin*

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**Wisconsin Winter Wheat Disease Update – May 11**

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

Brian D. Mueller, Graduate Research Assistant, UW-Madison
It was only a matter of time….

Today we confirmed the first observations of stripe rust in Wisconsin for 2016. Brian Mueller, Graduate Research Assistant in the Field Crops Pathology Lab at the University of Wisconsin-Madison found active stripe rust pustules in winter wheat in both southern and south central Wisconsin. In southern Wisconsin stripe rust was found in the Wisconsin Winter Wheat variety trial located in Sharon, Wisconsin. Stripe rust was at low incidence and severity on emerging flag leaves with some lesions manifesting as chlorotic flecks and not yet active. We speculate that the epidemic initiated recently. With the humid and rainy weather over the past several days, conditions have been ripe for symptom development. To read the full blog post about stripe rust, please follow the link below:

http://fyi.uwex.edu/fieldcroppathology/2016/05/11/wisconsin-winter-wheat-disease-update-may-11/

Wisconsin Pest Bulletin: Volume 61 Number 3 May 12, 2016

Wisconsin Department of Agriculture, Trade & Consumer Protection

Periodic rainfall during the week benefited crop establishment but slowed seasonal fieldwork across much of the state. An advancing low pressure system on Monday brought an end to the weekend warm spell, and below-normal temperatures with light to locally moderate showers lingered throughout the week. The rain boosted early-season soil moisture for emerging summer crops and eased concerns about short-term dryness in southern and central Wisconsin, but the wet weather delayed completion of spring tillage and stalled corn and soybean planting. After last week’s favorable conditions allowed producers to make double-digit planting gains, statewide planting progress remains well ahead of average. Corn planting advanced 34 percentage points to 56% complete during the week ending May 8, five points behind last year but 28 points ahead of the 5-year average. Soybean planting increased 16 points to 18% complete, 12 points ahead of the 5-year average. To view the full pest bulletin issue, please follow the link below:

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

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

Brian Hudelson, Sean Toporek, 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 April 30, 2016 through May 6, 2016.

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

**Specialty Crops**
Hops, Carlavirus, *Unidentified carlavirus*, Dane

**Vegetables**
Lettuce, Downy Mildew, *Bremia lactucae*, Ozaukee
Lettuce, Powdery Mildew, *Oidium* sp., Ozaukee
Potato, Fusarium Dry Rot, *Fusarium oxysporum*, Oneida
Tomato, Cucumber Mosaic, *Cucumber mosaic virus*, Clark

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

Vegetable Crop Update May 6, 2016

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

The 6th issue of the Vegetable Crop Update is now available. Click on the link below to view this update:

[http://ipcm.wisc.edu/download/vgu/May-6-2016.pdf](http://ipcm.wisc.edu/download/vgu/May-6-2016.pdf)
Early Season Armyworms

Bryan Jensen
UW Extension and IPM Program

Migrating adults were noticed in DATCP’s black light trap network a few weeks ago. Specifically, in Rock and Monroe Counties. Since those early captures, relatively few have been reported. I’m not sure why. Perhaps it is because of the cooler nighttime temperatures or………..because there are few migrating moths. Regardless, it might be a good time to review likely fields where spot-checking would be useful. It seems every year someone in the state is surprised by early season armyworm activity. Injury is often widely scattered but can be severe in isolated fields. Knowing those field characteristics which attract egg laying adults can really help target our scouting efforts.

Armyworm adults are usually attracted to dense, grassy surroundings to lay eggs, with one exception. Those attractive grassy areas could be weeds, crops and cover crops. Grassy weeds are certainly attractive as are grass cover crops such as cereal rye. Egg laying and/or feeding may start before corn is planted or emerged. Automatically tank mixing an insecticide with the burn-down herbicide is not recommended because effective rescue treatments are available if needed. Conservation of non-target species is important and may provide benefits later. Especially if slugs are a problem. Winter wheat and other dense growing spring seeded small grains may also be attractive egg laying sites. Concentrate scouting efforts in dense cover and/or where lodging has occurred.

The exception to the grassy weeds/crops/cover crops rule is corn that is no-tilled into alfalfa. For some reason, armyworms can be highly attractive to this field scenario.
Some Risk for Wheat Crop Injury From Saturday’s Cold Temps

Shawn Conley, Soybean and Wheat Extension Specialist, Department of Agronomy

Saturday mornings cold temperature may lead to crop injury in low lying areas across Southern WI. Based on the development in our wheat plots the highest risk for yield loss would likely come in the southern tier of WI counties. The wheat at our southern locations are either at the Feekes 8 (flag leaf visible) or 9 (flag leaf ligule and collar visible) crop growth stage dependent upon variety. Crop injury at these growth stages would occur in the 24 to 28 (duration of up to two hours) degree F temperature range. We did not see this temperature extreme at our Arlington location (Image 2; low temp of 30.5) however I have heard reports of extended cold temperatures in the sub 28 degree F range.

FYI, armyworm larvae have a tan head w/ numerous vein-like lines in the compound eyes. Body color and intensity can be very diverse and but alternating light to darker color lines are usually noticeable. Typically, the “belly” is lighter colored than the rest of the body. I mentioned larvae are nocturnal feeders, during the day larvae often rest deep within the corn whorl. Abundant frass in the whorl can be a give-away to their presence. Armyworm defoliate plants by (usually) feeding on leaf margins, although they may chew ragged holes in the leaves.

Armyworm Larvae

Image 1. Feekes 9 crop growth stage at Arlington WI on 5/16/16

Image 2. Arlington WI weather data for the last week.
The two types of crop injury I would be concerned about include stem damage and spikelet (head) injury. In Image 3 below you can see the brown discoloration and water soaking to wheat stems caused by freeze injury. This injury eventually lead to severe lodging among select varieties (Image 4). If you see this type of injury it would be best to take this field as a forage crop ASAP. The other type of injury would be direct damage to the wheat head. Peel back the boot and expose the wheat head. If healthy individual florets on the spikelet will appear pale green (Image 5). If they begin to appear water-soaked or off colored (brown) then crop injury occurred.

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).

Frost on Corn: The Key is Patience

This past weekend significant areas of northern Wisconsin were affected by frost with temperatures below 28 F. Most corn has either not emerged or is just starting to emerge. The key management practice here will be patience. It will take some time to determine if corn was damaged by this frost.

Corn plants will not be killed by frost unless temperatures get cold enough to kill the growing point that is 3/4 of an inch below the soil surface. So corn that has not emerged typically is well insulated from frost damage.
So corn that has not emerged typically is well insulated from frost damage.

Frost should not be a problem with corn until the growing point moves above-ground around V5 to V6. Farmers and agronomists usually do not worry about frost at these early stages of development. Early frost can have an impact on grain yield, but the trade-off between planting date impact on yield is greater than for frost damage impact on yield. Delayed planting further impacts profitability due to greater moisture and consequential drying costs.

Symptoms of frost damage will start to show up about 1 to 2 days after a frost. Symptoms are water soaked leaves that eventually turn brown. After 3 to 4 days watch for new green leaves emerging in the whorl. If new leaves are not emerging check the growing point for discoloration. Any deviation from a white, cream or light yellow color indicates that the growing point is killed.

To measure the impact of early defoliation on corn grain yield corn plants were clipped with a scissors. Clipping treatments were applied at V2, V4 and V6. Plants in the control treatment were not clipped. In another treatment, all plants in the plot were clipped. In another set of treatments, half of the plants were clipped in 2-, 4-, and 8-plant patterns. For example in the 2-plant pattern, the first 2 plants in the row were not clipped, the next 2 plants were clipped at ground level, the next 2 plants were not clipped, and so on.

Although these treatments do not fully simulate the frost damage, they do provide some guidance on what a frost might do that completely defoliates the plant without killing it. Figure 1 describes the impact of complete defoliation on corn grain yield at the V2 stage of development. When all plants were clipped, grain yield decreased 17 bu/A from 210 to 193 bu/A (8%). When half of the plants were clipped in various patterns, grain yield was not affected; the trend was a decrease of 8 to 9 bu/A (4%).

These data indicate that frost early in development has relatively little impact on corn grain yield. If all of the leaves are removed from every plant in the field at the V2 stage of development and plants are not killed, then the expectation is that grain yield would decrease up to 8%. If the recent frosts were hard enough to kill plants then use the publication UWEX 3353 for guidance on whether or not to keep a stand and what to look for when assessing plant health.

Further Reading:
Frost Effects on Corn
Corn replant/late-plant decisions in Wisconsin UWEX 3353

How long can we continue to plant corn in 2016?

Joe Lauer, Wisconsin Corn Agronomist

With average growing conditions corn planted after June 1 to June 5 in northern and central Wisconsin and after June 10 to June 15 in southern Wisconsin, will probably not mature with reasonable grain yield and moisture content, even with very early hybrids. However, corn silage from shorter-season hybrids may still have accept-
able quality when corn is planted until June 20. Corn planted after June 20 will likely contain little or no grain, and only stover (stems and leaves) will be produced. Table 1 lists alternate hybrid Relative Maturities for delayed planting dates for the standard Relative Maturity belts shown in Figure 1.

Pest Control

It is usually easier to control weeds in late corn plantings than in early plantings. Late tillage kills many germinated weeds and crop seedlings are more competitive due to warmer temperatures. For replant situations, weed control must take into account any previous herbicide applications. If herbicides were applied pre-emergence or pre-plant incorporated, their effectiveness may be reduced by the time corn is replanted, especially if the field is tilled before replanting.

Insects normally are a greater threat to late plantings than weeds. Later plantings may have more feeding from second-generation European corn borers, and silk feeding by corn rootworm beetles may also be more severe. Soil rootworm insecticide will need to be applied if the field was tilled since the initial planting application.

Effects of Early Freeze on Yield Potential

Earlier than normal autumn frosts can devastate late-planted corn. Yield is decreased if late-planted corn does not reach physiological maturity before plants are damaged by a freeze. Grain from corn plants killed by a freeze before maturity may be slow to dry down, and it tends to be brittle after artificial drying — making it more likely to break during handling. Test weight also will be lower when corn is prematurely killed. If late-planted corn does mature ahead of frost, grain will be wetter and probably have to dry down in weather less favorable for drying. The following lists grain characteristics and appropriate management considerations for corn killed at various growth stages:

- **Corn Killed in Dough Stage**: Kernels contain about 70% moisture. About one-half of mature kernel dry weight accumulated. Grain will unlikely achieve maximum yield potential unless stalk, ear and some lower leaves survive. Corn can be used for good quality silage, but entire plant must be allowed to dry to about 65% moisture.

- **Corn Killed in Dent Stage**: In early dent, kernels contain about 55% moisture; are 3 to 3.5 weeks from maturity; and about half of mature dry weight
has accumulated. In late dent, kernel moisture is decreasing and yield is within 10 percent of final mature dry weight when kernels are past half milk-line. Corn will make good silage when harvested at a whole plant moisture content of 65%. Can be harvested for grain after long field-drying period. Grain yields will be reduced and test weights low. If plant is only partially killed or the crop is close to physiological maturity before the freeze (kernel milk line half-way or closer to tip), yield loss will be only 5 to 20 percent, and test weight will be lower.

- **Corn Killed When Physiologically Mature (Black Layer):** Kernel moisture is 28 to 35% depending on hybrid. Killing freeze will not affect grain yield or quality. Dry-down rate of grain depends on hybrid and environment.

**Crop Choice**

If planting is delayed past the time acceptable corn production can be expected, consider planting an alternative crop. Compare the relative yield potential and current price of an alternative crop for a given date with that of late-planted corn.

For example, corn yield potential of a late planting declines at a faster rate than the yield potential loss of soybeans. After June 1, it may be advantageous to plant soybeans, instead of corn, if this fits your rotation. Sunflowers and buckwheat are other grain crops that can be planted very late. Forage sorghum, sorghum-sudan crosses or sudangrass can help boost forage supplies and be planted into July. You must consider prior herbicide and fertilizer applications, desired rotation, livestock feed requirements, and the possibility of erosion on slopes when you are choosing a crop to plant late. For more information on herbicide rotational restrictions, see UW Extension publication A3646 — Field crops pest management in Wisconsin.

**Cover Crops and Crop Insurance in Wisconsin**

Daniel H. Smith, Nutrient and Pest Management Program

Paul D. Mitchell, Extension State Specialist in Cropping Systems and Environmental Management, Department of Agricultural and Applied Economics

Wisconsin farmers have increasingly been using cover crops, in part because of the agronomic benefits cover crops can provide. Wisconsin farmers have also increasingly chosen to buy crop insurance. Crop insurance policies include several management rules, including some that pertain to cover crops. Because cover crop rules for insurance have been changing and there are many farmers relatively new to cover crops and/or crop insurance, we review some of these cover crop rules for crop insurance. We wrote a 2 page bulletin overviewing the crop insurance rules for cover corps. Of particular interest may be

- When must a cover crop be terminated by so the following crop can be insured?
- What are the rules for harvesting the cover crop for forage?
- What about interseeding and overseeding a cover crop?

Follow the link below to read the full bulletin detailing crop insurance rules for cover crops.


**Wisconsin Fruit News: Volume 1 Issue 3 – May 13, 2016**

The 3rd issue of Wisconsin Fruit News is now available. Click on the link below to view this newsletter:


All newsletters will also be posted onto the Wisconsin Fruit website, available at [www.fruit.wisc.edu](http://www.fruit.wisc.edu). There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.

Additionally, you will also able to view this newsletter by customizing the [IPM Toolkit](http://ipcm.wisc.edu/apps/ipmtoolkit) app which was created through the University of Wisconsin’s Integrated Pest and Crop Management program ([http://ipcm.wisc.edu/apps/ipmtoolkit](http://ipcm.wisc.edu/apps/ipmtoolkit)). Simply download the app, tap the (+) add News Feed in the upper right corner, and enter the fruit blog RSS newsfeed URL ([http://fruit.wisc.edu/feed](http://fruit.wisc.edu/feed)).
Post-freeze supplemental issue of WI Fruit News

It’s been a tough year so far for fruit production. Due to the sudden and unexpected cold temperatures throughout much of the state, we are providing an additional supplementary issue of the Wisconsin Fruit News today, with articles relating to post-frost damage mitigation (see link below). We hope you find this useful!


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

Brian Hudelson, Sean Toporek, 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 May 7, 2016 through May 13, 2016.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Crops</td>
</tr>
<tr>
<td>Wheat, Powdery Mildew, Oidium sp., Rock</td>
</tr>
<tr>
<td>Wheat, Pythium Root Rot, Pythium sp., Manitowoc</td>
</tr>
</tbody>
</table>

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

Vegetable Crop Update May 13, 2016

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

The 7th issue of the Vegetable Crop Update is now available. Click on the link below to view this update:


Wisconsin Pest Bulletin for 5-19-16

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

Volume 61 Issue No. 4 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: True armyworm larvae collected from alfalfa this week

FORAGES & GRAINS: Alfalfa weevil larvae emerging in more fields, counts still low

CORN: Black cutworm primary damage period to begin in the week ahead

SOYBEAN: Bean leaf beetles appearing in alfalfa fields

FRUITS: Cool weather continues to slow plum curculio and codling moth activity

VEGETABLES: Imported cabbageworm egg hatch underway

NURSERY & FOREST: Peony red spot, botrytis and mites found during this week’s inspections

DEGREE DAYS: Growing degree day accumulations as of May 18, 2016

Follow us on
Strip-Tillage: How does it affect yield in Wisconsin?

Joe Lauer, Wisconsin Corn Agronomist

Farmers in Wisconsin are often challenged by cool, wet soils in the spring. Many farmers will chisel plow and field cultivate (2x) to prepare a seedbed to overcome these typical soil condition challenges. Over the last 40-50 years some farmers have sought ways to be less aggressive with tillage leaving more residue on the soil surface to protect it from erosion. Often though there is a “yield penalty” for growing corn in reduced tillage and no-till, especially for continuous corn.

Strip-till is considered a variation of no-till. The Conservation Technology Information Center’s definition of no-till includes strip-till, provided less than one-third of the total row area is tilled. In strip-till, an 8-inch band in a 30-inch row spacing is aggressively tilled and fertilized using fluted coulters, knives and berm-forming baskets in either the fall or spring. The objective is to dry out and warm up soil in the seed placement zone before spring planting to encourage more uniform stand emergence and plant density.

In the fall of 2000, we initiated a tillage trial to evaluate the impact of strip-tillage on corn yield. The most aggressive tillage operation in the trial was chisel plow followed by two field cultivator operations, while the least aggressive tillage operation was no-till which used a single 13-wave fluted coulter and trash whippers on the planter. Four strip tillage treatments based on tool aggressiveness were applied. Treatment ST4 was the most aggressive strip tillage treatment (9-inch knife, 3 13-wave coulters and berm forming baskets). The strip-tillage treatments varied through the early years of the trial, however, from 2007 to 2015 the treatments were consistent. For Figure 1, we considered 2007 a “set-up” year and deleted it from the analysis. We analyzed 8 years of data (four 2-year cycles for the corn-soybean rotation).
No-till continuous corn yielded the least among the treatments at 164 bu/A. This treatment was used to compare all other treatments as a relative percentage. No-till in rotated corn yielded 6% more than no-till continuous corn (NT CC). Chisel plowing yielded 9-12% more than NT CC. Treatment ST4, yielded 9-10% more than NT CC. All of the strip-tillage treatments, except ST1 (the least aggressive tillage treatment) in continuous corn, yielded more than NT CC and were comparable to conventional tillage. These data are some long-term evidence that strip-tillage can overcome cool, wet soils in the spring and have the potential to protect soil from erosion with little impact on grain yield.

Seedcorn maggot: There are several generations of seedcorn maggots/year. The first generation peak adult flight occurs at approximately 360 degree days (Base 39 o F) and usually causes most of the damage to corn planted during the “normal” Wisconsin planting season. That peak adult flight, for southern WI, occurred in late April. The second generation peak (1080 dd) is likely to occur within the next 1½ – 2 weeks. Late planted corn, sweet corn and especially soybean will likely be affected by the second generation.

The seedcorn maggot adult is a fly and about ½ the size of a common housefly. However, it is the maggot which causes crop damage and they are a cream-colored, legless maggot. Adults will be attracted to recently tilled fields and green/livestock manure to lay eggs. Maggots will feed on the seed and the unemerged shoot. They will not feed on emerged foliage. The cooler weather we had after the first generation peak will likely increase the amount of damage because of longer exposure during the susceptible (below ground) stage.
Seedcorn maggot injury is usually random within the field. Symptoms will include poor emergence and holes in the cotyledon (first leaf) and perhaps the second true leaf. Once the shoot is emerged, that plant is unlikely to have economic yield loss. Dig up the seed if you have poor emergence. You may, or may not, find the maggot depending on your response time when compared to their short generation time. Finding maggots is sound seed is a good sign of seedcorn maggot feeding because saprophytic maggots (non-pest) will not infest sound seed. Conversely, if the corn seed is rotten and maggots are found there is a greater likelihood that something else killed the seed and the saprophytic maggots are only feeding on a rotten seed. When in doubt, navigate to the UW Extension Ag Weather Site, [http://agwx.soils.wisc.edu/uwex_agwx/thermal_models/index](http://agwx.soils.wisc.edu/uwex_agwx/thermal_models/index) and click on the Generic Degree Day Calculator. You can print daily and accumulated degree day information for seed corn maggot to see if the planting date may have coincided with the adult flight for your area.

There are no rescue treatments available for seedcorn maggot and wireworms.

Wireworms: Like seedcorn maggots, wireworms will feed on the ungerminated seed. However, unlike seedcorn maggot, their damage is usually clumped within a field and will have different above ground symptoms. Above ground symptoms can be either holes in the newest emerging leaves and/or wilted whorl leaves. Wireworms have an extended life cycle depending on the species and may last for several years. Timely scouting will usually result in finding wireworm larvae near some of the damaged plants. Wireworms are hard-shelled, copper colored and have three sets of jointed legs. Don't confuse wireworms with millipedes which are non-pest. Milipedes are dark-gray and have a fringe hair-like legs the length of their body. Wireworm will move deeper within the soil profile during warmer weather. Millipedes will not. Millipedes typically feed on organic matter and are more common during wet growing seasons.

Wisconsin Winter Wheat Disease Update – May 24

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison  
Brian D. Mueller, Graduate Research Assistant, University of Wisconsin-Madison

The Wisconsin Field Crops Pathology Crew scouted winter wheat near Sharon, Wisconsin and Arlington Wisconsin yesterday. Wheat in these locations ranges from emerging flag leaf (Feekes 8) to boot stage (Feekes 10). Stripe rust (Figure 1) is increasing in incidence in the Sharon location while the overall severity (area of leaf covered by yellow spore-producing pustules) remains low. At the Arlington location, susceptible varieties in the uniform variety trial have high incidence and high severity with damage already reaching flag leaves. Wheat in surrounding fields is also beginning to show higher levels of stripe rust incidence. As previously mentioned in my May 11 post, stripe rust can be very yield limiting when it advances to the flag leaves before head emergence. Humid conditions and rainy weather will provide conditions favorable for stripe rust increase over the next week. Now is the time to scout winter wheat fields in the state and determine the incidence and severity of stripe rust in the lower canopy. By scouting the lower canopy, you can get an idea of how much risk there will be for stripe rust moving up to the flag leaf. Fungicides will be most effective when applied to wheat before stripe rust advances to the flag leaf. While scouting also note the growth stage of the wheat crop. This will be helpful in making fungicide application decisions.
To add fuel to the fire, we also need to start thinking about Fusarium head blight (FHB) or scab. Within a week or so, there will likely be fully emerged heads with anthers present on some wheat varieties in the southern and south-central region of Wisconsin. This will be a critical time to make a decision about fungicide application to control FHB. Currently, the Wheat Scab Advisor is showing little risk for FHB (Figure 2). I would urge you to pay attention to the weather over the next week. We are about to enter a warm rainy period, which will be conducive for the FHB fungus, should heads emerge and anthesis begin during this time. The Wheat Scab Advisor will likely change quickly during this period. A fungicide may be needed especially on susceptible cultivars to control FHB and reduce DON (vomitoxin) contamination. The fungicides Prosaro or Caramba have both performed well on FHB in Wisconsin. Timing of application of these products is critical. I would urge you to wait until anthesis has begun in your field before applying. We have observed poor control where application of these effective fungicides were made before anthesis. In fact, we have observed improved control of FHB and lower levels of DON in finished grain where fungicide application was delayed 4-5 days after the beginning of anthesis, compared to applications at the start of anthesis. Data from a fungicide efficacy trial to support this observation can be found by clicking here and scrolling down to pages 16 and 17. Also, remember that application of fungicides should be made no later than 6-7 days after the start of anthesis. After this time, fungicide efficacy on FHB is much reduced.

So now if you are still reading this, you are probably asking yourself “Well Damon, when should I spray fungicide now that I have two diseases to worry about and wheat is only worth $4/bu?” My advice here will involve some leg work. I think folks need to see how much stripe rust is present this week and what growth stage the crop is at. If there is little rust present and the crop will be heading and going through anthesis in the next week or so, I would say to wait and target your fungicide application for FHB control. Both Prosaro and Caramba are rated “Excellent” in the University Small Grains Fungicide Efficacy Table. Therefore, if you wait to spray, you are still applying a product that can protect flag leaves should stripe rust move in later. Also consider the level of resistance to stripe rust in your wheat variety. If the variety has a decent level of resistance, then the rate of spread of stripe rust up the canopy will be slow relative to susceptible varieties.

If the crop is only at the emerging flag leaf stage and you find active stripe rust in the crop, I would not wait to spray at anthesis. This could result in significant levels of stripe rust on flag leaves on susceptible or moderately susceptible varieties considering the conducive weather pattern that is forecast for Wisconsin. A strobilurin fungicide such as Headline or Aproach might be useful as a preventative application for stripe rust and these products are in a different class as Prosaro or Caramba. You should be aware that solo strobilurin fungicides do not perform well on stripe rust once the disease is established. A triazole or mixed-mode-of-action fungicide might be needed in this case, but be aware that could limit your use of Prosaro or Caramba for FHB management later in the season. Consult the fungicide labels carefully.

We have also had a couple reports of low levels of powdery mildew in a handful of fields and Septoria leaf blotch continues to cook along in the lower canopy in most fields. Stay diligent with scouting over the next
couple of weeks and keep an eye on the weather. Hopefully we get enough rain to keep the crop moving along nicely and not enough to make disease worse. SCOUT, SCOUT, SCOUT!!

New video about Winter Wheat In-Season Disease Management

Damon Smith, UW-Madison, Extension Field Crops Plant Pathologist

Stripe rust is increasing in incidence in some Wisconsin locations, while the overall severity (area of leaf covered by yellow spore-producing pustules) remains low. At the Arlington Research Station location, susceptible varieties in a uniform variety trial have high incidence and high severity with damage already reaching flag leaves. Wheat in surrounding fields is also beginning to show higher levels of stripe rust incidence.

Here is a new 2 minute video update about stripe rust and scouting winter wheat at this growth stage.

Stripe rust can be very yield limiting when it advances to the flag leaves before head emergence. Humid conditions and rainy weather will provide conditions favorable for stripe rust increase over the next week. Now is the time to scout winter wheat fields in the state and determine the incidence and severity of stripe rust in the lower canopy. By scouting the lower canopy, you can get an idea of how much risk there will be for stripe rust moving up to the flag leaf. Fungicides will be most effective when applied to wheat before stripe rust advances to the flag leaf. While scouting also note the growth stage of the wheat crop. This will be helpful in making fungicide application decisions.

Wisconsin CCA Exam Resources

Bryan Jensen
UW Extension and IPM Program

Registration for the August CCA exams is now open, however, the June 24 exam registration deadline is less than a month away. The first step in preparation for either the international and/or state exam is to review the Performance Objective for each exam. These performance objectives will provide a subject matter list for their respective exam and may be downloaded from the CCA website https://www.certifiedcropadviser.org/ by clicking on the “exams” tab located at the top of the screen. Study materials for the International Exam are available at the above website by click on “CCA Exam Study Materials”.

Although UW-Extension does not offer a training session specific for the state exam, we have prepared a list of 50 YouTube videos with over 18 hours of instruction available for you to use. Although these videos were designed specifically for the Wisconsin exam, they also serve as a general resource for field crops. The play list for each of the categories is:

- Soil Science Fundamentals for Field Crops
- Field and Forage Crop Fundamentals
- Weed, Insect and Disease IPM for Field Crops

An additional set of electronic resources is available here with links provided to over 100 UW Extension resources. Furthermore, a list of UW-Madison websites is also available to supplement your studies.
UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Sean Toporek, 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 May 14, 2016 through May 20, 2016.

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

**Fruit Crops**
Apple, Dormant Oil Leaf Burn, None, Grant

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

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Wisconsin Pest Bulletin for 5-26-16

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

Volume 61 Issue No. 5 of the Wisconsin Pest Bulletin is now available at: https://datcpservices.wisconsin.gov/pb/pdf/05-26-16.pdf

**INSIDE THIS ISSUE**

LOOKING AHEAD: Risk of black cutworm damage to corn remains HIGH

FORAGES & GRAINS: Alfalfa weevil larvae counts on the increase

CORN: Spring flight of European corn borer now starting

SOYBEAN: Bean leaf beetles appearing in soybean fields

FRUITS: First codling moth flight now underway, biofix set in several orchards

VEGETABLES: Striped cucumber beetles observed in southern Wisconsin

NURSERY & FOREST: Plant viruses and leaf spot found during recent inspections

DEGREE DAYS: Growing degree day accumulations as of May 25, 2016

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Vegetable Crop Update May 20, 2016

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

The 8th issue of the Vegetable Crop Update is now available. In this newsletter we address the following topics:

- late blight and cucurbit downy mildew updates (national scope)
- potato plant nutrition in response to freezing stress
- special pesticide registration considerations for Wisconsin
- evaluating fungicide programs for early blight control and economic return in potato

Click here to view this update.

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What about Fungicide on Alfalfa for Dairy Production in Wisconsin?

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

Thinking about fungicide for your alfalfa crop in Wisconsin? Typically in a 30-day cutting interval on alfalfa, like that used in dairy production in Wisconsin, foliar diseases cause minimal damage. Coupled with the heightened risk of fungicide resistance development toward these modern fungicides, application of fungicide on alfalfa for dairy production is not recommended unless heavy disease pressure is observed. CHECK OUT THIS VIDEO TO LEARN MORE! You can also CLICK HERE to download an informational fact sheet on the return on investment potential when using fungicide on alfalfa in Wisconsin.
Now that the corn crop has been planted, you are probably thinking about disease and pest management once the crop emerges. After the 2015 field season, disease management is on everyone’s mind. To complicate this issue, corn prices are low. Is a fungicide application going to be worthwhile in this market? Watch this video to learn about potential corn disease issues in Wisconsin and what we have learned about using fungicide on field corn in the state.
Judging by degree day accumulations, most areas of the northern Wisconsin are at the point where scouting for alfalfa weevils should begin and peak feeding is occurring in southern Wisconsin. Good news is that harvest is well underway and I haven’t had reports of extensive feeding. Our typical recommendation is to scout second crop regrowth for those fields which were heavily infested during first crop. A concern is that harvest was well ahead of peak feeding and those fields with heavy damage may have gone unnoticed because larvae were small and damage was easy to miss.

If those larvae survive, you could get significant feeding on either the crown/stem buds and or new foliage. A suggestion would be to spot check fields just to determine what, if any feeding, is occurring. With recent rains, alfalfa should bounce back and regrowth should be occurring. If not, check around the crown to make sure weevils are present. You will find the larvae under leaf litter, and hiding at the juncture between stubble and soil. If regrowth is not occurring 4-5 days after harvest, you’ve had sufficient rainfall and larvae are present your best option is to treat.

Additionally, check regrowth for signs of feeding. During second crop regrowth the economic threshold is bumped up to 50% of the stems showing signs of feeding. Before treating consider size of larvae present. If all are 4th and final instar (approx. 3/8 inch) you may not be able to prevent enough damage to pay for an insecticide and the loss of beneficial insects. To confirm this suspicion, scout for the presence of pupae.
What is happening in the corn plant during the month of June?

Joe Lauer, Corn Agronomist, UW-Madison

Corn planting was nearly complete by the end of last week. As we head into the month of June, the corn plant changes from a juvenile to more of an adult. The seminal roots that originated in the seed are dying and the nodal roots are becoming the dominant root system which will eventually occupy a cylindrical volume roughly 5-6 feet in diameter and 5-7 feet deep depending upon soil characteristics.

Another change is occurring on the leaves. Juvenile leaves have cuticular and epicuticular wax on the surface giving the leaf a bluish cast. The V5-V7 leaves have decreasing amounts of epicuticular wax leaving only the glossy green cuticular wax commonly seen on adult leaves. By V8 the transition from juvenile blueish cast to adult glossy green wax is complete.

By V6 (about 24-30 days after emergence - 475 GDU) all plant structures have developed on the growing point. All plant parts are present. The growing point and tassel, differentiated in V5, are above the soil surface. The stalk is beginning a period of rapid elongation getting taller. The determination of kernel rows per ear begins and is complete by about V10-V12. This yield component is strongly influenced by hybrid genetics. Tillers (suckers) begin to emerge at this time. Lower leaves degenerate and are torn from the stalk as it expands. During early June there is a new leaf emerging (V-stage) about every 3 days.

June is the time to apply nitrogen (up to V8) before rapid uptake period in corn. Precise fertilizer placement is less critical. Lodging can often occur during this time since brace roots have not appeared. Rootworm eggs will soon hatch and larvae begin feeding on root systems. Defoliation from hail, wind, and leaf feeding corn borers may decrease row number on the ear. If a frost would occur during June there would be 100% yield loss caused from plant death and killing of the growing point. Hail can cause up to 53% yield loss when completely defoliated. Short-term flooding can cause severe yield loss if the growing point is below the water surface.

By V12 (42-46 days after emergence - 815 GDU) potential kernel rows are determined. The number of kernel rows is set. The number of ovules (potential kernels) on each ear and size of ear is being determined and is strongly affected by environmental stresses. During late June there is a new leaf emerging every 2 days and brace root formation begins stabilizing the upper part of the plant. The plant is utilizing 0.25 inches of water per day. Nutrient deficiencies, will reduce the potential number of kernels and ear size. Large amounts of nitrogen, phosphorous, and potassium are being utilized at this stage. Early hybrids progress faster through growth stages and usually have fewer leaves and smaller ears than late hybrids.

For most of Wisconsin hybrids (~100 day), each plant typically develops 20-21 leaves. The rate of plant development for any hybrid is directly related to temperature, so the length of time between the different stages will vary as the temperature varies. Environmental stress may lengthen or shorten the time between vegetative and reproductive stages. The length of time required for the yield components of ear density, kernel number,
kernel weight varies between hybrids and environmental conditions.

Ears per unit area, kernel number per ear and kernel weight all contribute to yield. These yield components of corn are determined early in the life cycle of the corn plant with some established by the end of June.

Wisconsin Winter Wheat Disease Update

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison, Brian D. Mueller, Graduate Research Assistant, University of Wisconsin-Madison

Despite the warm and rainy pattern that much of Wisconsin has been subjected to over the last week or so, the wheat FHB (scab) advisor is predicting low risk of FHB over much of the state (Fig. 1). Just a narrow band of moderate to high risk exists very close to the Lake Michigan shore. Extending the advisor out 72 hours increases risk for FHB slightly for susceptible cultivars, but leaves the majority of the state still at low risk.

In addition to FHB risk, there is a relatively high incidence of stripe rust in many fields that we have scouted. The Wisconsin Field Crops Pathology Crew scouted Winter Wheat Variety trials and commercial fields near Chilton and Fond du Lac on May 27th. At both locations, wheat ranged from boot stage to heading. Anthesis will occur sometime this week or is occurring as we speak in many of the varieties.

The primary disease at the Fond du Lac location was stripe rust. Incidence (less than 10% across varieties) and severity (less than 5% on F1 or F2 leaves) was generally low in most varieties. One variety in the small plot variety trial had stripe rust present on very old tillers. In fact, stripe rust had been active for a while as telia (pathogen structure) were forming. I suspect that stripe rust may have over-wintered on this variety at Fond du Lac considering our mild winter.

At the Chilton location, stripe rust incidence was much higher (25-30%) however, severity was generally low (less than 5% on F1 leaves). However, there were several hot spots of stripe rust present in the variety trial and also commercial wheat surrounding the trial. Growers will need to watch this situation carefully. I fear that stripe rust will be increasing dramatically this week with our rainy and humid weather.

If a fungicide has not been applied yet, stripe rust is present, and anthesis has begun this week, a fungicide should be considered to control FHB and stripe rust together. The fungicides Prostar or Caramba have both performed well on FHB in Wisconsin and are rated “Excellent” for stripe rust. Timing of application of these products is critical. I would urge you to wait until anthesis has begun in your field before applying. We have observed poor control of FHB where application of these effective fungicides was made before anthesis. In fact, we have observed improved control of FHB and lower levels of DON in finished grain where fungicide application was delayed 4-5 days after the beginning of anthesis, compared to applications at the start of anthesis. Also, remember that application of fungicides should be made no later than 6-7 days after the start of anthesis. After this time, fungicide efficacy on FHB is much reduced.

New video: Winter Wheat Disease Management Part III

Damon Smith, Wisconsin Extension Field Crops Plant Pathologist, talks about in-season fungicide use on winter wheat. https://youtu.be/8cvtiTqFnMg
Crop Diagnostic Training Center Workshops for 2016

Registration is open for UW-Madison Integrated Pest Management Program’s two Crop Diagnostic Training Center workshops for 2016. The Diagnostic Troubleshooting Workshop will be held July 26, 2015. The Crop & Pest Management Workshop will be held August 9, 2016.

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

Crop & Pest Management Workshop
Date: August 9, 2016
Time: 9:30AM- 2:45PM (lunch provided)
Location: Arlington Ag Research Station
CCA CEU’s: 1.0 Crop Management, 3.0 Pest Management,
Tiered fee: $75 before 8/1/16, $90 after 8/1/16
A multi-disciplinary and in-depth workshop covering agronomic concerns ranging from identification of crop and pest production problems to management options within production systems.

Diagnostic Troubleshooting Workshop
Date: July 26, 2016
Time: 9:00AM-2:15PM (lunch provided)
Location: Arlington Ag Research Station
CCA CEU’s: 4.0
Tiered fee: $75 before 7/15/16, $90 after 7/15/16
Topics Covered: This Workshop gives you the opportunity to fine tune your crop diagnostic skills in a fun and interactive setting. 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 8 separate diagnostic scenarios.
Flyer attached.

Wisconsin Pest Bulletin, Vol 61 Issue No. 6
Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection
LOOKING AHEAD: True armyworm larvae appearing in corn
FORAGES & GRAINS: Alfalfa weevil leaf tip feeding above-threshold in a few fields
CORN: Obliquebanded leafroller larvae and slugs common in corn this week
SOYBEAN: First soybean aphids of the season found on June 1
FRUITS: Sharp increase in codling moth emergence noted in apple orchards
VEGETABLES: Colorado potato beetle egg laying under way
NURSERY & FOREST: New invasive viburnum leaf beetle active in Milwaukee Co.
DEGREE DAYS: Growing degree day accumulations as of June 1, 2016
Read the full PDF issue >>>
or visit the website
http://datcpservices.wisconsin.gov/pb/index.jsp

Wisconsin Fruit News: Volume 1 Issue 4 – May 27, 2016
The 4rd issue of Wisconsin Fruit News is now available. Click on the link below to view this newsletter:
All newsletters will also be posted onto at the Wisconsin Fruit website, available at www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.
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 21, 2016 through May 27, 2016.

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

**Fruit Crops**
- Apple, Black Rot, *Sphaeropsis sp.*, Dane
- Apple, Cytospora Canker, *Cytospora sp.*, Dane
- Blueberry, Fusicoccum Canker, *Fusicoccum sp.*, Winnebago
- Cherry, Sooty Mold, None, Dodge
- Grape, Herbicide Damage, None, Pierce

**Weeds**
- Blindweed, *Root Rot*, *Fusarium oxysporum*, Stephenson (IL)

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

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**Vegetable Crop Update May 27, 2016**

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

The 9th issue of the Vegetable Crop Update is now available.

In this issue we address:

- national late blight updates, early season late blight symptoms (inoculum sources), and management
- link to potato blackleg webinar through Focus on Potato (Plant Management Network)
- cucurbit downy mildew national updates
- hop updates for Wisconsin

Click on the link below to view this update:

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**Vegetable Crop Update May 27, 2016**

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

The 10th issue of the Vegetable Crop Update is now available.

In this issue we address:

- the first PDay and DSV calculations for the season, with explanations for use of this information for preemptive early blight and late blight disease management of potatoes.

Click on the link below to view this update:
This workshop gives you the opportunity to fine tune your crop diagnostic skills in a fun and interactive setting.

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. Participants tell us this is one of the most challenging, useful and fun workshops they have ever attended!

Thursday – July 26, 2016, 9:00-2:15pm
Lunch is provided at noon.

Fee: $75 (Tiered fee: $90 after 7/15/16)
Location: Arlington Ag Research Station
Date: July 26, 2016
CCA CEUs: 4.0

Diagnostic Troubleshooting Workshop, July 26, 2016

Soybean stress symptoms, and a new replanting app,
Shawn Conley, Extension Soybean Agronomist
• Learn to evaluate soybean stress and relate the resulting symptoms to yield
• Have you ever been through the agonizing decision of whether to re-plant? Did you know this decision can be as easy as taking a picture? Introduce yourself to the soybean replant app and evaluate it on several different populations.

Corn & Soybean Diseases – Damon Smith, Extension Plant Pathologists
• This session will concentrate on both root and stem diseases of soybean as well as foliar diseases of corn.
• Learn Identification and management tactics for multiple crop diseases.

Herbicide Injury & Mode of Action – Dan Heider, UW Integrated Pest Management Specialist
• Tank contamination, drift and miss-application rates can leave behind some interesting crop injury symptoms
• Learn how to differentiate those symptoms and identify the true culprit in herbicide injury.

Residual Herbicide Use and Limitations – Mark Renz, Extension Weed Science Specialist
• Looking to reduce costs in the wake of current commodity markets? Should you be attempting to reduce costs with decreased herbicide use?
• This session will look at residual herbicides to evaluate their worth in your production systems

Schedule:
Thursday – August 9, 2016
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

Fee: $75 (Tiered fee: $90 after 8/1/16)
Location: Arlington Ag Research Station
Date: August 9, 2016
CCA CEUs: 1.0 Crop Management, 3.0 Pest Management

Workshops begin in the Public Events Facility of the Arlington Agricultural Research Station. Be aware that this is not a “traditional” field day. Training sessions are designed to be in-field and hands-on. Therefore we advise that you come prepared for all types of weather.
Cereal Leaf Beetle: A curiosity in WI small grains

Bryan Jensen
UW Extension and IPM Program

Recently, I’ve been hearing discussions regarding wheat disease management. During your disease scouting efforts some of you may have, or will soon notice some unusual insect feeding on the upper leaf surface. That could be the result of cereal leaf beetle (CLB) larvae, which at best, has been a curiosity and rarely an economic pest in Wisconsin.

Feeding is usually described as slender or elongated feeding scars on the upper leaf surface between major veins. These symptoms are often referred to as “window-paneing”. Early instars are pale yellow and have a brown head. Late instars cover themselves with fecal material and are often confused with slugs. However, CLB larvae will have a well-defined head no antennae and 3 sets of jointed legs.

Assessing Flood Damage to Soybean

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

Grover Shannon, University of Missouri, Division of Plant Sciences

Severe flooding has many low-lying soybean fields underwater. As the water dissipates yield potential and replant questions will arise. Flooding can be divided into either water-logging, where only the roots are flooded, or complete submergence where the entire plants are under water (VanToai et al., 2001). Water-logging is more...
common than complete submergence and is also less damaging. Soybeans can generally survive for 48 to 96 hours when completely submersed (Image 1). The actual time frame depends on air temperature, humidity, cloud cover, soil moisture conditions prior to flooding, and rate of soil drainage. Soybeans will survive longer when flooded under cool and cloudy conditions. Higher temperatures and sunshine will speed up plant respiration which depletes oxygen and increases carbon dioxide levels. If the soil was already saturated prior to flooding, soybean death will occur more quickly as slow soil drainage after flooding will prevent gas exchange between the rhizosphere and the air above the soil surface. Soybeans often do not fully recover from flooding injury.

Crop injury from water logging is difficult to assess. Water-logging can reduce soybean yield 17 to 43% at the vegetative growth stage and 50 to 56% at the reproductive stage (Oosterhuis et al., 1990). Yield losses are the result of reduced root growth, shoot growth, nodulation, nitrogen fixation, photosynthesis, biomass accumulation, stomatal conductance, and plant death due to diseases and physiological stress (Oosterhuis et al., 1990; VanToai et al., 1994 and 2003). A significant amount of genetic variability for flooding tolerance among soybean varieties occurs in maturity groups II and III (VanToai et al., 1994) and likely exists for maturity group I soybeans as well.

Increased disease incidence in the surviving plants may also occur and limit yield potential. The main culprit will likely be phytophthora given the warm wet weather; however phythium, rhizoctonia, or fusarium may also occur. Differential response among varieties will be tied to the sources of genetic resistance to these diseases.

Once we can get back into the fields the decision to replant will be based on the yield potential of the current stand relative to the cost and yield potential of the replanted soybean field (Table 1). Before any decision to tear up a field is made make sure you contact your crop insurance agent to discuss coverage and you have the replant seed on your farm or at least en route. As we all know seed supplies are tight and replant acres will be high. Also remember to check herbicide labels for plant back restrictions if you are planning to plant soybean into a flooded corn field.

Since full season maturity group soybeans are unrealistic for planting this late only early and mid-group soybean cultivars should be considered. The average yield potential for soybean planted in late June in southern WI is in the 30 to 35 bu yield range (Figure 1). For yield potential and harvestability, (a combine may not be able to pick up the lower pods) a grower should plant if possible a mid maturity group soybean instead of an early maturity group for their geographic area.

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Table 1. Expected relative soybean yield at four replanting dates compared to predicted yields for a range of plant populations resulting from an optimum planting date of May 1-20 for full season maturity or short season maturity varieties.

<table>
<thead>
<tr>
<th>Early plant population</th>
<th>May 1-20</th>
<th>June 1</th>
<th>June 10</th>
<th>June 20</th>
<th>July 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 x 1000</td>
<td>100</td>
<td>89</td>
<td>90</td>
<td>75</td>
<td>68</td>
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<td>180</td>
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<td>83</td>
<td>77</td>
<td>69</td>
<td>67</td>
<td>47</td>
</tr>
</tbody>
</table>

Yield potential of full season varieties are in bold while yield potential of earlier maturity group soybeans are given in normal text.
To maximize yield potential in late planted soybean, a minimum of 180,000 plants per acre is required in a drilled system as yield potential in rowed beans would be significantly reduced due to decreased canopy development. To achieve 180,000 plants per acre a grower may have to seed as many as 225,000 seeds per acre.

Literature Cited:


Improve Control of Giant Ragweed with New “Focus on Soybean” Webcast

Shawn Conley
Soybean and Wheat Extension Specialist
Department of Agronomy

Giant ragweed, if left unchecked, will compete with slower growing soybean plants for critical resources and can significantly reduce yield, with losses reaching as high as 30-90 percent in soybean field trials.

The Plant Management Network (PMN) has released a new presentation entitled “Herbicide Resistance in Giant Ragweed” for growers, crop consultants, and extension agents discussing the biological characteristics that make giant ragweed problematic in soybean production and how its increased resistance to herbicide impacts potential control strategies.

The webcast, developed by Bill Johnson, Professor of Weed Science at Purdue University, chronicles giant ragweed’s increasing resistance to herbicide varieties and describes how stem-boring insects can aid its chances of surviving a herbicide treatment. It also discusses the:

• Effectiveness of various herbicide application strategies
• Herbicide varieties that best combat different resistance profiles
• Essential techniques for optimizing ragweed control

The 20-minute presentation will remain open access through July 31 in the Focus on Soybean webcast resource.

The Plant Management Network is a nonprofit publisher of applied, science-based resources that help enhance the health, management, and production of agricultural and horticultural crops. Partnering with over 80 universities, nonprofits, and agribusinesses, PMN provides materials covering a wide range of crops and contemporary issues through the online PMN Education Center.
Survey results for the UW-Madison Wisconsin Crop Manager Newsletter

The Wisconsin Crop Manager (WCM) is an electronic newsletter that features weekly pest and crop management information throughout the growing season. There were over 1,100 subscribers in 2015, and UW faculty and IPM staff wrote over 200 articles on a range of IPM and agronomic topics. The 30 weekly issues were downloaded 20,000 times during 2015, and an average of more than 3,000 visitors per month visited the blog.

In fall of 2015, a link to an online survey was sent to everyone on the email subscriber list. 194 people filled out the survey for a response rate of approximately 50% of “active” readers and close to 20% of all subscribers. Over half (63%) of the respondents work in private industry, including consultants, IPM specialists, sales, insurance, and farmers (10% of the readership are farmers). Approximately one-third (32%) work for a federal, state, county or local government agency; including 7% who are Extension agents. Most have been reading or subscribing to the WCM for around 10 years.

Results of the survey

Do people like the format and delivery of the newsletter?

A large majority (88%) access WCM as issues or in newsletter format as compared to one article at a time (e.g. via the Twitter feed), and many respondents (82%) read 75-100% of the issues they receive. The ones who access WCM in the newsletter format tend to read more of the content than the ones who access WCM on an article basis. Most of the respondents like the format and delivery of the WCM, and a large majority (71%) do not recommend any changes in this regard.

Is the newsletter a trusted and valuable source of information?

The Wisconsin Crop Manager is a trusted source of information, with 95% of the respondents who “often” or “always” trust and believe the information they read there. This was true regardless of how many articles the respondent typically reads in each issue. Readers find the Wisconsin Crop Manager valuable for timely advice on crop production, pest management and nutrient management, timely information on educational programs, and unbiased, science-based information. In their work, readers of the Wisconsin Crop Manager use the information to help manage crop pests, diseases, weeds, and to provide forecasts or warnings. A large majority (87%) finds either “most” or “some” of the articles relevant (56% said “most” and 31% said “some”).

Most respondents are unsure if they would be able to get this information elsewhere, and most (68%) value WCM more than other industry sources. Readers do not think the information from the WCM is a duplicate (93%); in other words they receive information there that they do not receive elsewhere.

Great work with unbiased research! Farmers would not receive the same information if only company representatives shared information! You keep on top of items BEFORE they become a problem. You look at prevention rather than always a crisis treatment! Thank you! (Ag teacher, Central WI)

It is a very useful publication and I would hope you would continue publishing. Years ago I read a paper copy and always found it interesting. Keep up the good work. (CCA Conservationist, SE WI)

Keep up the good work. You are providing a very valuable resource! I have great confidence in the research and recommendations from UW scientist and extension staff. (USDA Agronomist, SW WI)

How far does WCM information go?

The WCM readership extends beyond those on the subscription list. Two-thirds of the respondents share information with others, typically crop consultants and farmers. This trend correlates with other research findings that describe how farmers are less likely to receive information directly from University Extension sources than they are to get it from crop consultants and advisors. The readers who share the information mostly share it by email (95%) or in conversation (89%) and by printed copy (63%). By having them report the number of people and the frequency with which they share information, we estimate that the WCM has a reach of almost 120,000
touches per year. On average, these readers share about once a month with anywhere from 1 to 2,500 people each time. Information is distributed orally, by email, and by printed copy to an average of 7-14 people each time and via social media, newsletters, websites, and publications to about 225-1,500 people.

Does it save readers money?

One-third (34%) of the respondents said they saved dollars in their farm or consulting practice. These savings accrued from pest predictions and notifications, crop scouting recommendations, information on fertilizer and pesticide applications, prophylactic treatment options, economic thresholds, weed control, and seeding rates.

*It is easily in the thousands to tens of thousands [of dollars].* (Self-employed, SE WI)

Where else would readers seek this information?

If the Wisconsin Crop Manager was unavailable, only 18% of the respondents said they would be able to get relevant information elsewhere, with most of this group (64% of this portion) identifying a neighboring state’s Extension service as their next likely source of relevant information.

*The issues I’m seeing in my fields are often the issues in this week’s crop manager. For example, I used an article to decide on the proper timing of a fungicide application to prevent head scab in wheat. It was my first use of the fungicide and it worked really well in preventing high vomitoxin levels.* (Grower, Central WI)

*Maximum Return to Nitrogen recommendations… this information was shared through various methods including the crop manager newsletter. As a result, at forage council spring field days, I had producers raise their hands to indicate if they had reduced their nitrogen rates using the MRTN info, and the majority of farmers in a meeting of about 45 people had indicated they had done so.* (Agricultural Agent – UW-Extension, NE WI)

A big thank you!

Thank you to everyone who contributed to the WCM survey and this report. Thank you to all WCM authors, contributors, subscribers and readers in general for making the WCM newsletter a valuable source of agricultural information.
Stalk borers are starting to move to corn in the southern part of the state and likely hop vine borers are doing the same. Both insects overwinter as eggs and initially feed on perennial grasses before migrating to corn. As a result, it is not always a well-timed migration. Look for feeding damage in all parts of the state over the next few weeks to be sure.

Field areas damaged from both insects are strongly correlation to the presence of perennial grasses. Usually this is along field edges such as ditches, waterways and field borders and feeding is confined to the first few (2-6?) rows of corn. However, damage can be found wherever these grasses were located last summer/fall during the egg laying period.

Preventing damage from stalk borer is arguably easier than hop vine borer. Stalk borers are susceptible during the migration to corn and while feeding in the whorl and/or when moving from plant to plant. However, once they tunnel into the stalk they are no longer susceptible. Economic thresholds have been developed...
holes in the emerging leaves. Pull the whorl leaves from a damaged plant and count the number of larvae/whorl. Treatment decisions will be based on a field average of infested plants and number of larvae/plant. You may calculate a threshold for first generation ECB by using the worksheet found on p. 65 of A3646, Pest Management in WI Field Crops. It is always a little dangerous to suggest treatment levels for ECB because they vary by price, yield and applications costs. However, to give you a ballpark estimate, a field with 60% of the plants infested and an average of 1.2 larvae/plant that yields 150 bu/a and a selling price of $3.80/bu will likely give a $27 loss/acre if your insecticide is 80% effective.

Timing of hop vine borer treatment is critical as their susceptibility to insecticide treatments is only during the initial migration to corn. They immediately tunnel into corn plants below ground and there is little plant to plant movement. Insecticide applications are suggested at first signs of damage if there was significant feeding in that same field the previous year.

Damage symptoms from stalk borer is small feeding scars on the newly emerging leaves and eventually holes in the leaves when larvae mature. Eventually you will find wilted whorl leaves if tunneling reaches the growing point on small corn plants. Symptoms from hop vine bore are often described as wilted whorls or dead-heart. You should also be able to find the entry point below ground. Because both species do not pupate until mid to late-July you can frequently find larvae in most, but not all, damaged plants.

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Northern Corn Leaf Blight
Positively Identified in Wisconsin in 2016

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

I was hoping that I would write this article later in the year. But it has happened relatively early for us. We have positively confirmed northern corn leaf blight (NCLB) on field corn at about the V7-V8 growth stage near Janesville, WI this week. This is a bit early for us, however, not entirely surprising given the levels of residual inoculum from the fungus that causes NCLB left from 2015 in many fields and the cool wet conditions we have had this spring. The situation has been similar to that in Iowa. Dr. Alison Robertson also reported the first find of NCLB in southeast Iowa this week. While this find is relatively early for Wisconsin, I don’t think the world is going to come to an end. Patience will be key over the next couple of weeks. I’ll explain why folks should be cautious in making management decisions below.

What is the Organism that Causes Northern Corn Leaf Blight (NCLB)?

A fungus called Setosphaeria turcica (synonym: Exserohilum turcicum) causes NCLB (Fig. 1). The fungus loves it wet and cool. The fungus is most active when wet weather coincides with temperatures between 65 F and 80 F. During these conditions, the fungus will readily make microscopic spores (called conidia) inside the symptomatic areas of leaves and those spores (Fig. 2) will get splashed onto more leaves. Therefore, the disease typically moves form the lower canopy, up the corn plant as the season progresses. When temperatures get above 80 F and it is dry, growth and spread of the fungus slows dramatically. Remember the disease triangle? It takes
three things for a plant disease to occur – susceptible plants, fungal inoculum present near those susceptible plants, and favorable weather. Early this season, all three legs of the triangle were present. We have lots of residual inoculum left from 2015, we have lots of corn planted again in many fields that had corn last year, and we had cool rainy conditions early on this season. However, as we think about the disease triangle moving forward, and look at forecasts over the next 7-10 days, weather is not going to be conducive for the NCLB fungus. Temperatures are forecasts to be above 80 F and there isn’t much rain in site. Without the weather component of the triangle, fungal growth, spread, and subsequent disease development will be halted.

What should I do About Managing NCLB in 2016?

Farmers and consultants should start actively scouting corn fields in Wisconsin and keep track of disease and disease development. Remember, that while the disease is manifesting early, it is currently affecting leaves that will be in the lower canopy of the plant and are not responsible for a large portion of grain yield. 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 disease. While scouting look in the lower portion of the canopy. If some symptoms

Figure 1. Northern Corn Leaf Blight symptoms on a corn leaf.

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 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 3 is a computer generated image that shows 5% of the corn leaf area 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.

When Should I Spray and What Should I Spray?

While it might seem tempting to spray fungicide now (between the V6-V8 growth stages) because of NCLB, remember that the disease will likely slow due to the hot dry weather pattern we are about to encounter. I would encourage you to be patient and save your fungicide spray until as close to tassel (VT growth stage) as you can. 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 (two fungicide applications). Over a 6 year period and well over 1,500 observations, the

Figure 2. A photo-micrograph of spores produced by the NCLB fungus.

Figure 3: A computer simulation of 5% NCLB severity on a corn leaf.
So what about fungicide application on corn in Wisconsin? We have compiled a 3-year dataset where we have looked at return on investment when using fungicide in fields where little disease was active (<5% NCLB ear-leaf severity) or where diseases active (>5% NCLB ear-leaf severity). When NCLB was active, we found that there was a positive yield response when using fungicide about 74% of the time with an average yield gain of 5.4 bushels per acre (Figure 5). When disease activity was low, that positive yield response dropped to just 32% with little gain over zero bushels (Figure 5).

How about the return on investment in the current corn market? If we consider the current corn pricing and a fungicide cost of $10 to $14, Figure 6 shows that in Wisconsin a positive return on investment (ROI) occurs about 50-65% of the time when disease is active on ear-leaves (Figure 6). When disease is not active, the odds of positive ROI drop to just 12% – 20%. For a full discussion and explanation, I would encourage you to watch this video about corn disease and fungicide applications in Wisconsin.

Also 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.

For information on fungicide efficacy for NCLB you can consult fungicide efficacy trial data in Wisconsin BY CLICKING HERE. You can also consult the National Corn
Disease Working Group fungicide efficacy table that was recently updated. The fungicide efficacy table can be found [here](#).

**Summary**

While it is earlier than normal to see NCLB in Wisconsin, I would encourage people to be patient in managing this disease with fungicide. Remember that conditions are going to be hot and dry over the next 1 – 2 weeks, which will dramatically slow the progress of NCLB. Also, 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 closer to VT. With the price of corn grain comparatively lower than in years past, one application of fungicide is about all that Wisconsin farmers can afford, therefore I would maximize that application and apply it as close to the VT growth stage as you can. As you approach that growth stage, continue scouting and consider if the disease is active. If it isn’t active and the weather pattern continues to be hot and dry, a fungicide application may not be needed at all.

**Wisconsin Winter Wheat Disease Update – June 16**

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Brian D. Mueller, Graduate Research Assistant, University of Wisconsin-Madison

The University of Wisconsin Field Crops Pathology team has completed leaf disease ratings at all Wisconsin winter wheat variety trials this week. We will begin rating for Fusarium head blight (FHB) damage in these same trials next week. We have also scouted wheat in production fields in various areas. Most wheat has completed anthesis and is filling grain. No FHB has been observed up to this point. However, stripe rust is pretty serious in most locations we have been (Figure 1). On susceptible varieties that haven’t been sprayed with a fungicide, we have observed 100% incidence with average severity on flag leaves ranging between 30 and 90%! We even have our token “Yellow Jeans” picture to demonstrate how severe stripe rust is in some fields (Figure 2). While there are many cases of severe stripe rust, we have observed some varieties to be very resistant. Little or no rust observed (Figure 3). I think there will be a wide range in yields of winter wheat this year in Wisconsin, based on stripe rust severity. Those who did not spray fungicide and have susceptibility will see significant yield losses and reduced test weight.

We have seen very few other foliar diseases on wheat during our travels. Leaf blotch diseases are present in some fields in the lower canopy, but in many cases, stripe rust is out-competing those diseases. We found powdery mildew in one isolated location in one field we have

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**Figure 1.** Stripe rust spores on a wheat leaf, being collected for research.

**Figure 2.** Stripe rust spore on denim jeans

**Figure 3.** A stripe rust susceptible winter wheat variety on the left and a resistant winter wheat variety on the right. Note the yellow leaves on the variety on the left.
been in. We suspect that we will find some FHB over the next several weeks as portions of the state had favorable weather for the FHB fungus during anthesis. We will continue to monitor this situation and alert you to what we find.

Finally, I want to note that fungicide applications should not be made after the anthesis period. Most fungicide will no longer be effective on these diseases once established. Also, the pre-harvest intervals on these products will not allow application after the anthesis period.

Using High-Input Systems for Soybean Management Increases Yield but Not Profitability

Shawn P. Conley
Soybean and Wheat Extension Specialist

As fields begin to dry out and growers look to get across their fields to apply inputs here are a few points to ponder for Midwestern farmers based on our USB funded High Yield Project.

1. V4 applications of nitrogen to soybean provided a +3.9% relative yield change, but a 0 to 27% chance of ROI based on yield levels from 45-75 bu per acre and $12 beans….. i.e. additional nitrogen to soybean does not pay!

2. Lactofen has efficacy on many broadleaf weeds and on white mold….it is not a yield enhancer for Midwestern farmers. We measured a 0% probability of ROI when lactofen was intentionally used to defoliate soybeans and promote branching in Northern and Midwestern soybean fields.

For additional information please review: Using High-Input Systems for Soybean Management Increases Yield but Not Profitability

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

Field Crops
Oats, Phyllosticta Leaf Spot, Phyllosticta sp., Sauk
Oats, Red Leaf (Suspected), Barley yellow dwarf virus, Sauk

Forage Crops
Alfalfa, Aphanomyces Root Rot, Aphanomyces euteiches, Walworth
Pythium Root Rot, Pythium sp., Walworth

Fruit Crops
Cherry, Bacterial Canker, Pseudomonas syringae, Dane
Cherry, Brown Rot, Monilinia sp., Dane
Grape, Antracnose, Sphaceloma ampelinum, Dane
Raspberry, Unidentified Viral Disease, Unidentified virus, Monroe

Vegetable Crops
Tomato, Herbicide Damage, None, Dane

Specialty Crops
Hop, Downy Mildew, Pseudoperonospora humuli, Fond du Lac

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

Vegetable Crop Update June 10, 2016

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

The 12th issue of the Vegetable Crop Update is now available.

In this issue :

- Late blight and cucurbit downy mildew updates from the U.S
- WI disease forecasting information for late blight and early blight diseases of potato
- Update on Orondis fungicide (Syngenta)

Click here to view this update.
Vegetable Crop Update June 15, 2016

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

The 13th issue of the Vegetable Crop Update is now available.

In this issue:

- Early prevention of late blight
- Considerations for kicking-off your preventive fungicide program

Click here to view this update.

Wisconsin Fruit News: Volume 1 Issue 5 – June 10, 2016

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

The 5th issue of Wisconsin Fruit News is now available. Click here to view this newsletter.

All newsletters will also be posted onto the Wisconsin Fruit website, available at www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.

Wisconsin Pest Bulletin for 6-9-16

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

Volume 61 Issue No. 7 of the Wisconsin Pest Bulletin is now available at: https://datcpservices.wisconsin.gov/pb/pdf/06-09-16.pdf

INSIDE THIS ISSUE

LOOKING AHEAD: More corn borers, stalk borers and armyworms expected next week

FORAGES & GRAINS: Alfalfa blotch leafminer appearing in southwestern WI alfalfa

CORN: Damage caused by slugs common in Wisconsin cornfields

SOYBEAN: Soybean aphids found in only three of 53 fields sampled from June 2-8

FRUITS: Codling moth treatments beginning in apple orchards

VEGETABLES: First squash vine borer moths expected to emerge by June 16

NURSERY & FOREST: Downy mildew and hollyhock rust noted this week

DEGREE DAYS: Growing degree day accumulations as of June 8, 2016

Wisconsin Pest Bulletin for 6-16-16

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

Volume 61 Issue No. 8 of the Wisconsin Pest Bulletin is now available at: https://datcpservices.wisconsin.gov/pb/pdf/06-16-16.pdf

INSIDE THIS ISSUE

LOOKING AHEAD: Peak corn rootworm egg hatch expected June 22-26

FORAGES & GRAINS: Potato leafhopper nymphs appearing in alfalfa

CORN: Minor European corn borer infestations noted this week

SOYBEAN: Rose chafer and slugs common in Wisconsin soybean fields

FRUITS: Scouting for OBLR larvae recommended

VEGETABLES: Squash vine borer moths observed on June 10

NURSERY & FOREST: Sale of NR 40 regulated invasive plants a problem in some nurseries

DEGREE DAYS: Growing degree day accumulations as of June 15, 2016
Save the Date – Agronomy/Soils Field Day at Arlington Ag Research Station on August 31st

The Departments of Agronomy and Soil Science in conjunction with the Arlington Agricultural Research Station will host their annual field day on August 31, 2016 from 8:00 a.m. to 2:30 p.m. The field day will highlight UW-Madison research on all facets of crop production and soil management. Look for more information in the weeks ahead.
Save the Date – Agronomy/Soils Field Day at Arlington Ag Research Station on August 31st

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2016 Wisconsin Cover Crop Conference

The 2016 Wisconsin Cover Crops Conference will be held Tuesday August 30 in the Lancaster area. The one-day conference, whose theme is “Coupling soil health and economics,” will feature a bus tour highlighting the operations of several local cover crop users, both dairy/livestock and cash grain, as well as cover crop research at the Lancaster Research Station. Special emphasis will be placed on using cover crops to improve the “bottom line.” Continuing education credits for agricultural professionals will be available.

The conference is a joint effort of the Michael Fields Agricultural Institute, Wisconsin NRCS, UW-Extension and UW Agricultural Research Stations. Information for the full program and additional details will be published soon. For more information please contact Jim Stute, (262) 642-3303, jstute@michaelfields.org

Preparing for Corn Rootworms

Bryan Jensen
UW Extension and IPM Program

Corn rootworm egg hatch has been underway in southern Wisconsin for a short period of time. Not that you would expect to see above ground symptoms, but it is a good time to start thinking about and preparing for root evaluation and beetle scouting. Never have these two practices been more important. Wisconsin is in a unique situation with respect to rootworm resistance management. We can have an impact on the “resistance curve” if we incorporate beetle scouting and root monitoring into our routine.
Scouting for beetles during the egg laying period (early/mid-August to early September) will provide information that is essential to delaying resistance. Beetle numbers have been low in recent years and field counts will give you information necessary to determine if rootworm protection is needed next year and which control tactic may be best suited for individual field needs. Thus, reducing reliance on a single management tactic.

Monitoring roots for larval damage should begin by the end of July and be completed before significant root regeneration takes place. Using the Iowa State Nodal Root Rating Scale will quantify the amount of feeding and indicate if your current rootworm management practice is working, if you had root injury on first year corn and especially if your Bt trait(s) are working.

There are several resources available which can help you gain experience with both practices and are listed below.

References
Corn Rootworm Rating
Corn Rootworm Beetle Scouting
IPM Decision Aid: Managing corn rootworm Bt resistance
Corn Rootworm: How to Validate Your Management Decision (Video)
How to Scout for Rootworm Beetles (Video)
Corn Rootworm Damage and Root Node Injury Scoring

Provide Comment Regarding Pyridate in Mint

Steve Salisbury
Mint Industry Research Council
Cell: 503-551-3747

The EPA has finally published our Section 18 request for Tough (pyridate) in the Federal Register this morning. The EPA is now accepting public comment regarding our proposed use of pyridate in mint. Please follow the web link below to provide comment to the EPA. This public comment period is only open for 15 days because this is a Section 18 emergency exemption request. The period closes July 1st. The EPA needs your comments so that they can hear and better understand our urgent need.

Please forward this email and web link to as many mint growers as possible so that our voice and need for pyridate is heard. We are inching closer to a decision with this. I’ve been told that product has been mobilized and is being repacked for immediate distribution if we get an approval. The indemnity agreements will be quickly circulated upon approval as well.

Let me know if you have any questions. Thank you for taking a few minutes to provide public comment.

Please follow: https://www.regulations.gov/#/documentDetail;D=EPA_FRDOC_0001-19249 and click “Comment Now!”

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

Brian Hudelson, Sean Toporek, 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 June 11, 2016 through June 17, 2016.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen</th>
<th>County</th>
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</thead>
<tbody>
<tr>
<td>Forage Crops</td>
<td></td>
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<tr>
<td>Alfalfa, Pythium Root Rot, <em>Pythium sp.</em></td>
<td>Lafayette, Sauk</td>
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<td>Fruit Crops</td>
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<tr>
<td>Cherry, Brown Rot, <em>Monilinia sp.</em></td>
<td>Dane</td>
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<tr>
<td>Cherry, Sphaeropsis Canker, <em>Sphaeropsis sp.</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Grape, Anthracnose, <em>Sphaeloma ampelinum</em></td>
<td>Dane</td>
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<tr>
<td>Vegetable Crops</td>
<td></td>
</tr>
<tr>
<td>Garlic, Stem and Bulb Nematode, <em>Ditylenchus dipsaci</em></td>
<td>Dane</td>
</tr>
<tr>
<td>Potato, Black Leg, <em>Dickey sp.</em>, Portage</td>
<td>Dane</td>
</tr>
<tr>
<td>Tomato, Edema, None, <em>Dane</em></td>
<td></td>
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For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

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Wisconsin Pest Bulletin for 6-23-16

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

Volume 61 Issue No. 9 of the Wisconsin Pest Bulletin is now available at:

INSIDE THIS ISSUE

LOOKING AHEAD: Annual western bean cutworm trapping survey now underway

FORAGES & GRAINS: Alfalfa weevil damage subsiding as pupation begins

CORN: Peak rootworm egg hatch expected next week across southern and central WI

SOYBEAN: Surveys continue to find very low aphid counts

FRUITS: Apple maggot emergence predicted for next week

VEGETABLES: Potato leafhopper counts likely to increase with late June heat

NURSERY & FOREST: Impatiens downy mildew found at Kenosha Co. garden center

DEGREE DAYS: Growing degree day accumulations as of June 22, 2016

Crop Diagnostic Training Center Workshops for 2016

Registration is open for UW-Madison Integrated Pest Management Program’s two Crop Diagnostic Training Center workshops for 2016. The Diagnostic Troubleshooting Workshop will be held July 26, 2015. The Crop & Pest Management Workshop will be held August 9, 2016.

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

Check out the flier here.
Soybean Flowers, Glyphosate Label, and Wheel Track Damage…Oh My!

Shawn P. Conley; Soybean and Wheat Extension Specialist

Given the quick start to our soybean growing season we will begin to see many soybean fields begin to flower (R1) over the next week. 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 ~
Time to Start Watching for White Mold in Soybeans

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Jaime Willbur, Graduate Research Assistant, University of Wisconsin-Madison

The warm weather over the last several weeks has pushed the Wisconsin soybean crop quickly toward the reproductive growth stages. By the end of the week, most early-planted soybean fields in the southern portion of Wisconsin will begin flowering (R1 growth stage). This growth stage is a critical time to make a fungicide application decision for white mold (Fig. 1; also called Sclerotinia stem rot). Fungicide decisions should be made for this disease between the R1 and the R3 (pods beginning to form on upper nodes) growth stages. After the R4 growth stage control of white mold using fungicides quickly declines. The decision to apply fungicide during this time should be made based on the weather. As discussed in this FACT SHEET and VIDEO, cool (less than 80°F) and wet and/or humid conditions during the R1-R3 growth stages can lead to increased risk of white mold later in the season.

Figure 2 illustrates the white mold cycle. Small hardened black structures called sclerotia survive many years in the soil (Fig. 2A). When conditions are cool and wet during the bloom period small mushroom-like structures called apothecia germinate from the sclerotia (Fig. 2B). The apothecia release spores that land on flower petals and germinate (Fig. 2C) allowing the fungus to infect and colonize the soybean plant. As the fungus continues to colonize the inside of the plant, symptoms will begin to develop around the R5 or R6 soybean growth stages. These include wilting plants and paper bag-brown lesions on stems. Eventually new sclerotia of the fungus begin to develop on the plant (Fig. 2D). These sclerotia become the source for future white mold epidemics. Because the white mold fungus needs the open flowers

**Wheel Track Damage to Drilled Soybean at R1**

Spraying Soybean at the R1 Growth Stage

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 stand (more than 100,000 plants per acre) planted in late April though mid-May can compensate for wheel tracks made when a field is sprayed at R1. Yield loss can occur, however, when wheel tracks are made at R1 or later in thin soybean stands (less than 100,000 plants per acre) or late planted soybeans. Regardless of stand, plants could not compensate for wheel tracks made at R3 (early pod development) or R5 (early seed development). The average yield loss per acre is based on sprayer boom width (distance between wheel track passes). In our trials yield losses averaged 2.5, 1.9, and 1.3% when sprayer boom widths measured 60, 90, and 120 foot, respectively. Multiple trips along the same wheel tracks did not increase yield loss over the first trip.


**Figure 1. Severe white mold in a soybean field.**
to infect and colonize soybean, it is important to apply a fungicide during this time to protect the plants from infection if the weather is conducive for the white mold fungus. It can be difficult to determine what “conducive weather” is and if you need to spray.

In an effort to help define these “conducive” conditions, a model was developed at the University of Wisconsin-Madison in conjunction with Michigan State University to identify at-risk regions which have been experiencing weather favorable for the development of white mold apothecia. This model predicts when apothecia will be present in the field using 30-day averages of maximum temperature, relative humidity, and wind speed. Using virtually available weather data, predictions can be made in most soybean growing regions. Based on these predictions, a map is generated (Fig. 3) to indicate areas at no (white), low (blue), medium (yellow), and high (red) risk levels. Fields in yellow or red areas have >40% chance of having apothecia present and may be at risk of white mold developing later in the season. Model predictions must be combined with soybean growth stage and canopy characteristics to aid in timing of fungicide sprays. If the model is predicting medium to high risk in your area, the soybeans are flowering, and the canopy is somewhat closed, then the white mold risk is elevated. If your fields are at-risk, we recommend to consult your local extension personnel or resources for the best in-season management options for your area. To view and download a handy user guide for the model, CLICK HERE.

For Wisconsin soybean growers, regular updates and commentary regarding risk of white mold can be found on this blog. Color coded, state-wide maps will be posted and our recommendations will accompany these posts. So be sure to check back regularly or subscribe to the blog to receive an automatic e-mail update when a new post has been added. You can subscribe via the window immediately to the right of this window. The inaugural post for 2016 can be viewed by clicking here.

If you have decided to spray soybeans for white mold, what are the best products to use. Over the last several years we have run numerous fungicide efficacy trials in Wisconsin and in conjunction with researchers in other states. Fungicides that have performed well in multi-state studies can be found in the 2016 version of the Soybean Fungicide Efficacy Table. In Wisconsin, we have observed that Endura applied at 8 oz at the R1 growth stage performs well. We have also observed that the fungicide Aproach applied at 9 fl oz at R1 and again at R3 also performs comparably to the Endura treatment. Other fungicide options also include Omega and Proline. You can view results of past fungicide evaluations by CLICKING HERE.

Figure 2. White mold cycle on soybean. Drawing created by Renée Tesdall.

Figure 3. White Mold Risk Map for Wisconsin on June 30, 2016. White and blue colors indicate low risk. Yellow and red colors indicate moderate to high risk, respectively.
For even more detailed information about white mold you can visit the Crop Protection Network page on white mold and also download this handy white mold scouting card. You can also find more information about white mold by clicking here and scrolling down to the white mold section.

To visit other posts on this blog about white mold, click below:

2015 Blog Post
2014 Blog Post

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**Fusarium Head Blight and Wisconsin Wheat Harvest in 2016**

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Shawn P. Conley, Extension Soybean and Small Grains Agronomist, University of Wisconsin-Madison

Fusarium head blight (FHB) or scab has been relatively low in most Wisconsin winter wheat fields this season. Occasionally we have run across a field with somewhat higher levels of FHB; however, compared to the 2015 crop, we suspect that the 2016 winter wheat crop should have much less FHB. With that said, it is still important to scout your maturing wheat crop and consider how much damage from FHB might be in a field as you prepare for harvest. While FHB can cause direct yield loss, the fungus that causes this disease can also produce deoxynivalenol (also known as DON or vomitoxin). Assessing wheat fields now can assist you in determining how much vomitoxin might be expected 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 < 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 elevators inspection and dockage procedure (each elevator can have a different procedure).
5. Scabby kernels does not necessarily mean high DON levels and vice versa. For example, in a 2014 fungicide evaluation very low visible levels of FHB were observed for all treatments (Fig. 2). However, when the finished grain was tested for DON, significant levels were identified for all treatments (Fig. 3). Be sure to test and know what levels of DON are in your grain even if you didn’t see a high level of visible disease. Also, don’t assume that because a fungicide was used, there will be no DON.

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.

For more information on Fusarium head blight click here.

References


The Nebulous of Non-Nodulating Soybean in 2015 and Again in 2016

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.

- 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 and 2016. In short less nodulation sites on the roots means increased likelihood for less nodules.

- 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.

• 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).

• Should I apply nitrogen to these poorly nodulating soybeans, and if so, how much? My general answer 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 and 2015 data shows that a soybean plant takes up 3.75 pounds of N in above-ground tissue per bushel of grain. So a 80 bu/a crop removed 302 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)


### Research lacking to back claims for foliar-applied fertilizers

Nathan Slaton, Rick Norman, Trent Roberts, Jason Kelley, Jarrod Hardke, Bill Robertson, Jeremy Ross and Leo Espinoza; University of Arkansas System Division of Agriculture

Farmers must ask at least two fundamental questions about every product they are asked to purchase and apply to their crop: What is the frequency of crop response and what is the average yield increase? The answers to these two questions should be based on an adequate amount of unbiased, reputable research. With such a large number of crop yield enhancing products and nutrient solutions formulated for foliar application available there is no way that each product can be thoroughly researched by university scientists. For the record, let’s establish that there is not a university scientist alive that does not want to discover or recommend farming practices and products that enhance grower yields and profits. If there is a foliar applied fertilizer or biostimulant that increases crop yield 10-20 percent for minimal cost, we want to be the ones doing the research and promoting it at professional educational meetings.

A lot of phone calls have been fielded in recent weeks regarding recommendations for and the agronomic value of foliar-applied nutrient solutions and tissue testing programs. These same questions have been around for the past 50 years, but the aggressiveness at which foliar feeding and the associated products are now promoted is unparalleled. The issue becomes even more complicated when you include “crop performance enhancing” chemicals, sometimes called biostimulants, which are often included in nutrient solutions. Both tissue testing and foliar feeding have a place in row crop agriculture in the mid-South but they must be adequately understood to ensure that they are properly implemented.

### Research lacking

Recommendations are being made to farmers based on crop tissue analysis programs offered by several farm-service providers. Farmers and consultants have shared the results and recommendations of some tissue analysis programs and the tissue nutrient concentrations used to define what is deficient or sufficient typically approximates textbook values. We must all recognize that the textbook values that define sufficient and deficient nutrient concentrations are not always based on research. For many of the essential micronutrients and some macronutrients, the critical concentrations are simply based on a survey of tissue collected from a large number of fields at a specific crop growth stage that generated a bell-shaped – normal — distribution curve. The
information from survey-based critical concentrations is agronomically interesting and useful, especially for troubleshooting field problems. However, for many nutrients, there is little or no published information showing a valid relationship between crop yield increase and tissue nutrient concentration that provides good reason for making widespread recommendations to apply a foliar- or soil-applied fertilizer that includes that nutrient. Research-based information is a challenge to find even for the few macro- and micro-nutrients for which nutrient deficiency occurs annually and is visually evident in commercial fields. The concentration of essential nutrients in crop tissues is likely related to crop performance, however, for many of these essential nutrients, we lack proven research that defines the exact minimum nutrient concentration below which yield is harmed and verifies that a beneficial yield response to foliar feeding occurs.

As a general rule, if land grant university recommendations do not include tissue monitoring thresholds and subsequent research-based relationships showing a yield benefit from soil or foliar fertilization then we would advise you to avoid the practice or approach it with a plan to test whether a crop response occurs (e.g., perform replicated strip trials on your own farm). Over the last few years, university research programs have examined various products marketed for foliar application to several crops and we have yet to find products that produce significant yield increases beyond what a solid fertilization and crop management program provide.

**Misinformation and high-pressure sales**

Most of the textbook critical tissue concentrations are specific to a particular plant part and growth stage. Any deviation from that specific plant part and growth stage may cause the critical nutrient concentration to change. There is usually no single nutrient concentration that can be used for the duration of a growing season to define nutrient deficiency, especially during reproductive growth. For most well-fertilized and watered crops, biomass accumulation will be more rapid than nutrient uptake during much of the critical growth periods when yield potential is set and will cause plant tissue concentrations to decline continuously as the plant develops.

Many of the recommendations being made for foliar feeding simply have little defensible merit, which suggests there is a lot of misinformation being passed about or sales tactics involving ultra-high yield potential, fear of crop failure, or low cost per acre are being used to promote and sell products. A recent tissue analysis for corn recommended the grower apply 1-2 quarts per acre of two different products near the R1 growth stage that would have added the equivalent of 0.68 pounds K2O and 0.30 pounds Mg/acre, which represent less than 0.5 percent of the total aboveground K and Mg content required to produce the typical 220 bushels per acre corn crop. If K and Mg were indeed deficient, the amounts recommended are too small and maybe too late to benefit crop growth, development and yield in our opinion.

**Micronutrients and yield**

Foliar application of micronutrients is an accepted and more logical practice since much smaller amounts are needed to satisfy plant requirements — compared to macronutrients — but tissue testing and substantiating the need for foliar micronutrient application is not without challenges. With the exception of a few micronutrients that are frequently deficient in particular crops (e.g., zinc in corn and rice) and have established fertilization recommendations, the problem with tissue analysis and foliar feeding of micronutrients is twofold. First, deficiencies of many of the essential micronutrients are rarely observed and there is little or no published research verifying significant yield benefits resulting from soil or foliar application. Thus, it is virtually impossible to answer the questions of what is the frequency and magnitude of benefit from fertilization with such nutrients. Second, the textbook critical tissue concentrations for all micronutrients are not always correct and many are based on the normal distribution from a survey that was previously described.

In the early 2000s, when boron deficiency of soybean was recognized as a major limitation to soybean production in parts of eastern Arkansas, research showed no consistent and significant yield benefit by rice or wheat to soil or foliar boron fertilization in the same fields where soybean showed severe deficiency the previous year. The research did show that tissue concentrations of these crops tended to be near or below the textbook critical concentration suggesting that the textbook critical concentration is likely too high for the particular crop. The textbook critical leaf boron concentrations for rice have not changed but continue to be used to make foliar recommendations to growers. A number of the nutrient solutions marketed for foliar application contain extremely low amounts of a suite of micro and macronutrients and their application is supposed to provide some insurance that these nutrients will be plentiful enough to ensure no yield limitation.

Tissue testing is a great idea and when done properly the results can help identify potential problems that require additional research, or crop management adjustments and in some cases a research-based recommendation can be implemented to correct an existing nutrient deficiency. While we would encourage tissue analysis at the appropriate critical growth stage, mid- to late-season foliar-feeding based on tissue analysis results we
believe are largely unwarranted. The reasoning for foliar application of many nutrient solutions and biostimulants is simply based on the low application volume and low cost per acre coupled with the product being piggybacked on the field with another planned application of herbicide or fungicide (e.g., application is free).

At the end of the day, this is still a cost that slowly adds up across applications and acres and depletes funds that may be needed for fundamental components of crop management.

Plant analysis are you using it and interpreting the results correctly?

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

Over the last two weeks I have received several calls/emails regarding interpretation of plant analysis results. In all situations, the agronomist asked how it was possible for corn plant sample results to come back saying that many nutrients were deficient or would be responsive to added fertilizer. One specific example had optimum or better soil test levels and a spring application 14,000 gal/a of dairy manure. Kind of hard to believe that V5 corn would be limited by N, P, S, Ca, Zn, B, and Mn in this situation. Lab results had been interpreted using guidance developed by an ag inputs company. I evaluated the lab results using the UW plant analysis interpretation guidelines. The agronomist and I were not certain how tall the plant was when sampled or what plant part was sampled (a third party agronomist sampled the field). Nitrogen and P were borderline deficient assuming that the plant was 12" tall or smaller and the whole plant was sampled. If the plant was more than 12" tall and the youngest leaf with collar exposed was sampled, then all nutrients were sufficient. A very different interpretation using UW plant analysis guidelines. The agronomist collected another tissue sample when the crop was at V7 and sent it to a lab that uses UW plant analysis interpretation guidelines. The crop was sufficient or high for all nutrients. I plan to follow up on this field after harvest.

Because there have been so many questions recently about plant analysis, I think it’s important to reiterate a few key points on the use the plant analysis. I will also

<table>
<thead>
<tr>
<th>Crop</th>
<th>Alfalfa</th>
<th>Field corn</th>
<th>Field corn</th>
<th>Field corn</th>
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</thead>
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<td>Growth Stage</td>
<td>Bud to 1st flower, prior to any cutting</td>
<td>12&quot; tall or smaller</td>
<td>Pre-tassel</td>
<td>Tassel to silk</td>
</tr>
<tr>
<td>Plant Part to Sample</td>
<td>Top 6&quot;</td>
<td>Whole plant</td>
<td>Leaf below whorl with collar exposed</td>
<td>Ear leaf</td>
</tr>
<tr>
<td>Number of plants to sample</td>
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<td>20</td>
<td>15</td>
<td>15</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Alfalfa</th>
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<th>Field corn</th>
<th>Field corn</th>
</tr>
</thead>
<tbody>
<tr>
<td>N, %</td>
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<td>2.5 - 3.33</td>
</tr>
<tr>
<td>P, %</td>
<td>0.25 - 0.45</td>
<td>0.30 - 0.50</td>
<td>0.25 - 0.45</td>
<td>0.25 - 0.34</td>
</tr>
<tr>
<td>K, %</td>
<td>2.25 - 3.50</td>
<td>2.5 - 4.0</td>
<td>2.0 - 2.5</td>
<td>1.75 - 2.63</td>
</tr>
<tr>
<td>Ca, %</td>
<td>0.7 - 2.5</td>
<td>0.30 - 0.70</td>
<td>0.25 - 0.50</td>
<td>0.30 - 0.55</td>
</tr>
<tr>
<td>Mg, %</td>
<td>0.25 - 0.70</td>
<td>0.15 - 0.45</td>
<td>0.13 - 0.30</td>
<td>0.16 - 0.34</td>
</tr>
<tr>
<td>S, %</td>
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<td>0.15 - 0.50</td>
<td>0.15 - 0.50</td>
<td>0.16 - 0.25</td>
</tr>
<tr>
<td>Zn, ppm</td>
<td>20 - 60</td>
<td>20 - 60</td>
<td>15 - 60</td>
<td>19 - 34</td>
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<td>5 - 25</td>
<td>4 - 25</td>
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<td>Mn, ppm</td>
<td>20 - 100</td>
<td>20 - 300</td>
<td>15 - 300</td>
<td>19 - 68</td>
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<td>Fe, ppm</td>
<td>30 - 250</td>
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<td>10 - 200</td>
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provide the sufficiency ranges that UW uses to interpret tissue test results for corn, soybean, wheat and alfalfa. Before I get to that, I’d like direct your attention to a newsletter article published last week by soil fertility specialists at University of Arkansas. The article is titled “Research lacking to back claims for foliar-applied fertilizers”. This is a well written article that is very applicable to Wisconsin. You can read the full text here: http://www.arkansas-crops.com/2016/06/23/research-applied-fertilizers/

Key points for plant analysis.

• Nutrient concentrations in the plant vary during the growing season and also vary among plant parts. Interpretations of nutrient sufficiency ranges were developed for specific growth stages and specific plant parts. Erroneous interpretations can be made by sampling the wrong part of the plant and/or sampling at the wrong growth stage. Based on questions I receive, plant samples are often collected improperly, especially for soybean.

• Plant nutrient uptake is influenced by location, hybrid/variety, soil test levels. Samples collected from several hybrids/varieties growing in the same field will have a range of nutrient concentrations in the plant. The same hybrid/variety grown on several fields with the same soil test levels will have different nutrient concentrations within the plant. The same is true if soil test levels varied among fields. Thus, nutrient concentrations just below the sufficiency range are not always limiting yield. The concentrations may just be part of natural variation.

• The sufficiency range is a range of nutrient concentrations that are considered adequate for high yields. Ideally, sufficiency ranges are developed through research that includes field trials where nutrients are or are not applied and yield is measured. Sufficiency ranges developed through surveying nutrient concentrations are limited because it is unknown if addition of nutrients would have resulted in greater tissue nutrient concentrations or yield.

• Sampling a field that looks good in an effort to find “hidden hunger” that is limiting yield is not suggested because of the points listed above.

• Plant analysis is best used when samples are collected from “good” and “bad” areas of the field along with soil samples collected from the same areas. The comparison of results along with field history information is very useful to understanding the problem in the field.
The correct plant part and growth stage at which to collect samples along with UW plant tissue sufficiency ranges for alfalfa, corn, soybean, and wheat, are provided in Tables 1 and 2. Please note that Wisconsin Department of Ag, Trade, and Consumer Protection certifies soil test labs, but they do not certify plant analysis labs. What this means is that each lab is free to interpret plant analysis results as they wish. The UW Soil and Forage Analysis Lab in Marshfield (715-387-2523, http://uwlab.soils.wisc.edu) interprets plant analysis results as described in Tables 1 and 2.

What is happening in the corn plant during the month of July?

Joe Lauer, Wisconsin Corn Agronomist

The corn plant during July transitions from developing vegetative structures to reproductive structures. It is significant for yield in that two of the three components of yield are set up during this month. In the first half of the month, the number of potential ovules that could develop into kernels is determined. In the second half, the number of potential cells in the kernel endosperm, which ultimately affects kernel weight, is determined. However, everything is predicated on the success of pollination and fertilization of the ovules on the topmost ear from pollen released by the tassel (see “Methods for determining corn pollination success”).

During early July ear development is rapid and prior to tasseling (V18). The upper ear shoot is developing faster than other shoots on the stalk. Brace roots are now growing from nodes above the soil surface. They will scavenge the upper soil layers for water and nutrients during reproductive stages. Moisture deficiency will cause lag between pollen shed and beginning silk (“nick”). Usually the largest yield reductions will result from this stress. The plant is using 0.30 inches of water per day. Lodging will cause 12-31% yield reduction. Frost (<28 F) will cause 100% yield loss due to plant death (see “Frost”). Hail will cause 100% yield loss when completely deformed (see “Hail damage on corn”). Drought will cause 4% yield loss per day due to drought or heat when leaf rolling occurs by mid-morning (see “Drought”). Flooding (<48 h) will not affect yield, however, other management options need to be considered (see “Flooding effects on corn”).

At the silking (R1) stage the actual kernel number and potential kernel size is determined. R1 begins when any silks are visible outside the husks. Pollen shed begins and lasts 5-8 days per individual plant. Silk emergence takes 5 days. Silks elongate from base of ear to tip of ear. Silks elongate until pollinated. Silks outside husks turn brown. The plant has now reached its maximum height. First 7-10 days after fertilization cell division occurs within kernel after which kernels begin to fill with starch. The plant must have a healthy root system because proper uptake of moisture and nutrients are critical at this time. Hot and dry weather results in poor pollination and seed set. Drought dehydrates silks (delaying silking) and hastens pollen shed causing plants to miss window nick for pollination. Drought decreases yield 7% per day (leaf rolling by mid-morning). Rootworm beetle clips silks which prevents pollination if less than a half-inch of silk is showing.

Nitrogen applied through irrigation water, should be applied by V18. Rootworm beetle control should be implemented if 4-5 beetles are observed feeding near ear tip. Stresses that reduce pollination result in a “nubbin” (an ear with a barren tip).

Wisconsin Northern Corn Leaf Blight Update – June 29, 2016

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

Since the first 2016 confirmation of northern corn leaf blight (NCLB) in Wisconsin on June 16, we have received additional corn samples from other areas of the state in my laboratory and also in the University of Wisconsin Plant Disease Diagnostic Clinic. All confirmations have been made in the laboratory, confirming the presence of the pathogen. Figure 1 shows counties, highlighted in red, where corn samples originated and were confirmed with NCLB.

While it is unusually early to find NCLB at this incidence level in Wisconsin, I continue to urge you to remain patient. All samples that we have examined have had low severity (very few and/or small lesions present on a single leaf). In addition, most of the damage has been
confirmed on lower leaves which do not contribute as much to yield as the ear leaves eventually will. As I mentioned in my previous post on June 16, Our economic analyses indicate that the likelihood of positive return on investment from a fungicide will be higher when the application is made as close to the tasseling period as possible. Considering that the weather this week is very dry and severity of NCLB has been relatively low, I would encourage growers to wait until closer to tasseling before making the decision to apply fungicide. If weather over the next week or two begins to turn continually wet, then this decision should be re-evaluated at that time. To learn more about NCLB and return on investment when using fungicide CLICK HERE. To watch a video about corn diseases in Wisconsin and fungicide use in corn, CLICK HERE. Remember to continue to SCOUT, SCOUT, SCOUT!

Irrigation / Evapotranspiration (ET) Software Tools Update

By John Panuska and Amanda Gevens

For growers using ET tools to schedule irrigation you have likely experienced issues with the ET data service. The reason for the service interruption is the unexpected failure of the system software following a campus power outage in mid-June. After several failed attempts to restart the 30+ year old system it appears to have found the end of its useful life. Luckily, anticipating this date was near, development work began on a new replacement system about a year ago and the good news is that the new service is now operational. So what was initially planned as a testing season has now become a replacement season for the new Ag. Weather Data Service.

In addition to the software failure, staff changes in the Department of Soil Science, where the system has been historically housed and maintained, have resulted in the loss of an in-house programmer to maintain the system. We have therefore been working with a private sector software developer to develop the new Ag. Weather System and will likely rely on this vender for future upgrades and maintenance. So to sum it up it's been a challenging year for ET tools at UW.

The user interface for the new Ag. Weather tool is identical to old system interface. The new system can accessed at: http://agweather.cals.wisc.edu/sun_water/. Select the Wisconsin and Minnesota link. To retrieve ET values, you simply enter the latitude and longitude for your pivot and date range for which you want ET data, press the Get Data Series button and the values will appear on the screen. We intend to continue working to restore more functionality to the site over the next several months and retire the old system this fall.

For those growers using the WISP irrigation scheduler you may interested to know that there is a new version of WISP (Version 2.0) being tested this summer with plans to upgrade the existing WISP 1.1.0 this winter. The look and feel of version 2.0 has not changed, however the multiple field grouping functionality has been restored and the authentication process has been simplified and no longer uses Google. You simply enter your email address and a password. The password is independent of the old version so you can reuse that password if wish. If you forget your password the system will email you a link to reset it and the WISP 2.0 also appears to be running faster than its predecessor. The software upgrade was also needed for better security. Look for the WISP 2.0 next spring.

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

Brian Hudelson, Sean Toporek, 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 June 18, 2016 through June 24, 2016.

Figure 1. Wisconsin Counties Where NCLB has been confirmed as of June 19, 2016.
Plant/Sample Type, Disease/Disorder, Pathogen, County

Field Crops
Corn, Northern Corn Leaf Blight, Exserohilum turcicum, Dane, Juneau, Jackson
Corn, Seedling Blight, Pythium sp., Fusarium spp., Dodge, Iowa
Soybean, Root Rot, Pythium sp., Walworth

Fruit Crops
Cherry, Cold Injury, None, Dane
Raspberry, Herbicide Damage, None, Dane
Raspberry, Root/Crown Rot, Pythium sp., Rhizoctonia sp., Fusarium spp., Waushara
Strawberry, Common Leaf Spot, Mycosphaerella fragariae, Jackson

Vegetable Crops
Cucumber, Damping-Off, Pythium sp., Fusarium sp., Waushara
Garlic, Stem and Bulb Nematode, Ditylenchus dipsaci, Dane
Pea, Ascochyta Blight, Ascochyta sp., Richland
Potato, Black Leg, Dickey sp., Portage
Potato, Early Blight, Alternaria solani, Columbia
Tomato, Bacterial Canker, Clavibacter michiganensis subsp. michiganensis, Outagamie, Winnebago
Tomato, Tomato Spotted Wild, Tomato spotted wilt virus, Dane

Soil
Alfalfa Soil, Aphanomyces Seedling Blight, Aphanomyces euteiches race 1 and race 2, Dane
Soybean Soil, Soybean Cyst Nematode, Heterodera glycines, Jefferson

Soil Analysis
Alfalfa Soil, Aphanomyces Seedling Blight, Aphanomyces euteiches race 1 and race 2, Dane
Soybean Soil, Soybean Cyst Nematode, Heterodera glycines, Jefferson

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

Wisconsin Winter Wheat Disease Update – June 29
Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Brian D. Mueller, Graduate Research Assistant, University of Wisconsin-Madison

This will likely be the last winter wheat disease update for 2016, as the University of Wisconsin Field Crops Pathology team has nearly finished winter wheat disease ratings for 2016. In our travels this season we have determined that the major disease of concern was stripe rust. We were able to find stripe rust in every field we visited this season. In the variety trials throughout the state, stripe rust hit some varieties very hard, causing significant damage and early defoliation. Other varieties did fairly well, so genetic resistance was obviously a big player for us this season. In production fields that did not receive an application of fungicide, stripe rust was often moderate to severe. Fields with resistant varieties or that received a well-timed fungicide had low levels of stripe rust and will yield well.

Unlike 2015, Fusarium head blight (FHB or scab) has been relatively minimal. In the southern and eastern wheat production areas of the state we could find some low levels of FHB, however, severity is fairly minimal. This is likely due to the fact that the weather was very hot and mostly dry during the anthesis period in this part of the state. Further to the north and closer to Lake Michigan, we have found higher levels of FHB. In a production field
near Marshfield, in central Wisconsin, FHB levels were significantly higher than observed in other parts of the state. Incidence was around 25-30% with severity averaging 15-20%. These higher levels of FHB likely resulted from more favorable weather for the FHB fungus during anthesis in this part of the state. For more information about how to handle FHB as we approach harvest CLICK HERE.

Septoria leaf blotch was present in low levels in some fields. However it won't be a substantial yield-reducer in 2016. Powdery mildew was nearly non-existent in the state for the fourth season straight.

**2016 Wisconsin Cover Crop Conference**

The 2016 Wisconsin Cover Crops Conference will be held Tuesday August 30 in the Lancaster area. The one-day conference, whose theme is “Coupling soil health and economics,” will feature a bus tour highlighting the operations of several local cover crop users, both dairy/livestock and cash grain, as well as cover crop research at the Lancaster Research Station. Special emphasis will be placed on using cover crops to improve the “bottom line.” Continuing education credits for agricultural professionals will be available.

The conference is a joint effort of the Michael Fields Agricultural Institute, Wisconsin NRCS, UW-Extension and UW Agricultural Research Stations. Information for the full program and additional details will be published soon. For more information please contact Jim Stute, (262) 642-3303, jstute@michaelfields.org
High demand for organic livestock feed and food-grade grain along with continued double-digit growth in the organic marketplace are creating opportunities for more farmers to grow organic—opportunities that are even more appealing in light of the current low prices for commodity grains. To help farmers learn about growing organic grain, the Organic Grain Resources and Information Network (OGRAIN) and the Midwest Organic and Sustainable Education Service (MOSES) are offering four field days this summer covering the tools, activities and inputs needed for successful organic grain production.

"Whether you’re a conventional producer interested in exploring the transition to organic grain production, a livestock or produce farmer curious about adding grain to your system, or a new farmer wanting to start with organic grain, you’ll find what you’re looking for in these field days,” says Anders Gurda, Associate Researcher in the Organic and Sustainable Cropping Systems lab at UW-Madison and program coordinator for OGRAIN.

Each field day will feature invited speakers including farmers, researchers, agency personnel and industry representatives. While some events will begin with more conventional presentations, all will incorporate engaging farm tours and plenty of unstructured time for discussion and networking.

The field days will collectively cover many agronomic aspects of organic food- and feed-grade corn, soybean, and small grain production. Depending on the field day, attendees will also learn about marketing opportunities, organic transition and certification, Whole Farm Revenue Protection crop insurance, and enterprise budgeting.

Significant barriers prevent many producers from making the leap to organic grain production. “Farmers are concerned about yields in organic systems, the organic transition process, and the skills and knowledge necessary for managing a successful organic grain operation,” Harriett Behar, Organic Specialist with MOSES explains.

"Farmers can avoid the roller coaster of commodity prices from year to year by growing and selling organic grain, with the added bonus of producing the crops in an environmentally responsible manner. These field days will be time well-spent for all attendees,” says Gurda.

Field days are available to anyone with an interest in learning more about organic grain production. However, the events emphasize the needs of beginning farmers who have been farming for fewer than 10 years.

The field day series is made possible by a grant from the USDA Beginning Farmer and Rancher Development Program. OGRAIN is a collaborative effort of the UW-Madison Center for Integrated Agricultural Systems (CIAS), the Farm and Industry Short Course (FISC), the UW-Madison Organic and Sustainable Cropping Systems lab, and the Midwest Organic and Sustainable Education Service (MOSES).

OGRAIN/MOSES field day calendar:

- **July 7, 2016 (10-3pm)** – Organic Small Grains Production, Milling, and Marketing Dolan Farms, Dodgeville, WI and Lonesome Stone Milling, Lone Rock, WI

- **July 28, 2016 (9-4pm)** – Managing Risk in Organic Production; Goldmine Farms, Pana, IL

- **August 11, 2016 (9-4pm)** – An Organic Grain Toolbox: weed control, crop rotations, cover crops, soil health, human health, and enterprise budgeting; Cooksville Community Center/Doudlah Farms, Evansville, WI

- **September 15, 2016 (1-4pm)** – Managing Organic Crops on A Large Scale; Fairview Farm, Cottonwood, MN

For more information about the field days and to register, visit mosesorganic.org or call 715-778-5775. Some field days require pre-registration and/or a fee for a lunch.

For more information about OGRAIN and its programs, contact Anders Gurda, agurda@wisc.edu, 612-868-1208. 

[Click here to view the flier](#)

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Jaime Willbur, Graduate Research Assistant, University of Wisconsin-Madison

Sclero-cast: A Soybean White Mold Prediction Model

**This tool is for guidance only and should be used with other sources of information and professional advice when determining risk of white mold development. We encourage you to read the model how-to guide which can be downloaded by clicking here**

Risk of apothecial presence and subsequent white mold development remains generally low for most of Wisconsin today. Risk has increased slightly across the state over the holiday weekend with some isolated pockets in the northern and south-central areas of the state. The UW Field Crops Pathology crew has been scouting for apothecia in fields in the soybean growing areas of southern and central Wisconsin and HAVE NOT found any apothecia. This confirms the generally low risk currently being predicted by the model. Growers near higher risk pockets should monitor the soybean crop for closing canopy and flowering growth stages that may lead to increased risk of white mold. We have seen numerous fields this week already in the R1 growth stage. Be sure to consult the how-to guide for assistance in interpreting this map if you are considering spraying fungicide to control white mold.

2016 DATCP Soybean Phytophthora Survey Update

Anette Phibbs, Plant Industry Laboratory Director, Wisconsin Department of Agriculture, Trade and Consumer Protection
Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison

Brown discoloration of a soybean stem as a result of infection by Phytophthora sojae. Photo Credit: Craig Grau.

The Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) pest survey team collected soybean seedlings from 30 fields in eleven counties...
The next few weeks will be critical for population buildup and damage to alfalfa. New seedings should be checked. Sweep established stands as well but don’t over commit unless you are finding levels above threshold.

**Rootworm beetles:** We will start to see emergence of adults soon. Populations have been relatively low over the last two years but do keep an eye out for any early (or late) pollinating corn for silk clipping. Lodging from larval feeding may be observed if we get high winds/rains on the most advanced fields in the near future. Remember to investigate lodged field for signs of larval feeding. Don’t assume all lodging is from rootworm feeding. We are still over a month away from significant egg laying.

**Western bean cutworm:** Damage was low in 2015. The most advanced fields within an area are likely candidates for oviposition.

### Wisconsin Cover Crops Conference

**Tuesday August 30, 2016**

9:00 am to 4:00 pm

Starts and ends at the Grant County UW-Extension Office:

Youth & Agriculture Center
916 E Elm Street, Suite A
Lancaster, WI 53813-0031

The theme of this year’s conference is “Coupling soil quality and economics” featuring a bus tour of cover crop research at the UW Lancaster Agricultural Research Station, and a tour of farms who have incorporated cover crops into their operations to improve the bottom line.

**Agenda**

8:00-9:00 Registration and refreshments

9:00 Welcome and General Session

**Why use cover crops? Helping other farmers adopt the practice**

Jeff Endres, Endres Berryridge Farms, Waunakee

Jeff is President of the Yahara Pride Watershed Group and a National Wildlife Federation Cover Crop Champion for Wisconsin.
How USDAs new risk management program supports diversification
Margaret Krome, Michael Fields Agricultural Institute

10:00 Bus Tour
Economics of frost seeding red clover in winter wheat: nitrogen credits for corn and yield response
Jim Stute, Michael Fields Agricultural Institute

Grass cover crops following corn silage and manure application
Matt Ruark, UW Soil Science/ UW Extension

Interseeding cover crops in corn and soybean
Dan Smith, UW Nutrient and Pest Management Program
Bill Meyer, UW Lancaster Agricultural Research Station

Winter rye after corn silage, Air-flowed mixes after wheat using vertical tillage
Gary Stelpflug, Lancaster

Winter rye after corn silage: forage yield and quality
Steve Adrian, Glen Haven

Registration is required by August 20 to assist with event planning. On-line registration is encouraged and is available on the Michael Fields Institute website: www.michaelfields.org

To register by email contact: Wisconsin Cover Crops Conference, WCCC@michaelfields.org

To register by phone contact: Ted Bay, Grant County UW-Extension, (608)723-2125

Cost of the conference is $30 which includes lunch and materials (fee waived for NRCS personnel). Five CEUs in crop management are available. For more information contact Jim Stute: (262) 642-3303, extension 112 or jstute@michaelfields.org

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

Brian Hudelson, Sean Toporek, 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 June 25, 2016 through July 1, 2016.

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Crops</td>
</tr>
<tr>
<td>Corn, Anthracnose, <em>Colletotrichum graminicola</em>, Calumet, Columbia, Dodge, Waushara</td>
</tr>
<tr>
<td>Corn, Northern Corn Leaf Blight, <em>Exserohilum turcicum</em>, Buffalo, Dane, Dodge, Sauk, Jefferson</td>
</tr>
<tr>
<td>Forage Crops</td>
</tr>
<tr>
<td>Alfalfa, <em>Aphanomyces Root Rot/ Seedling Blight</em>, <em>Aphanomyces euteiches</em>, Dane</td>
</tr>
<tr>
<td>Fruit Crops</td>
</tr>
<tr>
<td>Grape, Anthracnose, <em>Speloma amrpleinum</em>, Buffalo</td>
</tr>
<tr>
<td>Grape, Black Rot, <em>Phylllosttica amphilcida</em>, Wood</td>
</tr>
<tr>
<td>Grape, <em>Downy Mildew</em>, <em>Plasmodora viticola</em>, Green Lake</td>
</tr>
<tr>
<td>Peach, <em>Peach Leaf Curl</em>, <em>Taphrina deformans</em>, Walworth</td>
</tr>
<tr>
<td>Peach, Prunus Necrotis Ringspot (Suspected), <em>Prunus necrotic ringspot virus</em>, Marquette</td>
</tr>
<tr>
<td>Raspberry, Cane Blight, <em>Coniothyrium fuckelii</em>, Winnebago</td>
</tr>
<tr>
<td>Vegetable Crops</td>
</tr>
<tr>
<td>Asparagus, Fusarium Root/ Crown Rot, <em>Fusarium oxysporum</em>, Dane</td>
</tr>
<tr>
<td>Chard, Altemaria Leaf Spot, <em>Altemaria sp.</em>, Vemon</td>
</tr>
<tr>
<td>Lettuce, Bacterial Leaf Spot, <em>Xanthomonas sp.</em>, Vemon</td>
</tr>
<tr>
<td>Potato, Black Leg, <em>Dickeya sp.</em>, Portage</td>
</tr>
<tr>
<td>Snap Bean, <em>Herbicide Damage</em>, None, Dane</td>
</tr>
<tr>
<td>Tomato, Cucumber Mosaic, <em>Cucumber mosaic virus</em>, Ashland</td>
</tr>
<tr>
<td>Tomato, <em>Early Blight</em>, <em>Altemaria soloni</em>, Oneida</td>
</tr>
<tr>
<td>Tomato, <em>Herbicide Damage</em>, None, Dane</td>
</tr>
<tr>
<td>Tomato, Tobacco Mosaic, <em>Tobacco mosaic virus</em>, Ashland</td>
</tr>
<tr>
<td>Specialty Crops</td>
</tr>
<tr>
<td>Ginseng (American), <em>Phytophthora Root Rot</em>, <em>Phytophthora cactorum</em>, Delta (MI)</td>
</tr>
<tr>
<td>Ginseng (American), Rhizoctonia Root Rot, <em>Rhizoctonia sp.</em>, Delta (MI)</td>
</tr>
</tbody>
</table>

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

Vegetable Crop Update July 1, 2016

16th issue of the Vegetable Crop Update is now available. In this newsletter we focus on:

- Potato disease forecasting updates (PDays, DSVs)
- Late blight and cucurbit downy mildew national updates
• Onion Stemphylium - symptoms and management (Luna Tranquility fungicide is now registered for onion)

• UW-Ag Research Station Field Day agendas for Rhinelander (7/14) and Hancock (7/28)

Click here to view this update.

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**Wisconsin Pest Bulletin for 7-7-16**

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

Volume 61 Issue No. 10 of the Wisconsin Pest Bulletin is now available at:


**INSIDE THIS ISSUE**

LOOKING AHEAD: Summer flight of western bean cutworm moths underway

FORAGES & GRAINS: Potato leafhopper counts still below-threshold

CORN: First corn rootworm beetles of the season noted this week

SOYBEAN: Soybean aphid densities remain extremely low

FRUITS: Apple maggot flies captured in southeastern WI orchards

VEGETABLES: Squash bugs and tomato hornworms appearing in home gardens

NURSERY & FOREST: Leaf spot diseases and flea beetles observed during recent inspections

DEGREE DAYS: Growing degree day accumulations as of July 6, 2016
Evaluating Corn Roots for Rootworm Damage

Bryan Jensen
UW Extension and IPM Program

Evaluating corn roots for rootworm feeding has several benefits in continuous corn and includes validation of your current control practice, monitoring for potential resistance to Bt and to confirm/reject if rootworms are responsible for lodged corn. The time to do dig roots is after peak larval feeding but before significant root regeneration occurs. Typically, late July is a good time to start. It is hard to predict when (if) roots will start to regenerate. However, I would expect a three week window before root regeneration can conceal previous feeding.

The best (if not only) way to quantify feeding is to use the Nodal Injury Scale (NIS) developed by Iowa State Entomologists. For more information, please refer to http://ipcm.wisc.edu/download/pubsPM/Corn-root-Rate-card2015hx.pdf

Regardless of the control practice used, some feeding is likely, if not economically allowable. A general rule of thumb is if the NIS field average is less than 0.25 there should not be any economical loss. If the NIS rating was above 0.75 then economical loss is likely to occur. A rating between 0.25 and 0.75 is a gray area. Loss will be dependent on several factors which include hybrid, rainfall, compaction, fertility levels, etc.

You should expect to see some injury on Bt hybrids as well. You can use the above ranges to determine yield loss, however, your first concern will probably be resistance. Resistance should be considered if the field average is > 1.0 on single gene hybrid or > 0.5 on pyramid (two Bt crw proteins). Remember to avoid structured refuges and if a RIB is planted that 5-10% of the plants do not contain the Bt protein(s). If resistance is suspected, contact your seed sales person. They know the steps to take and are obligated to respond.

If you are responding to a lodged corn complaint, do not assume rootworms are the cause. They may or they may not. Or, they could be a contributing factor. Respond to the complaint as soon as possible and familiarize yourself w/ weather events from that area. Tall corn, especially with a developing ear, may easily lodge in areas exposed to wind, rain, etc.
Routinely monitoring roots in first year corn fields can alleviate concerns you might have regarding “rotation resistant” rootworms. Western corn rootworms have adapted to a corn/bean rotation by laying eggs in soybean fields. This phenomenon has been confined to selected areas of the Midwest, including southeast WI. However, recent complaints have been very infrequent. Northern corn rootworms have adapted to a corn/bean rotation because a percentage of their population requires 2 winter chill period before eggs hatch. This has not been confirmed in Wisconsin but may happen on rare occasions.

Here are some specific reminders:

1. Keep the engine compartment as clean and clear of debris as possible. Caked/oily residue means there’s a leak somewhere. Fix it.
2. Listen closely for unusual noises and pay attention to warning lights and sensors that could indicate bearing/belt/and other drive component issues. Fix them.
3. Many combine fires are ignited by the electrical system – blown fuses, flickering lighting, etc. are all signs that you might have damage.
4. The ABC dry chemical fire extinguisher is probably still the most cost-effective and overall effective type of extinguisher. The bigger the better (at least 10 pounds). Mount extinguishers (recommend at least two ten-pounders) where they can be grabbed quickly in the cab AND/OR from the ground.
5. If a combine does catch fire, pull it away from any standing crop quickly. Shut off the engine. The longer the fire burns, the more difficult it will be to put it out. If the engine is left running, it will be almost impossible to extinguish (even if the fire department shows up!)
6. Grab your extinguisher if time allows and get out. Call for help. It is not always possible to put out a vehicle fire with a handheld extinguisher. A second one is often needed, even on a smaller fire.
7. Always consider PERSONAL safety. A combine fire that gets into a fuel, oil, or other flammable liquid system will burn hot. Even more so if a tire is involved. A machine can be replaced. A life cannot.
8. If you’ve used an extinguisher (even for a short burst), it MUST be recharged. If you’re not sure where to recharge and re-tag your extinguisher, call your fire department.

Small Grains Harvest and Combine Fires

John Shutske; Professor & Extension Specialist; Biological Systems Engineering

It looks like wheat harvest is rolling in parts of the state. I saw a post from a friend in New Glarus saying they’d started late yesterday. Just a quick reminder on combine fire prevention and protection — “Protection,” because SOME machines will burn regardless of how hard you work at it. So you need to know what to do to minimize the damage. Over the years I (or my former students) have done a bunch of investigative work on about 12,000 fires (combines, tractors and other specialty harvesters). We’ve learned a lot…. 

See:
http://ipcm.wisc.edu/blog/2013/10/learn-not-to-burn-during-this-busy-harvest-season/
http://americanfarmservices.com/information/heavy-equipment-and-combine-fires/
http://nasdonline.org/static_content/documents/1494/d001294.pdf
when determining risk of white mold development. We encourage you to read the model how-to guide which can be downloaded by clicking here**

White Mold Risk- July 8, 2016

Risk of apothecial presence and subsequent white mold development remains generally low for most of Wisconsin today. Risk has increased slightly across the state over the holiday weekend with some isolated pockets in the northern and south-central areas of the state. The UW Field Crops Pathology crew has been scouting for apothecia in fields in the soybean growing areas of south and central Wisconsin and HAVE NOT found any apothecia. This confirms the generally low risk currently being predicted by the model. Growers near higher risk pockets should monitor the soybean crop for closing canopy and flowering growth stages that may lead to increased risk of white mold. We have seen numerous fields this week already in the R1 growth stage. Be sure to consult the how-to guide for assistance in interpreting this map if you are considering spraying fungicide to control white mold.

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

Brian Hudelson, Sean Toporek, 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 July 2, 2016 through July 8, 2016.

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

Field Crops
Corn, Eyespot, Kabatiella zeae, Green
Corn, Northern Corn Leaf Blight, Exserohilum turcicum, Adams, Green, Portage
Soybean, Herbicide Damage, None, Green

Fruit Crops
Grape, Anthracnose, Spaceloma ampelinum, Taylor

Vegetable Crops
Lettuce, Root/Crown Rot, Pythium sp., Rhizoctonia sp., Fusarium sp., Washington
Potato, Black Leg, Dickeya sp., Langlade, Portage
Squash, Root/Crown Rot, Pythium sp., Rhizoctonia sp., Fusarium sp., Dane
Tomato, Herbicide Damage, None, Outagamie

Specialty Crops
Hop, Apple mosaic, Apple mosaic virus, Champaign (IL)
Hop, Carlavirus, Unidentified carlavirus, Campaign (IL)
For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

**Don’t Miss Agronomy/Soils Field Day – August 31**

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

As usual Agronomy/Soils Field Day has a fantastic program lined up! Phil Townsend will discuss new frontiers in remote sensing for agriculture during the lunch program. A special tour focusing on UW research on remote sensing in agriculture is slated for the afternoon. Other tours will include recent research on soil fertility & management, grain production systems, forage production system and pest management.

The SnapPlus team and Nutrient and Pest Management Program along with the UW Soil & Forage Analysis Lab will have display booths to visit between tours. The Badger Crops Club will provide lunch ($5 donation).

The field day will be held at the Arlington Ag Research Station beginning at 8:30 am and concluding at 2:45 pm. This year all attendees will need to sign a waiver before they can ride tour wagons. Please come early to help facilitate this new process. Program details can be found in the flyer.

[Click here to view the flyer.](#)

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**Vegetable Crop Update July 8, 2016**

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

17th issue of the Vegetable Crop Update is now available. In this newsletter we focus on:

- Potato disease forecasting updates (PDays/DSVs)
- Late blight and cucurbit downy mildew national updates
- Agricultural Field Day agenda for Langlade County - Antigo Airport station

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

**Wisconsin Fruit News: Volume 1 Issue 7 – July 8, 2016**

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

The 7th issue of Wisconsin Fruit News is now available. Click on the link below to view this newsletter:


**Wisconsin Pest Bulletin for 7-7-16**

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

Volume 61 Issue No. 10 of the Wisconsin Pest Bulletin is now available at:


**INSIDE THIS ISSUE**

LOOKING AHEAD: Raspberry growers advised to prepare for SWD infestation
FORAGES & GRAINS: Alfalfa pest counts generally low for mid-July
CORN: Significant European corn damage found in a few fields
SOYBEAN: Soybean aphid densities increasing in R1-R3 fields
FRUITS: Apple maggot trap counts are up in some orchards
VEGETABLES: Striped cucumber beetles becoming more abundant
NURSERY & FOREST: Observations from this week’s nursery inspections
DEGREE DAYS: Growing degree day accumulations as of July 13, 2016
Don’t Miss Agronomy/Soils Field Day – August 31

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Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Jaime Willbur, Graduate Research Assistant, University of Wisconsin-Madison

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Although soybean aphid populations have been low this growing season, I thought I would offer a quick summary of an article recently written and reviewed by several research and extension entomologist from the northern soybean producing states. In recent years, there has been a wealth of soybean aphid management information provided from Land Grant Universities which are the results of multiple studies, conducted in several environments that are science-based, statistically sound and peer-reviewed. There is also advice offered from several other sources which contradicts these findings and/or makes claims based on hunches and/or observations. Always consider the source of your information as well as the method in which it was collected. The entire article can be reviewed at http://www.extension.umn.edu/agriculture/soybean/pest/soybean-aphid/soybean-aphid-biology-and-economics/

Soybean aphids damage soybean by extracting plant sap from phloem vessels which carry the products of photosynthesis to other parts of the plant. Initially aphids may “test-probe” plants to determine if they are suitable for sustained feeding. Sustained feeding during the early reproductive stages can result in reduced growth, pod number, seed size and weight as well as oil concentration. Feeding during the later reproductive stages may only affect seed size. Making crop stage an important consideration when making treatment recommendations. Duration of feeding is also an important consideration and is why multiple scouting trips are recommended.

Neither sustained feeding or test probing causes the plant to “leak sap” nor has there been documented evidence that this feeding transmits bacterial or fungal pathogens. However, aphid feeding does transmit viral pathogens such as alfalfa mosaic and soybean mosaic viruses. These viruses are not currently considered wide spread and are not included in the economic threshold.

Understanding the soybean aphid Economic Threshold (an increasing population of 250 aphids/plant on 80% of the plants) is better understood with an appreciation of the Damage Boundary (lowest pest population which can cause measurable yield loss) and Economic Injury Level (point at which cost of control equals yield loss). The Damage Boundary is not based on economics, but rather the ability of scientists to statistically measure yield loss at a specific pest population. No economic gain would be expected by treating aphid populations which are below the Damage Boundary. The Economic Benchmarking Soybean Production Systems in the North-Central USA

Shawn P. Conley, Soybean and Wheat Extension Specialist

This is our preliminary report (year 1) from our Region-Wide Project aimed at generating baseline producer data on current soybean management practices across the North-Central soybean production region. This project is funded by many state check-off boards including the WI Soybean Marketing Board (WSMB) and the North Central Soybean Research Program (NCSRP). The project goal is to identify the key factors that preclude Soybean Producers from obtaining yields that should be potentially possible on their respective individual farms. The term used for the difference between what yield is possible on your farm each year and what you yield you actually achieve is called a “Yield Gap”.

Click here to view this report.
Injury Level is based on economics and includes the cost of application and crop value. The Economic Threshold (250 aphid/plant, etc.) is an arbitrary and conservative number which was based on close monitoring of several multi-state research projects (including Wisconsin). It was established at this level to allow producers and crop advisors time to react and prevent an aphid population from reaching the Economic Injury Level. The soybean aphid Economic Threshold is well below the Damage Boundary. Some people question the legitimacy of the Economic Threshold because it was based on economic estimates from the mid-2000’s. Recall, the Economic Threshold is already below the Damage Boundary and no economic gain would be expected if treating below the Economic Threshold as some sources have suggested. It may help your understanding if you view the Economic Threshold as an “action” or “treatment” threshold. Furthermore, treating a population below the Economic Threshold decreases the chance that natural enemies or other environmental condition will control the aphid population for you.

There are additional costs to treating soybeans too early. New foliage that emerges after an application of a synthetic pyrethroid or organophosphate will not be protected. Other classes of insecticides may translocate upward but only a leaf or two. This is especially a concern if treatments are done early in the growing season.

Most insecticides used today are broad spectrum. Meaning they kill a wide variety of insect species not just those which are considered pests. Killing beneficial insects may allow for the soybean aphid population to resurge at a later date in the absence of these beneficial organisms. If spider mites are present at sub-economic populations and an insecticide is used that does not control mites, mite populations may flare in the absence of beneficial insects and mites.

Soybean aphid populations vary from field to field. Environmental, geographic, biological and agronomic factors can all influence soybean aphid populations. The low cost of insecticides and/or the concept of free applications costs when tank-mixed with another pesticide can lead to negative after-effects including insecticide resistance.

Cover crops following wheat or other small grains – Selection and management guidelines

Kevin Shelley, UW Nutrient and Pest Management Program
608-575-4746

Following harvest of winter wheat or other small grains in Wisconsin, if not planted to alfalfa, these fields are often left fallow. However, with more than 40 percent of the growing season remaining, typically planting a cover crop may be a good option. While the economics may not always be clear, many farmers are looking to cover crops to keep the soil covered, suppress some of the weeds that may otherwise grow, recycle and/or fix nutrients and improve soil health and functioning with additional organic matter. Producing supplemental forages, managing field nutrient budgets and meeting conservation requirements are other objectives for which cover crops can provide value.

The choice of which cover crop(s) depends on a farmer’s objectives and needs, and also the farm’s capabilities in terms of planting, management and termination. The cost and availability of good quality seed, versus anticipated benefits, are other factors to consider. Below are a few of the tried and true options for use in most parts of Wisconsin. Each are particularly well-suited to specific objectives. All can be seeded with light tillage or no-till planting. However, good seed to soil contact at the appropriate depth for the species is essential for good germination and establishment.

**Spring cereal grains, oats, barley, spring triticale,** can provide reliable mid-late summer cover and optional forage potential. They will grow rapidly in late summer and continue until a hard freeze. They will usually not over-winter in Wisconsin. These crops are often the best choice as a sequentially seeded soil cover or if fall-harvested forage is the main goal. They are more forgiving of temporary dry conditions than legume covers. Oats and barley have had equal yields in fall forage trials (1-3 TDM/acre) with spring triticale slightly lower.

**Winter rye** can be planted August-September for a late summer and over-winter cover. Stem elongation will not occur without vernalization (cold temperatures). Planted in August, rye will produce a thick cover, but usually less than one TDM biomass before winter dormancy. It will grow rapidly in early spring. Terminate rye as a cover crop by late April before it grows too large.

**Annual ryegrass (ARG)** is actually a southern-US adapted winter annual. It is considered not cold tolerant, but
will sometimes over-winter in Wisconsin with mild conditions. It has rapid growth with good biomass production when summer seeded on most soil types. It has a shallow, fibrous root system desirable for erosion control. ARG can be a good compliment for brassicas and/or annual clover. However, although a somewhat popular and economical cover crop option, planting ARG is, actually, discouraged due to concerns with its potential to become a difficult to control weed. It can be a prolific seed producer, even in the seeding year, and several glyphosate resistant biotypes have been identified. If it over-winters, it can be difficult to control with herbicides.

Legumes such as berseem clover, crimson clover or field pea (annuals) as well as medium red clover (MRC) (perennial) will accumulate biologically-fixed nitrogen (N) as they grow. The N is released back into the soil, becoming available for next year’s crop, after the legume plants die or are terminated. Allare good choices for a wheat-corn-soybean grain crop rotation. Clovers may also be harvestable as forage.

The annual legumes will grow quickly when planted in mid-summer if moisture is sufficient. Medium red clover can be seeded after wheat harvest, but is best when companion seeded early in the spring. A common method for medium red clover establishment is frost seeding, or broadcast seeding into fall-established wheat early the following spring. Early-planted medium red clover will normally yield more biomass and creditable N than sequentially seeded legumes. Field peas are a large-seeded, cool season annual, best companion-seeded with a spring cereal grain to encourage climbing and minimize lodging. Pea-small grain mixtures can also be harvested as forage, with similar yield, but slightly higher forage quality and palatability than small grain forage alone. Field peas, however, provide only a minimal N credit to a subsequent crop.

For more complete management and selection information on these and other mid-summer cover crop options, including brassicas (radish, turnips and rapeseed) and species mixtures, see the UW Extension Cover Crop Workgroup’s website, Cover Crops in Wisconsin at http://fyi.uwex.edu/covercrop/. From the home page, click on the Selecting Cover Crops for WI tab and then on Wheat.

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

Brian Hudelson, Sean Toporek, 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 July 9, 2016 through July 15, 2016.

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

**Field Crops**
- Corn, Common Rust, *Puccinia sorghi*, Grant, Rock
- Corn, Northern Corn Leaf Blight, *Exserohilum turcicum*, Grant, Rock
- Soybean, *Brown Spot*, *Septoria glycines*, Columbia
- Soybean, Iron/ Manganese Deficiency, None, Sauk
- Oats, Red Leaf, *Barley yellow dwarf virus*, Langlade

**Forage Crops**
- Alfalfa, Lepto Leaf Spot, *Leptosphaerulina briosiana*, Columbia

**Fruit Crops**
- Apple, Black Rot, *Sphaeropsis sp.*, Trempealeau
- Apple, Cedar-Apple Rust, *Gymnosporangium sp.*, Grant

**Vegetable Crops**
- Garlic, Cucumber Mosaic, *Cucumber mosaic virus*, Waukesha
- Garlic, Fusarium Basal Plate Rot, *Fusarium sp.*, Vernon, Waukesha
- Garlic, Garlic Mosaic, *Unidentified potyvirus*, Vernon
- Garlic, Stem and Bulb nematode, *Ditylenchus dipsaci*, Vernon
- Onion, Downy Mildew, *Peronospora destructor*, Rock
- Onion, Purple Blotch, *Alternaria porri*, Rock
- Onion Stenphylium Leaf Blight, *Stenphylium sp.*, Rock
- Potato, Potato Early Dying, *Verticillium sp.*, Adams
- Squash (Winter), Angular Leaf Spot, *Pseudomonas syringae pv. lachrymans*, Rock
- Tomato, Herbicide Damage, None, Portage
- Tomato, *Septoria Leaf Spot*, Septoria lycopersici, Portage

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).
Vegetable Crop Update July 15, 2016

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

19th issue of the Vegetable Crop Update is now available. In this newsletter we focus on:

- DSV (Late Blight forecast) and P-Day (Early Blight prediction) updates
- Late blight and Cucurbit downy mildew national updates

Click to view this issue.

Wisconsin Pest Bulletin for 7-21-16

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

Volume 61 Issue No. 12 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: Peak flight of western bean cutworm moths underway

FORAGES & GRAINS: Potato leafhopper counts still low for late July

CORN: True armyworm larvae appearing in alfalfa and corn

SOYBEAN: Soybean aphid densities well below 250 aphid-per-plant threshold

FRUITS: Marked increase in SWD trap counts noted in the last two weeks

VEGETABLES: Onion downy mildew confirmed by UW in Rock County

NURSERY & FOREST: Observations from this week’s nursery inspections

DEGREE DAYS: Growing degree day accumulations as of July 20, 2016
I have been receiving lots of questions over the last couple of weeks about rusts in corn. Folks are identifying pustules of common rust on field and silage corn in Wisconsin. Common rust is caused by the fungus *Puccinia sorghi*. Symptoms can include chlorotic flecks that eventually rise and break through the epidermis to produce pustules of brick-red spores (Fig. 1). Typically these pustules are sparsely clustered on the leaf. They can also appear on other parts of the plant including the husks and stalks. Conditions that favor the development of common rust are periods of high humidity and nighttime temperatures that remain around 70F with moderate daytime temperatures. This fungus needs very little free moisture for infection to occur. Thus, the weather conditions in Wisconsin over the last month have been somewhat conducive for this disease. However, very hot and dry weather can slow or stop disease development.

Management of Common Rust

Management for common rust primarily focuses on resistant hybrids. Most modern commercial hybrids have excellent resistance to common rust. Remember resistance is not immunity, so some pustule development can be observed even on the most resistant hybrids. Some inbred corn lines and specialty corn can be highly susceptible to common rust. Under these circumstances a fungicide may be necessary to control common rust. Fungicides with efficacy toward common rust can be found on the [Corn Fungicide Efficacy Table](#). Most of the hybrids I have scouted this season have some pustules, however incidence and severity is relatively low. Therefore, a fungicide application to control common rust isn’t needed for most of these hybrids in Wisconsin. Residue management or rotation is typically not needed for this disease as inoculum (spores) have to be blown up on weather systems from the southern U.S.
A related rust that we need to pay close attention to this season is southern rust. Southern rust is caused by the fungus Puccinia polysora. Symptoms of southern rust are different from common rust in that they are typically smaller in size and are often a brighter orange color (Fig. 2). Pustules of southern rust also typically only develop on the upper surface and will be more densely clustered. Favorable conditions for southern rust development are similar to those for common rust. High humidity and temperatures around 80°F encourage disease development. However, very little free moisture is need for infection to occur. **Southern rust is typically a rare occurrence in Wisconsin. When it does occur, it is usually in the southern and southern western portions of the state, with epidemics initiating late in the season.** Spores of this fungus have to be blown up from tropical regions or from symptomatic fields in the southern U.S. The fungus can not overwinter in Wisconsin. While southern rust epidemics can be rare events in Wisconsin, the disease can be serious when it occurs. Therefore close monitoring of forecasts and scouting are needed to make timely in-season management decision.

Currently the Corn Southern Rust iPIPE map is showing numerous confirmed cases of southern rust in the southern, southeastern U.S. and Kansas and Kentucky. No confirmed cases have been identified in Illinois, Iowa or Wisconsin. However, close attention should be paid to this disease in 2016 as the confirmed cases this year have been earlier than in the past. This could mean that conditions are ripe for movement of southern rust inoculum into Wisconsin.

**Management of Southern Rust**

Traditionally resistance was used to manage southern rust. However, in 2008 a resistance-breaking race of the southern rust fungus was confirmed in Georgia. Thus most modern hybrids are considered susceptible to southern rust. Rotation and residue management have no effect on the occurrence of southern rust. The southern rust fungus has to have living corn tissue in order to survive and can not overwinter in Wisconsin. Fungicides are typically used to control southern rust in parts of the U.S. where this is a consistent problem. Efficacy ratings are also available for fungicides against southern rust on the [Corn Fungicide Efficacy Table](#). Should southern rust make its way to Wisconsin prior to the “milk” (R3) growth stage in corn, it could cause yield reductions. Growers and consultants should scout carefully through the R3 growth stage and be sure to properly identify the type of rust observed. If you need assistance in identifying rust on corn, leaf samples of corn plants can be sent in a sealed plastic bag with NO added moisture to the University of Wisconsin Plant Disease Diagnostic Clinic (PDDC). Information about the clinic and how to send samples can be found by [CLICKING HERE](#).

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**Wisconsin Corn Disease Update – July 27, 2016**

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

**Northern Corn Leaf Blight**

Over the last week concerns have been increasing over corn diseases as we are at the critical time to make fungicide application decisions. See my previous post about the early onset of northern corn leaf blight (NCLB) in Wisconsin in 2016 by [CLICKING HERE](#). While NCLB can
be observed in many corn fields in the state, it can be difficult to find. The hot weather this year has managed to keep that disease in check. While now is a good time to scout and make spray decisions, remember that it would take 50% or more of plants in the field with 10% or more of the ear leaves covered with lesions of NCLB prior to the milk growth stage before significant yield loss will occur.

**Goss’s Wilt**

Just this week, the University of Wisconsin-Madison Plant Disease Diagnostic Clinic (PDDC) positively confirmed the first Goss's wilt sample of 2016. This sample came from Grant Co. Other samples have arrived, but no definitive confirmation has been made in other counties in the state. For information on Goss’s Wilt you can visit my previous posting from 2015 by CLICKING HERE.

**Rusts**

Southern Rust

Southern rust continues to be a disease to scout for in Wisconsin. No positive confirmations have been made in Iowa, Illinois, or Wisconsin. However, the disease has been confirmed in parts of Nebraska. CLICK HERE TO VIEW THE MAP. We have scouted several fields of dent corn and also sweet corn. Only pustules of common rust have been observed in these fields. Conditions have been suitable for this disease over the last several weeks. Remember that rust pathogens have to be blown in from the south. The inoculum of the fungi that cause these diseases do not overwinter in Wisconsin. To learn more about the two types of rust that can affect corn in Wisconsin and how to manage them, CLICK HERE to visit my post from last week.

Remember to get out there and SCOUT, SCOUT, SCOUT!

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**Wild Parsnip, an expanding problem along roadsides in Wisconsin**

Mark Renz Associate Professor and Extension Specialist. University of Wisconsin Madison

Wild parsnip (*Pastinaca sativa*), a non-native plant, was first discovered in Wisconsin before 1900. Even those this plant has been present for over 100 years populations continue to spread into unmanaged areas throughout Wisconsin. While this plant causes a range of impacts to the environment, the largest concern from this invading species is its ability to inflict burns to skin of people that come into contact with the sap from the plant. This reaction is called phytophotodermatitis as the sap will burn the skin when exposed to sunlight. Given the distribution of this species throughout the state (see map below) it's impact on the human health of citizens of Wisconsin is likely large.

While this plant can invade a wide range of habitats, it is most commonly found in grassland areas near or alongside roadsides. In these habitats this plant is well adapted and can easily flower and produce viable seed that can be transported to nearby areas. Spread has been amplified by plants proximity to roadsides as they are often mowed after viable seed are produced and move seed long-distances. This and other factors have likely allowed for the enhanced spread of this plant.

This plant is regulated in Wisconsin by DNR invasive species rule (NR-40) as a restricted species. Due to this designation it is required that plants and reproductive propagules cannot knowingly be spread into un-infested areas. Fortunately this plant is easy to manage with a range of tools. Implementation of the appropriate management practice at the correct timing is critical. Below I summarize common control techniques available and how they can be fit into a management plan. Information is a combination of personal research, research from others and personal accounts from land managers. A detailed factsheet is available that summarizes these control efforts.
CONTROL OPTIONS

Removal: Pulling or cutting the root from the stem is an effective individual plant control technique but is best utilized when infestations are small and isolated. Plants can be pulled if soil conditions allow for the removal of the taproot, but the best success has been observed when cutting the taproot with a sharp shovel 1–2" below the soil surface. If the entire taproot is severed it will not re-root and produce viable seeds. If seed is present make sure to properly dispose of so they do not spread into un-infested areas.

Mowing can be effective if timed after the emergence of flower heads, but before seeds enlarge. The optimum timing in Wisconsin is when the secondary inflorescences begin to flower. This has traditionally been around the first of July in southern Wisconsin. If using this method plants will resprout and likely flower. In Wisconsin’s climate these resprouting plants rarely produce viable seeds if mowed at the correct stage and the growing season is not atypically long. Mowing prior to flowering (June) will likely result in viable seed being produced if populations are not mowed when resprouts are flowering. When implementing mowing as a control method, results have been very successful if implemented at the correct stage for three consecutive years. This strategy’s effectiveness is based on the short lived seeds in the soil, therefore annual management is required for multiple years to eliminate seeds from the seedbank. Often this technique when initiated in the first year will result in an increase in the number of plants, with a reduction in populations not seen until the third year. Care must be taken not to mow when mature seeds are present as this will spread the seed.

While this strategy is effective and efficient it can be challenging to implement across large areas when equipment availability is limited as the window for mowing can be as narrow as a two to three week timeframe some years. Limited success is also observed if plants are unmanaged nearby and produce viable seed that can land in the mowed areas. This is typical of road sides where areas nearest the road are only managed.

Grazing/Biological Control: Wild parsnip is readily grazed by a variety of animals. While effective in suppressing aboveground growth, if parsnip constitutes too great a percentage of animals’ diets they can also develop toxicity to the plant. Light skinned livestock are particularly sensitive to wild parsnip, while dark skinned animals can tolerate ingesting this plant. If grazing animals on parsnip, ensure that other forages are included in sufficient amounts to prevent injury. While no studies have been conducted on long-term effectiveness of grazing, it is expected that 3-5 years of grazing at an intensity that would prevent seed production would be required to substantially reduce populations.

Several insects including the parsnip webworm can also feed and induce substantial injury to wild parsnip. While these can result in near complete defoliation of individual plants and prevent seed production, effectiveness of insects in reducing large populations has not been observed.

Prescribed Fire: Spring burns can kill germinating seedlings and can suppress above-ground growth of established plants depending on fire intensity. While seedlings are often killed as a result of fire many rosette plants will resprout and flower if not managed. This management method is not recommended unless integrated with other techniques such as mowing or herbicides.

Herbicides: A range of herbicides are effective at controlling wild parsnip. While research has shown that these products can control wild parsnip at any stage of development, the best results with the lowest rates applied have been obtained in the fall (September – October) rosettes. Applications of herbicides that include metsulfuron, 2,4-D, or dicamba have provided greater than 90% reduction in flowering plants following year. Unfortunately seedling germination the following spring is not reduced from herbicides with extended residual activity, therefore application would need to be applied the following year to prevent seed productions for two consecutive years. Spring applications to rosettes (April-May) can alleviate this issue if timed after seedling emergence as they will control seedlings and rosettes. This can result in two years of prevention of seed production with one application. Applications to plants that are about to or are flowering (June) can be effective, but higher rates of herbicides are required to prevent seed production. Applications when seeds are present on the plant (late July –August) ARE NOT RECOMMENDED as plants are beginning to senesce and viable seed has already been produced by the plants.

It is important to remember that these active ingredients mentioned can impact other broadleaf species, but are safe to most established grasses. If concerned about off-target damage to nearby desirable species spot or individual spot treatments are recommended. Non selective herbicides that contain glyphosate, while effective, are not recommended in grasslands as they will also injure desirable grasses and lead to reinvansion from parsnip or other unwanted species.

Selection of the appropriate herbicide for a site is critical to be in compliance with the label and minimize non-target damage. As many of these infestations are on/near roadsides, drift of herbicides should be considered. Of-
ten sensitive crops are grown adjacent to these locations that could be injured if the herbicides drift off-target. While drift can occur any time of the year, spring and summer applications are of the greatest concern. Fall applications after crops have senesced or been harvested can alleviate some of the risk, but depending on the product and rate applied enough residual activity may persist and cause injury the following spring.

**Developing a management plan:** While these management tools can be effective, the best results occur when individuals develop a multi-year management plan for infestations as one year of control with any technique rarely eradicates populations. These plans should include mapping, identification and implementation of acceptable control practices that fit the location, and monitoring of success of control methods applied. As some populations are too large for treatment in one year, this also allows for the development of a strategic plan that works from the leading edges of the infestation inward to over multiple years to efficiently reduce the population. For further information on how to identify and manage wild parsnip please visit [http://fyi.uwex.edu/weedsci/](http://fyi.uwex.edu/weedsci/) and enter wild parsnip in the search box.

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**Wisconsin White Mold Risk Map – July 22 & 27, 2016**

Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison
Jaime Willbur, Graduate Research Assistant, University of Wisconsin-Madison

**Sclero-cast: A Soybean White Mold Prediction Model**

**This tool is for guidance only and should be used with other sources of information and professional advice when determining risk of white mold development. We encourage you to read the model how-to guide which can be downloaded by clicking here**

Risk of apothecial presence and subsequent white mold development remains generally low for most of Wisconsin today. Risk has increased slightly across the state over the holiday weekend with some isolated pockets in the northern and south-central areas of the state. The UW Field Crops Pathology crew has been scouting for apothecia in fields in the soybean growing areas of south and central Wisconsin and HAVE NOT found any apothecia. This confirms the generally low risk currently being predicted by the model. Growers near higher risk pockets should monitor the soybean crop for closing canopy and flowering growth stages that may lead to increased risk of white mold. We have seen numerous fields this week already in the R1 growth stage. Be sure to consult the how-to guide for assistance in interpreting this map if you are considering spraying fungicide to control white mold.

This model was developed at the University of Wisconsin-Madison in conjunction with Michigan State University to identify at-risk regions which have been experiencing weather favorable for the development of white mold apothecia. This model predicts when apothecia will be present in the field using 30-day averages of maximum temperature, relative humidity, and wind.

White Mold Risk Map July 22, 2016
speed. Using virtually available weather data, predictions can be made in most soybean growing regions. Based on these predictions, this map is generated and indicates areas at no (white), low (blue), medium (yellow), and high (red) risk levels. Fields in yellow or red areas have >40% chance of having apothecia present and may be at risk of white mold developing later in the season. Model predictions must be combined with soybean growth stage and canopy characteristics to aid in timing of fungicide sprays. If the model is predicting medium to high risk in your area, soybeans are flowering, and the canopy is somewhat closed, then the white mold risk is elevated. For further information on how to use and interpret this risk map, CLICK HERE to download a how-to guide.

Crop Diagnostic Training Center 2016

UW-Madison Integrated Pest Management Program’s cost for the 2016 Crop Diagnostic Training Center workshop will increase by $90 on August 1. So register now!

The Crop & Pest Management Workshop will be held August 9, 2016.

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

Crop Diagnostics Training Center 2016 flyer

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

Brian Hudelson, Sean Toporek, 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 July 16, 2016 through July 22, 2016.

Field Crops
Soybean, Herbicide Toxicity, None, Winnebago (IL) Soybean, Phytophthora Root and Stem Rot, Phytophthora sp., Racine

Fruit Crops
Blueberry, Root Rot, Pythium sp., Fusarium sp., Jackson Cherry, Anthracnose, Colletotrichum sp., Dane Cherry, Brown Rot, Monilinia sp., Dane Cherry, Powdery Mildew, Oidium sp., Racine

Vegetable Crops
Onion, Stemphylium Leaf Blight, Stemphylium sp., Columbia Pepper, Bacterial Spot, Xanthomonas sp., Rock Pepper, Pseudomonas Seedling Blight and Leaf Spot, Pseudomonas syringae, Rock Potato, Potato Virus Y*, Potato virus Y, Oneida Squash (Butternut), Fusarium Crown and Foot Rot, Rosarium sp., Portage Tomato, Cucumber Mosaic, Cucumber mosaic virus, Door Tomato, Septoria Leaf Spot, Septoria lycopersici, Outagamie

Wisconsin Fruit News: Volume 1 Issue 8– July 22, 2016

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

The 8th issue of Wisconsin Fruit News is now available. Click on the link below to view this newsletter:


Vegetable Crop Update July 22, 2016

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

20th issue of the Vegetable Crop Update is now available. In this newsletter we focus on:

- updates on PDays and DSVs for disease control in potato
- updates on late blight (national and WI) and cucurbit downy mildew

Wisconsin Pest Bulletin for 7-28-16

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

Volume 61 Issue No. 13 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: Japanese beetle populations up across Wisconsin

FORAGES & GRAINS: Surveys continue to find below-threshold leafhopper counts

CORN: Annual western bean cutworm flight has peak in southern and central areas

SOYBEAN: Soybean aphid densities remain low in most soybean fields

FRUITS: Apple maggot emergence continues for fourth week

VEGETABLES: Late blight suspected in Adams County potato field

NURSERY & FOREST: Observations from this week’s nursery inspections

DEGREE DAYS: Growing degree day accumulations as of July 27, 2016
Brush Management on Working Landscapes in Southwest Wisconsin Field-day

Mark Renz Associate Professor and Extension Weed Specialist

Do you have large multiflora rose plants in your pastures? Do you cut back prickly ash only to see it resprout the next spring? Are bush honeysuckles taking over your fence-line? If you answered yes to any of these then consider attending this brush management in pastures field-day to be held on August 11th in Dodgeville from 10-1 pm on the Ruppert/Condon farm (2326 Ruppert Rd Dodgeville WI).

This event will highlight the efforts one farm has taken to reclaim their pastures from brush. This field day will feature an overview of the history of SW Wisconsin “working lands” and how it has changed as well as focus on key skillsets required for effective management. These include an overview of the common brush species found in Wisconsin’s pastures as well as an overview of common management techniques including herbicides, fire, mowing and grazing. NRCS staff will also be present to discuss federal programs available to assist and how to apply for these. Experts will also be available to answer specific questions on management options a producer may have. At the conclusion of this event, registered attendees, will receive a free barbecue lunch thanks to Dow Agrosciences.

See below for an abbreviated schedule, and if interested and available please contact Gene Schriefer (Iowa County Extension Agent) at gene.schriefer@ces.uwex.edu or (608)930-9850 to register for the event.

At the conclusion of lunch attendees are welcome to view field research plots that demonstrate the effectiveness of specific herbicides on bush honeysuckle, multiflora rose, and prickly ash.

AGENDA (10 am -1 pm)

- Welcome and History of SW Wisconsin- Gene Schriefer (UWEX Iowa County)
To determine the larval damage potential in continuous corn, count the number of beetles on five non-consecutive plants in each of 10 random areas of the field. First, grasp the ear tip tightly enclosing the silks in the palm of your hand and count beetles on all other areas of the plant. The silks often have the most beetles on the plant, so a tight hold on the ear tip keeps beetles from dropping out. Pull leaves away from the stalk to examine leaf axils and expose hiding beetles. Once the entire plant is examined, open your hand slowly and count the beetles that come out of the silks as you strip the husk away from the ear tip. Record the total number of beetles and divide by the number of plants counted (50). The grower will need to manage corn rootworm larval populations if you find an average of 0.75 beetles per plant during the egg laying period. Because beetles are mobile, a minimum of 2 counts, 7-10 days apart will be needed to make a reliable no-treat decision. However, if on the first scouting, beetle numbers are > 0.75 beetles/plant, a second if not third count would be useful to help decide on the appropriate treatment option next year.

Diversifying your management practices is an important resistance management tool. Having the field data (i.e., beetle counts) will increase your comfort level when making recommendations and can give you a point of reference for future years.

Two-Spotted Spider Mite and Soybean Aphid Update

Bryan Jensen, UW Extension and IPM Program

I recently received a phone call from an independent crop consultant who is finding treatable populations of two-spotted spider mites (TSSM) on soybean. I was surprised because I didn’t think our weather patterns would positively impact TSSM populations. However, the field background fits. That is, sandy soil and/or droughty areas where soybeans were moisture stressed. This information is important because it could be a sign of things to come. Or, ……maybe not. However, it does indicate to me that some field scouting for TSSM (and aphids) is necessary. I would suggest spot-checking fields or field areas that you think could be drought stressed. Look for leaf stippling and active mite infestation. Use a hand lens to confirm. At the same time survey the field for soybean aphids. TSSM control decision can positively
impact aphid populations by removing natural enemies. The reverse is also true because aphid control decisions can impact TSSM populations. Choose products which fit your pest populations. General statements that one insecticide class is strong on TSSM but weak on aphids are impossible to make. Read each label and match products and rates for the pest(s) you have. Read the fine print, some labels may have the pest listed but only for suppression. For pests with a high reproductive potential, such as aphids and mites, I want a product that indicates control, not suppression.

Soybean aphid numbers are rather light but recent reports indicate numbers are building. With a few fields at or near threshold. Managing late-season aphid populations is not easy because of the number of factors you need to consider. For example, crop stage, natural enemies and whether or not the aphid populations are building or declining. For other factors to consider please review this article at http://ipcm.wisc.edu/download/pubsPM/Soybean-aphid-IPM.pdf

Wisconsin Winter Wheat Performance Trials 2016

Shawn Conley, Adam Roth, John Gaska and Damon Smith

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.

Click here to see the complete document.

What is happening in the corn plant during the month of August?

Joe Lauer, Wisconsin Corn Agronomist

By August two of three corn yield components, ear number and kernel number, have been determined. The final yield component, kernel weight, will largely be determined during the month of August. Preliminary yield estimates can be made and depending upon the success of pollination, decisions regarding harvest use strategies can be planned.

Corn kernel development begins with silking (R1) and is marked by the blister stage (R2), milk (R3), dough (R4), and dent (R5) stages. The final stage called black layer formation (R6) marks the end of kernel development. The corn kernel accumulates weight in a sigmoidal pattern over a 55-60 day period beginning with a 7-10 day “lag” phase and ending with a 7-10 “maturation” phase (Figure 1). The linear phase of the sigmoidal curve lasts about 40 days.

For a 200 bushel per acre yield level about 5 bushels per day (200 / 40) accumulates during the linear phase of kernel development. About 60% of the starch that accumulates within the kernel is produced by the ear leaf. Leaves above and below the ear are also important sources for developing kernels, but as the distance from

Figure 1. Kernel weight accumulation pattern of corn.
the ear increases less starch is translocated to kernels and more to other plant parts. The stalk serves as a temporary storage organ during the day and photosynthate will be translocated to the kernels throughout the night.

Photosynthesis is maximized at about 1/3 of full sunlight, so even cloudy days can produce the starch needed to sustain accumulation in the kernel. Other plant parts (leaves, stalk and roots) demand photosynthate for respiration and are competitors with kernels. Temperatures that are comfortable for us (65-80 degrees F during the day and 50-65 degrees at night) provide the best trade-off between maximizing photosynthesis production and minimizing respiration in corn.

About 0.25 to 0.30 inches of water is being transpired by the plant during August. Every day that corn plants are stressed can lower yields 5% per stress day. Nutrients (N-P-K) are still being taken up by the plant until about the R3 to R4 stages. Brace roots are acting as a nutrient scavenger system in the upper layers of the soil profile, while roots deeper in the profile are used primarily for water uptake. During August it is important to protect the ear leaf since that is the plant part where most of the photosynthate is produced for a developing kernel.

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

Brian Hudelson, Sean Toporek, 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 July 16, 2016 through July 22, 2016.

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

**Field Crops**
- Corn, Common Rust, *Puccinia sorghi*, Sauk
- Corn, Eyespot, *Kabatiella zeae*, Sauk
- Corn, Goss’ Wilt, *Clavibacter michiganensis subsp. nebraskensis*, Grant
- Corn, Norther Corn Leaf Spot, *Bipolar zeicola*, Sauk
- Soybean, Herbicide Toxicity, None, Lafayette
- Soybean, *Phytophthora Root and Stem Rot*, *Phytophthora sp.*, Brown, Grant, Iowa, Rock

**Forage Crops**
- Intermediate Wheatgrass, *Ergot*, *Claviceps sp.*, Columbia

**Fruit Crops**
- Apple, *Cedar-Apple Rust*, *Gymnosporangium sp.*, Dane, Eau Claire
- Apple, *Cork Spot*, None, Oneida
- Blackberry, Botryosphaeria Cane Canker, *Botryosphaeria sp.*, Rock
- Blackberry, Septoria Leaf Spot, *Septoria rubi*, Taylor
- Pear, Entomosporium Leaf Spot, *Entomosporium sp.*, Oneida
- Raspberry, *Anthracnose*, *Sphaceloma necator*, Sheboygan
- Raspberry, Raspberry Leaf Spot, *Cylindrosporium rubi*, Price
- Raspberry, *Verticillium Wilt*, *Verticillium sp.*, Sheboygan

**Vegetable Crops**
- Basil, *Root Rot*, *Fusarium sp.*, Eau Claire
- Garlic, *Garlic Mosaic*, Unidentified potyvirus, Cook (IL)
- Kale, Fusarium Yellows, *Fusarium oxysporum*, Vernon
- Melon, *Bacterial Wilt*, *Erwinia tracheiphila*, Buffalo
- Pea, Aphanomyces Root Rot, *Aphanomyces euteiches*, Baraga (MI)
- Potato, Black Leg, *Dickeya sp.*, Langlade, Portage, Suffolk (NY)
- Potato, Rhizoctonia Canker, *Rhizoctonia solani*, Marathon
- Snap Bean, *Herbicide Damage*, None, Jefferson
- Tomato, Bacterial Canker, *Clavibacter michiganensis subsp. michiganensis*, Rock
- Tomato, Bacterial Speck, *Pseudomonas syringae pv. tomato*, Portage
- Tomato, Cucumber Mosaic, *Cucumber mosaic virus*, Jefferson
- Tomato, *Early Blight*, *Alternaria solani*, Marquette
- Tomato, *Herbicide Damage*, None, Jefferson
- Tomato, *Septoria Leaf Spot*, *Septoria lycopersici*, Marquette, Portage
- Tomato, Tobacco Mosaic, *Tobacco mosaic virus*, Jefferson

**Specialty Crops**
- Hop, *Apple mosaic*, *Apple mosaic virus*, Dane, Champaign (IL)
- Hop, *Carlavirus*, Unidentified carlavirus, Champaign (IL)
- Hop, *Fusarium Canker/Wilt*, Fusarium sp., Dane

**Soil**
- Alfalfa Soil, *Aphanomyces Seedling Blight*, *Aphanomyces euteiches race 2*, Buffalo

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
Vegetable Crop Update Aug. 1, 2016

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

21th issue of the Vegetable Crop Update is now available. In this newsletter we focus on:

• DSV and P-Day Updates
• Late blight updates for WI and the nation
• Cucurbit Downy mildew updates
• Cucurbit powdery mildew is starting up in WI (management recommendations)
• Conventional fungicide list for tomato late blight control
• Abbreviated and edited version of a summary on potato blackleg


Follow us on
Agronomy/Soils Field Day at ARS is on Wed, Aug 31

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

Agronomy/Soils Field Day will be held on August 31. There are five different tours from which to choose, but only three different tour departure times; so plan your day ahead of time. Tours include: use of remote sensing in the field, soil fertility & management, grain production systems, forage production systems, and pest management. Tour details can be found in the flyer on the web. An application has been made for Certified Crop Advisor continuing education units.

Please plan to register (free) at 8:00 and join us for coffee before the first tour departs from the main events center. All attendees will need to sign a waiver before they can ride tour wagons. Come early to help facilitate this new process. The Badger Crops Club will provide lunch ($5 donation).

Research results: Don’t delay soybean planting to manage SDS

Damon Smith, Department of Plant Pathology and Shawn Conley, Department of Agronomy, University of Wisconsin-Madison

A new 4 page publication titled “Don’t Delay Soybean Planting to Manage Sudden Death Syndrome (SDS): Yield Loss Can Result” is available to download in PDF format from the http://www.coolbean.info website.


Here are the results in a beanpod:

• Wisconsin soybean growers should not sacrifice early-May planting dates that maximize yield in order to reduce SDS development and subsequent yield loss.

• Highest amount of SDS symptoms occurred in early-May planting dates. Despite this, highest yields also occurred in the early-May planting dates.

• Careful attention should be given to selecting cultivars with high-yield potential as the first priority, and then focus cultivar selection using company SDS ratings.

Wisconsin Corn Southern Rust Update – August 10, 2016

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

Wisconsin corn continues to remain free of southern rust as of August 10, 2016. However, new confirmations have been reported in southern Indiana (see map). You
White Mold Showing Up in Wisconsin soybean fields

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

The UW Fields Crops Pathology team has begun to scout for white mold symptoms in soybean fields around the state. Generally white mold incidence has been relatively light in fields we have visited in the southern half of the state. Some pockets of higher incidence do exist, but pressure has been generally low.

Incidence in the northern half of the state is higher. We have visited fields as far north as Bloomer, Wisconsin and have observed incidence ranging from 3% to 20% of plants infected. Reports from areas in the northwest and northeast also confirm similar findings. Most of the soybean crop is at the R5 growth stage, with some earlier maturing fields approaching R6.

Questions have arisen about spraying fungicide now to reduce the damage caused by white mold and preserve yield. The short answer is NO. The reason is that the primary means of infection by the white mold fungus is through soybean flowers. These infections happened several weeks ago. Therefore, the optimal time to spray would be when flowers were out. A low level of plant-to-plant transmission can occur late in the season in soybeans. However, this rate is low enough, that spraying to prevent it does not produce favorable results.

Figure 1. White mold severity index ratings for soybeans treated with or without fungicide at the R5 growth stage.

Wilting and plant death as a result of Sclerotinia stem rot. Photo Credit: Craig Grau.

Once corn reaches the milk stage (R3), risk of yield loss from this and other foliar pathogens begins to quickly decline. Thus, as long as corn remains free of southern rust for another week or so, we will be in good shape for the rest of the season. If you need assistance in identifying rust on corn, leaf samples of corn plants can be sent in a sealed plastic bag with NO added moisture to the University of Wisconsin Plant Disease Diagnostic Clinic (PDDC). Information about the clinic and how to send samples can be found at - https://pddc.wisc.edu/
In 2014 we conducted a trial where we applied the fungicide Aproach and Endura to soybeans already showing symptoms of white mold and compared these treatments to a non-treated check. These were plots in a production field. We rated them for severity at the time of application and then again 2 weeks later. We also collected yield data.

Aproach and Endura both have good efficacy on white mold when they are applied at the right time. However, when applied late (R5 growth stage), like we did in this trial, we noticed no ability of these products to reduce disease advancement. Figure 1 shows the disease severity index ratings of the two treatments compared to the non-treated check. On the left are the pre-spray ratings and on the right are the post-application ratings. All treatments resulted in basically an equal increase in disease. Figure 2 shows the average yield for each treatment. You will notice that there is no statistical separation in yield, with only about a 2 bushel difference among treatments. In fact the yield for all treatments was equally low. There was no response out of these fungicides at this late application timing. Had the timing been appropriate (R1 to R3 growth stages) then we might expect a greater than 10 bushel response out of Aproach and Endura.

What should I do if I see white mold in my soybean field now?

Get out and survey your fields for white mold. It is a good idea to determine how much white mold you have in your fields, so you can make some educated harvest decisions. One way to move white mold from one field to the next is via combines. You could clean your combine between each field, but this can be time consuming. So my determining which fields have no white mold and which fields have the most white mold, you can develop a logical harvest order by beginning your harvest on fields with no white mold and working your way to the heavily infested fields. This will help reduce spread of the white mold fungus to fields that aren’t infested. You can also make some decisions on your rotation plan and future soybean variety choices based on these late season observations.

If you would like to learn more about white mold and management of this disease, CLICK HERE to download a fact sheet from the crop protection network. You can also watch a short video about white mold by CLICKING HERE.

Wisconsin Fruit News, Aug 5

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

Here is the 9th issue of the Wisconsin Fruit News: http://go.wisc.edu/77o1uu

In it you will find information about:

- Plant Disease Diagnostic Clinic update
- Insect Diagnostic Lab update
- Leaf tissue analysis for berry crops
- Blueberry stem gall wasp
- Cranberry degree-day map and update
- Grape disease update
- Grape insect scouting report
- Grape developmental stages
- Insecticide profile: Delegate
- Antique apples with modern value
- Update on brown marmorated stink bug
All newsletters will also be posted onto at the Wisconsin Fruit website, available at http://www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.

### Vegetable Crop Update August 6

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

The 22nd issue of the Vegetable Crop Update is now available. In this edition, please find information on:

- PDays, DSVs for potato disease management
- Late blight updates (in WI and nationally)
- Cucurbit downy mildew updates
- Cucurbit fungal disease identification and management (Alternaria, Anthracnose, Plectosporium)

Click on the link below to view this update:

http://ipcm.wisc.edu/download/vgu/August-5-2016.pdf

### UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update, Aug 5

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 July 30, 2016 through Aug 5, 2016.

<table>
<thead>
<tr>
<th>Plant/Sample Type</th>
<th>Disease/Disorder</th>
<th>Pathogen</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Crops</td>
<td>Soybean, Fusarium Root and Stem Rot, Fusarium sp., Buffalo</td>
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<td></td>
<td>Soybean, Phytophthora Root and Stem Rot, Phytophthora sp., Buffalo</td>
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<td></td>
<td>Soybean, Rhizoctonia Root and Stem Rot, Rhizoctonia sp., Buffalo</td>
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<tr>
<td></td>
<td>Soybean, Sudden Death Syndrome, Fusarium virguliforme, Rock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit Crops</td>
<td>Apple, Cedar-Apple Rust, Gymnosporangium sp., Dane</td>
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<td>Apple, Chemical Burn, none, Dane</td>
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<td>Apple, Root Rot, Phytophthora sp., Pythium sp., Dane</td>
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<td></td>
<td>Pear, Chemical Burn, none, Dane</td>
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</tbody>
</table>

### Wisconsin Pest Bulletin Aug 11

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

Volume 61 Issue No. 15 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: Western bean cutworm moth flight subsiding

FORAGES & GRAINS: Alfalfa pest pressure low to moderate for mid-August

CORN: Annual corn rootworm beetle survey now underway
SOYBEAN: Soybean aphid survey finds below-threshold counts in 170 fields

FRUITS: Codling moth resurgence flights observed in some apple orchards

VEGETABLES: Continued anti-late blight fungicide treatments advised for potatoes

NURSERY & FOREST: Assorted reports from recent nursery inspections

DEGREE DAYS: Growing degree day accumulations as of August 10, 2016
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Intensive Winter Wheat Management

Shawn Conley, State Soybean and Small Grains Specialist
John Gaska, Senior Outreach Specialist

A research trial was initiated at the Arlington Agricultural Research Station to assess the impact of various management levels (Table 1) on the yield, grain quality, and disease incidence of 14 soft red winter wheat varieties. Management levels were stair-stepped with increasing intensity of inputs. Each management step increased yield, however growers should verify individual farm gate input prices to see if yield increases had a positive ROI.

Click here to view the Intensive Winter Wheat Management Information.

Sudden Death Syndrome of Soybean Video
Dr. Damon Smith talks about sudden death syndrome (SDS) of soybean. SDS can be a significant problem in years where the spring is wet and cool resulting in infection by the fungus Fusarium virguliforme soon after emergence. However, SDS is often not noticed until the reproductive growth stages when foliar symptoms typically develop. The discussion here includes tips on spotting SDS, determining the difference between SDS and brown stem rot and how to manage the disease.

For more information about SDS visit the Soybean Plant Health Topics webpage at http://fyi.uwex.edu/field-croppathology... and scroll down to the “Sudden Death Syndrome” section.

To watch other videos about crop and soil management visit the University of Wisconsin Integrated Pest and Crop Management Youtube channel.

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**Plant Disease Diagnostic Clinic (PDDC) Update**

Brian Hudelson, Sean Toporek, 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 6, 2016 through August 12, 2016.

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

**Field Crops**
Corn, Goss’ Wilt, *Clavibacter michiganensis* subsp. *michiganensis*, Dane
Soybean, *Phytophthora Root and Stem Rot*, *Phytophthora sp.*, Green

**Fruit Crops**
Cranberry, Early Rot, *Phyllosticta vaccinina*, Wood
Cherry, Cherry Leaf Spot, *Blumeriella jaapii*, Dane

**Vegetable Crops**
Cabbage, Alternaria Leaf Spot, *Alternaria brassicicola*, Crawford
Caulliflower, Alternaria Leaf Spot, *Alternaria brassicicola*, Lafayette
Eggplant, *Verticillium Wilt*, *Verticillium sp.*, Dane
Garlic, Embellisia Skin Blotch, *Embellisia allii*, Crawford
Kale, Alternaria Leaf Spot, *Alternaria brassicicola*, Crawford
Lettuce, Anthracnose, *Microdochium panattonianum*, Lafayette
Onion, Sour Skin, *Burkholderia cepacia*, Fillmore (MN)

**Specialty Crops**
Pepper, Aerial Pythium, *Pythium sp.*, Rock
Pepper, Sunscald, None, Crawford
Tomato, Bacterial Speck, *Pseudomonas syringae* pv. *tomato*, Crawford
Tomato, *Blossom End Rot*, None, Sheboygan
Tomato, Cucumber Mosaic, *Cucumber Mosaic Virus*, Dane
Tomato, Root Rot, *Rhizoctonia sp.*, *Fusarium sp.*, Green
Lake
Tomato, *Septoria Leaf Spot*, *Septoria lycopersici*, Sheboygan
Tomato, Tobacco Mosaic, *Tobacco mosaic virus*, Dane
Tomato, Tomato Spotted Wilt, *Tomato Spotted Wilt Virus*, Dane
Zucchini, Bacterial Leaf Spotted Wilt, *Xanthomonas campes*tris pv. *cucurbitae*, Lafayette

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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**Plant Disease Diagnostic Clinic (PDDC) Update**

Brian Hudelson, Sean Toporek, 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 13, 2016 through August 19, 2016.

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

**Field Crops**
Corn, Gibberella Stalk Rot, *Fusarium graminearum*, Dane
Soybean, Stem Canker, *Diaporthe phaseolorum*, Rock
Soybean, Sudden Death Syndrome, *Fusarium virguliforme*, Rock

**Fruit Crops**
Blueberry, Gloeosporium Leaf Spot and Stem Canker, *Gloeosporium sp.*, Dunn
Blueberry, Ripe Rot, *Colletotrichum gloeosporioides*, Clark
Pear, *Fire Blight*, *Erwinia amylovora*, Dane

**Vegetable Crops**
Blueberry, Gloeosporium Leaf Spot and Stem Canker, *Gloeosporium sp.*, Dunn
Blueberry, Phomopsis Twig Blight/ Canker, *Phomopsis sp.*, Clark, Dunn
Blueberry, Ripe Rot, *Colletotrichum gloeosporioides*, Clark
Cranberry, Upright Dieback, *Phomopsis vaccinii*, Monroe
Pear, *Fire Blight*, *Erwinia amylovora*, Dane

**Specialty Crops**
Beet, *Bacterial Soft Rot*, *Pectobacterium sp.*, Monroe
Eggplant, *Root Rot*, *Pythium sp.*, *Rhizoctonia sp.*, Dane

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).
Onion, Slippery Skin, *Burkholderia gladioli pv. allicola*, Dane
Pepper, Sunscald, None, Dane
Potato, Late Blight, *Phytophthora infestans*, Polk
Tomato, Bacterial Canker, *Clavibacter michiganensis subsp. michiganensis*, Walworth
Tomato, Ghost Spot, *Botrytis cinerea*, Dane
Tomato, Late Blight, *Phytophthora infestans*, Polk
Tomato, Leaf Mold, *Passalora fulva*, Dane
Tomato, Septoria Leaf Spot, Septoria lycopersici, Dane, Portage

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

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

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**Vegetable Crop Update Aug. 12**

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

23rd issue of the Vegetable Crop Update is now available. In this newsletter we focus on:

- DSV (Blitecast, Late Blight) and P-Day (Early Blight) Updates
- Late blight and Cucurbit Downy mildew national updates
- Vegetable diagnostic updates from UWEX Plant Disease Diagnostic Clinic
- Powdery mildew confirmed on hops from Portage Co. WI


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**Wisconsin Pest Bulletin 8-18-16**

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

Volume 61 Issue No. 16 of the Wisconsin Pest Bulletin is now available at:

http://datcpservices.wisconsin.gov/pb/index.jsp
Question of the week: What is up with all of this white mold on soybeans?

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

I have been getting a lot of questions this week about the perceived large amount of white mold in soybeans in Wisconsin. There is more white mold out there than we predicted. However, there is also some confusion out there on how all this white mold got there and how to interpret the amount of white mold as it relates to yield loss. Below is a great question I received today and will try to answer below.

Question

What is up with all this white mold? Here is my interpretation of what is going on, correct me if I’m wrong. White mold infection happens at R1, way back in June, but disease symptoms (flagging plants) show up in late July and August, correct? While the plant got infected in June, the weather needs to be right for the disease to grow – cool nights, warm days and wet conditions. As we go into Au-

Answer

I’ll answer the easier part of the question first.

- Yes, everyone over-rates severity of white mold. Because it makes those bleached stems that look horrible, everyone estimates it much higher than it is. I had a person tell me that he had a field that was 60-70% white mold. I asked him, “you mean to tell me there are 6-7 plants out of every ten plants in that field infected?” He stopped a minute and then thought about his answer again. Our field crew has rated about 20 fields around the state, in addition to our research plots. In production fields incidence ranges from 0-30% with most in the 10% range.
We make 25 stops in a field. We rate the plants in 1 meter for two rows at that stop. We count all the plants in that one meter to establish the stand number, and then count infected plants. We then take a severity index rating too. I try to encourage people to make random stops and count the stand and then infected plants and not try to visually estimate. As humans, we make everything worse – its habit. So yes, at 10% and a stand of 130,000 plants you would need to have 13,000 plants per acre showing symptoms before you can detect reliable yield loss. Sure, you might have sections and pockets where you will have white mold and high yield loss, while other sections of the field yield really well, offsetting that loss. So you need to look across the whole acre to get a good estimate.

• Now for the hard part. The data, ours included, show that you have to have apothecia during bloom for infections. Yes, some plant-plant touching can spread the pathogen, but our data suggest that this method is infrequent. In 2016, the weather during the major part of bloom was really too warm and our models suggested this. However, here is what I'm thinking happened based on our observations and what we know about the white mold fungus biology. First, we had above average rain. Frequent rains can cool the plant canopy and offset the ambient temperature. This fungus is super sensitive to temperature. More so than moisture. Our lab and other labs have done a lot of work on this and it always comes back to temperature that is most important for the white mold fungus. Also, because we had good growing conditions, rows closed quickly this year, giving us thick canopy even at R1; bloom often started early this year. A lot of our soybean varieties are indeterminate and can have an extended flowering period. This also doesn't help our case. The longer that bloom lasts or flowers are present, the longer the crop is at risk for white mold. The weather has continued to be conducive now for apothecia. We continue to find apothecia right now (Mid-August) in our plots and my student is still trapping white mold fungus spores. This is unusual, but given that the canopy is thick and the weather is mild, not entirely surprising. If there are blooms out there, these spores are infecting. There is about a 10-14 day incubation period in the field. So fresh infections you are seeing now happened in early August. All of this just depends on when the crop bloomed and how long it bloomed for. So, late-planted soybeans with extended bloom periods probably got hit pretty hard. White mold is definitely heavier north of Arlington, Wisconsin. So I think having a slightly later planting and bloom period coincided with conducive temperature.

Summary

There is a lot of white mold out there. Be diligent in trying to assess the damage. Don’t just visually estimate incidence. Actually make 10-20 stop per acre and count plants with white mold and also total stand at that stop. Convert the white mold numbers to percentage based on the stand count. The rule of thumb is that for every 10% increase in white mold incidence yield loss with range between 2 and 5 bushels.

Top 8 Recommendations for Winter Wheat Establishment in 2016

Shawn Conley, State Soybean and Small Grains Specialist
John Gaska, Outreach Specialist
Damon Smith, State Field Crops Pathology Specialist

Top 8 winter wheat establishment recommendations:

1. Variety selection: please see the 2016 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

Click here to read more about each of the recommendations.
Start Managing for Fusarium Head Blight Now Before You Plant the 2016/17 Crop

Shawn Conley, State Soybean and Small Grains Specialist
Damon Smith, State Field Crops Pathology Specialist

Most WI winter wheat growers dodged the Fusarium head blight (FHB or scab) bullet in 2016; though many farmers especially those in SW WI became so disgusted with dockage and rejections in both 2014 and 2015 they didn’t plant a single acre this year. Therefore as we prepare to put the 2017 wheat crop into the ground here are a few considerations for managing FHB before we drop a single seed.

• 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 2016.

• Variety selection matters. Data from our 2015 and 2016 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 (2015) and Stripe Rust (2016) resistance and high yield. When evaluating disease resistance, low numbers for both incidence and severity can be helpful, but the major focus should be placed on incidence (measure of the number of symptomatic plants in a stand).

• 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.

• 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.

• Harvest timing and flash drying. The word on the street is that if FHB appears to be a problem in 2017 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.

Vegetable Crop Update Aug. 20

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

24th issue of the Vegetable Crop Update is now available.
In this newsletter we focus on:

- Information on P-Days and DSVs for potato disease control
- Summary of late blight and cucurbit downy mildew in WI and in the US

Click here to view this issue.

Wisconsin Fruit News, Issue 10

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

Click here for the 10th issue of the Wisconsin Fruit News.

In it you will find information about:

- Plant Disease Diagnostic Clinic update
- Insect Diagnostic Lab update
- Unusual fruit crops for Wisconsin markets: Currants
- Strawberry rootworm
- Cranberry degree-day map and update
- Grape disease update
- Grape developmental stages
- Ripening process of grapes in primary and secondary shoots
- Reduced-risk insecticide profile: Rimon
- Pre-harvest fruit drop control in apple orchards

Wisconsin Pest Bulletin 8-25-16

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

Volume 61 Issue No. 17 of the Wisconsin Pest Bulletin is now available at:


INSIDE THIS ISSUE

LOOKING AHEAD: Substantial corn earworm flights registered again this week

FORAGES & GRAINS: Potato leafhopper counts remain low to moderate
CORN: Final results of the annual corn rootworm beetle survey
SOYBEAN: Japanese beetles still common in soybean fields
VEGETABLES: Fall clean-up advised for reducing overwintering pest populations
NURSERY & FOREST: Leaf spot diseases of trees and shrub prevalent this season
DEGREE DAYS: Growing degree day accumulations as of August 24, 2016

Follow us on

facebook  twitter
What is happening in the corn plant during the month of September?

Joe Lauer, Wisconsin Corn Agronomist Corn

In mid-August, USDA-NASS made their initial corn yield projections for the 2016 season. However, September is really the month when we project how our farming skills and previous decisions come together to produce a corn crop. By this time, yield becomes secondary because the season and growth of the crop is largely over. A lot can still happen, but the focus of many decisions are based upon plant and grain moisture.

During the September, the crop has usually dented and the kernel milkline is progressing towards the kernel tip. Physiological maturity is reached when all kernels on the ear have attained their dry matter maximum accumulation. Eventually a black abscission layer forms indicating that moisture and nutrient transport from the plant has ceased. Once physiological maturity (R6-Black layer) is achieved it is a physical process to dry the grain down to a harvest moisture between 20 and 25%.

Husk leaves turn color and ears begin to droop. Most modern hybrids have the stay-green trait which allows for better stalk quality and standability in the field. High yielding years often put stress on the plant due to “stalk cannibalization” where nutrients are translocated to developing kernels at the expense of stalk health.

If ensiling can be used to store grain, then corn silage or high moisture grain can be harvested. Silage harvest would be slightly earlier than R6 as milkline moves down towards kernel tip (Figure 1). High moisture corn is usually harvested shortly after R6. Frost has no effect on yield at this point. However, lodging from disease, insect damage or can result in physical loss of yield.

September is the month when corn silage is harvested in Wisconsin. Silage choppers put a lot of material through a relatively small opening cutting (or shredding) plants to 3/4 inch TLC along with kernel processing to break kernels. Usually the window to harvest corn silage is about 7 to 14 days depending upon the maturities of the hybrids selected at planting. Owning your own chopper provides more flexibility for timing harvest. If dealing with custom silage choppers it is imperative to communicate accurately the whole plant moisture of your fields and the rate of drydown. Adjustments to silage moisture
can still occur by raising or lowering the cutter bar because the driest part of the plant is the grain.

During September, dry grain is usually not ready for safe storage; it needs to be at 13-15% moisture for long-term storage. It may be advantageous to let crop partially dry in the field.

Timing Corn Silage Harvest

Joe Lauer, Wisconsin Corn Agronomist

Corn must be ensiled at the proper moisture to get fermentation for preservation. But, determining when to harvest corn at the right whole plant moisture is difficult. Each storage structure properly ensiles at slightly different plant moisture optimums. Harvesting corn too wet for the storage structure will result in reduced yield, souring and seepage of the ensilage, and low intake by dairy cows. Harvesting too dry reduces yield, can cause mold to develop, and lowers digestibility, protein and vitamins A and E.

Kernel milk is not a reliable guide for timing silage harvest

Dry matter content of whole plant corn varies with maturity. The position of the kernel milk-line is not a reliable indicator for determining harvest timing. Geographic location, planting date, hybrid selection, and weather conditions affect the relationship between kernel milk-line position and whole plant dry matter content.

Determining field harvest order and initial plant sampling

The first step to determine when a field is ready for harvest is to note the order in which you planted your fields.
Next, note silking dates of the fields to project calendar days to when a field will mature. Once corn silks, approximately 55 to 60 days is required to achieve maturity at R6 or the “black layer” stage (Abendroth et al., 2011). Development during grain filling is influenced by temperature, but not as much as during the vegetative leaf emergence stages. Instead the number of days between pollination and a killing frost influence the time to maturity. So if an average killing frost occurs October 1, then subtracting 55 to 60 days means that the crop must be silking by August 2-7.

We know that kernel milk stage is not reliable for determining the actual harvest date, but it is a useful indicator of when to sample fields to measure plant dry matter. Silage harvest usually begins around 50% kernel milk which is 42 to 47 days after silking, so silking must occur by August 15-20 in order to mature before typical killing frost dates; but remember that the timing of silage harvest is dependent upon achieving the proper moisture for the storage structure (Table 1). Noting the order that fields silk will help plan the harvest queue of your fields and scheduling of custom choppers.

### Determining Silage Moisture

The only reliable method of determining the optimal time to harvest corn silage is to sample the crop and directly measure the % dry matter of whole plants. This information combined with average whole plant drydown rates can be used to roughly predict the proper time to harvest corn silage.

The next plant indicator that determines the order of fields to harvest is movement of the kernel milkline. Once kernel milkline begins to move, measure moisture of fields intended to be harvested for silage (Table 1). Corn should be first sampled to measure dry matter shortly after full dent stage (80% kernel milk) for bunker silos and bags, at 60% kernel milk for conventional tower silos, and at 40% kernel milk for sealed (oxygen-limited) tower silos. It is important to begin sampling early as a precaution against variation in dry down. You will likely be too wet, but you will have an indication of how quickly drydown is occurring when the next sampling date takes place.

#### Sampling a field for whole plant moisture

Ideally the field to be harvested is uniform in development, but the reality is that uniformity is rarely achieved. Separate uneven fields into representative groups. Figure 1 describes the moisture drydown patterns of two locations in the same field. Knoll areas were as much as 20% units different from swale areas.

Sample two or more locations for each representative group in the field. Over time, sample the same locations – trying to determine the rate of drydown. Scott Hendrickson (Manitowoc county agent) measured whole-plant moisture over time at three sites in the county by always returning to the same location in the field (Figure 2). Depending upon year the average drydown rate ranged from 0.4 to 0.7 percent per day.

#### Procedure for measuring plant moisture

1. Sample 3 to 5 plants in a row that are well bordered and representative.
2. Put in plastic bag,
3. Keep plants cool,
4. Chop as quickly as possible,
5. Measure moisture using NIR spectroscopy and/or by drying using a, Koster oven, microwave, or convection oven (Peters, 2000).

Predicting silage harvest date

Use 0.5% per day during September to predict the date when a field will be ready for the storage structure. For example, if a given field measures 30% dry matter at the early sampling date, and the target harvest dry matter is 35%, then the field must gain an additional 5% units of dry matter, thus requiring an estimated 10 days (5% units divided by 0.5 unit change per day). If weather is warm and dry, use a faster rate of drydown (1999 and 2000 in Figure 2). If weather is cool and wet, use a slower rate of drydown (1996 and 2001 in Figure 2). We are most interested in the rate of corn silage drydown. Wisconsin county agents have been accumulating corn silage drydown information since 1996. Results from county “Drydown Days” can be checked at the website http://fyi.uwex.edu/silagedrydown/ which averages and predicts area harvest dates.

This procedure provides only a rough estimate for the harvest date. Many factors affect dry down rate, including hybrid, planting date, general health of the crop, landscape position, soil type, and weather conditions. In general, corn silage that is slightly too dry is worse than corn silage that is slightly too wet. Therefore, starting harvest a little early is usually better than waiting too long.

Literature Cited


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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 20, 2016 through August 26, 2016.

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

**Field Crops**

- Corn, Common Rust, *Puccinia sorghi*, Dodge
- Corn, Southern Rust, *Puccinia polysora*, Rock
- Soybean, Bacterial Blight, *Pseudomonas syringae pv. glycinea*, Trempealeau
- Soybean, Brown Spot, *Septoria glycines*, Trempealeau
- Soybean, *Sclerotinia Stem Rot*, *Sclerotinia sclerotiorum*, Trempealeau
- Soybean, *Soybean Cyst Nematode*, *Heterodera glycines*, Trempealeau
- Soybean, Stem and Pod Blight, *Diaporthe phaseolorum*, Trempealeau
- Soybean, Stem Canker, *Diaporthe phaseolorum*, Trempealeau
- Soybean, Sudden Death Syndrome, *Fusarium virguliforme*, Pierce

**Forage Crops**

- Alfalfa, Spring Black Stem and Leaf Spot, *Phoma medicaginis*, Columbia
- Alfalfa, Stemphylium Leaf Spot, *Stemphylium sp.*, Columbia
- Alfalfa, Summer Black Stem and Leaf Spot, *Cercospora sp.*, Columbia

**Fruit Crops**

- Apple (‘Honeycrisp’), Honeycrisp Leaf Chlorosis, None, Jo Daviess (IL)
- Apple (Unspecified), Bitter Rot, *Colletotrichum gloeosporioides*, Dane
- Pear, Fire Blight, *Erwinia amylovora*, Waukesha

**Vegetable Crops**

- Pepper, Herbicide Damage, None, Jackson
- Tomato, Bacterial Canker, *Clavibacter michiganensis subsp. michiganensis*, Wood
- Tomato, Cucumber Mosaic, *Cucumber mosaic virus*, Portage
- Tomato, Late Blight, *Phytophthora infestans*, Polk
- Tomato, Tobacco Mosaic, *Tobacco mosaic virus*, Portage

**Specialty Crops**

- Hop, Alternaria Cone Disorder, *Alternaria sp.*, Dane
- Hop, Cone Tip Blight, *Fusarium sp.*, Dane

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).
Southern rust of corn has been confirmed for the first time this season by the UW Plant Disease Diagnostic Clinic (PDDC) in Wisconsin. The positive sample was submitted from Rock Co. along the Wisconsin/Illinois state line and confirmed on August 25, 2016. As previously predicted, southern rust did make it to Wisconsin this year, however, its arrival is late enough that it should have minimal impact on yield. We published an article on WisContext about some reasons why this occurrence was expected in 2016, you can click here to learn more.

Most corn in Wisconsin is at least well into the milk stage (R3) or dough (R4). Once corn reaches the milk stage (R3), risk of yield loss from this and other foliar pathogens begins to quickly decline. Thus spraying fungicide at this time of the season is not recommended. If you would like to learn more about telling the difference between the two types of rusts that occur on corn, or management of southern rust specifically, see my previous article by CLICKING HERE.

If you need assistance in identifying rust on corn, leaf samples of corn plants can be sent in a sealed plastic bag with NO added moisture to the University of Wisconsin Plant Disease Diagnostic Clinic (PDDC). Information about the clinic and how to send samples can be found by CLICKING HERE.
Start Managing Stripe Rust of Winter Wheat in 2017 At Planting

Brian Mueller, Graduate Research Assistant, Department of Plant Pathology, University of Wisconsin-Madison
Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison
Shawn Conley, Extension Soybean and Small Grains Agronomist, Department of Agronomy, University of Wisconsin-Madison

The 2016 Wisconsin winter wheat field season was reasonably successful with very high yields and low levels of Fusarium head blight throughout much of the state. The major disease concern this season was stripe rust. Some cultivars were hit very hard by this disease. Since 2000, stripe rust has become an increasing concern on winter wheat in the Midwest. In Wisconsin over the last four seasons, we have observed consistent stripe rust pressure on some varieties throughout the wheat production area of the state. Because of the consistent occurrence of stripe rust over the last few seasons, it is reasonable to expect continued pressure from this disease in 2017.

Stripe rust 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 disease 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. 1).

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

Figure 1. Stripe rust in a “striped pattern” on winter wheat leaves.
know if the stripe rust fungus can survive the summers in Wisconsin, once the wheat crop has been harvested. We are working on trying to understand the epidemiology of this pathogen better.

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.

**Stripe Rust Management**

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. Your job in managing stripe rust really begins now before planting. Take time to study the [2016 Wisconsin Winter Wheat Performance Trial report](#). These 2016 trial results include ratings for stripe rust. Locate the trial that was situated closest to you and look for a wheat variety that yielded well and had little stripe rust.

Figure 2. Wheat Stripe Rust Severity and Yield Loss Relationship Across Four Wisconsin Locations in 2016

In 2016, stripe rust caused a significant amount of yield reduction in the state. Across all varieties and variety testing locations in the state, the average yield potential was 130 bu/a. This was an excellent yield potential, however stripe rust caused a significant reduction in yield on susceptible varieties. In 2016 approximately 5.4 bu/a were lost for every 10% increase in flag leaf stripe rust severity (area of the flag leaf covered in rust) in Wisconsin (Fig. 2). This is a substantial yield reduction in these trials. It should be noted that no fungicide was used, thus, some wheat varieties have excellent resistance and yield potential and should be top choices to consider for planting in 2017.

In addition to choosing a resistant winter wheat variety, you can start making some decisions on what your fungicide program might look like. There are several effective fungicides for stripe rust. To find a product with an excellent efficacy rating, consult the Small Grains Fungicide Efficacy Table. Once you have sourced a suitable fungicide for your operation, timing of application of that product becomes the most important decision. We conducted an integrated management trial for stripe rust of winter wheat in 2016. In that trial we applied fungicides at three growth stage timings (jointing, flag leaf emergence, boot stage) and compared them to a non-treated control or full-season fungicide protection (not a recommended program, but was used as a positive control or best-case scenario). We applied fungicide at these growth stages on wheat varieties rated as resistant (Pro Seed 380), moderately susceptible (Kaskaskia), and susceptible (Pro Seed 420).

Figure 3 shows the mean relative stripe rust incidence (number of plants per plot with stripe rust) at each fungicide application timing on the three varieties. You will note that Pro Seed 380 was resistant enough that very little stripe rust occurred even in the non-treated control. Fungicide application on this variety resulted in no difference because of the low incidence. For Kaskaskia and Pro seed 420, however, the flag leaf and boot fungicide application timings offered suitable reductions in stripe rust incidence. The reason for this response is that stripe rust was first observed around the emerging flag leaf growth stage. Thus, fungicide application timing near the appearance of the disease offered excellent control.

![Figure 2. Wheat Stripe Rust Severity and Yield Loss Relationship Across Four Wisconsin Locations in 2016](image)

![Figure 3. Mean Relative Stripe Rust Incidence on Three Winter Wheat Varieties Treated with Fungicide at Three Growth Stages Compared to Not-treating or Treating with Fungicide Full-Season](image)
Figure 4 shows the mean yield response for these same treatments. The trend followed that of the incidence data. No significant yield response was observed for Pro Seed 380 for any of the fungicide application timings, as it was highly resistant to stripe rust. Kaskasia and Pro Seed 420 responded to the fungicide application timing with the best single application being either the flag leaf or boot application timing.

To best manage stripe rust on winter wheat in 2017, start now by choosing the most resistant, highest-yielding variety appropriate for your location based on the 2016 Wisconsin Winter Wheat Performance Trial report. Once you have chosen your variety, choose a fungicide that will best fit your operation, with a high level of efficacy based on the Small Grains Fungicide Efficacy Table. Next spring begin scouting your wheat crop frequently. Don’t use your fungicide application until you first see stripe rust. This will likely be closer to flag leaf emergence or the boot stage in Wisconsin. Don’t forget about other diseases like Fusarium head blight (FHB). You might have to treat twice with fungicide if the weather is conducive next season for FHB and you have to spray early for stripe rust. Remember that fungicides effectively protect wheat plants for around 14 days. To learn more about managing FHB in 2017, CLICK HERE.

Wisconsin Late-Season Corn Disease Update

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

NCLB and Anthracnose Stalk Rot

As corn silage harvest has begun and the corn grain crop is finishing, there have been some disease issues of note in Wisconsin. Northern corn leaf blight (NCLB) activity has picked up quickly over the last several weeks. This is due to the fact that the weather has become much cooler and has remained wet. These conditions are favorable for the fungus. You will remember that NCLB was observed very early this season. See my previous post on this topic by clicking here. The hotter and dryer weather we saw mid-season was not only good for corn growth, but it kept the NCLB pressure minimal during the critical time of silking and pollination. As stated in the fourth edition of the “Compendium of Corn Diseases” (Carson, 2016) direct yield losses from NCLB are typically minimal if infection is moderate or delayed until 6 weeks after silking. Therefore, the expected direct yield loss from NCLB in Wisconsin in 2016 is expected to be low, due to its late onset.

Certainly, there are other issues to consider with this late onset of NCLB. Dry-down will be accelerated. If you have a considerable epidemic in silage corn, then it would be advisable to try to chop as quickly as possible or consider taking the crop as high-moisture corn. Another issue to consider is the fact that a late-season NCLB epidemic can increase the risk for stalk rot issues. We have observed earlier than typical onset of anthracnose stalk rot this season (Fig. 1). Anthracnose stalk rot has been observed in many fields, with a range in severity dependent on the
hybrid resistance and field history. Fields in a corn-on-corn rotation, and/or no-tilled, and planted to a susceptible hybrid are at high risk of severe symptoms. We have observed several fields with significant lodging and wind damage where anthracnose stalk rot has advanced quickly (Fig. 2). In other fields lodging has been minimal, but some anthracnose stalk rot can be found.

Management of anthracnose stalk rot is multi-faceted. First, choose hybrids with best resistance available. Hybrids that also have good resistance to foliar diseases will also offer an advantage when managing stalk rot, as foliar disease can stress corn plants and lead to increased risk of anthracnose stalk rot. Cultural practices such as crop rotation and tillage to manage surface residue can also help. Other practices that reduce plant stress such as balanced fertilization, proper planting population, providing suitable drainage, and using well adapted hybrids for your location will reduce the risk of anthracnose stalk rot. Finally, in fields were stalk rot is an issue, harvest as early as possible to avoid yield losses from lodging.

Fungicides are not recommended for managing anthracnose stalk rot. Attempts to use fungicides to manage anthracnose stalk rot often result in high variability and little translation to a yield advantage. In 2015 we conducted a corn fungicide trial where anthracnose stalk rot was detected at harvest. While higher levels of stalk rot were observed, and some treatments did lead to a significant reduction in stalk rot severity, no differences in lodging or yield were identified among the treatments. To view results of this 2015 trial, click here and scroll down to pages 2 and 3.

Bacterial leaf streak – A new disease of corn in the U.S.

Bacterial leaf streak (BLS) of corn has recently been reported for the first time on corn in the U.S. The first reports were in Nebraska with subsequent reports coming in from other states in the U.S. corn belt including Iowa, Illinois, Colorado, and Kansas. Efforts are underway in Wisconsin to monitor for the disease. As of this writing, BLS has not been found in Wisconsin. However, survey and scouting efforts are continuing, to monitor for this disease.

Bacterial leaf streak is caused by a bacterium named *Xanthomonas vasicola pv. vasculorum*. Very little is understood about this disease on corn, as it is so new. This pathogen presents no risk to humans or animals and there is little evidence to suggest that it will have an adverse effect on corn yield and quality. You can click here to read the USDA APHIS Statement on *Xanthomonas vasicola pv. vasculorum*. To learn more about the disease and to watch a video by Dr. Tamra Jackson-Ziems at the University of Nebraska CLICK HERE. Helpful information and hints on initially diagnosing BLS can be found HERE.

If you suspect that you have BLS in your corn crop in Wisconsin, leaf samples of corn plants can be sent in a sealed plastic bag with NO added moisture to the University of Wisconsin Plant Disease Diagnostic Clinic (PDDC). Information about the clinic and how to send samples can be found by CLICKING HERE.

References


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**2016 UW Extension Pest Management Update Meeting Series**

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

Mark your calendars as the UW Extension’s Pest Management Update meetings are just around the corner (November 7-11).

The format has changed for 2016. Meetings will either be in the morning or afternoon and will run for 3 hours. Morning meetings will begin promptly at 9am and run to 12pm with lunch to follow. Afternoon meetings will begin at 1pm and conclude at 4pm with lunch served from 12pm-1pm.
The new format will include presentations by Bryan Jensen with UW-Madison Entomology, Dan Heider with the UW Integrated Pest and Crop Management Program, Damon Smith with UW-Madison Plant Pathology, and weed scientist, Mark Renz with UW-Madison Agronomy.

The focus of the first 2 hours has been changed with more emphasis on research updates and important highlights from the 2016 field season. The second session will be an interactive diagnostic troubleshooting exercise based on issues observed in the 2016 field season.

The diagnostic and focused-topic trainings have been a big hit over the past two years, so don’t miss 2016!

In addition to a new format, a packet of information will be supplied to all registered participants. The packet will include the usual handouts and also a copy of the 2017 Pest Management in Wisconsin Field crops (A3646) guide. We also will include in the packet one copy each of “A Farmer’s Guide to Soybean Diseases” and “A Farmer’s Guide to Corn Diseases”. This two volume set is a $60 value!

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.

Be sure to look at the 2016 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.

Three hours of CCA CEU pest management credits are requested and available at each location.

Registration fees at each location may vary, but will be around $50 which will include access to the packets, refreshments, 3 hours of CEU credit, and great information!

Click here to see the full schedule of all meetings.

Understanding Soybean Growth and Development: How to Properly Growth Stage Soybean

Mimi Broeske, NPM Program
Adam P. Gaspar, Ph.D. Candidate
John M. Gaska, Senior Research Agronomist Shawn P. Conley, Extension Soybean Specialist

Understanding growth stages can help to use production practices more timely and efficiently to obtain higher yields. This applies to planting, in-season diagnosis, herbicide, fertilizer, fungicide, insecticide, and harvesting.

Click here to see the new publication: Understanding Soybean Growth and Development: How to Properly Growth Stage Soybean.

It aides to help interpret what you are seeing in the field.

Cover Crop Success in Southwest WI

Dan Smith, University of Wisconsin-Madison & Extension Southwest Regional Outreach Specialist

Click here to read about successful cover crops or find it in the back of this edition. They consist of a dairy crop, a beef/cash crop, and a cash crop.

Vegetable Crop Update September 2, 2016

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

The 26th issue of the Vegetable Crop Update is now available. In this edition, please find information on:
Vegetable Crop Update
September 10, 2016

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

The 27th issue of the Vegetable Crop Update is now available. In this edition, please find information on:

- DSV (Blitecast, Late Blight) and P-Day (Early Blight) Updates
- Late blight and Cucurbit Downy mildew national updates
- Food Safety Modernization Act – Grower Feedback Sought

Click here to view this issue.

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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 27, 2016 through September 2, 2016.

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

**Fruit Crops**


**Vegetable Crops**


**Specialty Crops**

Hop, Carlavirus, Unidentified carlavirus, Dane

**Soil**

Soybean Soil, Soybean Cyst Nematode, *Heterodera glycines*, Boone (IL)

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

Wisconsin Fruit News, Issue 11

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

Click here for the 11th issue of the Wisconsin Fruit News.

In it you will find information about:

- Plant Disease Diagnostic Clinic update
- Endosulfan in strawberry, and correction on previous Rimon article
- Insect Diagnostic Lab update
- Unusual fruit crops for Wisconsin markets: Saskatoon
• Mechanical harvesting of black currants
• Cranberry degree-day map and update
• Grape insect pests: multicolored Asian lady beetle
• Grape disease update
• Grape developmental stages
• Reduced-risk insecticide profile: Entrust

Impact of spotted wing drosophila on the cherry industry

All newsletters will also be posted onto at the Wisconsin Fruit website, available at www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.
“Worms” in Corn Ears

Bryan Jensen, UW Extension and IPM Program

I’ve had a few calls as well as personnel observations regarding “worms” and their damage in corn ears. European corn borer seems to be making a bit of a comeback. Although these reports have been locally heavy, they have not been widespread. Western bean cutworm complaints have certainly increased from previous year, especially on traited corn. Fall armyworms, which migrate to Wisconsin, had a surprisingly early migration and their damage can mimic injury caused by other ear feeding insects. Finally, corn earworm is another one of those late-season migrants which arrived in very heavy numbers at some locations during the 2016 growing season. Normally it is not a field corn pest but when migrating populations are this high, field corn can be a host. One clue that you have an infestations of corn “worms” can be significant bird damage to the ears. Diagnosis of the injury can be important when planning for the future. However, diagnosis of injury symptoms can be a little tricky and not always definitive based on symptoms. Below is a quick synopsis that can be used for identification of both the larvae as well as type of damage.

European corn borer (ECB), as mentioned earlier, is making a bit of a comeback presumably because more conventional corn is being planted. They are normally controlled by hybrids expressing above ground trait(s). ECB have a very dark head (usually black) and a lighter cream to tan colored body and may grow up to an inch in length. Depending on the area of state, there is either 1 or 2 generations/year. However, I have had a few reports of a third generation this summer. Larvae from the third generation do not mature in time to overwinter successfully. Diagnosing injury can always be a little difficult, however, ECB larvae may still be present in the ear and the injury is typically confined to a smaller area on the ear tip if compared to other insects. ECB are also more likely to burrow into individual kernels and/or the cob. You also would expect to find ECB injury in ear shanks as well as tunneling within the stalks.

Western bean cutworms (WBC) are dark to light brown, without distinguishable stripes or dots and their skin is smooth. They will grow up to 1 ½ inch and the later instars will have two short/broad strips behind the head. WBC complete 1 generation/year and leave the ear to pupate in the soil. Injury to the ear can vary from light surface feeding on kernels to complete consumption of...
large areas of kernels. Molds may be found on the ear but this is not diagnostic of only WBC. They are not cannibalistic; therefore, more than one larva may feed on each ear. WBC injury is often associated with sandy soils. Several states in the Midwest, have had reports of significant WBC injury to traited corn.

Fall Armyworm (FA) is a species which occasionally migrates to our state. Larvae may be up to 1 ½ inch long, have variable coloration (green, light brown to almost black), smooth skin and light striping on their backs. A diagnostic feature of FA is an inverted white “y” on their head located between their compound eyes. Damage depends on crop stage and can range from leaf feeding to significant kernel injury on both the tip and sides of the ear.

Corn earworms (CEW) feed on a variety of crops, including sweet corn. Although an infrequent field corn pest, feeding can be significant during years of heavy pressure. CEW vary in color and can be green, yellow, brown, tan to almost black. All CEW larvae will have a tan head. CEW can easily grow to 1 ½ inches long and later instars have easily recognizable striping. Early instars will have small black hairs identifiable if you have magnification. Earworms usually enter the ear through the silk and damage is concentrated at the ear tip, however injury can be severe on any part of the ear. What can separate CEW injury from WBC and FA is that the latter two species may chew holes into the husks.

Considerations when using the end-of-season corn stalk nitrate test

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

There continues to be interest in taking end-of-season corn stalk samples to assess nitrogen (N) management practices. The purpose of this article is to briefly describe the end-of-season corn stalk nitrate test with regard to the intent of the test, sampling guidelines, and interpretation of test results.

Intent of the test

Many corn growers feel that their crop needs to be dark green throughout the growing season to achieve high yields and be profitable. As a result of this belief, high fertilizer N rates are often applied to maintain dark green leaves. Research in Wisconsin and throughout the Midwest has consistently shown that the most profitable rate of N fertilizer will result in plants that are less green late in the growing season. The end-of-season stalk nitrate test is intended to be a tool to help corn growers determine if their N management practices were adequate or if adjustments could be made to improve profitability and/or reduce N losses to the environment.

Sampling guidelines

The following criteria must be followed to ensure that samples are properly acquired:

- Samples should be taken 1 to 3 weeks after black layer
- An 8” segment of stalk should be taken from 6 to 14 inches above the soil surface, remove leaf sheaths
- Stalk segments from 15 plants make one sample
- A sample should not represent more than 20 acres
- If soil characteristics or past management practices vary across the field, then separate samples should be collected for each area.
- Stalks severely damaged by insect or disease should not be used
Following the sampling criteria outlined above is important for collecting samples that can be interpreted. The guidelines were developed because each criterion is known to influence stalk nitrate results.

Samples should be placed in paper bags and sent to a laboratory for analysis. Samples should be refrigerated (not frozen) if they are to be stored for more than one day before shipping. Most soil testing laboratories will conduct this test. Contact your laboratory to confirm that they run the stalk nitrate test.

Interpretation of stalk nitrate test results

The interpretation of the stalk nitrate test was developed using data from 98 sites in Wisconsin collected over four years (Bundy, 1996). Results from the stalk nitrate test are reported in parts per million (ppm) of nitrate-N. Stalk nitrate test interpretations are provided in Table 1.

It is important to keep in mind that the stalk nitrate test has several limitations. First, the test identifies excessive and optimal N rates more accurately on medium yield potential soils compared to high yield potential soils (Table 2). In addition, a little more than one-third (37%) of the high yield potential soils categorized as having excess N supply actually had optimal, not excessive, rates of fertilizer. Second, research in Wisconsin has shown that the test may occasionally incorrectly indicate that excess N was supplied to fields with recent (within two years) history of manure application and/or alfalfa in the rotation; particularly on high yield potential soils. Third, the test does not provide an indication of the amount of N that was over or under supplied. Fourth, the test can be impacted by weather. In extremely dry years, the stalk nitrate values tend to be high; in contrast, test values tend to be low in an extremely wet year.

Because the adequacy of any given N rate on a field is dependent upon environmental conditions, basing future N rate decisions solely on one year’s stalk nitrate values could result in poor management decisions. Stalk nitrate data collected over several years coupled with fertilizer and manure application history, growing season weather conditions and general crop management history may be useful in determining if N fertilizer rates should be reduced to improve profitability.

References and other reading


Table 1. Interpretation of end-of-season corn stalk nitrate test.

<table>
<thead>
<tr>
<th>Category</th>
<th>Nitrate-N concentration</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive</td>
<td>&gt; 2000 ppm</td>
<td>High probability that N availability was greater than if fertilized according to UW-Extension guidelines</td>
</tr>
<tr>
<td>Optimal</td>
<td>700–2000 ppm</td>
<td>High probability that N availability was within the range needed to maximize profitability</td>
</tr>
<tr>
<td>Low</td>
<td>&lt; 700 ppm</td>
<td>High probability that greater N availability would have resulted in increased yields</td>
</tr>
</tbody>
</table>

Table 2. Accuracy of the end-of-season stalk nitrate test to categorize sites as having low, optimal, or excessive N rates on 49 medium and 49 high yield potential soils.

<table>
<thead>
<tr>
<th>Soil yield potential</th>
<th>Stalk nitrate test category</th>
<th>% of sites correctly categorized</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Optimal</td>
</tr>
<tr>
<td>Medium</td>
<td>60</td>
<td>92</td>
</tr>
<tr>
<td>High</td>
<td>75</td>
<td>56</td>
</tr>
</tbody>
</table>
Wet Wisconsin: Moldy Corn and Crop Insurance

Damon L. Smith, Plant Pathology, UW-Madison/Extension
Paul D. Mitchell, Agricultural and Applied Economics, UW-Madison/Extension

It’s been a warm and wet summer and flooding has recently hit many areas hard in Wisconsin. Due to the heavy moisture we have seen during the 2016 growing season, Wisconsin farmers should be especially aware of moldy corn this year. Molds can cause serious problems if fed to livestock and can be food safety problems in the supply chain. Buyers will also be looking for moldy corn and other quality problems; ear rots have been reported, as well as some grain sprouting on the ear. For those with crop insurance, quality losses due to moldy corn can trigger indemnities if losses are large enough. Farmers suspecting losses due to moldy grain should contact their crop insurance agents before they harvest. The company will follow-up and tell you how to proceed.

Corn Ear Rots and Mycotoxins

Ear rots caused by fungi in the groups Diplodia, Fusarium, and Gibberella will be the most likely candidates in 2016. Fusarium and Gibberella are typically the most common fungi on corn ears in Wisconsin. This group of fungi not only damage kernels on ears, but can also produce toxins called mycotoxins. These toxins (fumonisins and vomitoxin) can threaten livestock that are fed contaminated grain. Thus grain buyers actively test for mycotoxins in corn grain to monitor mycotoxin levels to be sure they are not above certain action levels established by the U.S. Food and Drug Administration (FDA).

The FDA has established maximum allowable levels of fumonisins in corn and corn products for human consumption ranging from 2-4 parts per million (ppm). For animal feed, maximum allowable fumonisin levels range from 5 ppm for horses to 100 ppm for poultry. Vomitoxin limits are 5 ppm for cattle and chickens and 1 ppm for human consumption.

Diplodia ear rot does not produce mycotoxins, but can damage grain. This disease is often more severe in years where dry weather precedes silking, followed by wet weather immediately after silking. While this disease does not result in mycotoxin accumulation, it can cause grain yield loss and quality issues.

For more information about ear rots and to download a helpful fact sheet produced by a consortium of U.S. corn pathologists, visit this webpage: http://cropprotectionnetwork.org/corndiseases/ear-rots/. For more information on mycotoxins and to download a fact sheet, visit this webpage: http://cropprotectionnetwork.org/corndiseases/mycotoxin-faqs/.

Reducing Mycotoxin Risks

Before harvest, farmers should check their fields to see if moldy corn is present. Similarly, during harvest they should carefully monitor the grain for mold. If substantial portions of fields appear to be contaminated with mold, it does not mean that mycotoxins are present and vice Learning for life versa. Appropriate grain samples should be collected and tested by a reputable lab. Work with your corn agronomist or local UW Extension agent to ensure proper samples are collected and to identify a reputable lab. If tests show high levels of mycotoxins in grain, that grain SHOULD NOT BE BLENDED with non-contaminated corn.

Helpful information on grain sampling and testing for mycotoxins can be found here: http://cropprotectionnetwork.org/corndiseases/grain-sampling-mycotoxin-testing/.

If you observe mold in certain areas of the field during harvest, consider harvesting and storing that corn separately, as it can contaminate loads and the fungi causing the moldy appearance can grow on good corn during storage. Harvest corn in a timely manner, as letting corn stand late into fall promotes Fusarium ear rot. Avoid kernel damage during harvest, as cracks in kernels can promote fungal growth. Also, dry corn properly as grain moisture plays a large roll in whether corn ear rot fungi continue to grow and produce mycotoxins. For short term storage over the winter, drying grain to 15% moisture and keeping grain cool (less than 55F) will slow fungal growth. For longer term storage and storage in warmer months, grain should be dried to 13% moisture or less. Also, keep storage facilities clean. Finally, mycotoxins are extremely stable compounds: freezing, drying, heating, etc. do not degrade mycotoxins that have already accumulated in grain.

For more information on properly storing grain and to download a fact sheet on the subject, visit this webpage: http://cropprotectionnetwork.org/corndiseases/storing-mycotoxin-affected-grain/.

Crop Insurance Rules

Quality losses due to moldy corn are insurable losses for those with crop insurance, but to claim indemnities, growers must follow crop insurance rules. If you suspect mold issues, contact your crop insurance agent before harvesting, storing or selling the corn. The key is to communicate with your crop insurance agent before
harvesting. Your crop insurance agent will tell you how to proceed. Samples will have to be collected by a third party, such as a crop adjustor, plus many grain elevators will collect and store grain samples short-term for crop insurance purposes for loads with discounted prices due to low quality. Also, growers may be asked to leave unharvested rows for crop loss adjustors to use to determine indemnities. If fumonisin or vomitoxin tests indicate contamination above safety limits, insured growers following proper procedures will be compensated for the reduction in value of the grain if it is large enough to trigger insurance indemnities. An issue some farmers will face this year is that small price reductions due to grain quality problems will not be enough to trigger crop insurance indemnities when combined with above average yields.

For More Information Contact your crop insurance agent with specific questions regarding your crop insurance coverage. Contact your local UW Extension agent or the authors with questions or for more detailed information. For a list of laboratories that can test corn grain for mycotoxins, consult Table 2-16 in UW Extension publication A3646 – Pest Management in Wisconsin Field Crops: https://learningstore.uwex.edu/Assets/pdfs/A3646.pdf.

**Slug Feeding in Cereal Rye Cover Crop Seedings**

Bryan Jensen & Mike Travis, UW Extension
Brian Briski, Mark Biel and Dana Swanson, NRCS

During a brief survey of recent cereal rye cover crop seedings in NW Wisconsin (Pierce, Pepin and Dunn Counties) we observed severe slug feeding on cereal rye seed that was broadcast onto the soil surface in standing corn and soybeans. This feeding was severe enough that it will undoubtedly affect establishment. The broadleaf seeds (vetch and tillage radish) appeared unaffected. Two species of slugs (grey field slug and marsh slug) were found feeding on the “germ” (reproductive portion of the seed) leaving that area of the seed hollowed out.

Common factors among all the fields with severe slug feeding was no-till and heavier soil types, which are both understandable because of the amount of residue present and moist environment. Certainly, the recent wet weather was also a factor. What was a little surprising was that early season slug damage was not noticed in some of these fields.

Using a slug bait to control feeding is not a good suggestion at this point. Several factors including cost and legal issues must be well-thought-out. Before considering a bait, please read the label and make sure that application is within label, including whether the standing crop is labeled for use in Wisconsin and that PHI can be met. You must also consider whether the specie(s) of cover crop is listed on the label and the application timing/rate is acceptable for it. Labeling for the cover crop species is not required if you will not be harvesting the cover crop for forage, feed or seed (i.e., that crop does not leave the field where it was planted). This can be a lot to understand and digest at first. Another issues before considering a slug bait is that proper slug management needs to be thought about within a “systems” context, not as a quick fix. That is, short term solutions are unlikely to be effective and that several management options should be considered including, but not limited to, time of planting, planting method, crop rotation, residue management, use of insecticide seed treatment and foliar application of insecticides.

Scouting is suggested prior to broadcasting cereal rye seed. Slugs can be difficult to find during daylight hours. However, scouting during cool/cloudy days can be effective but time consuming. One trick that might help is to place a flat object like a board, weighted down cardboard, paneling, etc on the soil surface. These objects provide good cover for slugs during the day and provide you with a quick method of assessing populations. The boards we used were a little over 1 sq. ft. in size and we found a range of 4-10 or more slugs/board. There are

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**Left**: Grey Field Slug; **Right**: Marsh Slug

Above: Slug Damaged Cereal Rye Seed
no established thresholds for slugs, however, this information can be used to help decide if drilling is a better alternative than broadcast.

At this point we are unsure if other grass seeds will be similarly affected.

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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 3, 2016 through September 23, 2016.

<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 graminicola</em>, Portage</td>
</tr>
<tr>
<td>Corn, Anthracnose Stalk Rot, <em>Colletotrichum graminicola</em>, Kenosha</td>
</tr>
<tr>
<td>Corn, Common Rust, <em>Puccinia sorghi</em>, Dodge, Grant</td>
</tr>
<tr>
<td>Corn, Eyespot, <em>Kabatiella zeae</em>, Grant, Portage</td>
</tr>
<tr>
<td>Corn, Giberella Stalk Rot, <em>Fusarium graminearum</em>, Kenosha</td>
</tr>
<tr>
<td>Corn, Goss’ Wilt, <em>Clavibacter michiganensis subsp. nebraskensis</em>, Buffalo, Saunder</td>
</tr>
<tr>
<td>Corn, Northern Corn Leaf Blight, <em>Exserohilum turcicum</em>, Dodge, Portage, Shawano</td>
</tr>
<tr>
<td>Corn, Northern Corn Leaf Blight, <em>Bipolaris zeicola</em>, Portage</td>
</tr>
<tr>
<td>Corn, Southern Rust, <em>Puccinia polysora</em>, Grant</td>
</tr>
<tr>
<td>Corn, Tar Spot, <em>Phyllachora maydis</em>, Iowa</td>
</tr>
<tr>
<td>Sunflower, Alternaria Head Rot, <em>Alternaria spp.</em>, Marathon</td>
</tr>
<tr>
<td>Sunflower, Alternaria Leaf Blight, <em>Alternaria spp.</em>, Marathon</td>
</tr>
<tr>
<td>Sunflower, Botrytis Head Rot, <em>Botrytis cinerea</em>, Marathon</td>
</tr>
<tr>
<td><strong>Fruit Crops</strong></td>
</tr>
<tr>
<td>Apple, Bitter Rot, <em>Colletotrichum gloeosporioides</em>, Fond du Lac</td>
</tr>
<tr>
<td>Apple, Elsinoe Fruit Spot, <em>Sphaceloma pirinum</em>, Lafayette</td>
</tr>
<tr>
<td>Grape, Phomopsis Fruit Rot, <em>Phomopsis viticola</em>, Marinette</td>
</tr>
<tr>
<td>Strawberry, <em>Root/Crown Rot</em>, <em>Phytophthora sp.</em>, <em>Pythium sp.</em>, <em>Fusarium sp.</em>, Dane</td>
</tr>
<tr>
<td><strong>Vegetable Crops</strong></td>
</tr>
<tr>
<td>Basil, <em>Downy Mildew</em>, <em>Peronospora belbahrii</em>, Jefferson, Outagamie</td>
</tr>
<tr>
<td>Cabbage, Alternaria Leaf Spot, <em>Alternaria sp.</em>, Portage</td>
</tr>
<tr>
<td>Cabbage, <em>Black Rot</em>, <em>Xanthomonas campestris pv. campestris</em>, Rock</td>
</tr>
<tr>
<td>Cauliflower, <em>Verticillium Wilt</em>, <em>Verticillium sp.</em>, Rock</td>
</tr>
<tr>
<td>Potato, Black Leg, <em>Dickeya sp.</em>, Rock</td>
</tr>
<tr>
<td>Rutabaga, <em>Black Rot</em>, <em>Xanthomonas campestris pv. campestris</em>, Rock</td>
</tr>
<tr>
<td>Pumpkin, Phytophthora Fruit Rot, <em>Phytophthora capsici</em>, Portage</td>
</tr>
<tr>
<td>Squash (Butternut), Alternaria Leaf Blight, <em>Alternaria sp.</em>, Portage</td>
</tr>
<tr>
<td>Squash (Butternut), <em>Powdery Mildew</em>, <em>Oidium sp.</em>, Portage</td>
</tr>
<tr>
<td>Tomato, <em>Septoria Leaf Spot</em>, <em>Septoria lycopersici</em>, Dane</td>
</tr>
</tbody>
</table>

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

### Wisconsin Fruit News, Issue 12

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

Click here for the 12th issue of the Wisconsin Fruit News.

In it you will find information about:
- Insect Diagnostic Lab update
- Blueberry virus survey
- Diversifying your fruit crops: Aronia
- Cranberry degree-day map and update
- Spotted wing drosophila management for Wisconsin grape growers
- Late season downy mildew management
- Grape developmental stages
- Hazelnut harvest and processing
- Apple fruit maturity: how to determine the optimal harvest date
# Potato Disease Risk Values

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

Below is a chart of Potato Disease Risk Values, including new totals from September 16.

<table>
<thead>
<tr>
<th>Location</th>
<th>Planting Date</th>
<th>Emergence</th>
<th>NEW totals Sep 16</th>
<th>Previous Totals Sep 10</th>
<th>Added since Sep 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>P Day</td>
<td>S Val</td>
<td>P Day</td>
</tr>
<tr>
<td>Antigo area</td>
<td>earliest May 1</td>
<td>June 2</td>
<td>832</td>
<td>160</td>
<td>794</td>
</tr>
<tr>
<td></td>
<td>mid May 18</td>
<td>June 7</td>
<td>797</td>
<td>150</td>
<td>759</td>
</tr>
<tr>
<td></td>
<td>late June 3</td>
<td>June 21</td>
<td>695</td>
<td>135</td>
<td>657</td>
</tr>
<tr>
<td>Grand Marsh area</td>
<td>earliest April 15</td>
<td>May 22</td>
<td>914</td>
<td>193</td>
<td>868</td>
</tr>
<tr>
<td></td>
<td>mid May 1</td>
<td>May 27</td>
<td>877</td>
<td>187</td>
<td>831</td>
</tr>
<tr>
<td></td>
<td>late May 15</td>
<td>June 3</td>
<td>818</td>
<td>176</td>
<td>772</td>
</tr>
<tr>
<td>Calculated with data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>from Hancock through 6/10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hancock area</td>
<td>earliest April 18</td>
<td>May 24</td>
<td>850</td>
<td>204</td>
<td>807</td>
</tr>
<tr>
<td></td>
<td>mid May 3</td>
<td>May 29</td>
<td>809</td>
<td>191</td>
<td>766</td>
</tr>
<tr>
<td></td>
<td>late May 18</td>
<td>June 5</td>
<td>752</td>
<td>182</td>
<td>709</td>
</tr>
<tr>
<td>Plover area</td>
<td>earliest April 20</td>
<td>May 25</td>
<td>813</td>
<td>222</td>
<td>770</td>
</tr>
<tr>
<td></td>
<td>mid May 5</td>
<td>May 30</td>
<td>770</td>
<td>207</td>
<td>727</td>
</tr>
<tr>
<td></td>
<td>late May 20</td>
<td>June 6</td>
<td>714</td>
<td>198</td>
<td>671</td>
</tr>
</tbody>
</table>

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What is happening in the corn plant during the month of October?

Joe Lauer, Wisconsin Corn Agronomist Corn

For most of Wisconsin hybrids (~100 day), each plant typically develops 20-21 leaves, silks about 55-60 days after emergence, and matures about 120 days after emergence. All normal plants follow this same general pattern of development, but specific time intervals between stages and total leaf numbers developed may vary between different hybrids, seasons, planting dates and locations. The rate of plant development for any hybrid is directly related to temperature, so the length of time between the different stages will vary as the temperature varies. Environmental stress may lengthen or shorten the time between vegetative and reproductive stages.

The length of time required for the yield components of ear density, kernel number, kernel weight varies between hybrids and environmental conditions.

During October, frost has no effect on yield. However, lodging from disease, insect damage or hail can result in physical loss of yield. Grain harvest usually begins at about 25% grain moisture and is completed by 20% grain moisture. Some grain drying is usually necessary to get moisture down to 13-15% for long-term storage.

Yield

Ears per unit area, kernal number per ear and kernal weight all contribute to yield. These yield components of corn are determined early in the life cycle of the corn plant. It is true that yield is the end product but the plant must go through a number of stages to produce yield. Understanding this process won’t necessarily put “money in your pocket”, but by knowing when yield components are determined helps to interpret management and environmental factors influencing yield.
Ear number, kernel number and kernel weight are determined at six critical stages: at planting and emergence (VE-V4) when the potential number of ears in an acre is at a maximum; when the ear sets the maximum number of kernel rows (V5-V6); when the ear sets the maximum number of kernels along length of the ear (V15-VT); when the maximum number of ovules are pollinated to form developing embryos (R1-R2); when the maximum number of kernels is determined (R4-R5); and when the maximum kernel size is established (R5-R6).

Moisture

While corn grain yield is determined over the full season, at some point during the growing season yield is no longer the main production objective. Rather grain moisture becomes the main production focus and directly influences grain quality during storage. Grain quality is often established by conditions at the very end of the growing season. During wet fall weather growers need to move quickly on deteriorating grain.

Post mortem

The corn ear can tell us much about a plant’s development during the growing season. Abnormal ear development has multiple causes – environmental stresses, pests, cultural practices. Combined with information on field history, knowledge of ear and kernel anomalies can be an effective diagnostic tool in troubleshooting corn production problems. Understanding how corn ears respond to stress can help determine the nature of the stress, when it occurred, and how it might be managed or avoided in the future. See “Troubleshooting Abnormal Corn Ears” at http://u.osu.edu/mastercorn/.

October is also the month to learn how your management style interacted with the environment. It is the time to evaluate your on-farm trials and observations. It is important to write down these observations about how your land responded to your management and decisions you made this past year.

Phomopsis seed decay – An Increasing Issue for Delayed Soybean Harvest in Wisconsin

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

As the rain continues in Wisconsin and the 2016 soybean harvest gets delayed longer, Phomopsis seed decay is going to become an increasing concern. Phomopsis seed decay (Fig. 1) of soybean is caused by the fungus Diaporthe longicolla which is the same fungus that causes pod and stem blight (Fig. 2). This fungus also causes

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Corn moisture content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13%</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
</tr>
<tr>
<td>50</td>
<td>84</td>
</tr>
<tr>
<td>60</td>
<td>47</td>
</tr>
<tr>
<td>70</td>
<td>26</td>
</tr>
<tr>
<td>80</td>
<td>15</td>
</tr>
</tbody>
</table>

* Based on 0.5% maximum dry matter index - calculated on the basis of USDA research at Iowa State University. Corresponds to one grade number loss, 2-3% points of Total Damaged grain.
“zone lines” that are often observed in split stems and tap roots. These “zone lines” were once thought to be cause by the charcoal rot fungus, but we now know that is incorrect. You can learn more about “zone lines” by CLICKING HERE.

What does Phomopsis seed decay look like?
The fungus that causes Phomopsis seed decay can infect soybean plants early in the season and colonize pods and infect seeds near, or at maturity. Infected seed will often be shriveled or undersized (Fig 1.) and can have a white or chalky appearance. If pods are opened in the field a white cottony “mold” (different than that of white mold) can be observed. Infected seed can pass the Phomopsis seed decay fungus on in seedlings of the next soybean crop. Therefore, it is important to identify Phomopsis seed decay especially in soybean-seed fields.

What conditions are favorable for Phomopsis seed decay?
Warm and wet weather during pod fill and maturity favor the development of Phomopsis seed decay. The conditions were prevalent throughout much of the state in of Wisconsin in 2016. Soybean varieties that matured early are also more prone to Phomopsis seed decay. Other stresses such as nutrient deficiencies or virus infections can also increase the occurrence of Phomopsis seed decay. Infested seed is a likely source of Phomopsis seed decay, however, the fungus can survive on soybean debris and certain weeds like velvetleaf.

How should I handle soybeans with Phomopsis seed decay?
Scout fields before harvest to get an idea of how much Phomopsis seed decay you might have in a field. Scout multiple plants in at least 5 locations in a field, opening pods to determine if Phomopsis seed decay is present. In fields where Phomopsis seed decay is observed, harvest should be prioritized as soon as combines can enter the field. Seed infected with the Phomopsis seed decay fungus will continue to rot in the pod until they are harvested.

How should I manage Phomopsis seed decay in the 2017 soybean crop?
Harvested grain intended to be seed for the 2017 crop should be cleaned thoroughly and undersized or damaged seed removed. Seed with an extremely high incidence of Phomopsis seed decay should not be used. Using a fungicide seed treatment may help improve emergence of infected seed. Resistant soybean varieties should also be used. Choose later maturing varieties appropriate for your location. Earlier maturing varieties tend to be more susceptible to Phomopsis seed decay. Finally, cultural practices such as rotation (corn or wheat are preferred) and tillage to manage infested residue should be considered in high-risk fields.

Additional Resource
A fact sheet about Pod and Stem blight and Phomopsis seed decay has been developed by a consortium of soybean extension pathologists. You can download that fact sheet by clicking here.
2016 WSA Soybean Yield Contest
Shawn P. Conley, Soybean and Wheat Extension Specialist

This is a friendly reminder that entry forms for the WSA Soybean Yield Contest need to be post marked by October 15, 2016.

[Click here to obtain a PDF of the form.]

Guidelines for Soil Compaction Management During a Wet Harvest Season

Francisco Arriaga, Assistant Professor and Extension Specialist, Dept. of Soil Science; francisco.arriaga@wisc.edu
Brian Luck, Assistant Professor and Extension Specialist, Dept. of Biological Systems Engineering; bluck@wisc.edu
University of Wisconsin-Madison, and UW-Extension

Fast Facts:

• Waiting for better soil moisture conditions is best, but not always possible.

• Reduce axles loads and maintain low equipment tire pressure.

• Managing equipment traffic pattern can help contain and reduce soil damage.

• Don’t assume subsoiling is needed.

• Surface tillage might be needed to address ruts.

• Cover crops can help.

Background:

Crop yields are decreased in compacted soils. This reduction in yield is caused by a reduction in root growth, water infiltration and plant water availability. Therefore, it is important to reduce the risk of soil compaction. Wet soil conditions in the fall increase the risk for causing soil compaction during harvest operations. Below are some guidelines to help prevent forming, diagnose, and manage soil compaction during wet harvest conditions. Preventing soil compaction from happening is usually the best management approach when possible.

Guidelines:

One of the main issues during wet harvest is the creation of ruts from equipment traveling in a field. Rutting creates an uneven soil surface which affects seed to soil contact during planting the following season’s crop. Also, ruts are a sign of surface soil compaction and clay smearing which increase the likelihood of soil crust to form. An effective strategy to reduce the risk of ruts is to manage traffic patterns in a field.

Most discussions of traffic pattern management within agricultural fields involves uniform machinery sizing and Global Positioning System (GPS) guidance of machines. However, it can also be achieved with some awareness and discipline on the part of the operators. This is even easier in wet conditions where rutting has occurred. Maintaining repeated travel patterns between transport equipment and the harvester (i.e. driving in the ruts) can reduce the damage of operating on wet soils and will confine any damage to specific and well known locations in the field. Figure 1 shows GPS data, collected once per second, on every piece of equipment involved in an operation harvesting alfalfa for ensiling. The left image shows the paths of two mergers, the forage harvester, and six transport trucks. The right image only shows the path of the forage harvester, simulating managed traffic, where every other piece of machinery is staying within the forage harvester tracks. Although the entire field is impacted by the operation of the machinery future corrective measures could be taken on the locations of the ruts rather than applying the correction to the entire field.

Some other machinery specific considerations for operating in wet conditions are to: 1) utilize machines equipped with tracks if possible, 2) maintain tire pressures as low as practical, 3) attach dual wheels wherever possible, 4) consider only carrying half (or reduced) loads out of the field, and 5) utilize tractor based transport equipment within the field while loading transport trucks at the edge of the field. Using equipment equipped with tracks spreads the mass of the machine over a greater area which reduces the overall pressure exerted on the soil. This effect is also achieved by running tire pressures as low as practical and implementing dual wheels wherever possible. Reduction of the total machine weight by only carrying half loads out of the field will reduce the total pressure exerted on the soil as well. There is a harvest efficiency consideration with this, in that it will take longer to harvest, so a judgement call on whether this is a good approach will need to be made based on crop quality and weather conditions. Finally, utilizing grain carts or dump carts to carry the product out of the field will reduce compaction with that equipment having larger tires and spreading the load over a larger area as opposed to utilizing trucks.
If there is a considerable amount of tire ruts, doing some light tillage to smooth the soil surface will help with planting operations. If ruts are present, surface tillage might be needed to improve the seedbed. Surface tillage can be done localized to those areas with ruts only if needed. Then plant a cover crop if possible, probably a grass such as cereal rye that has a fibrous root system that will help that soil surface.

If shallow compaction (<6″ deep) is detected, plant a cover crop (again cereal rye would be a good option for this, maybe mixed with a legume but not necessary for this) and track compaction with a penetrometer in the fall and spring. Freeze/thaw conditions this winter can also help alleviate shallow compaction but might not always work.

Don’t assume that the presence of ruts indicates subsoil compaction. Soils are most susceptible to compaction at water contents near field capacity because the proportion of soil pores filled with air and water is just right for compaction (soil consolidation) to occur. It seems counterintuitive, but soils with most of the pores filled with water are less susceptible to subsoil compaction. Recall that liquids are not compressible, unlike air, thus can bear an equipment load whereas air would allow for a pore space to collapse. However, soils near saturation are very prone to rutting and smearing near the surface.

If deep/subsoil compaction (deeper that 6″) is detected, a sub-soiling or deep strip-tillage operation might be helpful. A cover crop would help here as well, but it will depend more on the growing season required for that cover crop and its root system’s ability to penetrate the compacted layer. Freeze/thaw will not help for deep compaction (need the freeze/thaw cycles, similar to wetting/drying, to loosen the soil). There is a chance that a cover crop will help here, so it might pay off to monitor compaction this fall and again in the spring to determine if a deep tillage operation (e.g. sub-soiling or deep strip-till) is needed.

It is recommended for long-term no-tillage fields with ruts or other soil damage in localized spots in the field, to just target those areas with tillage if needed and leave the rest of the long-term no-tillage field alone.

**Figure 1.** Global positioning system data of an alfalfa forage harvest operation with all equipment involved; merger path, chopper path, and six transport trucks *(Left).* Global positioning system data of forage harvester path only simulating controlled traffic within a harvest operation *(Right).*
Soils in long-term no-tillage fields have a greater ability to "bounce" back than of conventional tillage managed soils.

In general, soils should be allowed to dry before any other operations are implemented, if weather cooperates. The diagram below can be used as an aid to assess the risk of soil compaction after harvest in wet field conditions (Figure 2). A You Tube video “Using a penetrometer to detect soil compaction” can be accessed at: https://youtu.be/Zq_785JqRq8?list=PLF17555C62D9A378B

Figure 2. Decision diagram to assist in determining soil compaction presence after harvest during wet field conditions.

To be considered, the 2017 Nomination Form must be completed and 3 letters of reference provided. Nomination Criteria will help with the nomination process.

Deadline for submission is March 3, 2017. The 2017 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.

**Wisconsin CCA Exam Study Materials**

Bryan Jensen, UW Extension and IPM Program

The registration period for the February 3 CCA Exam is open until December 9. Online registration is available on the CCA website. Study materials for the International exam may also be found on the CCA website by clicking on the Exam tab.

The first step in exam preparation is to read the International Performance Objectives and/or the Wisconsin Performance Objectives. Performance Objectives are updated every 4 years and are broken into four sections: Nutrient Management, Pest Management, Crop Management and Soil and Water Management. All exams questions are based on these performance objectives.

2017 Wisconsin CCA of the Year

Bryan Jensen, UW Extension and IPM Program

The Wisconsin CCA Board is now accepting nominations for the 2017 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 help prepare for the Wisconsin exam, UW Extension has prepared several resources for you to use. Approximately 50 short videos have been prepared specifically for the state exam and are grouped in three playlists:

- **Soil Science Fundaments for Field Crops**
- **Field and Forage Crop Fundamentals**
- **Weed, Insect and Disease IPM for Field Crops**

An additional set of over 100 electronic resources have been developed by UW Extension specialists and can be useful for both exam preparation as well as for general crop production recommendations. A list of UW-Madison websites is also available on this list.

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**Corn Stalk Rots and Ear Rots: A Double Whammy for Wisconsin Corn Farmers**

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

The 2016 growing season is going to end with many challenges for Wisconsin farmers. The excessively wet weather has slowed or ended harvest of corn silage and grain harvest has barely started in much of the state. Couple this with warm and wet weather is August and we have a double whammy of stalk rot and ear rot issues to contend with this fall.

[Click here to read more.](#)

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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 24, 2016 through September 30, 2016.

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

<table>
<thead>
<tr>
<th>Plant/Sample Type, Disease/Disorder, Pathogen, County</th>
<th>Field Crops</th>
<th>Fruit Crops</th>
<th>Vegetable Crops</th>
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<tbody>
<tr>
<td>Field Crops</td>
<td>Corn, Anthracnose Stalk Rot, <em>Colletotrichum graminicola</em>, Portage</td>
<td>Apple (‘Gala’), Necrotic Leaf Blotch, None, Outagamie</td>
<td>Garlic, Embellisia Skin Blotch and Bulb Canker, <em>Embellisia allii</em>, Dane</td>
</tr>
<tr>
<td></td>
<td>Corn, Common Rust, <em>Puccinia sorghii</em>, Rock</td>
<td>Apple (‘Honeycrisp’), Honeycrisp Leaf Necrosis, None, Outagamie</td>
<td>Garlic, Fusarium Bulb Rot, <em>Fusarium sp.</em>, Dane</td>
</tr>
<tr>
<td></td>
<td>Corn, Eyespot, <em>Kabatiella zeae</em>, Rock</td>
<td>Apple (Unspecified), Bitter Pit, None, Jefferson</td>
<td>Potato, Black Heart, None, Portage</td>
</tr>
<tr>
<td></td>
<td>Corn, Fusarium Ear Rot, <em>Fusarium sp.</em>, Grant</td>
<td>Apple (Unspecified), Bitter Rot, <em>Collectotrichum gloeosporioides</em>, Langlade</td>
<td>Potato, Heat Necrosis, None, Portage</td>
</tr>
<tr>
<td></td>
<td>Corn, Fusarium Root Rot, <em>Fusarium sp.</em>, Rock</td>
<td>Apple (Unspecified), Black Rot (Canker), <em>Sphaeropsis sp.</em>, Clark</td>
<td>Potato, Internal Browning, None, Portage</td>
</tr>
<tr>
<td></td>
<td>Corn, Gray Leaf Spot, <em>Cercospora sp.</em>, Rock</td>
<td>Apple (Unspecified), <em>Flyspeck</em>, <em>Schizothyrium pomi</em>, Green, Langlade</td>
<td>Squash (Spaghetti), Black Rot/ Gummy Stem Blight, <em>Didymella bryoniae</em>, Monroe</td>
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<tr>
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<td>Corn, Helminthosporium Root Rot, <em>Exserohilum pedicellatum</em>, Rock</td>
<td>Apple (Unspecified), Phomopsis Fruit Rot, <em>Phomopsis sp.</em>, Langlade</td>
<td>Squash (Winter), Sour Rot, <em>Geotrichum sp.</em>, Dane</td>
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<tr>
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<td>Corn, Northern Corn Leaf Blight, <em>Exserohilum turcicum</em>, Rock</td>
<td>Apple (Unspecified), Sooty Blotch, Miscellaneous sooty blotch fungi, Green, Langlade</td>
<td>Cherry, Cherry Leaf Spot, <em>Blumeriella jaapii</em>, Racine</td>
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<td></td>
<td>Corn, Pythium Stalk Rot, <em>Phytophthora sp.</em>, Portage</td>
<td>Potato, Black Heart, None, Portage</td>
<td>Garlic, Embellisia Skin Blotch and Bulb Canker, <em>Embellisia allii</em>, Dane</td>
</tr>
<tr>
<td></td>
<td>Corn, Rhizoctonia Stalk Rot, <em>Rhizoctonia sp.</em>, Portage</td>
<td>Potato, Black Heart, None, Portage</td>
<td>Garlic, Fusarium Bulb Rot, <em>Fusarium sp.</em>, Dane</td>
</tr>
<tr>
<td></td>
<td>Sorghum, Grain Weathering, <em>Alternaria sp.</em>, Calumet</td>
<td>Potato, Internal Browning, None, Portage</td>
<td>Potato, Bacterial Soft Rot, <em>Pectobacterium sp.</em>, Portage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Squash (Spaghetti), Black Rot/ Gummy Stem Blight, <em>Didymella bryoniae</em>, Monroe</td>
<td>Potato, Black Heart, None, Portage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Squash (Winter), Sour Rot, <em>Geotrichum sp.</em>, Dane</td>
<td>Potato, Internal Browning, None, Portage</td>
</tr>
</tbody>
</table>
For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Fruit News, Issue 13

Janet van Zoeren, Christelle Guédot, and Amaya Atucha, University of Wisconsin – Madison, Departments of Entomology and Horticulture

Click here for the 13th issue of the Wisconsin Fruit News.

In it you will find information about:

• Wrapping things up for the summer of 2016
• Plant Disease Diagnostic Clinic
• Insect Diagnostic Lab update
• Spotted Wint Drosopila: 2016 monitoring update
• Spotted Wing Drosophila survey for WI berry growers
• Cranberry degree-day map and update
• Grape developmental stages
• It’s never too late to think about apple scab
• Brown marmorated stink bug is preparing for winter

All newsletters will also be posted onto at the Wisconsin Fruit website, available at www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.

Vegetable Crop Update October 9, 2016

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

The 28th issue of the Vegetable Crop Update is now available.

In this edition, please find information on:

• 24(c) special registration updates for chlorothalonil use on potato in WI
• Late blight updates
• Information on spotted wing drosophila.

Click here to view this update.
2016 Soil, Water, & Nutrient Management Meetings

Francisco Arriaga, Assistant Professor and Extension Specialist, Dept. of Soil Science

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 Tuesday, November 29 through Friday, December 9. The purpose of these meetings is to provide research updates in the field of soil fertility, nutrient management, soil and water conservation, and water quality. Discussion topics will include: What's new in nitrogen management for corn and wheat; Recurring soil fertility questions filling my inbox; Update on plant tissue analysis research; Reviewing the benefits of soil biological additives; Behold the power of legumes (as a nitrogen source); Taking care of soil compaction issues during and after a wet fall; Managing Wisconsin's soils for improved health; Proper plant tissue sampling and result interpretations; Nutrient management update: Rule revision, plan reviews and new 590. Speakers include Wis. DATCP staff and Matt Ruark, Robert Florence, Francisco Arriaga, and Carrie Laboski from UW-Madison Department of Soil Science. The following CEUs 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 $45.00 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 2016 Soil, Water, & Nutrient Management Meetings is:

- Tues., Nov. 29, Dane Co., Madison, Heidi Johnson, fyi. uwex.edu/danecountyag or 608-224-3716
- Wed., Nov. 30, Monroe Co., Sparta, Bill Halfman, 608-269-8722
- Thurs., Dec. 1, Eau Claire Co., Eau Claire, Mark Hagedorn, 715-839-4712
- Tues., Dec. 6, Sheboygan Co., Kiel, Mike Ballweg, 920-459-5904
- Wed., Dec. 7, Shawano Co., Cecil, Jamie Patton, 715-526-6136
- Thurs., Dec. 8, Iowa Co., Dodgeville, Gene Schriefer, 608-930-9850
- Fri., Dec. 9, Dodge Co., Juneau, Loretta Ortiz-Ribbing, 920-386-3790

Find the full brochure at the end of this publication.

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**UW Discovery Farms Conference on December 13, 2016**

Callie Herron, 715.983.5668, callie.herron@ces.uwex.edu

Pigeon Falls, WI. – On December 13, 2016 in Wisconsin Dells, UW Discovery Farms will host its 5th annual conference that is geared towards farmers and emphasizes strategies that work on farms and for water quality. The conference will bring together farmers, farm advisors and experts to apply science and experience to today’s hot topics. All in attendance can expect to leave with new ideas and practical tips that can be applied to their situation.

Two farmer panels and four speakers will cover the hot topics of soil health, cover crops, tile drainage, and manure management. Hear researchers from Canada, Iowa, Minnesota, and Wisconsin dive into data and pull out thought provoking and applicable information. Innovative Farmers will continue the discussion with panels on solutions to common cover crop problems and examples of innovative ways to handle liquid and solid manure. This conference will provide valuable information to all farmers interested in continuing to improve soil and water resources while preserving farm productivity and profitability.

The conference will be held on December 13th from 9:00am to 3:45pm at the Glacier Canyon Conference Center, Wilderness Resort in Wisconsin Dells. Registration is $40 for members of sponsoring organizations or $50 for non-members and includes a noon meal. Registration is now open. For up-to-date information follow Discovery Farms on facebook and twitter. Questions? emailcallie.herron@ces.uwex.edu or call 715.983.5668.

**About UW Discovery Farms**

For 15 years, UW Discovery Farms has worked with Wisconsin farmers to identify the water quality impacts of different farming systems around the state. The program, which is part of UW-Extension, is under the direction of a farmer-led steering committee and takes a real-world approach to finding the most economical solutions to agriculture’s environmental challenges. If you are interested in learning more about UW Discovery Farms, visit www.uwdiscoveryfarms.org or email us at uwdiscoveryfarms@gmail.com.

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**Wisconsin Soybean Marketing Board Continues Free Nematode Testing Program for 2016**

Shawn P. 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 2016, 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.

**Delineating Optimal Soybean Maturity Groups Across the United States**

Shawn P. Conley, Soybean and Wheat Extension Specialist

Soybean is the most important oilseed crop in the U.S., and its cultivated area is the second largest after corn (USDA, 2016). The cultivated area includes a wide range of environments that extend from northern North Dakota to south Texas and from western South Dakota to northeastern New York.

Soybean maturity is classified in different groups (MGs) ranging from 000 for the very early maturing varieties to 9 for the later. Gradations within MGs are also commonly noted by adding a decimal to the MG number. A variety is classified to a specific MG according to the length of period from planting to maturity. This phenological attribute is determined by two abiotic factors: photoperiod and temperature (Cober et al., 2001), and these factors can dictate the most suitable MG for a particular geographical location.

More than 45 years ago, Scott and Aldrich (1970), delineated optimum MG zones across the U.S. A more recent study redefined the optimum MG zones using variety trial yield data from 1998-2003 and found that adaptation regions for varieties with MG 0 to MG 3 had not changed from the work done in 1970. Whereas, varieties in the MG 4 to MG 6 range, adaptation zones are much broader than previously thought (Zhang et al., 2007). Nevertheless, there have been significant changes in soybean germplasm and management practices since 2003, and the climate has changed over the past 80 years across the U.S. (Mourtzinis et al., 2015). Therefore, the objective of this study was to delineate soybean MG adaptation zones across the U.S. using current soybean genetics and climate conditions.
Early 2016 Corn Grain Yields Look Promising for Wisconsin

Joe Lauer, Wisconsin Corn Agronomist

We have never had a year like 2016 for high grain yields in the UW Corn Performance Trials. Every location had yields above the 10-year average (see below). For example, at Arlington over the previous 10-years (2006 and 2015) we have tested 1501 corn hybrids with an overall yield average of 232 bu/A. In 2016 we tested 127 hybrids which produced an average yield of 258 bu/A, an 11% increase over the previous 10-year average. This year corn hybrids at Arlington, Montfort, Chippewa Falls, Marshfield, Seymour, Valders, Coleman and Spooner produced a yield increase of more than 10% over the 10-year average.

This year is unique because usually at one or more locations, corn yields are below the 10-year average and the percent change column is negative. Stay tuned for publication results of individual hybrids and the top performances of 2016.

Calculating The Soybean Yield Gap for WI Soybean Farmers

Shawn P. Conley, Soybean and Wheat Extension Specialist

We are embarking on Year #2 of a State-Wide Project aimed at generating baseline producer data on current soybean management practices in Wisconsin's production systems. This project is funded by the Wisconsin Soybean Marketing Board and the North Central Soybean Research Program (NCSRP). The project goal is to identify the key factors that preclude the State’s Soybean Producers from obtaining yields that should be potentially possible on their respective individual farms. The term used for the difference between what yield is possible on your farm each year and what you yield you actually achieve is called a “Yield Gap”.

We are therefore asking Crop Producers in Wisconsin to provide us with yield and other agronomic data specific to their soybean production fields. You can find the survey below. With that data, we will then conduct an in-depth analysis of what on-farm factors might be causing a Yield Gap on producer farms. We intend to provide annual reports to all crop producers informing them of what factors we may have identified that, based on our

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<table>
<thead>
<tr>
<th>Location</th>
<th>2006-2015</th>
<th>2016</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington</td>
<td>1501</td>
<td>127</td>
<td>11</td>
</tr>
<tr>
<td>Janesville</td>
<td>1497</td>
<td>127</td>
<td>4</td>
</tr>
<tr>
<td>Lancaster/Montfort</td>
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<td>127</td>
<td>13</td>
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<td>10</td>
</tr>
<tr>
<td>Spooner</td>
<td>1742</td>
<td>177</td>
<td>38</td>
</tr>
</tbody>
</table>

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analysis of the data collected from farms, are likely limiting you from achieving soybean yields closer to yield potential that is likely possible on your farms! These results will be presented at our 2017 Area Soybean meetings held in January 2017 and at Corn Soy Expo! Here is a link to the introductory data we collected in 2015! 2015 Yield Gap Summary Data

Below please find links that are also on my webpage that describe the process, the guidelines for data collection, as well as the data collection form. Please know that this data will not be shared individually and your information will be held strictly confidential. Please let me know if you have any questions or concerns regarding this request. Please return all completed forms to my address below! Due to several requests I have also attached a fillable pdf version for ease of data entry.

- Yield Gap: Letter to WI Soybean Producers
- Yield Gap: Guidelines for Data Collection
- Yield Gap: Data Collection Form

Summary for Soybean 2016 PDF.

Multiple Resistance to ALS- and HPPD-inhibiting Herbicides in Palmer Amaranth from Iowa County, Wisconsin

Nathan Drewitz, Devin Hammer, Shawn Conley, and Dave Stoltenberg, Department of Agronomy, University of Wisconsin-Madison

Increasing Concern over Palmer Amaranth

Palmer amaranth (Amaranthus palmeri) has become a challenging weed management problem in the southern U.S. and has recently spread to the upper Midwest (Legleiter and Johnson 2013; Sprague 2013). Palmer amaranth is a highly competitive weed that has become more difficult to manage due to herbicide resistance. Several populations have evolved resistance to one or more of six herbicide sites of action (Heap 2016). Many of the populations in the southern U.S. show multiple resistance to ALS-inhibiting herbicides and glyphosate.

The northward movement of Palmer amaranth has been attributed to several mechanisms including the spreading of contaminated manure from animal operations that have fed cottonseed feed by-products transported from southern U.S. production fields, transport of seed on field equipment, and contaminated seed mixes used for prairie restorations.

Palmer amaranth is dioecious (male and female reproductive organs on separate plants) and capable of producing 600,000 seeds per female plant (Figure 1). These traits increase the likelihood of resistance spread through pollen and seed dispersal.

Palmer Amaranth in Wisconsin

The first occurrence of Palmer amaranth in Wisconsin was documented in Dane County in 2013 (Davis and Recker 2014). This population was subsequently confirmed resistant to glyphosate (Butts and Davis 2015). Since that time, Palmer amaranth has been found in Iowa (2014), Grant (2015), and Sauk counties (2015). Screening results from the University of Illinois Plant Clinic found that the Sauk County population is resistant to glyphosate. In contrast, research at the University of Wisconsin-Madison determined that the Grant County population is sensitive to glyphosate, ALS-, and HPPD-inhibiting herbicides (data not shown).

For Palmer amaranth from Iowa County, we have determined that this population is sensitive to glyphosate (data not shown). However field observations suggested that this population may be resistant to other herbicide sites of action. Consequently, we conducted research to determine the response of the Iowa County population to the ALS-inhibiting herbicides imazethapyr (Pursuit) and thifensulfuron (Harmony SG), and the HPPD-inhibiting herbicide tembotrione (Laudis).

Screening for Herbicide Resistance

Imazethapyr, thifensulfuron, and tembotrione dose-response experiments were conducted under greenhouse conditions using mature seed collected from suspected herbicide-resistant female plants located in Iowa County. A known herbicide-sensitive population from Nebraska was used for comparison to the Iowa County population. Imazethapyr was applied to 4- to 6-inch tall plants at six rates ranging from

Figure 1. Female Palmer amaranth plant in Grant County, WI.
0 to 6.25 lb ai ac-1 (400 fl oz Pursuit ac-1, 100 times the labelled rate). Thifensulfuron was applied to 4-inch tall plants at seven rates from 0 to 0.039 lb ai ac-1 (1.25 oz Harmony SG ac-1, 10 times the labelled rate). Tembotri- one was applied to 4- to 6-inch tall plants at seven rates from 0 to 0.82 lb ai ac-1 (30 fl oz Laudis ac-1, 10 times the labelled rate). All herbicide treatments included recommended adjuvants.

Weed shoot biomass was collected 28 days after treatment. Separate experiments were conducted for each herbicide. The experimental design was a randomized complete block with eight to 10 replications of each herbicide treatment. Each experiment was conducted three times. The effective herbicide dose that reduced shoot dry biomass by 50% (ED50) compared to non-treated plants was used to determine if there was a differential response between the Iowa County and Nebraska populations.

Results: Multiple Resistance to ALS- and HPPD-inhibiting Herbicides

The Iowa County Palmer amaranth population displayed a high-level of resistance to the ALS-inhibiting herbicide imazethapyr compared to the sensitive Nebraska population (Figures 2 and 3). At the labelled rate of 0.063 lb ai ac-1 (4 fl oz Pursuit ac-1) rate, most plants (96%) of the Iowa County population survived and grew to an average height four times greater than at the time of treatment (Figure 2). The imazethapyr ED50 for the Iowa County population was estimated to be greater than the highest rate applied (6.3 lb ai ac-1, 400 fl oz Pursuit ac-1 or 100 times the labelled rate). In contrast, the ED50 for the Nebraska population was 0.04 lb ai ac-1. Consequently, the ratio of Iowa County to Nebraska ED50 values indicates a greater than 150-fold level of imazethapyr resistance in the Iowa County population (Figure 3).

We found that the Iowa County Palmer amaranth showed a low level of resistance to the ALS-inhibiting herbicide thifensulfuron (Figure 4). Thifensulfuron ED50 values were 0.00058 lb ai ac-1 and 0.00012 lb ai ac-1 for the Iowa County and Nebraska populations, respectively. The ratio of Iowa County to Nebraska ED50 values indicated a 4.9-fold level of thifensulfuron resistance (p-value = 0.07) in the Iowa County population.

The Iowa County Palmer amaranth population was also found to have a low level of resistance to the HPPD-inhibiting herbicide tembotrione (Figure 5). At the labelled rate of 0.082 lb ai ac-1 (3 fl oz. Laudis ac-1) 50% of all treated plants survived and grew to a height approximately 1.4 times greater than height at the time of treat-

Figure 2. Response of Nebraska (left) and Iowa County Palmer amaranth (right) to 0.063 lb ai ac-1 imazethapyr

Figure 3. Response of Iowa County and Nebraska Palmer amaranth populations to imazethapyr (Pursuit) 28 days after treatment. The labelled rate (1X) is 0.063 lb ai ac-1

Conclusions

These results confirm the first case of multiple herbicide resistance in Wisconsin Palmer amaranth. Although we found that the Iowa County Palmer amaranth was sensitive to glyphosate, this population demonstrated a high-level of resistance to the ALS-inhibiting herbicide imazethapyr, a low-level of resistance to the ALS-inhibit-
ing herbicide thifensulfuron, and a low-level of resistance to the HPPD-inhibiting herbicide tembotrione. At this site in Iowa County, it is suspected that herbicide-resistant Palmer amaranth seeds were transported on field equipment used previously in infested fields out of state.

Resistance management strategies are key to reduce the selection for herbicide-resistant weeds, and if present, to reduce their persistence and spread. These strategies include:

- Understanding the biology of weeds present and using a diversified approach to managing those weeds with the intent to prevent weed-seed production.
- Using weed-free crop seed and planting into weed-free fields.
- Scouting fields routinely to aid in identifying potential weed management issues.
- Using appropriate cultural practices that increase crop competitiveness with weeds.
- Using multiple herbicide sites of action applied at the labeled rates and at recommended weed heights.
- Cleaning equipment after use to prevent spread of weed-seed from field to field.

More information on management of Palmer amaranth and other herbicide-resistant weeds can be found at http://takeactiononweeds.com and http://wssa.net/wssa/weed/resistance.

Acknowledgment

The authors thank Vince Davis and Tommy Butts for previous contributions to this research.

References


Figure 4. Response of Iowa County and Nebraska Palmer amaranth populations to thifensulfuron (Harmony SG) 28 days after treatment. The labelled rate (1X) is 0.0039 lb ai

Figure 5. Response of Iowa County and Nebraska Palmer amaranth populations to tembotrione (Laudis) 28 days after treatment. The labelled rate (1X) is 0.082 lb ai ac-1.
Common Waterhemp (Amaranthus rudis): Confirmed Herbicide Resistance and Spread Across Wisconsin

Devin Hammer, Nathan Drewitz, Shawn Conley, and Dave Stoltenberg
Department of Agronomy, University of Wisconsin-Madison

Herbicide resistance is not new to Wisconsin, but is spreading.

Common waterhemp (Amaranthus rudis) has become an increasing concern in Wisconsin in recent years. A close relative to redroot pigweed (Amaranthus retroflexus) and Powell amaranth (Amaranthus powellii), common waterhemp is infamous for its abundant seed production and propensity for developing herbicide resistance (Bradley 2013), which are two things growers do not want happening in their fields.

Herbicide-resistant common waterhemp was first confirmed in Wisconsin in 1999, when a population was found to be resistant to acetolactate synthase (ALS)-inhibitors (Heap 2016). More recently, glyphosate-resistant waterhemp was found in Pierce and Eau Claire counties (Butts and Davis 2015). Since that time, efforts have been made to monitor the spread of waterhemp in the state, especially those populations that may be resistant to glyphosate and other herbicide sites of action (SOA). Nationally, waterhemp management has become increasingly challenging as this species has developed resistance to six unique SOAs, with 18 states reporting resistance to at least one herbicide SOA (Heap 2016). Six of those states also have waterhemp cases of multiple herbicide resistance of up to four different SOAs.

Dose-response experiments were conducted to determine glyphosate resistance.

Responding to widespread concern of possible glyphosate-resistant waterhemp in 2014 and 2015, we collected seed heads from several mature female plants that had survived exposure to glyphosate in the field. Six populations were sampled from Chippewa, Outagamie, Sheboygan, and Waupaca counties in 2014, and five populations were sampled from Crawford, Lafayette, and Walworth counties in 2015. Once dried and threshed, seeds were stratified (cold treated) for 6 weeks, planted, and grown in the greenhouse for whole-plant herbicide dose-response experiments. Five to 10 plants per population were treated at each of eight rates of glyphosate ranging from 0 to 12.4 lb ae acre-1 (up to 16x the labelled rate) plus 17 lb ammonium sulfate 100 gal-1 water. Each suspected resistant population was tested in two screenings to determine resistance.

Shoot dry biomass was collected 28 days after glyphosate application, dried, and weighed. Comparisons between a known susceptible population and suspected resistant populations were made based on the predicted dose required to reduce shoot biomass by 50% (ED50) compared to non-treated plants (Knezevic et al. 2007). Some populations were also tested for resistance at the University of Illinois Plant Clinic using a molecular screening methodology for specific genetic markers (Bell et al. 2013).

Since 2013, herbicide-resistant waterhemp populations have been found in 16 Wisconsin counties.

Dose-response experiments confirmed glyphosate resistance in waterhemp populations from Chippewa, Crawford, Lafayette, Outagamie, Sheboygan, Walworth, and Waupaca counties (Table 1). The majority of plants across these populations survived the 1x rate of glyphosate (0.77 lb ae acre-1) and grew to approximately three times their height 28 days after treatment compared to their height at the time of treatment (see Figure 1 for responses of populations from Crawford and Walworth counties). Dose-response curves (examples shown in Figures 2 and 3) allowed us to estimate ED50 values (Table 1) for each suspected resistant population for comparison to a known susceptible population (Wisc-S).

Results from testing at the University of Illinois Plant Clinic confirmed glyphosate resistance in waterhemp populations from Brown, Jackson, Jefferson, Monroe, Pepin, Richland, and Sauk Counties. The population from Monroe County was also found to be resistant to PPO-inhibiting herbicides making it the first confirmed case of multiple resistance to these two herbicide SOAs in Wisconsin. In total, herbicide resistant waterhemp populations have been confirmed in 16 Wisconsin counties since 2013 (Figure 4).

Managing herbicide-resistant weeds moving forward.

It is important to utilize diverse strategies when combating herbicide-resistant weeds. Tank-mixing multiple, effective herbicide SOAs has been shown to reduce selection for herbicide resistance in common waterhemp than simply rotating SOAs year to year (Evans et al. 2015). It is also crucial to make the most of the critical weed-free period during crop growth, so early planting when possible in conjunction with pre-emergence herbicides will allow for canopy closure with minimal weed interference. This also reduces selection pressure on weed.
populations in the field that are exposed to herbicides applied postemergence (POST). Make sure to apply the full labeled herbicide rates at recommended weed sizes and scout fields following POST herbicide applications to determine herbicide efficacy. Any weed escapes can then be removed by hand. It should also be noted that ALS-inhibiting herbicides are not recommended for sole management of common waterhemp. While ALS-inhibiting herbicides can offer effective management of certain weed species, it has been well-documented that resistance to that class of herbicides has become the norm in pigweed species (Tranel et al. 2011).

Proper cleaning of tillage and harvest equipment can also help to prevent spreading of weed seeds from field to field. Alternative crop traits (e.g. glufosinate-resistant varieties) may also be utilized which allow for an additional herbicide SOA to be used. Further information on herbicide resistance management may be found at: http://www.takeactiononweeds.com/ and http://wssa.net/wssa/weed/resistance/

If you suspect that herbicide resistance is an issue in your fields, contact your local county extension agent.

Table 1. Glyphosate effective dose (ED\textsubscript{50}) values for suspected resistant (R) and known susceptible (S) populations tested in greenhouse dose-response experiments.

<table>
<thead>
<tr>
<th>Collection Year</th>
<th>Population</th>
<th>ED\textsubscript{50} [lb ae acre\textsuperscript{-1}]</th>
<th>ED\textsubscript{50} R:S ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Wisc-S</td>
<td>0.34</td>
<td>---</td>
</tr>
<tr>
<td>2014</td>
<td>Chippewa-R</td>
<td>0.58</td>
<td>1.7*</td>
</tr>
<tr>
<td>2014</td>
<td>Outagamie-R</td>
<td>1.83</td>
<td>5.3*</td>
</tr>
<tr>
<td>2014</td>
<td>Sheboygan-R1</td>
<td>0.78</td>
<td>2.3*</td>
</tr>
<tr>
<td>2014</td>
<td>Sheboygan-R2</td>
<td>0.79</td>
<td>2.3*</td>
</tr>
<tr>
<td>2014</td>
<td>Sheboygan-R3</td>
<td>2.61</td>
<td>7.6*</td>
</tr>
<tr>
<td>2014</td>
<td>Waupaca-R</td>
<td>4.15</td>
<td>12.1*</td>
</tr>
<tr>
<td>2015</td>
<td>Wisc-S</td>
<td>0.16</td>
<td>---</td>
</tr>
<tr>
<td>2015</td>
<td>Crawford-R</td>
<td>2.66</td>
<td>17.0*</td>
</tr>
<tr>
<td>2015</td>
<td>Lafayette-R1</td>
<td>1.28</td>
<td>8.2*</td>
</tr>
<tr>
<td>2015</td>
<td>Lafayette-R2</td>
<td>0.59</td>
<td>3.8*</td>
</tr>
<tr>
<td>2015</td>
<td>Walworth-R1</td>
<td>2.48</td>
<td>15.9*</td>
</tr>
<tr>
<td>2015</td>
<td>Walworth-R2</td>
<td>3.42</td>
<td>21.9*</td>
</tr>
</tbody>
</table>

* Significant at α=0.1

Figure 1. Common waterhemp plants from susceptible, Crawford County, and Walworth County populations 28 days after treatment with glyphosate at 0.77 lb ae acre\textsuperscript{-1}.

Figure 2. Glyphosate dose-response curves for Crawford County and known susceptible common waterhemp populations 28 days after treatment.
Figure 3. Glyphosate dose-response curves for Walworth County and known susceptible common waterhemp populations 28 days after treatment.

Figure 4. Common waterhemp reported distribution and herbicide resistance in Wisconsin.

Acknowledgment
The authors thank Vince Davis, Tommy Butts, and Ross Recker for previous contributions to this research.

References
Bell MS, Hager AG, Tranel PJ (2013) Multiple resistance to herbicides from four site-of-action groups in waterhemp (Amaranthus tuberculatus). Weed Sci. 61:460-468


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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 8, 2016 through October 14, 2016.

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

Fruit Crops
Raspberry, Late Leaf Rust, _Arthuriomyces peckianus_, Dunn
Raspberry, Raspberry Leaf Spot, _Cylindrosporium rubi_, Dunn
Raspberry, _Root/Crown Rot_, _Pythium sp._, Dunn

Soil
Soybean Soil, _Soybean Cyst Nematode_, _Heterodera glycines_, Dane, Fond du Lac, Pierce, Rock, Trempealeau

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, Jake Kurczewski 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 15, 2016 through October 24, 2016.

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

Field Crops
Corn, Gibberella Stalk Rot, Fusarium graminearum, Dodge
Corn, Goss’ Wilt, Clavibacter michiganensis subsp. nebraskensis, Dodge
Soybean, Green Stem Syndrome, Miscellaneous viral pathogens, Rock

Fruit Crops
Apple, Flyspeck, Schizothyrium pomi, Oneida
Apple, Russet, None, Oneida
Apple, Sooty Blotch, Miscellaneous sooty blotch fungi, Oneida

Vegetable Crops
Garlic, Fusarium Bulb Rot, Fusarium sp., Dane
Garlic, Penicillium Bulb Rot, Penicillium sp., Dane

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

Soil
Soybean Soil, Soybean Cyst Nematode, Heterodera glycines, Adams, Columbia, Dodge, Fond du Lac, Iowa, Jefferson

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

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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 22, 2016 through October 28, 2016.

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

Vegetable Crops
Pepper, Syringae Leaf Spot, Pseudomonas syringae pv. syringae, Dane
Spinach, Downy Mildew, Peronospora sp., Dane

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
2017 IPM Field Scout Training Class

Bryan Jensen, UW Extension and IPM Program

A reminder that the Madison Field Scout Training Classes will be held on the UW Madison Campus from January 3-6, 2017. 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. 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

For more information on this course, please contact Bryan Jensen at:

Dept. of Entomology
1630 Linden Dr.
Madison, WI 53706
(608) 263-4073
bmjense1@facstaff.wisc.edu

2017 WSA Area Soybean Conferences

Shawn P. Conley, Soybean and Wheat Extension Specialist

This year’s WSA Area Soybean Conferences features:

• Featuring What you need to know about new soybean herbicide traits in 30 minutes or less
Finalists for the 2016 WSA Soybean Yield Contest are Announced

Shawn P. Conley, Soybean and Wheat Extension Specialist

The Wisconsin 2016 growing season was one for the record books indeed! The National Agricultural Statistics Service projects the statewide average soybean yield in WI to be a record of 55 BPA. Similarly overall production is expected to be another record at 107 million bushels. The great yields also led to a great contest. Please join me in congratulating the below finalists.

The top two entries in each division (listed in no particular order) were:

Division 4:
- Rick DeVoe, Monroe (planted DuPont Pioneer P31T77R)
- Kevin Bahr, Belmont (planted Asgrow AG2535)
- *WI Bean Team (Adam Gaspar, Steve Vosberg), Madison (planted DuPont Pioneer P28T33R)

*The WI Bean Team is ineligible for official prizes as they are grad students of Dr. Conley; however, their efforts are still unofficially recognized.

Division 3:
- Jim Salentine, Luxemburg (planted Steyer 1401L)
- David Wilkens, Random Lake (planted NK S20-T6 Brand)

Division 2:
- Thad Sparby, Arkdale (planted FS HiSOY HS 19A50)
- Irvin Osterloh, Arkdale (planted FS HiSOY HS 23L50)

Division 1:
- Dawn Lundgren, Amery (planted Croplan R2C1400)
- David Lundgren, Amery (planted Croplan R2C1572)

New for 2016 was the Soybean Quality Contest. It was optional for any Soybean Yield Contest entrants. There are no geographical divisions for the Quality Contest. One cash award will be presented statewide to the highest protein plus oil yield per acre (measured in lbs. per acre).

The finalists for the Soybean Quality Contest are:
- Dawn Lundgren, Amery (planted Croplan R2C1400)
- Thad Sparby, Arkdale (planted FS HiSOY HS 19A50)

The final ranking and awards will be presented at the 2017 Corn Soy Expo to be held at the Kalahari Convention Center, Wisconsin Dells on Thursday February 2nd during the WSA/WSMB annual meeting.

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.

2016 Wisconsin Corn Hybrid Performance Trials

Joe Lauer, Wisconsin Corn Agronomist

Every year, the University of Wisconsin Extension-Madison and College of Agricultural and Life Sciences conduct a corn evaluation program, in cooperation with the Wisconsin Crop Improvement Association. The purpose of this program is to provide unbiased performance comparisons of hybrid seed corn available in Wisconsin. These trials evaluate corn hybrids for both grain and silage production performance. In 2016, grain and silage performance trials were planted at fourteen locations.
**Situation:** A one bushel increase by Wisconsin corn farmers increases farm income $8 to $32 million dollars depending upon corn price.

**Objective:** To provide unbiased performance comparisons of hybrid seed corn available in Wisconsin.

These results are a “Consumer Report” for commercial corn hybrids. The trials evaluate grain, silage, and systems including organic, transgenic and refuge systems.


Link to 52 page booklet, PDF version >>>> [http://corn.agronomy.wisc.edu/HT/2016/A3653.pdf](http://corn.agronomy.wisc.edu/HT/2016/A3653.pdf)

**2017 Wisconsin Agronomy Update Meetings**

Shawn P. Conley, Soybean and Wheat Extension Specialist

The Department of Agronomy will offer Crop Production and Management Meetings at eight locations during 2017. 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 information materials. Certified Crop Advisor CEU credits have been requested (3.0 CEU hours-Crop Management). A $45.00 registration fee (which includes the meal) will be charged for the meeting. A “walk-in” fee will be charged to those who have not preregistered. Extra information packets are available for $21.00 each. Make your reservations with the host agent one week prior to the scheduled meeting date.

We invite you to be a part of these meetings. The meeting dates and locations for the 2017 Agronomy Update meetings are:

- **Janesville** Tuesday, Jan. 3 at 12:00
- **Madison** Wednesday, Jan. 4 at 7:30 am
- **Fond du Lac** Wednesday, Jan. 4 at 12:00
- **Kimberly** Thursday, Jan. 5 at 7:30 am
- **Wausau** Thursday, Jan. 5 at 12:00
- **Eau Claire** Friday, Jan. 6 at 7:30 am
- **Sparta** Friday, Jan. 6 at 12:00
- **Belmont** Monday, Jan. 9 at 12:00

Please join us at a meeting in your area. Help us spread the word by informing seed dealers and the ag industry from your county or area, and encourage them to attend. For all the details, click here to view the flier.

**Wisconsin Soybean Variety Performance Trials 2016**

Shawn P. Conley, Adam C. Roth and John M. Gaska
Department of Agronomy
University of Wisconsin, Madison

The Wisconsin Soybean Performance Trials are conducted each year with the producer’s needs in mind. Our objective is to give producers the information to select varieties that will satisfy their specific goals and are most likely to perform best under their management practices. Click here to view the full PDF.

**2016 Wisconsin Pest Management Update Tour Slides Now Live!**

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

Yet another Wisconsin Pest Management Update Tour is in the books. It was great to see everyone again this year. I hope you found value in the presentations and that information can improve farm productivity. As promised, I have uploaded the slides from the 2016 tour with some of our preliminary data from 2016. You can download a PDF by CLICKING HERE. Hope to see you at a winter meeting near you!
Does Strip Tillage or Fertilizer Placement Influence the Soybean Row Spacing Yield Response?

Shawn P. Conley, J Gaska, A Roth, and S Mourtzinis
State Soybean and Small Grains Specialist
University of Wisconsin, Madison

Strip tillage adoption in corn and soybean has increased. This can alleviate cold, compacted soils in rotated production systems. Potential agronomic benefits are earlier planting dates, warmer soil temperatures, greater fertilizer efficiencies, less soil disturbance and fertilizer incorporation and soybean yield response to strip till has tended to be less consistent than in corn.

The objective of this study is: Quantify the effect of strip tillage and fertilizer placement on soybean stand establishment and seed yield

Click here to learn more about this research.

State Crop Hybrid/Variety Trials: A Wealth of Information

Joe Lauer, Wisconsin Corn Agronomist

Seed is one of the best ways to transfer technology to the farm-gate. Every year universities across the country conduct crop hybrid/variety evaluation programs. The purpose of these programs is to provide unbiased performance comparisons of crop varieties and hybrids available commercially to farmers. These trials are important because slight increases in yield can translate into huge economic impacts for farmers. For example, a one bushel increase by U.S. corn farmers across 90 million acres increases farm income $180 to $450 million depending upon corn price ($2 to $5 per bushel). Recent corn yields have been increasing at the rate of 2 bushels per acre year.

Click here to get the latest crop hybrid/variety results.

Delineating Optimal Soybean Maturity Groups Across the United States

Shawn P. Conley, Soybean and Wheat Extension Specialist

Soybean is the most important oilseed crop in the U.S., and its cultivated area is the second largest after corn (USDA, 2016). The cultivated area includes a wide range of environments that extend from northern North Dakota to south Texas and from western South Dakota to northeastern New York.

Soybean maturity is classified in different groups (MGs) ranging from 000 for the very early maturing varieties to 9 for the later. Gradations within MGs are also commonly noted by adding a decimal to the MG number. A variety is classified to a specific MG according to the length of period from planting to maturity. This phenological attribute is determined by two abiotic factors: photoperiod and temperature (Cober et al., 2001), and these factors can dictate the most suitable MG for a particular geographical location.

More than 45 years ago, Scott and Aldrich (1970), delineated optimum MG zones across the U.S. A more recent study redefined the optimum MG zones using variety trial yield data from 1998-2003 and found that adaptation regions for varieties with MG 0 to MG 3 had not changed from the work done in 1970. Whereas, varieties in the MG 4 to MG 6 range, adaptation zones are much broader than previously thought (Zhang et al., 2007). Nevertheless, there have been significant changes in soybean germplasm and management practices since 2003, and the climate has changed over the past 80 years across the U.S. (Mourtzinis et al., 2015). Therefore, the objective of this study was to delineate soybean MG adaptation zones across the U.S. using current soybean genetics and climate conditions.

Click here to view the full PDF.

New Traits Don’t Automatically Translate to Highest Yield!

Shawn P. Conley, Soybean and Wheat Extension Specialist

Last week’s announcement by the EPA to register Dicamba formulations for use on Dicamba Tolerant Crops has the soybean world abuzz and for once that buzz isn’t about pollinators! Many of my weed scientist colleagues
across the country will be discussing best management practices (BMP's) for introducing this technology into our agricultural landscape and will put forward recommendations to prolong the shelf-life of this technology. Here is one such example from UNL entitled: Understanding the Roundup Ready 2 Xtend Soybean Weed Management System. ***Side bar… I decided to highlight this article since UNL never has any highlights in WI and Purdue and IL are like playing the J.V. squad.***

In this brief article I would just like to highlight four points to consider when making soybean variety selection choices for 2017.

New doesn’t always mean it is automatically better. The WI Soybean program evaluated 200 RR2Y (Roundup Ready 2 Yield©) and 47 RR2X (Roundup Ready 2 Xtend©) varieties in 2016. On average across all varieties and regions RR2Y out-yielded RR2X by a significant +1.8 BPA (Figure 1.)

Remember every variety must stand on its own. Use independent trial data and pick varieties that not only perform well (we call them **starred varieties**) but also have the traits you are interested in (e.g. herbicide tolerance). Please see the 2016 Wisconsin Soybean Variety Performance Trials for individual variety performance as we have RR2X varieties starred in each region.

RR2X soybeans are a stack of herbicide traits and not yield traits (i.e… these traits protect yield, not enhance yield). Remember this point with all pest management traits!

Hey Mr. Ivory Tower if I don’t use this technology my yield loss will be a lot more than 1.8 bu per acre. I am fully aware of the amaranthus spp. train wreck across much of the corn belt and mid-south. We are starting to see herbicide resistance move across Wisconsin as well. I just want to reiterate #2 above that every variety must stand on its own as well as remind growers to use multiple modes of action and consider incorporating other traits such as Liberty Link soybeans into your soybean weed management plans. All of the data and models I have seen suggest that the Dicamba tolerant crops shelf-life will be much shorter than the original RR if we don’t manage this technology correctly.

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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 29, 2016 through November 4, 2016.

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

**Field Crops**
Corn, Anthracnose Stalk Rot, Collectotrichum graminicola, Dodge
Corn, Gibberella Stalk Rot, Fusarium graminicola, Dodge
Corn, Nigrospora Ear and Cob Rot, Nigrospora sp., Dodge
Corn, Nigrospora Stalk Rot, Nigrospora sp., Dodge

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

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

Brian Hudelson, Sean Toporek, Jake Kurczewski 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 November 5, 2016 through November 11, 2016.

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

**Vegetable Crops**
Tomato, Late Blight, Ploptophthora infestans, Racine

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.
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 November 12, 2016 through November 18, 2016.

**Forage Crops**
- Alfalfa, Fusarium Wilt, *Fusarium oxysporum*, Dane

**Fruit Crops**
- Apple, Honeycrisp Leaf Chlorosis, None, Racine

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

**Wisconsin Pest Bulletin 12-8-16**

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

Volume 61 Issue No. 19 of the Wisconsin Pest Bulletin is now available at:

[https://datcpservices.wisconsin.gov/pb/pdf/12-08-16.pdf](https://datcpservices.wisconsin.gov/pb/pdf/12-08-16.pdf)

**In This Issue**

**PEST HIGHLIGHTS OF 2016:** Brown marmorated stink bug trapped in Dane County orchards

**FORAGES & GRAINS:** Potato leafhopper counts low to moderate all season long

**CORN:** Corn rootworm beetle populations up in northern WI, down in the south

**SOYBEAN:** Soybean aphid densities generally low in 2016

**FRUITS:** Blueberry maggot detected for the first time in Wisconsin

**VEGETABLES:** Late blight far less prevalent in 2016 compared to 2015

**NURSERY & FOREST:** Detections of emerald ash borer surge this season