Wisconsin Crop Manager

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Start Managing Stripe Rust of Winter Wheat in 2017 At Planting

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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 *Puccninia 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. Fig-

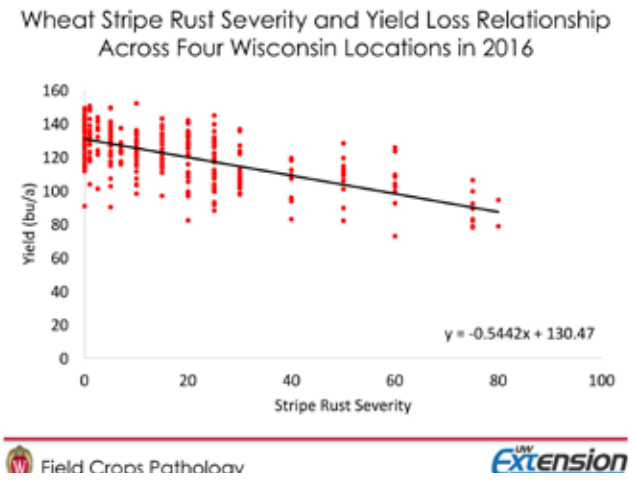


Figure 2. Wheat Stripe Rust Severity and Yield Loss Relationship Across Four Wisconsin Locations in 2016

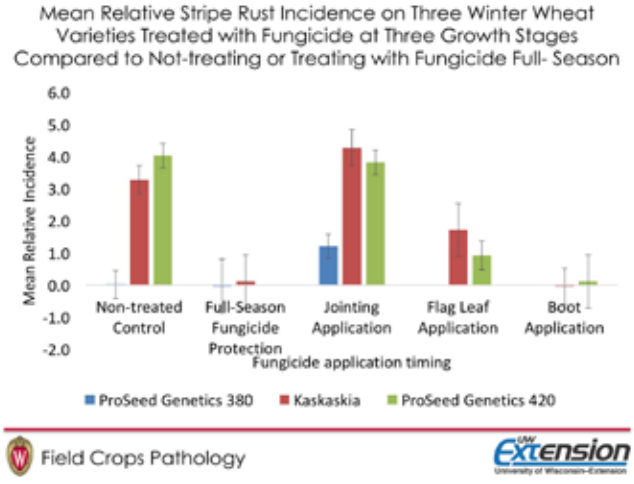


Figure 3. Mean Relative Stripe Rust Incidence on Three Winter Wheat Varieties Treated with Fungicide at Three Growth Stages Compared to Not-treating or Treating with Fungicide Full- Season

ure 4 shows the mean yield response for 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. Kaskaskia 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.

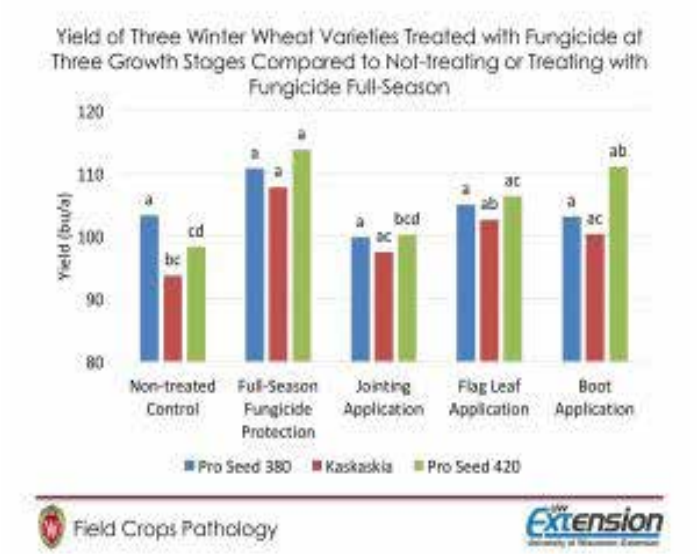


Figure 4. Yield of Three Winter Wheat Varieties Treated with Fungicide at Three Growth Stages Compared to Not-treating or Treating with Fungicide Full-Season

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

Figure 1. Anthracnose stalk rot symptoms in a cut corn stalk.

Figure 2. Corn field with considerable lodging due to anthracnose stalk rot.

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

Esker, P. 2016. Anthracnose stalk rot: in "Farmers Guide to Corn Diseases" Edited by: K. Wise, D. Mueller, A. Sisson, D. Smith, C. Bradley, and A. Robertson. APS PRESS.

M.L. Carson. 2016. Northern Corn Leaf Blight: in "Compendium of Corn Diseases, Fourth Edition." Edited by: G.P. Munkvold and D.G. White. APS PRESS.

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

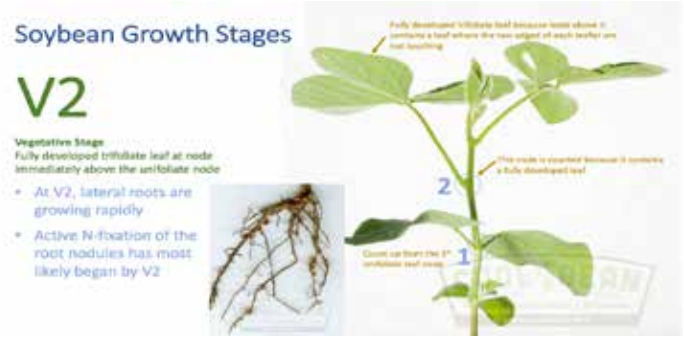
Adam P. Gaspar, Ph.D. Candidate

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:

- DSV and P-Day values for potato disease management (with fields in late stages, we may only have a few more weeks' of values to offer this season)
- Late blight and Cucurbit downy mildew updates (national and state)
- UW-Rhinelander ARS and WPVGA Potato Harvest Event announcement

Click here to view this update.

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

Blueberry, Phomopsis Canker, *Phomopsis sp.*, Chippewa
Cranberry, Bitter Rot, *Colletotrichum acutatum, Colletotrichum gloeosporioides,* Juneau, Wood
Cranberry, Early Rot, *Phyllostica vaccinii,* Wood
Grape, Anthracnose, *Sphaceloma ampelinum,* Buffalo
Grape, Downy Mildew, *Plasmopara viticola,* Buffalo
Grape, Septoria Leaf spot, *Septoria sp.*, Buffalo

Vegetable Crops

Basil, Downy Mildew, *Peronospora belbahrii*, Rock
Cucumber, Anthracnose, *Colletotrichum orbiculare, Portage*
Kale, Yellows, *Fusarium sp.*, Winnebago
Pepper, Bacterial Spot, *Xanthomonas sp.*, Dane
Snap Bean, Root Rot, Pythium sp., *Fusarium sp.,* Portage
Snap Bean, Unidentified Viral Disease, Unidentified virus, Milwaukee
Potato, Black Leg, *Dickya sp.*, Waushara
Potato, Early Blight, *Alternaria solani,* Sawyer
Potato, Verticillium Wilt, *Verticillium sp.,* Door
Tomato, Antracnose, *Colletotricum sp.,* Portage
Tomato, Bacterial Speck, *Pseudomonas syringae pv. tomato,* Dane
Tomato, Bacterial spot, *Xanthomonas sp.,* Dane, Racine
Tomato, Cucumber Mosaic, Cucumber mosaic virus, Milwaukee
Tomato, Early Blight, *Alternaria solani,* Milwaukee
Tomato, Septoria Leaf Spot, *Septoria lycopersici,* Dane, Portage

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.

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: EntrustImpact 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.

Follow us on

Cover Crop Success in Southwest WI

DAIRY

Adrian Ridge Farms, Glen Haven

Steve Adrian and his son Adam milk 300 cows, feed 160 steers and cash crop several hundred acres. Steve began using cover crops in 1978 due to a hay shortage when he planted winter cereal rye to feed to heifers. For the past 12 years, their farm has been planting rye after silage corn. During the first three years of cover cropping, they received cost share from Natural Resources Conservation Service (NRCS). Following silage corn harvest, manure (liquid dairy) is applied at 8,000-10,000 gallons per acre, and a field cultivation pass is done to incorporate the manure. The rye is seeded with a drill at 80 lb per acre. The following spring, rye is harvested for dairy and steer silage at boot stage, and soybeans are then no-till planted. No additional fertilizer is applied for the rye or soybeans. The rye typically yields 15 tons per acre with moisture of 65-68% and is stored in a silage bag. The rye is chopped free of atmospheric moisture (dew) to better control moisture content and quality. The rye makes an excellent forage for their steer high energy and finisher rations. The dairy cows receive 3.5 lb rye per day. Rye has also been an excellent feed supplement when dry years have reduced expected forage production. Rye planted after silage corn helps reduce runoff and soil loss, helping to meet the standards of their comprehensive nutrient management plan. Steve and Adam have never seen a decreased soybean yield following rye when compared to the corn-soybean rotation acres. Adrian Ridge Farms use rye as a cover crop to protect their land and provides a high quality feed source the following spring. Their nutritionist, Danny White (White's Feed Service in Fennimore) sees rye as a great supplemental feed source. Rye should be stored properly for best feed value and planning should include speedy harvest, which must often occur during the spring planting season, to maintain quality and avoid weather damage.

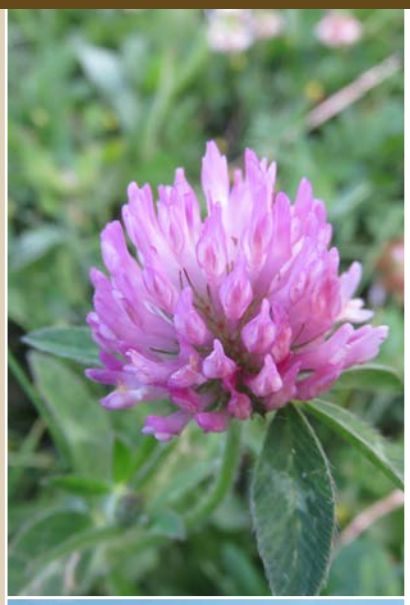
BEEF/CASH CROP

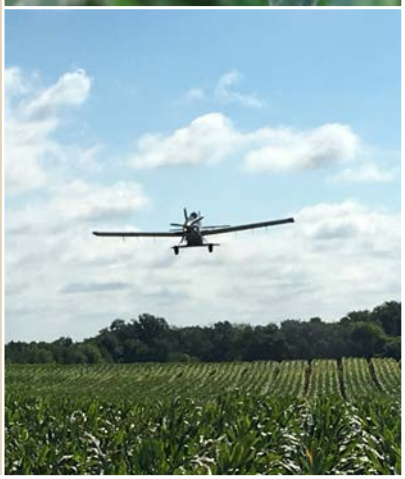
Stelpflug Farms, Lancaster

Gary Stelpflug farms several thousand acres, raises hogs and overwinters bred dairy heifers. Gary began using cover crops in 1983 through the PIC program in which he seeded down acres with alsike clover and planted corn the following year. Gary utilizes straw for his livestock and he currently plants winter wheat and harvests the wheat for both grain and straw. Following wheat, he establishes a cover crop of winter cereal rye and radish and harvests the mix in the fall for forage, using it for heifer feed. Since the radish always winterkills and the rye overwinters, he usually terminates the rye in the spring with a burndown. In past years, he has harvested the rye in the spring for forage and also grows his own rye for seed. He has had the rye self-seed following seed harvest and in the fall can harvest a forage crop from these fields. This year, he harvested 1.75 tons per acre from this self-seeded rye. Rye grown for seed receives additional nitrogen for optimum rye yield and from his 2 bushel seeding rate typically yields 40-60 bushels of rye. When the rye is harvested for seed, the straw is harvested as well. Gary uses oats and peas or barley plus pea mixes as an alternative to rye. Radish has been successful on Gary's farm, and he harvests the radish for silage or lets his heifers graze on these acres. He often mixes a small amount of clover seed in his mixes for additional cover crop benefits. Gary wants to keep cover crops costs below $25 per acre. He typically has the local coop seed his cover crops when they are spreading fertilizer for the following crop with an air flow fertilizer spreader. A vertical tillage pass incorporates the seed to 1-11/2 inches. He sees many benefits to using cover crop on his farms, including the soil and environmental protection, excellent feed source and soil health benefits. His farms use a nutrient management plan, and cover crops have reduced soil loss.

CASH CROP

Knutson Farms, Ferryville





Kristopher Knutson farms nearly 1,800 acres using no-till and minimal till practices in Crawford County, and his son raises 50 steers on the farm. He started using cover crops following wheat harvest as part of the Conservation Stewardship Program (CSP) while working with the Natural Resources Conservation Service in Crawford County. Kristopher started using the Environmental Quality Incentives Program (EQIP) cost share program to fly on cereal rye, radish and oats onto standing corn and soybeans in 2014. He has learned that timing is critical to cover crop success with aerial seeding. Cereal rye established well in the aerial application following soybeans when applied at the correct crop maturity. On his wheat acres, he uses a fertilizer spreader to put on fertil-izer (potash) with oats, radish and field pea. Following the spreader application, he uses a vertical tillage tool to incorporate the seed and fertilizer. With experience, the EQIP cost share program in cooperation with the Crawford County Land Conservation Department has resulted in aerial seeding of cover crops on over 3,000 corn and soybean acres in Crawford County with great success. To improve cover crop and main crop success, he uses a chopping corn head, row cleaners, and Precision Planting on both of his planters to manage residue while increasing production. Kristopher sees many benefits in using cover crop on his land. As he moves to become more resilient and sustainable on the rolling land of Crawford County, he has begun applying small amounts of nitrogen throughout the growing season and has purchased the equipment to begin interseeding cover crops at the same time. He decided to invest in the equipment after having success with the rye and is experimenting with interseeding red clover into V5-V7 corn. Planting cover crops has allowed for improved nitrogen utilization and hopefully reduced application rates in the future. He has seen a large reduction in soil erosion, particularly with cover crops helping to absorb heavy rainfalls and prevent gully erosion on many of his acres. Terminating the cover crop early in the spring saves soil moisture and helps improve planting conditions. He is currently working to incorporate cover crops on 100% of his acres.

Farmer interviews conducted by Daniel H. Smith, Nutrient and Pest Management Program, University of Wisconsin-Madison; and Ted Bay, Grant and Lafayette County Agriculture Agent, University of Wisconsin Extension

NPM

This publication is available from the Nutrient and Pest Management (NPM) Program.
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cover crops in WISCONSIN