Wisconsin Crop Manager

Volume 21 Number 20 - - - University of Wisconsin Crop Manager - - - July 16, 2014

Wisconsin Pest Bulletin 7/10/14

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

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

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

http://datcpservices.wisconsin.gov/pb/pdf/07-10-14.pdf

Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, Joyce Wu, Tom Hinsenkamp, and Catherine Wendt, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from July 5, 2014 through July 11, 2014.

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

FIELD CROPS,

Corn, Nitrogen Burn, None, Iowa

Soybean, Seedling Blight, *Fusarium* spp., Lafayette

FRUIT CROPS,

Apple, Phyllosticta Leaf Spot, *Phyllosticta* sp., Portage

Apple, Root Rot, *Pythium* sp., *Fusarium* spp., Dane, Washington

Apple, Sphaeropsis Canker, *Sphaeropsis* sp., Portage

Apple, Winter Injury, None, Dane, Portage, Washington, Winnebago

Grape, Black Rot, *Phyllosticta ampelicida*, Jefferson

Grape, Downy Mildew, *Plasmopara viticola*, Dane

VEGETABLES,

Asparagus, Alternaria Leaf Spot, *Alternaria* sp., Waushara

Asparagus, Anthracnose, *Colletotrichum* sp., Waushara

Asparagus, Phomopsis Canker, *Phomopsis* sp., Waushara

Asparagus, Root/Crown/Stem Rot, *Fusarium oxysporum*, Waushara

Asparagus, Rust, *Puccinia asparagi*-Waushara

Celery, Fusarium Yellows, *Fusarium oxysporum*, Waushara

Celery, Root Rot, *Pythium* sp., Waushara

Kohlrabi, Crown Gall, *Agrobacterium tumefaciens,* Winnebago

Tomato, Black Walnut Toxicity, None, Dane

Tomato, Blossom End Rot, None, Dane

Tomato, Herbicide Damage, None, Columbia

Tomato, Septoria Leaf Spot, *Septoria lycopersici,* Dane, Racine

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

Fusarium Head Blight and Other Winter Wheat Diseases in Wisconsin, 2014

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

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

Winter wheat in most of Wisconsin is maturing nicely and starting to dry down in the southern portions of the state. For most of the season, wheat diseases have been at low levels in Wisconsin. However, certain areas of the state have been identified with high levels of Fusarium head blight (scab) in the last week. These areas include Fond du Lac up through to Chilton and likely northward. Growers and consultants should scout fields now to estimate the level of scab present in their fields.

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.

Figure 1: Symptoms of Fusarium head blight (scab) on a wheat head.

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 deoxynivalenol (also known as 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 near our Fond du Lac location is maturing making it very difficult to assess the incidence and severity of the infection. Understanding a fields risk will help growers either field blend or avoid highly infected areas so entire loads are not rejected.
2. 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.
3. Know your elevators inspection and dockage procedure (each elevator can have a different procedure).
4. Scabby kernels does not necessarily mean high DON levels and vice versa.
5. 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).
6. 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.
7. Do not store grain from fields with high levels of scab. DON and other mycotoxins can continue to increase in stored grain.
8. For more information on Fusarium head blight click here.
9. For More information on harvesting click here.

Other Wheat Diseases in Wisconsin

In general foliar diseases on wheat were present in low levels this year. Some Septoria/Stagnospora leaf blotch was observed on wheat around the Arlington and Fond du Lac areas. Severity was low at 10-20% on the lower leaves and less than 5% on the flag leaves. Yield loss from Septoria/Stagnospora leaf blotch will be negligible this year.

Leaf rust was observed on several varieties of winter wheat throughout the wheat growing area of the state this year. Severity on flag leaves was 10% or less and it did not typically become apparent until late in the growing season. Yield loss from leaf rust will also be low this year.

Stripe rust was virtually non-existent this season in Wisconsin. Only two leaves at our Arlington variety trial were found with stripe rust pustules. Stem rust was also observed at this location in one plot, and not found at any other site that we visited this year. Yield loss from stripe rust and stem rust will be negligible this year in Wisconsin.

Powdery mildew was not observed in any field we visited this year.

At the Fond du Lac variety trial, high levels of Cephalosporium stripe were noted on certain varieties. This location has seen short rotations between wheat crops, likely contributing to this epidemic. We also noted high incidence (90%) of bacterial leaf streak on several varieties at this location and the Chilton, Wisconsin location.

References

Cowger, C., and Arellano, C. 2013. *Fusarium graminearum* infection and deoxynivalenol concentrations during development of wheat spikes. Phytopathology 103:460-471.

Salgado, J. D., Wallhead, M., Madden, L. V., and Paul, P. A. 2011. Grain harvesting strategies to minimize grain quality losses due to Fusarium head blight in wheat. Plant Dis. 95:1448-1457.

Tasseling Corn - Scout Now for Foliar Diseases and What about Fungicide?

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

I have been riding through much of the southern tier of Wisconsin this week and am noticing quite a few corn fields that are beginning to tassel. This growth stage presents itself as a good time to scout for foliar diseases of corn and make decisions on in-season management for any diseases you might find.

As for which diseases might be important this year? I wish I had a crystal ball. However, if I had to make an educated guess, three come to mind: Northern corn leaf blight, Eyespot, and Anthracnose leaf blight.

Figure 1. NCLB symptoms on a corn leaf.

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

Figure 2. Eyespot symptoms on a corn leaf.

Eyespot: Eyespot typically first develops as very small pen-tipped sized lesions that appear water-soaked. As the lesions mature they become larger (¼ inch in diameter) become tan in the center and have a yellow halo (Fig. 2). Lesions can be numerous and spread from the lower leaves to upper leaves. In severe cases, lesions may grow together and can cause defoliation and/or yield reduction. Eyespot is also favored by cool, wet, and frequently rainy conditions. No-till and continuous corn production systems can also increase the risk for eyespot, as the pathogen is borne on corn residue on the soil surface. Management should focus on the use of resistant hybrids and residue management. In-season management is available in the form of fungicides. Again, fungicides should be applied early in the epidemic and may not be cost effective for this disease alone.

Figure 3. Anthracnose leaf blight symptoms on a corn leaf.

Anthracnose leaf blight (ALB): ALB symptoms include oval or elongated lesions that are brown in color and surrounded by a yellow or orange area (Fig. 3). Sometimes on older lesions, small black hair-like structures (setae) can be observed erupting from the leaf surface in the center of the

lesions. In severe cases, ALB can result in leaf death that can affect yield. Again, the ALB pathogen overwinters on corn residue. Therefore fields in no-till and/or continuous corn production might be at higher risk for ALB. Long periods of rainy overcast and warm weather can favor ALB. Fields with poor soil fertility can also be at higher risk for ALB development. Management should focus on selecting resistant hybrids and residue management. Some fungicides are labeled for management of ALB, but control and yield increase in response to applications have been inconsistent.

Over the last several years there has been a lot of interest in applying foliar fungicides on corn to protect or increase yield. There are many products on the market and we tested several of these at various timings in 2013 on hybrid grain corn. The results of that trial can be found by clicking here and scrolling to page 2. In this study we had very low levels of common rust. Yield was highly variable in the trial and only one product/timing resulted in a yield increase over the non-treated plots. This high level of variability and inconsistency in treatment has also been observed in trials conducted throughout the corn belt of the U.S. over the last several years.

In a recent summary of foliar fungicide trials on corn from 2010-2013, 985 site/trials were conducted. No single product was identified to be more effective than another in these trials, however disease ratings were not the focus. When timing of fungicide application was analyzed, the best time to apply a fungicide and expect some yield increase over the non-treated control was between the VT and R2 growth stages. The average yield increase across all trials and years at the VT to R2 timing was 3.5 bushels per acre.

Break-Even Scenarios

Corn price ($/bu)	Application cost ($/A)				
	$20	$24	$28	$32	$36
$3.00	6.7	8.0	9.3	10.7	12.0
$4.00	5.0	6.0	7.0	8.0	9.0
$5.00	4.0	4.8	5.6	6.4	7.2
$6.00	3.3	4.0	4.7	5.3	6.0
$7.00	2.9	3.4	4.0	4.6	5.1
$8.00	2.5	3.0	3.5	4.0	4.5
$9.00	2.2	2.7	3.1	3.6	4.0
$10.00	2.0	2.4	2.8	3.2	3.6

Figure 4. Break-even scenarios for corn foliar fungicide application costs.

While there seems to be an overall positive response in yield with the application of fungicide, that increase is likely not high enough to recover the cost of application. A quick review of fungicide prices and expected application costs reveals that to apply fungicide one time might cost around $28 USD. Figure 4 shows a table of various costs to apply fungicide along the top, corn prices along the left column, and the bushel advantage required by the fungicide application to break-even with the cost of fungicide application in the center. The red box in figure 4 shows our 3.5-bushel average advantage that we saw across the region-wide trial. The arrow shows the corn price needed to recover the cost of one $28 fungicide application. This $8.00/bushel corn price is more than twice today's average corn price!

The previous point on economics was made in the absence of disease on corn, however. When might we expect more consistent yield benefit from a fungicide? The answer is in the situations where disease levels are high of course! These situations include the following factors:

1. Hybrids susceptible to foliar disease are used in fields with a history of disease
2. Continuous corn production systems
3. No-till or reduced tillage systems
4. Late-planted corn
5. Where irrigation is used
6. Weather conditions are favorable for disease development

If one or more of these factors are important in your field, then scouting during the tasseling period will be important. Gauge the present levels of disease and look at the weather forecast to see if the epidemic might increase. Then make a consideration on if a fungicide application is needed in your field. Consider the economics of that application and also the fact that repeated application of fungicide can also promote fungicide resistance in some of the pathogens you might be targeting. So spray responsibly.

For more information about fungicides and fungicide mode of action visit my fungicide information page by clicking here.

Vegetable Crop Update 7/11/14

The 13th issue of the Vegetable Crop Update is now available. This issue contains potato production updates, late blight updates, blitecast and P-Days for late blight and early blight management, a cucurbit downy mildew update, and a hops update. Click here to view this update.

Harvest Considerations for Fusarium Head Blight (Scab) Infected Wheat Fields

Shawn Conley, Soybean and Wheat Extension Specialist

Subsection taken from Smith and Conley 2014. Fusarium Head Blight and Other WinterWheat Diseases in Wisconsin, 2014

A survey of the Wisconsin Winter Wheat Variety Trials indicates that some fields will be at risk for dockage or outright rejection of winter wheat grain later this month. Environmental conditions that lead to high risk coupled with susceptible genetics and the grower's inability to simply get fungicides applied all contributed to this issue. As we move forward into harvest here are a few point to consider to help mitigate dockage and deoxynivalenol (DON or vomitoxin) risk moving forward.

1. Scout your fields now to assess risk. Wheat near our Fond du Lac location is maturing making it very difficult to assess the incidence and severity of the infection. Understanding a fields risk will help growers either field blend or avoid highly infected areas so entire loads are not rejected.
2. 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.
3. Know your elevators inspection and dockage procedure (each elevator can have a different procedure).
4. Scabby kernels does not necessarily mean high DON levels and vice versa.
5. 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).
6. 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.
7. Do not store grain from fields with high levels of scab. DON and other mycotoxins can continue to increase in stored grain.
8. For more information on Fusarium head blight, visit this information page: http://fyi.uwex.edu/fieldcroppathology/fusam-head-blight-scab-of-wheat/

References

Cowger, C., and Arellano, C. 2013. Fusarium graminearum infection and deoxynivalenol concentrations during development of wheat spikes. Phytopathology 103:460-471.

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Harvesting Wet Fields of Alfalfa

Carole Curtis

June 2014 has the dubious distinction of being the fifth wettest June in recorded history. Therefore, it's no surprise that July began with 11 percent of Wisconsin's first cutting of hay still standing in the fields.

"Clearly, we have significant problems in some places," **Dr. Dan Undersander, University of Wisconsin Extension professor of agronomy**, said during a World Class Webinar on forage being presented by Professional Dairy Producers of Wisconsin.

The dilemma is alfalfa declines 4-5 points in relative forage quality per day, so the longer it sits in the field, the lower the quality. Those that got first cutting off can look to second cutting for heifer feed, while those coming into second cutting should be able to get it in pretty good shape. Those looking at first cutting will be getting some lower quality feed to deal with, Undersander observed.

One thing farmers might not be aware of is that the yield of next cutting will be reduced if alfalfa is left in the field. "We focus so much on the present that we don't realize the longer we leave the existing cutting in the field, the more we reduce our yield for the year and the next cutting," he said.

Take shoots into consideration

As a stand gets tall, shoots for the next cutting begin to grow. At the bud stage, the shoots are typically not visible enough for dairy farmers to notice at cutting.

However, as the plant moves into its flower stage, the growing shoots are clearly visible and can be up to 4 inches or more tall. "At this point, it is worthwhile to check your fields before cutting," Undersander said. "If you can cut above those shoots, then you have the stems left to continue growing and next cutting will come back in a timely manner."

If the crop is cut below the top of the shoots, the growing tips are severed. "Then you have not only taken off the cutting that is there, but you've cut off the regrowth for the next cutting and the plant has to start all over," he explained.

The plant will come back a little weaker and yields for the next cutting will be later and delayed. "So if you have to cut

late, think about checking the stand and seeing if it would be beneficial to cut higher," Undersander advised.

Alfalfa regrowth needs to be taken into consideration because some varieties recover quicker than others. "Some of the varieties being grown can be 10 or 25 percent flower and you won't have to worry too much about those shoots in there," Undersander said.

With other varieties, the shoots will be 4-6 inches taller. Farmers must then decide whether they are going to cut off the growing tips or cut above them. For some late fields, that might mean cutting at six inches. "It's not desirable, but we're looking at what's the least of several bad situations that we could participate in," Undersander said.

Stick with wide swathes

Undersander has also been fielding lots of questions whether hay laid in wide swaths will dry well on soggy soils. "I would suggest to you that wide swathes are particularly important on these wet fields," he stressed.

If alfalfa is put into directly into windrows, it is definitely not going to dry very well, Undersander said. It is far better to spread out a wide swath on wet soil and at least have the surface of that swatch exposed to sunlight and drying. "If you immediately put it in windrows, only the surface of that windrow dries and, when you come back 24 hours later, that windrow will be as green inside as it was when you cut it," he pointed out.

Try to limit damage to the field

Harvesting when the soil is wet can really damage a field. "There are no good answers here. I saw a mower stuck in a field the other day; another where a caterpillar was pulling a truck out of a field," Undersander shared. "Imagine the damage that's doing."

While farmers might need to let one cutting get a little more mature to let the soil dry out, there are several options to consider when harvesting on wet soil.

It might be worthwhile to use wagons with flotation tires, instead of trucks. It will slow down the harvest tremendously, but it might save that field for next cutting. "When we're putting ruts several inches deep, we're virtually eliminating that field from future harvest," Undersander said.

Another option, when coming out of wet conditions, is to harvest older fields first and hold off on younger fields for a few days when there is the possibility they can dry a bit. If the older fields suffer damage, they are more in line to be torn up anyway.

Consider taking partial loads off. "None of these are things we'd like to do, but they might be worthwhile if we want to keep the field from being deeply rutted and torn up," Undersander said.

White tipped/bleached Canada thistle, a good thing

Mark Renz, University of Wisconsin Extension Weed Specialist

Wet springs, bring good and bad things from a weed perspective. First the bad: we often see much more Canada thistle in our pastures, row crops, and roadsides in Wisconsin in wet springs. While this weed can tolerate a wide range of habitats and weather patterns, infestations are more common and visible under these conditions. The past two years I have seen populations establish and expand, due to the spring precipitation mixed with the overgrazing and lack of desirable plant regrowth due to previous years' drought. As most know, Canada thistle can be very competitive and reduce crop yield, forage utilization and reduce habitat quality in natural areas.

The good news is that wet springs increase the chances of a disease infecting and injuring Canada thistle. The most common is a disease called *Pseudomonas syringae pv. tagetis*, PST for short. This disease is a bacteria that naturally occurs in Wisconsin and infects Canada thistle shoots. While it can also infect many other broadleaf species in the sunflower family, it is most commonly found on Canada thistle in Wisconsin. Symptoms of infection are a distinct bleached or white color of the shoot (see picture 1). Infected shoots have slower development and can increase mortality of Canada thistle populations. Effectiveness appears to be dependent on the strain of PST, level of infection/reinfection and likely many other factors. Driving throughout the state the last several weeks I have seen many pastures, fields and roadsides with large-scale infections (see picture 2).

Regardless of the level of damage, infected plants are less competitive. In pastures and other grassland settings this is a welcome addition to Canada thistle management plans. To promote the spread of this disease, research suggests land managers mow infected (bleached) shoots when water is present on the leaves. Mowing damages the leaves of uninfected plants and spreads the bacteria to throughout the field. The added moisture improves the chances of the bacteria infecting Canada thistle. Once a leaf is infected it rarely survives. While Canada thistle plants require reinfection every year, populations of PST are likely present to reinfect plants every year IF conditions are right. So embrace the white Canada thistle shoots as one more tool to suppress Canada thistle. This year we certainly need all the tools we can get!

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