Wisconsin Crop Manager

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Corn Rusts in Wisconsin

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

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.

Figure 1. Brick-red Pustules of the common rust fungus on a corn leaf.

Figure 2. Southern rust pustules on a corn leaf. Photo credit: Department of Plant Pathology., North Carolina State University, Bugwood.org

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 be more densely clustered. Favorable conditions for southern rust development are similar to those for common rust. high humidity and temperatures around 80F 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

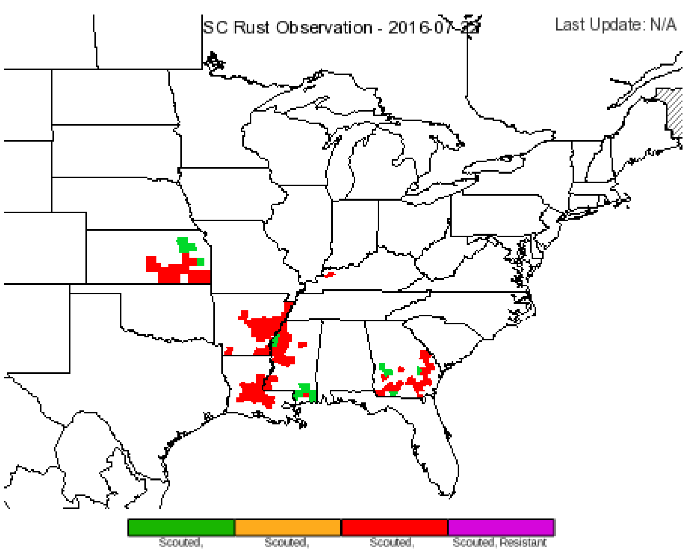


Figure 3. Corn Southern Rust Observations as of July 22, 2016

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.

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 RustSouthern 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!

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 methods 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 <u>three consecutive years.</u> 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 roadsides 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) to rosettes. Applications of herbicides that include metsulfuron, 2,4-D, or dicamba have provided greater than 90% reduction in flowering plants the 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 broadleaf plants 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 reinvasion 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. Often 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/ and enter wild parsnip in the search box.

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

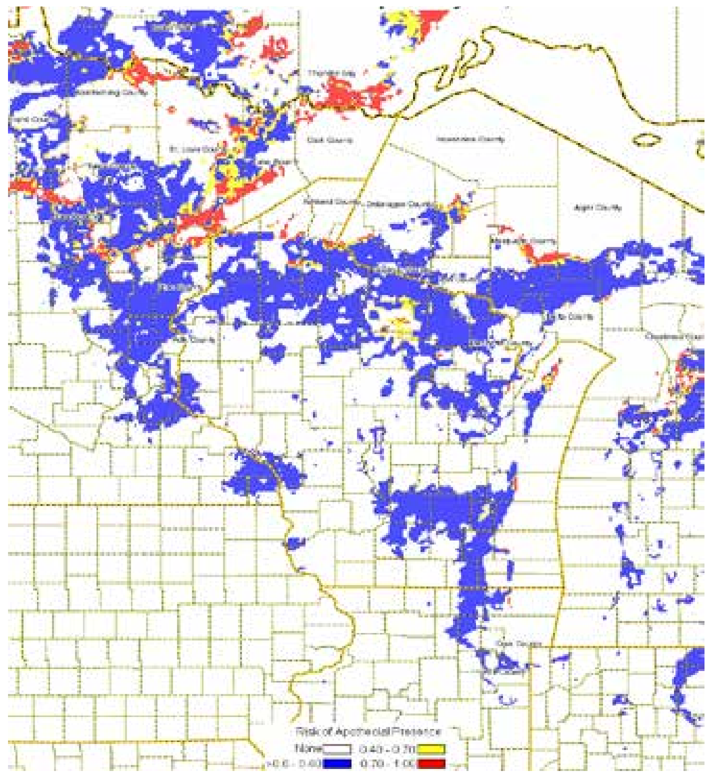
Sclero-cast: A Soybean White Mold Prediction Model

***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**](#)*

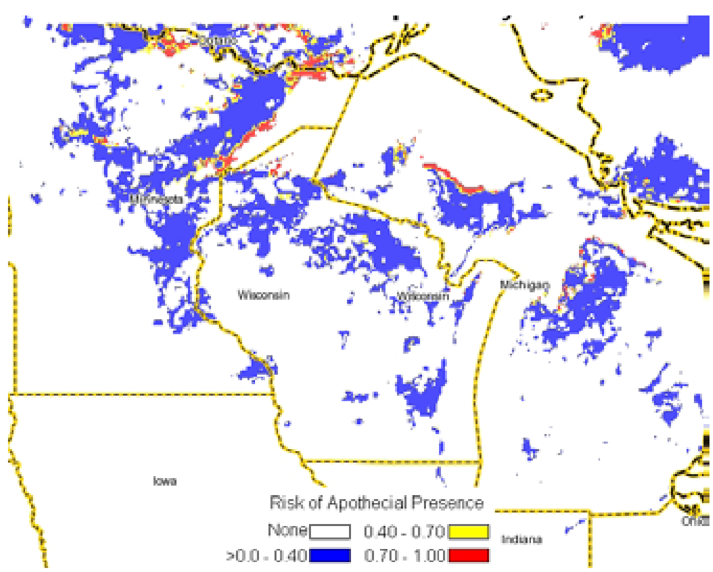
Risk of apothecial presence and subsequent white mold development remains generally low for most of Wisconsin today. Risk has increased slightly across the state over the holiday weekend with some isolated pockets in the northern and south-central areas of the state. The UW Field Crops Pathology crew 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



White Mold Risk Map July 27, 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.

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

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

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

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:

https://fruit.wisc.edu/wp-content/uploads/sites/36/2016/07/Wisconsin-Fruit-News-vol1-issue8.pdf

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

http://ipcm.wisc.edu/download/vgu/VegCropUpdateJuly-22-2016.pdf

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:

https://datcpservices.wisconsin.gov/pb/pdf/07-28-16.pdf

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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