Wisconsin Crop Manager

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# Down Corn

Joe Lauer, Wisconsin Corn Agronomist

The August and September USDA-NASS yield estimates indicate that Wisconsin corn farmers are on-track to produce a record yielding corn crop. We are starting to see lodging issues at Arlington as silage harvest begins. Some lodging is due to an earlier wind event occurring around V10 to V12 that flattened plants and caused them to 'snake' back up. However, high yields in and of themselves can cause lodging issues.

For a corn plant to remain healthy and free of stalk rot, the plant must produce enough carbohydrates by photosynthesis to keep root cells and pith cells in the stalk alive and enough to meet demands for grain fill. When corn is subjected to stress during grainfill, photosynthetic activity is reduced. As a result, the carbohydrate levels available for the developing ear are insufficient. The corn plant responds to this situation by removing

carbohydrates from the leaves, stalk, and roots to the developing ear. While this "cannibalization" process ensures a supply of carbohydrates for the developing ear, the removal of carbohydrates results in premature death of pith cells in the stalk and root tissues, which predisposes plants to root and stalk infection by fungi. As plants near maturity, this removal of nutrients from the stalk to the developing grain results in a rapid deterioration of the lower portion of corn plants in drought stressed fields with lower leaves appearing to be nitrogen stressed, brown, and/or dead.

Other plant stresses which increase the likelihood of stalk rot problems include: loss of leaf tissue due to foliar diseases (such as gray leaf spot or northern corn leaf blight), insects, or hail; injury to the root system by insects or chemicals; high levels of nitrogen in relation to potassium; compacted or saturated soils restricting root growth; and high plant populations.

For some ideas on how to handle down corn, click here.

**Further Reading**

Carter, P.R. 2015. Wind Lodging Effects on Corn Growth and Grain Yield. Pioneer Insights, click here.

Carter, P.R., and K.D. Hudelson. 1988. Influence of simulated wind lodging on corn growth and grain yield. J. Prod. Agric. 1:295-299.

Nielsen, B., and D. Colville. 1988. Stalk Lodging in Corn: Guidelines for Preventive Management. Agronomy

Guide, AY-262 Purdue University, West Lafayette, IN

# What Should You Know about Corn and Soybean Diseases as You Prepare for Harvest?

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

As the fall is approaching and crop harvest plans are being made, it is important to continue to assess disease issues in corn and soybean. These assessments aren't being made in order to make plans for in-field management, but to improve the quality of grain that is harvested and allow for some educated decision-making for 2016.

**Some Diseases to Consider in Corn at Harvest**

Now is the best time to begin scouting corn for stalk rot issues and also fungal ear rot potential. Diseases such as Anthracnose stalk rot and Gibberella stalk rot are becoming apparent in corn. Inspect the stalks integrity on the outside. Be sure to squeeze the outside of the stalk to gauge the potential severity of the rot on the inside of the stalk. Cut a few stalks from diverse areas of the field to see how rotted stalks might be. In figure 1, the stalk on the left has a severe case of Gibberella stalk rot, while the stalk on the right is far less rotted. Fields that had high levels of norther corn leaf blight (NCLB) this

Figure 1. Gibberella stalk rot on corn. Severe stalk rot on the left and less severe stalk rot on the right.

Figure 2. Diplodia ear rot.

season, are going to be more prone to stalk rot due to the added stress of the foliar disease. The more severely rotted stalks are, the more likely they will lodge. Therefore timely harvest is important. Growers should target harvesting of fields with severe stalk rot before fields that have less stalk rot, in order to minimize harvest losses due to lodging.

Ear rots can also be an issue at harvest time. Fusarium ear rot, Gibberella ear rot, and Diplodia ear rot (Fig. 2) are just a few that can damage corn in Wisconsin. It will be critical to check fields in the next several weeks in order to make decisions on what fields to harvest first. Harvest priority should be placed on fields with a high level of ear rot. As corn stands late into the fall, certain ear rot fungi can continue to grow, damage ears, and cause increases in mycotoxins in grain. The quicker these fields dry and can be harvested, the more likely the losses due to ear rot and mycotoxin accumulation can be minimized.

**Soybean White Mold Management at Harvest**

In Wisconsin, the main disease to consider when making harvest plans in soybean is white mold. White mold is present in some soybean fields in the state and has caused considerable damage in a few of those fields. Remember that the white mold fungus not only causes stem blight and damage, but also causes the formation of sclerotia (fungal survival structures that look like rat droppings) on and in soybean stems (Fig. 3). These sclerotia serve as the primary source of fungal inoculum for the next soybean crop. They also get caught in combines during harvest. These sclerotia can then be spread in combines to other fields that might not be infested with the white mold fungus. **Therefore, it is important to harvest non-infested soybean fields first, followed by white mold-infested fields, to be sure the combine does not deposit any residual sclerotia in the non-infested fields.** If this is not an option and you must

Figure 3. Sclerotia of the white mold fungus inside a soybean stem.

harvest white mold infested fields before non-infested fields, be sure to clean the combine thoroughly between fields.

For more information about white mold management in soybean you can click here and scroll down to "white mold" or watch a video by clicking here.

**Identify Corn and Soybean Diseases Now to Make Decisions for 2016**

While most of the focus during this time of season is on equipment and calibrating yield monitors, it is important to get an accurate diagnosis on any soybean and corn diseases you are seeing now. This information will help this winter as you review variety and hybrid trials and make decisions about what you are going to plant in 2016. Have knowledge of the primary disease issues in your fields. This will allow you to choose varieties and hybrids with the best disease resistance package to combat those diseases. Finally, now is a great time to sample for soybean cyst nematode (SCN). For more information on sampling for SCN in Wisconsin, CLICK HERE.

# Beautiful Weather for Drying Corn

Joe Lauer, Wisconsin Corn Agronomist

The recent high pressure ridge that has settled over Wisconsin has meant millions of dollars to farmers in reduced drying costs. The favorable weather of sunny, warm days with little rain has allowed the 2015 corn crop to dry faster than normal. Last week farmers in northern Wisconsin had corn below 25% moisture.

There is a trade-off though. With high fuel prices and/or low grain prices, it is important to let corn grain dry in the field as much as possible, yet hold harvest losses at a reasonable level. Most corn hybrids mature when the grain has about 30% moisture. Ideally harvest should begin around 25% kernel moisture and be complete by the time grain reaches 20%. Corn ears that are too dry can break from the plant and drop to the ground. Also, kernels can shatter off the ear as they are stripped from the plant by the combine head.

Kernel Moisture Ranges (%) for Harvesting Corn for Various Uses

33-40% Kernel moisture = Silage harvest

29-32% Kernel moisture = High Moisture Corn (ensiled)

25-26% Kernel moisture = Ideal for combining

20-23% Kernel moisture = Ideal for picking

< 20% Kernel moisture = field losses increase, but cost of drying shell corn is reduced

Once the kernel is mature (black layered) the drydown of corn grain is a simple drying process subject to weather conditions and most consistently associated with degree-days (Hallauer and Russell, 1961). Factors that have been shown to speed the rate of drying include premature death (Troyer and Ambrose, 1971), physical structure of the seed coat or pericarp (Purdy and Crane, 1967), a low number off loose, short husks (Troyer and Ambrose, 1971), and ear angle and date of husk death (Cavalieri and Smith, 1985). Factors not associated with faster drydown were husk and shank characteristics and the shape or size of ears (Crane et al., 1959)

This year it will be even more important because of high yields and the potential for lodging, especially for growers with a long harvest season due to acreage demands. In years past, European corn borer caused increased lodging and ear drop. All are reasons to pay attention to corn harvesting. As harvest is delayed from October to December, losses can increase 5 to 18%. Of course there is always a risk of 100% loss due to a storm or some other bad weather event.

Harvest decisions are affected by the kind of drying and storage facilities available and depends upon the use of the grain. Grain stored for a long period of time (> 1 year) must be dried to less than 14% which is not likely in a field situation, so some artificial drying must occur. Corn stored above 15% moisture is subject to heating from the natural respiration of the grain and molds present. As temperatures rise so does humidity which causes molds, insects and bacteria to grow and decreasing the amount of time that the grain can be stored before it goes out of condition. Regardless of the moisture in stored grain, aeration is needed to control moisture migration.

**Further Reading**

Wisconsin Corn Agronomy – Grain Harvesting

Eckert, D.J., R.B. Hunter, and H.M. Keener. 1987. Hybrid maturity-energy relationships in corn drying. National Corn Handbook NCH-51.

Nichols, T.E. 1988. Economics of On-Farm Corn Drying. National Corn Handbook NCH-21.

**Literature Cited**

Cavalieri, A.J., and O.S. Smith. 1985. Grain Filling and Field Drying of a Set of Maize Hybrids Released From 1930 to 1982. Crop Sci. 25:856-860.

Crane, P.L., S.R. Miles, and J.E. Newman. 1959. Factors Associated with Varietal Differences in Rate of Field Drying in Corn. Agron. J. 51:318-320.

Hallauer, A.R., and W.A. Russell. 1961. Effects of selected weather facttors on grain moisture reduction from silking to physilogic maturity in corn. Agronomy Journal 53.

Purdy, J.L., and P.L. Crane. 1967. Influence of pericarp on differential drying rate in "mature" corn (Zea mays L.). Crop Science 7:379-381.

Troyer, A.F., and W.B. Ambrose. 1971. Plant Characteristics Affecting Field Drying Rate of Ear Corn. Crop Sci 11:529-531.

# High Moisture Corn and By-Products

Joe Lauer, Wisconsin Corn Agronomist

As we move into the 2015 harvest season, many growers harvest high moisture corn for feed. The following is a summary of a publication on High Moisture Grain and Grain By-Products,

High moisture corn is, as the name implies, corn harvested before the kernels dry down, usually processed by a roller mill or hammer mill, packed into an appropriate structure and allowed to ferment. High moisture ear corn is similar to high moisture corn but it includes some portion of the cob. Snaplage includes the grain, cob, and shuck (husk leaves and shank).

Preservation of high moisture grains and grain by-products is a common practice for feeding livestock in most temperate regions of the world. High moisture storage of grain has been driven by the savings of not having to dry grain at harvest. The moisture content of most high moisture grain is within the range of 20 to 35%, and the storage time required is usually no more than the time interval between harvests, or up to 12 months. For grain by-products, where the moisture content is much greater, the pressure for high moisture storage is also driven by cost savings. However, storage of by-products is usually for short periods of time only.

As with forages, the anaerobic fermentation during ensiling of these products is based primarily on lactic acid, but amounts produced are variable both between batches of ensiled high moisture grain and even during the storage of any given batch. Not surprisingly, ethanol is found in ensiled grain. Differences in pattern of acid and ethanol production in grain may be attributed to moisture content and form of the grain. Ensiled high moisture grains and grain by-products are prone to considerable aerobic deterioration with post-storage exposure to air. Of the potential additives to facilitate storage, propionic acid is the most successful, although it is used only when the material stands a risk of significant exposure to air during storage. Results from inoculation of high moisture grains and by-products with bacteria are inconclusive, but recent studies with bacteria producing propionic acid show promise. Recovery of dry matter and nutrients after ensiling grain and by-products is usually more than 90% and for grains is usually optimized by storing the grain in sealed structures and at a moisture content between 25 and 30%.

High moisture grains usually contain the same amount of available energy for pigs and ruminants as the corresponding dry grain. In a recent comprehensive review of

feeding grains to beef cattle, it was found that high moisture corn and sorghum were not as efficiently utilized as the corresponding steam rolled dry grain. For lactating dairy cows, however, high moisture grain is used as efficiently, if not more efficiently, than the corresponding dry grain. High moisture storage of grains and by-products does not usually affect food intake.

**For Further Reading:**

Buchanan-Smith, J., T.K. Smith, and J.R. Morris. 2003. High Moisture Grain and Grain By-Products, p. 825-854, In D. R. Buxton, R. E. Muck and J. H. Harrison, eds. Silage Science and Technology. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America.

Hoffman, P.C., R.D. Shaver, and N.M. Esser. 2010. The Chemistry of High Moisture Corn. Proc. 2010 4-State Dairy Nutrition & Management Conf., Dubuque, IA.

# Soybean Yield Contest

Shawn Conley, WI State Soybean and Wheat Extension Specialist

There are some record soybean yields sitting out in the fields this year. Don't forget you have until October 15th to enter the WI Soybean Marketing Board and WI Soybean Association 2015 WI Soybean Yield Contest. Below please find direct links to the yield contest brochure, rules, and entry forms. Also please note a few minor changes to the rules.

- 2015 Wisconsin Soybean Yield Contest Brochure
- 2015 Wisconsin Soybean Yield Contest Rules
- 2015 Wisconsin Soybean Yield Contest Entry Form

2015 WI Soybean Yield Contest rule changes:

1. The minimum field acreage has been reduced to 5 acres.
2. The entry date has been extended until October 15.
3. Division county borders have changed based on 10 year rolling yield averages. Please check map in brochure.

Please visit http://www.coolbean.info or click to view the 2015 WI Soybean Yield Contest rules and entry form.

# 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 September 26, 2015 through October 2, 2015.

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

**Field Crops**

Corn, Anthracnose, *Colletotrichum graminicola,* Buffalo

Corn, Gray Leaf Spot, *Cercospora sp.*, Buffalo

Corn, Northern Corn Leaf Blight, *Exserohilum turcicum*, Buffalo

Soybean, Charcoal Rot, *Macrophomina phaseolina*, McHenry (IL)

Soybean, Sudden Death Syndrome, *Fusarium virguliforme,* McHenry (IL)

**Fruit Crops**

Apple, Flyspeck/ Sooty Blotch, *Flysepck/Sooty blotch fungal complex*, Dane

Apple, Frogeye Leaf Spot, *Botryosphaeria obtusa*, Dane

Apple, Fruit Russet, None, Dane

Apple, Phoma Leaf Spot, *Phoma sp.*, Dane

Apple, Phomopsis Leaf Spot, *Phomopsis sp.*, Dane

Raspberry, Root/Crown Rot, *Phytophthora sp.,* Dane

**Specialty Crops**

Mint, Root Rot, Rhizoctonia sp., *Fusarium sp.*, Rock

**Vegetables**

Basil, Root Rot, *Fusarium sp.*, Sauk

Corn (Sweet), Maize White Spot Disease, *Pantoea ananatis*, Waushara

Cucumber, Downy Mildew, *Pseudoperonospora cubensis,* Dane

Kale, Alternaria Leaf Spot, *Alternaria sp.*, Fillmore (MN)

Kale, Black Rot, *Xanthomonas sp.*, Fillmore (MN)

Potato, Pink Eye, *Pseudomonas fluorescens*, Oneida

Squash, Powdery Mildew, *Oidium sp.*, Rock

Squash, Downy Mildew, *Pseudoperonospora cubensis,* Rock

Tomato, Late Blight, *Phytophthora infestans*, Washington, Waukesha

Tomato, Septoria Leaf Spot, *Septoria lycopersici*, Marathon

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

## 2015 UW Extension Pest Management Update Meeting Series

Damon Smith, Extension Plant Pathology Specialist

Mark your calendars as the UW Extension's Pest Management Update meetings are just around the corner (November 9-19). This year's program will follow the new format established in the 2014 series, with more interaction between presenters and the audience, and participation by Bryan Jensen and Dan Heider with the University of Wisconsin Integrated Pest and Crop Management Program.

We will focus the entire morning (10-noon) on integrated pest management updates by crop (corn, soybean, alfalfa, and small grains). This session will be streamlined to focus on new pesticide registrations, pest updates, and highlight important issues from 2015. After lunch, topics will be more focused on specific updates and diagnostic training. These topics will include:

- Herbicide resistance update and identification
- Managing corn rootworms
- Soybean stem disease identification

These diagnostic and focused trainings were a big hit in 2014 so don't miss out in 2015!

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.**

**Note that due to low turnout in past years, the Arlington location has been dropped from the rotation in 2015.** There will only be 7 locations to attend the update meetings, rather than 8 locations as in previous years. Be sure to look at the 2015 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.

Four hours of CCA CEU pest management credits are requested and available at each location.

The speakers will be extension specialists Mark Renz, weed scientist, perennial cropping systems; Dan Heider, IPM outreach specialist, Bryan Jensen, entomologist, and Damon Smith, field crop plant pathologist.

2015 Pest Management Update Topics:

Integrated Pest Management Updates in corn, soybeans, alfalfa, and small grains: Update on new products and/or use of existing products as well as brief highlights of the 2015 pest situations in each crop.

Herbicide resistance update and identification: Dan Heider and Mark Renz discuss the herbicide resistant weed situation in Wisconsin and how to identify problematic situations.

Managing corn rootworms: Bryan Jensen will take you through identifying corn rootworm problems and how to manage them in field corn.

Soybean stem disease identification: Damon Smith will discuss the 2015 soybean stem disease situation in Wisconsin. He will offer tips on how to identify and manage the various stem diseases that cause problems in Wisconsin.

Check out the full meeting schedule click here.

## 2016 Wisconsin CCA of the Year

Bryan Jensen UW Extension

The Wisconsin CCA Board is now 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 must be completed and 3 letters of reference provided. Nomination Criteria will help with the nomination process.

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.

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