European Corn Borer Resistance Confirmed to Cry1F

Bryan Jensen, Department of Entomology, Division of Extension

Perhaps this won’t come as a surprise, but field resistance has been confirmed in a European corn borer population to the Cry1F protein. However, you may be surprised to find out it was confirmed in Nova Scotia, a Canadian maritime province. Although you may not consider this area to be a corn growing powerhouse, you probably are wondering if this is an example of the “canary in the coal mine” like I am.

The only protein that was affected was the Cry1F which is common in many trait packages both as a pyramid and as a stand-alone above ground trait. For a better understanding of the trait packages please view the Handy Bt Trait Table.

What should this mean for Wisconsin? It means we need to be vigilant and actively looking for damage in hybrids using that protein. Either as a single trait or as a pyramid with other above ground proteins. If you find elevated damage, commonly referred to as Unexpected Damage (UXD,) over and above what you would expect in a RIB, report it to your sales representative. Don’t be bashful. Don’t dismiss it. Catching resistance at an early stage is beneficial to all.

Symptoms of first-generation ECB damage is window-paning on corn leaves followed by either random or transverse holes in corn leaves. This happens as young larvae (pictured above) are feeding within the whorl prior to stalk tunneling. Second generation is a little more cryptic and can include entrance holes in the stalk commonly associated with frass, mid-rib feeding, kernel feeding, dropped ears, broken tassels and broken/lodged stalks.

Fortunately, many hybrids incorporate 2 or more above ground traits and only the Cry1F protein has been implicated at this point. Pyramids can be a good resistance manage tool, however, if resistance goes undetected in one of the proteins the other protein can mask resistance and this puts increased selection pressure on the viable protein.

On one hand the above ground traits have been viable for a long time. On the other hand, it is a matter of time before resistance was document. Keep an eye out for UXD and please report it if found.
Be on the Lookout for Slug Activity

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The cool, wet weather has me thinking ……. of slugs. Although some of our best control practices including tillage, crop rotation, not using insecticide seed treatments and planting date have already been made (or in the case of planting date have been made for us), do be on the lookout for increased slug activity.

Slugs have a “rasp-like” mouthpart and damage seedling plants by scraping off leaf tissue. Because of late planting dates and cool growing conditions seedlings may have a difficult time outgrowing slug damage.

Seedling soybeans are quite susceptible to slug feeding because the growing point is above ground at emergence, therefore stand density can be reduced. Corn can withstand more seedling damage and the economic potential of slug damage is often overestimated. However, make sure the seed furrow is closed or corn can also have significant stand reduction.

What can be done in-season to control slugs? No surprise here, but control early season weed growth to reduce habitat. Do not use foliar applied insecticides unless necessary. Often, using insecticides is a knee jerk reaction because we have come to expect our broad-spectrum insecticides will control all “critters”. No so. Slugs are mollusks and insecticides will not control them. Instead these insecticides will kill beneficial insects that help reduce slug populations. Furthermore, use of the neonic seed treatments will not control slugs but will kill insects that feed on these slugs.

Slugs baits can be effective but given tight profit margins they might not be an option for entire fields. Economic thresholds have not been developed for slugs. Before baits are considered, thoroughly read the label including all applicable footnotes! The metaldehyde-based baits are not labeled for use on soybeans in Wisconsin. This is not obvious because you must refer to a footnote which indicates approved states. The Sodium Ferric EDTA containing product (Iron Fist) comes with precautions as

Alfalfa Weevil

Bryan Jensen, Department of Entomology, Division of Extension

Alfalfa weevil eggs are probably starting to hatch in southern Wisconsin. Although usually considered an occasional pest, there seems to be isolated areas of Wisconsin that receive economic damage each year. Damage from early instar larvae can be hard to spot right now unless you look closely at the terminal portion of the stems and within folded leaves. As larvae grow, damage will be more noticeable.

Alfalfa (42° F) and alfalfa weevil (48° F) have different base developmental temperatures. In a normal year, we expect peak larval feeding around first crop harvest. A well-timed harvest often eliminates weevil damage. Call me crazy, but I don’t think the 2019 growing season is starting out “normal”. A concern at this point would be that alfalfa development is ahead of weevil development. A late egg hatch can shift peak damage from first crop to early second crop. In fields with a history of weevil damage and/or fields with higher than normal first crop damage, consider scouting second crop regrowth for damage to buds and regrowth. If windrows are left for an extended period of time, damage will often be more severe under the protection of that windrow.

Verify presence of weevils in those fields that may not be regrowing as quickly as expected. Unless it is a cool/cloudy day you may not readily find them. Look under leaf litter, cracks in the soil or at the juncture of the crown and soil. If weevils are the cause of slow green up you will find them. A threshold does not exist for this damage, rather you will have to use your best judgement based on amount of damage and larval populations. For alfalfa that has regrown, the economic threshold is 50% tip feeding. Make sure larvae are present before spraying.
Although labeled for Wisconsin corn and soybean production it must be applied between the rows at the seedling and later stages of crop development. Do not expect slug baits to be a cure-all solution. High slug populations, rain and uneven granule distribution will reduce % control.

A final suggestion would be to make detailed field histories while scouting this spring. Use this information to make preventive management decisions next year.

Wisconsin Winter Wheat Disease Update – May 21, 2019

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison, Brian Mueller, Assistant Field Researcher, Department of Plant Pathology, University of Wisconsin-Madison

Winter wheat in Wisconsin continues to move through growth stages at a fairly even pace. Winter wheat plots in our research program located at the Arlington Agricultural Research Station, Arlington, Wisconsin are just approaching the emerging flag leaf stage. Perhaps by the weekend or early next week, flag leaves will have emerged. Interestingly, this growth stage will likely occur almost at the same date as in 2018. Last season, we applied our Feekes 8 fungicide treatments on May 25th. So while it has been cool, and wheat appears to be moving through growth stages slowly, things aren’t too far off from 2018.

Weather remains very wet. Most wheat we have scouted this week appears to be clean of disease. One concern we have is the development of Septoria leaf blotch. In 2016 we had an early epidemic of this leaf disease, that impacted yield. The cool conditions are not particularly conducive for this disease, but the high humidity and wet conditions certainly are. Weather forecasts indicate warmer conditions over the next week, thus keep your eyes peeled for the development of the disease.

Septoria leaf blotch can be identified by necrotic lesions that develop on leaves of winter wheat. Small fruiting structures (pycnidia) can often be identified inside the necrotic area of the lesions, with the naked eye or a good hand lens (pictured next column). Prolonged wet/humid conditions broken by a brief dry period, followed by more wet conditions, can favor infection. Temperatures between 60 and 77 F favor disease development. Septoria leaf blotch can be managed with varietal resistance (both race-specific and partial resistance) and also fungicides. For a list of effective fungicides for Septoria leaf blotch control, CLICK HERE to download a copy of the Small Grains Fungicide Efficacy Table. For more information pertaining to Septoria leaf blotch, and other related leaf blotch diseases, CLICK HERE to download a fact sheet.

Thus, there was no inoculum in the state to infect fall-sown wheat. Inoculum for an epidemic to initiate in 2019 will have to come from the southern U.S. The best way to make an educated decision to spray is to scout and catch the disease in its early stages. Continue to pay attention to extension reports as we track stripe rust from the southern U.S., northward.

How Will Delayed Planting Influence Crop Diseases in 2019?

Damon Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison, Darcy Telenko, Extension Field Crops Pathologist, Purdue University

We keep getting this question, because as we write this, it is storming yet again in many locations in the Midwest. Rain, rain, and more rain has pushed back timely planting everywhere. Concern is starting to mount about not only yield loss simply from delayed planting, but what increased risk of yield loss due to disease there might be in 2019. As we consider this issue, we will use tar spot of corn and white mold of soybean as just two examples of where this could be an issue.

The Plant Disease Triangle. Remember that the plant disease triangle is the foundation for understanding how plant diseases develop and how to manage them. In order for a plant disease to occur you must have a virulent
pathogen, a susceptible host plant, and favorable weather conditions to coincide at the same time. If any one of these three components is missing (or we implement a management strategy that removes or reduces one component) then a plant disease will not occur. When it comes to the host component, it not only matters that the host is generally susceptible but is also at a susceptible growth stage. Consider white mold of soybeans for a minute. All stages of soybean are susceptible to infection by the white mold fungus, but most infections occur through open flowers. Thus, the disease triangle is met when you have (1) white mold fungal spores flying around at the same time that (2) soybean flowers are open (susceptible stage), during, (3) cool and wet weather (favorable environmental condition) completing the triangle. The point here is that if we continue in a cool wet pattern, and delayed planting continues, we may quickly find ourselves with crops at susceptible growth stages when the weather is very conducive to disease.

Delayed Planting and White Mold of Soybean. In 2017, we had an epic epidemic of white mold on soybean across the upper Midwest (pictured above). One of the main reasons that the epidemic was so bad is that it was generally cool for a large portion of the season. This resulted in soybeans that moved very slowly from one growth stage to the next. When it came to flowering, soybeans bloomed for an extended period of time. This left them in a susceptible growth stage for about twice as long as normal. These cool conditions also coincided with wet weather that was favorable for the pathogen. In 2018, planting occurred reasonably on-time and we accumulated heat units quickly. Bloom started early in the season and was about half as long as it was in 2017. This meant that soybeans “escaped” infection in large portions of the upper Midwest. Fast-forward to 2019. If this cool rainy cycle persists, and planting is delayed, then soybeans may bloom later and over an extended period of time during wet/humid weather conditions. Keeping an eye on weather before and during the soybean bloom period along with consulting the Sporecaster smartphone app can help you make the educated decision to spray fungicide or not.

Delayed Planting and Tar Spot of Corn. In 2018 Tar spot of corn (pictured below) created quite a stir. The epidemic was widespread and caused some significant yield losses in areas that it occurred. The tar spot fungus is residue-borne. There is also decent evidence that it can survive over-winter on corn residue. Our laboratories have been investigating tar spot fungal survival on corn residue collected after snow-melt in Wisconsin and Indiana. Regardless of whether there was fall tillage performed or not, survival of tar spot fungal spores (ascospores) on the residue collected ranged between 15 and 40%, with an average around 20%. These are VERY preliminary findings (and the numbers might change once we finish counting and analyzing data), but the point is that there is viable tar spot fungal inoculum present in Midwest corn fields. Therefore, one component of the triangle is met! As for the other two components, corn is being planted later than normal and conditions are cool and wet. Again, if this cycle of cool and wet holds, conditions will be favorable for the fungus. Delayed planting of corn will also push corn into conducive growth stages for the fungus to infect and cause heavy yield losses (although, we have seen infection at all growth stages as long as there was green tissue available). One of the reasons that the 2018 tar spot epidemic was so significant, was that many areas of the upper Midwest had cool and excessively wet conditions around the V6 growth stage and again near or after the VT growth stages. When foliar diseases of corn start at early growth stages (V6 or V8) the risk for yield loss can be much higher than if they start after R2 or brown silk. Keep an eye on the weather between the V6 and R2 growth stages and consult with your local extension personnel to decide if a fungicide might be warranted for corn to prevent tar spot, or other foliar diseases.

Scouting and Watching Weather Reports Might Pay in 2019. Once corn and soybeans are planted, take the time
to scout and pay attention to the weather. While thorough scouting can take time, it may be worth it in 2019. Catching a plant disease early can be the difference in being successful in managing it or not. Pay attention to the weather leading up to, and during, the critical crop growth stages. This can also help you make an educated decision about in-season application of fungicides. If it is cool and humid/rainy, and the crop is at a susceptible growth stage, then a fungicide application might be warranted. If it is hot and dry and the crop moves quickly through susceptible growth stages, then a fungicide might not be warranted. Study the disease triangle and use it to your advantage. The 2019 field season could be a year that this knowledge might be handy!

**Palmer amaranth and Herbicide Resistance, detected in WI**

Dr. Rodrigo Werle Assistant Professor & Weed Specialist
Department of Agronomy

Another Herbicide-Resistant Palmer amaranth population detected in Wisconsin. In 2018, Dr. Rodrigo Werle detected Palmer amaranth in a soybean field in south-central Wisconsin. Palmer amaranth seeds were collected and submitted to molecular and greenhouse screenings for herbicide resistance.

**Is Strip-till a Useful Soil Management Tool for Wisconsin Corn and Soybean Production?**

Derek Potratz, Spyridon Mourtzinis, John Gaska, Joe Lauer, Francisco Arriaga, and Shawn Conley

- Strip-till reduced penetration resistance in the root zone of strip-till rows.
- Soybean seed yield was similar between the strip-till 30” row and no-till 15” row spacings.
- Strip-till and banded fertilizer increased corn grain yield.
- Crop rotation increased corn plant population and yield.

**INTRODUCTION**

Wisconsin corn and soybean growers have steadily improved grain and seed yield over the past decade; however, they are annually challenged with yield suppressing conditions such as cold, dense soils, difficult early season planting conditions, and highly erodible landscapes. To resolve these issues, many growers utilize tillage as a soil management technique. However, the combination of tillage and erodible landscapes can increase erosion (Seta et al., 1993). Current recommendations for corn and soybean production in a corn/soybean (CS) rotation in Wisconsin are to utilize no-till 30” and 15” row spacings, respectively. Due to a perceived yield plateau to row crop no-till soybean and corn, growers in Wisconsin have become increasingly interested in strip-till as a management tool to improve early season planting conditions while maintaining soil structure and health (Allmaras and Dowdy, 1985). By combining strip-till with different commonly used corn and soybean management practices, the objectives were: 1) quantify the effect of strip-till, row spacing (soybean only), crop rotation (corn only), fertilizer placement, and in-furrow fungicide on corn and soybean plant population, canopy coverage, and grain or seed yield, 2) evaluate strip-till, row spacing, fertilizer placement, and in-furrow fungicide on soil temperature and penetration resistance, and 3) determine best management recommendations for strip-till use in Wisconsin corn and soybean production systems.

Continue reading the post: Is Strip-till a Useful Soil Management Tool for Wisconsin Corn and Soybean Production?
Adjust Your Seeding Rate (Higher) But Not Your Maturity Group For Late May Planted Soybean

Adapted from original article written in 2018 by Authors: S.P. Conley, J.M Gaska, S. Mourtiznis, D. Mueller, and A. Varenhorst

With only 11 days left in May and roughly only 19% of the Midwestern soybean crop planted (WI:12%, IA:27%, SD:4%) what if any production changes should growers consider modifying?

• Do Not Switch Your Maturity Group….Yet
• Increase your seeding rate to roughly 154,000 seeds per acre
• Interpret the below information on return above seed cost cautiously

Continue reading the post Adjust Your Seeding Rate (Higher) But Not Your Maturity Group For Late May Planted Soybean appeared first on Cool Bean.

Corn Replant/Late-plant Decisions in Wisconsin

Dr. Joe Lauer, UW-Madison Agronomy and Extension State Corn Specialist

Many areas of Wisconsin are faced with a late-planting situation for corn. Please see the first publication (http://corn.agronomy.wisc.edu/Pubs/UWEX/A3353.pdf) for guidelines on yield impacts and hybrid maturity switch dates.

For other information about corn late-planting, see http://corn.agronomy.wisc.edu/Management/L010.aspx

Also, Paul Mitchell, UW Ag Economist, has summarized Prevent Planting and Crop Insurance options at https://aee.wisc.edu/pdmitchell/CropInsurance/LatePrevent-Plant2019.pdf.

Links to Recent Wisconsin Pest Bulletins

Krista Hamilton, Entomologist, Wisconsin Department of Agriculture, Trade and Consumer Protection

Volume 64 Issue No. 04 of the Wisconsin Pest Bulletin is now available at: https://datcpservices.wisconsin.gov/pb/pdf/05-23-19.pdf

- LOOKING AHEAD: Peak black cutworm damage window opening this weekend
- FORAGES & GRAINS: Alfalfa weevil larvae appearing in sweep nets
- CORN: True armyworm moths continue to arrive in Wisconsin
- SOYBEAN: Low risk of bean leaf beetle defoliation for emerging soybeans
- FRUITS: Codling moth spring biofix and plum curculio migration expected next week
- kVEGETABLES: Seedcorn maggot ‘fly-free’ period beginning soon
- NURSERY & FOREST: Root rots and powdery mildew prevalent due to wet weather
- DEGREE DAYS: Growing degree day accumulations as of May 22, 2019

This post originates at the Wisconsin Pest Bulletin website.

Links to Recent UW-Madison Vegetable Crop Updates

Amanda Gevens, Associate Professor & Extension Specialist, Potato & Vegetable Pathology, Plant Pathology Department

Update 4 – May 23, 2019

- White mold of potato and vegetable crops
- Access to the A3422 Veg Production Guide

Update 3 – May 12, 2019

- Vegetable production updates
- Disease forecasting info and updates for potato

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