Wisconsin Crop Manager

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Pea Aphids in Alfalfa

Bryan Jensen

UW Extension

After looking at a few alfalfa fields on the Arlington Agricultural Research Station and talking with PJ Liesch, UW Entomology, it appears that some aphid species have been doing quite well this spring.

Pea aphid populations in both the established stands and new seedings were elevated but not to the point where rescue treatments were needed. However, as pea aphid populations start to increase they become very conspicuous and can get people's attention.

Pea aphids are an occasional insect pest on alfalfa and their threshold is high compared to potato leafhop

Pea aphids

pers. Although it is possible to have economic damage on established stands it is unusual. Many factors keep populations at sub-economic levels including intense cutting schedules, environmental conditions, pathogens, predators and parasitoids. Aphid populations can build to higher levels in new seedings but that is also rare. Do scout and monitor aphid populations just don't get too excited because you see lots of insects. Unnecessary insecticide applications can, and have led to aphid resurgence. You kill most of the natural enemies but not all the aphids. Without this natural control aphid populations increase rapidly.

Pea aphids can be either green or rose colored, winged or unwinged and large or small depending whether they are nymphs or adults. You will also find dead individuals that are light tan and attached to leaves. Either this can be the result of a fungal pathogen or aphids kill by parasitoids.

The economic threshold is listed as a field average of 100 pea aphids/sweep. Under good growing conditions I doubt you would see an economic benefit to spraying, especially in established stands. But if the alfalfa is under stress then a foliar application may be needed. Unless you are close to cutting. Harvesting alfalfa is an excellent cultural control method and few aphids will survive.

Pea aphid killed by parasitoid

Essentially, winged pea aphids will have to recolonize the field.

So how might this weather relate to Soybean Aphids? While this type of weather can be conducive, it is much too early to tell for sure. Proper and timely scouting will give you the information needed.

Slugs

Bryan Jensen

UW Extension

I have been getting some calls and emails regarding slug damage in corn and soybean. With the way the weather has been going it was only a question of when, not if.

Slugs are herbivorous and will feed on a variety of broadleaf and grass plants. Both soybean and corn are attractive hosts. Slugs are be also found feeding in small grains and alfalfa, however, their damage rarely is of economic importance.

Slugs have a "rasp-like" mouthpart and damage seedling plants by scraping off leaf tissue. These feeding scares are usually longitudinal (especially in corn) and may initially leave the wax-like cuticle intact. This symptom is often call "window paneing". Eventually the cuticle will weather and drop off. Slugs may be difficult to find because they are nocturnal. However, they may be active on cool, cloudy days. During daylight hours, they hide under soil clods and plant debris. Slug injury is often so characteristic that finding slugs to confirm their damage (vs. other insects) may not be needed.

Initiate scouting for slugs in fields with a history of slug feeding or in fields with significant residue. Economic thresholds based on % defoliation or slug numbers have not been developed.

Water conservation is extremely important for slug survival. Conditions that lead to greater slug survival include cool/wet weather, excessive crop residue and high weed pressure. Prevention is important and controlling residue is probably the most effective cultural control practice. However, many growers are committed to reduce or no-till systems and are unable to change the amount of residue.

Other cultural practices may, or may not provide adequate levels of prevention. Use of row cleaners/trash whippers when planting may help under low to moderate slug populations. Also, early planting may give corn and soybeans a head start and allow them to outgrow damage. Planting corn instead of soybean into suspected slug hotspots may also be an option because corn's growing point is below ground for a period of time. However, make sure the seed furrow is completely closed during planting. Open seed furrows allow slugs to feed on the emerging plant and consume the growing point. Open seed furrows also serves as another protected site to hide during daytime hours.

Chemical control using baits in corn can a rescue option. Baits using the active ingredient methadehyde can be an effective treatment but they should not be considered a "silver bullet". Bait formulations have gotten better in recent years. Both in terms of higher % active ingredient and their persistence. A ballpark cost estimate is $1.90-$2.00/lb of product. However, that price is dependent on several factors including availability, incentives, amount purchased, etc. Your costs will vary. Per acre costs will of course vary depending on use rates. Accurate distribution of product is very important. Read and follow label directions for assistance with timing, application type(s), rates and product distribution.

I have heard anecdotal evidence of people using liquid fertilizers in an attempt to control slugs. However, results have not repeatable. Furthermore, I would have concerns over crop injury at rates necessary to get adequate coverage to control slugs.

Vegetable Crop Update June 13, 2015

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 14th issue of the Vegetable Crop Update is now available which addresses the following topics:

- disease forecast updates (PDays and DSVs)
- national late blight updates

Click here to view this issue.

Vegetable Crop Update June 17, 2015

Amanda Gevens, Assistant Professor & Extension Vegetable Plant Pathologist

The 14th issue of the Vegetable Crop Update is now available which addresses the following topics:

- disease forecast updates - all regions and plantings of potatoes in WI (but for late planted in Antigo area) have exceeded DSV18 threshold
- late blight updates
- considerations for shortage of chlorothalonil in 2015
- downy mildew updates for cucurbits, basil, and onion

Click here to view this issue.

UW Madison/ Extension Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Sean Toporek, Ann Joy and Joyce Wu

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 June 6, 2015 through June 12, 2015.

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

Field Crops
Wheat, Cephalosporium Stripe, Cephalosporium gramineum, Lafayette

Fruit Crops
Blueberry, Gloeosporium Canker, Gloeosporium sp., Trempealeau
Blueberry, Root Rot, Pythium sp., Trempealeau

Vegetables
Tomato, White Mold, Sclerotinia sclerotiorum, Dane

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

UW Madison/ Extension Plant Disease Diagnostic Clinic (PDDC) Update

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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 June 13, 2015 through June 17, 2015.

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

Field Crops
Corn, Seedling Blight, Fusarium sp., Sauk
Soybean, Seedling Blight/ Root Rot, Pythium sp., Rhizoctonia sp., Fusarium sp., Brown, Grant, Marathon
Wheat, Cephalosporium Stripe, Cephalosporium gramineum, Vernon

Forage Crops
Alfalfa, Crown Rot, Phomo sp., Fusarium sp., Jefferson

Fruit Crops
Blueberry, Sphaeropsis Canker, Sphaeropsis sp., Jefferson

Vegetables
Cucumber, Unspecified Potyvirus Disease, Unspecified potyvirus, Columbia
Onion, Seedling Blight, Pythium sp., Fusarium sp., Columbia
Onion, Stemphylium Leaf Blight, Stemphylium sp., Columbia
Tomato, Root Rot, Pythium sp., Fusarium sp., Dane
Tomato, Septoria Leaf Spot, Septoria lycopersici, Sauk

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

Herbicide injury during and after emergence in soybean

Liz Bosak, Outreach Specialist, Department of Agronomy, University of Wisconsin

Pre-emergence and post-emergence herbicides can injure soybean plants. This year, soybean injury symptoms following pre-emergence applications have been relatively slight for May 13 and May 19 planting dates. In the herbicide evaluation program, soybean injury symptoms that we typically observe are stunting, drawstring (puckering), chlorosis (yellowing), and necrosis. However, it is important to keep in mind that injury symptoms may be due to weather, soil conditions, or disease (Fig. 1)

To diagnose an injury problem at or during emergence, first check the root system of the plant. Seedling root growth inhibitors, ALS inhibitors, and growth regulators change the root architecture in different ways. Next step, if the roots appear normal, take a look at the leaves for yellowing (chlorosis), bleaching, or drawstring (puckering). To help with diagnosis, University of Wisconsin Extension has a two-page guide, available for download at http://ipcm.wisc.edu/download/pubsPM/herbicideinjury_new.pdf , and an online diagnostic tool at http://wcws.cals.wisc.edu/herbicide-injury-diagnostic-tool/ .

After emergence, PPO inhibitor injury tends to appear on the leaves that receive the application but younger leaves will not show any injury symptoms. Typical damage includes yellowing (chlorosis) and browning of the leaf surface in spots (necrosis) (Fig. 2A). Researchers at Purdue University have a five minute video discussing PPO inhibitor and fluopyram (ILeVO) seed treatment injury, https://youtu.be/GQwJodB7E_M . It is important to remember that despite the damage, in most cases yield is not affected. Also, PPO inhibitors add another site of action to your resistance management plan and effectively control a variety of broadleaf weed species. Growth regulators cause leaf cupping or epinasty (downward growth habit) (Fig. 2B). The leaves of soybean plants with ALS inhibitor injury show chlorosis and distinctive reddish leaf veins (Fig. 2C).

During or at Emergence
Mimics of Herbicide Injury to Soybean

GROUP #	HERBICIDE SITE OF ACTION	SYMPTOM
4 19	GROWTH REGULATORS	Crusted soil
5 6 7	PHOTOSYNTHESIS INHIBITORS	Frost
		Sandblasting
		Sun scald
		Disease- Phytopthora
		Disease- Rhizoctonia seedling rot
14	PPO INHIBITORS	Sandblasting
		Disease- Bacterial leaf blight
3	SEEDLING ROOT GROWTH INHIBITORS	Cold/Wet soil
		Compacted soil
		Swollen hypocotyls caused by crusted soil or deep planting
		Damage- Nematode

After Emergence
Mimics of Herbicide Injury to Soybean

GROUP #	HERBICIDE SITE OF ACTION	SYMPTOM
2	ALS INHIBITORS	Iron deficiency
		Potassium deficiency
9	EPSP SYNTHASE INHIBITOR (GLYPHOSATE)	Iron deficiency
		Potassium deficiency
10	GLUTAMINE SYNTHETASE INHIBITOR (GLUFOSINATE)	Frost
		Iron deficiency
4 19	GROWTH REGULATORS	Disease- Virus
		Damage- Aphid feeding
5 6 7	PHOTOSYNTHESIS INHIBITORS	Frost
		Sandblasting
		Sun scald
		Iron deficiency
		Potassium deficiency
		Disease- foliar
		Disease- root
		Disease- seedling
22	PHOTOSYSTEM I ELECTRON DIVERTER	Frost
		Sun scald
		Disease- Septoria leaf spot
		Disease- Bacterial leaf blight
14	PPO INHIBITORS	Disease- Pythium
		Disease- Rhizoctonia
		Disease- Phytopthora
8 15 16	SEEDLING SHOOT GROWTH INHIBITORS	Deep planting
		Crusted soil
		Disease- Phytopthora
		Disease- Pythium
		Disease- Rhizoctonia

Figure 1. Mimics of herbicide injury to soybean during or after emergence.

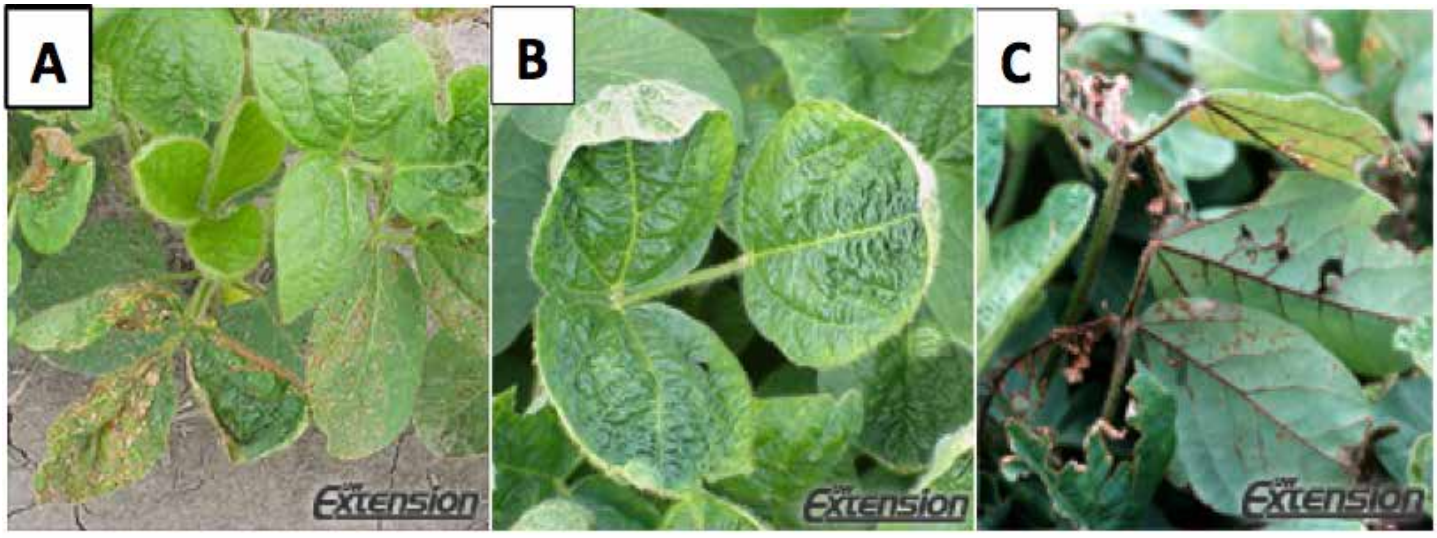

Figure 2. A) PPO inhibitor damage, B) Growth regulator induced leaf cupping, C) ALS inhibitor injury.

Injury symptoms typically appear seven to fourteen days after application and will gradually decrease through the season when the plants resume normal growth. Phytotoxicity data are available in the WCWS research reports at http://wcws.cals.wisc.edu/research/herbicide-evaluation-program/ . Each trial contains a summary section that will mention if any phytotoxicity symptons were observed. If the injury differed by treatment and exceeded five percent then a bar graph is included. Crop injury resulting from an application made according to the label instructions usually does not cause a reduction in yield. "Pest Management in Wisconsin Field Crops" shows the relative risk of soybean injury from different herbicides on pages 143 and 144, available at Cooperative Extension's Learning Store, http://learningstore.uwex.edu/Pest-Management-in-Wisconsin-Field-Crops2015-P155.aspx .

2015 Agronomy/Soils Field Day on August 19th

The Departments of Agronomy and Soil Science in conjunction with the Arlington Agricultural Research Station will host their annual field day on August 19, 2015. The field day will highlight UW-Madison research on emerging technologies and relevant crop production issues. The field day will begin at 8:00 am and run until 2:30 pm. Lunch will be provided by the Badger Crops Club ($5 donation).

Program

8:30- Registration & coffee; Pest Management, Soil Fertility & Management, & Bioenergy Cropping Systems tours

10:30- Grain & Forage Production Systems, Pest Management, & Bioenergy Cropping Systems tours

12:00- Lunch provided by Badger Crops Club ($5 donation).

Rick Klemme, Dean and Director of UW Cooperative Extension, will present "Re-booting UW-Extension: Transforming Today's Extension for Tomorrow's Possibilities"

1:00- Grain & Forage Production Systems, Soil Fertility & Management, and Organic Cropping Systems Tours

Note: Tours depart promptly as scheduled.

Tours

Grain and Forage Production Systems (tours at 10:30 and 1:00)

- When is yield "determined for corn grain production (Joe Lauer)
- Revamping outdated soybean nutrient uptake models: Results from a high input systems model (Dave Marburger & Adam Gaspar)
- Other CoolBean stuff! (Shawn Conley)
- Forage harvest logistics image based kernel processing score & applied UAV research (Brian Luck)

Pest Management (tours at 8:30 and 10:30)

- A Wisconsin perspective on corn rootworm resistance to Bt hybrids: Detection, avoidance, and management (Bryan Jensen)
- Herbicide resistance management in corn and soybean (Liz Bozak & Devin Hammer)
- Can we manage weeds without roundup ready crops when we plant corn & alfalfa? (Mark Renz)
- Soybean disease & insect management research results & recommendation (Jaime Willbur & Chris Bloomingdale)

Soil Fertility and Management (tours at 8:30 and 1:00)

- Response of no-till corn & soybean to P & K (Carrie Laboski)
- Management impacts on soil organic matter & productivity of continuous corn (Francisco Arriaga)
- Untangling the rotation effect on soil resilience (Bill Bland)
- Cover crops as a trap crop for soil nitrate (Matt Ruark)
- Introduction of new Soil & Forage Analysis Lab Director at Marshfield (Robert Florence)

Bioenergy Cropping Systems (tours at 8:30 and 10:30)

- Exploiting available genetic variability for biomass-based biofuel production: The example of corn (Natalia de Leon)
- Developing sustainable perennial bioenergy crops (Mike Casler)
- What have we learned growing eight bioenergy cropping systems over eight years (Randy Jackson)
- Integrating information from breeding tools for biofuel crop development (Shawn Kaeppler)

Organic Cropping Systems (tour at 1:00)

- Managing organic cropping system for carbon stabilization and accrual (Gregg Sanford)
- Pasture & soil quality surveys from organic dairy farms across Wisconsin (Geoff Brink, Chelsea Zegler, & Anders Gurda)
- Cover crop-based no-till systems: Options for Wisconsin's organic farmers (Erin Silva)
- Breeding for organic sweet corn: The case of "Who Gets Kissed" (Bill Tracey)

Visit the exhibits between tours and during lunch: Apps for Ag; Nutrient & Pest Management Program; Integrated Pest Management Program; SnapPlus; and more!!

The Arlington Research Station is located on Hwy. 51, about 5 miles south of Arlington. Watch for Field Day signs. GPS coordinates: 43.300467, -89.345534

For more information contact the Dept. of Agronomy 608/262-1390 or the Dept. of Soil Science 608/262-0485.

In the event of rain, presentations will be held inside.

For more information click here.

Time to Start Looking for Corn Diseases in Wisconsin

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

The 2014 field season was a bit of a challenge for corn growers in Wisconsin, to say the least. We had poor growing conditions, which made for a lot of challenges including diseases. On the top of that list in Wisconsin was Northern Corn Leaf blight (NCLB). A close second was Goss's Wilt. Already in 2015, states like Iowa and Nebraska have already reported both diseases on corn. This is among the earliest reports of both diseases in many years. In Wisconsin, we haven't seen either of these yet, but given the weather patterns recently, I think it is only a matter of time.

For many folks, identification of these two diseases can be challenging. Many are confused by the subtleties of each disease "signature." Diagnosis is critical in making your management decisions properly. Obviously, the best way to properly diagnose any plant disease problem is to send a sample to the Plant Disease Diagnostic Clinic. A sample can be sent by following their helpful sample guidelines, which can be found by clicking here. In addition to sending a diagnostic sample, there are some signs and symptoms that can be identified in the field, to help get you closer to diagnosing the right disease. Here are some helpful details for each disease.

Figure 1. NCLB Lesions on a corn leaf

Northern Corn Leaf Blight (NCLB): NCLB is caused by a fungus called *Exserohilum turcicum*. 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. Often the best time to apply fungicides to field corn to maximize the benefits is near the VT/R1

Figure 2. Foliar symptoms of Goss's wilt on a corn leaf. Photo Credit: Larry Osborne, Bugwood.org.

growth stage. However, if NCLB is visible on leaves earlier than this time, a fungicide might be beneficial at those earlier stages. The only way to determine this is to scout frequently and keep an eye on the disease situation in your corn crop.

If you elect to control NCLB with fungicides, you might consider taking a look at my page on FUNGICIDE INFORMATION. This page talks about fungicide use in general and also includes the 2015 Corn Fungicide Efficacy Table. You will find products listed with good efficacy toward NCLB on this table.

Additional NCLB Information

Purdue University – https://www.extension.purdue.edu/extmedia/BP/BP-84-W.pdf

Iowa State University – http://www.extension.iastate.edu/CropNews/2014/0714Robertson.htm

Goss's Wilt: Goss's wilt is caused by the bacterium *Clavibacter michiganensis subsp. nebraskensis*. First visual symptoms usually appear as gray or yellow stripes on leaves that tend to follow the leaf veins (Fig. 2). Often "freckles", or brown or green irregular spots, can be observed within the leaf lesions (Fig. 3). Freckles are an excellent diagnostic symptom to confirm Goss's wilt. Vascular tissue, husks, and kernels can sometimes take on an orange hue. Occasionally, bacterial ooze or dried ooze can be observed on symptomatic leaves. **Fungicides do not work for Goss's wilt, because this is caused by a bacterium, not a fungus.** Management is preventative for Goss's wilt. Choose hybrids with the best possible resistance, manage excessive amounts of corn surface residue, and rotate crops. The longer the rotation between corn crops, the better. There are some foliar products being marketed for the control of Goss's wilt, but no efficacy data are currently available.

Figure 3. "Freckles" on a corn leaf with Goss's wilt. Photo credit: Larry Osborne, Bugwood.org.

Additional Goss's Wilt Information

University of Nebraska – http://pdc.unl.edu/agriculture-crops/corn/gosswilt

Purdue University – https://www.extension.purdue.edu/extmedia/bp/BP-81-W.pdf

Corn Diagnostics Quick Guide: Many of you likely attended the 2014 Pest Management Update Series and obtained the corn diagnostics quick guide sheet to help differentiate between Goss's wilt and NCLB. I have again attached it to this post for download as a PDF. This is a quick guide to help you differentiate the diseases in the field. Remember, the only way to definitively differentiate the diseases is to send a sample to the diagnostic clinic. Get out there and SCOUT, SCOUT, SCOUT!

Wisconsin Pest Bulletin 6-18-15

Krista Hamilton, Entomologist

Issue No. 9 of the Wisconsin Pest Bulletin is now available at: https://datcpservices.wisconsin.gov/pb/pdf/06-18-15.pdf

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