Wisconsin Crop Manager

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Contents

Early Season Armyworms

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UW Extension and IPM Program

Migrating adults were noticed in DATCP's black light trap network a few weeks ago. Specifically, in Rock and Monroe Counties. Since those early captures, relatively few have been reported. I'm not sure why. Perhaps it is because of the cooler nighttime temperatures or……. because there are few migrating moths. Regardless, it might be a good time to review likely fields where spot-checking would be useful. It seems every year someone in the state is surprised by early season armyworm activity. Injury is often widely scattered but can be severe is isolated fields. Knowing those field characteristics which attract egg laying adults can really help target our scouting efforts.

Armyworm adults are usually attracted to dense, grassy surroundings to lay eggs, with one exception. Those attractive grassy areas could be weeds, crops and cover crops. Grassy weeds are certainly attractive as are grass cover crops such as cereal rye. Egg laying and/or feeding may start before corn is planted or emerged. Automatically tank mixing an insecticide with the burn-down herbicide is not recommended because effective rescue treatments are available if needed. Conservation of non-target species is important and may provide benefits later. Especially if slugs are a problem. Winter wheat and other dense growing spring seeded small grains may also be attractive egg laying sites. Concentrate scouting efforts in dense cover and/or where lodging has occurred.

The exception to the grassy weeds/crops/cover crops rule is corn that is no-tilled into alfalfa. For some reason, armyworms can be highly attractive to this field scenario.

Armyworm damage to seedling corn

Often to the field and/or line within a field. Additionally, in 2015 we had a few reports of stand loss in weed-free soybeans. I am still confused why this happened. It could be an "any port is a storm" type of egg laying circumstance or perhaps armyworms read different books than we do. Insect behavior can be difficult to predict.

As you would expect, the economic threshold for armyworms varies according to the crop. However, one commonality is that armyworm are best controlled when under 1-inch long. In wheat, the long established economic threshold is a field average of 3 armyworms/square foot. Armyworm larvae are nocturnal feeders and damage from early instars can be hard to detect in dense small grain fields. Look for larvae on the soil surface during the day. In seedling corn, the threshold is a less clear cut than for small grains. In late vegetative/early reproductive corn, the threshold is 1 armyworm on 75% of the plants or 2 armyworms on 25% of the plants. Seedling corn, can be very resilient. In a recent article published by Kelly Tilmon and Andy Michel, Ohio State University, they suggested rescue treatments may be needed if stand infestation is greater than 50% and larvae are not yet mature. I think that is an excellent guideline.

Armyworm Larvae

FYI, armyworm larvae have a tan head w/ numerous vein-like lines in the compound eyes. Body color and intensity can be very diverse and but alternating light to darker color lines are usually noticeable. Typically, the "belly" is lighter colored than the rest of the body. I mentioned larvae are nocturnal feeders, during the day larvae often rest deep within the corn whorl. Abundant frass in the whorl can be a give-away to their presence. Armyworm defoliate plants by (usually) feeding on leaf margins, although they may chew ragged holes in the leaves.

Some Risk for Wheat Crop Injury From Saturday's Cold Temps

Shawn Conley, Soybean and Wheat Extension Specialist, Department of Agronomy

Saturday mornings cold temperature may lead to crop injury in low lying areas across Southern WI. Based on the development in our wheat plots the highest risk for yield loss would likely come in the southern tier of WI counties. The wheat at our southern locations are either at the Feekes 8 (flag leaf visible) or 9 (flag leaf ligule and collar visible) crop growth stage dependent upon variety.

Image 1. Feekes 9 crop growth stage at Arlington WI on 5/16/16

Crop injury at these growth stages would occur in the 24 to 28 (duration of up to two hours) degree F temperature range. We did not see this temperature extreme at our Arlington location (Image 2; low temp of 30.5) however I have heard reports of extended cold temperatures in the sub 28 degree F range.

Image 2. Arlington WI weather data for the last week.

The two types of crop injury I would be concerned about include stem damage and spikelet (head) injury. In Image 3 below you can see the brown discoloration and water soaking to wheat stems caused by freeze injury. This injury eventually lead to severe lodging among select varieties (Image 4). If you see this type of injury it would be best to take this field as a forage crop ASAP. The other type of injury would be direct damage to the wheat head. Peel back the boot and expose the wheat head. If healthy individual florets on the spikelet will appear pale green (Image 5). If they begin to appear water-soaked or off colored (brown) then crop injury occurred).

Image 3. Freeze damage to wheat stem.

Image 4. Subtle difference is crop growth stage led to severe lodging due to freeze injury.

For more detailed information I have attached a link to a publication entitled Spring Freeze Injury to Kansas Wheat. For ease I have also removed a table from that publication to stress the importance of growth stage on damage potential (Table 1).

Image 5. Healthy spikelet and florets.

Table 1. Wheat Resistance to Freeze Injury (From: Spring Freeze Injury to Kansas Wheat)

Figure 1. Temperatures that cause freeze injury to winter wheat at different growth stages. Winter wheat rapidly loses hardiness during spring growth and is easily injured by late freezes (graph adapted from A.W. Pauli).

Table 1. Temperatures that cause freeze injury to wheat at spring growth stages and symptoms and yield effect of spring freeze injury.

Growth stage	Approximate injurious temperature (two hours)	Primary symptoms	Yield effect
Tillering	12 F (-11 C)	Leaf chlorosis; burning of leaf tips; silage odor; blue cast to fields	Slight to moderate
Jointing	24 F (-4 C)	Death of growing point; leaf yellowing or burning; lesions, splitting, or bending of lower stem; odor	Moderate to severe
Boot	28 F (-2 C)	Floret sterility; spike trapped in boot; damage to lower stem; leaf discoloration; odor	Moderate to severe
Heading	30 F (-1 C)	Floret sterility; white awns or white spikes; damage to lower stem; leaf discoloration	Severe
Flowering	30 F (-1 C)	Floret sterility; white awns or white spikes; damage to lower stem; leaf discoloration	Severe
Milk	28 F (-2 C)	White awns or white spikes; damage to lower stems; leaf discoloration; shrunken, roughened, or discolored kernels	Moderate to severe
Dough	28 F (-2 C)	Shriveled, discolored kernels; poor germination	Slight to moderate

Frost on Corn: The Key is Patience

This past weekend significant areas of northern Wisconsin were affected by frost with temperatures below 28 F. Most corn has either not emerged or is just starting to emerge. The key management practice here will be patience. It will take some time to determine if corn was damaged by this frost.

Corn plants will not be killed by frost unless temperatures get cold enough to kill the growing point that is 3/4 of an inch below the soil surface. So corn that has not emerged typically is well insulated from frost damage.

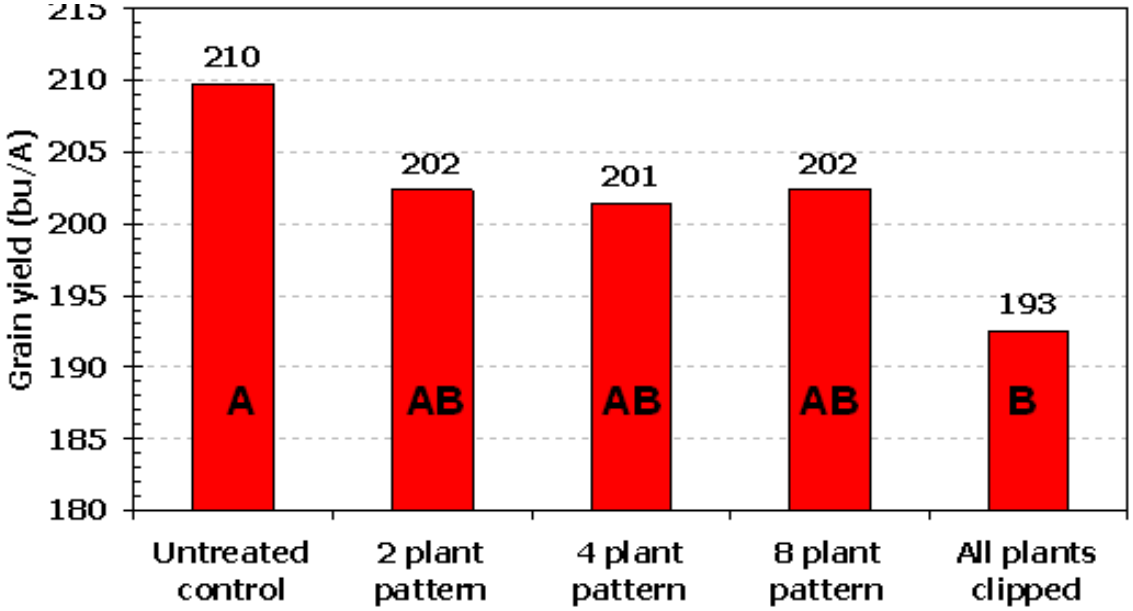

Figure 1. Impact of clipping corn leaves at V2. Experiments were conducted in 2001, 2002, 2003, 2004, and 2005 at Arlington, WI. Treatments consisted of clipping at ground level (or not clipping) consecutive plants in 2-, 4-, 8-, and all-plant patterns.

So corn that has not emerged typically is well insulated from frost damage.

Frost should not be a problem with corn until the growing point moves above-ground around V5 to V6. Farmers and agronomists usually do not worry about frost at these early stages of development. Early frost can have an impact on grain yield, but the trade-off between planting date impact on yield is greater than for frost damage impact on yield. Delayed planting further impacts profitability due to greater moisture and consequential drying costs.

Symptoms of frost damage will start to show up about 1 to 2 days after a frost. Symptoms are water soaked leaves that eventually turn brown. After 3 to 4 days watch for new green leaves emerging n the whorl. If new leaves are not emerging check the growing point for discoloration. Any deviation from a white, cream or light yellow color indicates that the growing point is killed.

To measure the impact of early defoliation on corn grain yield corn plants were clipped with a scissors. Clipping treatments were applied at V2, V4 and V6. Plants in the control treatment were not clipped. In another treatment, all plants in the plot were clipped. In another set of treatments, half of the plants were clipped in 2-, 4-, and 8-plant patterns. For example in the 2-plant pattern, the first 2 plants in the row were not clipped, the next 2 plants were clipped at ground level, the next 2 plants were not clipped, and so on.

Although these treatments do not fully simulate the frost damage, they do provide some guidance on what a frost might do that completely defoliates the plant without killing it. Figure 1 describes the impact of complete defoliation on corn grain yield at the V2 stage of development. When all plants were clipped, grain yield decreased 17 bu/A from 210 to 193 bu/A (8%). When half of the plants were clipped in various patterns, grain yield was not affected; the trend was a decrease of 8 to 9 bu/A (4%).

These data indicate that frost early in development has relatively little impact on corn grain yield. If all of the leaves are removed from every plant in the field at the V2 stage of development and plants are not killed, then the expectation is that grain yield would decrease up to 8%. If the recent frosts were hard enough to kill plants then use the publication UWEX 3353 for guidance on whether or not to keep a stand and what to look for when assessing plant health.

Further Reading:
Frost Effects on Corn
Corn replant/late-plant decisions in Wisconsin UWEX 3353

How long can we continue to plant corn in 2016?

Joe Lauer, Wisconsin Corn Agronomist

With average growing conditions corn planted after June 1 to June 5 in northern and central Wisconsin and after June 10 to June 15 in southern Wisconsin, will probably not mature with reasonable grain yield and moisture content, even with very early hybrids. However, corn silage from shorter-season hybrids may still have accept-

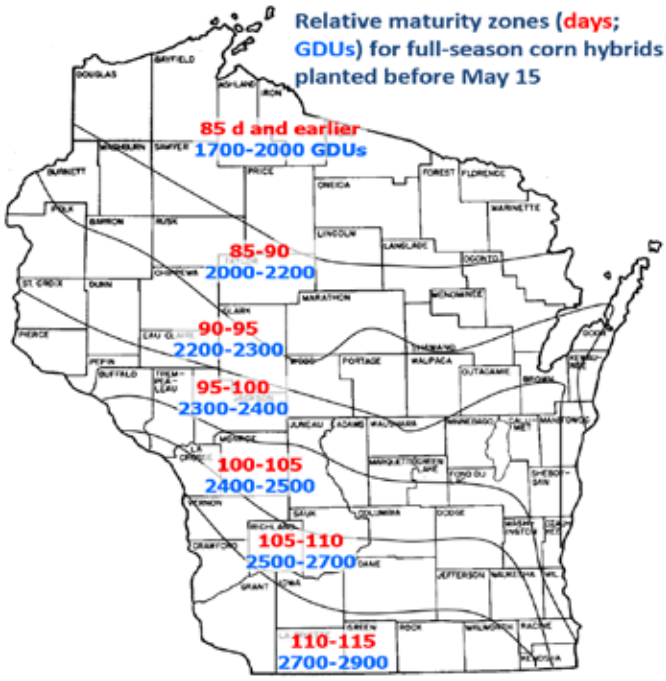

Figure 1. Relative maturity zones (in days and Growing Degree Units – GDUs) for full-season corn hybrids planted before May15. Click here for a larger image.

able quality when corn is planted until June 20. Corn planted after June 20 will likely contain little or no grain, and only stover (stems and leaves) will be produced. Table 1 lists alternate hybrid Relative Maturities for delayed planting dates for the standard Relative Maturity belts shown in Figure 1.

Pest Control

It is usually easier to control weeds in late corn plantings than in early plantings. Late tillage kills many germinated weeds and crop seedlings are more competitive due to warmer temperatures. For replant situations, weed control must take into account any previous herbicide applications. If herbicides were applied pre-emergence or pre-plant incorporated, their effectiveness may be reduced by the time corn is replanted, especially if the field is tilled before replanting.

Insects normally are a greater threat to late plantings than weeds. Later plantings may have more feeding from second-generation European corn borers, and silk feeding by corn rootworm beetles may also be more severe. Soil rootworm insecticide will need to be applied if the field was tilled since the initial planting application.

Effects of Early Freeze on Yield Potential

Earlier than normal autumn frosts can devastate late-planted corn. Yield is decreased if late-planted corn does not reach physiological maturity before plants are damaged by a freeze. Grain from corn plants killed by a freeze before maturity may be slow to dry down, and it tends to be brittle after artificial drying — making it more likely to break during handling. Test weight also will be lower when corn is prematurely killed.If late-planted corn does mature ahead of frost, grain will be wetter and probably have to dry down in weather less favorable for drying. The following lists grain characteristics and appropriate management considerations for corn killed at various growth stages:

- **Corn Killed in Dough Stage**: Kernels contain about 70% moisture. About one-half of mature kernel dry weight accumulated. Grain will unlikely achieve maximum yield potential unless stalk, ear and some lower leaves survive. Corn can be used for good quality silage, but entire plant must be allowed to dry to about 65% moisture.
- **Corn Killed in Dent Stage**: In early dent, kernels contain about 55% moisture; are 3 to 3.5 weeks from maturity; and about half of mature dry weight

Table 1. Relative maturity of adapted corn hybrids for different planting dates and relative maturity zones. Derived from UWEX A3353 – Corn Replant/Late-Plant Decisions in Wisconsin.

full-season relative maturity zone[a]	——relative maturities[b] for late planting——			
	May 20	June 1	June 10	June 20
85 and earlier	75-80	75-80 (silage)	—	—
85-90	80-85	75-80 (silage)	—	—
90-95	85-90	75-80	75-80 (silage)	—
95-100	90-95	80-85	75-80 (silage)	—
100-105	95-100	85-90	75-80	75-80 (silage)
105-110	100-105	90-95	80-85	75-80 (silage)
110-115	105-110	95-100	85-90	75-80 (silage)

has accumulated. In late dent, kernel moisture is decreasing and yield is within 10 percent of final mature dry weight when kernels are past half milk-line. Corn will make good silage when harvested at a whole plant moisture content of 65%. Can be harvested for grain after long field-drying period. Grain yields will be reduced and test weights low. If plant is only partially killed or the crop is close to physiological maturity before the freeze (kernel milk line half-way or closer to tip), yield loss will be only 5 to 20 percent, and test weight will be lower.

- **Corn Killed When Physiologically Mature (Black Layer)**: Kernel moisture is 28 to 35% depending on hybrid. Killing freeze will not affect grain yield or quality. Dry-down rate of grain depends on hybrid and environment.

Crop Choice

If planting is delayed past the time acceptable corn production can be expected, consider planting an alternative crop. Compare the relative yield potential and current price of an alternative crop for a given date with that of late-planted corn.

For example, corn yield potential of a late planting declines at a faster rate than the yield potential loss of soybeans. After June 1, it may be advantageous to plant soybeans, instead of corn, if this fits your rotation. Sunflowers and buckwheat are other grain crops that can be planted very late. Forage sorghum, sorghum-sudan crosses or sudangrass can help boost forage supplies and be planted into July. You must consider prior herbicide and fertilizer applications, desired rotation, livestock feed requirements, and the possibility of erosion on slopes when you are choosing a crop to plant late. For more information on herbicide rotational restrictions, see UW Extension publication A3646 — Field crops pest management in Wisconsin.

Cover Crops and Crop Insurance in Wisconsin

Daniel H. Smith, Nutrient and Pest Management Program

Paul D. Mitchell, Extension State Specialist in Cropping Systems and Environmental Management, Department of Agricultural and Applied Economics

Wisconsin farmers have increasingly been using cover crops, in part because of the agronomic benefits cover crops can provide. Wisconsin farmers have also increasingly chosen to buy crop insurance. Crop insurance policies include several management rules, including some that pertain to cover crops. Because cover crop rules for insurance have been changing and there are many farmers relatively new to cover crops and/or crop insurance, we review some of these cover crop rules for crop insurance. We wrote a 2 page bulletin overviewing the crop insurance rules for cover corps. Of particular interest may be

- When must a cover crop be terminated by so the following crop can be insured?
- What are the rules for harvesting the cover crop for forage?
- What about interseeding and overseeding a cover crop?

Follow the link below to read the full bulletin detailing crop insurance rules for cover crops.

Cover Crops and Crop Insurance in Wisconsin: http://www.aae.wisc.edu/pdmitchell/CropInsurance/CCandInsurance2016.pdf

Wisconsin Fruit News: Volume 1 Issue 3 – May 13, 2016

The 3rd 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/36/2016/05/Wisconsin-Fruit-News-vol1-issue3.pdf

All newsletters will also be posted onto at the Wisconsin Fruit website, available at www.fruit.wisc.edu. There you will also be able to search by category or tag, to find crops and/or subject material of interest to you on a particular day.

Additionally, you will also able to view this newsletter by customizing the **IPM Toolkit** app which was created through the University of Wisconsin's Integrated Pest and Crop Management program (http://ipcm.wisc.edu/apps/ipmtoolkit/). Simply download the app, tap the (+) add News Feed in the upper right corner, and enter the fruit blog RSS newsfeed URL (http://fruit.wisc.edu/feed).

Post-freeze supplemental issue of WI Fruit News

It's been a tough year so far for fruit production. Due to the sudden and unexpected cold temperatures throughout much of the state, we are providing an additional supplementary issue of the Wisconsin Fruit News today, with articles relating to post-frost damage mitigation (see link below). We hope you find this useful!

https://fruit.wisc.edu/wp-content/uploads/sites/36/2016/05/Wisconsin-Fruit-News-vol1-Frost-Supplement.pdf

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 May 7, 2016 through May 13, 2016.

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

Field Crops

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

Wheat, Pythium Root Rot, *Pythium sp.,* Manitowoc

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

Vegetable Crop Update May 13, 2016

Amanda J. Gevens, Associate Professor & Extension Vegetable Plant Pathologist

The 7th issue of the Vegetable Crop Update is now available. Click on the link below to view this update:

http://ipcm.wisc.edu/download/vgu/VegCrop-May-13-2016.pdf

Wisconsin Pest Bulletin for 5-19-16

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Volume 61 Issue No. 4 of the Wisconsin Pest Bulletin is now available at:

https://datcpservices.wisconsin.gov/pb/pdf/05-19-16.pdf

INSIDE THIS ISSUE

LOOKING AHEAD: True armyworm larvae collected from alfalfa this week

FORAGES & GRAINS: Alfalfa weevil larvae emerging in more fields, counts still low

CORN: Black cutworm primary damage period to begin in the week ahead

SOYBEAN: Bean leaf beetles appearing in alfalfa fields

FRUITS: Cool weather continues to slow plum curculio and codling moth activity

VEGETABLES: Imported cabbageworm egg hatch underway

NURSERY & FOREST: Peony red spot, botrytis and mites found during this week's inspections

DEGREE DAYS: Growing degree day accumulations as of May 18, 2016

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