



## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

### IPM STUFF 2015-1

Volume 18 number 1

04/16/15

This newsletter and the advice herein are free. You usually get what you pay for.

#### Crop weather

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

At the SWROC, soil moistures are slightly less than average. Concerning is the lower than average moistures at 48-60". Area steams are quite low. The crop should get a start but a prolonged dry spell could make things more tense than usual.



Figure 1. Planted April 3, photo April 16, 2015.

Most of the spring wheat and oats trials at the SWROC and SW MN area went in around Easter weekend.

Winter wheat and alfalfa made it through the winter well here at the SWROC but there are reports of some poor winter survival issues in some SW MN alfalfa fields. The [U of M Extension Forage Quarterly Spring -2015](#) issue has information on stand evaluation and many other topics .

Depending on your location in SW MN, some corn has gone in since April 13th. It's early yet, but some may have pushed field conditions, working things a bit on the wet side; some could have gone earlier, and some, I suspect, planted when it was just right.

Corn planted April 3 at the SWROC is now germinated with a 1/4 inch or so radicle (root). We are not trying to make a profit on this planting. It is a demonstration plot for a SWROC educational field day geared toward growers on August 13.

Some are planning to take a break in corn planting before the forecast cold rain on Sunday. Emergence can sometimes be affected if the initial water uptake (imbibition) by the seed is of very cold water. On the other hand, corn mesocotyl (shoot) development can be injured by large soil temperature swings during emergence. The good news is there should not yet be any mesocotyls developed in SW MN...unless April 11 came awfully early to the field.

*Do not plant early corn shallow* in an attempt to get it out of the ground quicker! Temperature and moisture are both more erratic near the soil surface and shallow rooted corn often becomes vertically challenged later in the season.

To the north, and on coarse textured soils elsewhere, growers are facing very dry topsoil conditions. The last two Minnesota springs set a high bar for PRE herbicides that can sometimes struggle without rainfall. They are needed, especially in fields with heavy weed pressure.

The high winds this spring should remind us of rootworm insecticide placement issues. In-furrow placement and incorporating can help if windy. Read the label for the product you use.

Southern Minnesota buckthorn broke bud on April 10th. Soybean aphid eggs should be hatching now.

### **Using a sweep net**

Contrary to popular perception, using an insect net is the delicate a process as often illustrated in the old Saturday morning cartoons. While there are delicate aerial butterfly nets designed for capturing delicate species for collection purposes, sweep net sampling is a vigorous and highly technical affair... well, OK, it involves walking and moving your arms, and there are a few simple rules. We just shot a video on [use of a sweep net in alfalfa](#). Sure wish the budget had allowed for a body double and voice over.

### **Black cutworms**

We have a good crew of cooperators monitoring the migration of black cutworm moths into Minnesota. Last week found a few cutworms making their way to Minnesota, but, to this point, flights aren't large enough to cause concern for 2015 damage. Traps are checked daily and results posted each Thursday. Damage from black cutworm infestations can partially be predicted from sex pheromone trap captures and degree days. Data and black cutworm information can be found at [U of M IPM Black cutworm network](#).

## Twitter

I have been using Twitter <https://twitter.com/SWMNpest> a bit more for quick updates this spring. The 140 character limit makes one focus if, like me, one likes to drone on and on and on and on and... Several of this spring's tweets were incorporated into this newsletter.

**[Another bad pest control decision.](#)** This is an urban example, but let's be careful out there!

**Other newsletters** - I don't often repost articles from newsletters that you should already be subscribed to. If you are involved in MN agriculture, you might want to be subscribed to the University of Minnesota Extension crop news blog. Unfortunately, the subscribe button is temporarily inactive but in process of being fixed. In the meantime, if you would like to subscribe to MN crop news send an [emailto:bonga028@umn.edu](mailto:bonga028@umn.edu). Put subscribe in the subject line.

Other U of M Extension crops information can be found at [University of Minnesota Extension crops](#).

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

### IPM STUFF 2015-2

Volume 18 number 2

04/29/15

This newsletter and the advice herein are free. You usually get what you pay for.

#### Crop weather

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC) website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.*

The SWROC has had only 2.27 inches of precipitation from January 1 to April 28, 2015. This is less than half the 5.1 inches we receive on average.

Thanks to late season rains in 2014, soil moistures here have been good for germination and early growth. Most soils at the SWROC can hold around 9 inches of moisture when fully recharged. As of April 15th, we were less than 6 inches of available water in the top five feet of soil. This is more than 2012 and 2014. Many areas west and north are drier and SE MN is off to a slower start.

Figure 1. The first corn up at the SWROC 4/29/2015



#### The kids are all right.

The SWROC experienced low air and 2" depth soil temperatures of 22° F and 31° F, respectively on April 23. Emerged small grains and alfalfa and peas came through the event in good shape. Some of these look very good.

I can't address corn survival in fields other than I have checked, but the early planted corn I have looked at seems to have done just fine. I suspect most corn is similar.

Corn planted on April 3 planted at the SWROC started to emerge today

Figure 2. A planting depth of 1/2" is not enough for good standability later in the season.



(Figure 1). Part of the stand that was accidentally planted very shallow is emerged (Figure 2) while the seeds tucked safely at 2 inches is doing well but the shoot is still a ways from the surface. This shallow corn had a very stressful beginning with temperature extremes. Unfortunately, the part of the shallow planted stand that was planted on the surface did not germinate or did germinate and died (Figure 3).

Figure 3. This is planted shallow enough to be hopeless. Note: There is not a PPI or PRE herbicide applied here.



So...why not just plant your corn at 1/2 to 1" deep to get it off to an early start and impress and aggravate the neighbors?

Sure, shallow planted corn can emerge quicker unless: the surface soil dries out or air temperatures dip to very cold lethal temperatures for several hours.

The downside to the potential for early emergence is that the growing point is now closer to

the surface. It is more likely to be exposed to early season frost.

A second potential problem is nodal root development is impaired with shallow planting. The result can be lodged corn as the plants get larger. A row cultivator set to throw soil to the base of the plants can sometimes help shallow-planted corn avoid vertical instability.

The early-planted corn at Lambertson has been a focal point for some of the SWROC field crew who have mid-April planted corn on their farms. One of the primary causes of mortality to seed and seedling corn, particularly in early, cold, or wet springs is nervous agriculturists. The April 3rd planted corn plot at the SWROC now looks like Goldy Gopher and his entire extended family had moved in.

Some pointers on scouting corn follow. We can expect to see some uneven emergence due to dry soils in some areas. You can probably tell I am not a fan of shallow seeding

of corn. On the other hand, while you want to seed to moisture, don't seed soybeans much deeper than 2 inches!

### Scouting early-season corn (from a May 2010 issue...when emerged corn froze)

Corn scouting should begin in earnest as soon as fields can be rowed. Initial efforts should focus on evaluating stand. Select several areas of the field and determine stand in 1/1000s acre length of row (Table 1).

Determining the cause in areas with poor emergence might require some detective work because there are many potential causes of poor stand. My suggestion is to start with the obvious. Was seed planted? Most of us can make a mistake once in a while and any mechanical device is predestined for failure. More than one frustrated operator has ignored or turned off the alarm on the monitor.

Row width (inches)	Length = to 1/1000s of an acre
15	34' 10"
20	26' 2"
22	23' 9"
30	17' 5"
36	14' 6"

Before blaming insects (wireworms, seed corn maggot, cutworm) or a disease, eliminate abiotic factors such as seed depth, compaction, and drowning. Remember that dead seedlings, regardless of the cause, will rot under high moisture conditions. They also seem very attractive to wireworm.

Cold, slow growing conditions do, however, favor seedling-attacking insects and disease.

Look for corn seed. How about planting depth? Shallow planted corn might emerge later and less evenly than corn planted a bit deeper. Shallow planted corn (< 1 ½ inches) is exposed to greater temperature fluctuations and less consistent moisture. Shallow seeded corn is also at risk for poor root development and root feeding insect damage when it does emerge.

Did the seed germinate? Lack of moisture or cold conditions are the primary cause of poor germination. Has the seed rotted? Fungicide seed treatments do a good job of protecting seed and seedlings from some fungal pathogens but can be overwhelmed under prolonged very wet, cold conditions.

In the case of seedling corn plants that had emerged and freeze, check the below ground tissue. If firm, the plant is likely to survive. Splitting the stems to look at tissue color will point out future problems. Brown, gray and water soaked tissue; particularly crowns, indicate a short life expectancy for the plant.

If plants are frost injured it is best to leave them to recover on their own (particularly the small corn this season). Removing the dead tissue by mechanical means or spraying plant health inducing compounds will not improve the survivability of the crop and could make things worse.

Is there evidence of insect feeding? Seed corn maggot and wireworms are the two insects most often associated with corn emergence failures in southwest Minnesota. Seed corn beetles can also occasionally reduce stand. Slow emerging corn is at greater risk from these below ground pests. Unfortunately, there is no effective treatment, other than replanting, for these insects after corn is planted. The insecticide treated seed provided with most Bt-hybrids (and others) should minimize problems from seed corn maggot but occasionally allow attack from heavy wireworm infestations.

\*\*\*

It looks like there is a conflict with the SWROC educational field day geared toward growers on August 13 and the Corn Cob Open Golf Classic. Stay tuned for a potential date change for this event. The field day planners know that disrupting golf outing is generally looked on with disfavor.

*I could not catch a squirrel to compare its ear size to these bur oak leaves.*

*Basing a planting decision on the size of oak leaves may not be wise but it does look like it could be a good acorn crop!*

*Have a good finish to the 2015 planting season.*

Happy trails,

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## Southwest MN IPM STUFF

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IPM STUFF 2015-3

Volume 18 number 3

05/07/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

Many areas got a small shot of much needed rain overnight and this morning. As I write this, we are at about 0.3 inches at the SWROC and we could use more. Hopefully, now that the pump is primed, rain will continue in moderation. The rain should help produce a more uniform soybean emergence and increase pre-emerge herbicide performance. With continued good weather, we have a chance at a very good crop.

Scouting stands for emergence and weed issues should be in full swing now.



Early corn stands look very good for the most part. The few reports of problems I have heard so far are where corn was planted shallow or folks worked fields a wee bit early.

Seems that many corn emergence problems are first detected by the neighbors checking out the crops next door.

We are studying the effects of volunteer soybeans on soybean aphid and soybean

cyst nematode populations. Untreated soybeans broadcast April 14 and incorporated with a drag before corn planting are up and doing fine. Note: Using a drag for soybean seed depth control is not a recommended soybean planting practice. There should be large number of soybean fields emerged by next week.

In dry western Minnesota, some planted fields show giant ragweed and common lambsquarters. These fields need early attention with an early post-emerge herbicide application tailored to broad leaves. A rotary hoe can work on small weeds in corn too.

### **Black cutworm**

Moth captures continue to be low. Most fields have been worked and planted and should be a low risk for black cutworms. However, planted fields with a heavy broadleaf emergence could be attractive to late flights. The growing corn crop might be able to escape injury from any late eggs but could be a tight race. We will monitor flight activity and degree-days for another week.

### **Small grain crops**

You might want to consider getting an herbicide on your southern MN wheat crop sooner, rather than later. Check the label for your chosen herbicide for crop and weed height restrictions.

At this point, winter and spring grains on the SWROC are looking excellent and remarkably free of significant disease symptoms. I have been looking for rust and barley yellow dwarf symptoms on winter wheat varieties and been pleasantly disappointed so far.

I had a chance stop at the USDA-ARS Cereal Disease Lab on my last trip to campus. I had a brief visit with Jim Kolmer and an old friend, Mark Hughes. They mentioned that wheat stripe rust is common in the southern plains but leaf rust is less so. Cool, wet weather in the southern plains had favored disease development.

Rust spores and subsequent rust infections move from south to north across the plains each spring. Northward movement of the rusts north can occur long-distance or in shorter distance spurts. It all depends on the geography where the disease is present and producing spores and the availability of weather systems to move spores about.

The pathway is similar to the migration systems of black cutworm and other insects. Both rust spores and insects use weather systems to help with transport with the difference being rust dispersal is more or less passive while insect behavior helps them with active migration.

## Alfalfa

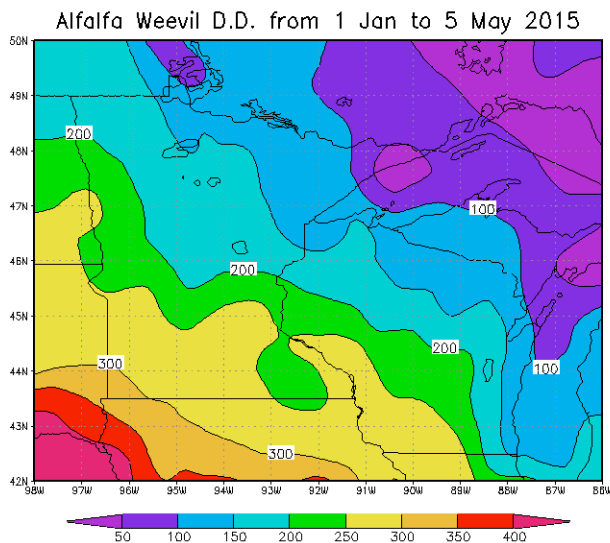
Area alfalfa is now 16 inches or so tall and looks good. The dry spring has minimized leaf diseases in the fields I have checked.

Earlier this spring, Matt Bruyette sent a picture of an alfalfa caterpillar larva. My understanding is that most alfalfa caterpillars overwinter as a pupa and the yellow alfalfa caterpillar butterflies emerge in the spring. Obviously, the individual pictured did not get the memo. It doesn't always pay to be different.

This procrastinating caterpillar didn't get around to pupating as Matt's preemptive strike took it out of the gene pool.



Degree-day models indicate that spring laid alfalfa weevil eggs should soon be hatching in SW MN at 300 Degree-Days (base 48°F) accumulated from January 1st.



[Source: University of Wisconsin Ag Weather.](#)

It is too early to evaluate or treat alfalfa weevil. I have not yet seen any alfalfa weevil adults move into SWROC alfalfa and found very few early first instar (stage) clover leaf weevil larvae. The eggs of the latter were laid last fall.

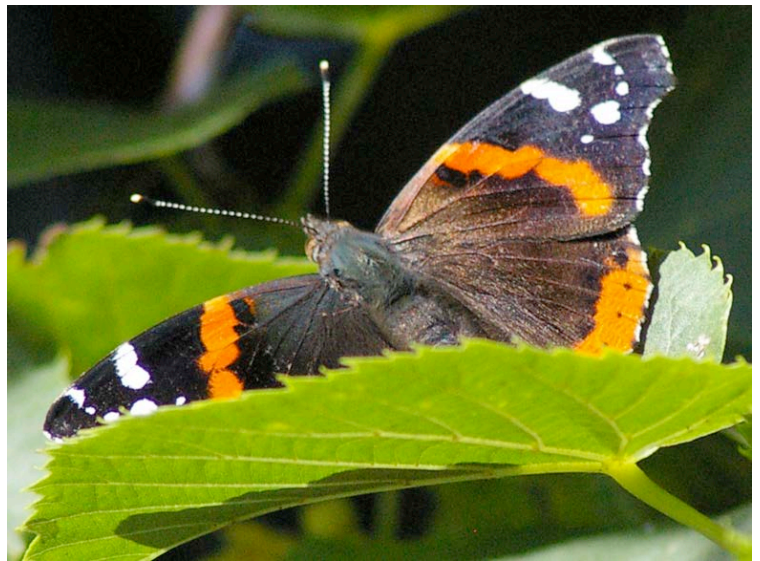
Pest insects have been largely absent from the alfalfa I have looked at this spring. This could change quickly with the arrival of migrant potato leafhoppers or other pest insects.

Particularly with migratory species, insect populations can be vastly different from field to field and between geographic areas.

Sweep net sampling is not a reliable estimator of pest populations when windy conditions occur - pretty much most days in western Minnesota. Yesterday, I found some calm in the leeward side of an SWROC grove, and I took a few quick sweeps of

some alfalfa. I found a few pea aphids and tarnished plant bugs (*Lygus*). Populations of lady beetles, parasitic wasps and other beneficial species were found as well.

Recently arrived red admiral butterflies were using the same grove for shelter from the high winds. The first few admirals arrived in early April but a larger group showed up this week. I know others have observed the butterflies too. The grove is full of nettle, the food plant for larvae, and the female butterflies will probably lay their eggs there. I took a few minutes to watch the red-banded black butterflies feeding on dandelion flowers and males fighting over territory. Seems like some don't like their neighbors too close.



Happy trails,

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## Southwest MN IPM STUFF

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IPM STUFF 2015-4

Volume 18 number 4

05/15/15

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### **Crop weather**

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It has been a rainy week and the rain has been welcome.

Scouting stands for emergence and weed issues should be in full swing now. Most fields with appropriate PRE or PPI herbicides in SW MN are fairly clean. I did receive a report where there may have been some nitrogen burn on corn from manure applied this spring and dry soil conditions but do not think this is typical.

Early corn stands look very good. Thanks to GPS and wide planters, the roadside viewings show incredibly straight rows; the only obvious variations are probably just optical illusions caused by changes in field topography. I hope this precision works out okay because I was often told as a youth that you got more plants/acre and yield/acre with crooked rows. Come to think of it, this was always by folks that didn't plant straight.

Corn is yellow but growing, some working on the third leaf. It will green up fine with some heat and sunshine.

Soybeans have been emerging and look good. I have soybeans in an experiment that are struggling with heavy residue and poorly adjusted row cleaners. The May 1 planted beans look healthy as they emerge but are struggling with the residue and associated cool soils underneath. Yellow tips on the unopened cotyledons show where cool weather stalled their emergence for a while.

## Black cutworm

Moth captures continued to be low. This has been the lowest rate of moth captures for the last three years by far [MN Cooperative black cutworm network](#). It is a low-risk year based on pheromone trap capture and timing of weather systems out of the wintering areas.

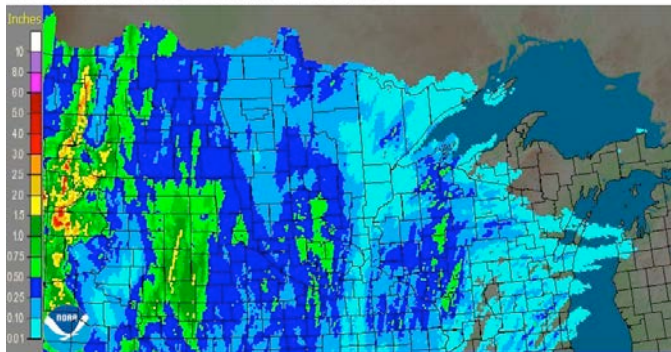
## Corn rootworms

The winter soil temperatures and their effect on rootworm egg survival will be similar to those in 2013-14. Bad for rootworm researchers but hopefully will be good for everyone else.

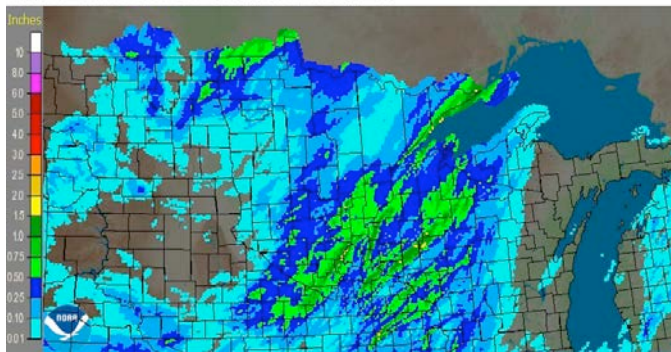
## Small grain crops

Spring wheat and oats are tillering well and still look excellent. Winter wheat and rye are jointing.

Minnesota: 5/7/2015 1-Day Observed Precipitation  
Valid at 5/7/2015 1200 UTC- Created 5/14/15 15:42 UTC



Minnesota: 5/8/2015 1-Day Observed Precipitation  
Valid at 5/8/2015 1200 UTC- Created 5/14/15 16:30 UTC



Weather systems brought a few aster leafhoppers to SWROC spring wheat and oats, probably over the 7th and 8th.

The numbers I am finding are very low (1/10 sweeps) but it has been too wet to be in the field most of the week. I am less concerned about aster leafhoppers and the potential transmission of aster yellows virus on wheat, oats and barley than I am on other crops. Aphids and barley yellow dwarf make me more nervous but so far, I have not observed any aphids in grains. Barley yellow dwarf risks of yield loss decline with later infections.

I'll do a more thorough assessment of small grain insects and diseases early next week - if the weather permits.

## **Alfalfa**

Area alfalfa looks good and will soon be ready to cut.

Alfalfa weevil larvae have started to hatch. I found a few 1st instar larvae early this week. Since I have not found any adults in alfalfa yet this spring, I suspect that these larvae may have been from eggs laid last fall.

The first potato leafhopper migrants were detected in SWROC alfalfa on May 12. Initial numbers were very low about 1/100 sweeps.

As always your mileage may vary. Base your pest management decisions on the insect pests and beneficials, weeds, and diseases in your fields. Insecticide decisions that are based on field researched, experimental data usually produce the greatest Return On Investment and create the fewest problems later in the season.

The insects in your fields are boringly consistent. For a particular susceptible crop and crop stage, they always eat the approximately the same amount as they develop and they begin to hurt yield at approximately the same populations - regardless of crop or insecticide price. Most research-based thresholds factor these and other variables into account. The possible exception to this rule is those few insects that can read, watch television and listen to the radio...they seemed to get more worked up than the others.

Happy trails,

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## Southwest MN IPM STUFF

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IPM STUFF 2015-5

Volume 18 number 5

05/29/15

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The Lamberton location accumulated 299 Growing Degree Days (base 50°F) from May 1- May 29; slightly behind the historic average. For those of you that planted early 29 GDD were accumulated from April 15 to May 1.

We don't keep records on wind at the SWROC but this spring seems exceptionally breezy. While the wind has helped us get back into the fields quickly after rains it has not helped with herbicide applications. We have had 6.47 inches of precipitation since January 1. After a dry April, it looks like May is going to end up above average for rain; those of you trying to finish planting and apply post-emerge herbicides have probably already figured that out.

I made quick tour of SWROC research plots with student interns yesterday to refresh their memories on growth staging crops. Some crop stages for earliest planted/emerged crops were:

### **Corn**

#### **4 collars**

Recovering well from wind and cold. Wind was tough and some very localized and minimal frost damage to leaf tips. Greening up well now. Weather delays could challenge weed control in some fields. As corn reaches 5 - 6 collars, compaction, root injury and related nutrient problems become more obvious.

**Soybean****V2 stage**

Most plants look excellent, some issues with residue slowing emergence. No significant insect or disease issues. This could change as wet soils could encourage some root rot pathogens.

**Winter wheat*****Joint - Early heading depending on maturity***

The window for herbicide applications is closed. Not looking as well as it did earlier. While winter survival was good, wheat is short and some varieties will probably not yield well. Typical diseases are showing up. A single wheat leaf rust pustule was observed but heavy flecking indicate some varieties will show as rust, or other pathogens, next week. Cool weather in the forecast could promote rust development.

**Winter rye*****Headed***

Rye looks excellent but usually does. We noted some minor thrips injury to rye leaves as well as winter wheat. Aster leafhopper numbers were very low where we looked in rye and other small grains.

**Spring wheat*****Jointing/stem elongation***

Looks very good to this point but this could change from a disease perspective if wet weather continues. We are seeing some parasitized English grain aphids. Fusarium head blight (Scab) severity will be determined by rain during flowering. Some of you in SW Minnesota got caught by scabby wheat in 2014. The [Fusarium head blight prediction center](#) provides some predictive tools for scab risk.

**Oats*****Did not stage this crop but should be similar to wheat***

And so far, they look good from the road and stem elongation has begun. The aecia stage on buckthorn leaves is much less severe than it was here in 2014.

**Alfalfa*****Bud***

I did not see any blooms where I looked. Some research trial alfalfa is down and the rest will be cut as soon as the weather straightens out.

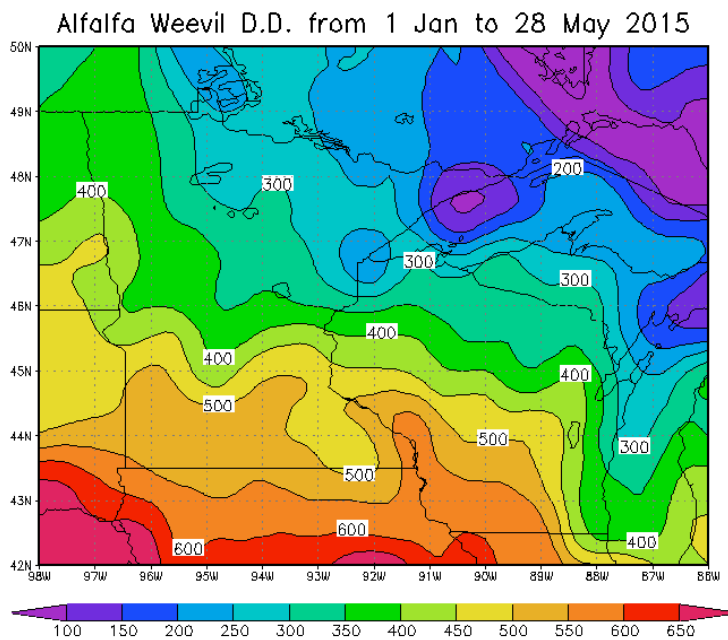
Potato leafhoppers, both green and pink color morphs of pea aphids and plant bugs were all at sub-economic levels.

Several beneficial insect species were active. Numerous seven-spotted lady beetle mating pairs were observed (they seemed to be doing it correctly) and the results should help keep aphids and other small, soft bodied insects under control. *Avoid insurance insecticide treatments to alfalfa as most insecticides will kill beneficial insects*

and populations can flare other problems - pea aphids, for example. Avoid spraying blooming alfalfa to protect bees. For many pest species, cutting can stop a problem or delay management to the next cutting

I was hoping for a low alfalfa weevils population year but may have been too optimistic.

My observations may, or may not, reflect what is going on in your fields. Regardless of degree-day and other models and scouting reports each field is unique. If you farm, scout your fields or hire someone you trust to scout for you. May and June is a hectic time of year for agriculturalists but making decisions without looking at the field often ends badly.



### Alfalfa weevil

Egg hatch (300 degree days base 48°F) should be underway in most of in Minnesota with some 3rd instar larvae (504 degree days base 48°F) in SW MN and near the Iowa border ([alfalfa weevil thermal models](#)).

In SWROC and a couple other SW MN alfalfa fields, weevils were present and in some cases numerous at up to 2 larvae/stem.

Adults along with 1<sup>st</sup> through late 2<sup>nd</sup> stage larvae and their feeding damage to upper foliage are present. It might be assumed that un-hatched are present and that there are eggs yet to be deposited in

Alfalfa weevil larvae: Note the white stripe on the back and the black heads of larger larvae.



alfalfa stems. There is a wide range in larval sizes because the adults move into alfalfa over a prolonged period in the spring and egg laying is extended as well. The larvae pupate in cocoons on the ground at 814 degree days (base 48°F).

Depending on the alfalfa growth stage, it may be better to cut rather than using an insecticide treatment for an AW infestation. Cutting and crimping and windrowing can kill the larvae by direct mechanical injury or by desiccation. Avoid, where possible, leaving windrows on fields for an extended period as the alfalfa weevil congregate there.

Re-scout stubble fields within 4-5 days of cutting. When scouting early second crop, pay close attention to fields with 1<sup>st</sup> cutting damage and higher alfalfa weevil populations. Treatment may be justified if larvae are present, crowns have weevil feeding, and re-growth (green up) is delayed.



**Alfalfa weevil feeding damage in the upper canopy. From a distance, alfalfa with heavy feeding often has a frosted appearance. Initial feeding by small larvae creates a pinhole damage.**

I am seeing a low number of variegated cutworms in some fields. A combination of high alfalfa weevil and variegated cutworm larva populations can wreak havoc under a windrow.

Something has changed in alfalfa weevil ecology. This insect was believed controlled by several introduced parasitoids and rarely a problem; however, for the past several years, this insect has been a consistent pain in central, west central and southwestern MN alfalfa.

## **Black cutworm**

The final report of the season is present at the [MN Cooperative black cutworm network](#). It is a low-risk year based on pheromone trap capture and timing of weather systems out of the wintering areas. Don't be surprised if you see more early season insect pressure where last year's weedy areas or cover crops were planted. Several cutworm species tend to lay eggs in these areas of the field. Weedy areas can attract other insect species as well.

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-6

Volume 18 number 6

06/04/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center* (SWROC) website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The Lamberton location accumulated 371 Growing Degree Days (base 50°F) from May 1 through June 4. For those of you that planted early 29 GDD were accumulated from April 15 to May 1.

We have had 6.25 inches of precipitation since May 1. Herbicide applications continue to be weather challenged for some, myself included. Standing water in fields on or near the SWROC has been minimal - so far.

Some crop stages for earliest planted/emerged crops were:

### **Corn** *5 collars*

Purple and yellow corn reports have started as nodal root development begins and wet soils have slowed root development. These should look soon look better as growth continues.

### **Soybean** *V1-V2 for early planted*

In spite of recent wet conditions in some fields, roots and shoots are still relatively healthy.

Some, if not all soybean aphids have made the move from buckthorn to soybeans in SW Minnesota and the SWROC. Student workers Aaron and Tyler found these young female aphids on some volunteer soybeans near buckthorn today. A winged female probably deposited them a couple days ago.



We need to wait and see what weather, predators, parasites and disease can do to keep soybean aphid populations low in 2015.

It is too early to get serious about soybean aphid scouting. These few early colonizers are a long way from any soybean field needing an insecticide application to protect yield.

Some might have a different opinion on when to start treating aphids. They would most often be wrong from a return on investment aspect. The 250 aphid/plant average is still a good place to start.

**Winter wheat**                      **Boot - Heading depending on maturity**

Expect some *Fusarium* head blight, leaf rust and stripe rust if wet weather continues. Some varieties should be flowering soon.

**Spring wheat and oats**                      **Boot**

Bird-cherry oat aphid populations are starting to build. Nothing economic in the research plots I have looked at but evaluate aphid populations before making a fungicide application. I have not seen any obvious barley yellow dwarf virus (BYDV) infection centers, but individual plants are starting to show BYDV-like symptoms. This virus is transmitted by aphids, and symptoms are more severe with early infection of oats, wheat and barley.

Some leaf tips and edges are showing damage from wind and some slight yellowing and streaking where water stood could be confused with disease.

Leaf diseases remain minor at this point but pay close attention to *Fusarium* head blight (scab). One fungicide application timed for scab may be enough in much of Southwest MN. I don't look at many wheat fields so the situation on your farms could be completely different.

### **Oats**

### **Boot**

See comments on wheat above

### **Alfalfa**

### ***Late bud - re-growth of second crop***

Alfalfa weevil are the current pest of interest in SW MN. Early this week, we shot a quick YouTube [alfalfa stem sampling video](#). Emily Neperman at the SWROC performed the herculean task editing through wind noise and my stammering, and poorly chosen words. Hundreds, perhaps thousands, of alfalfa weevil were harmed during the production of this video.

Check re-growth for weevils, particularly where slow to green up. Potato leafhoppers and other potential insect pest are present but only in low, non-economic numbers in SWROC alfalfa.

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-7

Volume 18 number 7 Pest alert

06/09/15

This newsletter and the advice herein are free. You usually get what you pay for.

### True armyworm:

The mere mention of armyworms can cause angst in those who have experienced outbreaks and the news of armyworms in the area causes can trigger unnecessary insecticide applications. Fortunately, other than taking some time, scouting for armyworms is fairly straight forward and they are easily controlled with insecticides.

There is a small problem with using trap captures to predict armyworm (*Mythimna unipuncta*, formerly known as *Pseudaletia unipuncta*, Haworth) outbreaks in Minnesota. The moths captured can predict when a problem is likely and when it will occur but not where it will occur. Immigrant moths are particularly likely to re-migrate. Pheromone



Armyworm larvae. Note the banding on the abdominal prolegs.

traps are available but what the captures mean is not clear in relation to crop damage.

Armyworm moths target specific environments in which to lay eggs. Areas of dense grasses are favored egg laying sites. Field edges near lodged grassy areas, lodged small grains and corn that had earlier areas of heavy grass weed problems should be checked.

Armyworms are native to eastern North America but they cannot overwinter in MN. Each spring, they migrate north like their black cutworm cousins. They seem to be more abundant in cool, wet years. Heat and dry weather are hard on armyworm eggs and small larvae.

Armyworm larvae are often heavily parasitized by flies and wasps and they can be infected by fungal and virus diseases.

Eggs of fly parasites can sometimes be seen behind the heads of larvae and cocoons parasites cover some infested larvae.

These are not the tent caterpillars (called armyworms by some) that feed on broadleaf trees and shrubs.

The true armyworm prefers grasses. In previous infestations, I have seen armyworms clean out the weedy grasses in a sunflower or bean field and ignore the broadleaf crop. However, they have occasionally been reported as a pest on some broadleaves. This may be a result of larvae migrating when depleting their food.

Hungry larvae will move a fair distance to find a new food source. The “armies” can easily cross a road and feed well into a field on the other side in a single night. Armyworms have multiple but distinct generations in Minnesota. The larvae can range from tan and olive to nearly black in color. The pattern of a dark band flanked by white bordered pink to orange bands on along the side is a distinguishing character as is the net-like pattern on the head.

There are six larval instars (stages) and most of the vegetation is consumed during the last week of larval life. Larvae are approximately 1 ½ inches long when mature. When these larvae move underground to pupate, the year’s risk is over.

### **Scouting and management**



**Early instar true armyworm. Note net-like reticulations on head and the pattern of bands on the body. This moth larva has five pairs of prolegs. Color can vary from tan-olive to nearly black.**

Chewing damage on crop leaves and the presence of frass (insect fecal pellets) on plants and the ground indicate that an insect was present. The presence of live armyworm larvae should be confirmed before an insecticide is applied.

Armyworm larvae are most active at night and cloudy days. During the heat and bright sunlight, larvae often hide under leaf litter on the ground. Scouting and insecticide applications are often more effective near dawn and dusk and on cloudy days. When disturbed, armyworms drop to the ground and curl into a C-shape to “play possum”. Preliminary scouting for armyworms in small grains and field edges can be done with a sweep net.

**Wheat, barley, oats:** Pay close attention to areas that are lodged, have grassy weeds or near lodged grass borders when trying to detect larval populations. When an economic armyworm infestation is suspected in a small grain field, populations per square foot should be estimated. Shake the plants and look for larvae on the ground in a square foot area. In small grains the treatment threshold is 4-5 larvae/square foot. Check under debris and soil clumps. Do this in at least 5 locations within the field.



2013 Armyworm damage to corn. Photo: Tyson Kaldenberg

The larvae occasionally clip heads and when significant can require treating at lower populations. Head clipping is a behavioral change and usually occurs after leaves have been defoliated or senesce.

In spite of the preference for broadleaves, anyone, including an armyworm, can make a mistake. I'd be a little nervous with an alfalfa under seed being undamaged. A barley (or wheat) cover crop may have more armyworm pressure than oats but all are hosts.

**Corn:** Grassy weeds are attractive to egg-laying moths. When scouting, pay close attention to field borders and within-field or areas with current or past high grass weed pressure. Grass cover crops may also be attractive egg laying sites if not killed before moths arrive.

Examine plants for feeding damage and larvae. Larvae can often be found in the whorl and the nighttime feeding often occurs in the whorl.

Treat whorl stage corn when 25% of plants have 2 larvae/plant or 75% of plants have one larva or more. On tassel stage corn, minimize defoliation at or above the ear leaf.

This handy [Handy Bt Trait Table 2015](#) from Chris DiFonzo at Michigan State University shows which Bt proteins have some effect on true armyworm (TAW).

We are typically dealing with larger, less susceptible larvae moving from weeds and field borders into corn. Secondly, insects must eat the Bt to be affected. Even if the protein were effective, damage could occur with very high armyworm populations on the move.

### **Insecticides:**

Do not base treatment decisions solely on field edge populations. Treatment of populations that are near or starting to pupate or are heavily parasitized is not recommended.

Partial field or border insecticide treatments for armyworm are often sufficient when infestations are well identified by scouting and armyworms populations are found early are the armyworms are migrating. Treat several boom widths ahead of the infestation. Long insecticide residuals are not needed because of the short time a larval generation is damaging. Many products are labeled and effective. Refer to the insecticide label for rates. It is important to check the pre-harvest interval of any small grain pesticide. Take precautions to protect pollinators, particularly as corn nears tassel stage.

### **True armyworm lookalikes in MN spring corn and cereal crops:**

Be aware that there can be an armyworm imposter lurking on field edges. **Grass sawfly** larvae range from tan to green. They are in the order Hymenoptera (bees and wasps) rather than Lepidoptera (butterflies and moths).



Sawfly larva. Note three pairs of true legs and 8 pairs of abdominal rear prolegs and the single eye. Photo: Aaron Hass

A giveaway are the fleshy prolegs which number more than five. In the Lepidoptera, the prolegs number 5 or less. Lepidoptera caterpillar prolegs have minute hooks (crochets) and while those of sawflies do not.

Sawflies can clip small grain heads but I cannot remember a Minnesota infestation heavy enough to require treating.

**Cutworms.** Several species of cutworms may be found in corn and small grain crops. These will have five proleg pairs like armyworm.



Some sawfly larvae are green

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-8

Volume 18 number 8

06/11/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lambertson, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The Lambertson location accumulated 490 Growing Degree Days (base 50°F) from May 1 through June 10. For those of you that planted early, 29 GDD were accumulated from April 15 to May 1.

We have had 6.4 inches of precipitation since May 1 and 9.01 inches of precipitation since January 1.

### **Some crop stages and notes for earliest planted/emerged crops are:**

#### **Corn**

#### **7 collars**

Some may be concerned that once uniform corn stands becoming uneven or yellowing. While there can sometimes be nutrient or disease issues associated with these symptoms, most often this is temporary and related to the young corn plant shifting to nodal root development. Typically, things look the worst at 6-7 leaf corn. Residue, planting depth, soil type, soil moisture and weather can all influence root development and nutrient uptake at this time. As root development increases to match the rapidly growing shoots, growth will approve.

#### *Corn rootworm*

The adults of one of the *firefly* species are now present in SC and SW Minnesota. As a result of this phenological marker, I suspect corn rootworm egg hatch has begun.

However, temperature dependant development (degree day) models would indicate that the 2015 western corn rootworm hatch is a long way from complete.

### *European corn borer*



For the 1st generation flight of multivoltine *European corn borer* should be on now. A few moths have been captured at Rosemount in Dakota County but nothing in has been captured in the SWROC black light as of yet. While the low numbers are not unexpected, there are very light traps operating in Minnesota this year.

Corn borer populations have been very, very low for several years. As a result, some of the younger agriculturalists may not have seen these in the wild. I included a photo of the adult to serve as an identification aid for the young and to refresh memories of the old. Some corn growers opted for corn hybrids without Bt to save 2015 input costs. Continued very low corn borer flight numbers would be welcome news. I wonder if they included corn borers in the new movie "Jurassic World"?

### Armyworm

As mentioned earlier in the week, *Armyworm larvae* have damaged some corn where a rye cover crop was used. The rye cover seems to be a common factor in reports from near Hastings, south of Owatonna and even northeast Nebraska. I would also pay close attention to fields with heavy early season grass weed pressure. In sweeps of grassy field margins at the SWROC, small larvae are not hard to find but also not alarmingly high. The lack of black light trap locations means we may easily have missed observing a significant flight into the state from the south. *Economic infestation of armyworm could be in other areas than those mentioned above.*

### **Soybean** **V3-V4 for early planted**

Most fields look good. There are several giant ragweed disasters out there but most fields have good weed control, good stands and post emerge weed control is in progress.

Areas with prolonged wet soils may see some root disease develop. There have been a few scattered reports of *seedcorn maggot* with the usual manure/green manure trigger. *Soybean aphids* are not hard to find on the largest soybeans.

### **Winter wheat** **Flowering**

Stripe rust is present a low levels in variety trials at the SWROC. Leaf rust is also present but at even lower levels. We are seeing some scattered plants with late

developing and presumably less yield limiting symptoms of *barley yellow dwarf virus*. *Bird-cherry oat aphid* populations are declining at this location and *English grain aphids* are currently hard to find.

**Spring wheat**                      **Boot - heading**

Bird-cherry oat aphid populations have net progress and probably declined. At the SWROC, leaf diseases remain minor but stripe and to a lesser extent leaf rust is present. Aphid populations have declined. *Pay close attention to field edges and any lodged areas for armyworm.*

**Oats**                                      **Heading**

See comments on spring wheat above

**Alfalfa**                                      **Re-growth of second crop**

With the recent wet weather re-growth has been good. Watch for leaf diseases in second crop for leaf disease.

**What is it?**

Some of you may know what these are and some of you might have seen the following insect and plant and wondered what they are. I'll give the answers in the next issue. There are no cash or other prizes for guessing these correctly but feel free to buy yourself something nice if you think that you know what these are!



*#1 This caterpillar was found in alfalfa but it is not commonly an economic pest in Minnesota. If you count the insect's legs, you will see that it comes up a couple pairs short of a typical butterfly or moth. This creates a characteristic humpbacked gait. The adult is often seen feeding on flowers during late summer evenings. Larval populations are controlled by virus and other natural enemies.*



*#2 This plant seems a bit more abundant than usual this spring. Is most common along the edges of groves. It is native to Eurasia and an escapee from cultivation. In spite of its showy, four-petal spring flowers, it is an invasive weed.*

Happy trails,

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Corn borer moth captures have been very low in the light traps reporting in 2015. [2015 corn borer and corn earworm trap data for MN can be found here](#). You may want to start scouting non Bt-corn for small "shot holes" caused by feeding of small larvae. Focus on largest fields in the area first.

### **Soybean** *V4 for very early planted*

The 1<sup>st</sup> generation of SCN females (cysts) are begin to emerge from the roots of early planted SW Minnesota soybeans. There will be 2 or 3 more generations in SW Minnesota. Don't just assume the yellowing of your SCN resistant soybean field is from herbicide or IDC. Check root systems a few times this growing season.

### **Green cloverworm**

Upon seeing some small round holes in soybean leaves, I thought I might have stumbled upon and old adversary, the bean leaf beetle.



After a quick look, it was apparent that green cloverworm larvae were causing these holes and more significant damage to unfurling new leaves. The larvae are easily identified by four sets of prolegs (rear legs), longitudinal narrow white stripes and the habit of thrashing vigorously when disturbed. The larvae I observed were far from economically damaging levels.

On the other hand, the bean leaf beetles have been very, very scarce in soybeans at the SWROC for the past 5 or 6 years.

### **Soybean aphid**

I am now finding a few soybean aphids in all the SWROC soybeans with two or more trifoliates and found aphids without too much effort in Brown County as well.

I have also had reports of soybean aphid sightings in Yellow Medicine, Cottonwood and Dakota Counties and suspect other areas have fields with early populations. Kelly Tillmon mentioned finding aphids in eastern South Dakota as well.

The early soybean planting this year probably helped colonization success as aphids moving from buckhorn found numerous emerged fields to colonize.

Once the first round of soybean post-emerge herbicides winds down, it might not hurt to start checking a few indicator fields (fields where aphids tend to become problems early). We will soon begin to see whether or not this early colonization success will lead to populations needing an insecticide intervention or just more well-fed ladybeetles.

I wonder if I can find a correlation with post-emerge herbicide products and aphid populations. The formosafen and lactofen could be giving aphids indigestion... or a rash.

**Spring wheat**                      **headed - flowering**

Aphid populations have declined. Aphid control after flowering is not recommended. Some headed spring wheat has lodged. *Pay close attention to field edges and any lodged areas for armyworm.*

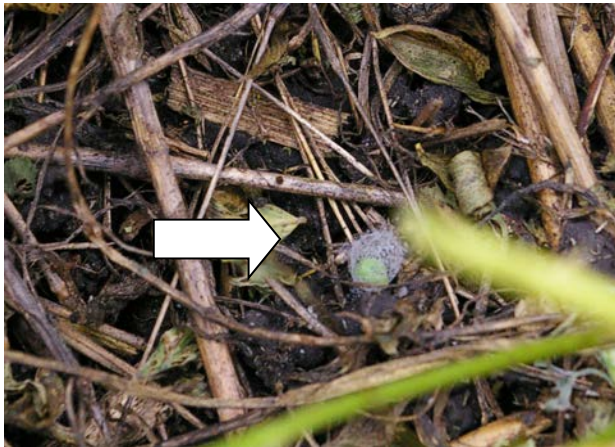
**Oats**                                      **headed - flowering**



Some very small infection centers of barley yellow dwarf virus (BYDV) can be found but incidence is much lower than the previous few years at this growth stage. The oats and BYDV infected plant in the photo are a later planted organic oats crop. While BYDV infections might still occur, symptoms and yield loss are usually less with late infections.

On SWROC oats, crown rust is currently hard to find.

**Alfalfa**                                      **Re-growth of second crop**



Most re-growth is 8-10 inches or less depending on when it was cut and how long it lay under a windrow.

At the SWROC, small round cocoons can be found near the base alfalfa plant indicating that alfalfa weevil larvae have pupated.

Potato leafhoppers, plant bugs, pea aphids and even a few spotted alfalfa aphids are presented but at less than economic numbers and beneficial insect populations are good. Your fields may be similar... or not.

**What is it?**

Some of you may know what these are and some of you might have seen the following insect and plant and wondered what they are. I'll give the answers in the next issue. There are no cash or other prizes for guessing these correctly but feel free to buy yourself something nice if you think that you know what these are!



**#1** These small gray flies (about 1/4 inch long including wings) have been very common in some localized areas southern Minnesota over the past couple weeks. The flies are often infected with a species of fungus and climb to high points to die (I usually can find a few on asparagus fronds). The fungus infection creates a sort of insect zombie and, from the heights, fungal spores are

better able to disperse to new victims. The larvae feed on organic material and members of this insect family can infest soft plant tissues including roots and germinated corn and soybean seeds.



**#2** This vine forming perennial weed goes by several common names. It is easily transplanted or re-grows from small fragments of root systems, making control of established populations by tillage or herbicide difficult. The buds shown in the photo will develop into somewhat attractive funnel shaped white flowers. While the photo shows the weed in a grass pasture environment this plant also invades fields, gardens and lawns.

### The incomplete answer to last week's specimens



**#1** This specimen is one of several Plusiine looper species. The larvae are hard to identify to species and the task is beyond my meager taxonomic skills. Possible candidates in this group of Noctuid moths are alfalfa, celery and cabbage and soybean loopers. Loopers occasionally can cause problems in some vegetable crops but are not generally of concern in SW Minnesota field crops or forage crops.



**#2** The plant in the photo is Dame's rocket, *Heperis matronelis*. The four petaled flowers and long seed pods place it in the Brassicaceae (formerly known as Cruciferae) family along with mustards, cabbages and radishes. It is sometimes confused with the unrelated, native, woodland phlox, *Phlox divaricata*.

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-10

Volume 18 number 10

06/23/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The SWROC location accumulated 708 Growing Degree Days (base 50°F) from May 1 through June 22 compared to 727 historic average for the period (about 1-2 days behind average). For those of you that planted earlier, 29 GDD were accumulated from April 15 to May 1.



We have had 10.36 inches of precipitation since May 1<sup>st</sup>; this is well above long-term average of 6.61 inches. It has been a wet June.

There was a significant storm the morning of June 22 over much of SW and SC Minnesota. At the SWROC, 2.59 inches of rain and high winds caused damage to the roof of a building and to area crops. Rain fell at a rapid rate and much ran off creating temporary standing water in low-lying areas.



More problematic was the wind, creating root lodging and brittle snap in some fields. Small grains had started to fill and lodging was common there as well. Wind tattered soybean leaves and yellow soybeans are common with waterlogged soils. Some of the yellowing is from IDC.

**Some crop stages and notes for earliest planted/emerged crops in the SWROC area are:**

**Corn** *10 collars for April 15th planted*

Corn growth is rapid and many fields have started to close rows. Corn is recovering its vertical stability in most cases, brittle snapped plants being the exception.

On June 19<sup>th</sup>, we were able to float a few small corn rootworm larvae from research plots. At least some survived the winter.

Common stalk borer are moving from grasses on field edges and giant ragweed to corn.

Hop vine borer has also been observed to the east.

**Soybean** *V7 for very early planted*

If you have yellow soybeans, check the root systems for SCN and root diseases as well as IDC tolerance and SCN resistance of the variety. The wind was hard on soybean leaves in some fields and should have been hard on soybean aphids. I wonder if some aphids left their mouthparts behind when they blew off soybean plants?

**Spring wheat** *beginning grain fill*

The fields I have seen have partially recovered from lodging.

**Oats**

On SWROC oats, crown rust is present on a susceptible variety. As of the 19<sup>th</sup>, most varieties looked ok. If oats are a cover crop for under-seeded alfalfa and remain severely lodged, take them off early as oatlage to avoid injuring alfalfa stands.

**Alfalfa** *Re-growth of second crop*

Potato leafhoppers are at economic levels in some alfalfa fields now. Many fields are close to the second cutting and can avoid an insecticide application, at least temporarily.

Scout potato leafhopper in the third crop. Potato leafhopper adults are very mobile and can re-colonize a field quickly.

**What is it?**

Some of you may know what these are and some of you might have seen the following insect and plant and wondered *what the heck are they?*

There is no reason to reply and I'll give the answers in the next issue. There are no cash or other prizes for guessing these correctly but feel free to buy yourself something nice if you think that you know what these are!



**# 1** *The damage to this corn leaf is caused an insect that does not have chewing mouthparts.*

*This insect feeds on many plant species. In corn, it is most often found in reduced or no till fields, particularly after warm winters.*

*Most insects in this insect family feed on plant juices but some are predators.*

**You may think these "what is it?" questions stink, but I am not trying to trick anyone.**



**#2** *This is one of the most common foliar diseases of soybean in Minnesota.*

*Symptoms on new leaves often occur after a heavy rainfall. The necrotic angular spots are surrounded by a yellow halo. These spots can enlarge and fall out, leaving the leaf with a tattered appearance. This disease is rarely severe enough to reduce yield. A fungicide application might help stimulate the economy, but it would do nothing to help this disease.*



**The answer to last week's specimens**

**#1** *Seed corn maggot adult. Not a problem in many fields but if fresh, decaying organic matter and fly egg laying overlap corn, soybean and some vegetable crops can be significantly damaged.*



**#2** *The perennial weed is field bindweed, Convolvulus arvensis, This weed was introduced from Eurasia. This species could be confused with wild buckwheat, an annual with small nondescript green flowers or with the similar native perennial, hedge bindweed. The characteristics are the basal leaf shape with the outward facing points. A better diagnostic clue, while not very visible on last week's flower buds, is the two small bracts separated on the stem from the base of the flowers in field*

*bindweed. Hedge bindweed has two large bracts at the base of the flower (see the photo below).*

*During its early years, the SWROC was a research site for field bindweed control. We still have a bunch.*



Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-11

Volume 18 number 11

07/02/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The SWROC location accumulated 846 Growing Degree Days (base 50°F) from May 1 through June 29 compared to 870 historic average for the period (still about 1-2 days behind average). For those of you that planted earlier, 29 GDD were accumulated from April 15 to May 1.

We received only 0.46 inches of rain over the period last week but 5.05 inches total for June. For the most part, the crop reflects early planting into good seedbeds, abundant rainfall and moderate temps.

Most lodged corn and small grains recovered from last week storms, but a few low lying areas did have some drown out.

There have been recent areas of hail in SW and WC MN. Late enough that replanting is not an option for corn and not a good option for soybeans. Where the corn crop was not destroyed, Goss' blight and wilt, common smut, and some bacterial disease can be expected. In soybean, stem callous from deep bruises on the lower stem may hinder harvest; the larger concern is an open canopy in fields with a waterhemp seed bank.

### **Some crop stages and notes for earliest planted/emerged crops in the SWROC area are:**

#### **Corn**

#### ***14 collars for April 15th planted***

Corn growth continues to be rapid as we begin to approach tassel. Emerging leaves are sometimes temporarily bound up in the whorl. That is cause of the scattered **yellow corn** plants that are so visible in some fields now.

Recently, there is a lot of information circulating on impending leaf disease disasters and the need for fungicides in corn.



**What the current kerfuffle seems to be about. Northern corn leaf blight symptoms. Typical lesions are cigar shaped but corn genetics can influence the size and appearance. This is not a current photo.**

These bits of agronomic and sales advice may be irrelevant for your fields in SW Minnesota. While the situation may change, there is currently little visible leaf disease in SWROC corn.

Remember, other areas of the corn belt have different environments, hybrid selections, and cropping systems than we do in Minnesota. For example, Illinois is reporting levels of **gray leaf spot** and **northern corn leaf blight** in some of their research

plots, *but* it has been very wet in parts of that state. Therefore this information is more meaningful for those who have "Land of Lincoln" on their license plates.

Within southwest Minnesota, disease potential can vary widely, even from field to field. I would like to suggest, and I can only suggest, that you make any corn fungicide decisions based on the presence of disease in your field and your local weather. You have time until after pollination to make that decision.

## **Soybean**

### ***Up to V7 and R2 for very early planted***

The early-planted soybeans have up to seven trifoliates and are in full bloom, while later plantings are less. The large number of vegetative nodes developed before soybean began to bloom this year could help yield.

It would be worth the effort to look for some **soybean aphids** after the Independence Day holiday. Focus on the fields that usually have aphids first. These are often early-planted, small-sized fields with buckthorn nearby.

**Weed control of waterhemp and giant ragweed** are a major concern. Pre- and post-weed control, chemical selection and timing, crop rotation, planting date, row spacing and row cultivation are all tools that should be selected and combined to work in a harmonious fashion to the detriment of your weed populations. This should be a hot topic during winter meetings.

Resistant weeds do not disappear because you change an herbicide program. In other words, if glyphosate did not kill your waterhemp or ragweed last summer, it should not have been expected to kill them this year. I am hearing quite a bit of talk about cultivating soybeans this year.

**Yellow beans** are unusually prevalent in SW Minnesota this year. A disturbingly large percentage of these have large numbers of **SCN** on the roots of SCN resistant soybeans varieties.



Yellowing caused by from SCN infestation. Symptoms can vary from barely detectable to mild temporary yellowing, as in this example, to severe stunting and chlorosis.

In Southern and West Central Minnesota, **iron deficiency chlorosis (IDC)** tends to be worse along the rims of low areas. Yellow soybeans on higher ground, in the high organic low ground, or areas of a field without a history of IDC are suspect - particularly when the chlorosis first develops on larger soybeans. The visible presence of SCN females on the outside of roots will vary throughout the growing season as generations of the SCN are produced.

The emerging lemon-shaped females are initially small and white but as they develop, turn yellow and eventually tan. The more mature, yellow bodies are usually the easiest to see.



SCN infested soybean root system. Not dark roots of this heavily infested plant. Compare the size of the white females in the circled area to the nodules at the bottom of the image.

Currently, white females are visible on late planted, V2 soybeans at the SWROC, while only scattered, yellow females are present on the roots of early planted soybeans.

Root systems heavily infested by SCN have a characteristic appearance. The very dark roots are small in diameter and nodulation is often reduced.

The feeding of the **nematodes** can open up the root system for fungal infections and roots may be decayed as a result.

Sudden death syndrome (SDS) and top die back (*Diaporthae / Phomopsis*) are two soybean diseases that are often correlated with SCN infestations.

When you suspect an SCN infestation, look at the roots in and near the affected area. A trowel to dig and water to wash roots is the preferred method. The females will be more

visible if you let the roots air dry for a couple minutes. In a pinch, grasping and gently pulling up several adjacent plants together will sometimes provide enough of the smaller roots to show some nematodes.

Take a soil sample for SCN eggs or re-check the root systems in a couple weeks if you are not finding SCN.

I would wait until fall to collect infested soil for Hg typing. By that time the SCN in your field will have gone through the final generation of selection pressure on that variety.



Immature, white SCN females on soybean root. Note the dark, shriveled root appearance and the lack of nodules.

In my opinion, SCN populations capable of infesting and reproducing on one or more sources of SCN resistance is a very serious threat to long-term economical soybean production in Minnesota and the issue is now reaching a critical point. That said, there is some saying about opinions and everyone having one.

For more information on SCN you can see the [University of Minnesota Soybean Cyst Nematode Management Guide](#).



Close-up image of an SCN female and nodule (upper right). Note the lemon shape of the developing cyst.

## Spring wheat

## Milk - early dough



Bacterial leaf streak of wheat



Wheat stripe rust

Fields have partially or fully recovered from lodging. The crop is looking very good. Diseases are very variety dependant in trails at the SWROC. Some **scab** is currently present and **stripe rust** and **bacterial leaf streak** is now moderate - severe on some varieties.

**Oats late milk -early dough**  
**Crown rust** has rapidly increased on some varieties. If **stalk integrity persists, yields** may be good this year.

**Alfalfa Re-growth of 3rd crop**

**Potato leafhoppers** are the main insect concern now and a 15-inch sweep net is your friend.

## True armyworm

The Lambertson black light trap captures have been moderate but consistent all spring. I have been suspecting more problems with armyworm, but it has been quiet since the reports of problems in some fields planted into winter rye.

Yesterday, I visited with an agriculturalist about large numbers of armyworm in a Redwood County sugarbeet field. The moths had been attracted to lay eggs in an early-planted sugar beet field with a heavy oats cover crop. As is typical management, the oats were killed a few weeks ago and the armyworm were forced to move to sugarbeet. The Armyworm damage to the sugarbeets was still minimal at this point. They greatly prefer to feed on grasses and hungry armyworm are unpredictable. *I am not predicting widespread problems, but you just might want to take a last look at any lodged oats or wheat, or corn with early season grass weeds.*

## What is it?

Some of you may know what these are and some of you might have seen the following insect and plant and wondered *what the heck are they?*

There is no reason to reply and I'll give the answers in the next issue. There are no cash or other prizes for guessing these correctly but feel free to buy yourself something nice if you think that you know what these are!



**#1. No clues. You need to turn in your Birkenstocks if you don't know what this caterpillar is.**



**# 2 These eggs the underside of a corn leaf used to be much more common in MN corn. They are important clues when scouting non Bt corn.**

## The answer to last week's specimens



*# 1 Corn leaf with brown stinkbug feeding damage. The pattern of rows of holes was made by the stinkbug mouthparts when the leaf was still rolled.*



*#2. Bacterial blight of soybean- early infection symptoms.*

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-11 addendum

Volume 18 number 11b

07/03/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **More on corn fungicides**

One approach is to corn leaf disease control is to arbitrarily start bombing corn fields with a fungicide.

Another, probably more efficient and economical approach would be to prioritize scouting and any control efforts on several factors. While not nearly as exciting as matching wits with insect pests, this is how I would go about making a decision if I thought I might need a fungicide:

- 1) Leaf diseases of the most concern are gray leaf spot and northern corn leaf blight.
- 2) All spots on a corn leaf are not a fungal disease. Correctly identify diseases. Use a good identification reference to help identify key diseases. This web reference by Dean Malvick, U of M Extension pathologist, is just one example: <http://www.extension.umn.edu/agriculture/crop-diseases/corn/>. If you are unsure, you can submit samples to the U of M Plant Disease Clinic. Sample submission guidelines are available at <https://pdc.umn.edu/>.
- 3) The residue in continuous corn will have more early season disease inoculum than 1st year corn. Reduced tillage fields can have higher disease pressure. Some other diseases that move into the state on winds, southern rust for example, would not follow this pattern.
- 5) Some hybrids are more susceptible to these diseases, focus on those.
- 6) Weather will influence disease pressure and rainfall and heavy dews will favor disease, a drought will not. Low lying areas and protected areas will have higher humidity and dews and often show symptoms first.
- 7) Focus any treatment on high risk fields *with* disease.

*I believe the research data supports this approach. I suppose, that if someone wanted to expend the effort, this same approach could be adapted to foliar diseases of other crops as well.*

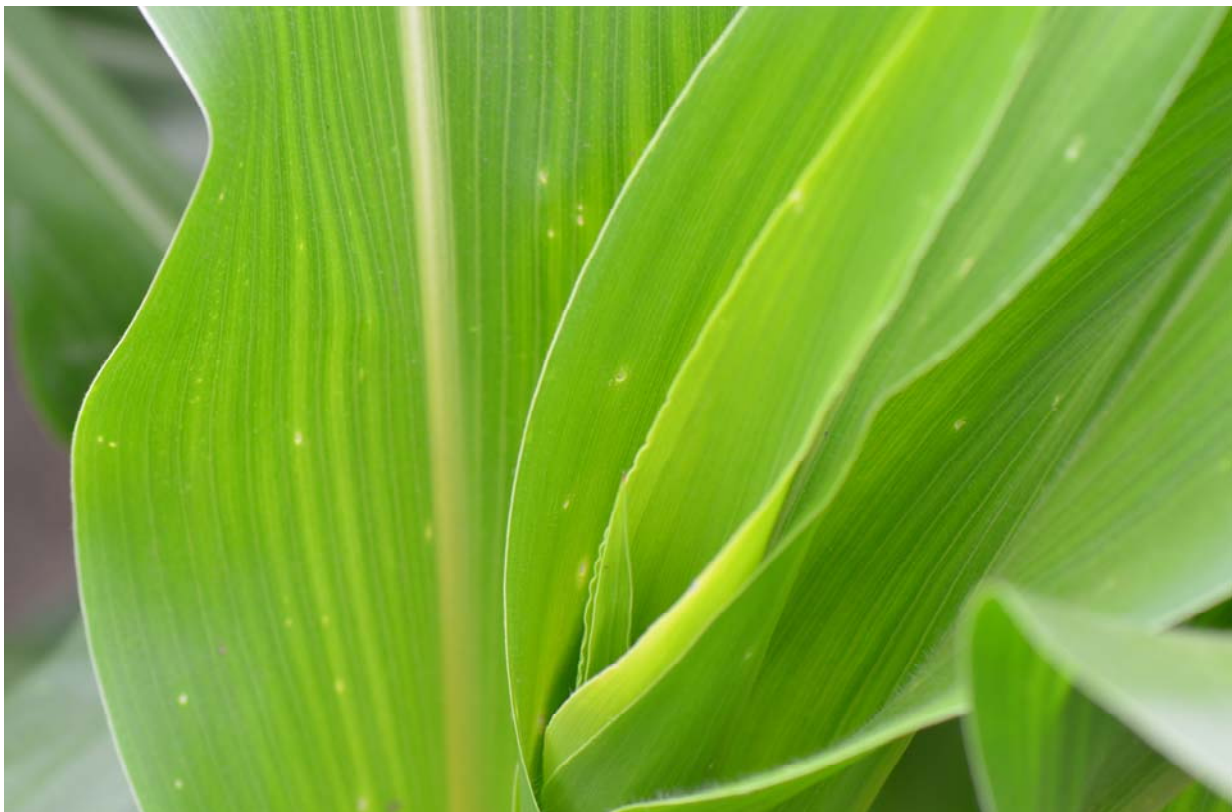
### **True armyworm**

After the yesterdays newsletter was emailed, I heard about some treatment of armyworms on wheat in SW MN. Additionally, some consultant friends let me know that they have been treating some wheat for armyworm across the border in eastern South Dakota. One mentioned that areas with hail have had problems.

Why hailed areas? Like black cutworm, true armyworm move north with weather systems from the south and drop out with thunderstorms. Additionally, the lodged, tangled stems of hailed on wheat or other grasses provides a good environment for eggs and larvae.

*Unlike black cutworm, it is difficult to predict where problems from armyworm flights will occur geographically. Minnesota is a big place but I would focus on lodged small grains and not-Bt corn with grass weed pressure first.*

### **European Corn borer**



**Feeding damage in corn whorl caused by 1st instar European corn borer larvae. Notice the scattered nature of the small shot holes. This damage is from a 2015 artificial infestation at the U of M SWROC, not a commercial field.**

There is more non-Bt corn planted this year and some are scouting for corn borer eggs and larvae. There seems to be some confusion on what 1st generation corn borer damage looks like.

The small larvae are active in the whorl. The feeding pattern is distinctive. The larvae cause randomly scattered small, round holes or "shot holes" that become visible as leaves emerge from the whorl. Scattered holes in leaves near the base of the plant are not corn borer. Uniformly spaced holes, large, oblong holes or irregular shaped holes



**These more or less uniform, oblong scars on a developed leaf are not caused by corn borer. They are caused by the corn blotch leaf miner adult fly.**

are not corn borer. *I do not anticipate any widespread problems from corn borer in 2015.*

## **SCN**

Yellow soybeans are not the only symptom of SCN and yellowing is often temporary. Potassium deficiency-like symptoms, irregular uneven growth, slow closing of the rows can also indicate SCN damage and should be examined.

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-12

Volume 18 number 12

07/16/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The SWROC location accumulated 1105 Growing Degree Days (base 50°F) from May 1 through July compared to 1169 historic average for the period (about 3 days behind average). For those of you that planted earlier, 29 GDD were accumulated from April 15 to May 1.

We received only 0.02 inches of rain over the week of July 7-13. There has been 11.90 total inches of rain since May 1, still well above the long-term average.

### **Some crop stages and notes for earliest planted/emerged crops in the SWROC area are:**

#### **Corn**

Tassel - early silk for early to moderate maturity hybrids.

Recently, there is a lot of information circulating on impending leaf disease disasters and the need for fungicides in corn.

We caught the first **European corn borer** moth for 2015 in the SWROC light trap. This is probably an adult for the Univoltine (single generation) strain of corn borer. Not expecting any widespread problems from this biotype of corn borer.

We are beginning to see adult northern and western corn rootworms emerging. Damage is present on some plots without a below ground rootworm trait at the SWROC.

Leaf disease remains at very low levels, at least in the corn I have looked at.

## Soybean

### *Up to R3 for very early planted*

Bacterial blight and *Rhizoctonia* root rot are the most common diseases present in SW Minnesota now.

**Green cloverworm, grasshopper nymphs and red-headed flea beetles** are the most common defoliators in the same area. I am not aware of any yield limiting populations as of yet.

## **Pest alert - Two-spotted Spider Mites in soybeans**

*Bruce Potter, Bob Koch and Ken Ostlie*

In spite of the abundant rainfall and the relatively mild temperatures, some Minnesota soybean fields have populations of two-spotted spider mites (TSSM) at or near economic damaging levels and mites can be found at lower levels in others.



Photo: Wayne Maiers, Hutchison Coop - Arlington Location.



An upper soybean leaf with injury (stippling) caused by two spotted spider mite feeding. The small yellow stipples are where mite feeding has destroyed leaf cells. The black spots are dead soybean aphids and frass (feces) from predatory insects. Mites and silk webbing are present on the underside of leaves

TSSM infestations have been observed in several counties. In Sibley County, problem fields were soybeans planted into alfalfa. It makes sense that these fields would have higher TSSM populations because the mites winter on perennial plants.

TSSM problems are typically associated with drought. What is unusual, and causing concern and some confusion are the high TSSM populations in an area of abundant rainfall and without a period of prolonged hot, dry weather.

A Brown County soybean field was observed with disturbingly abundant TSSM. The mites and their damage had already progressed to the tops of the plants in small pockets in the field.

As is typical, the field border was more heavily infested but the mites had been present for

some time, most likely before the adjacent road ditch was mowed. We also received a report of a TSSM infestation in a Carver County soybean field. Both of these areas have had above average rainfall.

## How can we have a spider mite infestation in soybeans without drought stress?

- It could be related to impaired root systems from root disease and/or SCN leading to poor water uptake, even though soil moisture is good. **Rhizoctonia root rot** and **SCN** were both obvious in the Brown County field.
- **Neozygotes**, a fungus that normally controls mites when weather is cool and wet, was apparently not effective in these fields. Insecticide and fungicide applications can remove the beneficial arthropods and fungi that typically keep TSSM populations low.
- Some entomologists suspect that seed and foliar applications of pesticides containing neonicotinoid insecticides (look for thiamethoxam, imidacloprid or clothianidin on the label) can increase the probability of spider mite problems.

*If you applied a seed insecticide, foliar insecticide or foliar fungicide to a soybean field earlier this year, you might want to check to see if you unintentionally created another problem.*

Dimethoate, chlorpyrifos, bifenthrin and products containing these insecticides are labeled for TSSM control in soybean. When TSSM are present in a field, be careful with any insecticide applications for soybean aphid. The pyrethroid insecticide bifenthrin (e.g. Brigade, Hero, Tundra) is labeled for two-spotted spider mite control. However, other pyrethroid insecticides are not very effective on mites, and some pyrethroid insecticides can actually increase TSSM reproductive rates.

If you treat a field for spider mites or insects, make sure you evaluate control 5-7 days later. The hatching of two-spotted spider mite eggs and any immatures or adult mites surviving poor spray coverage can rapidly re-infest a field.

Resistance to pesticides is always a concern with mites. A chlorpyrifos (e.g. Lorsban) resistant mite population was documented in Redwood County in 2012. It is not known how widespread this resistance is, or even if it is still present in Minnesota mite populations. TSSM populations resistant to chlorpyrifos and/or to bifenthrin are known to occur in other parts of the country. Currently, we do not recommend tank-mixes of insecticides for TSSM control in MN. The use of tank mixes of chlorpyrifos and bifenthrin insecticides is best reserved until mite populations cannot be controlled with the individual products.

Include TSSM in your scouting efforts. [Managing two-spotted spider mites in soybeans](#) gives additional details on spider mites and will be updated in the near future.

At this time, there are relatively few reports of TSSM. We do not yet know the extent of this year's problem. However, it is surprising that we have any reports of significant mite infestations given this year's weather patterns. If the weather turns hot and dry, we could be fighting TSSM problems for the next two months. *Treat the soybean pest problems you know you have and can be effectively controlled. Insurance pesticide applications, in the form of insecticides (of any kind) or foliar fungicides, are probably not the best idea in fields with spider mite populations.*

Spider mites populations are present at low levels in most, if not all, soybean fields every year. *Adding a "just in case", low rate of chlorpyrifos or other product with TSSM activity to a tank mix of insecticide(s) with poor performance on TSSM is a recipe for pesticide resistance problems. Instead of "fixing" any gaps in insecticide performance, you may end up fixing pesticide resistance in your TSSM population...a very bad thing.*

### **Soybean aphid**

Soybean aphid populations are highly variable throughout Minnesota. I would pay close attention to fields that tend to have early economic threshold populations of aphids. If you have not already started, begin assessing the aphid populations in your or your clients' fields in a systematic manner.

A few fields have reached economic threshold. Small field size and buckthorn nearby are common factor for some. An increasing number of fields will likely be reaching economic threshold levels in the near future

Avoid spraying early. If this continues to shape up as a higher aphid population year, any fields treated now have a high probability of needing re-treatment in a few weeks as aphids re-infest fields.

Unless the hotspots are numerous, avoid treating fields with small areas of infestation now.

Consider aphid predators and mite populations in the field when making an insecticide application decision. Soybeans are now blooming so any using the pollen and nectar are at risk. Using the economic threshold to make treatment decisions will minimize the collateral damage. See [protecting pollinators](#) for further information

### **What is is?**

#### **The answer to last week's specimens**



# 1 Monarch butterfly caterpillar on common milkweed.

There are adult monarchs out now. Some of them seem intent on trying to commit suicide by pickup truck.



#2 Egg mass of the European corn borer. This is what you cue in on for univoltine corn borer scouting.

The ECB is not extinct. Several readers have sent pictures (thanks for those) of shotholing and tunneling of 1st generation. They are relatively rare though.

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-13

Volume 18 number 13

07/23/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC) website*: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The SWROC location accumulated 1270 Growing Degree Days (base 50°F) from May 1 through July compared to the 1324 historic average for the period (still about 3 days behind average). For those of you that planted earlier, 29 GDD were accumulated from April 15 to May 1 with many area corn fields able to take advantage of that.

We received 0.17 inches of rain over the week of July 7-13. There has been 12.04 total inches of rain since May 1, still well above the long-term average of 9.72. One of these heavy rainfall events came hard and fast with significant run off so the rainfall total is a bit misleading. It would be nice to receive a bit of rain and some cool weather for corn pollination. In some areas, coarse textured soils are showing moisture stress now. Many of you have already put in an order for an inch of rain of without any high winds. Still a good looking crop.

### **Some crop stages and notes for earliest planted/emerged crops in the SWROC area are:**

#### **Corn**

R1 silk - R2 blister for late to early maturity hybrids. Pollination is in progress from the base of the corn ear to the tip.

In the fields I have been in, including corn on corn, northern **corn leaf blight** and other foliar fungal diseases are hard to find. The hot weather in the weekend forecast *will not* be favorable for northern corn leaf blight and **common rust of corn** development.

We are beginning to rate roots for damage in some corn rootworm studies. I have observed extended-diapause **northern corn rootworm** damage in hybrids without the Bt -RW trait in a few SW Minnesota rotated corn fields. **Western corn rootworm**

populations may be declining and northern corn rootworm may be increasing in SW MN but I still need to see a bit more of the emergence before jumping to any conclusions. You should be starting to scout fields for rootworm beetles.

As small grains mature, we are seeing some **Bird-cherry oat aphids** move to corn. If you find a field of corn with heavy aphid populations I would like to hear about it.



Severe flea beetle feeding on a corn leaf

### When is a corn disease not a disease?

In the rush to find corn leaf diseases, things can get confused.

There is some damage by **red-headed flea beetles** on corn leaves now. This damage is seldom, if ever economic. The flea beetles feed on soybean leaves and several other plants in addition to corn.



Red-headed flea beetles on corn silks

**Corn blotch leaf miner** also causes symptoms similar to a leaf disease on corn leaves. The damage by adults and the tunneling within the leaves most often remains on the lower leaves.

A relative of the corn blotch leafminer is the **alfalfa blotch leaf miner**. The later has been more abundant than usual this year. The adults of both look like a tiny housefly.



Small scars caused by adult flies and tunnels (blotches) caused by the feeding of larvae

There a possibility injury from insect feeding can open the leaves up to some diseases, the bacterium which **causes Goss's blight and wilt** for example, but this has never been documented.

## Small grains - Harvest is underway in SW MN.

There should be a very good crop in SW MN as in most disease developed late. There will be some ***Fusarium* head blight** (scab).

## Alfalfa

Potato leafhopper is the primary insect concern now.

## Soybean - *Up to R5 for very early-planted, early-season (mid group I) varieties*

As plants grow larger, and weather becomes warmer, the increased moisture demands of the soybean requires a good root system.

***Phytophthora* root rot** has shown up in one study at the SWROC. The plants dying with leaves on, shepherd's crook appearance at the top of the plant, and the brown to chocolate colored lesions extending above the soil are diagnostic. Just what I needed in an SCN experiment... more variability.



A late instar green cloverworm larva killed by disease.

**Green cloverworm** are common in many fields.

This insect is causing much of the minor leaf feeding in many SW Minnesota fields. I have not heard of any potentially yield limiting populations as of yet.

In most cases, the presence of green cloverworm larvae helps keep predators in the field. They are rarely numerous enough to hurt yield. The larvae are susceptible to fungal and

viral pathogens. Disease can, and often does, kill most of a field's green cloverworm in short order.

Rolled soybean leaves may contain painted lady butterfly larvae but the adults are rare this year and I don't expect large numbers of larvae this year. If the rolled leaf contains a small, green larva, it is likely the **oblique-banded leafroller**.

**Two-spotted spider mites** are still present in some fields with moisture stress, include them in your scouting program.

## Soybean aphids

I had the pleasure of visiting with many of you by phone, email and text this week. More fields are reaching treatment levels (an average of 250 soybean aphids/plant with 80 % or more of the plants having some level of aphids present). I appreciate the reports. This is going to be an interesting year.

Considerable acreages have been treated in some geographies of Minnesota and yet soybean aphid populations are at very low levels in others. The infestation levels and the percentage of fields treated, vary widely by geographic area and by field. While most insecticide treatment has been in those fields that typically have threshold populations (fields that are near buckthorn, smaller in size and where soil moisture is not excessive) early infestations are becoming more general and could continue to do so over the next few weeks.

Winged female aphids (alates) have begun moving from fields or areas of fields under moisture stress. Additionally, as early-planted, early-maturing varieties approach the R5 (beginning seed) stage, alates often begin leaving the field. Many of these aphids will on disperse long-range on the winds; looking for new soybean fields to colonize. In most of Minnesota, this migration typically peaks in late July, the week before the Sturgis, SD motorcycle spectacle (or Farmfest week for those of you from areas that do see much of the migrating motorcycle traffic).

In a soybean date of planting study at the SWROC, this mid-season emigration has begun on soybeans at the more advanced growth stages while populations on late-planted soybeans shot up the past week. Some 3 and 4 trifoliolate plants having 10 or more alates producing nymphs.

Aphids can now be found well down into the canopy on R3 and later stage soybeans - don't just look at the tops of the plants for aphids.

I am beginning to find "white dwarves," low in the canopy of the most advanced stage soybeans now. Include these small white aphids in your counts.



Populations within a field can change quickly this time of year as winged aphids leave heavily populated fields and arrive in others. For example, the aphid suction trap at Crookston, Minnesota picked up a number of these long-distance migrants last week.

Populations in many fields in SW, SC and WC MN are fairly uniform indicating there were good sources of winged aphids to colonize these fields.

*If you have problems seeing soybean aphids get help from someone who can. An average of 250 aphids/plant is not a heavily infested field. Fields with large areas of*

stunted soybeans covered with black sooty mold are well past economic threshold and economic loss has been incurred. Fields that were treated with insecticide may need to be treated again if re-infested by winged aphids.

2015 is shaping up to be a year with significant soybean aphid pressure but this is not yet a certainty. Can the fact that 2015 is also the 75th anniversary of the Sturgis motorcycle rally be a coincidence?

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-14

Volume 18 number 14

07/31/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

Reliable sources have reported a few soybean fields with symptoms of **white mold** in SC and C MN and **SDS** in SC MN.

**Corn rootworm** beetles should be scouted now. Western corn rootworm survival is better than I expected.

**Green cloverworm** adults, eggs and larvae are very abundant in many soybean fields. I would use the 20% defoliation of the plant (assess the top, middle and healthy lower canopy leaves, not just the top leaf or two) as an action threshold if larvae are still abundant. It sounds like a field or two may have been treated for these insects. I don't know if these were real problems or just someone afraid their insecticide stockpile would get stale if they didn't use it quick. However, a few green cloverworm or holes in the leaf *are not* a reason to adjust economic thresholds for aphids.

### **Soybean aphid notes:**

Populations are increasing...rapidly in some fields, not so much in others.

Scout fields before you spray. Some fields have low numbers, particularly in areas with recent heavy rainfall, and winged aphids may start to leave some of the more mature and moisture-stressed fields, possibly lowering numbers.

*Do not assume that soybean aphids are controlled just because you sprayed.* Mixing and application errors happen. Recheck the field, some products work faster than others but all should show results 4-5 days after treatment. Recently deceased aphids may remain on the leaf but can be easily brushed off or will fall off if you shake the leaf.

Live aphids, mostly in the lower canopy, indicate a *coverage problem*. Use adequate water volumes when spraying. Very coarse droplets provide poor coverage and very fine droplets do not penetrate the canopy. Use the right spray tip for the job.

Live aphids, mostly near the top of the plant, indicate a *re-infestation problem*. Unfortunately, there are many winged female aphids available to re-infest fields right now.

While claims for insecticide residual can vary widely, the more realistic ones are based on the probability of an insect population rebounding to economic levels after the insecticide treatment.

Hot weather can decrease the efficacy of some synthetic pyrethroids and can increase the volatilization of some organophosphates.

Hot weather increases the speed at which some insecticides are degraded.

Temperature inversions or wind can affect spray distribution.

Contrary to rural myth, effective concentrations of systemic insecticides do not move through the entire plant. Late-emerging leaves will not be protected.

To put marketing claims into perspective, I can personally guarantee season-long residual control for any soybean aphid insecticide *if* you get 100% control *and if* no new aphids immigrate into the field; neither of which is likely.

Re-spraying a field with the same insecticide is not advised, particularly where the first application performed poorly. Repeat applications of the same insecticide, or even the same insecticide class, would quickly identify an insecticide-resistant insect or mite population in your field...an intellectually stimulating but not economically stimulating discovery. Try to switch chemistries when re-treating a field. This possibility of needing to re-treat is one reason we do not recommend premixes or tank mixes of insecticides *unless* resistant populations or multiple species at economic levels are targeted.

*At this point, we do not have good evidence of any insecticide resistant populations of soybean aphids in Minnesota. Only one insecticide resistant two-spider mite population has been documented.*

However, Bob Koch, U of MN, Extension soybean entomologist is screening for insecticide resistance. Please let us know if you suspect an insecticide performance problem on soybean aphids or spider mites. New populations of pesticide resistance can always develop.

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-15

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### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

### **Aphids in corn**

As agriculturalists re-enter corn fields to scout corn rootworm beetle populations and begin to estimate yield potential, they often find some unwelcome aphid visitors.



**Bird-cherry oat aphids on a corn leaf. Note the dark color and red coloration around the cornicles**

Small, dark-olive bird-cherry oat aphids are usually found lower in the canopy, particularly when populations first establish on corn. These move upward on the plant as populations increase. They are the most abundant species in corn this year.

English grain aphid are found higher in the canopy. Sometimes, colonies of these larger, light-green aphids with long black cornicles are mixed with those of bird-cherry oat aphids and this is common in corn I have looked at this year.

Some years, the blue-green corn leaf aphid can also be found in the



**English grain aphids. Note the long black cornicles (tail pipes). The black aphid on the upper left has been parasitized by a wasp.**

upper part of the canopy but this species seems less common in SW Minnesota than it once was. Even more rarely we may see some greenbug colonies on corn. All these species also feed on small grains and several other grasses and may move to corn as the small grain crop matures.

You may have heard about the sugarcane aphid that has recently caused significant problems on sorghum in southern states. This species has not been found in Minnesota and does not feed on corn or wheat.

Bird-cherry oat and English grain aphids are often more abundant where corn is moisture stressed. Those of you who look at hybrid comparisons or walk numerous fields have probably noticed that there are differences in which hybrids are more heavily infested. Sometimes, we see more aphids where fungicides or insecticides were previously applied and the beneficial insects and fungi removed.

Either of these species can become very abundant, covering plants with aphids and honeydew. The honeydew is aphid waste and consists of water and sugars the aphids cannot use. These populations often build rapidly and peak in R3 or milk stage corn. Even more quickly, populations can collapse very quickly from predators and fungal disease epidemics. Aphids can, and often do, leave corn as it begins to mature to dough stage. If subsequent rainfall washes off the sooty mold, honeydew, and cast skins, the only evidence of the infestation may be small discolored areas on leaf sheathes and shanks.

It is difficult to compare aphids and their damage on corn with those on soybeans, small grains and other crops. I am not aware of significant virus diseases of corn that would be transmitted by aphids, particularly this late in the season. Corn biomass is much larger than a soybean plant and the amount and water/nutrient content of the two crop's sap are quite different.

At this time, corn has already pollinated and pollinated well. The published thresholds for aphids on corn are based on whorl and pre-pollination corn growth stage populations of corn leaf aphids, not the late-milk stage bird-cherry oat and English grain aphid populations we have been finding in Minnesota the past few years.

Chances for a payback for insecticide applications in blister to dough stage corn are less likely because of insecticide coverage issues for aphids lower in the canopy that can quickly reinfest treated foliage. Many 2015 fields are taller than typical, increasing the coverage problem. Secondly, very high aphid populations may, in part, be a symptom rather than cause of crop stress. Aphid populations may be responding to changes in nutrient quality of corn sap. These heavily infested areas often show stalk rot later in the season another possible connection with hybrid differences. This year's tall plants with high kernel counts are more likely to undergo

stress if rainfall gets bit short. Finally, insecticide applications can make aphid populations worse by killing beneficial insects and they can flare spider mites or other secondary pests.

There are not many good data sets on these late-season infestations but most of I have visited with have not seen a yield response for treating these. However, if you feel an uncontrollable urge to kill some corn aphids or just want to experiment, there are several products that are labeled. that are infested. Leave wide enough check strips to account for spray drift and leave multiple check strips to account for spatial differences in corn yield potential and aphid populations.

I would suggest that you chose fields to experiment on where:

- Corn has not started to dent.
- The field is generally infested with a high percentage of plants having aphids. Fields infested only in borders or pockets in the field are hard to draw conclusions from.
- If aphid populations are very heavy above the ear leaf and there is a there is a potential for photosynthesis-blocking sooty mold development on honeydew covered upper leaves
- Predators and wasp parasitoids (lady beetles, Syrphid flies, parasitized mummies, and etc.) and signs of fungal disease are not abundant. How's that for a generality? Once established, predators and disease can remove large numbers of aphids without your help and may trigger aphids to move.
- Winged aphids or nymphs with wing pads *are not* easily found. If present, the population may be ready to leave the field.
- The plants are not already covered with sooty mold or showing signs of stress. Any yield loss has already happened.

There are no guarantees on return. Most often doesn't because heavy infestations are discovered late and the aphids were ready to leave anyhow or damage had occurred.

*My inclination is to leave these late season populations alone. Walk away from dented corn where a large portion of yield is already fixed- the aphids usually do.*

## **Soybean aphid**

Aphid treatment has expanded into more areas. Soybean aphid control with insecticides (and any insecticide) begins with good application technique. Some have a problem with using enough water, being overly optimistic of the width of their spray boom/sprayer swath and adding enough insecticide. Soybean aphid populations have been much higher this year than the past several. Sloppy applications could well show up as stunted black strips in your soybean field. If you are spraying to kill a potentially economically damaging population of aphids, do it right.

Based on observations in this year's experiments, I would encourage using high rates if using pyrethroids. Avoid using low rates of insecticides in tank mixes. Some fields will need to be re-treated. *Do not use the same insecticide class retreating a field.* If you not already seen this, and readers of this newsletter should have, this MN Crop News article, <http://blog-crop-news.extension.umn.edu/2015/08/what-to-consider-when-treating-soybean.html>, provides more information.

Wet, cool weather could trigger fungal disease outbreaks and after next week, cool temps and maturing soybeans could begin the move of aphids to buckthorn.

## **Soybean cyst nematode (SCN)**

The yellow spots showing up in many soybeans over the past two weeks are symptoms of SCN infestations, possibly associated with *Diaporthae* and *Phomopsis* fungal diseases. Recent heavy rains in some areas should increase the chances of *sudden death syndrome* (SDS) foliar symptoms. I would be noting which varieties have the most issues.

### **Save the date:**

**There will be an SCN plot tour at the SWROC, Lamberton, Wednesday September 9. It will be a good opportunity to see SCN research on varieties and chemical control of SCN and visit with U of M researchers.**

Happy trails,

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## Southwest MN IPM STUFF

*All the pestilence that's fit to print*

IPM STUFF 2015-16

Volume 18 number 16

08/15/15

This newsletter and the advice herein are free. You usually get what you pay for.

### **Crop weather**

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lambertson, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

The crop looks good overall but will need additional moisture to finish in some areas. We are seeing moisture stress in some areas of SW MN. Cool nights would be beneficial.

Early-planted shorter season corn hybrids are beginning to dent. Treatment for most insects, mites and diseases should stop at this point.

Early maturity soybeans are reaching R6 (seed fills the canopy in one of the upper 4 nodes). Most are mid R5.

[Aphids in corn: The dilemma of post-pollination infestations : Minnesota Crop News : University of Minnesota Extension](#). Yes, they can make a disgusting mess in your corn. There were many questions on these over the past week so Ken Ostlie and I re-worked and added some pictures to last week's article and posted it to the Minnesota Crop News blog. While we still don't have any research-based threshold recommendations, payback for treatment is definitely not a given. The bird-cherry oat aphids have started to leave some fields.

### **Soybean aphid**

Some previously sprayed fields look good from the road but they may have heavy soybean aphid populations. This is just another reminder to check fields to ensure the application worked and the field has not become reinfested. Heavy flights of winged aphids have made long-term control difficult in many fields. Insecticides need good

coverage for best aphid control. This season's tall, dense crop made adequate coverage more difficult than usual.



### **Moths**

There have been many questions on the dark, triangular-shaped moths appearing in Southwest Minnesota. These are the adults of the legume feeding **green cloverworm**. The projections at the front of the head are the labial palps of the mouthparts, elongated in this species.

The larvae that produced these moths were responsible for creating some of the holes in upper soybean leaves this year.

If concerned about defoliation make sure larvae are still abundant. The populations often collapse from disease or parasitism. Don't base decisions on field borders or only upper leaves. Use a 20% whole-plant defoliation treatment threshold. Average the defoliation on leaves from the top, middle and lower canopy to determine whole-plant defoliation.

We had a larger than usual migration of moths into Minnesota this spring. There are several generations of this insect in Minnesota, each one taking about a month. Although this insect has been unusually abundant this year, there is no reason to kill the moths.

The yellow butterflies that are abundant in some areas are the adults of **alfalfa caterpillar**. The larvae feed on legumes, including soybeans and alfalfa but seldom reach economic levels.

### **Save the date:**

**There will be an SCN plot tour at the SWROC, Lamberton, Wednesday September 9. It will be a good opportunity to see SCN research on varieties and chemical control of SCN and visit with U of M researchers.**

Happy trails,

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## Southwest MN IPM STUFF

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IPM STUFF 2015-17

Volume 18 number 17

08/20/17

This newsletter and the advice herein are free. You usually get what you pay for.

### Crop weather

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC)* website: <http://swroc.cfans.umn.edu/WeatherInformation/index.htm>.

As of August 17, we are about average on degree day accumulations. The SWROC has accumulated 1877 GDDs compared to 1888 long-term average. For those of you that planted earlier, 29 GDD were accumulated from April 15 to May 1.

The SWROC received 3.74 inches of precipitation from the 16th-20th. Some areas of SW MN received less but others had much more...up to 8 inches.

### Corn

The crop is on a calendar schedule for maturity now and needs approximately 60 days from tassel/silk to reach black layer (physiological maturity). Most corn in SW MN is at or near dent. The recent rain will help finish grain fill. There has been considerable tip back in some fields, but the crop looks good overall.

Pest management-wise it's time to start to relax. If you have not made a decision on **corn rootworm adult** populations to predict future problems it is time to start wrapping that up on all but the latest maturing fields. Western corn rootworm problem fields seem reduced this year but northern corn rootworm and extended diapause did cause problems some non Bt-RW corn fields. The extent of damage will not be known until combines hit the field.

Some of you have found some isolated fields with **Goss's blight and wilt**. While some **northern corn leaf blight** can be found, the early rumors of an impending disaster seem to have been greatly exaggerated, at least in SW Minnesota.

### Soybeans

Most soybean fields are mid to late R5 now. Early maturity soybeans are at R6 (seed completely fills the canopy in one of the upper 4 nodes). There should fields starting to

turn by late next week or the week after. The moisture should help with pod retention and seed size.

Once fields reach the R6.5 stage (yellow pods starting to appear), quit worrying about crop pests reducing yields. Even pod feeding insect (**grasshoppers, bean leaf beetle, stink bugs**, etc) problems should have been found and dealt with by then. While they can be found, I have not heard of, nor do I expect, any problems from pod feeders.

However, for those who enjoy worrying, there is still the potential for hail, early frost, excessive rainfall, early snow, and machinery breakdowns to create harvest problems. Hopefully, none of these will occur.

**Brown stem rot (BSR)** systems have started to appear in R6 stage soybeans. Foliar symptoms of this disease can be confused with **sudden death syndrome (SDS)**. Brown stem rot will have discolored pith in the lower stem, SDS will not. The stem symptoms will be present on infected plants even when foliage is symptomless. Occasionally, soybean plants can be infected with both BSR and SDS. There will be some white mold problem fields from rainy periods during flowering. The recent rain and cool weather came too late to cause problems for fields that had completed flowering.

## **Small Grains**

This was a very good year for wheat and oat yields.

## **Alfalfa**

Good yields and relatively few pest problems. Potato leafhopper populations required treatment in some of the earlier cutting but populations should now be declining as August progresses.

## **Soybean aphid**

What to do? There have been several calls about late-season aphid control this week. We recommend treating at the economic threshold of 250 average soybean aphids/plant and 80% or more of the plants infested until the R6 stage of soybeans. Aphids often do quite well and reproduce rapidly on late R5 and R6 stage soybeans.

Don't, however, forget the remaining part of the economic threshold for soybean aphids: aphid populations are increasing. Populations seem to be declining in some fields. There could be several reasons for this. Some lower leaves are starting to drop. Predators are moving into some infested fields. Many of you have seen the small black or larger tan mummies of aphids parasitized by wasps. Some of you may have even taken the time to watch the tiny wasps stinging and laying eggs inside the aphids.

Fields with increasing aphid populations that are well over threshold should be treated now. However, with the recent prolonged rainfall and cool weather in many areas, it may be prudent to wait a few days before making a treatment decision on fields that are near, at, or slightly above economic threshold. Rainfall may influence aphid populations in several ways:

Heavy rain and wind may wash aphids off plants, but this is usually more effective on the upper canopy and on smaller beans.

Prolonged, wet weather may trigger **fungal disease** outbreaks. Most of the fungi that attack aphid are active when humidity is high and temperatures moderate. For example, *Pandora sp.* are one of the most common fungi attacking soybean aphids in Minnesota and are most effective at temperatures of 50-70 F. With the proper weather and a few infected aphids as a start, fungal disease can wipe out aphid populations in a matter of days. Check for diseased gray, tan or brown aphids that can often have a fuzzy appearance. Dews and high humidity under the canopy can help with this.

Plants growing under sufficient moisture conditions, may be poorer hosts for aphids. Remember, in many areas, we were on the dry side before these rains.



Winged asexual female (gynoparae) and her immature sexual female nymphs (oviparae) on buckthorn. When they mature, the wingless sexual females will mate with winged males (androparae) arriving from soybeans.

Movement of soybean aphids from soybean to buckthorn can occur any time now. Often, but not always, I see aphids leaving early maturing soybeans first. *On August 20<sup>th</sup> we started to observe the first winged female aphids and their nymphs of 2015 on fall SWROC buckthorn.* Several species of predators and parasites were present on buckthorn too. Whether this is the start of a mass migration movement to buckthorn or just an advance wave of immigrants is unclear. Look for large numbers of winged aphids or nymphs with wing pads as a clue to potential aphid emigration from soybeans.

When scouting or considering and insecticide application, look at soybean growth stage. It will take more, probably much more, than 5000 aphid days (e.g. 5000 aphids/plant for 1 day, 500 aphids for 10 days, 250 aphids for 20 days) to reduce yield in these late season soybeans with good growing conditions.

Early-planted, early-season beans should be off scouting schedule now. All but the late-planted and full-season beans should be off the schedule after next week. Pre-harvest intervals for soybean aphid insecticides are 21 days or longer.

I'll try to keep an eye on late-season aphid populations here.

I will be on my annual trip to determine the western range of soybean aphid next week. This year's plans had to change because of the forest fires. I was worried I would be fishing for trout that were smoked before I caught them. I will have limited cell and email access but will return calls and messages as I can.

**Save the date:**

**There will be an SCN plot tour at the SWROC, Lamberton, on Wednesday, September 9<sup>th</sup> from 1-4 PM. It will be a good opportunity to see SCN research on varieties and chemical control of SCN and visit with U of M researchers.**

Happy trails,

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## Southwest MN IPM STUFF

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IPM STUFF 2015-18

Volume 18 number 18

09/03/17

This newsletter and the advice herein are free. You usually get what you pay for.

### Crop weather

Rainfall, air and soil temperatures, degree-days, soil moistures, and other current and historical weather data for a little spot about two miles west of Lamberton, MN can be found at the University of Minnesota *Southwest Research and Outreach Center (SWROC) website: <http://swroc.cfans.umn.edu/>* under the tab for weather.

As of August 31, we are about average on degree day accumulations since May 1. The SWROC has accumulated 2064 GDDs compared to 2148 long-term average. For those of you that planted earlier, 29 GDD were accumulated from April 15 to May 1.

Over the same May through August period, the SWROC has received 18.77 compared to a 14.09 long-term average.

Warm nights are usually not conducive to corn and soybean grain fill. The recent hot, humid weather is pushing maturity. This will be an early harvest unless September rains keep folks out of the field.

There are pockets where dry or overly wet conditions have reduced yields but, in general, the 2015 crop has good potential.

### Corn

The milk line is moving down. Early-planted, short season hybrids are physiological maturity (black layer).

Some premature death of corn is being observed in SW Minnesota. This may



Root and crown rot of corn. Note the decay and red discoloration.

have a genetic/physiological basis in the case of some hybrids, but root, crown, and stalk rots are at play in others. Corey Sinn sent a picture of the root system of a plant that had died prematurely. It shows a reddish coloration in the roots coloration very suggestive of *Fusarium*.

Stalk rots directly reduce yield by stopping grain fill. Indirectly, they reduce yield by poor harvestability of lodged corn.

As fields mature, a simple way to assess stalk quality is to grasp a stalk at waist to chest level and push it forward from vertical. Any stalks with poor quality will collapse. It is usually beneficial to harvest those fields with stalk rot issues first.

**Corn rootworm beetle** emergence continues but has slowed.

Scattered, dark-green to black spore filled kernels were spotted on corn ears near the SWROC. The culprit is likely



Black kernels likely caused by *Cladosporium* spp. This fungus can also grow superficially on and between kernels on the ear.

***Cladosporium* ear mold.**

This fungus is not generally limiting to corn yields and is not known to produce mycotoxins harmful to humans or livestock.

This diagnosis is based on visual symptoms only, I have not yet sent samples to the [University of Minnesota Plant Disease Clinic](#) to be cultured and given a definitive ID.

## Soybeans

It won't be long till harvest

Most soybean fields are R6 now, many at R6.5 with yellow pods and leaves beginning to turn. Early maturity soybeans are at R7 with pods starting to turn brown and with yellowing and dropping foliage.



Linear rows of pycnidia on soybean stem indicating a Pod and Stem blight infection.

As leaves senesce, symptoms of several soybean diseases become visible. One of these is **Pod and Stem blight (*Diaporthe* spp.)**. Look for the fruiting structures of the fungus arranged in linear rows on the stem. This disease seems more prevalent than usual this year.

I am also seeing scattered lesions developing on pods. These could also be caused by *Phomopsis* (asexual form) or *Diaporthe*.



**Cercospora leaf blight.** The tattered leaves are a result of bacterial blight.

Leaves in some soybean fields are showing symptoms of **Cercospora leaf blight**, caused by the fungus *Cercospora kikuchii*. A purple color and leathery appearance to leaves indicate this disease may be present. Warm, wet weather (sound familiar) favors infection which is often confined to upper leaves and usually occurs late in the season.

This disease is unlikely to cause much, if any, yield loss with late reproductive stage onset. The surface of *C. kikuchii* infected seeds show a purple discoloration. Other

than the undesirable coloration, seed quality is normal.

The foliar symptoms of this soybean disease can be confused with sun scald but can be easily differentiated by a plant pathology lab.

Other foliar diseases present at varying levels in soybean are **downy mildew**, **bacterial blight** and **Septoria brown spot**.

Sclerotinia stem rot, a.k.a. **white mold**, is present in many fields and significant in some.

## **Soybean aphid**

Soybean aphid movement to buckthorn, fungal diseases and soybean maturity and leaf drop are causing rapid population collapses in some fields. Some of you have noticed numerous black aphids this year. These "mummies" are produced when soybean aphids are parasitized by tiny parasitoid wasps.

While some aphids have moved to buckthorn, others have re-colonized late-maturing soybeans where significant populations can still exist. This includes some soybeans at the SWROC where numerous planting dates, soybean maturities, small plots with bare alleys and varied chemical and fertilizer treatments create a smorgasbord for soybean aphids.

It appears that two weeks ago, I should have been scouting late-season aphids at the SWROC rather than further west. Aphid populations in late R6 stage soybeans at the

SWROC declined and increased rapidly in some previously treated R5-R6 soybeans during the previous week, particularly in borders. Pre-harvest interval (PHI) restrictions will prevent treating these now declining populations.



The brown aphids have been killed by entomopathogenic (insect killing) fungi. It is likely that many of the "normal" green aphids are already infected too. Some of the exoskeletons of the aphid cadavers have ruptured, revealing masses of spores.

## Moths

As mentioned in a previous issue, the dark moths that are abundant now are **green cloverworm**. While any offspring of these moths will be harmless to the remaining 2015 soybean crop, they are now officially a serious problem. Seems they recently started to show up in the Twin Cities Metro area and...

On another Lepidoptera related note: This is shaping up to be a banner year for the **Monarch butterfly** in SW Minnesota. The adults will soon begin to gather as they begin their migration south.

## SCN management plot tour

*There will be an SCN plot tour at the SWROC, Lamberton, on Wednesday, September 9<sup>th</sup> from 1-4 PM. It will be a good opportunity to see SCN research on resistant varieties and chemical control of SCN. Dr. Seth Naeve, Dr. Senyu Chen, Dr. Dean Malvick, Ryan Miller and yours truly will be on hand to answer questions. Check the [U of M SWROC website](#) for weather(mud) related cancellations.*



While I did not find any soybean aphids much further west than the Missouri River, there were many plants with aphid and other insect, some species that I had not seen before, and a blizzard of Baetid mayflies in an alpine lake. The trout seemed exceptionally gullible this year.

Happy trails,

Bruce Potter

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