Entomology

Scouting focus: potato leafhoppers in alfalfa; cereal aphids; soybean aphids; black cutworms

News from our neck of the woods

A field of spring wheat near Harrold was peppered with white heads, and stems with white heads were easy to pull out breaking right at the first node. This type of damage is typical of wheat stem maggot, a small fly whose larvae (maggots) bore into the main wheat stem, feed inside and eventually cut the stem. Adult flies of this pest are small yellowish insects with three black stripes on thorax and abdomen. There are no chemical control options or resistant wheat varieties. If you have severe infestation of this pest this year, crop rotation with unsusceptible crops such as soybeans, flax, sunflowers or legumes will help to keep this pest in check. Because larvae overwinter in stems of wild grasses and volunteer grain, plowing under volunteer grains and proper weed management are good preventative practices. (A.S. and R.B.)

Wheat heads infested with wheat stem maggot pull out easily and detach at the node.
Photo credit: Ruth Beck, SDSU Extension Agronomy Field Specialist
Cereal aphids are still on everyone’s radar, and scouting for these insects should continue. Bird cherry oat aphids are among the most important aphids to be concerned about because they vector the barley yellow dwarf virus (BYD). The bird cherry-oat aphid, *Rhopalosiphum padi*, is a large (1/8 inch), dark olive green aphid that has long antennae and a pair of long tubular cornicles at the end of its abdomen. Wingless forms of the bird cherry-oat aphid have a characteristic orange to brown spot that is visible at the base of the cornicles. Greenbugs, *Schizaphis graminum*, are small (1/16 inch), pale green aphids that are pear-shaped with a dark green stripe running down their backs. They can also be identified by their black-tipped legs and cornicles. Greenbugs feeding damage on wheat appears as discoloration or striping, wilting, and if present at high number, these aphids can kill the plant. Typical greenbug damage appears as yellowing foliage with red spotting. Greenbugs do not overwinter in South Dakota and are carried in by southern winds during the early spring. Early and consistent scouting is critical to establishing a successful management of these pests. The English grain aphid, *Sitobion avenae*, is about 1/10 inch long, light green to brown with black antennae, cornicles, and joints. It is a known vector of BYD, but the major damage to wheat is caused by the aphid’s direct feeding injury to the heads of small grains. Foliage damage occurs until grain begins to head. Once heading initiates, these aphids move and aggregate at the heads and aggressively feed upon the ripening kernels. Scouting is the key word for aphids because there are many natural predators of these pests that can keep populations under economic threshold. I recently visited a winter wheat in Clark that received no pesticide applications apart from seed treatments, and I found a huge diversity of predators such as several species of ladybird beetles, lacewing eggs and adults, long-legged flies and other predators that can nicely clean out the wheat of the pesky aphids. Scout and adhere to thresholds before making decisions about pesticide applications. (A.S. and J.N.)
Greenbugs on the underside of a leaf. Photo credit: Ada Szczepaniec, SDSU Extension Entomologist

Lacewings, another key predator of aphids, lays its eggs on stalks. If you see these on wheat leaves it's a good thing! Photo credit: Alex Wild.

Ladybird beetle on wheat head. Large populations of these and other natural predators of aphids can keep aphid numbers in check, so if you have these present in your fields hold off pesticide applications unless aphid populations are increasing above threshold levels. Photo credit: Ada Szczepaniec, SDSU Extension Entomologist

<table>
<thead>
<tr>
<th>Type of Aphid</th>
<th>Seedling Stage</th>
<th>Boot to Heading Stage</th>
<th>Flowering Stage</th>
<th>Milky Ripe Stage</th>
<th>Milk to Medium Dough Stage</th>
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<tr>
<td>Greenbug</td>
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<td>25</td>
<td>&gt;25</td>
<td>&gt;25</td>
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<td>Corn Leaf Aphid</td>
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<td>30</td>
<td>&gt;25</td>
<td>&gt;25</td>
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<td>Birdcerry/Oat Aphid</td>
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<td>30</td>
<td>&gt;5</td>
<td>10</td>
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<td>30</td>
<td>30</td>
<td>5</td>
<td>10</td>
<td>&gt;10</td>
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</tbody>
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Thresholds for cereal aphids on winter wheat. Authors: G. Hein and J. Thomas
False chinch bugs in large numbers descended on a crambe field in Brookings and Pierre area late last week. I’ve heard about them from my counterpart in Nebraska as well, so they’re likely worth mentioning. These insects rarely become an issue but might cause problems in cruciferous crops that are deficient in moisture and have trouble compensating for false chinch bug feeding damage. They prefer plants in the mustard family (radish, canola, mustard greens) but I hear that in some years they move into other crops as well. They rarely require control measures, and can disappear as quickly as they appear. False chinch bugs tend to aggregate in spots and usually are not a widespread pest within fields. If chemical management is warranted, pyrethroid insecticides registered for use on specific crops usually provide good control (A.S. and K.G.)
First reports of soybean aphids are trickling in from surrounding states and it won’t be long before they start showing up in South Dakota too. Weekly scouting efforts for this pest can begin any time. However, soybean aphids seldom start to become a problem until the middle of July. Tank-mixing a preventative spray with an early roundup application can backfire and create worse aphid outbreaks by destroying the beneficial natural enemies that are often present in the field and help suppress early aphid buildup. Even in years when aphid treatment is needed, a single well-timed application based on scouting and thresholds can usually take the place of two badly timed applications. Aphid scouting and management guidelines can be found at [http://www.sdstate.edu/sdces/resources/crops/upload/Soybean-Aphids-in-SD.pdf](http://www.sdstate.edu/sdces/resources/crops/upload/Soybean-Aphids-in-SD.pdf) (K.T.)
Painted Lady Butterfly Caterpillars Found on Canada thistle

We have been receiving a number of calls and questions about the caterpillars feeding on Canada thistle plants around the state. The caterpillar is the larval stage of the painted lady butterfly (Vanessa cardai), also known as the thistle butterfly. The painted lady butterfly is a native insect, common to the southwestern US and Mexico. The adult (butterfly) annually migrates to the northern regions of the US and Canada. Major migration of the butterfly generally occurs only once every eight to eleven years. The last major migration took place in South Dakota in the early 2000’s. The migrating pathway is fairly narrow and entomologists at SDSU saw higher than normal painted lady butterflies migrating earlier this spring. The butterfly has 3 to 4 generations per year. The caterpillars are aggressive feeders and will feed on over 75 species of plants, however they do tend to prefer thistle species especially Canada thistle. The caterpillars will strip the leaves off the Canada thistle plants and leave the stem and leaf midrib. This will only temporarily set back the thistle and new growth will be back this fall or next spring. The caterpillar can be detected by looking for the presence of the loose silk webbing and droppings or frass on thistle leaves and buds. The caterpillars are light brown to black in color and have a pale yellow stripe on each side along with small spines. Mature caterpillars are 1 ¼ - 1 ½ inches in length.

Another point to remember is the painted lady caterpillar can be and has been a pest of some of our agronomic crops in South Dakota. Crops like sunflower, soybean and legumes need to be monitored if caterpillar numbers are higher than normal. Even though the caterpillars may feed on and prevent Canada thistle from seeding it is not a recommended bio-control agent for this noxious weed. (DD)
I heard from Roger Barrick in Armour-Delmont area that alfalfa weevils are pretty much done there, but alfalfa is growing slowly mostly owing to low moisture. Roger has seen a fare number of grasshoppers in fields though. Scouting for grasshoppers should be done in three locations in the field (away from the field edge) by sweeping 40 times in each location while walking in a half circle pattern. After each sampling, the number of grasshoppers should be divided by 10 to derive the number of grasshoppers per sq. yd. All thresholds given below are based on the number of grasshoppers per sq. yd. Treat if grasshopper numbers reach threatening levels. (A.S. and J.N.)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Nymphs/sq. yd.</th>
<th>Adults/sq. yd.</th>
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<tbody>
<tr>
<td></td>
<td>Margin</td>
<td>Field</td>
</tr>
<tr>
<td>Threatening</td>
<td>50–75</td>
<td>30–45</td>
</tr>
<tr>
<td>Severe</td>
<td>100–150</td>
<td>60–90</td>
</tr>
<tr>
<td>Very Severe</td>
<td>over 200</td>
<td>over 120</td>
</tr>
</tbody>
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Updates from our neighbors

Armyworms in corn fields are making headlines in Pennsylvania, Ohio, Ontario (Canada), and Wisconsin. So far they are not causing significant trouble for growers in our neighboring states, however, so the armyworm Armageddon, as my colleague from PA called what he was seeing there, might not be in our future. If we hear about them in IA and NE, we will alert you to potential issues. Nonetheless, here is some information on identification and thresholds. This is one of these insects that we just have to scout for once there is some indication for growing populations, because their outbreaks are nearly impossible to predict. Armyworms grow to be about 1.5” long, are dark green to grey in color and have four yellow-orange stripes running down along their bodies. Their heads have a characteristic net-like pattern. Armyworm moth lays eggs in grassy areas so managing weeds along and within corn fields is an important cultural practice that helps prevent armyworm infestations. Armyworms damage the plants by stripping lower leaves of corn and although damage to ear is possible, they are minor ear pests. Whorl-stage corn should be treated when 25% of plants have two or more larvae or 75% of plants have at least one larva. Only infested portions of the field should be treated. Photo below [www.cropwatch.unl.edu](http://www.cropwatch.unl.edu)
Soybean aphids were confirmed in northeast Iowa and in North Dakota. Because of dry conditions in much of Midwest, extension entomologists in NE, IA and IN are reporting some spotty but severe infestations of spider mites on soybeans. Spider mites do best in hot and dry conditions, so if dry weather persists for us, we might be seeing more of these insects in our neck of the woods later this year too. We’ll keep you posted. Cereal aphids are making news in Minnesota and North Dakota, and North Dakota is seeing some wheat damage from wheat stem maggot. Aster leafhopper nymphs were also reported in Minnesota. False chinch bugs were reported on cruciferous plants in NE, and these insects can move to other crops as well if their populations are high. Potato leafhoppers are active in Nebraska and Iowa, and black cutworm scouting is heating up in neighboring states too. We included information on this pest in last week’s newsletter (http://igrow.org/agronomy/profit-tips/pest-crop-newsletter/).

Unusually early activity of all life stages of corn rootworms is reported pretty much everywhere in the Midwest. This week I read about rootworm injury in a field planted with a Bt hybrid expressing Cry3Bb1 in Illinois, reported by an extension entomologist Mike Grey. Resistance to Bt toxins is a serious concern, and something we need to keep a watchful eye on in South Dakota. If you are seeing rootworm injury to Bt hybrids, please let us know (adrianna.szczepaniec@sdstate.edu).

Cutworm activity was reported on sunflowers last week. There is no indication of outbreaks, and damage was sporadic. A very unusual clipping damage to sunflowers caused by ash grey blister beetle was reported by Janet Knodel, North Dakota State University Extension Entomologist. Unusual news and reports just keep coming this year!

Weeds

Is volunteer corn control worth it?

Other than causing seed contamination and harvesting problems, volunteer corn can be quite competitive with soybeans resulting in yield loss. For example, only 1 volunteer corn plant per 10 X 10 ft area (100 sq ft) can reduce soybean yield by 2.5% or cause a $10/A loss. Since control may cost about $6 - $10/A, that density may justify the control cost. In addition to these factors, volunteer corn may also act as a food source for rootworm larvae allowing them to become a problem in corn rotational crops. This may be particularly problematic as corn rootworms are becoming more difficult to control with Bt hybrids. If you want to estimate soybean yield loss based on volunteer corn densities (plants/sq. meter) in your field, the equation is: Soybean yield loss (%) = (24.2*density)/(1+24.2*density/124.2).

Clethodim (Select) and quizalofop (Assure) herbicides are commonly used for volunteer corn control. It is important to apply these herbicides early to get complete control. Herbicide activity declines as the volunteer corn gets larger. Extreme (glyphosate + imazethapyr) provides some suppression, but not complete control. Liberty (glufosinate) on Liberty Link soybeans may also only provide 80% control of...
Roundup Ready volunteer corn that is lacking the Liberty tolerance trait. Since volunteer corn is fairly competitive, it is important to get good control to prevent yield loss.

Volunteer corn in corn can also be a problem. At the density described above (1 plant per 10 X 10 ft area) corn yield may decline by nearly 1%. Corn yield loss based on volunteer corn density (plants/sq. meter) is: Corn yield loss (%) = (7.4*density)/(1+7.4*density/81.7). Control options are limited. Rotating to Liberty Link corn is one option. Volunteer corn control with Liberty is best when the volunteer corn is about 10 – 20 inches tall as the growing point is above or near the soil surface at that time. Earlier applications may be slightly less effective.

More information regarding these research results may be found on the SDSU Extension Weeds web site (http://www.sdstate.edu/ps/weed-mgmt/weed-mgmt-crops.cfm).

**Herbicide rotation concerns for replants**

Now is the time when severe storms occasionally destroy wheat crops causing people to consider replant options. Recent hail storms caused much damage to wheat fields in central South Dakota. Some wheat herbicides may limit rotation options. For example, cheatgrass herbicides such as Everest, Olympus, Rimfire, and others could limit rotation options to crops such as sunflowers. Herbicide tolerant sunflower varieties, such as Express tolerant sunflowers, may reduce the risk of carryover injury but registered rotation restrictions may not support such short rotation intervals, particularly if the herbicides were applied in the spring. Millet may be another rotation restriction. Few herbicides define rotation restrictions to minor crops such as millet, so a bioassay may be required. That would include planting the desired crop in treated soil and monitoring early growth for deformities or discoloration. I have not conducted much research regarding herbicide rotations to millet, but I did apply Everest preemergence in one millet trial and I did not notice millet injury. The Everest label does not support rotation intervals for millet though. For more information on this and other research studies, see the SDSU Extension Weeds web site at http://www.sdstate.edu/ps/weed-mgmt/weed-mgmt-crops.cfm.

**Preharvest herbicide applications in winter wheat**

Preharvest applications may be considered if weed escapes may inhibit harvesting or if noxious weeds are going to seed in wheat seed production fields. Glyphosate is most effective on weeds and is the only option that may hasten wheat drying, but do not use glyphosate in seed production fields as it may reduce seedling vigor. It is also important to wait until the wheat seed is less than 30% moisture (hard dough stage) to avoid decreasing test weight. Other preharvest herbicide options include 2,4-D ester or amine, Clarity (dicamba), Ally (metsulfuron), and Aim (carfentrazone). A fact sheet that summarizes preharvest options may be found on the SDSU Extension Weeds web site (http://www.sdstate.edu/ps/extension/weed-mgmt/weed-mgmt-small-grains.cfm).
Diseases

Goss's Wilt
We are already seeing Goss's wilt showing up in several locations in South Dakota. Injury to leaves is required for pathogen infection, especially that caused by hail, sand blasting, or heavy wind. The pathogen can also be seed borne and seed transmitted, but transmission to seedlings has been demonstrated at low rates and is not believed to be a major source of infection except that it can provide the inoculum for introduction into new locations. Goss's wilt disease can progress rapidly under the right conditions (warm 80 degree F and wet) resulting in extensive leaf blight and death of the canopy. The pathogen overwinters on the soil surface in infested residue, which serves as the primary inoculum source for future corn crops. Continuous corn production increases the spread of this disease. Some additional hosts for this pathogen are green foxtail, shatter cane, and barnyard grass. Goss's wilt lesions are large, have wavy margins and are brown, yellow, gray in color. They may be elliptical or V-shaped and usually extend down a leaf vein. The tissue neighboring the lesion is water soaked. It is common for the bacteria that cause this disease to ooze out onto the leaf surface, so the lesions often have a shiny appearance. Most characteristic though, are the dark green “freckles” that occur within the lesion. Goss's wilt disease can progress rapidly under the right conditions (warm 80 degree F and wet) resulting in extensive leaf blight and death of the canopy. (C.T.)

Weather and Planting

USDA Winter Wheat Production Update
This week the June USDA NASS Crop Production report was issued dealing with winter wheat production forecast and had some changes from May report. The US winter wheat production was lowered 1 percent from May forecast at 1.68 billion bushels which is still 13 percent about last year. Hard Red Winter Wheat was also forecast down 1 percent from last month to 1.02 billion bushels. In South Dakota the winter wheat acres are forecast at 1.3 million acres down 290,000 acres from 2011 but unchanged from the May report. The yield was lowered 1 bushel from May to 43 bushels compared to 42 bushels in 2011. Production is forecast at 55.9 million bushels which is down 2 percent from May and 16 percent below last year's 66,780 million bushels. Kansas and Texas yields were unchanged from May with Texas at 31 bushels and Kansas at 43 bushels. The Oklahoma winter wheat crop was increased 1 bushel to 37 bushels. Nebraska and
Colorado had the largest declines. Nebraska lowered the bushel per acre estimate by 7 bushels from May to 40 bushels per acre compared to 45 bushels for 2011.

The other report issued this week was the USDA World Agricultural Supply and Demand Estimates for June. Total wheat supplies for the 2012/2013 marketing year were lowered 51 million bushels from a lower carry-in and lower forecast winter wheat production. The beginning stocks were lowered 40 million bushels reflecting an increase of 10 million bushels in food use and an increase of 30 million bushel in exports for the 2011/2012 marketing year. Winter wheat production is forecasting a 10 million bushel decline for Hard Red Winter (HRW) and Soft White Winter Wheat. This should help with prices as producers look forward to winter wheat harvest in South Dakota; however wheat futures prices often follow corn futures prices used as a feed substitute. (DG)

Weather Week In Review

It was another week of scattered thunderstorm activity, with some areas of western South Dakota benefiting from some heavier totals for the week (through June 13). The mix of red and green dots on the map below show the difference between the wet and dry locations, and how localized some storms can be. Some large hail was reported on June 13 and 14, particularly in the southeastern region. Hail sizes over an inch fell in several areas. Unfortunately, there wasn't much rain with that same system.

Precipitation (in)
6/7/2012 - 6/13/2012

[Map showing precipitation patterns]
For fear of sounding like a broken record, temperatures were again above normal this week. Some locations in eastern South Dakota were 5 degrees or more above average for the week. The northwest was just slightly above average for this time of year, just a degree or two.

(Diagram: Departure from Normal Temperature (°F) 6/7/2012 - 6/13/2012)

(Maps courtesy of High Plains Regional Climate Center, hprcc.unl.edu)

Drought

Many areas across the state are teetering on drought conditions, and are just a week away from quickly degrading conditions in yards and fields. It is challenging for us climatologists to monitor drought conditions during this time of year where impacts can be significant, and can build quickly. We are keeping a close eye on the situation. The central part of South Dakota appears to be near climatological “normal” for this time of year. Elsewhere, we are hearing of scattered reports of dry topsoil and early signs of drought stress on row crops, yards and gardens.
If you have drought impacts to report (or want to report non-drought conditions), or feel that the U.S. Drought Monitor is not accurate in your location, please send comments to laura.edwards@sdstate.edu. (L.E.)

An update to the U.S. Seasonal Drought Outlook was released last week. Climate Prediction Center's projection does not specify any concerns for South Dakota over the summer season through August. We are aware though, that during the growing season, moderate to severe drought can develop and disappear over the period of a few weeks or a month. The next couple of weeks may be a tipping point for depicting worsening conditions if significant rainfall does not come soon, especially if temperatures remain above normal and windy or breezy conditions prevail.
Next Week’s Climate Outlook

The forecast for the next five days looks a little more promising through the central part of the state, with forecast rainfall totals of .50-1.00 inches. Elsewhere in the state, lesser total amounts of .10 to .50 inches are projected. This is not a huge amount, but every little bit will help stave off our borderline drought concerns, particularly in our cropping and forage areas. A fairly active weather week is ahead with scattered showers and possible thunderstorms across the state.

Events

South Dakota State University
IPM Field School for Agronomy Professionals
July 26 and 27, 2012
Southeast Research Farm
Beresford, South Dakota

The Integrated Pest Management (IPM) Field School provides the latest, most up-to-date information. Presentations include hands-on-activities or field demonstrations in small groups to encourage interaction between presenter and participants.

A total of 10.5 CCA continuing education credits will be awarded for the two day school. Thursday and Friday noon lunches, break refreshments, and Thursday evening supper will be provided.

The 2012 IPM Field School session topics are:

- Weed Management: Crop Injury Characteristics and Weed Identification
- Soybean Cyst Nematode and Corn Nematodes
- Scouting and Identifying Common Soybean Diseases and New Diseases in Corn
- Precision Agronomy: Variable Rate Fertilizer Application
- Know Thy Enemy (And Thy Friend): Scouting, Identification and Thresholds for Major Insect Pests of Corn, Soybeans, and Forage Crops
- Soil Salinity and Why We Are Seeing the Problem
- Climate Trends Impacting Agriculture

Directions to the Southeast Research Farm from Beresford, SD: Travel 5.5 miles west of Beresford on SD Hwy 46, turn south on University Road and drive 3 miles. The Research Farm is on the east side of the road.

For more information contact:
Darrell Deneke, SDSU Extension IPM Coordinator
605-688-4595
Email: darrell.deneke@sdstate.edu

Registration information is available from the South Dakota Agri-Business Association at: Phone: 1-800-994-2445 or 605-224-2445.
Online: http://www.sdaba.org
The IPM Field School is sponsored by:
South Dakota State University Extension IPM Program
South Dakota State University, Plant Science Department
South Dakota Agri-Business Association

Pennington County Crop Tour

The Pennington County crop tour will be on Wednesday, June 20 at 3:30PM. Those interested in attending should plan on meeting at the SDSU test plot located on the Dale Patterson farm. To get to the plots take exit 107 and travel 5.5 miles north on Cedar Butte Road. Turn west on 228th Street and travel 3 miles to the Patterson farmstead. The plots are just north of the farmstead just east of the grass runway. Variety trials include winter wheat, spring wheat, oats, field peas, safflower and biofuels. Speakers will include: John Rickertsen SDSU Extension Agronomy Field Specialist, Thandiwe Nleya, SDSU Agronomist, and Bruce Swan, SDSU Senior Research Technician. For more information contact John Rickertsen at the Rapid City Regional Extension Center at 605-394-1722. (JR)

Bennett County Winter Wheat Tour

The Bennett County winter wheat tour will be on Thursday, June 21 at 10:00AM. Those interested in attending should plan on meeting at the SDSU test plot located on the Carl Novotny farm. To get to the plots go 5.5 miles east of Martin on hwy 18 and turn west on old hwy 73, the plots are ¼ mile west on the south side of the road. SDSU Extension Agronomy Field Specialist John Rickertsen will provide information on the varieties and current wheat production issues. For more information contact John Rickertsen at the Rapid City Regional Extension Center at 605-394-1722.
Other upcoming events

1. June 28, Dakota Lakes Research Station Field Day
2. July 10, SE Research Station Field Day
3. July 11, NE Research Station Field Day
4. July 26 and 27: IPM Field School, SE Research Station
5. July 28: Organic Field Tour, SE Research Station

To be added to the mailing list for this newsletter, email: Lisa.Ulvestad@sdstate.edu

You can find this newsletter www.igrow.org/agronomy

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