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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2002-18
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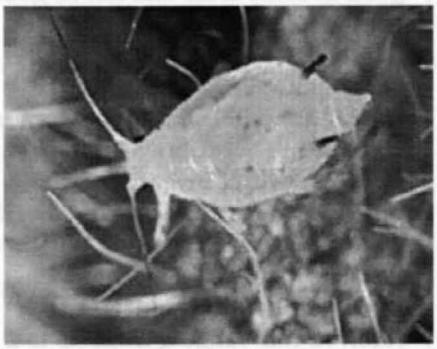
Soybean aphid reports expand, scout fields now

As reported in last week's *Crop Watch*, the soybean aphid is popping up in eastern Nebraska. To date, the soybean aphid has been confirmed in Cedar, Dixon, Dakota, Thurston, Burt, Sarpy, Lancaster and Saunders counties. So far we have found fields with only extremely low to low numbers of aphids, but because aphid populations can rapidly increase, farmers should check their fields for this insect.

The soybean aphid is new to North America. It is an Asian soybean pest that was first discovered in the United States in the summer of 2000 in Wisconsin. Since then it has spread throughout the north central U.S. and parts of Canada.

Heavy infestations of this insect can cause significant damage and yield loss. Yield losses exceeding 25% were observed in Minnesota and Iowa last year. In addition,



Soybean aphid

soybean aphids can transmit viral diseases, such as alfalfa mosaic, soybean mosaic, bean yellow mosaic, peanut mottle, peanut smut, and peanut stripe.

This issue of *Crop Watch* will discuss soybean aphid biology, life cycle, management, current status in Nebraska, and ongoing research.

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Inside

New farm bill allows base acre/yield changes, soybean as a commodity

Learn more about the impact of these changes on your operation and the latest research-based recommendations for soybean production at this year's
Soybean Management Field Days Aug. 14-18.

The 2002 Farm Bill is providing for major changes for farm landowners and operators and especially soybean producers, according to one of the speakers scheduled for this year's Soybean Management Field Days.

Soybeans and other oilseeds now will become commodity crops and are eligible for direct payments that are guaranteed each of the next six years. The new counter cyclical payments will replace the market loss and oilseed payments that have been provided each of the past three years. These payments are received when prices are low and decline as the national price increases.

Steven Johnson, an extension field specialist from Iowa State University, said a major decision will need to be made by farm land owners and operators by FSA farm number. They will need to determine whether to keep old base acres and yields and update to soybeans or to update to new base acres and yields of crops planted or prevented planted in the new base years, 1998 to 2001. Johnson said these decisions could easily make a difference of $5 to $25 per acre in payments annually for each tillable acre over the six-year life of the new farm bill. A national signup for landowners and operators that includes the 2002 commodity crops is expected to begin within the

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Updates

Management tips July 26 - Aug. 9

♦ **Now is a good time to evaluate whether your center pivot sprinkler package is resulting in runoff.** If the system is moving uphill, walk behind it. If it is moving downhill, walk ahead of it. The outside tower is the best place to look first. For information on how to combat runoff, see NebGuide G91-1043, AWater Runoff Control Practices for Sprinkler Irrigation Systems.

♦ **Check lower leaves of corn and soybean plants for possible development of spider mites.** Early damage consists of small yellow spots where spider mites feed. As mites become abundant, lower leaves may yellow and die. Check for presence of spider mites and their webbing before treating; drought, nitrogen deficiency and foliar diseases may cause similar injury.

♦ **Check upper leaves of corn plants for western bean cutworm egg masses.** High populations of western bean cutworms have been reported in central Nebraska from Aurora to Gothenburg. If 8% of the plants have egg or newly hatched larvae present, treatment may be warranted. Treat before larvae enter ear.

♦ **Check lower leaves of sorghum plants for greenbugs.** Often colonies become established after the sorghum has canopied.

♦ **Be alert to the potential for blister beetles in hay being fed to horses.** Because blister beetle larvae feed on grasshopper eggs, there is often an increase in areas of high grasshopper populations. Horses are particularly susceptible to blister beetle poisoning.

Field updates

Karen DeBoer, Extension Educator in Cheyenee County: The wheat harvest is nearly complete here. Yields have been surprisingly good in some areas and not so good in others. The drought is taking its toll on dryland crops like corn and proso millet. Irrigated crops like alfalfa, dry edible beans and corn are still looking good; however we've heard reports of irrigation wells pumping air in areas where groundwater is not very deep.

Gary Zoubek, Extension Educator in York County: York received rain ranging from 0.5 to 2 inches July 21-22. The moisture and cooler temperatures are sure welcome. There have been reports that spider mites are beginning to show up in corn fields. Producers are looking at alternative uses for drought stressed corn.

Paul Hay, Extension Educator in Gage County: Grasshoppers eating our dryland corn are suffering constipation from the high dry matter content of the foliage. The hoppers dining on soybeans are practicing para-sailing as the leaves dry and glide to the ground. I have noted some hoppers on milo which have become dizzy from going around so many times. The Lower Big Blue NRD is releasing water to the Big Blue River likely providing seven days of relief for irrigators.

Tom Dorn, Extension Educator in Lancaster County: Early season moisture carried most corn fields through the vegetative growth stages when potential ear size was determined. A check of several area corn fields last week showed good potential ear size with 14 to 16 rows and 40 to 50 kernels per row. Lancaster County had five straight days of high temperatures in the 70s and 80s just when some of the dryland corn was shedding pollen (July 10-14). Despite low soil moisture, fields pollinating at that time appear to have pollinated surprisingly well.

Fields that were planted later, or where more tillage dried the soil, had only 12-14 rows of kernels, indicating significant drought stress at early growth stages (10-12 leaf collars visible). Some fields were just silking July 18-21 when temperatures were back in the upper 90s and higher. Pollen doesn't live long

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CROP WATCH

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Lisa Jasa, Editor; Email: ljasa1@unl.edu

Soybean aphid *(Continued from page 163)*

Soybean aphid description

The aphid is light green to pale yellow, less than 1/16 inch long, and has two black-tipped cornicles (cornicles look like tailpipes) on the rear of the abdomen. It has peircing-sucking mouthparts and typically feeds on new tissue near the top of soybean plants or on the undersides of mature leaves. Later in the season the aphids can be found on all parts of the plant. It is the only aphid in North America that forms colonies on soybean.

Life cycle and injury to soybean

The seasonal life cycle of the soybean aphid is complex with up to 18 generations a year. It requires two species of host plant -- the buckthorn and soybean -- to complete its life cycle. Buckthorn is a woody shrub or tree and is the overwintering host plant of the aphid. Soybean aphids lay eggs on buckthorn in the fall. These eggs overwinter and hatch in the spring, giving rise to wingless females. These females reproduce without mating, producing more females. After two or three generations on buckthorn, winged females are produced that migrate to soybean. Multiple generations of wingless female aphids are produced on soybeans until late summer/fall, when winged females and males are produced that migrate back to buckthorn, where they mate. The females then lay eggs on buckthorn, which overwinter, thus completing the seasonal cycle.

Soybean aphid populations can grow to extremely high levels under favorable environmental conditions. Reproduction is fastest when temperatures are 72-77°F. Developmental time slows when temperatures exceed 81°F. When populations reach high levels during the summer (there are reports of up to 13,000 aphids per plant), winged females are produced that migrate to other soybean fields. Like a number of other insect species (e.g. potato leafhoppers), these migrants can be caught up in weather patterns, moved great distances, and end up infesting fields far from their origin.

Soybean aphids injure soybeans by removing plant sap with their needle-like mouthparts. Symptoms of soybeans infested by soybean aphid may include yellowed, distorted leaves and stunted plants. A charcoal-colored residue also may be present on the plants. This is sooty mold that grows on the honeydew that aphids excrete. Soybean plants appear to be most vulnerable to aphid injury during the early reproductive stages. Heavy aphid infestations during these stages cause reduced pod and seed counts.

Soybean aphid management

At this time, soybean aphid management recommendations vary and are often based on subjective observations. The aphid is very new to North America and experience with the insect is limited. The following guidelines are adapted from those of Iowa (*Soybean aphids: economic thresholds*, Marlin Rice, 7/1/2002, *Iowa State Integrated Crop*

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Soybean aphid research in Nebraska

Because the soybean aphid is so new to North America, researchers are still determining soybean aphid biology, impact, and management options in North America. It is likely that the aphid will behave differently in different parts of the Midwest, so it is important that aphid infestations be reported to Nebraska researchers so Nebraska-specific studies can be initiated. If you find aphids in your soybeans this season, please contact Tom Hunt, UNL Extension Entomology Specialist, Haskell Ag Lab, Concord, NE, (402) 584-2863, *thunt2@unl.edu* .

UNL entomologists Tom Hunt and Leon Higley have initiated several projects that address the soybean aphid. A project funded by the Nebraska Soybean Board, *Soybean Aphid Survey and Early Warning Program*, will identify regions in Nebraska with the potential for early season soybean aphid colonization of soybean, establish survey circuits in eastern Nebraska for aphids on overwintering hosts and soybean fields, alert farmers upon the earliest appearance of the soybean aphid in Nebraska, and disseminate the most recent aphid biology and management information.

Another collaborative project between Nebraska and Minnesota addresses the physiological responses of soybean to aphid injury. This project is led by Dr. Higley and will be instrumental for the development of economic thresholds and management strategies for the soybean aphid on soybean. Other research projects planned by UNL entomologists and agronomists include those examining soybean aphid biology, population dynamics, plant-insect relationships, insecticide efficacy, disease-vector relationships, and resistance/tolerance in soybean germplasm.

Tom Hunt, Extension Entomologist
Northeast REC

Soybean aphids *(Continued from page 165)*

Management Newsletter). As we gain more experience with the aphid, recommendations will be refined and developed to manage the aphid under Nebraska conditions.

Begin weekly scouting of soybean fields in late June. If possible, scout five locations per 20 acres. At each location, pick five plants and examine the underside of the leaves for aphids. Make rough estimates of aphid numbers per plant (i.e. dozen, hundred, several hundred, over one thousand).

Look for the presence of aphid natural enemies such as lady beetles, green lacewings, and other insect predators. These predators may keep low or moderate aphid populations in check. The presence of "fuzzy" aphid carcasses indicate fungal pathogens are present, which can lead to dramatic reductions of aphid populations.

Check the upper two or three trifoliate leaves for aphids in July. Aphids are most likely to concentrate at the top of the plant, although in later reproductive stages they will move onto stems and within the canopy.

Take note of winged aphids or "broad-shouldered " nymphs. Nymphs with broad or squared- off shoulders will become winged adults. These aphids will leave the plant, so if the majority of aphids are winged or about to become winged adults, the field may not have to be treated because the population will rapidly decline.

Take note of plant condition. Plants under moisture stress are more vulnerable to economic damage.

Closely examine late emerging soybean fields. It appears aphids damage late-planted soybeans more than early-planted soybeans. Use guidelines *(above)* to help determine when treatment is necessary.

Preliminary research has indicated that the highest yield responses were obtained when insecticide treatment occurred between mid-July and the first few days of August (early reproductive stages). Treatment after this period resulted in less yield response.

If fields are treated, leave an untreated test strip to compare against sprayed sections. This also provides a refuge for beneficial insects.

Good insecticide coverage and penetration is required for optimal control of soybean aphid, as aphids feed on the undersides of the leaves and within the canopy. Use high water volume and pressure.

Several insecticides are labeled for the soybean aphid (Chinese aphid on some labels), including Asana XL, Furadan 4F, Lorsban 4E, Mustang, Penncap-M, Pounce 3.2EC, and Warrior. Be sure to read the label for preharvest intervals, etc.

Treatment guidelines

Consider insecticide treatment for the soybean aphid when all of the following five conditions are met:

- Soybeans are in the R1 stage (first bloom) or later.
- Aphid populations are heavy and cover the upper trifoliate leaf on a majority of the plants.
- Lower leaves are not yet covered with honeydew or sooty mold.
- Invested plants do not yet appear stunted.
- A majority of aphids are not winged or developing wings.

If the plants are covered with honeydew or sooty mold or stunted, an insecticide treatment may still be beneficial but the optimum time of treatment is past.

Status of the soybean aphid in Nebraska

The most severe yield losses associated with soybean aphid occur when the aphid colonizes the soybean plant in the early vegetative stages and undergoes rapid population growth to reach high populations during the early reproductive stages (R1, R2). Fortunately for Nebraska, only low aphid populations have been found and most soybean fields are now at or entering reproductive stage R3, so it is unlikely we will experience the yield reductions reported in other regions. However, because aphids are capable of explosive population growth, farmers should still scout their soybean fields for this insect. Also, although the aphid has only been found in eight Nebraska counties, it is likely established throughout eastern Nebraska. There may be pockets where the aphid has thrived.

Resources

More information on the soybean aphid can be found through the UNL Entomology web site, *http://entomology.unl.edu*, and at the Soybean Aphid Watch web site at *http://www.pmcenters.org/Northcentral/Saphid/Aphidindex.htm.*

Tom Hunt
Extension Entomologist
Northeast REC

Yellow soybeans? Check for nodules

Irrigated soybeans in south central Nebraska generally are looking good. The interrow spaces are closed or will soon close. Vibrant dark green colors predominate. These colors may not persist, however, if some of the fields at the research farm are any indication. We have several fields where the plants still look normal but there are few if any nodules. We speculate that the abnormally dry soil in the spring reduced the effectiveness of the liquid inoculant we used. Normal nodule counts this time of year should average 20 or more per plant. Our numbers are considerably less than 10 nodules per plant.

If soils are deficient in nitrogen, the plants may turn yellow. If soils have high residual nitrogen levels, you may not see any deficiency symptoms. When I've seen these problems before, the yellowing patterns followed anhydrous ammonia application patterns on the previous corn crop.

It would pay to dig some plants if you are not certain of the nodulation status or if yellow patterns develop. Be aware that nodule counts often vary considerably among plants. Carefully dig at least 10 plants in several parts of the field for evaluation.

Yellow patterns, however, may not be related to nodulation problems. Consider other sources of yellowing before concluding it is a nodulation problem. These include:

1. Denitrification, which often occurs in low-wet areas or areas with leaky pipes or gaskets.
2. Varietal, some varieties are naturally more yellow than others.
3. Herbicide related.
4. Iron chlorosis resulting from high pH soils.

Options for nitrogen deficient soybeans due to nodulation failure

Soybeans with a full size pod in the top four nodes (R5) are just beginning to reach the point of maximum nitrogen uptake. Access to nitrogen during pod elongation (R4) and seed fill (R5-R6) is necessary to produce maximum yields. Well-nodulated soybeans can fix up to half of their nitrogen needs from the soil atmospheric nitrogen. This may not happen with low nodule counts and with low soil residual nitrogen. Extension soil specialists have suggested that 50 to 60 pounds of nitrogen per acre could be applied to solve nitrogen deficiency problems. If the seeds are less than full size in the top four nodes (that is before the R6 stage), you may expect some yield response to applied nitrogen assuming plants are yellow and nodulation is poor. The method of nitrogen application will depend on your individual situation and equipment availability.

Roger Elmore, Extension Cropping Systems Specialist South Central REC

Soybean Management Field Days *(Continued from page 163)*

next six weeks at county FSA offices.

Johnson will be one of the speakers at this year's Soybean Management Field Days to be held at four sites across the state Aug. 14-18.

Johnson and Roy Smith, a Nebraska farmer and ag market consultant, will present information on "finding stronger links to profitability" at each of the field days.

University researchers and specialists also will be addressing pressing soybean production issues and explore methods for improving production cost efficiencies. Other topics and their presenters are:

- "Getting the Upper Hand on Weed Control" with Alex Martin, extension weed specialist, and Bob Klein, extension cropping system specialist.
- "Managing Soil Water and Irrigation," with Paul Jasa, extension engineer, and Bill Kranz, extension irrigation specialist
- "Understanding Insect and Disease Interactions" with Thomas Hunt, extension entomologist, and Loren Giesler, extension plant pathologist.

"Innovation, experience, perseverance, and new knowledge — for decades this has been the formula for success in American agriculture," according to Keith Glewen, event co-coordinator and NU Extension Educator.

"Nebraska soybean growers are facing challenges like they have never experienced before. By attending the Soybean Management Field Days, growers will take home unbiased, research-based answers to enhance profitability and remain competitive.

The field days will be held at each site from 9 a.m. to 2:30 p.m. and features field stops at demonstration plots, a free lunch and a question and answer period. Field days sites are:

August 13, Bob Moseman Farm, Oakland, located 2.5 miles west of Oakland off Hwy 32.

August 14, David Prothman Farm, Albion, located off Hwy 39, 4 miles south of the Hwy 14 and 91 intersection in Albion.

August 15, Chad Dane Farm, Clay Center, located 3 miles west of Clay Center and 1 1/4 miles north.

August 16, David Antholz Farm, Burr, located 3 miles west of the Hwy 50 and Burr Spur intersection south of Syracuse.

Admission is free and CCA credits are available. Registration will be at the door. For more information, visit the Soybean Management Field Days 2002 Web site at *http://ardc.unl.edu/smfdhome.htm*

Soybean Management Field Days 2002 is sponsored by the Nebraska Soybean Board in cooperation with the University of Nebraska Cooperative Extension. Presenters include University of Nebraska specialists, educators and industry consultants. Information and demonstrations presented at the meetings is unbiased and research-based.

Jointed goatgrass, feral rye targeted

New wheat cultivar, herbicide increase weed control options

This season wheat growers will have a new tool to manage some of their toughest weeds, such as jointed goatgrass, feral rye, and downy brome. BASF Corporation is offering the Clearfield Production System for Wheat (CPSW). It combines the use of Beyond herbicide with a winter wheat cultivar containing the gene that confers tolerance to this herbicide. Wheat cultivars that contain this gene may be treated with Beyond with minimal risk of injury to the crop. Winter wheat cultivars that do not contain the tolerance gene are seriously injured or killed when treated with Beyond.

In university field studies conducted in western Nebraska and throughout the western winter wheat belt, the system provided excellent control of jointed goatgrass and downy brome when weeds were treated with 4 ounces of product per acre in the fall or early spring. Good control of feral rye required an early fall application with 5 ounces of product per acre. Optimum control of feral rye was achieved when Beyond was applied before rye plants had produced a tiller. To prevent injury, wheat plants had to have at least three leaves emerged. No previous technology has provided this level of selective control for jointed goatgrass or feral rye in winter wheat. However, as with most technology, there are some concerns with using this system.

Among university weed control specialists, the biggest concern with the Clearfield production system for wheat is the potential development of herbicide-resistant weeds. Because Beyond provides such excellent control of jointed goatgrass and downy brome, it will exert a tremendous selection pressure for resistance.

Beyond belongs to a class of herbicides known as ALS-inhibitors. Other herbicides in this class, such as Glean and Pursuit, have a history of quickly selecting for resistance in weed populations. Examples include ALS-resistant kochia, prickly lettuce, and pigweed. In the case of jointed goatgrass, resistance also may occur through pollen transfer. Jointed goatgrass and wheat share a common genome, the D genome, acquired from a common ancestor. Research has shown that there is a slight chance of moving the resistance gene from a Clearfield cultivar to jointed goatgrass within several generations. Without adequate safeguards, it is likely that weeds resistant to Beyond will be common in just a few years.

In order to delay the onset of herbicide resistance, fields treated with Beyond should not be treated with another ALS-inhibitor such as Ally or Peak. If additional weed control is needed, for example to control warm season broadleaf weeds like kochia or pigweeds, use a herbicide with a different mode of action. Herbicides containing 2,4-D or dicamba would be good choices for additional weed control.

The BASF Clearfield stewardship program for wheat requires the use of only certified seed in order to prevent the pollen flow required to produce a jointed goatgrass plant with resistance to Beyond. Growers will not be allowed to save back any

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Control volunteer wheat to prevent wheat streak mosaic

While the dry weather, particularly in western Nebraska, has probably restricted the growth of volunteer wheat, it would still benefit growers to check their stubble fields for the presence of any volunteer.

We were surprised this year by the amount of wheat streak mosaic in Nebraska. The disease was not only present in western Nebraska, but caused isolated losses in some fields in southeast Nebraska. Wheat streak mosaic is a nasty disease that ranks number one in importance in our state along with crown and root rot and leaf rust.

In a May 2002 survey in the Panhandle, all wheat streak mosaic situations found in that survey could be traced to the presence of volunteer wheat in the adjacent stubble. In some cases the amount of volunteer was small, but it doesn't take much to provide that summer bridge necessary for mite survival. The volunteer that emerges before harvest is the cause of the problem. Late volunteer emerging after harvest posses little threat in the epidemiology of wheat streak mosaic.

In the July 12, 2002 *CropWatch*, Bob Klein, Drew Lyon and Gail Wicks provided information on controlling weeds after wheat harvest. Good weed control after harvest and planting at the proper time are two important steps in controlling wheat streak mosaic and crown and root rot.

John Watkins
Extension Plant Pathologist

NU South Central REC field day to spotlight latest research, impact of new technologies

"Agriculture in Changing Times" will be the theme of a field day Thursday, Aug. 8, at the South Central Research and Extension Center Research Farm near Clay Center. Participants are invited to visit the five tour stops as well as the indoor exhibits. The program will be conducted between 9 a.m. and 3:30 p.m. and includes a free lunch.

"Research at the Center is responding to a number of issues faced by today's ag industry," said Alan Baquet, SCREC district director. "It is evaluating the impact of new technologies on both the profitability and environmental sustainability of farming operations and providing key, non-biased information with which farmers can make sound management decisions."

"Previous research on irrigation scheduling techniques, and pesticide, herbicide and fertilizer management has impacted many farms in south central Nebraska," he said.

Research and demonstration topics and presenters are:

- Sub-surface drip irrigation, Jose Payero, Extension water resources engineer;
- Nebraska soil fertility project, Richard Ferguson, Extension soils specialist;
- Weed management with glyphosate and Callisto herbicides, Fred Roeth, Extension weeds specialist;
- Corn rootworm management update, Bob Wright, Extension entomologist;
- Corn spacing uniformity and effects on yield, Roger Elmore, Extension crops specialist;
- Corn-grain sorghum profitability comparisons, Steve Melvin, Extension educator, Frontier County;
- Economics of dryland farming systems, Roger Selley, Extension farm management specialist;
- Weed management in dryland cropping systems, Irv Schleufer, ag research technician;
- Gray leaf spot of corn, integrated pest management project, Jim Stack, Extension plant pathologist; and
- Profitable management of corn diseases, Jim Stack, Extension plant pathologist.

The field day is sponsored by the University of Nebraska, Nebraska Grain Sorghum Board, Nebraska Corn Board, Nebraska Corn Growers Association, and the Nebraska Soybean Board, as well as numerous agricultural and financial businesses from the area.

For more information contact Kim Peterson, Emily Kauk or Ellie Watts at the South Central REC at (402) 762-3535.

Clearfield wheat *(Continued from page 168)*

grain for seed. The stewardship program also does not allow the use of the CPSW more than twice in a four-year period. University researchers in the Great Plains are concerned that this requirement is not adequate to sufficiently delay the onset of herbicide-resistant weeds. They recommend that the CPSW not be used more than once every three years. This would prevent growers in the winter wheat-fallow rotation from using the system every time they grow wheat.

Another concern with this system is the high cost of the herbicide. The price is expected to be between $14 and $16 per acre for a 4-ounce-per-acre use rate. There will likely be a rebate program in the Great Plains that will return about $2 of this price to the grower.

For the 2002 planting season, there will only be three Clearfield cultivars available to Nebraska growers. These are Above, AP 401CL, and AP 502CL. Above is a public variety developed at Colorado State University. It is a TAM 110 type with marginal adaptation for Nebraska. Agripro will have two Clearfield cultivars for sale. AP 401CL is a hard white wheat with the gene for tolerance to Beyond and AP 502CL is similar to Above. Dr. Stephen Baenziger, wheat breeder at the University of Nebraska-Lincoln, expects to have several high yielding Nebraska-adapted cultivars for the CPSW available to growers in the fall of 2005 or 2006.

The gene conferring resistance to Beyond was developed by mutagenesis, a technique that has been used in plant breeding for over 70 years. Cultivars with the gene are not considered to be genetically modified organisms, also known as GMOs, and market acceptability is not a concern.

Growers interested in the CPSW should check with their local BASF agricultural representative or agricultural chemical dealer. Growers will be required to sign a contract with BASF to ensure stewardship requirements are followed. With proper management, the CPSW provides winter wheat growers with a very effective weapon to gain the upper hand in the battle against jointed goatgrass, feral rye, and downy brome.

Drew Lyon
Extension Dryland Cropping Systems Specialist
Gail Wicks
Extension Weeds Specialist

Second flight European corn borers underway

The second flight of European corn borer (ECB) moths has begun in Nebraska. Moth counts have been relatively low to date in the southern half of Nebraska (well below 100 per night), and are just starting in the northern half of the state. Current information on light trap catches can be found through the UNL Department of Entomology Web site at *http://entomology.unl.edu/* or go directly to *http://entomology.unl.edu/fldcrops/fldcrops.htm*

Timely and accurate scouting is the key to managing ECB in standard (non-Bt) corn hybrids. Remember that conditions are localized and fields must be scouted on an individual basis to make accurate decisions. We have had it easy the last few years -- flights have been relatively low; however, this cannot last forever. Last year's flights were up a little from the previous few years, as was this year's first flight. Begin scouting fields soon to determine when egg laying begins in your area.

Fields with green silks during the peak moth flight period are most susceptible to second-generation egg laying. The white, flat eggs overlap each other like fish scales and are laid in masses of five to 40 eggs. Eggs are most likely found on the underside of leaves, near the mid-rib, on the ear leaf and the three leaves above or below the ear leaf. Approximately 90 percent of the egg masses will be found on these middle seven leaves. A black spot is visible on the eggs for about 24 hours before they hatch. The spot is the head of the developing corn borer; this stage is often referred to as the black head stage.

To determine whether control would be profitable, examine 25 plants at four sites per field (100 plants total). Record the number of egg masses and the number of plants sampled. If you sampled only the middle seven leaves, multiply the number of egg masses by 1.1 to estimate the total present over the whole plant. Use this adjusted mean in the worksheet below. Go through the calculations outlined in the worksheet (also available from NebFact 98-365, Second generation European corn borer scouting and treatment decisions *http://www.ianr.unl.edu/pubs/insects/nf365.htm)* to determine if an economic infestation is present. You also will need to know:

- crop stage
- expected yield
- expected market price for corn
- percent control with insecticide
- cost of control (insecticide plus application costs)

An interactive version of this worksheet is available at *http://www.ianr.unl.edu/forms/forms.skp/ecb_2nd.html*

This worksheet will help you better evaluate the factors influencing the cost/benefit relationship for second generation European corn borer treatments. Average values are suggested in the worksheet but may be modified for local conditions.

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Management worksheet for second generation European corn borers

_____ Number of egg masses per plant x 3 borers per egg mass* = _____ borers per plant

_____ Borers per plant x 4% yield loss per borer** = _____ percent yield loss

_____ Percent yield loss x _____ expected yield (bu per acre) = _____ bu per acre loss

_____ Bushels per acre loss x $_____ sale price per bu = $_____ loss per acre

$_____ loss per acre x 70% control*** = $_____ preventable loss per acre

$_____ preventable loss per acre

- $_____ cost of control (product + application costs)

=$_____ profit (+) or loss (-) per acre if treatment is applied

If preventable loss exceeds cost of control, insecticide treatment is likely to result in economic benefit.

* Assumes survival rate of three borers per egg mass; may vary with weather and egg mass size.

** Use 3 percent loss per borer per plant if infestation occurs after silks are brown. The potential economic benefits of treatments decline rapidly if infestations occur after the corn reaches the blister stage.

*** 70% is an average, you may use another value if desired.

Scout for greenbugs in sorghum; check threshold

Greenbugs are approaching damaging number in some sorghum fields and should be monitored closely for the next couple of weeks. Predator populations, particularly lady beetles and lacewings are increasing, and a few greenbug parasites (mummies) have been found in some fields. Because parasites and predators can be highly effective in controlling greenbugs and insecticide resistance is an occasional problem in Nebraska, it is advisable to delay use of insecticides as long as possible. Following are the treatment thresholds for greenbugs.

Plants 6 inches tall to boot stage:

Greenbug colonies beginning to cause red or yellow leaf spotting on leaves of most plants, and before any entire leaves are killed, and if parasite numbers are low (less than 20% of greenbugs are mummies.)

Boot to heading:

Treat if greenbug colonies are present on most plants and have killed one lower leaf, and if parasite numbers are low (less than 20% of greenbugs are mummies.)

Heading to hard dough:

Treat if greenbug colonies are present on most plants and have killed two normal-sized leaves, and if parasite numbers are low (less than 20% of greenbugs are mummies.)

Parasitism should increase in the next couple of weeks. For additional information on greenbug management, refer to the UNL Department of Entomology Home page at *http://entomology.unl.edu/instabls/greenbug.htm.*

ZB Mayo, Head
Department of Entomology

2nd generation ECB *(Continued from page 170)*

1. Borer survival is suggested to be 15%. Larval survival varies with weather conditions and irrigation. In irrigated corn, larval survival may be 20% or more, while in dryland corn with no significant rainfall, it may be 10% or less. Survival of eggs and small larvae decreases greatly in hot, dry weather or with extended periods of heavy rain.

2. Yield loss will be about 4% per borer for infestations occurring before silks turn brown and 3% per borer after silks turn brown but before blister stage. These averages are based on published research but only account for physiological yield losses (reduced grain production) and do not consider yield loss from stalk breakage or ear drop. These factors are difficult to predict and vary with hybrid, cultural practices and weather.

3. Percent control with insecticides is suggested to be 70%; change this value if you think that control will be different in your situation.

Infestations are most damaging when corn borers enter the stalk early in corn's reproductive cycle. There is a short time between first egg hatch and significant stalk tunneling when corn borers are best controlled. Concentrate scouting efforts in this early egg laying period and repeat every three to five days. Often, second generation egg laying may extend to 21 days or more. Although later hatching corn borers do not directly reduce grain yield as much, they may still cause stalk breakage or ear drop. Early harvest of fields damaged by corn borers and selecting varieties with good stalk strength and resistance to stalk rot can reduce this loss.

If treatment is needed, time insecticide applications to coincide with the beginning of egg hatch to achieve acceptable control. Generally, liquid and granular formulations of the same insecticide are equally effective against corn borer larvae. However, in considering other pests that may need to be controlled at this time of year (western bean cutworms, rootworm beetles, grasshoppers, spider mites), liquids may be preferred. Rates and restrictions of registered insecticides for European corn borer control can be found on the label or at the UNL Entomology home page at *http://www.ianr.unl.edu/ianr/entomol/fldcrops/fldcrops.htm*

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Field updates

(Continued from page 164)

under those conditions, and silks dry quickly. Pollination is bound to be hurt on those fields.

With three days over 100°F and no moisture, all fields suffered last weekend. Potential yield has slipped badly even on fields that had successfully pollinated. Farmers are considering their options. Some are planning to cut the corn for forage or windrow and bale the stover. Nitrates are likely to be high in drought-stressed corn. Ensiling will remove some nitrate but cutting for dry stover will not. If making stover, cut high leaving about 12 inches of the lower stalk. Test nitrate levels before feeding.

Soybeans are short but blooming. Timing and effectiveness of weed control is making a big difference on canopy growth. A rain in the next week or two could revive the crop and we still could get some yield.

Making forage from soybeans can optimize crop options

Soybeans stunted by lack of rain or damaged by hail can be salvaged as hay or silage. When made right, soybean hay and silage have characteristics for harvest and feeding similar to alfalfa. Since soybean stems tend to be coarser than alfalfa stems, grinding often helps increase consumption and reduces refusal of stems in the feedbunk or hay rack by cattle.

Harvest soybean forage before bottom leaves first start to turn yellow. If possible, cut earlier than this because late cut soybean stems become woody and are of poor quality. It is especially important to harvest before a freeze to prevent rapid leaf loss.

Making hay

If harvesting soybeans as hay, be sure to condition or crimp the hay to hasten stem dry down. Also, avoid raking if at all possible. Soybean leaves crumble easily when dry, reducing yield and lowering feed value. In addition, stems are woody and dry slowly, making it hard to dry soybean hay easily. If you rake windrows to dry out any stems on the bottom, leaves are apt to crumble and fall away, leaving just sticks for hay.

Producers have two options for haying soybeans. You can leave the windrow alone while it slowly dries and hope that it doesn't rain before it's fit to bale. This may be your best option if weather cooperates. The second option is to rake soy hay within a day of cutting, before leaves on top have dried enough to crumble. This may be your only option if raking is necessary to put two or more windrows together for satisfactory baling.

Making silage

Making good soy silage is less risky if you have silage equipment and follow the procedure. When making silage, chop when the moisture content is between 60% and 70%. This often occurs as leaves first start to turn yellow. Chop soybean plants well and pack them tightly. Uniformly add a silage inoculant designed for legumes like alfalfa and one or two bushels of rolled or ground grain to each ton of silage to improve fermentation. Another option is to add fifty pounds of molasses to each ton of wet silage to aid fermentation.

A better method may be to mix the chopped soybean plants in with corn or sorghum silage. A ratio of one ton soybean silage to three or four tons of corn or sorghum silage will improve fermentation of the soybean silage and increase protein content of the corn or sorghum silage by 2 to 3 points. And pack soy silage especially well.

Grazing

Soybeans can even be grazed. Cattle generally take some time becoming accustomed to soybeans, eating weeds along fences and between rows before starting on the bean plants. Once they begin grazing the soybeans, though, they quickly adapt and readily eat most of the plant.

Before turning animals into soybean fields to graze, fill them with some other feed like grass hay to discourage them from quickly eating a large meal of a new feedstuff. Cattle can bloat when grazing soybeans, but it occurs only rarely. Soybeans also cause loose manure in some animals; providing some grass hay free choice for those animals can reduce these problems.

Salvaging soybeans as a forage may not be fool-proof, but it can result in a pretty good feed.

Bruce Anderson
Extension Forage Specialist

NU offers new drought web site

A new University of Nebraska Web site provides Cooperative Extension and other resources to help Nebraskans cope with drought.

The NU Institute of Agriculture and Natural Resources' Drought Resources and Information Web site features a variety of drought-related information from managing crops and livestock to handling stress and maintaining landscapes, said DeLynn Hay, Cooperative Extension program leader.

"This site is one point of entry where people can access drought-related information as we continue to deal with the situation," Hay said. "It's an easy way to get information without having to go to a lot of places."

The site is at *http://ianrhome.unl.edu/drought/*. The IANR news stories, Web broadcasts and extension publications that this site offers come from NU extension specialists and IANR researchers.

The site includes print articles, audio and video interviews, links to *CropWatch* drought stories, the National Drought Mitigation Center, extension's Market Journal, weather information and other resources.

The site was developed by IANR's Communications and Information Technology unit. It's updated regularly to offer the latest news and information on Nebraska's ongoing drought.

Irrigators:

CropWatch features growing degree day accumulations, evapotranspiration rates, and precipitation amounts for a number of crops and sites across the state. Check it out at

cropwatch.unl.edu/weather.htm