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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

University of Nebraska Lincoln

No. 2003-16, June 27, 2003

Assessing hail damage to crops

Hail storms earlier this week in central and eastern Nebraska damaged crops, leaving producers to determine whether replanting or planting to another crop is a viable option. Generally, damage has not been as widespread as in some previous years.

While reports of small to 1.5-inch hail were fairly common in areas of central Nebraska, Aurora in Hamilton County reported hail ranging from the size of a softball to a small cantaloupe. The National Weather Service (NWS) in Hastings measured the largest recovered hail stone in Aurora and found it just 1/8 inch short of the national record for circumference of a single hail stone.

"With a diameter of 6.5 inches and a circumference of 17 3/8 inches, it was pretty amazing," said Steve Carmel, hydrological meteorological technician at the NWS office in Hastings. (The current record-holding hail stone fell in Coffeeville Kansas in 1970.) Luckily, the larger hail stones were somewhat of an anomaly.

Andy Christiansen, Extension Educator in Hamilton County, reported that most of the hail damage was limited to a relatively small area north of Hampton. About eight sections of farmland between Benedict and Hampton had quite a few soybean acres with almost total defoliation and many broken stems. Corn in that area was severely shredded, but little was actually sawed off. Another 10-15 sections in Hamilton and York counties had less severe damage.

"There will be some replanting of soybeans," Christiansen said, "but t I doubt much corn will be touched."

In neighboring York County, Extension Educator Gary Zoubek said 25-30 sections had at least some hail damage, varying greatly depending on crop and stage of development.

In Nebraska, summer can be stormy and events such as those earlier this week are likely to occur somewhere in the state for the next six to ten weeks. If hail strikes your farm, the following information may be helpful in assessing your options. In most cases, wait 7-10 days before making any decisions.

Replanting considerations

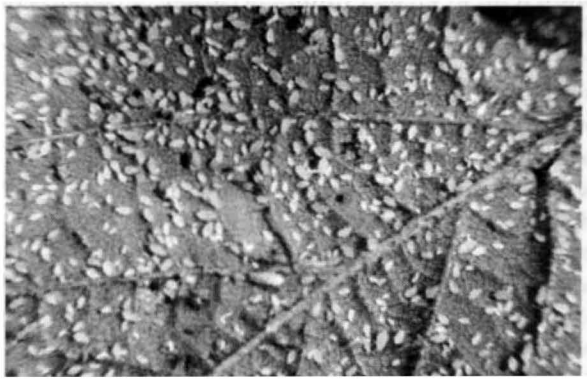
For many producers, options may be limited by previous herbicide selection, timing (in many areas it's too late to replant corn), and wet fields. Many areas received heavy

(Continued on page 151)

Inside

Scout for soybean aphids

The soybean aphid (*Aphis glycines* Matsumura) was found in two southeastern Nebraska counties earlier this month. Only four aphids were found, but they serve as a reminder that farmers should begin scouting for this insect.



Soybean aphids. In Minnesota, as many as 13,000 soybean aphids have been found on a single plant.

The soybean aphid is new to North America. It is an Asian soybean pest that was first discovered in the United States in Wisconsin in summer 2000. Since

(Continued on page 155)

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Updates

Gary Hein, Extension Entomologist at the Panhandle REC: Wheat growers in western Kansas have been having problems at the elevator due to the presence of insect damaged kernels (IDK), in some cases serious enough to downgrade entire loads. This damage has been caused by the **wheathead armyworm** as it feeds at night on developing kernels.

Nebraska wheat growers are urged to check wheat fields for this insect. This can best be done by using a sweep net to sample throughout the field. The larvae will tend to be more common in the field margins so it's important to sample the whole field to achieve an accurate assessment. The wheathead armyworm can be up to 1 inch long, tapered (narrowed) toward the rear end, and greenish gray with yellow and brown stripes. Little can be done if infestations are found in nearly mature wheat, but more serious damage may still be prevented in green wheat. If treatments are deemed necessary, harvest intervals for the insecticide will be a major consideration.

Mexican bean beetles have shown up in greater numbers earlier this year in Panhandle dry beans. High populations coupled with slow plant growth in the cooler weather have combined to leave some bean stands more vulnerable to this earlier adult feeding damage. It is important to examine fields for beetles and feeding to determine the severity of infestations. Beans can tolerate considerable defoliation while in the vegetative stages (up to 25%) without serious impact, but small plants can be threatened by extensive feeding. Infestations that approach 20% defoliation on small beans would probably justify treatment. These early infestations are often more serious on field margins. Applying lower use rates in narrow bands over the small plants will reduce treatment costs and should provide acceptable control.

C. Dean Yonts, Extension Engineer at the Panhandle REC: Many areas in the Panhandle remain dry. Some areas received up to 1 inch of rain the past few days, but most areas received less than 0.1 inch. Row crops are still looking good despite the dryness, partially due to the recent cool weather. In anticipation of warmer weather pump irrigators are beginning to start their systems as the soil dries. Once it warms up and crop water use increases, operators may have a hard time keeping up with crop water demands. Storing water in the soil profile while water use is reduced can help later in the season.

In the North Platte Valley, many of the larger irrigation districts will begin making water deliveries this week. Surface irrigators are still anticipating about a 50% supply compared to normal; irrigation districts hope to stretch this limited water supply for approximately 60 days. This means water supplies should be depleted by late August.

There also have been numerous reports of domestic wells going dry in the North Platte Valley. This has been caused primarily by the lack of recharge coming from the irrigation canals. Water was shut off early last year and is coming in late this year. With the increased demand for ground water, shallow wells are experiencing some difficulty. These issues may subside when the canals begin running; however, with an early shutdown again this year, increased demand for groundwater, and the lack of rain we are still in the middle of a significant drought and may likely see some of the same problems again next year.

John Watkins, Extension Plant Pathologist, Lincoln: With the recent rains and heat, **leaf diseases** are continuing to develop in wheat. We're way beyond the treatment window for any wheat diseases, however.

Producers should be scouting their alfalfa fields for summer black stem and other leaf spotting diseases. In a dense canopy leaf diseases could cause considerable defoliation before the next cutting. The cutting may need to be taken a little earlier if the plants are starting to lose leaves to disease. Scouting

(Continued on page 157)

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

Hail damage (Continued from page 149)

rains with the hail, delaying when producers might reenter the field. Producers will need to consider potential yield loss of the existing crop vs. replanting costs and potential reduced yields. In some cases, the reduced yield of a hail-damaged field may be higher than the potential yield from replanting.

It's almost too late to replant corn for grain and replanting soybeans now could mean up to a 30% potential yield reduction. Estimated yield losses for sorghum are slightly less than for soybeans at this time.

Before doing anything with the field, notify the proper government agency and, if you plan to make a claim, your insurance provider. Discuss replant options and limits; when they'll be able to determine the severity of the loss and their assessment of the loss. Next, consider your investment in the crop, additional expenses, and expected yield at this point. Weed and pest control will continue to be costly, and weed control may be even more difficult if the crop canopy is open. Be sure to consider herbicide replant options for this year as well as next year if applying herbicide this late in the season.

Whenever you open the canopy, weeds will develop quickly. Timely rescue treatments when the weeds are small will be most effective and cost efficient. Otherwise weeds may grow quickly and make harvest difficult to impossible. In addition the weeds will use valuable moisture and nutrients and be very competitive with the crop. Once established they also will produce weed seed which can complicate weed control in future years. If you plan to rotate to another crop next year, check the herbicide label carefully to ensure that herbicide carryover won't be a problem.

Hail and wind damaged fields also may face increased insect problems, depending on area infestations. Some insects prefer later maturing corn and may flock to those fields, requiring continued diligence in scouting. Diseases too can flare in plants where hail or wind may have damaged the plant and created openings for pathogens to infect the plant.

Large hail stones like those falling in Aurora Sunday night are extremely rare, said Steve Carmel, hydrological meteorological technician at the National Weather Service office in Hastings.

The difference between a storm that produces record-setting stones and one producing "regular" sized stones is the strength of the updraft in the storm cell. In a strong supercell, like the one that hovered over Thayer and Hamilton counties Sunday night, hail develops and moves up and down in the center of the cell until it becomes so heavy it falls to the ground. To create hail the size of that found in Aurora, you would need an updraft of more than 300 mph, Carmel said.

Hail damage assessment and management options vary according to plant stage, however the procedures are fairly similar from crop to crop and stage to stage:

- estimate the growth stage;
- assess the damage; and
- consider options if yield potentials are low.

Resources

Three NebGuides -- for corn, soybeans and sorghum -- offer valuable information on assessing hail damage and estimating potential yield losses at various stages. Correct assessment of potential yield is essential when determining continued inputs (herbicides, tillage, irrigation, etc.) Check with your local Cooperative Extension office or on the Web at *http://www.ianr.unl.edu/pubs/* for copies of:

Assessing Hail Damage to Corn (G86-803), which includes illustrations and tables from the National Crop Insurance Association's Corn Loss Instructions; and addresses losses due to stand reduction and defoliation as well as when the plant is most susceptible to damage. For 7-8 weeks after emergence the corn plant grows rapidly and becomes increasingly vulnerable to hail damage up through the tasseling stage. Once past tasseling, hail causes progressively less yield loss as the plant approaches maturity.

Soybean Yield Loss Due to Hail Damage (G85-762), which includes stand loss tables and a worksheet to calculate total actual loss. With soybeans, yield loss predictions are based on: stage of growth and degree of plant damage, including leaf defoliation, stand reduction, stem damage and pod damage. Stand reduction refers to the number of plants actually killed by hail; defoliation is measured as a percentage of the leaf area destroyed by the storm; and stem damage covers stem cutoff (stems completely cut off and removed from the plant) and stems bent over or broken.

Sorghum Yield Loss Due to Hail Damage, (G86-812), which also includes illustrations, tables and a worksheet to calculate total actual loss. With sorghum, yield loss predictions are based on two factors: growth stage and plant damage. Plant damage may be either direct (stand reduction, stalk damage and head damage) or defoliation.

(Continued on page 152)

Duration, temperature of flood waters dictate extent of crop damage

Some areas of central and eastern Nebraska received extensive precipitation over several relatively short periods this week, causing flooding in rural and urban areas.

How much rain is too much and how long is too long when fields are flooded? The severity of damage from flooding and ponding will depend on the depth of the flooding, the length of time an area was flooded and the temperature of the flood water.

Depth of flooding refers not only to the water visible above ground, but also to the level of moisture in the soil profile. In some situations, producers may want to dig ditches to help drain a field more quickly. Before doing so, check with the Natural Resource Conservation Service (NRCS) to ensure that you will not be committing a wetlands violation. Help facilitate field drainage by ensuring that drainage paths are clear of plant residue, brush and other clogging materials. Even after the surface flood water has receded, the soil may remain saturated for some time. While the shoot may appear healthy, the roots may be suffocating. Once the surface water has receded, the field's ability to drain internally will be important.

Hail

(Continued from page 151)

When possible, wait 7-10 days following the storm to determine loss. By that time, regrowth of living plants will have begun and discolored dead tissue will be apparent. Also, some plants initially surviving a storm may soon die because of disease infection entering at the site of plant damage.

Roger Elmore
Extension Crops Specialist
South Central REC
Bob Klein, Extension Crops Specialist, West Central REC

Tiled fields will drain faster, providing quicker relief to the crop.

The length of time a field is flooded also affects the rate of plant survival. Peter Thomison, Extension Corn Specialist at Ohio State University, notes that corn usually can survive two to four days of ponding, depending on the temperature. If the air temperature is over 77°F, plants may not survive longer than 24 hours.

Early spring flooding is a lot less harmful than late spring flooding when the flood waters are apt to be warm. The temperature of the flood water is important for two reasons: 1) there is less oxygen available in warm water than in cool water; and 2) microorganisms that use oxygen are more active in warm water and will compete with roots for oxygen. After using the oxygen, microorganisms will begin to break down nitrate nitrogen, converting it to a gas through denitrification. (During flooding, nitrogen also is apt to be lost through leaching.)

Even if flooding doesn't kill plants outright, it may have a long-term negative impact on crop performance and the potential for disease development. Thomison notes, "Excess moisture during the early vegetative stages retards corn root development and can kill the deepest roots. As a result, plants may be subject to greater injury during a dry summer because root systems are not sufficiently developed to access available subsoil water."

Seth Naeve, Extension Soybean Specialist at the University of Minnesota, notes several indirect effects of flooding on soybeans, which producers also may need to be addressed. They include 1) root diseases, 2) nitrogen deficiency, 3) and other plant nutrient imbalances.

(Continued on page 153)

Understanding types of field flooding

Field flooding may occur by either *stream flooding* or *lowland flooding*. The former results from creeks or rivers overflowing their banks onto a flood plain. In this case silt and sand is often deposited in the field and plant tissues are covered with soil material. The latter case results from water accumulation in depressed areas due to inadequate soil permeability or surface drainage.

These flooding types can be further divided into *soil waterlogging*, where the soil is merely saturated, or *complete submergence* where the crop is entirely submerged. The type of flooding occurring on a farm directly impacts growth and yield potential of [soybeans in] that field. Although stream flooding can quickly recede, the resulting silt deposits can bury the crop and cover leaf tissue with thick layers of soil. Without rains to wash silt from soybean leaves, recovery is greatly slowed. Fortunately, soil types prone to stream flooding are often coarse-textured. These sandy soils drain well, allowing quick crop recovery or replanting. Lowland soils often retain water so that as the water disappears from the surface, the soil profile may remain waterlogged for several more days.

Seth Naeve
Extension Soybean Specialist, University of Minnesota

From the University of Minnesota publication, *Flooded Fields and Soybean Survival*, MNCN80, published June 14, 2002.

Control volunteer corn in soybean

It's not surprising to see volunteer corn in soybean since the two crops are used in rotation; however, in this case volunteer corn is a weed and should be treated accordingly. It reduces light interception to soybean, interferes with harvesting procedures and makes the field look 'messy'. Generally corn grows faster than soybean, so if it's left uncontrolled it will overtop the soy-bean canopy. Control can be achieved by mechanical means (eg. inter-row cultivation) and herbicides.

Timing of inter-row cultivation should depend on the weed pressure. If volunteer corn is a predominant "weed", cultivate at about the 5-6 leaf stage of corn. The growing point of corn remains in the ground until the 6th leaf stage. Therefore, any cultivation prior to that leaf stage may result in regrowth of the plant, necessitating a second cultivation. It is especially true with shallow cultivation.

If you have Roundup-Ready soybean, Roundup will control volunteer corn, unless you have had Roundup Ready corn in the previous year. Roundup will not control volunteer Roundup Ready corn in Roundup Ready soybeans.

Herbicides also can be used to effectively control volunteer corn. Several grass type herbicides (graminicides) can be used at lower rates post-emergence in both conventional and Roundup Ready soybean. These herbicides and their lower rates include: Assure (4 oz), Fusilade (4 oz), Fusion (2 oz), Poast Plus (10-16 oz), and Select (4 oz). Best control is achieved when herbicides are applied by the 3-4 leaf stage of corn. These herbicides at full label rates also will control many grassy species, including barnyardgrass, green and yellow foxtail, fall panicum and sandbur.

Stevan Knezevic, Extension Integrated Weed Management Specialist

Flooding *(Continued from page 152)*

Caring for recuperating soybean stands should focus on reducing further plant stress where possible. Cultivation should be considered to increase soil aeration, and post-emergence herbicides should only be applied to conventional soybean crops judiciously. Herbicide stress should be minimized and postponed where possible, Naeve writes in his University of Minnesota publication, *Flooded Fields and Soybean Survival*, MNCN80, published June 14, 2002.

Producers may want to carefully weigh the costs and benefits of further inputs into some badly damaged fields. To confirm plant survival, check the color of the growing point. It should be white and cream colored rather than dark and soft. New leaf growth should appear three to five days after water drains from the field.

Replanting may not be a very viable option in many fields where conditions are likely to stay soggy for several weeks, not allowing for timely field work and planting.

Soybean producers with field populations below 75,000 plants per acre may consider replanting if they can get back into the field relatively soon. Lenis Nelson, Extension Crops Specialist, did not recommend changing the maturity class significantly when replanting soybeans. If a producer had previously planted a mid-group II variety, he or she might consider now planting an early group II variety.

Nelson also recommended planting in narrow rows so the canopy closes faster and weeds are better controlled.

Bob Caldwell, Extension Cropping Systems Specialist
Lisa Jasa, Crop Watch Editor

Emergency forages an option, but check previous herbicides

We've seen it all this year — drought, flash floods, hail, insects, and tornadoes. After disaster strikes, replanting a grain crop may be nearly impossible due to herbicide carryover or the late planting date. Under these circumstances, consider planting an annual emergency forage crop.

Unfortunately, previous herbicide use also can cause problems with forages. Many corn and sorghum herbicides will injure pearl millet and foxtail millet. Sudangrass, forage sorghum, and sorghum-sudan hybrids will tolerate moderate levels of atrazine, and with some herbicides, using safened seed may be an option. These sorghums also tolerate most herbicides labeled for use with grain sorghum.

Another possible emergency forage crop is short-season corn as silage or late season as pasture, especially if the previous corn herbicides eliminate other crop possibilities.

Soybean herbicides that have residual soil activity can cause even bigger problems for replanting to forages. All summer grasses are sensitive to most soybean herbicides. Sunflower silage and soybeans for hay or silage are among the few alternatives compatible with soybean herbicide carryover.

Even when you find out that an annual forage will grow, sometimes you may not be allowed to feed it legally. Many row crop herbicides have specific restrictions or at least lack approval for use with forages. Carefully check your options before making your selection.

Nobody likes to replant, but if you must, select a forage that is compatible with your herbicides and livestock.

Bruce Anderson
Extension Forage Specialist

GDD accumulations for corn lag behind average

Planting delays caused by above normal precipitation during the first three weeks of May have led to average emergence dates that are behind normal statewide. The five-year statewide average emergence date for corn is May 18, but the date for average emergence this year is May 26. This year only 25% of the state corn crop had emerged by May 15, while 75% had emerged by May 30. Since emergence, most of the eastern two-thirds of the state has received below normal temperatures, particularly in early June.

The primary question facing producers is whether the crop can make up for the planting delays and overcome the cool start in early June. It is highly unlikely that deficits can be overcome during the next two months, but they could be erased with above normal temperatures from mid-August through mid-September.

Growing Degree Day (GDD) units are the primary method for tracking crop development. Corn GDD unit accumulations use the following formula: ((Tmax + Tmin)/2) - 50. Tmax indicates the maximum temperature on a given day, while Tmin indicates the minimum temperature. However, these variables are limited by upper and lower base temperatures of 86°F and 50°F. Therefore, anytime Tmin dips below 50°F or Tmax rises above 86°F, the equation forces Tmax and/or Tmin back to the upper or lower base. For example, a temperature of 96°F would provide the same GDD units as a temperature of 86°F.

From July 1 through August 15, the normal high temperature for all of Nebraska is over 86°F. Due to the limitations on the GDD accumulation equation, it is impossible to gain GDD units, as compared to normal, based on above normal maximum temperatures. The only way to cut into accumulated GDD deficits is to have above normal minimum temperatures. For every 2°F that the minimum temperature is above normal, you would reduce accumulated deficits by one GDD unit.

Daily updates of growing degree day accumulations and evapotranspiration rates are available on the CropWatch *Web site at* cropwatch.unl.edu/weather.htm *for several locations and crops (corn, soybean, sorghum, potato, sugarbeet, and dry bean).*

The table shows accumulated GDD units from several locations, based on the average emergence date reported by the Nebraska Agricultural Statistics Service for the corresponding agricultural district. In addition, GDD departures from the average emergence date and from May 15 are included. These departures are derived by calculating the GDD units under normal temperatures, then subtracting them from the GDD units that have accumulated this year.

Positive GDD accumulation departures since emergence in the table indicate warmer than normal temperatures have occurred, while negative numbers indicate cooler than normal temperatures. During the last 30 days, only areas west of North Platte have been warmer than normal. When you add the GDDs that were lost because of the planting delays in May, it is obvious that all locations within the state are behind normal, with the greatest departures in eastern Nebraska.

Using the High Plains Regional Climate Center phenological models, the statewide average maturity date for corn (100% black layer) is projected for the last week of September. This maturity date assumes normal temperatures through the rest of the growing season. If temperatures remain normal from July 1 to August 15 and average 2°F above normal for the rest of the season, the 100% black layer date will occur around September 20. Conversely, if temperatures are below normal during the next two months, the corn crop will not reach maturity until the first half of October.

(Continued on page 156)

Table 1. Growing Degree Day (GDD) accumulations and departures comparisons based upon the average 2003 corn emergence dates.

Site	*Avg emerg. date*	*GDDs accumulated from emerg.*	*GDD depart. (+ or -) from emerg*	*GDD depart. (+ or -) from 5/15**
Scottsbluff	5/27	327	41	-93
Imperial	5/26	326	18	-119
McCook	5/26	332	-2	-131
North Platte	5/26	322	-1	-128
Ord	5/26	301	-59	-192
Clay Center	5/23	362	-60	-204
Beatrice	5/17	416	-127	-152
Mead	5/22	356	-110	-201
Concord	5/26	295	-66	-198

*May 15 was used as the normal emergence date for corn for comparison.

Soybean aphid (Continued from page 149)

then it has spread throughout the north central United States and parts of Canada. We expect the aphid to spread to all soybean-producing areas of Nebraska.

Heavy infestations of this insect can cause significant damage and yield loss. Yield losses exceeding 25% were observed in Minnesota and Iowa in 2000. In addition, soybean aphids can transmit viral diseases, such as alfalfa mosaic, soybean mosaic, bean yellow mosaic, peanut mottle, peanut smut, and peanut stripe.

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 piercing-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 different species of host plant -- buckthorn and soybean -- to complete its life cycle. Buckthorn, a woody shrub or tree, 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 and migrate back to buckthorn, where they mate. The females then lay eggs on buckthorn, which overwinter, thus completing the seasonal cycle.

Hundreds of soybean aphids can gather on a single soybean stem.

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 were reports of up to 13,000 aphids per plant in Michigan), winged females are produced and 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 can cause reduced pod and seed counts.

Soybean aphid management

The aphid is very new to North America. As we gain more experience with it, the following management recommendations will be refined for Nebraska conditions.

1. Begin weekly scouting of soybean fields in late June. If possible, scout five locations for every 20 acres. At a minimum scout 10 locations per field. At each location, select five plants and estimate the aphid density per plant. 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. As the season progresses, aphid numbers can change rapidly (populations can double in two to three days), so in July increase scouting to twice a week.

2. 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. Often you may be able to find soybean aphids by examining plants where lady beetles are observed. The presence of "fuzzy" aphid carcasses indicates fungal pathogens are present, which can lead to dramatic reductions of aphid populations.

3. 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

(Continued on page 156)

Soybean aphid (Continuedfrom page 155)

adults, the field may not have to be treated because the population will rapidly decline. A magnifying glass is helpful to see the "broad-shouldered" nymphs, but the winged adults are easy to see with the naked eye.

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

5. Closely examine late emerging soybean fields. It appears aphids damage late-planted soybeans more than early-planted soybeans.

6. Consider insecticide treatment when soybeans are in the R1 to R2 stage (first bloom to full bloom) and there are over 200 aphids per plant, most of which do not have wings or "shoulder-pads".

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

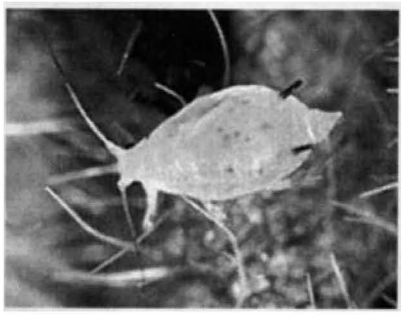
8. Initial research has indicated that the highest yield responses were obtained when insecticide treatment occurred between mid-July and the first few days of August (R1-R2 stages). Treatment after this period resulted in less yield response, however, 2002 field trials in South Dakota indicated treatment as late as stage R5 (beginning seed) resulted in significant yield protection.

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

10. 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.

11. Several insecticides are labeled for the soybean aphid (Chinese aphid on some labels). A list of registered insecticides, rates, preharvest intervals, etc. is available on the UNL Department of Entomology Web site at *http://entomology.unl.edu/instabls/soyaphid.htm*

12. Always read and follow label directions.



Soybean aphid

Current status in Nebraska

Although the aphid has only been found in about 15 Nebraska counties, it is likely established throughout eastern Nebraska. Common buckthorn, the aphid's overwintering host, has been found in much of eastern Nebraska. It is particularly prevalent along creek and river bottoms and also can be found as an understory shrub/small tree in wooded areas.

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 .

More information on the soybean aphid can be found at 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
Haskell Ag Lab, NEREC

GDD data

(Continued from page 154)

The situation for the nation's corn crop is worse across the eastern Corn Belt. Eastern Iowa, Illinois, Indiana, and Ohio have been locked into a persistently cool pattern for the last few months. Iowa reported that the average height of their corn crop on June 22 was 19 inches compared to a normal 29 inches. In Illinois, the average height of the corn crop was 18 inches, compared to the normal 30 inches.

If normal temperatures occur from this point forward, most of the corn crop should come into pollination during the last 10 days of July. Statistically, this is the hottest time of the year. In addition, corn maturity dates are projected to occur during the first 15 days of October. Above normal temperatures after August 15 could shift the crop maturity date into the first week of October.

Right now the greatest risk for freeze damage to the corn crop appears to be in Minnesota and Wisconsin. However, below normal temperatures for the rest of the growing season will significantly increase the probability of freeze damage.

Al Dutcher
State Climatologist

Crop report

USDA Nebraska Agricultural Statistics Service report as of June 23: Corn condition improved and rated 1% poor, 16% fair, 57% good, and 26% excellent, above last year and average. Cultivation and hilling for irrigation were active.

Soybean condition improved and rated 1% poor, 16% fair, 64% good, and 19% excellent, above last year and average. Ninety-seven percent of the fields had emerged, behind 100% last year and 97% average. Sorghum condition moved higher and rated 1% poor, 26% fair, 64% good, and 9% excellent.

Field updates and briefs *(Continued from page 150)*

the alfalfa stand early to assess leaf disease incidence and severity can help you decide about whether an early cutting is necessary and can may reduce forage losses. Leaf loss due to disease reduces the quality of the forage harvested.

Doug Anderson, Extension Educator in Nuckolls County: We had heavy rains in Thayer and Nuckolls counties (more than 7 inches), and small hail with little damage. Wheat is down in many areas. Most of the damage was from excessive rain. The bright spot here is that the heavy rains probably drowned any six-legged critters on the crop.

Paul Hay, Extension Educator in Gage County: Two fields here were damaged by the **southern corn leaf beetle.** In one case 18 acres were destroyed and in another, 13 acres were destroyed. This pest is relatively new to Nebraska. Further information on scouting and treatment is available in the May 2 *CropWatch* and on the UNL Department of Entomology Web site at *entomology.unl.edu.*

Chinch bugs are going to be a problem this year. Early migration out of wheat fields is already causing some damage.

Gary Zoubek, Extension Educator in York County: I surveyed the northwest part of the county and found 25-30 sections with at least some hail damage. The amount of damage varied greatly, depending on the crop, stage of development and the amount of hail. In addition considerable water damage occurred with water over roads in several places. Standing water was observed at several sites. Rainfall amounts varied greatly across the county from almost none to over 6 inches. Producers are working at hilling corn and soybeans. Several soybean fields also have been sprayed and several more will need to be sprayed soon.

Ralph Kulm, Extension Educator in Holt County: About 200 center pivots were damaged or destroyed and many farmsteads and homes sustained serious property damage when tornados and high winds left a path of destruction across the county June 9. Between new and repaired systems about 80% of the affected pivots are back in operation. Of course numerous fields sustained damage from the hail and high winds, ranging from minor damage to total crop loss. Hail damaged more fields Monday night, June 23.

Recent rains have improved the outlook for dryland grain crops, second cutting alfalfa and pastures; however, yield potential for oat and wheat has been reduced considerably by barley yellow dwarf. Much of the small grain acreage has been cut for hay. Grasshoppers continue to present a big threat to much of the Holt/Boyd county area. Some spraying of pastures, road ditches and other waste areas has taken place and more is being planned.

Starane approved

A crisis exemption has been provided for fluroxypyr to help control kochia in sorghum fields across Nebraska. The crisis exemption allows for the application of fluroxypyr (trade name Starane) to help control herbicide-resistant kochia in sorghum. It can be applied by ground or aerial applicators through July 15.

Starane, which is manufactured by Dow AgroSciences, may be applied following all label directions, restrictions and precautions on the Environmental Protection Agency registered product label, as well as restrictions within the release notice.

Other restrictions include:

Do not make more than two applications or apply more than 1 pint per acre per crop season.

Pre-harvest interval: Do not allow livestock to graze or harvest forage within 40 days of application. Do not apply within 70 days of harvesting grain or stover.

Retailers are required to obtain a permit to sell Starane. Applicators will only be able to buy sorghum-labeled Starane from permitted dealers. Permits are available from NDA by calling (402) 471-2394.

Nebraska Department of Agriculture News Release

Grasshopper deadline Monday, June 30

Ranchers have until June 30 to sign up for the cost-share rangeland grasshopper suppression program being coordinated by the USDA Animal and Plant Health Inspection Service (USDA-APHIS). The Nebraska Department of Agriculture, the University of Nebraska Cooperative Extension, and UNL Department of Entomology have been assisting with the program.

USDA-APHIS and NDA may still have cost-share dollars available for treatment, but these funds are diminishing. Treatment costs can be split in thirds between the federal government, the state government and the rancher.

Producers are required to organize and collectively have at least a 10,000-acre block of land for the treatment program to be enacted. Not more than 20% of the block may be crop land, and the crop land would not be treated under this program. Program participants also must be prepared to put their one-third portion of the treatment cost into an escrow account prior to the treatment action.

For more information on the program, contact Steve Johnson at the Nebraska Department of Agriculture at 471-2341.

Take advantage of nutrients in winter wheat residue

Winter wheat residue has a carbon to nitrogen ratio of about 80 to 1. Corn stover has a C:N of about 57 to 1 while young alfalfa hay has a C:N of 13 to 1. When the ratio is about 17 to 1, nitrogen begins to be released for plant use. This high carbon to nitrogen ratio of winter wheat residue results in crop residues that will persist. These residues have many benefits such as helping reduce wind and water erosion, protecting seedling crops, trapping snow, reducing evaporation, increasing water infiltration, improving soil tilth, and providing cover for wildlife.

Table 1. Winter wheat stubble in 2000 and no-till dryland corn yields (bu/A) in 2001 at Tribune, KS; 2001 (A. Schlegel, KSU).

Treatment	Stubble height Low, 7.5"	High, 15"
	Corn/bu/acre the next year	
No-till, initial spraying in July	44	59
Delayed spraying until mid-August	25	38

In general in Nebraska 6,000 lbs of winter wheat residue has given maximum nitrogen and carbon for rainfed corn and grain sorghum if evenly spread. (This is the amount from a 60-bushel wheat crop; on the average each bushel of wheat produces 100 lbs of residue). Spreading both the long straw and the fines is critical. The key to being able to plant through the crop residue next spring begins at harvest this summer and fall with good crop residue distribution.

Next week's *CropWatch* will feature tips for adjusting combines for downed wheat. The story will be posted early in the week to *cropwatch.unl.edu*

One critical factor is to cut the winter wheat as high as possible up to a height of 15 inches.

Allan Schlegel, research agronomist at Kansas State University, conducted a study in 2001 at Tribune, Kansas to examine the effect of height of wheat stubble and time of spraying on no-till corn yields the next year. Moisture was very limited at Tribune in 2001.

With a stubble height of 15 inches vs 7.5 inches and initial weed control in July, the corn yield increase was 15 bushels per acre or 2 bushels per inch of additional stubble height (*Table 1*). Each average filled wheat head per square foot is equal to about 1 bushel per acre. It may take 1.5 to 2 or more of the lower heads to equal a bushel since these are usually smaller with smaller kernels. If wheat is worth $3/bu and additional cost for custom harvest is $0.13/bu plus $0.13/bu to haul or a total of $0.26 cost per bushel for a net return of $2.74/bu.

These results indicate you can give up at least one head and probably two or three heads of wheat per square foot to get an additional inch of stubble height. The table also indicates the value of starting weed control in July vs mid-August with yield increases of 19 to 21 bushels depending on stubble height.

After harvest, begin weed control as quickly as possible so weeds can't get an early foothold, stealing valuable moisture from the crop and producing seed. Consider using a glyphosate and if adding 2,4-D, it's preferable to use an amine formulation to avoid volatilization with ester formulations.

Then in September, apply atrazine and use a burndown herbicide to take care of winter annuals and volunteer wheat. Controlling volunteer wheat almost eliminates the potential for the disease wheat streak mosaic.

In summary, cutting the stubble at 15 inches instead of 7.5 inches and starting weed control in July vs. mid-August combined for a yield increase of 34 bushels per acre. Standing residue offers more benefits than cut residue, which deteriorates more quickly.

Stripper headers are best used with the semi-dwarf varieties with good straw strength and can leave more standing residue. When used with the taller wheat varieties and/or shorter varieties with poor straw strength the stubble tends to lodge, making it difficult to plant or seed. Stripper headers also work very well in lodged wheat. The more straw is cut up by the combine, the more fragile it becomes.

Good distribution of the crop residue is important to making this system work. This includes spreading both the long straw and fines. With poor crop residue distribution you lose twice. Too much residue makes planting difficult and complicates control of volunteer wheat. Too little residue won't provide the benefit of residue suppressing weeds. In most of Nebraska in most years, dryland crop yields are maximized at crop residue levels of 6,000 lbs if good crop stands are obtained.

Bob Klein, Extension Crops Specialist
West Central REC

Wheat forecast up 49% from 2002

Nebraska's 2003 winter wheat crop, based on June 1 conditions, is forecast at 72.6 million bushels, up 49% from last year's crop and 16% from last month's forecast. Average yield is forecast at 44 bushels per acre, up 12 bushels from last year and 6 bushels above last month.

Acreage to be harvested for grain is estimated at 1.65 million acres, up 9% from last year.