7-25-2003

CropWatch No. 2003-19, July 25, 2003

Lisa Jasa
University of Nebraska-Lincoln, ljasa1@unl.edu

CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

University of Nebraska Lincoln

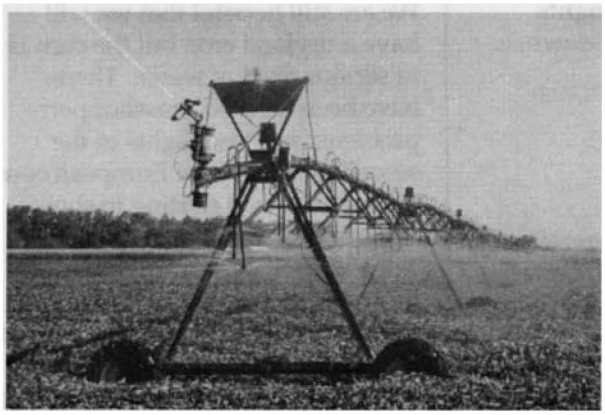
No. 2003-19, July 25, 2003

Critical soybean irrigation period begins at R3

Soybeans are nearing the critical period for irrigation to provide maximum yield response.

Irrigations in the R3.0 to R3.5 stages will almost always provide the maximum bang for your irrigation buck, said Jim Specht, NU soybean researcher. Nebraska research has shown that, when possible, producers should always irrigate soybeans when the plants are in the pod elongation stage, usually in late July or early August. In addition to increasing production costs, adding unnecessary water during the vegetative (and flowering) stages can increase plant height but at the increased risk of lodging (and white mold).

Soybeans are in the R3 stage (beginning pod elongation) when there is a 1/4-inch pod in at least one of the four uppermost nodes of the soybean plant (i.e., count down from the top node -- the fully expanded leaf). There may be a few open flowers near the stem tip, but not many. Don't worry about pods lower down in the plant, Specht said, because irrigation-induced yields come from pods in the upper third of the plant. The R3 stage usually occurs in late July or early August for soybeans planted in mid May.



Soybean yields have been proven to get a boost from concentrated irrigation from the R3 to the R4 growth stage.

Irrigation is critical during the 8-10 days soybeans are in stages R3.0 to R4.0 (pods in upper four nodes reach 3/4 inch in length) and should continue after that as rainfall conditions dictate. Waiting for rain or not irrigating enough during this period can lead to reduced yields. In 15 years of NU research, heavy irrigation during pod elongation always led to large yield responses, Specht said.

Soybeans can benefit from irrigation through early September, he said.

"A lot of people shut off the water on soybeans too soon, when they're finished with their corn," he said. "Soybeans can actually use water for one more week. This is critical for some farmers."

For further information, see *Irrigating Soybean*, NebGuide G1367, available from your local Extension office or online at *http://www.ianr.unl.edu/pubs/fieldcrops/g1367.htm*

Inside

Soybean aphid alert

Significant field infestations of soybean aphids have now been reported in Adams, Dawson and Stanton counties. Soybean producers should be watching very closely for signs of infestation.

The June 20, 2003 *CropWatch* includes a comprehensive story on soybean aphid identification, scouting and management. It is available on the Web at *http://cropwatch.unl.edu/archives/2003/crop03-15.htm*

Keith Jarvi, IPM Extension Assistant, Northeast REC

Updates

Paul Hay, Extension Educator in Gage County: We're so dry we're praying for dew. There may have been a 10% loss of corn yield potential last week and perhaps a 5%-10% corn yield loss per day this week. All Big Blue river rights issued after 1968 are shut down.

Some alfalfa struggling

Despite good yields from first and most second cuttings of alfalfa, stands in many areas now are struggling to grow. Even irrigated fields aren't doing so well. Several factors may be affecting production, some of which producers may be able to change.

Potato leafhoppers have turned many fields yellow and these fields will not grow well again until the yellow growth is cut off. Grasshoppers and other insects also are feeding on alfalfa in many areas and need to be controlled if it's economically feasible.

The critical factor in most fields, though, is water. Last year the drought dried up nearly all dryland alfalfa. And it's probably happening again. Good rainfall this spring was sufficient to support early growth, but little or no moisture reached deep into the subsoil, which was completely dried out last year. Now when it gets really hot and dry and alfalfa needs extra moisture, there is none to spare. And there is nothing you can do about it, so don't waste time and money trying. Just cut when plants recover from the last cut and there is enough to justify a harvest.

Irrigators can apply more water for more yield, but remember that with temperatures in the 90s, it takes 7 to 8 inches of water to produce a ton of hay.

Bruce Anderson
Extension Forage Specialist

Douglas Anderson, Extension Educator in Thayer County: Nuckolls and Thayer counties continue to dry out. Dryland crops will need water soon before problems start developing for the grain. We are still hopeful that we will have a dryland crop but the corn is in serious need of water. There have been isolated grasshopper problems and low flights of the second generation of European corn borers. Grass is starting to show signs of heavy stress.

Duane Lienemann, Extension Educator in Webster County: Our dryland crops are in desperate need of moisture, especially corn and soybeans. The grain sorghum seems to be holding on with most fields in a "pineappling" mode. Pivot corners are showing the effects of early moisture and then drought conditions. Those with corn in their pivot corners will get little or nothing back for their efforts.

Pastures are dry and most have an unusually high population of wild oats which have turned brown and matted. A lot of pastures are about 100% covered. It turns out that the early lush grass growth that had everyone's hopes up was nothing more than this pest.

We had some good wheat yields with many in the 70+ range. Fields with rust and mozaic had yields of 20-30 bushels. A bad storm hit northern Webster County and southern Adams County Sunday night with 70 mph winds and golf ball size hail. The Blue Hill area seemed to get hit the worst. A lot of buildings, grain bins and trees were damaged. Needless to say we have many farmers that experienced dramatic losses in corn, soybean, and milo fields. When you drive through the part of the country there is a definite smell of "silage".

Several farmers are talking of sowing turnips in the stripped corn and hoping to get something out of it -- at least for grazing. Some are talking about putting up silage. Others are thinking about turning it under and putting it to wheat (especially milo and soybean fields). Greensnap in certain varieties of corn was really obvious this year with earlier winds. Not surprisingly, now we're really seeing snapped off stalks.

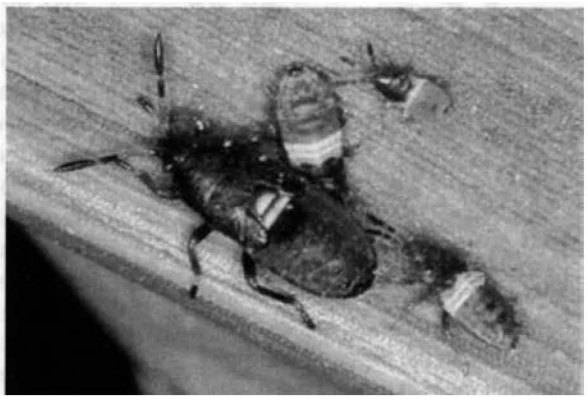
CROP WATCH
cropwatch.unl.edu

Crop Watch is published from March to November by Cooperative Extension and Communications and Information Technology in the University of Nebraska Institute of Agriculture and Natural Resources, PO Box 830918, 108 Agricultural Communications Bldg., UNL, Lincoln, NE 68583-0918. To order a print subcription or to change your address, write to *Crop Watch* at the above address or call (402) 472-7981. The newsletter also is available on the web at **cropwatch.unl.edu**

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

Scout for mid-summer chinch bugs in grain sorghum

Chinch bugs are building up in areas of some sorghum fields in southeastern Nebraska, according to recent producer reports. Usually we think of chinch bugs damaging seedling sorghum as they move out of maturing wheat fields, but once the adults emerge they can fly anywhere and will colonize areas throughout sorghum fields. Once they start reproducing, chinch bug numbers may reach damaging numbers in portions of the field.



Chinch bug adult and nymphs.

Growers in southeast Nebraska should be checking for chinch bugs throughout their sorghum fields, not just the areas bordering wheat or small grains. Chinch bugs feed at the base of the plant, but also may hide behind the leaf sheaths in the heat of the day.

According to KSU entomologists, "Unless spot treatment can be used, the size of the area infested must be compared to the cost of treating the entire field. Consider using fieldwide treatment with ground-applied sprays for midsummer infestations in fields where infested spots (averaging 50 bugs/plant of plants sized from about 1 foot in height through the flowering) are equivalent to about one acre infested in each seven acres of field size." To think about this in terms of percentages, this is equivalent to the infested spots (as defined above) equaling 14% or more of the field.

A variety of foliar insecticides are labeled for control of chinch bugs in grain sorghum, including Sevin XLR (1-2 quarts per acre), Furadan 4 F (1 pint per acre), Warrior 1EC (2.56-3.84 fl oz per acre), Mustang (3.4-4.3 oz per acre), Baythroid 2EC (1.3-2.8 oz per acre) and Lorsban 4E (1-2 pints per acre). Higher spray volumes provide improved control because the sprays must penetrate the canopy to reach where chinch bugs feed on the lower part of the plant.

See the label or the NU Department of Entomology Web page, *Insecticides for Chinch Bug Control in Sorghum*, at *http://entomology.unl.edu/instabls/chinchbg.htm* for information on rates and restrictions for these products.

Bob Wright
Extension Entomologist
South Central Ag Lab

Soybean Management Field Days

August 12 – Overton area
August 13 – DeWitt area
August 14 – Shelby area
August 15 – Dakota City area

Profit-making topics

- Unlocking the mysteries of high soybean yields
- Managing weeds to cut costs and increase yields
- Strengthening your financial position
- Understanding soil water and managing irrigation

More in the next *CropWatch* or see *http://lardc.unl.edu/soydays.htm*

Blister beetles numerous in alfalfa

Blister beetles (*Epicauta* spp.) are very common this year and alfalfa producers should be on the alert as they prepare for the next cutting. The increase in blister beetles is likely because immature blister beetles feed on grasshopper eggs, which are plentiful this year.

Blister beetles feed on a plant's flowers and leaves, but usually cause little damage. They can create a serious problem, however, for the animals that consume them. Blister beetles contain a lipid soluble blistering agent called cantharidin, which causes blisters on skin tissue upon contact and can severely irritate an animal's digestive tract, especially a horse's system.

Adult blister beetles vary in size and color but can be recognized by elongated, narrow, cylindrical and soft bodies. When viewed from above, they have a constriction behind the head where it attaches to the narrowed anterior end of the thorax. Several species of blister beetles are common to Nebraska and pose varying degrees of problems. In Nebraska, the three-striped, gray and black blister beetles are the most common. The three-striped is long, slender, brown and yellowish-gray with yellowish stripes. The gray is a larger beetle that is 9/16 inch to 11/16 inch long. The gray coloring is due to a thick covering of hair. The black blister beetle is the largest of the three species. It is more robust and is 5/8 inch to 7/8 inch long.

Adult blister beetles can generally be found in alfalfa through the second and third cuttings and some years into the fourth cutting. Horses are particularly susceptible to blister beetle poisoning. Part or all of a horse's digestive tract can be severely irritated, leading to secondary infections and bleeding. Cantharidin is absorbed and excreted through the kidneys, thus irritation of the kidneys, ureter, urinary bladder and

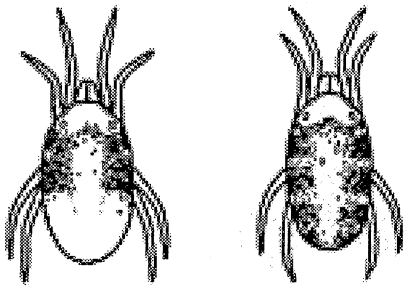
(Continued on page 178)

Differentiate spider mite species before treating

We are reaching the time of year when spider mites may start causing damage in corn and soybeans. While we haven't received reports of any economically damaging infestations, current and projected weather conditions favor an increase in spider mite populations. Producers should be scouting fields and keeping a close eye out for spider mites.

Identifying the species

Two species of spider mites, the Banks grass mite and twospotted spider mite, commonly feed on Nebraska corn. Banks grass mites feed almost exclusively on grasses, including corn and sorghum. Twospotted spider mites not only feed on many species of grasses, but also on soybeans, fruit trees and a variety of vegetables and ornamental plants. Although these two species are somewhat similar in appearance, they differ in several biological characteristics and in their susceptibility to pesticides.



Twospotted spider mites (left) and Banks grass mites (right). Notice the difference in the pigment patterns between the two insects.

Banks grass mites usually appear earlier in the season, feed mostly on the lower leaves of the corn plant, and in Nebraska are moderately susceptible to many of the commonly used miticides. On the other hand, twospotted spider mites tend to appear in mid to late season, increase rapidly, feed over the entire plant, and often are not consistently controlled by available pesticides.

The most useful characteristics for identification are the overall shape of the body and the pattern of pigmentation spots on the back (*see figure*). The dark green spots on both species are caused by food particles that accumulate in their gut. Because of differences in gut structure, these pigment spots accumulate in slightly different patterns. In Banks grass mites the pigments accumulate along both edges of the body near the rear and along the sides of the body. In twospotted spider mites, the pigments accumulate along the sides of the body in two distinct spots and do not extend back more than halfway on the body. The Banks grass mite is also slightly less robust than the twospotted spider mite and is slightly flatter from top to bottom. Mites damage crops by piercing plant cells with their mouthparts and sucking the plant juices.

The first evidence of mite feeding, which can usually be seen on the top of the leaf, is a yellow or whitish spotting of the leaf tissues in areas where the mites are feeding on the lower leaf surface. Because many other things can cause similar discoloration, it is important to check leaves closely to make sure mites are actually causing the damage. Leaf discoloration caused by mite feeding can be easily identified by checking the undersurface of leaves for the

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Blister beetles *(Continued from page 177)*

urethra could be followed by secondary infections and bleeding. The substance also lowers serum calcium levels and causes damage to heart muscle tissue.

Researchers estimate that the minimum lethal dose of cantharidin is about 1 mg/Kg body weight of a horse. The lethal dose for cattle may be as low as 0.5 mg/Kg body weight. Consequently, a few beetles with a high cantharidin level would kill a small horse, but quite a few with a low level would be required to kill a larger horse. About 1700 black blister beetles would be needed to kill an 825-pound horse, but only 120 three-striped blister beetles. However, only 40 three-striped blister beetles would kill a 275-pound colt. As little as 4-6 grams of dried beetles can be fatal to a horse.

Management

Toxicosis by blister beetles is related to simultaneous cutting and crimping of hay when beetles are present. If hay is cut with a sickle bar or rotary mower and not crimped, the beetle can leave the hay after it is cut. If the beetles are not allowed to escape, the trapped beetles die and are incorporated into the hay.

Scout fields, particularly in border areas, for the presence of blister beetles and if found, treat with a short residual insecticide before cutting. Insecticides approved for use on alfalfa can be found on the UNL Department of Entomology web site at *http://entomology.unl.edu*.

When selecting a pesticide, read the label to determine harvest restriction intervals. Kansas State University doesn't recommend blister beetle treatment because the dead beetles, which are still toxic, remain in the field. Other recommendations include not using crimpers on hay intended for horses and cutting alfalfa in the bud stage because blooms attract blister beetles.

It is difficult to eliminate the possibility of blister beetles in alfalfa, but carefully examining the hay being fed to horses may help detect their presence.

Jack Campbell, Extension Entomologist, West Central REC
Keith Jarvi, Extension IPM Northeast REC

Spider mites *(Continued from page 178)*

Table I. Economic injury level for the Banks grass mite or twospotted spider mite on corn, based on the percentage of infested leaves per plant and percentage of total leaf area damaged.

Control cost/acre	Market value per acre ($)										
	200	250	300	350	400	450	500	550	600	650	700
	Percent infested leaves per plant/Percent of total leaf area damaged										
$5	15/8	12/6	10/5	8/5	7/4	7/3	6/3	5/6	5/3	5/2	4/2
$10	29/16	24/13	20/10	17/9	15/8	13/7	12/6	11/6	10/5	9/5	8/4
$15	44/23	35/19	29/16	25/13	22/12	20/10	18/9	16/9	15/8	14/7	13/7
$20	59/31	47/25	39/21	34/18	29/16	26/14	24/13	21/11	20/10	18/10	17/9
$25	74/39	59/31	49/26	42/22	37/20	33/17	29/16	27/14	25/13	23/12	21/11

presence of mites, eggs and webbing. Both Banks grass mites and twospotted spider mites produce webbing, and a fine network of silken webs will likely be associated with mite colonies. A magnifying glass or 10X hand lens is helpful in examining plants for mites.

Management

The economic injury level indicated in the table provides a method for deciding when to treat, taking into account the value of corn. This table works for both twospotted spider mites and Banks grass mites.

The first row refers to the expected value of the crop ($/acre), determined by multiplying the expected yield (bu/acre), by the expected crop price ($/bu). For example, if the expected yield is 200 bu/acre and the expected price is $1.50/bu, then the value per acre is $300.

Deciding whether to treat involves two steps. First, determine the percentage of leaves infested with mites (an infested leaf has one or more live mites). Compare that number with the first number in the table. If the field average is less than the table value, you don't need to treat, but do continue to monitor the field. If the field average exceeds the table value, then estimate the percentage of total leaf area damaged by mites. If the field average exceeds the table value, it is likely that treating for spider mites will increase yield above the cost of treatment.

Also, note that control costs are a factor in this table. Depending on the product chosen, the critical values may change greatly. For example, under the column $300 market value, the critical value for percent infested leaves varies from 20%, if control costs are $10, to 49% if control costs are $25.

Labeled products for spider mite control on corn include dimethoate (several formulations), Comite 6.55EC and Capture 2EC. Dimethoate has performed reasonably well in Nebraska against Banks grass mites, but not twospotted spider mites. If twospotted spider mites are present, either Comite or Capture would provide better control. See the Department of Entomology web site on spider mite control or product labels for specific rates and restrictions. With the exception of Comite, pesticides do not kill mite eggs, and there is a possibility of re-infestation of the fields as eggs hatch out. Since many of their natural enemies were probably killed by the initial pesticide application, these populations may build up rather quickly and should be monitored carefully. Corn is unlikely to benefit from treatment for spider mites after the dent stage.

Twospotted spider mites also may develop on soybeans. No research has been conducted that would allow calculation of an economic injury level for twospotted spider mites on soybeans. Iowa State University Extension specialists have suggested that control may be warranted when infested plants have substantial spotting or leaf yellowing and live mites, but before mites cause browning and leaf drop. Damage from mites may be confused with that caused by drought and several foliar diseases, so be sure to base treatment decisions on the presence of mites, rather than just apparent injury symptoms.

Fields may be spot treated if the infestation is localized, but check other areas for mites (especially downwind of infestation) and extend treatments into these areas if large numbers of mites are found. Although late season infestations may accelerate soybean senescence and increase pod shattering, use caution when evaluating whether to treat with pesticides because many of the pesticides used for mite control have 21-28 day preharvest intervals.

Products to use in soybeans include dimethoate (several formulations) and Lorsban 4E at ½ to 1 pint per acre. See the NU Department of Entomology web site or product labels for specific rates and restrictions.

For more information see the UNL Cooperative Extension publication, *Spider Mite Management in Corn and Soybeans*, G1167.

Bob Wright
Extension Entomologist
South Central Ag Laboratory

Use corn rootworm scouting numbers as basis for production decisions in 2004

With the registration of YieldGard Rootworm corn, beetle scouting also can be used to determine where it would be most profitable to use this technology.

Western corn rootworm beetles began emerging in early July in southeastern and south central Nebraska. Beetle emergence will be somewhat later in northeastern and western Nebraska. Beetles emerging before silk emergence may feed on corn leaves. They feed by scraping the surface tissue, leaving a white parchment-like appearance. Once silks emerge this is the favored food. The earliest silking fields in an area often are most heavily damaged because beetles will move around in search of green silks.

There are no thresholds for silk-clipping damage based on beetle numbers because damage levels are not correlated well with beetle densities. Usually an average of at least 10 beetles per ear are required to seriously affect pollination. Severe silk feeding at 25-50% pollen shed may indicate the need to apply an insecticide, especially in seed production fields. Visit the NU Department of Entomology web site for a list of insecticides labeled for adult rootworm control.

Traditionally we have talked about the value of rootworm beetle scouting to determine the need for insecticides the next year if a field is to be planted back to corn. With the registration of YieldGard Rootworm corn, beetle scouting also can be used to determine where it would be most profitable to use this technology. Unlike European corn borers, we can predict where the greatest likelihood for rootworm injury will be, and beetle scouting information from this summer can be used to target placement of transgenic corn hybrids next year for rootworm control.

During late July and August these beetles will lay eggs in corn fields. These eggs overwinter in the soil, hatch into rootworms in the spring, and feed on corn roots if continuous corn is grown. However, not all continuous corn fields have economic infestations of corn rootworms. Weekly scouting of adult rootworm beetles in July and August will provide the information needed to decide whether rootworm control is needed next year. With adult beetle control programs decisions as to whether to treat and if so, when to spray, should be based on information from field scouting.

Start scouting for corn rootworm beetles soon after beetle emergence begins and continue scouting weekly until threshold levels are exceeded or beetle activity stops. Examine 50 plants per field, taking samples from each quarter of the field. Sampled plants should be several paces apart, so that examining one plant doesn't drive beetles off of the next plant to be sampled. The most reliable method is to examine the whole plant for beetles. Beetles may hide behind leaf sheaths or in the silks, so care is required to observe all beetles present. An alternative method is to check for beetles only in the ear zone (the area including the upper surface of the leaf below the primary ear and the under surface of the leaf above the primary ear).

(Continued on page 181)

Average number of western corn rootworm beetles present in cornfields that may produce an economically damaging rootworm population in corn the following year.

Plants per acre	Average number of rootworm beetles			
	Continuous corn[1]		*First year corn*[2,3]	
	Per plant	*Per ear zone*	*Per plant*	*Per ear zone*
14,000	1.28	0.64	0.96	0.48
16,000	1.12	0.60	0.84	0.42
18,000	1.00	0.50	0.75	0.37
20,000	0.90	0.45	0.68	0.34
22,000	0.81	0.40	0.61	0.30
24,000	0.75	0.37	0.56	0.28
26,000	0.69	0.34	0.52	0.26
28,000	0.64	0.32	0.48	0.24
30,000	0.60	0.30	0.45	0.23
32,000	0.56	0.28	0.42	0.21

[1]Based on a 50:50 ratio of females to males.

[2]Based on a 70:30 ratio of females to males.

[3]Use this threshold for continuous corn fields that did not have larval populations earlier in the season (adult beetles are immigrants, similar to first year corn).

Plant turnips for winter grazing

Planting turnips into wheat or oat stubble can provide a high quality pasture for late fall and early winter grazing and pay big dividends for growers.

Turnips can provide good grazing beginning in October and often lasting into the new year. Turnips also are cheap to plant since seed can cost less than $5 per acre.

Seedbed preparation and planting can be done several ways. Some turnip growers work soil like a fully prepared alfalfa seedbed. Others heavily disk their ground, but leave it fairly rough, while a few spray Roundup or Gramoxone on wheat or oat stubble to kill weeds and then plant no-till.

Whatever method you choose, good early weed control is essential. Turnips do poorly if weeds get ahead of them. Once started, however, turnips compete well. Since no herbicides are labeled for turnips, weeds must be controlled either by tillage or by using contact herbicides like Roundup or Gramoxone before planting. Then plant quickly to get the turnips off and running before the weeds get a chance to come back..

Plant only 1 to 3 pounds of turnip seed per acre. Turnip seed is very small, so barely cover it. If the seed is drilled, just scratch the surface with the openers. Simply broadcasting seed onto tilled soils works well for many growers, especially on rough seedbeds where rainfall washes soil on to the seeds for soil coverage.

Then wait. With a few timely rains you will have excellent green feed for October, November, and December.

Bruce Anderson
Extension Forage Specialist

Corn rootworms *(Continued from page 180)*

In continuous corn if beetle counts exceed 0.75 beetle per plant, damaging populations of corn rootworms are possible in that field next year. In first year corn, there is a higher proportion of female beetles, so the threshold is lowered to 0.56 beetle per plant. These thresholds are based on a 24,000 plant population per acre. The number of beetles per plant to equal a threshold level should be adjusted for different plant populations (see table or NebGuide G86-774, *Western Corn Rootworm Soil Insecticide Treatment Decisions Based on Beetle Numbers).* If the ear zone method is used for scouting, divide the above thresholds in half, since on average only 50% of the beetles on a plant are counted using this method.

In fields with insect levels over the threshold, consider rotating out of corn, planting a transgenic corn active against rootworms or plan to use an insecticide at planting or cultivation to prevent economic damage. Fields remaining below the threshold level throughout the beetle egg-laying period are not expected to have economic populations of rootworms next year.

Individuals using adult beetle control programs should begin treatments when the beetle threshold is exceeded and 10% of the female beetles are gravid (abdomen visibly distended with eggs). This is an important point since the first beetles to emerge are mostly male, and females require at least 10-14 days of feeding before they can lay eggs. Treatments applied too early may be ineffective if large numbers of females emerge after the residual effectiveness of the treatment has dissipated. Continue to monitor fields weekly after treatment for rootworm beetles. If beetle numbers exceed 0.5 beetles per plant, retreatment is warranted. Late maturing fields are particularly susceptible to corn rootworms moving into them from nearby earlier maturing fields.

A complete discussion of adult corn rootworm management can be found in *Corn Rootworm Management* (EC1563) available online at *http://www.ianr.unl.edu/pubs/insects/ec1563.htm.*

Bob Wright
Extension Entomologist
South Central Ag Lab

Protect pollinators when spraying for grasshoppers

With grasshopper numbers on the rise, farmers and ranchers may be spraying ditches with insecticides and inadvertently killing beneficial insect pollinators. When scheduling applications, consider plant growth stage and peak activity periods for pollinating insects.

If bloom is not present, precautions are not warranted. If bloom is present, applications should be as late in the day as possible, and short residual products should be selected. Synthetic pyrethroids, such as Asana, are good products when bloom is present; however, they should be applied in the late evening. The insecticide Dimilin can be applied any time without harming pollinators.

Some commonly used insecticides that will devastate pollinators if applied to blooming crops or weeds include: Furadan F, Penncap-M, Sevin WP, Lorsban EC, Cygon, Guthion and Malithion.

For further information, see the NU NebGuide, *Protecting Bees When Using Insecticides* (G98-1347) or contact Marion Ellis, extension entomologist, at (402) 472-8696 or email mellis3@unl.edu

Manure field days offer land application training

A series of University of Nebraska Cooperative Extension manure management field days will give producers the latest information and education in land application training.

"From Brown to Gold — Nebraska's Manure Value Field Days" will be at five locations across the state. The morning classroom program will focus on interpreting soil and manure test reports and developing a manure application plan, said Richard DeLoughery, NU Cooperative Extension water quality educator. The afternoon program will be conducted in the field and include demonstrations of manure and soil sampling and applicator calibration.

"By attending both morning and afternoon sessions, participants will receive Nebraska Department of Environmental Quality land application training education credits," DeLoughery said. "These are required of livestock producers who have received a new or updated livestock waste control facility permit since April 1998."

Dates, locations, additional topics and contacts are:

Aug. 7 -- Rich Waller farm, from Holdrege go 8 miles north on Highway 183 or from Interstate 80 go 9 miles south on Highway 183 then go 2.5 miles west on Road 740; applications on wheat stubble and ridge till; contact: Chuck Burr, extension educator, Phelps County, (308) 995-4222.

Aug. 14 — Haskell Agricultural Laboratory, 1 mile east of Concord or 2 miles south and 6 miles west of Allen; soil test comparison study, buffer strip demonstration, toxicity of foliar application of liquid manure; contact: DeLoughery at (402) 370-4061.

Sept. 4 — Agriculture Research and Development Center near Mead, Highway 63, 6.2 miles east of Highway 77 or 6 miles south of Mead on County Road 10 then .8 miles east; composted feedlot manure study, salt effects of manure; contact: Paul Hay, extension educator, Gage County, (402) 223-1384.

Sept. 10 — West Central Research and Extension Center at North Platte, from Interstate 80 go south on Highway 83 for 1.5 miles and at the bottom of the hill turn west onto State Farm Road then turn south into the parking lot immediately after the traffic island; part of the afternoon session will be at an area feedlot; effluent on irrigated pasture; contact: Steve Gramlich, extension educator, Lincoln County, (308) 532-2683.

Sept. 17 — Bridgeport, the morning program will be at Prairie Winds Community Center, 424 N. Main, and lunch and the afternoon program will be at Laux Feedlot, 5 miles south of Bridgeport on Highway 88, at the Pumpkin Creek bridge, where Highway 88 curves west, turn south onto County Road 99 and go 1.25 miles south, at the T intersection go east .5 mile on County Road 80. The feedlot is on the south side of the road; pulverizing manure spreader, manure composting equipment and the composting process; contact: Tom Holman, extension educator, Morrill County, (308) 262-1022.

Registration is $30 for the full day or $20 for the afternoon field program. The morning program begins at 10:30 a.m. with registration at 10 a.m. Lunch will be provided at noon to all participants. The afternoon program begins at 1 p.m. and will end by 3:30. Space is limited for the morning programs. To preregister, call the local contacts listed above at least two days before the event.

For more information, consult the NU Nebraska's Comprehensive Nutrient Management Planning Web page at *http://cnmp.unl.edu.* The event is partially funded by the Nebraska Environmental Trust and Cooperative Extension in NU's Institute of Agriculture and Natural Resources.

Sandi S. Alswager
IANR News and Publishing

Manure calibration kits available

Livestock producers needing equipment and supplies for calibrating dry or liquid manure spreaders can find what they need at a local University of Nebraska Cooperative Extension office, an NU water quality educator said.

Manure calibration kits, funded by a Nebraska Environmental Trust grant, will make calibrating manure spreaders easier, said Richard DeLoughery, NU Cooperative Extension water quality educator.

"Some of these items are not necessarily available in one place. We thought it would be important to have this equipment all in one place for farmers and consultants to borrow," he said.

In order to get the full value from the nutrients in manure, and to meet Nebraska Department of Environmental Quality regulations, farmers need to calibrate their applicators so they know how much manure they are applying, he said.

The kits will be demonstrated at upcoming field days and in September will be available for checkout at 16 extension offices. Counties offering kits are: Box Butte, Boone, Brown, Cass, Cuming, Custer, Dixon, Gage, Holt, Lincoln, Merrick, Perkins, Phelps, Scotts Bluff, Washington and York.

Among other items, each kit includes a measuring wheel, a platform scale, an electrical conductivity meter for checking salt concentration of liquid manure, rain gauges for sprinkler applications, and instructions and forms for calibration. They also will have some sampling supplies for manure nutrient testing, DeLoughery said.

For more information, consult the NU Nebraska's Comprehensive Nutrient Management Planning Web page at h*ttp://cnmp.unl.edu.*

Field day to focus on carbon sequestration in crops

Research on how best to store carbon in soil, improve crop production efficiency in the western Corn Belt and protect the environment will be featured at a University of Nebraska field day in August.

The Carbon Sequestration in Irrigated and Dryland Agriculture Field Day will be Aug. 22 at NU's Agricultural Research and Development Center near Mead from 9 a.m. to 1:15 p.m. Attendance is limited to 150 people and registration is due by Aug. 1 by calling (402) 472-1547 or e-mailing smachacek2@unl.edu.

Field day participants will hear updates on major interdisciplinary NU research on carbon sequestration, or storage, in irrigated and dryland cropping systems. Tours will feature the state-of-the-art field research facilities scientists use to measure and study how much carbon is stored under different crop management schemes.

This research is designed to answer practical as well as scientific questions about carbon sequestration in the different farming systems of Nebraska and the north-central United States, said Shashi Verma, a UNL micrometeorologist who co-leads the interdisciplinary team.

Steadily increasing atmospheric concentrations of carbon dioxide, a major greenhouse gas associated with global warming, are driving interest in storing more carbon in cropland. Utilities or other companies might pay farmers to store carbon in their soil in exchange for credit toward their carbon dioxide emissions.

"This is a chance to provide information on what carbon sequestration is, how it's measured and monitored, and how it's affected by crop and soil management practices," said Ken Cassman, project co-leader and head of UNL's Agronomy and Horticulture Department. "We'll explain how the net benefits from carbon sequestration are tightly linked to other aspects of crop production that maximize profitability and minimize environmental concerns."

Field day registration deadline is Aug. 1

While much more research is needed, preliminary results point to the potential to boost carbon storage and crop yields.

"We can say that our initial results indicate substantial potential to increase the amount of carbon recycled to soil while also achieving high yields and high crop input efficiency," Cassman said.

Field day presentations include: agriculture's contribution to greenhouse gas mitigation; the need for low-cost carbon sequestration monitoring; the potential for carbon sequestration, renewable energy and environmental protection; market mechanisms to support carbon sequestration; and sequestration considerations in the U.S. Department of Agriculture's environmental quality initiative.

The field day is designed for a wide audience, including crop producers, policy-makers, commodity groups and industry representatives. Attendance is limited because of space, Cassman said, but if more than 150 people register by the Aug. 1 deadline, the team will organize a second field day.

For more information about the field day, contact Maribeth Milner at (402) 472-0503, mmilner1@unl.edu. More information about the research is available online at *http://csp.unl.edu/public/index.html.*

"Nebraska is ideally situated for this research because it sits at the intersection of major continental climate zones where both irrigated and rainfed cropping systems are common," Verma explained. "This provides a wide range in (crop) productivity and carbon sequestration potential."

Event sponsors are USDA's Consortium of Agricultural Sciences for the Mitigation of Greenhouse Gases, Nebraska Corn Board, Nebraska Soybean Board and NU's Institute of Agriculture and Natural Resources.

Vicki Miller
IANR Science Writer

USDA to consider carbon storage when assessing program efforts

In June USDA announced it will give consideration to management practices that store carbon and reduce greenhouse gases in implementing ag conservation and incentive programs. These measures could include financial incentives, technical assistance, demonstrations, pilot programs, education and capacity building, along with measurements to assess the success of these efforts.

In FY 2004, USDA will invest almost $3.9 billion in agriculture and forest conservation, an increase of $1.7 billion over FY 2001. USDA estimates these actions will reduce greenhouse gas emissions and sequester roughly 12 million tons of greenhouse gases (measured in carbon equivalent terms) annually by 2012.

Most U.S. cropland soils have lost at least one-third and some up to 60% of their carbon since they were first converted to crop production beginning about 200 years ago. This diminished carbon pool can, however, be replenished by changes in land use and land management. For more information, see: *http://www.usda.gov/news/releases/2003/06/0194.htm*

Wheat growers: Be alert to smut, quality issues when selecting seed for 2004

Common bunt, or as it is sometimes called, stinking smut can be a producer's nightmare when it shows up in harvested grain. The immediate effect is elevator rejection of the grain. The delayed effect is saving back contaminated seed and having a worse problem next year. We have had two samples in the disease clinic and one report of common bunt in wheat this month. In all cases the grain was rejected by the local elevator.

Presence of stinking smut or common bunt in harvested grains is easily detected by a distinctive objectionable fishy odor to the grain and by the presence of bunt/smut balls mixed in with the healthy grain. With common bunt the normal kernel is replaced by a bunt ball containing a black, sooty, powdery mass of fungal spores enclosed by the seed coat. The bunt balls are easily ruptured during combining and the black spores on seed can be detected in grain samples. Harvested grain has an overall dusty, grayish-black appearance.

Smut-contaminated grain causes a total economic loss since nothing can be done with it. Feeding is not an option. Although it isn't toxic to livestock, i.e. hogs, they won't eat it because of the unpalatable odor and poor kernel quality. Even diluting it with noncontaminated grain doesn't seem to improve hog acceptance. It definitely can't be used for seed for fall planting or stored with clean grain. About the only option is to bury it.

The common bunt in these incidences was brought about by growers saving their own seed for planting and not treating the seed with a fungicide prior to planting. Losses are easily prevented by not saving grain for seed but rather by using certified seed every two to three years and by having the seed treated with a fungicide by a commercial seed conditioner prior to planting. Seed treatments such as Raxal MD, MD Extra or ET; Gaucho XT; Dividend XL or XL RTA or Baytan effectively prevent common bunt and loose smut. Uniform application is important, so they are best applied by a commercial seed treater.

John Watkins
Extension Plant Pathologist

Wheat and oat production forecast

Based on July 1 conditions, Nebraska's 2003 winter wheat crop is forecast at 79.9 million bushels, up 64% from last year's crop, 10% above last month's forecast, and highest since 1999, according to a report from USDA's Nebraska Agricultural Statistics Service.

Average yield is forecast at 47 bushels per acre, up 15 bushels from last year's yield, 3 bushels above last month, and second highest on record behind 1999 at 48 bushels. Acreage to be harvested for grain is estimated at 1.70 million acres, 180,000 acres more than last year and the highest since 1999.

Oat production is forecast at 4.4 million bushels, up 87% from last year's drought reduced crop. Acreage for harvest, at 65,000 acres, is up 10,000 acres from 2002. Yield is forecast at 68 bushels per acre, up 25 bushels from the previous year and the highest since 1997.

Winter wheat: Area harvested, yield and production
Selected states and United States, 2002-2003

State	Acres Harvested		Yield		Production	
	2002	2003 [1]	2002	2003 [1]	2002	2003 [1]
	1,000 Acres		Bushels		1,000 Bushels	
Colorado	1,650	2,200	22.0	35.0	36,300	77,000
Kansas	8,100	9,700	33.0	49.0	267,300	475,300
Missouri	760	780	45.0	58.0	34,200	45,240
Montana	750	1,750	28.0	37.0	21,000	64,750
Nebraska	1,520	1,700	32.0	47.0	48,640	79,900
Oklahoma	3,500	4,700	28.0	41.0	98,000	192,700
South Dakota	625	1,520	29.0	41.0	18,125	62,320
Texas	2,700	3,600	29.0	29.0	78,300	104,400
Washington	1,750	1,800	59.0	64.0	103,250	115,200
United States	29,651	36,491	38.5	47.0	1,142,802	1,715,912

[1]Forecasted July 1, 2003.
Source: USDA NASS Crop Production, July 11, 2003.