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Worksheet provides treatment guideline

**Begin scouting for corn borers**

European corn borer moths have been emerging since mid-May in south central Nebraska, and newly laid eggs were first seen on June 6 at Clay Center. Larvae hatching from eggs laid on plants less than 17 inches tall (extended leaf height) will not survive well, due to the natural resistance factor DIMBOA found in smaller corn plants. As plants get larger (22-36 inches tall, extended leaf height) survival will increase as the DIMBOA level decreases within the plant. Moths prefer to lay eggs on taller plants (earlier planted fields) in an area. Because of this and the poor survival of borers on smaller plants, begin scouting early planted fields.

To determine whether to treat for corn borers, survey fields for plants showing leaf feeding injury and count the number of live corn borers. Check at least 25 plants in each of four areas of a field (100 plants total). Record the percentage of plants with shot-hole damage. Unroll two or more damaged plants at each site and record the number of live larvae per plant. This will provide an estimate of the maximum number of borers that might survive to enter the stalk. Remember that natural mortality of corn borers is often high, due to insect natural enemies, diseases and weather. Avoid making treatment decisions until most borers are second instar, to take full (Continued on page 69)

**Maintain moist top inch of soil to avoid rootless corn syndrome**

A few hot days, coupled with strong winds and lack of adequate rainfall or irrigation, can dry the upper inch of soil very quickly. It is in this area that corn seedlings are developing their initial sets of nodal roots. What happens when root 'buds' contact hot, dry soil? They stop growing or fail to elongate normally, giving rise to the "rootless corn syndrome." Affected plants are forced to depend on the seminal roots, seed reserves, and mesocotyl for nourishment, when normally this lifeline has already become secondary to the nodal root system. If the initial sets of nodal roots fail to develop on schedule, subsequent development of the plant may suffer.

Under severe conditions, the corn seedlings are poorly anchored and may appear to be root-lodged or "floppy." The permanent roots will be stubbed off but not eaten. The tips of the roots will be dry and shriveled. These symptoms are unlike any associated with herbicide injury or insect feeding.

Because several sets of roots may not have formed below ground, the crown may appear to be at or above the surface.

Remember, roots will not develop in dry soil. They do not grow toward moisture. If roots are already in moist soil, they develop rapidly and may appear to follow moisture down as the soil dries. Row cultivation may throw enough moist soil around the stalks to encourage root development as well as provide some structural support. The best event, however, would be a nice, gentle, soaking rain.

David S. Wysong
Extension Plant Pathologist

(Continued on page 69)
Control jointed goatgrass at harvest

Volunteer rye and jointed goatgrass are winter annual weeds which can be a serious problem in the winter wheat-fallow area of western Nebraska. They compete with winter wheat for water, nutrients, light, and space. In addition, grain dealers often discount winter wheat contaminated with rye seed and/or goatgrass joints. Removing jointed goatgrass joints from wheat grain is a slow and costly process so elevators without grain cleaning equipment may reject wheat containing any joints.

Insist that all combines be cleaned prior to entering a new field. Be especially careful with custom combines coming from areas with infested fields. If you have farm ground that is in a three- or four-year rotation with winter wheat (for example, winter wheat-millet-fallow), have custom combines start harvest in these fields so combines get cleaned out before entering wheat-fallow fields. Rye and jointed goatgrass are more easily controlled in a three-year or four-year rotation involving a late-planted spring crop than in winter wheat-fallow. If only a few small areas of rye and jointed goatgrass are located in a field, avoid these areas at harvest or cut separately to keep from spreading the infestation.

Joints of jointed goatgrass are lightweight and often sift to the top of a moving truck where they can be easily blown out and start new infestations along roadsides. It is important to cover trucks with a tarp to prevent spreading these weeds. Jointed goatgrass joints are often confused with pieces of broken wheat straw or may not be easily visible so it’s important to cover all grain trucks.

To check winter wheat grain for joints of jointed goatgrass, take a clear plastic bag, coffee can, or pail and fill about 1/2 full with grain. Then add enough water to cover the grain plus 1" and shake or stir. The joints will float and the wheat will sink. Also check winter wheat seed before planting. Do not keep and try to clean any wheat for seed that contains rye or jointed goatgrass.

Immediately after winter wheat harvest, plant the rye and/or jointed goatgrass seed with a light disking or single pass of a sweep plow. Good long straw and chaff distribution increases the success of this tillage operation in planting seeds. The increased seed-to-soil contact will help germinate the seed in late August or early September when sufficient rainfall is received. The more seed that can be germinated and destroyed during the fallow season, the fewer seeds left to germinate in the winter wheat where few control options are available. Approximately two weeks after a good late August or early September rainfall, a flush of rye and/or jointed goatgrass should emerge. Control this flush with tillage or herbicides. A residual herbicide like atrazine may help control later flushes of rye and jointed goatgrass. Tillage will plant more seeds, but reduces the amount of residue and makes the soil more susceptible to erosion.

Robert Klein, Extension Cropping Systems Specialist
Drew Lyon, Extension Dryland Crops Specialist
European corn borers (Continued from page 75)

advantage of this natural control.

Enter information from field scouting into the accompanying worksheet. This takes you through the calculations needed to estimate the potential yield loss if all these corn borers survive to bore into the stalk, the preventable loss if an insecticide is used, and the control costs.

Treatments will be effective only if borers are still feeding in the whorl. Treatments made after corn borers begin to bore into the stalk (when they are about half grown) will not be effective. Based on research data, the best control is achieved with granular formulations or applications through sprinkler irrigation systems, which provide the best penetration of insecticide into the whorl where the corn borer larvae feed.

Consider the use of products containing Bacillus thuringiensis (Dipel, Biobit, Thuricide, M-Peril, Condor, and others). These products effectively control first generation European corn borers without reducing the populations of insect natural enemies, and offer reduced risk to applicators. Refer to EC 94-1509, Insect Management Guide for Nebraska Corn and Sorghum, for a list of suggested insecticides, rates and restrictions.

Bob Wright
Extension Entomologist, Clay Center

Management worksheet
First generation European corn borer

1. Yield potential (bu/acre) for this field

Example: 125

Your field

2. Number of live larvae per plant =

Average number of live larvae per damaged plant x average percent damaged plants (4 larvae/damaged plant x 50% damaged plants = 2 larvae/plant)

Example: 2

Your field

3. Potential yield loss (bu/acre) = 2 larvae/plant x 5% loss/larvae = 10% yield loss; 10% x 125 bushels = 12.5 bushels per acre

Example: 12.5

Your field

4. Dollar loss/acre = 12.5 bushels/acre x $2.50/bushel = $31.25 loss/acre

Example: $31.25

Your field

5. Preventable loss/acre (assume insecticide is 75% effective*) = Dollar loss/acre x percent control

$31.25 x .75 = $23.44

Example: $23.44

Your field

6. Treatment costs/acre = Insecticide cost + application cost

$8 + $4 = $12

Example: $12.00

Your field

7. Compare preventable loss (5) with treatment costs (6)

$23.44 - $12.00 = $11.44 = $/acre saved by treatment

Example: $11.44

Your field

If preventable loss (5) exceeds treatment costs (6) you may benefit from an insecticide application for first generation corn borer.

*75% control is a good average estimate of the control achieved with insecticides for first generation borer control. You may use other estimates if you wish.
Preharvest herbicide options for wheat

Spring was very dry in many areas of Nebraska, and there has been precious little moisture for wheat development, let alone weed development. However, if rain returns before wheat harvest, weeds may develop rapidly and cause problems at harvest. This is especially likely in poor stands of wheat.

If you have a winter wheat field or fields with weed populations that may interfere with wheat harvest, consider 2,4-D Low Volatile ester as a harvest aid treatment. Apply 2,4-D Low Volatile ester at a rate of 1 quart/acre (4 pounds active ingredient/gallon) to winter wheat in the hard dough stage. Earlier application of 2,4-D may cause serious injury to the wheat. The 2,4-D must be applied at least 7 days prior to harvest. Not all brands of 2,4-D are labelled for use as a harvest aid treatment, so be sure to check the label before applying as a harvest aid.

Ally + 2,4-D has received a federal supplemental label for use as a preharvest aid treatment. Ally at 0.1 oz/acre + 2,4-D at 4-8 oz/acre (4 pounds active ingredient/gallon) + surfactant at 1 quart/100 gallons of spray solution provides more rapid burndown and control of large kochia and Russian thistle plants than 2,4-D alone. Some things to consider before applying Ally + 2,4-D as a harvest aid include: 1) no more than 0.1 oz/acre of Ally may be applied to a single field in a 22 month period, 2) some crops can not be planted for up to 22 months following the application of Ally (sunflowers for example), and 3) this treatment must be applied at least 10 days prior to harvest, but after the wheat has entered the dough stage.

Roundup RT and Landmaster BW both have supplemental labels for preharvest application in wheat. These products must be applied to wheat after the hard-dough stage of grain and at least 7 days prior to harvest. Roundup RT requires the addition of surfactant at 0.5% by total spray volume. The addition of 1 to 2% dry ammonium sulfate by weight may increase the performance of Roundup RT and Landmaster BW on annual weeds. See the label for recommended use rates.

Before spraying, check adjacent fields for susceptible crops. Also recognize these are harvest aids; the damage to the wheat from weed competition has already been done.

Bob Klein Extension Cropping Systems Specialist, North Platte

Winter wheat quality declining

Varied would describe the condition of winter wheat in west central Nebraska. Devastating hail wiped out fields in several areas. In other locations, the shortage of moisture and high temperatures contributed to continued crop decline.

The Nebraska Agricultural Statistics Services this week estimated winter wheat condition at 29% poor, 42% fair, 27% good and 2% excellent. "The crop has begun turning color across the state and was rated at 27% turned, slightly ahead of normal," according to its weekly newsletter, Nebraska Weather and Crops.

Yields are reduced when the filling period is shortened. Cool nights and daytime temperatures not above 85°F produce optimum yields.

Spotty rains and cooler temperatures last week helped where the crop was able to respond. There have been a few disease, weed and insect problems this year and a small amount of damage from the late freeze.

Bob Klein Extension Cropping Systems Specialist, North Platte

Nebraska weed tour

The Nebraska Weed Tour begins Monday in Concord and will continue through the week, ending Thursday in Scottsbluff.

Monday, June 20
1:00 p.m. Concord
Northeast Research and Extension Center

Tuesday, June 21
9:00 a.m. Lincoln
84th and Havelock
3:00 p.m. Clay Center
South Central Research and Extension Center

Wednesday, June 22
8:30 a.m. North Platte
West Central Research and Extension Center
3:00 p.m. (MDT) Sidney
High Plains Agricultural Laboratory

Thursday, June 23
8:30 a.m. (MDT) Scottsbluff
Panhandle Research and Extension Center

John McNamara
Extension Assistant Agronomy-Weed Science
Numbers now increasing

Scout alfalfa, soybeans for potato leafhoppers

Growers in eastern and central Nebraska should begin examining their alfalfa and soybean fields for the potato leafhopper. This insect, which can cause significant damage to these crops, is increasing in number in many fields. The light green, dagger-shaped leafhoppers are only about 1/8 inch long as adults and are even smaller in the nymph or immature stages.

The potato leafhopper has piercing-sucking mouthparts that allow it to inject saliva into plant tissues prior to sucking up plant juices for nutritional purposes. The plants are damaged internally during this feeding process, which hampers their ability to move water and nutrients. Plant damage symptoms include stunting, tissue discoloration, and death.

Observe seedlings to determine the number of leafhoppers per plant. Treatment thresholds are based on the number of insects per plant. The thresholds are 0.8 insects/plant at soybean stage V1, 1.6 insects/plant at stage V2, and 2.4 insects/plant at stage V3. Late planted soybean is most vulnerable to damage.

The most efficient way to sample for this insect in alfalfa is to use a sweep net. Treatment thresholds are based on the number of leafhoppers per sweep. Treatment is most effective in reducing losses if done before damage symptoms are visible.

The accompanying tables are the treatment thresholds for the potato leafhopper in alfalfa. Additional information is available in Potato Leafhopper Management in Alfalfa, G93-1136, and Insect Management Guide for Nebraska Alfalfa, Soybeans, Wheat, Range and Pasture, EC93-1511, both of which are available at a University of Nebraska Cooperative Extension Office.

Steve Danielson, Extension Entomologist
Tom Hunt, Extension Entomology Technologist

Table I. Dynamic Treatment Thresholds for Potato Leafhoppers (average number per sweep) on Alfalfa that is 1 to 4 inches tall.

<table>
<thead>
<tr>
<th>Value of hay (per ton)</th>
<th>Cost of insecticide application (per acre)</th>
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<td>$10 $12 $14 $16 $20</td>
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<td>$ 60</td>
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<tr>
<td>$ 80</td>
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<tr>
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<td>0.15 0.2 0.2 0.3 0.3 0.4</td>
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Table II. Dynamic Treatment Thresholds for Potato Leafhoppers (average number per sweep) on Alfalfa that is 4 to 8 inches tall.

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<th>Cost of insecticide application (per acre)</th>
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<tr>
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<tr>
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Table III. Dynamic Treatment Thresholds for Potato Leafhoppers (average number per sweep) on Alfalfa that is 8 to 12 inches tall.

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</tr>
<tr>
<td>$160</td>
<td>0.8 0.9 1.0 1.2 1.5 1.8</td>
</tr>
</tbody>
</table>

Correction

On page 74 of the June 10 issue of CropWatch, the maximum rate for Atrazine 90DF in a water carrier on emerged sorghum should have been listed as 2.2 lbs/A.

Alex Martin, Extension Weeds Specialist
John McNamara, Extension Assistant, Weeds
Nebraska weather data as of June 13

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<th>Growing degree days</th>
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<td>4.33 49</td>
</tr>
</tbody>
</table>

*Base 50 is used for corn, sorghum and soybean production
**Days indicates number of days ahead or behind normal, relative to accumulated growing degree days on June 12.
Crop water data aids irrigation planning

Beginning this week, the CropWatch weather data will be expanded to include: growing degree day accumulations for four crop emergence dates; precipitation amounts for the previous week and the growing season; and evapotranspiration data and projections.

The automated weather data network, operated by the UNL High Plains Climate Center, provides daily estimates of crop water use. The estimates reflect regional conditions, such as average crop emergence date, temperature, humidity, solar radiation and wind, and are available for several crops. If conditions at any site vary significantly from those at the weather station, the numbers may need slight adjustments. The crop water use estimates generated from the weather stations are for non-stress conditions, so water use estimates for crops experiencing water stress, disease, and mechanical damage might need further refinements. See NebGuide G90-992, Evapotranspiration (ET) or Crop Water Use, for more details on the water use calculations and the weather network.

Overall, the water use estimates are an important part of a two-step process for determining the correct irrigation timing and amount. First, use the appearance and feel method (NebGuide G84-690, Estimating Soil Moisture by Appearance/Feeling) to determine the current water status in the active root zone. Remember that varying textural layers in the root zone require a weighted average when calculating the amount of crop-available water remaining. Then, use the most recent three-day crop water use average to estimate the next irrigation date.

This is done by dividing the remaining available root zone water by the average crop water use rate. The amount of water to apply is based on the moisture holding capacity of the soil. These calculations are detailed in NebGuide G85-753, Irrigation Scheduling Using Crop Water Use Data.

The water use estimates also provide a quick check of system performance. Check the combined irrigation and rainfall efficiency by comparing the cumulative crop water use between two irrigation dates to the sum of the depth of irrigation water applied and the total rainfall during that period.

Joel Cahoon, Extension Water Management Engineer

Storms, hail pelt crops; Heat spell to continue

A series of thunderstorms dumped heavy rains over most of Nebraska last week, except in the western section where precipitation was more spotty precipitation. Along with the storms came heavy hail damage in some areas, the most serious in the Panhandle, Southwest, and North Central districts.

These areas typically receive four to eight days of hail per year compared to two to four for eastern Nebraska. Areas outside the Panhandle and Southwest have adequate subsoil moisture and good topsoil moisture.

Evapotranspiration rates for young crops will rise rapidly over the next two weeks. With temperatures in the low 90s and wind speeds of 10-15 mph, evapotranspiration rates for corn should increase from 0.20 inches per day at current to 0.40 inches within the next ten days.

As the heat begins building over the Midwest this week, crop stress is becoming a concern. Significant crop stress begins when the amount of available soil moisture falls below 50% of what can be stored. Therefore, if no rains are received, stress could become significant for dryland crops within the next 10 to 14 days. Additionally, if the current temperature trend continues, most of the corn crop is projected to reach the silking stage July 1-5.

Areas within the eastern corn belt are suffering drier conditions than the western corn belt. These areas will undergo crop stress earlier if substantial rains fail to materialize within the next week. Unfortunately, the new 30-day forecast for mid-June through mid-July calls for a 60% chance of below normal precipitation and above normal temperatures over the eastern corn belt. Over the western corn belt, probabilities drop to a 55% chance. With this scenario, irrigators should begin a water scheduling routine that will compensate for the possibility of higher than normal crop evapotranspiration rates.

Al Dutcher
State Climatologist
Agricultural Meteorology
Kansas disease report

Prepared by the Plant Protection and Weed Control Section of the Plant Health Division of the Kansas Department of Agriculture. (June 10, 1994)

The hot dry weather of the past few weeks has quickly matured the wheat crop. Take All was reported across the state at scattered locations. Incidences generally were below 3 percent with some reports of 5 and 10 percent. Counties included were Harvey, Reno, Saline, Ottawa, Marion, Dickinson, Thomas, Clay and Brown.

Foliar disease has been minimal this year with an occasional field of moderate disease pressure. Leaf rust has struggled throughout the spring and just recently reported in the majority of fields. The greatest amount of rust has been in extreme south central and southeast Kansas. In central and northern counties, rust has been only a light sprinkling and of little significance to the crop.

Speckled leaf blotch and tan spot have been present in the crop to a greater extent than leaf rust. Lower leaves have been lost to speckled leaf blotch and both diseases have had reports of flag leaf infection. Recently, the hot dry weather stopped both diseases from any further infection and limited respective losses. Speckled leaf blotch had two significant recent reports of 25 and 15 percent infection of the flag leaf in Clay and Brown counties, respectively. Other fields in north central and northeast Kansas had less than 4 percent infection of the flag leaf. Tan spot had one significant report from Saline County with 15 percent of the flag leaf infected.

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Barley Yellow Dwarf has been the disease of greatest statewide concern. Previously the survey found substantial amounts in south central, southeast, and central Kansas. Western Kansas has not escaped barley yellow dwarf with recent reports indicating moderate amounts of disease pressure from the aphid transmitted virus.

Occasional fields of 10 to 50 percent incidence were from southwest Kansas and a few from west central and northwest regions.

Other reports of disease included wheat streak mosaic from western counties. Incidences were 1 to 3 percent, indicative of the statewide picture for wheat streak mosaic. Scab which was epidemic last year at this time in eastern Kansas has been absent except in southeastern Kansas. During recent travels in northeast Kansas (home of the 1993 epidemic) trace amounts of scab were found and nothing in north central and central Kansas.

Kansas insect survey

Prepared by the Plant Protection and Weed Control Section of the Plant Health Division of the Kansas Department of Agriculture. (June 10, 1994).

Very light infestations of larvae tentatively identified as the Cereal Leaf Beetle were found in oats in these additional eastern Kansas counties since the last report: Doniphan, Atchison, Wyandotte, Leavenworth, Douglas, Miami and Linn. The pest has been found in 11 Kansas counties.

European corn borer moths were still being seen this past week in small grains and in grasses along corn field borders in eastern Kansas so egg hatch is likely continuing. Light infestations (4 to 10%) of small larvae were found in whorls of larger corn surveyed in Doniphan, Douglas, Shawnee and Pottawatomie counties in northeast and east central areas of Kansas this past week. Whorl infestations are expected to climb as more eggs hatch. Moths were being found this past week by several consultants in southwest Kansas.

We have received no reports yet, but first generation immature chinch bugs should have started their migrations from some of the more mature fields of small grains. Recent cooler rainy weather should slow the migration somewhat and heavy rains where they occurred probably destroyed some of the smaller nymphs and buried some of the eggs. However, many of the small and most of the larger nymphs probably escaped destruction.

Growers in all areas where the chinch bug has been a pest and who have planted milo or corn next to or near small grains should be alert for possible migrations. Growers should be particularly alert where:

1) the winter survey showed higher numbers of wintering bugs;
2) it has been mostly dry in recent weeks, and
3) where the corn and milo are near wheat or other small grains with thin stands.

Substantial rains that fell in some areas recently should also help by allowing the corn and milo crops to grow fast. Remember, it doesn't take nearly as many chinch bugs to seriously damage small, slow-growing drought-stressed plants as it does larger, fast growing plants.

Grasshoppers have been reported bothersome in various crops and gardens in Kiowa County.