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Insecticide-resistant greenbugs reported increasing in number

Over the past few weeks greenbugs have been found in many sorghum fields in Nebraska. As a general rule, greenbug populations have remained below economic levels in most fields planted to Biotype E or Biotype I resistant sorghum hybrids. Although Biotype E resistant sorghums look good in many fields, in a couple of Biotype E resistant sorghum fields I checked last week, greenbugs and damage were increasing rapidly which indicates that Biotype I is probably present.

Greenbugs and some damage are also present in some fields planted to Biotype I resistant sorghums. Insecticide resistant greenbugs (Type II) were identified in a field near York last week. Lorsban did not provide satisfactory control and greenbug numbers and damage increased rapidly after treatment. Type II insecticide-resistant greenbugs are resistant to several organophosphate insecticides and some resistance to carbamates also has been detected.

In my studies last summer, broadcast application of DiSyston, Furadan, and Lorsban provided over 98% control of susceptible greenbugs. The same insecticides, however, provided only 20%, 47%, 0% control, respectively, of insecticide-resistant greenbugs. Drop nozzle applications aimed directly at greenbugs on lower leaves increased control to 60-66% for DiSyston and Furadan. However, even 60% control may not be adequate if the insecticide kills most of the predators and parasites. Greenbug populations can increase very rapidly when predators and parasites are no longer present. Because insecticide-resistant greenbugs may be present in some fields, delay insecticide treatments as long as possible.

The treatment threshold for greenbugs is to treat if greenbug colonies are present on most plants, before an average of one lower leaf has been killed, and if greenbug parasitism (mummies) is less than 20%. Parasitism in most fields I checked ranged from 5% to 12%. Parasitism should increase in the next week and growers may want to consider accepting a little more damage than indicated in the above treatment threshold if parasitism is close to 10%.

We do not have good insecticide treatment options for insecticide-resistant greenbugs at the present time.

For more information on greenbug management refer to the Extension NebGuide G87-838, Management of Greenbugs in Sorghum, and UNL EC94-1509, Insecticide Management Guide for Nebraska Corn and Sorghum. Updated information on recommended insecticides and management is available on the University of Nebraska Department of Entomology home page (http://ianrwee.unl.edu/ianr/entomo/entdept.htm).

Z B Mayo
Professor of Entomology
Spider mite update

Updated information for pesticides suggested for spider mite control on field corn has been placed on the University of Nebraska Entomology home page. For this and other information pertinent to insect control, see http://ianrwww.unl.edu/ianr/entomol/pestcont/pestcont.htm.

Economics of treatment

How may the increased value of corn influence insect management procedures?

The general rule, where economic injury levels are known, is that if the value of corn used in the original calculation was $2/bu and corn is now worth $4/bu, then the economic injury level is one-half of the original. For example, it takes half as many insects for a treatment to pay for itself in increased yield, assuming other factors (yield, control costs) remain the same. This adjustment is done automatically in the worksheets for first and second generation European corn borer (See Worksheet for Second Generation Corn Borer on page 128).

Our treatment thresholds for corn rootworm beetles are a special case. Numbers this year are used to predict whether an economic problem will occur next year. Even if you treat to control adults this year, you are doing it to protect next year's crop. If you were to modify the threshold level based on the value of corn you would have to predict the value of next year's corn crop.

Bob Wright
Extension Entomologist
South Central District

<table>
<thead>
<tr>
<th></th>
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Avoid honeybee losses when applying insecticides now through August

The Nebraska Department of Agriculture is charged with regulating pesticides, enforcing the Nebraska Pesticide Act, and ensuring that federal pesticide labels are adhered to. It also is charged with investigating reports of bee colony losses allegedly caused by pesticide exposure.

Most bee loss complaints received by the Nebraska Department of Agriculture occur from late July through August. This period coincides with when pesticides are applied to corn to control adult corn rootworm beetles to prevent egg laying and protect next year’s corn crop. Applications for second generation European corn borer and western bean cutworm also are made at this time.

Unfortunately, these applications often occur when corn is pollinating and weeds are blooming in or near the treated field, which may attract foraging bees.

In Nebraska the insecticide most commonly applied to pollinating corn is Penncap-M. Bees entering treated areas are not immediately killed as is the case with many insecticides, but rather they pick up the encapsulated product on their body hairs and return these capsules to the hive and expose the entire colony.

The policy of the Nebraska Department of Agriculture in investigating reports of bee losses is as follows:

1. Appropriate samples of the dead bees or other items are collected to determine the cause of the loss.
2. Individuals applying pesticides within the immediate vicinity are interviewed and pesticide application records and pesticide labels are examined.
3. Weather data for the periods of relevant applications are collected.
4. If there is evidence of off target application of the pesticide, samples, photographs and other substantiating evidence are collected.

Penncap-M insecticide has a label which reads in part “Do not apply Penncap-M or allow it to drift to blooming crops and/or blooming weeds if bees are foraging the areas to be treated.” This means that so long as bees are not in the field at the time of application the product can be applied even if the crops or weeds are blooming. The Nebraska Department of Agriculture does however, encourage applicators and corn growers to scout fields prior to application as a means of ensuring that bees are not present and also as a means of determining the appropriateness of the application being made as a pest control measure. The presence of an apiary does not in any way restrict pest control operations if label precautions are followed.

From a regulatory perspective the above section summarizes how the Nebraska Department of Agriculture approaches the problem of unintended bee losses. Our experience over the past several years has been that the vast majority of bee losses are not the result of misapplication, negligence or intentional disregard of the label. Minimizing the effects of pesticides on the agricultural honey industry requires communication and a willingness to work with and understand both the corn and honey production industries. To promote this communication the Nebraska Department of Agriculture provides county lists of registered bee yards and lists of all aerial applicators.

Both the Nebraska Department of Agriculture and the University of Nebraska Cooperative Extension have information to help beekeepers, aerial applicators, crop consultants and corn growers develop management plans and strategies to reduce or eliminate unintended bee losses. Of particular interest is the Cooperative Extension Bulletin G93-1174, Avoiding Honeybee Losses when Using Insecticides.

Cooperative voluntary efforts are usually far more effective and beneficial than regulations or other mandatory requirements. We encourage beekeepers, aerial applicators, crop consultants and corn growers to use available bee protection strategies and above all else to keep the lines of communication open.

Geir Friisoe
Manager, Pesticide Program
Nebraska Department of Agriculture

1997 Herbicide Guide: speak now or...

Farmers, Extension educators, industry representatives, and all other users of our Herbicide Use Guide: now is the time to submit your suggestions for our 1997 edition. We have appreciated your previous input. You have helped make the Nebraska Herbicide Use Guide a most useful weed control aid for farmers, dealers, applicators, farm managers, consultants, Extension educators, and others.

Please send your suggestions by Aug. 30 to the Agronomy Department-Weed Science, Attention: John McNamara, 362 Plant Science Building, University of Nebraska, Lincoln, NE 68583-0915.

Alex Martin, Extension Weeds Specialist
John McNamara, Extension Assistant, Weed Science
Determining treatment for second generation European corn borers

The second or summer flight of European corn borer moths is underway over much of Nebraska and moth emergence will soon spread to all areas of the state. Focus on scouting for egg masses with the second generation. Egg masses are used to predict numbers of cavities and determines the need and timing of treatments.

Eggs generally are laid on or near the midrib on the undersides of the leaves in the middle of the plant. We recommend examining only the ear leaf and the three leaves below and the three leaves above for egg masses. Most egg masses will be laid within one week of peak moth flight. Corn fields that are pollinating during peak moth flight are most attractive to moths. These fields generally tend to have been planted late or are late maturing cornfields.

Timing of an insecticide application is critical for satisfactorily control. Best control results come with applications timed when eggs begin to hatch and some larvae may be visible in leaf axils. Considering the economics of field corn and under the premise of protecting the plant through the dough stage, a single application is usually satisfactory. Borers invading after the dough stage will have minimal effect on ear size.

Suggested insecticides for controlling second generation borers include Ambush 2E and 25W, Capture 2E, Dyfonate II 20G, Furadan 4F, Lorsban 4E & 15G, Asana 1.9EC or XL, Penncap-M, Pounce 3.2EC, 25WP and 1.5G and Warrior 1E. Consult individual product labels for rate, restrictions and comment.

Based on a comprehensive scouting report, use the estimated average number of egg masses per plant in the attached worksheet and use it as a guideline to determine whether treatment is necessary. Note: Always factor in the risk for possible build-up of spider mites after insecticide applications.

John Witkowski, Extension Entomologist Northeast District

Management worksheet for second generation European corn borers

| Number of egg masses per plant¹ x 3 borers per egg mass² = borers per plant |
| Biners per plant x 4% yield loss per borer³ = percent yield loss |
| Percent yield loss x _______ expected yield (bushels per acre) = bu/acre loss |
| Bushels per acre loss. $ _______ sale price per bushel = $ _______ loss per acre |
| $_______ Loss per acre x 70% control⁴ = $ _______ preventable loss per acre |
| $_______ Preventable loss per acre |
| $_______ Cost of control (chemical + application costs) |
| = $_______ Profit (+) or loss (-) per acre if treatment is applied |

¹Correct for having restricted the scouting area to only seven leaves per plant by dividing the average number of egg masses per plant by 0.90.
² Assumes a survival rate to fifth instar larvae of about 15% of the eggs in each egg mass. Survival could be higher or lower depending on environmental conditions.
³ Consult the accompanying table for a sliding scale of percentage loss attributed to each cavity as the plant matures.
⁴ An average estimate of percentage control or make your own estimate.

Table 1. An average percentage yield loss in field corn caused by European corn borer larvae at succeeding growth stages under average environmental conditions.

<table>
<thead>
<tr>
<th>Plant stage</th>
<th>Percentage loss per larva per plant¹</th>
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<tbody>
<tr>
<td>Silking</td>
<td>4</td>
</tr>
<tr>
<td>Blister</td>
<td>3</td>
</tr>
<tr>
<td>Dough</td>
<td>2</td>
</tr>
<tr>
<td>Dent</td>
<td>0</td>
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</table>

¹Losses are physiological yield losses and percentages do not account for yield losses due to stalk breakage or ear drop.
²If corn plants experience prolonged moisture stress after significant European corn borer tunneling, the loss per cavity can be substantially higher. Likewise, adequate irrigation can moderate these values.
Armyworms found in hailed corn in Perkins County; scout grassy areas

Crop Consultant Mike Troxel of Sutherland Tuesday reported finding armyworms on hailed corn in northern Perkins County.

The worms are still small and feeding on grassy weeds which became established when hail removed enough canopy to stop shading the soil surface. The worms consume the weeds and then move to the corn and begin stripping the leaves; often leaving only the midrib on the leaf.

Armyworms probably overwinter in states south of Nebraska and the first generation moths migrate north. This first generation normally occurs in May and June and is primarily a pest of small grains and pastures. There usually aren’t enough to cause economic damage. The second generation is generally present in late July and early August and there may be a third generation in late summer and early fall.

The armyworm moths are dull brown but have a small white dot near the center of each forewing which can be used for identification. Egg masses range from 25-100 and are deposited at night in grassy areas in and around corn fields. The small larvae are light colored tan or brown but darken as they grow. They are practically hairless and have several longitudinal stripes on the body including two broad, orange stripes on the sides and two dark stripes on the back. The head is medium brown with net-like patterns of dark lines. The small larvae consume comparatively little food but older larvae may consume large amount of forage in a short time. They may consume the grassy weeds rather quickly and move to the corn plants.

Fields infested with grassy weeds or low grassy areas around fields should be scouted. Since the worms feed mainly at night, they may be hard to find. Feeding damage will appear first on the lower leaves of corn. The distribution of grassy weeds may be patchy and control may be needed only in those areas if at all, depending on whether the weedy vegetation is abundant enough for the army worms to complete their larval development.

Control efforts are recommended when armyworms migrate in enough numbers to cause the loss of the two lower corn leaves until the kernels are fully dented. Carbaryl (Sevin), chlorpyrifos (Lorsban) ethyl parathion, esfenvalerate (asona), malathion, methomyl (Lannate), methyl parathion (Penncap-M) and permethrin (ambush or bounce) are all labeled for armyworm control. The last five of these are restricted use pesticides. Several can be applied through center pivots. Consult the labels for rate restrictions and safety requirements before using any pesticide.

Jack Campbell
Extension Entomologist
West Central District
Cercospora leaf spot symptoms appeared on western Nebraska sugar beets this week and an alert system has been established for producers. High leaf spot severity levels in some areas of the North Platte River Valley in 1995 provided significant inoculum carryover into this year’s crop. With favorable weather conditions for infection the disease could become severe and reduce root yield and sugar content. Infection is favored by temperatures averaging in the mid-sixties or above during long periods of high relative humidity or leaf wetness which usually occurs in evening or early morning hours.

Measurements of temperatures and relative humidity in the canopy of a sugar beet field on the University of Nebraska Panhandle Research and Extension Center at Scottsbluff provide estimates of infection potential for the general region. Each day infection potentials will be reported as unfavorable, marginal, or favorable for infection. Suggested options will be for fungicide application or further monitoring of advisory reports and leaf spot symptoms in the field. Reports will be updated at approximately noon most days until mid-September.

Daily updates for infection potential are submitted to KNEB Radio, the Scottsbluff Star-Herald, and the University of Nebraska Panhandle Research and Extension Center world wide web site http://ianrwww.unl.edu/ianr/phrec/leafspot.htm

Relative humidity and temperature inside the sugar beet canopy will be different in some fields than in the field being monitored for leaf spot alerts due to differences in soils, irrigation, and cultural practices. The field which is being monitored has a history of only moderate leaf spot severity. However, growers should be aware of the potential for leaf spot in their fields.

See NebGuide G95-1240, Cercospora Leaf Spot of Sugar Beet, for more details on control practices. Table 1 lists some of the fungicides available for control of cercospora on sugar beets. Review current fungicide product labels and follow all label directions. **Available fungicides**

The fungicides available for cercospora leaf spot are listed as protectant or systemic fungicides. The systemic fungicides are all in a class of benzimidazole products. They include Benlate and Tonsin M. They provide somewhat longer protection than protectant fungicides and are not washed off by rain once they are absorbed into the leaves. Their greatest disadvantage is that Cercospora develops resistance to this type of fungicide. When the fungus develops resistance to one of the fungicides, it becomes resistant to the other. If systemic fungicides are used, they should always be alternated or tank mixed with a protective fungicide to minimize the risk of the fungus developing resistance. Perhaps the best use of systemics is before the disease becomes active, then follow with a protective fungicide when conditions are favorable for infection.

Protective fungicides disrupt the natural sequence of infection. These fungicides act on the leaf surface to kill the newly germinated spores. Thus, timing of fungicide application is important. The first application should be several days prior to usual observation of initial leaf spot symptoms. It is important that the fungicide be allowed to dry on leaf surfaces. If it’s washed off by rain, it won’t be effective. Once dried, the fungicide is not easily washed off.

**Eric Kerr, Extension Plant Pathologist, Panhandle District**

**AI Weiss, Professor of Agricultural Meteorology**

**Table 1. Systemic and protectant fungicides registered for use on sugar beet for control of Cercospora leaf spot.**

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate/acre</th>
<th>Preharvest interval (days)</th>
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<td><strong>Systemic fungicides</strong></td>
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<tr>
<td>Benlate Fungicide 50 WP*</td>
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</tr>
<tr>
<td>Tonsin M 70 W</td>
<td>6-8 oz</td>
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<tr>
<td>Tonsin M 4.5 F</td>
<td>8-10 oz</td>
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</tr>
<tr>
<td>Tonsin M 85 WDG</td>
<td>.3-.4 lb</td>
<td>21</td>
</tr>
<tr>
<td><strong>Protective fungicides</strong></td>
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<tr>
<td>Super Tin 4 L</td>
<td>4-10 oz</td>
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<td>Triple Tin 80 WP</td>
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<td>Protex</td>
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<tr>
<td>Manex</td>
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<tr>
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*Do not use Benlate alone. Use only in combination with a labeled non-benzimidazole fungicide.

This list of fungicides is supplied with the understanding that there is no guarantee of effectiveness by the University of Nebraska, nor discrimination intended for any products not listed, and no endorsement for those listed.