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Watch for ergot and stinking smut in harvested wheat

Seed-associated diseases of wheat draw considerable attention because they often reduce both grain quality and yield. Two that sometimes occur in harvested grain this time of year are ergot and stinking smut (common bunt). We have had one confirmed report of several thousand bushels of wheat affected by common bunt, which will translate into several thousand dollars in losses for both the farmer and the grain elevator. Neither ergot nor stinking smut are common in Nebraska, but when they do occur losses are usually significant.

Spores of the ergot fungus infect floral tissues prior to fertilization or within the first few days after fertilization. Instead of developing a kernel, infected florets develop a black ergot sclerotia. In the harvested grain, sclerotia, which are similar in size and shape to wheat kernels, may be broken or intact.

Federal grain standards classify wheat as ergoty if the harvested grain contains more than 0.3% of ergot. These low tolerances are necessary because the ergot bodies contain alkaloid compounds that are toxic to humans and animals. Feed containing 0.1% ergot bodies should be regarded as dangerous. It is best if livestock producers adopt a zero tolerance for ergot in either hay or feed grains. Any suspect hay or grain can be assayed for ergot alkaloids by this laboratory:

Veterinary Diagnostic Center
University of Nebraska
P.O. Box 83097
Lincoln, NE 68583-0907

Stinking smut doesn’t present the toxin threat associated with ergot grain, but its presence certainly ruins grain quality. Smutted grain fields result from planting smut-contaminated seed. Spores on the outside of the seed coat germinate and infect the developing wheat seedling, eventually becoming established in the growing point. When infected plants head, smut galls have replaced the kernels.

Harvested grain contaminated with bunt spores has a darkened appearance and a pungent odor of decaying fish. Neither of these symptoms are desirable qualities for baking bread. Thus, smutted wheat is often rejected by the elevator. Smutted grain is not toxic to livestock, but the pungent odor usually makes it unpalatable.

Stinking smut is easily prevented by using certified or smut-free seed for planting or by treating seed with a fungicide before planting.

John E. Watkins
Extension Plant Pathologist

Scout fields for second generation European corn borer eggs

Increasing numbers of European corn borer moths have been found in our light trap at Clay Center beginning July 22, signaling the beginning of the second corn borer moth flight. These moths lay eggs during late July and August in south central Nebraska.

Fields with green silks during the peak moth flight period are most susceptible to second-generation egg laying. The white, flat eggs overlap each other like fish scales and are laid in masses of five to 40 eggs. Eggs are most likely found on the

(Continued on page 177)
Paul Hay, Extension educator in Gage County: Stored grain being received at local elevators has been in good condition.

Grain is in the temperature range of 68-75 F. Farmers continuing to store grain need to be on alert. At these temperatures, insect activity, moisture migration, heating and mold development are real concerns. Producers should monitor grain at least every two weeks and take steps to correct problems before they reduce the grain’s value even more than current low prices.

Early planted soybeans have entered the podding stage in southeast Nebraska and need supplemental irrigation water this week. Irrigation water has the most yield-increasing effect during podding and bean fill periods.

Ralph Anderson, Extension educator in Buffalo County: Crops in Buffalo County are progressing well. Very little acreage was treated to control either first or second brood corn borer. Extremely warm weather encouraged crop growth at the first part of last week while the moisture and cool weather was appreciated over the weekend.

Many acres have been treated for adult rootworm beetles and some will require a second treatment.

Gray Leaf Spot is present in many fields and the continued cool, moist weather has caused additional concern about the potential for severe Gray Leaf Spot infestations.

County Fair is over and life goes on! Next is the Soybean Management Field Day at Holdrege on Aug. 13.

Noel Mues, Extension educator in Furnas County: Conditions were favorable for wheat harvest and reports indicate that this may be a record year for yields in our area. The Furnas County variety plot, located 4 miles east of Arapahoe, had yields ranging from a low of 41 bu./ac. for Turkey to 91 bu./ac. for Quantum XH9806. The average for 41 entries was 71 bu./ac.

Heat and humidity is causing stress on people and livestock but is necessary to push crops toward maturity. Ecosallow corn and sorghum are holding on because of abundant subsoil moisture. Producers are occupied with irrigating, haying, moving grain to market, caring for heat-stressed livestock, and soil preparation for fall-seeded wheat.

Although crops are in good to excellent condition, farmers are discouraged about the low crop and livestock prices.

Ray Weed, Extension instructor in Kimball-Banner counties: Wheat harvest is 95% complete here in Kimball-Banner counties. There are a few fields remaining to be harvested because they were dormant planted (during the winter), are center pivot irrigated fields, or have been too wet because of the 2+ inches of rainfall this past weekend.

Proso millet, irrigated corn and dryland corn, and sunflowers have all benefited from the recent rains. Late planted sunflowers (replanted due to severe hail in June) are coming on fast with the heat and moisture.

Dry edible beans are now flowering. Early tests of the “Blue Plate Test” that we ran in cooperation with Jim Steadman (UNL Plant Pathology) and two DEB growers here did not indicate economic levels of white mold spores present at early flowering, which is good news, of course.

We have received hail again in the last 10 days or so, but it fell primarily on rangeland. The cattle in some areas are having a hard time finding grass because of the hail; other pastures are looking excellent because of the rain.
Scout fields for second generation European corn borer eggs (continued from page 175)

underside of leaves, near the mid-rib, on the ear leaf and the three leaves above or below the ear leaf. Approximately 90 percent of the egg masses will be found on these middle seven leaves. A black spot is visible on the eggs for about 24 hours before they hatch. The spot is the head of the developing corn borer; this stage is often referred to as the black head stage.

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

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

Management Worksheet for Second Generation European Corn Borers

\[
\text{Number of egg masses per plant} \times 3 \text{ borers per egg mass}^* = \text{borers per plant} \]

\[
\text{Borers per plant} \times 4\% \text{ yield loss per borer}^{**} = \text{percent yield loss} \]

\[
\text{Percent yield loss} \times \text{expected yield (bu per acre)} = \text{bushels per acre loss} \]

\[
\text{Bushels per acre loss} \times \$\text{sale price per bu} = \$\text{loss per acre} \]

\[
\$\text{loss per acre} \times 70\% \text{ control}^{***} = \$\text{preventable loss per acre} \]

\[
\$\text{preventable loss per acre} - \$\text{cost of control (product + application costs)} = \$\text{profit (+) or loss (-) per acre if treatment is applied} \]

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

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

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

\*** 70% is an average; you may use another value if desired

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

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

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

2) Yield loss will be about 4% per borer for infestations occurring before silks turn brown and 3% per
Yield maps to be discussed at soybean field days

With yield monitors and GPS, producers gather the data to map yields during harvest, allowing them to research products and practices on their own fields. This mapping, part of precision agriculture, assigns a yield to each point in the field based on the flow of grain into the combine’s tank. Unfortunately, the grain flow dynamics through the combine make it difficult to identify the exact location in the field where the grain was harvested. In addition, improper or incomplete calibration may make the resulting data almost meaningless.

Participants at Soybean Management Field Days will learn how combine yield monitors gather the data necessary to calculate yields, how GPS is used to geo-reference yields to specific field areas, and how combine operation and dynamics affect those numbers. Actual field data and yield maps will be used to demonstrate the importance of calibration and provide an understanding of how to interpret yield maps and develop management zones.

Producers adopting precision ag technologies are usually surprised at how many areas of their fields are not profitable using their existing “whole farm” management and cropping practices. Their yield maps give an indication of yield variability within a field, providing valuable information to develop management zones that correspond to differences in soil characteristics, field conditions, yield potentials or combinations of these. With improved management, they are now using management zones and redefining on maximizing profits, not necessarily yields.

The greatest return to the producer and the environment is realized when producers use precision ag technologies to reduce inputs on areas of the field with lower yield potentials. Too often, producers think they can increase one or two inputs and improve yields from these low areas. They usually find they are not able to because several factors may be contributing to the low yields. Yields can be increased in some field areas if producers can identify and exploit the factors contributing to higher yield potentials. This rearranging of inputs may not reduce production costs but usually results in increased average yields and less environmental risk.

See the July 16 Crop Watch for further details on Soybean Management Field Days.

Paul Jasa
Extension Engineer
Mark Schroeder
ARDC Farm Operations Manager

Scout fields for second generation European corn borer eggs (continued from page 177)

Pests

Borer after silks turn brown but before blister stage. These averages are based on published research but only account for physiological yield losses (reduced grain production) and do not consider yield loss from stalk breakage or ear drop. These factors are difficult to predict and vary with hybrid, cultural practices and weather.

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

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

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

Robert Wright
Extension Entomologist
Clay Center
Greenbugs invading many sorghum fields

Greenbugs are present in many sorghum fields and should be monitored closely for the next couple of weeks in case economically damaging populations develop. Predator populations, particularly lady beetles, are high and greenbug parasites have been found in many fields. The greenbug parasite is highly effective in controlling greenbugs if it gets started early. The adult parasite is a small wasp that lays eggs inside greenbugs. The immature stage (larva) of the parasite develops internally and ultimately kills the greenbug. Just before completing development, the larva causes the greenbug exoskeleton to swell and change to a tan color. This is the parasite pupal stage, called a mummy. The wasp will emerge from the mummy in 1-2 days. Because parasites and predators can be highly effective in controlling greenbugs, delay use of insecticides as long as possible. Treatment thresholds for greenbugs are:

Plants 6 Inches Tall to Boot Stage:
Greenbug colonies beginning to cause red or yellow leaf spotting on leaves of most plants; before any entire leaves are killed, and if parasite numbers are low (less than 20% of greenbugs are mummies.)

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

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

Parasitism should increase in the next two weeks. Because grain prices are low, growers may want to consider accepting a little more damage than indicated in the above treatment threshold, especially if parasitism is at least 10% in the field. For additional information on greenbug management refer to University of Nebraska NebGuide G87-838 “Management of Greenbugs in Sorghum.” Most insecticides registered for greenbug control usually provide excellent control. Insecticide resistant greenbugs have occasionally been present in Nebraska but there have not been any recent reports of insecticide failure in either Nebraska or Kansas. Information on recommended insecticides and management is available on the University of Nebraska Department of Entomology home page (http://ianrwww.unl.edu/ianr/entomol/entdept.htm).

Z B Mayo
Extension Entomologist
Spider mite infestations may become common in field corn

During early to mid August, corn producers should begin to check for spider mites, particularly in fields where insecticides have been applied for other pest problems. Previously treated fields may have fewer predatory insects that would normally keep spider mite populations low. In addition, spider mite populations usually increase late in the season when the ears begin to fill. Droughty weather conditions also can affect this population increase, resulting in potentially damaging infestation levels. Any combination of these conditions could cause a spider mite outbreak.

There are two mite species common on field corn in Nebraska. The Banks grass mite, which feeds strictly on grass plants, and the twospotted spider mite, which feeds on a wide variety of plants, will attack field corn. Both feed by removing fluids from the cells of plant leaves. They can be found anywhere on the plant but usually prefer to colonize the under surface of the leaves. These colonies can be recognized by leaf damage and the webbing that the mites produce. Within this webbing, the mites lay their eggs, which hatch into nymphs within a few days. The nymphs begin to feed on corn as soon as they hatch and, depending on the weather, will reach the adult stage within 5-10 days. There can be as many as 10 generations during the growing season. Thus, if conditions are favorable for their development, the potential for damage is high.

The amount of damage and the biology of these mites are similar but there are some important differences. Difficulty in controlling infestations with miticides is one of the most important. Banks grass mites are relatively easy to control, whereas only a few products control or reduce populations of twospotted mites. Because of this difference, correct field identification of mites is essential. The use of a 10X hand lens will help in mite identification. Banks grass mites are slightly smaller than twospotted mites and have green pigmentation throughout their bodies. Twospotted mites are more rounded in shape than Banks grass mites and have green pigmentation concentrated in two distinct spots on their upper back. Banks grass mite colonies are usually concentrated on the lower leaves of the plants while twospotted mite colonies may be found anywhere on the plant. The leaf webbing formed by Banks grass mites is generally sparse, whereas webbing produced by twospotted

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Product name</th>
<th>Rate (Formulation per acre)</th>
<th>Restrictions or comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>bifenthrin</td>
<td>Capture 2EC</td>
<td>5.1-6.4 fl oz</td>
<td>Apply a minimum of 2 gallons of finished spray per acre by aircraft or 10 gallons with ground equipment.</td>
</tr>
<tr>
<td>dimethoate</td>
<td>Dimethoate (Cygon 400)</td>
<td>2/3 - 1 pint</td>
<td>Field corn only. Do not apply during pollen-shed period.</td>
</tr>
<tr>
<td>propargite</td>
<td>Comite 6.55EC</td>
<td>2-3 pints</td>
<td>Treat when leaves are dry. Treat early when corn is small enough (3-4 ft) to allow good coverage. Two gallons per acre minimum spray volume by air, 20 gallons per acre minimum spray volume by ground.</td>
</tr>
</tbody>
</table>

Comite II 2.25 pints

Same as for Comite 6.55EC

Table 1. Suggested treatments for spider mites

<table>
<thead>
<tr>
<th>Control cost per acre</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market value per acre ($)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>15/8</td>
<td>10/5</td>
<td>7/4</td>
<td>6/3</td>
<td>5/3</td>
<td>4/2</td>
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<tr>
<td>10</td>
<td>29/16</td>
<td>20/10</td>
<td>15/8</td>
<td>12/6</td>
<td>10/5</td>
<td>8/4</td>
</tr>
<tr>
<td>15</td>
<td>44/23</td>
<td>29/16</td>
<td>22/12</td>
<td>8/9</td>
<td>15/8</td>
<td>13/7</td>
</tr>
<tr>
<td>20</td>
<td>59/31</td>
<td>39/21</td>
<td>29/16</td>
<td>24/13</td>
<td>20/10</td>
<td>17/9</td>
</tr>
<tr>
<td>25</td>
<td>74/39</td>
<td>49/26</td>
<td>37/20</td>
<td>29/16</td>
<td>25/13</td>
<td>21/11</td>
</tr>
</tbody>
</table>

Source: Texas Agricultural Extension Service.
mites may be dense. Finally, the leaf stippling damage caused by Banks grass mites begins with a yellow color, eventually giving the crop a fired appearance, while damage caused by twospotted mites begins with a white color, eventually giving the crop a frosted appearance. With a little practice, these differences will become apparent and mite identification will be relatively easy.

When scouting fields for spider mites, attention should be given to the number of infested leaves and the percentage of total leaf surfaces damaged by the mites. These data should be collected from at least 10 plants in each of five locations throughout a field. The average percentage of mite infested leaves and average percentage of damaged leaf surfaces are compared to the value of the crop and the cost of control per acre. This comparison is made to determine if the mite damage potential exceeds the cost of control (Table 1). If the percentage of mite infested leaves and the percentage of damaged leaf surface area exceeds the table value for your crop and the cost of control, an insecticide application should be considered. If control is required, Capture 2EC, Comite II, dimethoate and Di-Syston 8E have provided reasonable control of Banks grass mites. Capture 2EC and Comite II are the only products that have provided control of twospotted mites. When controlling any spider mite infestation, the miticide should be applied in 2-5 gallons total volume.

Field scouting for mites should continue even if the populations have been treated with a miticide. Resurgence of the infestation is possible, particularly under hot, dry weather conditions. These activities should continue until the plants have reached the full dent stage, after which feeding by spider mites is of little concern.

Ronald C. Seymour
Extension Assistant - IPM
West Central Research and Extension Center

Good seedbeds, sprays, moisture boost late summer seeded alfalfa

Planting alfalfa in August requires special attention to moisture, seedbed preparation, late summer insects and weeds. The most critical factor is moisture. Adequate moisture is critical for seedling establishment and for six to eight weeks of growth before frost. Planting alfalfa after Aug. 31 is risky in Nebraska because stands don’t have a chance to get well established before frost. Plant shallow for rapid emergence and to develop good cold tolerance.

Before planting, scout for grasshoppers in field margins. When more than 20 hoppers per square yard are detected, treat promptly because grasshoppers feed on new alfalfa seedlings.

Spray field margins with insecticides before new alfalfa seedlings emerge if grasshoppers are present. Orthene usually provides the best grasshopper control. Parathion, Penncap-M, Sevin, Furadan, Malathion, Lorsban and Cygon also are effective. Grasshoppers are large in late summer, so use the highest rate allowed on the label. However, be careful to protect bees around blooming plants. Consider the time of day when spraying and use less toxic insecticides in these areas. Always read pesticide labels and follow instructions carefully to prevent misuse of chemicals.

Seedbed preparation is critical for late summer seeding of alfalfa. Small grain stubble works well but should be free of weeds before planting. This includes eliminating foxtail, sunflowers and volunteer grain by using herbicides such as Roundup or Gramoxone Extra. Many drills can place alfalfa seeds into stubble soil nicely. Fully tilled seedbeds often work best but they must be kept firm by rolling, harrowing or irrigating.

Bruce Anderson
Extension Forage Specialist

User suggestions are sought for 2000 herbicide use guide

Farmers, extension educators, industry representatives and other users of our Herbicide Use Guide are invited to submit suggestions for our 2000 edition. We appreciate 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 for the 2000 Herbicide Guide by Sept. 1 to the Agronomy Department - Weed Science, Attention Alex Martin, University of Nebraska, 362 Plant Science Building, P.O. Box 830915, Lincoln, NE 68583-0915.

Alex Martin
Extension Weed Specialist
Jeff Rawlinson
Extension Technologist Weed Science
High Plains field day to be Aug. 12

Farmers and ranchers in western Nebraska will get hands-on experience in a variety of areas during the High Plains Ag Lab August Field Day on Aug. 12 at the Panhandle Research and Extension Center.

Topics will address livestock and crop concerns typical of this time of the year in western Nebraska. The half-day event will shift focus every 15 to 20 minutes in a series of workshops hosted by regional professionals and University of Nebraska Cooperative Extension experts, said Dave Baltensberger, plant breeding specialist at Panhandle REC.

Topics for some of the workshops include:

- precision agriculture
- weed and insect control in sunflowers, corn and wheat
- alternative crops
- summer forages
- yield monitors
- livestock systems
- new corn varieties

Registration begins at 8:30 a.m. and the event ends at 12:10 p.m. All producers are welcome. For more information, contact Baltensperger at 308-632-1230 or by e-mail at Dbaltensperger1@unl.edu

Dave Baltensperger
Plant Breeding Specialist
Panhandle Research and Extension Center

Precipitation

Maps courtesy Al Dutcher, State Climatologist, Agricultural Meteorology

July 26 to August 1

April 1 to August 1

Percentage of normal precipitation, April 1 to August 1