6-30-1995

CropWatch No. 95-15, June 30, 1995

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Check grain before feeding to livestock

Head diseases prominent in wheat

Many wheat fields in eastern and south central Nebraska are showing premature ripening of heads causing shrunken grain. Symptoms are a black discoloration of the glumes and peduncle (neck) area just below the head accompanied by premature ripening of the head. This gives fields the appearance of having a mixture of white and green wheat heads.

I'm not certain what is causing the problem. Isolations for the bacterium causing black chaff were negative. Kansas is reporting a glume blotch caused by *Septoria tritici*. We are trying to recover *S. tritici* from wheat heads collected in Nebraska, and preliminary examination indicates *Septoria* is involved. The affected heads mature early causing the kernels to be shrunken.

The incidence of scab in eastern and south central Nebraska is high; however, the severity within most fields is light.

Scab affects individual spikelets and produces a salmon-colored fungal growth along the crease on the glumes and at the base of the florets. It also may be involved in some of the discoloration of the neck area just below the head. Scabby kernels appear chalky, shriveled and may or may not have a pinkish color. Scab and glume blotch may be present in the same wheat head.

Scabby kernels may contain mycotoxins DON (vomitoxin) and zearalone. Although not considered carcinogenic, these toxins can reduce livestock performance if scabby grain is fed. The following laboratories will assay for the two toxins:

- Department of Veterinary and Biomedical Sciences
  Fair Street and East Campus Loop
  Box 830907
  Lincoln, NE 68583-0907
  (402) 472-1434

- Midwest Laboratories
  13611 B St.
  Omaha, NE 68144
  (402) 334-7770

Loose smut, although not widespread, is more evident this year than it has been in the past. The smutted heads are black and filled with millions of black smut spores contained within a thin membrane. This membrane is easily broken, releasing the black powdery spores. Do not confuse loose smut with ergot. Ergot forms a very hard black sclerotium in the head that is not easily crushed and resembles mouse droppings.

Take-all and root and crown rot are causing plants to ripen early and kernels to shrink. All of the tillers will show symptoms and examination of the crowns and roots reveals the shiny black mycelial mat of take-all or the brown discoloration of crown and root rot.

John E. Watkins
Extension Plant Pathologist

Wheat condition update

According to the Nebraska Agricultural Statistics Service report of June 25, winter wheat condition declined and was rated 71% good to excellent, 21% fair, and 8% poor to very poor. The percent of crop turning color moved quickly to 43%. This is almost two weeks behind normal. Harvest in southern Nebraska is expected to begin in two to three weeks.
Early spring was very dry in much of Nebraska, followed by cool wet conditions that didn’t allow wheat producers to treat weeds.

For winter wheat fields with weed populations that may interfere with 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 seven days before harvest. Not all brands of 2,4-D are labelled for use as a harvest aid treatment, so be sure to check the label.

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.

Consider the following factors before applying Ally + 2,4-D as a harvest aid:

### Crop condition

According to the Nebraska Agricultural Statistics Service, corn condition declined last week to 55% good to excellent, 40% fair and 5% poor to very poor.

Soybean condition declined to 54% good to excellent, 43% fair and 3% poor. Plant emergence was rated at 88%, which compares with 97% for the five-year average.

Sorghum condition was rated at 45% good to excellent, 48% fair and 7% poor to very poor.
Stop volunteer rye and jointed goatgrass

Volunteer rye and jointed goatgrass are winter annual weeds that 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 jointed goatgrass joints. Rye cannot be satisfactorily removed from winter wheat.

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. Many rye infestations also begin this way. 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 control is not possible. 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. Be sure to match atrazine rate to soil pH, organic matter, and soil texture. Tillage will plant more seeds, but reduces the amount of residue and makes the soil more susceptible to erosion.

Robert N. Klein, Extension Cropping Systems Specialist
West Central District
Drew J. Lyon, Extension Dryland Cropping Systems Specialist
Panhandle District

Control grasshoppers when small

Rangeland grasshoppers are fairly numerous in several areas of western Nebraska. The hatch may not be completed, but ranchers should check the more productive forage areas they want protected (hay meadows, alfalfa, etc.).

Grasshoppers are much easier to control when small. As they become larger nymphs or adults, insecticides are less effective and the grasshoppers can move farther to infest increasingly larger areas. Economic infestation levels depend to some extent on climate and range condition, but generally 15-20 nymphs or 8-12 adults per square yard are enough to justify treatment.

One species (Melanoplus sanguinipes) may be present in alfalfa. Treating an uncut strip, which will harbor most of the grasshoppers, may be the most economic treatment. Many insecticides are registered for grasshopper control. When selecting one, read the product label to determine grazing or harvest restrictions for lactating dairy cattle and treatment-slaughter intervals for beef cattle.

Jack Campbell
Extension Entomologist
West Central District
Cultivation increases erosion potential

Agricultural producers usually think of row crop cultivation as a practice to reduce weed pressure. While this is true, it is also a tillage operation that incorporates crop residue. With less residue on the soil surface after cultivation, soil is more susceptible to raindrop impact. With intense rains, or rains of long duration or frequency, soil particles can easily be dislodged and then contribute to increased soil erosion.

Row crop cultivation is typically performed with sweeps although chisel shanks may be used. In ridge tillage “hillers” are used. Each of these tools can incorporate different amounts of residue. When cultivating it is imperative to minimize the amount of residue incorporated and maintain erosion control.

The only other erosion control “tool” present at cultivation is the growing plant. The plant may trap raindrops and prevent them from reaching the soil surface. Plants also may reduce raindrop impact by first intercepting raindrops and then allowing them to fall a short distance from the plant to the soil.

Unfortunately, any crop canopy at cultivation is not well developed and does not protect much of the soil surface. The crop canopy, when combined with residue cover, provides fairly good erosion protection. However, cultivation will markedly reduce residue cover, exposing more soil to raindrop impact. Many weeks pass after cultivation before the crop canopy provides enough erosion control to compensate for the reduction in surface residue cover.

In general, row crop cultivation can incorporate 40% to 80% of surface residues. The extent to which cultivation ultimately incorporates residue and reduces erosion control also depends upon the crop being grown, crop residue type and the amount of crop residue after planting.

In the adjoining table, soil loss is estimated for several cropping and tillage options common to Nebraska. All values are calculated on a relative basis using cultivated continuous corn with conventional tillage as the standard for comparison.

For all rotations, soil loss is greatest for conventional tillage because of the lack of residue on the soil surface in the spring and summer when rains are most prevalent. Soil loss is less for conservation tillage and is further reduced in no tillage systems.

Cultivation has little effect on soil loss in conventional tillage because there is little residue to incorporate. In fact, soil loss with cultivation in conventional tillage may be a bit less than without cultivation because cultivation roughens the soil surface so it can trap more water than if the surface were smooth. However, soil loss is still very high.

Adding soybeans in a rotation increases soil loss because little residue is produced and it breaks down rapidly. Drilled soybeans typically are not cultivated in Nebraska but row crop cultivation can be an option if weed growth is a problem.

With conservation tillage and no-till systems, eliminating row crop cultivation can reduce soil loss 6% to 9% depending upon the crop rotation and row width being used. Eliminating row crop cultivation is one more management decision

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Relative soil loss associated with cropping and tillage options with and without row crop cultivation.

<table>
<thead>
<tr>
<th>Tillage system</th>
<th>Crop rotation</th>
<th>With Cultivation</th>
<th>Without Cultivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% of potential soil loss+</td>
<td></td>
</tr>
<tr>
<td>Conventional tillage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous corn (wide row)</td>
<td>100</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>Corn (wide row)/Soybean (wide row)</td>
<td>124</td>
<td>126</td>
<td></td>
</tr>
<tr>
<td>Corn (wide row)/Soybean (drilled)</td>
<td>123</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>Conservation tillage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous corn (wide row)</td>
<td>48</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Corn (wide row)/Soybean (wide row)</td>
<td>71</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Corn (wide row)/Soybean (drilled)</td>
<td>68</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>No tillage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous corn (wide row)</td>
<td>26</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Corn (wide row)/Soybean (wide row)</td>
<td>39</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Corn (wide row)/Soybean (drilled)</td>
<td>37</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

+ All values are compared to cultivated continuous corn with conventional tillage.

¶Sorghum can be substituted for corn in the table as corn and sorghum provided the same erosion control.
Stalk borers found; chemical control measures not recommended

Several reports of common stalk borer in corn have been received in the last several days. Traditionally, this insect was a problem only in the outer few rows of corn next to weedy or grassy areas. In recent years, we have noticed more problems across fields rather than just around the borders and this may reflect changes in cropping, particularly with more reduced or no tillage farming.

Female stalk borer moths lay their eggs on dry grasses in late summer and early fall. The eggs overwinter there and do not hatch until spring when the new growth or crop of weeds and grasses is beginning to grow. Generally, the borers feed on small stemmed grasses or weeds as long as they can, but they often will eventually outgrow these plants and then have a tendency to migrate to larger hosts such as nearby corn plants. Larvae feed for a total of about 10 weeks and then pupate in the soil before emerging in late summer and fall to complete the one generation per year life cycle.

Cultivation

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that can protect valuable topsoil from the erosive forces of rainfall and runoff. For producers interested in keeping their investment in fertilizers, pesticides, organic matter accumulation, nutrient-supplying capacity and good soil water-holding capacity on the land, every opportunity to control erosion must be seized.

Alice J. Jones, Extension Specialist, Soil Erosion Control/Conservation Tillage

Those of you that are tracking growing degree day accumulations this year may want to know that movement to corn usually occurs in the area of 1100 to 1300 GDD (base is 41 degrees F) with 50% migration at about 1650 GDD.

The young larvae are purple to black in color with longitudinal white stripes at the front and rear ends of the body. The stripes are interrupted at mid-body by a solid dark purple band. Fully grown larvae do not have the characteristic stripes and band, but are uniformly dirty grey in color. Fully grown larvae can be 1 inch long.

Chemical control of the common stalk borer is not usually suggested, primarily because this insect tends to be isolated to a few spots in a field or to the few rows around a field border. Also, the larvae often are protected from insecticides by the stalk of the host that they are in and control is therefore nearly impossible unless timed when they are moving from one host to another.

Steve Danielson
Extension Entomologist

Survey fields, calculate threshold for treating European corn borers

European corn borer moths have been emerging since the first week in June in south central Nebraska, and eggs were beginning to hatch during the week of June 19 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. Moths prefer to lay eggs on taller plants in an area. Because of this and the poor survival of borers on smaller plants, scouting should begin in fields with taller corn than neighboring 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 present. 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 damaged 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 advantage of this natural control.

Enter field scouting information into the worksheet. This takes

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European corn borer (Continued from page 111)

you through the calculations to estimate potential yield loss if all the corn borers survive to bore into the stalk, the preventable loss if an insecticide is used, and 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 using 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, South Central District

Management worksheet
First generation European corn borer

1. Yield potential (bu/acre) for this field
   Example  Your field
   125

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  Your field
   2

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  Your field
   12.5

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

5. Preventable loss/acre (assume insecticide is 75% effective*) = Dollar loss/acre x percent control
   Example  Your field
   $23.44

6. Treatment costs/acre = Insecticide cost + application cost
   Example  Your field
   $12.00

7. Compare preventable loss (5) with treatment costs (6)
   Example  Your field
   $11.44

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.
Clean harvest equipment and storage facilities

Now is a good time to clean storage areas and harvesting equipment to protect the new wheat crop from storage pests. By eliminating leftover grain, dust, and trash, you reduce the likelihood that insects will move from these areas to the newly harvested grain.

You also may want to spray these areas with a residual insecticide such as malathion or methoxychlor to kill any insects hiding during cleaning. Once the spray is dry, it is safe to contact with grain. Always follow product label instructions and precautions when working with pesticides.

Steve Danielson
Extension Entomologist

Special crops offer protection from insect pests

The Environmental Protection Agency has cleared three crops that produce their own insecticides to be used on farms, but not sold. The decision will allow companies to increase seed stock in preparation for when the varieties are approved for commercial release.

The three crops are corn, developed by Ciba, and cotton and potatoes, developed by Monsanto. Over 8,000 acres of potatoes will be planted, 36,000 acres of cotton, and 9,000 acres of corn.

Larry Schulze
Environmental Programs

Wind injures young sugar beet plants

Recent episodes of strong wind injured young sugar beet plants and caused a significant loss of stand in some fields. The hypocotyl is injured at soil level especially when the soil surface is crusted. Oscillation of plants back and forth results in girdling or break down of hypocotyl or root tissue which may resemble damage from fungi. The injury later develops into 'strangles,' a constriction in the tap root at or just below soil level. The tap root continues to swell above and below the constriction and disturbances of cultivation or wind eventually break off the top of the plant. The condition is most often observed in plants up to the six or eight-leaf stage. Another injury caused by high winds is abrasion or sand blasting of cotyledons and leaves of young plants.

Shelter provided between the rows, i.e. cover crops, crop residue, or soil roughness left by cultivation, may provide adequate protection on light sandy soils where wind injury is most severe.

Eric Kerr, Extension Plant Pathologist
John Smith, Machinery Systems Engineer
Panhandle District

Pesticide registration process speeded up

As part of EPA efforts to allow less risky pesticides to enter the market more quickly, in 1994 it registered 31 new pesticide active ingredients. A high proportion, 15, or nearly half, were biologically based pesticides, which are the fastest growing segment of registration activity. Biological pesticides generally pose fewer risks to the environment.

Kansas disease update

The following report was compiled from the Kansas Department of Agriculture weekly pest survey results.

Wheat scab was at high levels in a number of fields visited in northeast Kansas. Incidence in several fields was greater than 70% of the heads.

Although not as much as the 1993 wipe out, incidence levels were extremely high and should be of concern because of yields and potential toxins produced by the scab fungus. Infected heads averaged three to five good berries compared to 20-24 berries of healthy appearing heads.

A welcomed new disease into Kansas was the musk thistle rust, Puccinia cordourum. The rust was released by the United States Department of Agriculture in 1987 in Virginia and by 1992 had found its way through much of the Ohio Valley. Last year the fungus was in central Missouri. This year, it was found to be widespread in northwest Missouri. The first report in Kansas was made in Miami County two years ago.

A leaf spot was associated with musk thistle in northeast Kansas. Septoria leaf spot was at moderate levels and defoliated the lower leaves of plants at many sites. The disease appeared as a brown circular, 1/4-inch spot. Spots coalesced in severe infections killing entire leaves. The black pycnidia of the fungus was present within the spots. The leaf spot has been reported on various thistle species through much of the United States.

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Plants catching up with lost heat units

After two weeks of relatively dry weather, scattered thunderstorms last week were a refreshing change. The heaviest totals were recorded over the western Sandhills, extreme south central, and southwest Nebraska, which received over one inch while most of the rest of the state received less than 1/2 inch.

The dry spell benefitted crops. Planting is statistically complete and most of the major grain crop acreage has emerged or will emerge within the next seven days. The warm temperatures over gave the corn crop an additional growing boost. GDD accumulations from April 15 were averaging 17 days behind normal at the beginning of June. As of June 26, they are averaging 10 days behind normal. Since the majority of the corn crop emerged 14 to 17 days behind normal, the crop has gained three to five days in the past three weeks. It is now running about 10 to 14 days behind where it should be at this time of year.

The National Weather Service has indicated that temperatures over the next five weeks across the state will have a tendency to be normal to below normal. Precipitation is not shown to have any tendency, as there is an equal chance for below normal, normal, and above normal rainfall across the state. In the short term, the forecast for July 2-9 calls for above normal precipitation coupled with below normal temperatures.

Al Dutcher
State Climatologist