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Lisa Brown Jasa
University of Nebraska-Lincoln, ljasa@unlnotes.unl.edu

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Research indicates:  

**Dry matter not lost after corn maturity**

Nebraska’s corn crop is maturing earlier and faster than normal, eliminating the need for grain drying in many areas. At this stage, deciding when to harvest and what fields to harvest first may depend more on the threat of lodging, stalk rot or other diseases. Scout fields continually for signs of lodging or stalk rot and schedule harvest accordingly.

With corn maturing earlier than usual, dry down is beginning when the climate is still hot and dry. With the harvest period possibly more compressed than usual, producers trying to plan for harvest may be wondering about whether kernel weight decreases after drydown.

There have been reports in the popular press that corn dry matter decreased for every percent loss in moisture as corn dried in the field after black layer. The decreases were associated with specific hybrids and were linked to seed respiration.

Research in Nebraska and in other states has not supported this. A review of related research showed that in most of the studies no changes in kernel dry weight were observed after black layer. In one report, however, four of 18 hybrids and five of 42 hybrids studied had changes in kernel dry matter as corn dried from 35% to about 15% grain moisture. Of the hybrids with changes, some had increased dry matter and some had decreased dry matter, but none of the changes were consistent from year to year.

Trials conducted in south central Nebraska from 1995 to 1997 with various hybrids found no evidence of kernel dry matter loss after physiological maturity. These trials are reported more fully in *Corn Grain Yield and Kernel Weight Stability After Black Layer*, NU Extension NebGuide, G1398. (Available on the Web at http://www.ianr.unl.edu/pubs/fieldcrops/g1398.htm.)

**Factors affecting drydown**

You may notice how various hybrids dry down at different rates. Bob Nielsen, an agronomist at Purdue University, recently wrote in *Post-Maturity Grain Drydown* that “Certain hybrid characteristics interact to influence grain moisture loss rates. The relative importance of each trait varies throughout the duration of the field drydown process.” He notes that grain moisture loss will be more rapid in those varieties:

- with fewer or thinner husk leaves;
- where leaf senescence occurs earlier;
- where less husk covers the tip of the ear;
- where the husk covering the ear is loose;
- with earlier ear drop to a downward position;
- with a narrow cob diameter; and
- with thinner pericarp thickness.

Nielsen’s column is available at: http://www.agry.purdue.edu/ext/corn/news/articles.00/Grain_Drydown-0819.html.

**Recommendation**

Harvest schedules should be based on grain moisture, stalk quality, and ear retention after black layer. Producers should monitor these variables of individual corn hybrids and fields and base decisions on these variables rather than on concerns of dry matter loss.

Roger Elmore, Extension Crops Specialist, South Central REC
Crop updates

**Tom Dorn, Extension educator in Lancaster County**, based on a field survey Monday (Aug. 28):

**Corn** -- Ears formed and filled fairly well with few barren tips, thanks to the 10 inches of rain in June and July. When the rain shut off in early August, most corn was in the dough stage. Soil moisture was quickly depleted and leaves on nearly all dryland corn “fired”, leaving little green tissue to contribute additional dry matter to the grain crop. Consequently, most ears are “loose” when twisted by hand. Yield reduction from early death of the leaves may be about 15%-20%.

**Soybeans** -- Soybeans are highly variable. In some fields, areas with reduced soil moisture due to lighter soil texture, weed pressure, or excessive tillage contributed to the beans dying early (August 10-15). The 2.5 inches of rain in August revived areas that had not already undergone senescence. Most fields have only about 0.75 to 1 inch of soil moisture available.

**Grain sorghum** -- Heads are fair to average size and filling fairly well in most fields. Most milo fields would still benefit from additional rain.

Barb Ogg, Extension educator in Lancaster County, has reported higher than normal chinch bug numbers in crops and bunch grasses this year. Plan accordingly when selecting crop rotations for next year.

**Roy Seymour, Extension educator in Adams County**: Irrigated crops are in good condition and showing signs of early maturity. Dryland crops range from moderate moisture stress to dying due to lack of soil moisture.

**Corn** - Plants are in the hard dent stage with the starch layer from 1/2 to 3/4 down the length of the kernels. Gray leaf spot was noticed in all irrigated corn fields checked.

**Soybeans** -- The plants are in the R6 stage. The number of bean leaf beetles has increased significantly, ranging from two to four per sweep of a net in fields that were checked. These beetles had caused about 10%-20% defoliation as well as some minor pod scarring. Velvetbean caterpillars and yellow woolybear were also found in the soybeans. An average of about one worm per sweep was found in the fields with 20%-30% defoliation.

**Sorghum** -- Plants are in the soft dough stage and look good. No pest infestations were noticed.

**Gary Hall, Extension educator in Phelps County**: Some dryland corn has been harvested in Phelps County. Irrigated crops look good and average to above average yields are expected. Silage is being harvested in many areas. Most of the irrigation has ceased and pipe is being picked up in many fields. Drydown of corn and soybeans is expected to go quickly.

**Jennifer Chaky, director of the NU Plant and Pest Diagnostic Clinic**: The following diseases were diagnosed Aug 15-29 in the Clinic:

- **Alfalfa** -- slime mold (Sherman county);
- **Corn** -- Fusarium stalk rot (Phelps County), Goss’s bacterial wilt and blight (Hall, Logan, and Platte Counties), gray leaf spot (Merrick and Platte Counties), MCMV (Gosper and Kearney Counties) and Stewart’s bacterial wilt (Dawson and Holt Counties);
- **Soybean** -- bacterial blight (Phelps County).

**Terry Gompert, Extension educator in Knox County**: We caught rains too late to help previously damaged crops. Those crops with low yields (under 30 bushel for corn and under 15 bushels for soybeans) do not have economical harvest options. In this area a solution is to graze the crops and rest the pasture.

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Late-season soybean diseases affecting seed quality and harvest decisions

As soybean fields reach maturity there are some diseases which may affect seed quality and affect your harvest decisions. Based on what I have seen in fields this season, it appears there is a potential for Phomopsis seed decay, Alternaria pod and seed decay, and poor quality seed associated with plants infected with bean pod mottle virus.

We have seen a high incidence of bean pod mottle virus in some fields and in most cases this will result in poor seed quality due to seed mottling in infected plants. In addition, plants infected with bean pod mottle virus may have green stems after the pods have matured which can make harvest difficult. Plants infected with bean pod mottle virus also can have higher levels of Phomopsis seed decay. Phomopsis seed decay is caused by *Phomopsis spp.*, which survive in crop debris. *Phomopsis* is a fungus commonly found in Nebraska and is usually more of a problem in food grade soybean production. Symptoms of Phomopsis seed decay are shriveled, elongated, and cracked seeds. Seeds infected with Phomopsis may also appear chalky, but seeds can be infected and show no symptoms. More severe infection often occurs when harvest is delayed and when warm, humid weather occurs near maturity or after. Often infection will be more severe at the bottom of the plant than at the top and when insect damage occurs.

Another problem associated with injury from insect feeding is Alternaria pod and seed decay. With the high bean leaf beetle populations this year, we expect a lot of this in fields with heavy feeding pressure. *Alternaria* is an opportunistic fungus that infects and decays the seeds by using the beetle feeding site as a doorway into the pod. Symptoms of Alternaria pod and seed decay include shriveled, dark, discolored seed. Without beetle feeding on the pods, this will generally not occur.

These three problems will not occur in all fields, but if you have any history of these problems or if you have pod feeding by bean leaf beetles, there is a strong possibility that you may have some of these problems this year.

Consider harvesting fields with these problems first to reduce the impact of the disease. For example, fields with a history of Phomopsis that are maturing early should be harvested first to reduce the potential of higher amounts of pod infection. Also consider which fields have a history of soilborne diseases such as soybean cyst nematode, sclerotinia stem rot, or sudden death syndrome. Harvest these fields last, assuming these other factors do not put your crop at high risk, to reduce any potential movement of the soilborne problems.

Loren J. Giesler
Extension Plant Pathologist

**Harvest soybeans early to avoid overdrying**

Producers sustain a loss of potential income when selling soybeans below 13% moisture content because soybeans are sold by weight. Soybeans dry very quickly after reaching maturity and should be harvested before they become overly dry. At full maturity (R8), 95% of the pods have reached their mature pod color. From this time, only about 5 to 10 good drying days are needed before harvest. Combine harvest of soybeans can start anytime the moisture content is below 18%.

Often harvest can begin when there are still some leaves attached and some of the stems are still green. (See *Combine Adjustment Tips*, page 182, for help on handling green stems and tough threshing conditions.) Delaying harvest greatly increases shatter losses and overdries the soybeans. The table (see page 182) is based on a yield of 50 bushels per acre. It illustrates the potential losses from marketing low moisture soybeans. The table assumes that all 50 bushels per acre get harvested. The loss of potential income is even greater when you consider harvest losses due to shattering. Shattering losses increase as moisture content decreases and can easily exceed 10%. Ten percent of 50 bushels per acre at $5 per bushel (approximate loan rate for soybeans) results in an additional loss of $25 per acre.

To reduce these problems, follow these tips:

- Start harvest the first time soybeans reach 14% moisture when shatter losses are lower.
- If binning the soybeans, start at 16% moisture and aerate to dry down to an average of 13%.
- The elevator price dock for beans at 14% moisture is usually

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Soybean harvest
(Continued from page 181)

less than the income loss of selling 12% beans, and the shatter losses are higher at 12%.

Harvest overly dried soybeans after a rain or in the morning after a dew, when the pods are damp and the beans may have a higher moisture content.

Shatter losses are far higher after several wetting and drying cycles of the pods.

Paul Jasa
Extension Engineer

<table>
<thead>
<tr>
<th>Price, $/bu</th>
<th>Market Loss, $/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Content, percent</td>
<td>13.0</td>
</tr>
<tr>
<td>4.50</td>
<td>0.00</td>
</tr>
<tr>
<td>5.00</td>
<td>0.00</td>
</tr>
<tr>
<td>5.50</td>
<td>0.00</td>
</tr>
<tr>
<td>6.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6.50</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Equivalent bu/A because of reduced moisture

50.0 | 49.4 | 48.9 | 48.3 | 47.8 | 47.3

Combine adjustment tips for soybeans

One key to maximizing profits is to make sure you harvest and sell every soybean you raise. Harvest losses often approach 10% of the yield according to several university studies and damaged grain gets docked at the market. Harvesting overly dry soybeans increases both harvest losses due to shattering and damage due to splits. (See Harvest soybeans early, page 181.) This year, however, timing the harvest may be a little more difficult as some areas of the fields are maturing early and will be overly dry while others may still be green and difficult to thresh.

Proper combine adjustment and operation gets more beans in the bin and reduces damage. Start with the combine owner’s manual and read it in detail to be totally familiar with the machine. You must become a combine operator, not just a combine driver. Often times, the settings must be changed during the day or even on-the-go when passing through the field. Some general guidelines and operating tips are:

Operate the head as low as possible to harvest all the lower pods. A floating cutterbar or flex-head allows the head to follow the ground contours. Automatic header height control keeps the head low and minimizes gouging soil with the sickle. The sickle should be operated with the guard points tilted slightly upward (about 5 degrees) to reduce gouging and improve feeding. The head needs to be kept parallel to the ground to avoid gouging the soil on the ends. Tilting heads with automatic control (field trackers) makes this easier, especially on wider heads.

Operate the reel about 25% faster than the ground speed. The reel should rotate at about 10 to 11 revolutions per minute per mile an hour of ground speed for a standard 42-inch reel (ie: 30 rpm for 3 mph). Operating the reel too fast increases shattering losses greatly and may result in the reel carrying some soybean plants up and over the reel, out of the head. A spot of paint on one reel bat makes it easier to count the rpm.

Due to the drought, soybeans may be mature, green or overly dry in the same field, complicating harvest and requiring on-the-go adjustments. (IANR Photo)

Operate the reel in the right position compared to the sickle. When the soybean plants are standing good, the reel should be about 6 to 9 inches ahead of the sickle, about 12 inches above the ground. This allows the reel to catch the plants in the upper third of the plant, gently laying them into

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Combine tips (Continued from page 182)

the head in front of the auger. When the soybean plants are lodged or tangled, operate the reel about 9 to 12 inches ahead of the sickle and about 1 inch above the ground, to pick up the plants before the sickle cuts them off. Slow the reel down in lodged soybeans to reduce shattering.

Adjust the auger to feed in the soybean plants. The auger should be as low as possible in the header tray (virtually no clearance when the head is flexed up) to reduce feeding problems. Also, the stripper should be set to just touch the auger. By minimizing the gaps, the auger can more aggressively pull the crop away from the sickle and feed with little bunching. Worn augers can be sharpened with a portable grinder to give them a square edge to better grip green stems. Do not move the reel closer to the auger to aid in feeding as this usually lays the soybean plants on the auger rather than under it. With a close reel placement, shattering losses by the auger are higher and the reel is more likely to carry plants up and over the reel.

Adjust the concave and cylinder/rotor speed for best threshing. Close down the concave slightly for green stems, higher moisture content beans, or other tough threshing conditions (first choice). As with the auger, the reduced clearances aid in feeding. Speed up the cylinder/rotor slightly for green stems, higher moisture content beans, or other tough threshing conditions (second choice as higher speed may increase damage). To minimize damage open up the concave and/or slow down the cylinder/rotor throughout the day as the soybeans dry and become easier to thresh. Reset them as the dew comes near nightfall or the next morning.

Adjust the airflow in the separator to reduce losses. Increase the fan speed and direct the air further back in the cleaning shoe when harvesting higher moisture content beans or soybeans with green stems. Without the increased airflow, the heavy green materials will not "float" above the sieves and will carry beans out the back of the combine. Reduce the fan speed when harvesting overly dry beans and small beans to avoid blowing the lightweight beans out of the back of the combine. The loss monitor can give some guidance on the adjustment but too great of airflow may blow beans out the back without contacting the sensor.

Make changes on-the-go to match crop conditions. Experience is one of the best teachers on how and when to make the adjustments. On newer combines, most of the adjust-ments mentioned can be made on-the-go, from the cab. However, the operator must stop periodically to check harvest losses, in front of, beneath, and behind the combine. This will allow evaluation of preharvest, header, and total losses, respectively. By identifying the type of loss and where it occurred, adjustments can be made to improve harvesting efficiency and profitability. On fields with wide variability in growth and maturity, it may be advantageous to harvest it in sections, adjusting the combine to match the crop conditions in each section.  

Paul Jasa  
Extension Engineer

Crops maturing ahead of normal; condition continues to decline

The Nebraska Agricultural Statistics Service reported Monday that corn condition declined last week and rated 17% very poor, 14% poor, 28% fair, 32% good, and 9% excellent. Irrigated corn condition declined to 58% good to excellent while dryland corn declined to 13% good to excellent.

Reports indicated that 92% of the crop was in or beyond the dough stage, this compared with 89% last year and 81% average. About 64% had dented, last year at this time 45% had dented while the average was 34%. Twelve percent had matured, 1% had reached this stage last year and for the five year average. Seed corn harvest was beginning and field corn harvest is anticipated to begin by mid September.

Soybean condition rated 20% very poor, 23% poor, 34% fair, 21% good, and 2% excellent. By week's end, 34% of the crop had turned color, over three weeks ahead of average. Fifteen percent were dropping leaves, also well ahead of average. Alternative harvest plans were being considered in the worst drought stressed areas.

Sorghum condition rated 19% very poor, 21% poor, 36% fair, 23% good, and 1% excellent. The crop was 56% colored by weeks end, well ahead of last year and average at 23%. About 3% was mature.

The first cutting of alfalfa progressed to 82% harvested; this compared to 77% last year and an average of 64%. Producers who will be able to take four cuttings this summer were 9% complete, none of the fourth cutting had been harvested at this time last year. Condition of the alfalfa crop rated 29% very poor, 29% poor, 28% fair, 13% good, and 1% excellent.

Pasture and range condition declined and rated 50% very poor, 33% poor, 14% fair, and 3% good. Producers continued to move cattle around or off pastures, provide supplemental hay and/or protein, or move cattle to market.

Nebraska Agricultural Statistics Service
Predicting the last irrigation

Determining when to apply the last irrigation for the season is an important water management decision. While shutting off too early could potentially reduce yield, running later than necessary reduces room for storing off-season precipitation, increases the potential for leaching nitrogen, and adds to production costs. Balancing between the two requires knowledge of how much water is available in the root zone and how much more water the crop will need to reach physiological maturity.

Water requirements to reach maturity depend on the crop and growth stage. Table 1 gives the approximate number of days to maturity and estimated water use “typical” for south central Nebraska for various growth stages of corn, grain sorghum and soybeans. (See table on page 186 for soybean water needs during the four stages of R6.)

The last irrigation usually can be applied two to four weeks before physiological maturity, depending on the water holding capacity of the soil (Table 2). This will leave room in the soil moisture reservoir for storing off-season precipitation. Typically, 60% of the available moisture in the top four feet of the root zone can be depleted at crop maturity without reducing grain yield. Table 2 gives the minimum allowable balance for common soil textures.

Producers should monitor soil moisture to determine if another irrigation is needed. The current soil water status in the crop root zone can be measured or estimated “by feel” and the remaining usable moisture in the root zone can be calculated by subtracting the minimum allowable balance (see worksheet). The need for additional irrigation can be determined if you know the predicted water requirement to reach maturity and the remaining usable moisture.

For more information, see NebGuides G84-690, Estimating Soil Moisture by Appearance and Feel (http://www.ianr.unl.edu/pubs/irrigation/g690.htm), and G82-602, Predicting the Last Irrigation for Corn, Grain Sorghum and Soybeans (http://www.ianr.unl.edu/pubs/irrigation/g602.htm) available from your local University of Nebraska Cooperative Extension office or on the Web.

Paul Jasa
Extension Engineer

Worksheet to determine last irrigation

<table>
<thead>
<tr>
<th>Field</th>
<th>Crop</th>
<th>Soil type</th>
<th>Date</th>
<th>Present stage of growth</th>
<th>1. Water needed to reach crop maturity, in inches (Table 1)</th>
<th>2. Current soil water balance, in inches (estimated in field)</th>
<th>3. Minimum allowable balance, in inches (Table 2)</th>
<th>4. Remaining usable moisture, in inches (Line 2 minus Line 3)</th>
<th>5. Irrigation requirement assuming no rainfall, in inches (Line 1 minus Line 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: If Line 4 is greater than or equal to Line 1, another irrigation is not needed.

Table 1. Normal water requirements for corn, grain sorghum, and soybeans between various stages of growth and maturity.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Approximate water use (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td></td>
</tr>
<tr>
<td>Beginning dent</td>
<td>24</td>
</tr>
<tr>
<td>Full dent</td>
<td>13</td>
</tr>
<tr>
<td>Black layer</td>
<td>0</td>
</tr>
<tr>
<td>Grain sorghum</td>
<td></td>
</tr>
<tr>
<td>Soft dough</td>
<td>23</td>
</tr>
<tr>
<td>Hard dough</td>
<td>12</td>
</tr>
<tr>
<td>Black layer</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td></td>
</tr>
<tr>
<td>Beginning seed fill</td>
<td>29</td>
</tr>
<tr>
<td>Full seed fill</td>
<td>17</td>
</tr>
<tr>
<td>Beginning maturity</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2. Available water capacity for various soil types and minimum allowable balances at physiological maturity.

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Available water capacity (inches/foot)</th>
<th>Minimum allowable balance in top 4 feet of soil profile (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silty clay loam</td>
<td>1.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Upland silt loam</td>
<td>2.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Bottomland silt loam</td>
<td>2.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Very fine sandy loam</td>
<td>1.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Sandy loam</td>
<td>1.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Fine sands</td>
<td>1.0</td>
<td>1.6</td>
</tr>
</tbody>
</table>

*Based on depletion of 60% of the available water.
Test for nitrates in damaged forage and silage

When planning to use a drought or hail damaged field for grazing, forage, or silage, consider having it tested for nitrates to avoid inadvertently poisoning livestock. Many times, drought or hail stressed crops contain high levels of nitrates. If selling the crop, the buyer may request a test and base the price accordingly. If levels are high, the field may need to be harvested differently or feed rations may need to be mixed differently.

Silage

Making silage may seem the safest route for handling high nitrate plants since the fermentation process usually reduces the nitrate content of the feed—sometimes by as much as 40% to 60%. Using silage too quickly after chopping, however, can be deadly. During the first few days of early fermentation the chopped forage begins to heat, converting nitrates into nitrites. Nitrites are as much as 10 times more poisonous to cattle than nitrates. These nitrites are then converted into other compounds that make them less toxic.

If you feed freshly chopped forage before it has completed its full fermentation cycle, you risk providing highly poisonous forage filled with nitrates.

To avoid feeding high-nitrate or high-nitrite silage, wait four weeks after chopping before feeding fresh silage. Test your silage for nitrates before feeding. Crops normally have lower nitrate levels at maturity, so harvest when the crop is as near

maturity as possible. If the corn or sorghum field being harvested as silage has been identified as or is suspected of having high nitrate concentrations, raise the cutter head to selectively avoid stalk bases that have the highest nitrate concentration.

Forages

Forages that contain high nitrate levels can be diluted in the diet with grains or with other forages low in nitrates and then can be fed safely. This can be accomplished easily in feedlot rations where grain is fed and forages are chopped and mixed as a complete ration. Feeding grain in combination with high nitrate

(Continued on page 187)

Late-season growth stages of soybean

This table may be useful when trying to determine the timing and amount of late-season irrigations on soybeans.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Stage Description</th>
<th>Estimated Days to R7</th>
<th>Estimated Water use to R7''</th>
</tr>
</thead>
<tbody>
<tr>
<td>R 6.0</td>
<td>Full seed stage. <strong>One pod</strong> in the top four nodes contains <strong>a seed</strong> that fills the entire seed cavity.</td>
<td>15%</td>
<td>18</td>
</tr>
<tr>
<td>R 6.5</td>
<td><strong>All the normal pods</strong> on the top four nodes have pod cavities completely filled, suture to suture with seeds. (Leaf senescence (yellowing) begins in the lower canopy just before this and progresses upward.)</td>
<td>50%</td>
<td>9</td>
</tr>
<tr>
<td>R 6.75</td>
<td>Leaf senescence (yellowing)' is very noticeable in the upper nodes. Pods are becoming more yellow.</td>
<td>50%</td>
<td>9</td>
</tr>
<tr>
<td>R 6.8</td>
<td>Pods on all positions on the stem are losing green color and some are entirely free of green (that is they are yellow).</td>
<td>50%</td>
<td>9</td>
</tr>
<tr>
<td>R 7.0</td>
<td>Physiological maturity. One normal pod on the main stem has reached its mature pod color.</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>R 8.0</td>
<td>Ninety-five percent of the pods have reached their mature pod color. Five to 10 days to harvest.</td>
<td>100%</td>
<td>0</td>
</tr>
</tbody>
</table>

'Leaf senescence is sometimes hard to see. For that reason, seed size within pods at R 6.5 and pod color at R 6.75 may be easier signs to use than leaf color. To discern between normal plant senescence and premature plant death: leaf petioles of plants that have died due to stress (e.g. heat, drought, frost, etc.) remain attached; they do not drop off easily.

**Adapted from NebGuide G82-602, Predicting the Last Irrigation for Corn, Grain Sorghum, and Soybeans.

Roger Elmore, Extension Crops Specialist
The greater U.S. grain market and the effects of this year's climate

Virtually everyone is aware of the drought problems that have plagued Nebraska this growing season. The grain markets consistently discounted negative yield implications from our state for most of the growing season. Instead, they focused on expectations that bumper yields from the eastern corn belt would offset yield declines here. USDA corn production estimates at the beginning of August pegged the national crop at 10.3 billion bushels, with soybeans coming in at 2.9 billion bushels.

The August forecast was released two weeks after the national crop condition report peaked for both corn and soybeans. On July 23, 75% of the corn crop was reported in good to excellent condition, but this declined to 67% good to excellent August 27. The soybean condition rated 68% good to excellent on July 23 and has declined to 58% good to excellent.

Declines in the crop condition reports during the last four weeks have begun to temper expectations of a record U.S. corn and soybean crop. With the 2000 production season rapidly approaching, I have listed regions of the country that are still vulnerable to climatic conditions that could further reduce U.S. grain production.

Frost

Nearly every year a frost scare occurs in the grain market. Even with the early start to this year’s production season, this trend should continue. The area most vulnerable to freeze damage this year will be Michigan, central Minnesota, northern Ohio, and Wisconsin. Crop conditions are favorable for above normal yields in these states.

Abundant rainfall this summer has come at a price. Below normal temperatures place the corn crop two weeks behind normal in Minnesota and northern Ohio, three weeks behind in Michigan, and up to one month behind in Wisconsin. Michigan and Wisconsin have been so cool this summer that receiving a freeze on or before the average date will result in yield losses.

Based on the persistent upper air pattern since May, the Great Lakes and northeastern United States have the greatest likelihood of an early freeze. An early freeze is not anticipated across the western corn belt and would be of little concern since crops are two to three weeks ahead of normal.

Excessive Heat

Above normal temperatures have been a persistent problem across most of the southern and central plains this growing season. The core of this heat wave has been situated over Arkansas, Kansas, Oklahoma, and Texas. Eastern Colorado and southern Nebraska have extended periods of heat, but not to the extreme of our southern counterparts.

Crop conditions continue to deteriorate in this region, with Nebraska dryland corn ratings at 13% good to excellent and irrigated corn at 58% good to excellent as of August 27. Crop conditions have declined steadily for soybeans and sorghum during the past three weeks. Especially troubling are Kansas yield prospects, where the potential for normal to above normal yields has been replaced by the potential for significant crop losses.

Texas producers have estimated losses over $500 million. Wheat planting in Texas and Oklahoma will likely be delayed due to nearly two months of little or no precipitation and daily temperatures exceeding 95 F.

Precipitation

The driest region of the country lies south of the Mason-Dixon line and accounts for about 10% of the U.S. soybean crop. Persistent drought conditions ranging from moderate to extreme can be found from Texas eastward through Georgia. The worst hit areas are central and western Texas, along the Mississippi delta region and southwestern Georgia.

Double cropping is common throughout this region, so late summer and early fall rains could help yields; however, significant yield decreases are expected. It would probably take tropical storm activity to alleviate long-term drought conditions in this region.

Short-term precipitation deficits have been reported in northern Illinois and Indiana and may affect yield. Severe thunderstorm activity during the past weeks damaged many fields in central and southern Illinois.

Crop conditions have deteriorated in Iowa, Kansas, Nebraska over the last three weeks. The most significant crop condition declines have occurred across Kansas with this recent stretch of hot-dry weather. Crop conditions in Nebraska have declined continuously for the last six weeks. Short-term moisture deficits in western Iowa are beginning to impact soybeans, and to a lesser extent, corn.

Persistent wetness in Wisconsin and Michigan has slowed crop maturity. Some soybean stress problems have been reported due to excessive wetness. These two states face an increased risk of frost damage and harvest delays if the current pattern continues for the next 30 days.

(Continued on page 187)
Market/climate
(Continued from page 185)

Lack of rainfall has had a significant impact on pastures. Nebraska leads the nation with 82% of pastures rated poor to very poor. Every state west of the Missouri River is reporting pasture conditions as poor to very poor at least 50% of available acreage. In addition, the southeastern United States is also reporting negative pasture conditions.

Conclusion

If forecasts for continued heat and below normal precipitation during the next two weeks materialize, the September USDA production estimates should be expected to decrease. This would be a repeat of last year when the yield and total production estimates continually declined after the August forecast. There are enough problem areas across the U.S. that final 2000 corn production may slip to less than 10.0 billion bushels, with soybean production slipping below 2.7 billion bushels.

Al Dutcher
State Climatologist
Agricultural Meteorology

Women in Agriculture

The Sept. 14-15 conference, "Women in Agriculture: The Critical Difference", will be held in Kearney and cover topics ranging from marketing and record keeping to estate planning and farming opportunities for the next generation. To register, call (800) 535-3456 or e-mail Deb Rood at drood@unl.edu. The conference fee is $55 if paid before Sept. 8 or $65 after that date.

Keynote speakers are: Gloria Schaefer of Kennebec, S.D., on the strengths women bring to an operation; Mary Kay Muller of Omaha, on how to stay positive during hard times; and Lynette Brown of Oxford, with humorous insights about farm life.

Nitrate testing (Continued from page 185)

Feeds helps reduce the effect of the nitrate content. Energy from the grain apparently helps complete the conversion of nitrate to bacterial protein in the rumen.

Deaths have been reported when nitrate content in the overall diet contained as little as .21% NO3N (.93% NO3-). Rations containing substantially more than .21% NO3N have been fed without harm. One such instance was reported from Missouri where researchers fed rations containing .28% to .33% NO3N from sudangrass hay. Steers were slowly adapted to the high nitrate feed and performed satisfactorily.

Storing silage

Even after silage has been chopped and piled and packed correctly, it still can be damaged seriously by air and moisture slowly penetrating the outer 3 to 4 feet. In fact, good silage can lose 15% to 20% of its feed value from fermentation and spoilage under normal conditions. This loss can be cut in half if covered well by a sheet of plastic.

Cover freshly chopped silage with black plastic immediately after you finish filling the trench, bunker, or pile. Then cover the plastic with something to help hold it down. Old tires often are used because they are readily available and do a good job of keeping plastic from blowing away.

But tires only keep the plastic in direct contact with the silage directly under the tire. In between the tires, air can circulate and cause some spoilage. A better choice would be a solid cover, something like freshly chopped forage or weeds or maybe even a 6-inch layer of manure. Then, the entire surface of silage will be fully protected. For more information on nitrate testing, see Nitrates in Livestock Feeding (Revised March 1988), G74-170, available on the Web at http://www.ianr.unl.edu/pubs/beef/g170.htm

Bruce Anderson
Extension Forage Specialist

Methods of reporting nitrate values in feed

When reviewing nitrate test results and negotiating a price, make sure you're not comparing apples with oranges. Different labs may report results according to different criteria. Following is a guide to understand the results and how to convert results to be more comparable. Note: The amount of nitrate in water usually is expressed as parts per million (ppm) of nitrate nitrogen (NO3N) or nitrate ion (NO3-).

Methods of reporting feed nitrates concentrations (dry basis).

<table>
<thead>
<tr>
<th>Potentially toxic amounts</th>
<th>(ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate nitrogen (NO3N)</td>
<td>Over 0.21, 2,100</td>
</tr>
<tr>
<td>Nitrate (NO3-)</td>
<td>Over 0.93, 9,300</td>
</tr>
<tr>
<td>Potassium nitrate (KNO3)</td>
<td>Over 1.5, 15,000</td>
</tr>
</tbody>
</table>

Formulas for converting methods of reporting:

Potassium Nitrate = Nitrate Nitrogen X 7.22
Potassium Nitrate = Nitrate X 1.63
Nitrate = Nitrate Nitrogen X 4.43
Nitrate = Potassium Nitrate X 0.613
Nitrate Nitrogen = Potassium Nitrate X 0.139
Nitrate Nitrogen = Nitrate X 0.226
High numbers of caterpillars reported in soybeans

We have received several reports of caterpillars abundant in soybeans the last week or so. There seem to be two main types. One is the “woollybear” which will vary in color from white to yellow to orange. It is very hairy and may grow to over 1 ½ inches in length. These caterpillars will feed on the leaves and turn a darker orange as they mature.

Also present are thistle caterpillars. These spiny, black and yellow caterpillars use their webbing to roll up leaves into a “nest” where they will stay protected during the day. Often dark black pellets of frass will be in the nest with the caterpillar. They feed on leaves and may grow to 2 inches in length. They will also feed on thistles and sunflowers.

Normally these caterpillars are not abundant so there has been little field information on which to base treatment thresholds. The one year where woollybears were a serious problem in northeast Nebraska was in 1983, the “PIK” year, when almost 50% of the corn acres went unplanted. Weeds grew in the unplanted fields and it was thought that woollybears became abundant in those fields, and later in the year moved to soybeans. Some soybean fields in southern Cedar County were almost entirely stripped that year. Eventually most of the woollybear caterpillars succumbed to a late season fungus disease.

Soybeans are maturing rapidly this year and most fields should not need to be treated; however, if defoliation is exceeding 35% and beans are more than two weeks away from maturing, a treatment may recover costs. Remember to look at harvest restrictions when choosing a chemical application. Some have 60 day harvest intervals.

Keith Jarvi
Integrated Pest Management
Northeast REC

Precision farming workshop Sept. 6

A Cooperative Extension workshop on precision farming will be held at the Agricultural Research and Development Center near Mead Sept. 6. The Precision Farming Management and Technologies Clinic will be conducted from 7:45 a.m. to 4:30 p.m.

Topics to include in-field calibration of a yield monitor; computer systems need for GPS/GIS software; understanding using digital soil surveys as part of a site specific management system; how to transform data from a yield monitor to a map; interpreting a yield map; and use of remote sensing in crop production. Cost is $115 if registering before Aug. 30 and $165 afterward.

Clinic costs include training, lunch and reference materials. Space is limited for these clinics and will not be guaranteed without a registration payment. For more information, check out the class web site at: http://ianrwww.unl.edu/ianr/ardc/CMDC.htm. To register for these programs, contact:

NU ARDC
CMDC Programs
1071 County Road G
Ithaca, NE 68033
Phone: (402) 624-8030
Fax: (402) 624-8010
Email: cdunbar2@unl.edu.

Keith Glewen, Extension Educator, Saunders County

USDA foreign ag head at UNL Sept. 28

Timothy Galvin, administrator of the U.S. Department of Agriculture’s Foreign Agricultural Service, will speak at the University of Nebraska-Lincoln in September. He will discuss world food production and demand during a lecture at 2 p.m. Sept. 28 at the Nebraska East Union on UNL’s East Campus.

Galvin will talk about whether the United States can simultaneously feed the world and help farmers worldwide become more profitable, said Roy Frederick, NU agricultural economist.

A former legislative assistant to U.S. Sen. Bob Kerrey of Nebraska, Galvin oversees the federal agency’s export promotion, trade policies and economic development in underdeveloped countries.