2001

**Crop Watch No. 2001-21, August 31, 2001**

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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, maybe even less this year considering the warm weather we’re having. 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. This is especially important this year as drought stress may cause some pods to dry down early, increasing shatter losses. The combine needs to be adjusted to handle the green stems and frequently re-adjusted as the crop dries down. Delaying harvest greatly increases shatter losses and overdries the soybeans. Assuming a field yields 50 bushels per acre, the table 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.

Remember to consider LDPs and other government programs when determining the value of the crop. 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%. Aeration is required anyway for temperature control of stored grain.
- The elevator price dock for beans at 14% moisture is usually less than the income loss of selling 12% beans, and the shatter losses.

(Continued on page 189)

Top wheat producers in 2001: Wahoo, Millennium and Alliance

Winter wheat variety results are in from across the state and are now available in EC01-103, The Nebraska Fall-Sown Small Grain Variety Tests. The “blue book” of wheat variety tests is available at local extension offices or on the web at http://varietytest.unl.edu/whttst/2001/wheatbk01.pdf Yields and other traits from the trials closest to your farm should be studied closely for specific adaptation. Highlights of the overall state performance is summarized here. The top three varieties of those tested at every location across the state were Wahoo, Millennium and Alliance.

Select wheat varieties that complement each other and improve your profitability. In this year’s tests it meant a difference of $15-$20 an acre.

Wahoo, new for 2001, is a medium maturing, medium height variety with good to very good winter hardiness and moderate

(Continued on page 189)
Field updates

Karen DeBoer, Extension Educator in Kimball and Banner counties: Proso millet harvest is in full swing in Cheyenne County. Producers are hoping to get the crop harvested before wheat planting begins. In Kimball and Banner counties, wheat seeding is starting and will increase over Labor Day weekend.

Noel Mues, Extension Educator in Furnas County: Heat, humidity, and abundant moisture are pushing crops toward early maturity. Much needed moisture was received from several mid-August rains. The Arapahoe area received approximately four inches in August. The southwest portion of the county and areas west of Furnas County are still dry. Isolated areas have received hail damage from recent storms. Alfalfa butterflies, painted ladies, woolly bears and various other species have been abundant all summer. Many soybean fields have been treated with insecticides; however, a fungus disease has provided excellent control in recent weeks. Many irrigators are scheduling their last irrigation. Producers are preparing to harvest high moisture corn and silage.

Ralph Anderson, Extension Educator in Buffalo County: The production and irrigation season is winding down here as producers gear up for harvest. Feedlots who harvest high moisture corn and hybrid seed corn facilities both expect to be harvesting by next week. The rest of the producers are looking for the last irrigation and are starting to break pipe in anticipation of picking it up. Generally crops look favorable in Buffalo County. Although the planting season was a little spread out, much of the later planted crops grew well and narrowed the maturity window. We are expecting an early harvest and a fairly bountiful one. After harvest, we will start worrying about how to pay for the big input bills with low crop prices.

Gary Hall, Extension Educator in Phelps and Gosper counties: Some silage has been harvested in Phelps County. Recent rains have shortened or ended the irrigation season for many. Plot signs for corn and soybean hybrids are popping up as producers begin to evaluate this year’s crops and decide what to plant for next year. Gray leaf spot is showing up in our disease test plot but at this point it doesn’t seem to be a major concern.

Gary Zoubek, Extension Educator in York County: Most of York County received a little moisture last Thursday and Friday. Producers are now beginning to harvest corn for silage and seed corn harvest is just beginning. Producers are finally scheduling those last irrigations hoping for a little more rain. It’s been a long irrigation season that is finally coming to an end. In general crops look good, but will be variable depending upon many factors.

Nebraska spuds

Potatoes appear to be making a comeback in Nebraska agriculture. In the 1930s, approximately 125,000 acres were devoted to potato production; however, as production became more complex, many small producers were driven from the market. By 1989 and 1990, only 10,000 acres of potatoes were planted in Nebraska.

Now the number of acres of potato production is increasing. Potatoes were grown on nearly 26,000 acres in 2,000 with each acre yielding almost 42,000 lbs of spuds.

Crop Watch

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Lisa Jasa, Editor

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**Soybean harvest** *(Continued from page 187)*

are higher at 12%.

Harvest overly dried soybeans after a rain or in the morning after a dew, when the pods are damp and shattering losses are lower. The beans may have a slightly higher moisture content as well.

Shatter losses are far higher after several wetting and drying cycles of the pods. You may not be able to wait for moisture to re-wet the beans.

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>
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<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

| Moisture content, percent | 50.0 | 49.4 | 48.9 | 48.3 | 47.8 | 47.3 |

**Top wheat** *(Continued from page 187)*

straw strength.

It is best adapted to rainfed wheat production in eastern Nebraska as well as broad production in Nebraska and Wyoming. This variety was developed by Nebraska and the USDA-ARS from the cross of Arapahoe/Abilene/Arapahoe and was tested under the designation NE94654.

Millennium, new in 2000, is a medium maturing, medium height variety that is well adapted to most of Nebraska’s dryland wheat production areas. It has fair to good winter hardiness, medium length coleoptile, very good tillering ability, and moderately strong straw. Millennium was developed by Nebraska and the USDA-ARS from the cross Arapahoe/Abilene/NE86488. It was tested under the designation NE94479.

Alliance, released in 1993, is a moderately early maturing, moderately short height variety best adapted to dryland production. It has fair to good winter hardiness, short coleoptile, very good tillering ability, moderately strong straw, and good milling/baking qualities.

**Average yields of wheat varieties tested at all locations**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Bu/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wahoo</td>
<td>59.4</td>
</tr>
<tr>
<td>Millennium</td>
<td>58.7</td>
</tr>
<tr>
<td>Alliance</td>
<td>57.2</td>
</tr>
<tr>
<td>Arapahoe</td>
<td>54.1</td>
</tr>
<tr>
<td>Culver</td>
<td>53.7</td>
</tr>
<tr>
<td>Trego</td>
<td>53.0</td>
</tr>
<tr>
<td>Jagger</td>
<td>52.4</td>
</tr>
<tr>
<td>Wesley</td>
<td>52.2</td>
</tr>
<tr>
<td>Golden Spike</td>
<td>50.6</td>
</tr>
<tr>
<td>2137</td>
<td>47.9</td>
</tr>
<tr>
<td>Betty</td>
<td>47.3</td>
</tr>
<tr>
<td>NuPlains</td>
<td>46.4</td>
</tr>
<tr>
<td>Lakin</td>
<td>45.4</td>
</tr>
<tr>
<td>Heyne</td>
<td>43.2</td>
</tr>
</tbody>
</table>

Alliance is similar to Redland in test weight and protein. Alliance was developed by Nebraska and the USDA-ARS from the cross Arkan/Colt/Chisholm.

Jagger suffered from winterkill in eastern Nebraska, but yielded well in the west. NuPlains and 2137 were hit by stripe rust, but occurrence of this disease is relatively infrequent and these varieties should still work well in Nebraska. 2137 has been heavily used under irrigation and has the best level of wheat streak mosaic resistance of adapted cultivars. Wesley, another cultivar well suited for irrigation, has excellent stripe rust resistance, but is highly susceptible to wheat streak mosaic virus.

Now is the time to pick the wheats that complement each other and make your farm as profitable as possible. Field tests indicate that this year it would have been $15 per acre more profitable to have planted Wahoo than Arapahoe and $20 per acre more profitable to have planted an equal acreage of Wahoo, Millennium and Alliance than Jagger.

David Baltensperger, Extension Crop Breeding Specialist
Panhandle REC

**Wheat variety trial results**

Be sure to check out the results and yields from all of the NU wheat variety trials in Extension Circular EC01-103, *Nebraska Fall-Sown Small Grain Variety Tests*, also available on the web at [http://varietytest.unl.edu/whitst/2001/wheatbk01.pdf](http://varietytest.unl.edu/whitst/2001/wheatbk01.pdf)
Fertilizing winter wheat

First test soil for nitrogen, phosphorus

In Nebraska, nitrogen and phosphorus are essentially the only soil nutrients that are ever low for wheat production and even these nutrients are adequate in some soils growing winter wheat. Soil tests are needed to determine nitrogen and phosphorus requirements and application rates.

Nitrogen

Most winter wheat grown in Nebraska requires some additional nitrogen fertilizer for profitable wheat production. This is true for virtually all Nebraska soils where wheat is commonly grown unless there is a large carryover of fertilizer nitrogen. Residual fertilizer nitrogen can be measured effectively with a residual soil nitrate test of the root zone. While depth of the root zone for wheat is often six feet or more, most available nitrogen affecting yield is in the top two or three feet of soil. The producer can sample less than three feet deep for making nitrogen recommendations, but they are slightly less accurate.

The optimum nitrogen rate for winter wheat is calculated according to the following equation, where "N price" is the price of nitrogen fertilizer in dollars per pound; "Wheat price" is the price of wheat in dollars per bushel, and NO₃-N stands for the average ppm nitrate-nitrogen in the top three feet of soil.

Wheat N Rate (pounds/acre) = ((N price / Wheat price) + 0.014558 x NO₃-N - 0.235) / -0.00138

All fertilizer nitrogen sources (ammonium nitrate (33-0-0); urea (45-0-0); urea-ammonium-nitrate UAN (28-0-0); and anhydrous ammonia (82-0-0) are generally effective for nitrogen fertilization. Ammonium nitrate, because it least susceptible to losses of nitrogen due to volatilization, is the preferred nitrogen fertilizer for topdressing when incorporation is impossible. With incorporation soon after application all nitrogen sources should be equally effective. Therefore, the most economical source of nitrogen that fits the restriction of the particular wheat production system should be used.

Phosphorus

Wheat responds to applied phosphorus more than the other major Nebraska grain crops. Phosphorus mainly increases tillering in the fall, which increases the number of heads harvested, and thereby, grain yields. To a lesser extent, phosphorus increases seed size and numbers of kernels in the head. All soils are not phosphorus deficient for wheat, so good soil sampling and testing is necessary to maximize profits.

Table 1: Optimum amount of nitrogen to apply based on residual nitrate in the soil to a depth of three feet. (See NebGuide G91-1000, Guidelines for Soil Sampling, for suggestions on taking soil samples). Recommendations in pounds of nitrogen to apply per acre are shown for two nitrogen prices (15 cents and 25 cents per pound of nitrogen) and wheat prices ($2.50 and $3.00 per bushel). If a soil test isn’t taken, use the recommendations for 8 ppm of nitrate-N per acre. This represents an average or medium soil nitrate level.

<table>
<thead>
<tr>
<th>Residual nitrate-N (3-feet soil sample)</th>
<th>Avg ppm</th>
<th>lb. N /acre</th>
<th>Wheat price ($/bushel)</th>
<th>Fertilizer price ($/pound of N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>22</td>
<td>0.15</td>
<td>$2.50</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>44</td>
<td>0.25</td>
<td>$3.00</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>65</td>
<td>$0.15</td>
<td>$0.25</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>87</td>
<td>$0.25</td>
<td>$0.15</td>
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<tr>
<td></td>
<td>10</td>
<td>108</td>
<td>$0.25</td>
<td>89</td>
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<tr>
<td></td>
<td>12</td>
<td>130</td>
<td>113</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>22</td>
<td>35</td>
<td>71</td>
</tr>
<tr>
<td></td>
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<td>47</td>
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<td>87</td>
<td>29</td>
<td>5</td>
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<td>10</td>
<td>108</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>130</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

The optimum phosphorus rate for winter wheat is calculated according to the following equations, depending on application method, where "LN" is the natural log, "P" stands for the appropriate soil phosphorus test (ppm), "Yld" stands for yield in bushels per acre, "P price" stands for dollars per pound P₂O₅, and "Wheat Price" is in dollars per bushel of wheat. The Bray-1 P test is for use on acid or neutral pH soils, and the Olsen P test is for use on alkaline soils.

Row or dual placement

Bray-1 P Test: P₂O₅ rate (pounds/acre) = (-9.98 - 2.38 x LN (Bray-1 P) + 4.39 x LN Yld) / (Phosphorus price/Wheat price)

Olsen P Test: P₂O₅ rate (pounds/acre) = (-9.98 - 2.38 x LN (P Olsen x 1.5) + 4.39 x LN Yld) / (Phosphorus price/Wheat price)

Broadcast

Bray-1 P Test: P₂O₅ rate (pounds/acre) = (17.13 - 3.21 x LN (Bray-1 P) + 2.89 x LN Yld - 9.81 x LN pH) / (Phosphorus price/Wheat price)

Olsen P Test: P₂O₅ rate (pounds/acre) = (17.13 - 3.21 x LN (P Olsen x 1.5) + 2.89 x LN Yld - 9.81 x LN pH) / (Phosphorus price/Wheat price)

(Continued on page 191)
Fertilizing wheat  (Continued from page 190)

There are three basic methods for applying phosphorus to wheat:
1) directly with the seed;
2) broadcasting and incorporating prior to seeding; or
3) dual placement or applying liquid phosphorus (ammonium polyphosphate 10-34-0) together with anhydrous ammonia prior to seeding.

Applying phosphorus directly with the seed or in a band is usually the preferred method because phosphorus concentrated in a small zone of soil generally is more available to the plant for a longer time. The normal superphosphate and ammonium phosphates generally have a negligible effect on wheat stands because of the low salt content of phosphorus fertilizer compared to nitrogen fertilizer, because of the low concentration associated with the narrow rows (7 to 12 inches), and because of the generally high rates of seeding used with present wheat varieties. Therefore, the seeding mechanism for applying phosphorus fertilizer with the seed (or in bands) is not critical unless the producer applies nitrogen at the same time. If large amounts of nitrogen are to be applied (over 15 to 20 pounds of nitrogen per acre), the fertilizer nitrogen must be separated from the seed or stand losses may result.

Jürg M. Blumenthal, Soil Fertility/ Nutrient Management Specialist
Panhandle REC

Distance education opportunities for fall

The University of Nebraska Institute of Agriculture and Natural Resources offers a variety of distance education opportunities related to agriculture. Most of these are listed on the IANR Web site at http://ianrhome.unl.edu/distanceEd/.

Following is a description of the distance education courses being offered by the NU Department of Agronomy and Horticulture this fall. For more detailed information on any of these, visit the Department of Agronomy Distance Education Web site at http://agronomy.unl.edu/distance_ed/2001fall/ or contact Deana Namuth, agronomy distance education lecturer, 402-472-1549 or dnamuth1@unl.edu

Agronomy distance education courses, fall 2001

Crop and Weed Genetics, Agronomy 412/812, Oct. 22-23
Self-Pollinated Crop Breeding, Agronomy 896A, Aug. 27 to Sept. 29.
Germlasm and Genes, Agronomy 896B, Oct. 1 to Nov. 3

(Continued at right)

Table 2: Optimum amount of phosphorus to apply based on residual phosphate in the soil to a depth of eight inches. (See NebGuide G91-1000, Guidelines for Soil Sampling, for suggestions on taking soil samples).

Recommendations in pounds of phosphate to apply per acre are shown for two application methods (row/dual placement and broadcast) and three yield goals (40, 50, and 70 bushels per acre). Assumptions in this data include a wheat price of $2.50 per bushel, a price of $0.30 per pound of P₂O₅, and a soil pH of 7 (broadcast only).

<table>
<thead>
<tr>
<th>Residual phosphate</th>
<th>Yield goal (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bray-1P Olsen-P</td>
<td>40 50 70</td>
</tr>
<tr>
<td>ppm</td>
<td>Optimum phosphate</td>
</tr>
<tr>
<td></td>
<td>pounds per acre</td>
</tr>
<tr>
<td>5 3 20 30 40</td>
<td>5 3 7 15 25</td>
</tr>
<tr>
<td>10 7 5 15 25</td>
<td>10 7 10 15 25</td>
</tr>
<tr>
<td>15 10 0 5 20</td>
<td>15 10 0 5 20</td>
</tr>
<tr>
<td>20 13 0 0 15</td>
<td>20 13 0 0 15</td>
</tr>
<tr>
<td>25 17 0 0 10</td>
<td>25 17 0 0 10</td>
</tr>
<tr>
<td>30 20 0 0 5</td>
<td>30 20 0 0 5</td>
</tr>
</tbody>
</table>

Row or dual placement

Broadcast

<table>
<thead>
<tr>
<th>Residual phosphate</th>
<th>Yield goal (bu / acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bray-1P Olsen-P</td>
<td>40 50 70</td>
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<tr>
<td>ppm</td>
<td>Optimum phosphate</td>
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<tr>
<td></td>
<td>pounds per acre</td>
</tr>
<tr>
<td>5 3 30 35 45</td>
<td>5 3 30 35 45</td>
</tr>
<tr>
<td>10 7 10 15 25</td>
<td>10 7 10 15 25</td>
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<tr>
<td>15 10 0 5 20</td>
<td>15 10 0 5 20</td>
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<tr>
<td>20 13 0 0 5</td>
<td>20 13 0 0 5</td>
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<td>25 17 0 0 0</td>
<td>25 17 0 0 0</td>
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<tr>
<td>30 20 0 0 0</td>
<td>30 20 0 0 0</td>
</tr>
</tbody>
</table>

Cross-Pollinated Crop Breeding, Agronomy 896D, Nov. 5 to Dec. 8
Phytopathological Principles, Agronomy 830, Aug. 27 to Oct. 20.
Diseases of Corn, Agronomy 830A, Oct. 24 to Dec. 14
Introduction to Crop Modeling Agronomy 896x1, Dec. 10-14
Crop Modeling: Case Studies, Agronomy 896x2, Dec. 10-14
Modeling Root-Zone Water Quality, Agronomy 896x3, Dec. 10-14
Designing GIS Applications for Crop Management, Agronomy 896x4, Dec. 10-14
Don’t stop irrigating soybeans too soon

Producers have been raising irrigated corn for years and have pretty much learned when to stop irrigating; however, as they add soybeans to their crop rotation they must consider how and when soybeans respond to irrigation and adjust their irrigation scheduling accordingly.

Most of the soybean crop’s water needs are during pod fill. To achieve the greatest yield, irrigation should be scheduled to meet this need. Often producers are surprised at how many inches of water are needed to finish out the soybean crop. Shutting off too early reduces bean size, greatly reducing yield. Use the worksheet below to determine timing of the last irrigation.

Worksheet to determine last irrigation

Field ____________________________
Crop ____________________________
Soil type ____________________________
Date ____________________________
Present stage of growth ____________________________

1. Water need to reach crop maturity, in inches (from Table 1, page 193) ____________________________
2. Current soil water balance, in inches (estimated in field) ____________________________
3. Minimum allowable balance, in inches (from Table 2, page 193) ____________________________
4. Remaining usable moisture in inches (Line 2 minus Line 3) ____________________________
5. Irrigation requirement assuming no rainfall, in inches (Line 1 minus Line 4) ____________________________

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

Scheduling the last irrigation

In many areas of the state corn farmers are in the midst of picking up pipe or eagerly preparing for the last irrigation. In southeast Nebraska, however, where rains have been limited or anywhere soybeans were planted late, irrigation may need to continue.

Determining when to apply the last irrigation for the season is an important water management decision for any crop. 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 on page 193 gives the approximate number of days to maturity and estimated water use “typical” for south central Nebraska for various stages of corn, grain sorghum and soybeans. Note that even though soybeans may seem to be shutting down when they start turning yellow, they still need about two inches of water to reach maturity.

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, page 193). 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, and G82-602, Predicting the Last Irrigation for Corn, Grain Sorghum and Soybeans available from your local University of Nebraska Cooperative Extension office or on the Web.

Paul Jasa
Extension Engineer
Soybean stand reduction is dramatic with just 10% decrease in seed germination

A small decrease in soybean germination rate listed on the seed tag can bring a big drop in actual germination in the field, according to field test results from the University of Missouri Hundley-Whaley Farm in northcentral Missouri.

Steve Norberg, regional extension agronomist at Bethany, Missouri, compared seed with 90% germination to seed with 80% germination. When planted at 150,000 seeds per acre, the higher germination seed had a 93.5% emergence. The 80% germination seed dropped to 50.5% emergence in side-by-side comparisons.

“Germination listed on the seed tag doesn’t tell the whole story,” Norberg said. “It’s [based on] a warm-germination test, which doesn’t match actual field conditions. An accelerated aging or cold-germination test would tell a lot more about the vigor of the seed.”

That difference was especially important this year when soybean seed was planted into cold, wet soil. “A good disease-resistant, vigorous seed is important when planting into an environmentally stressful situation,” Norberg said.

In the test, Norberg also planted an extra 50,000 seed per acre in an attempt to offset the expected reduced germination.

“That helped increase the stand by about 31,000 plants per acre, but it would have been wiser to pay for 90% germination seed than to use that money to buy an extra 50,000 seeds per acre,” Norberg said.

Producers across northern Missouri noted reduced and erratic stands of soybeans this year because of poor planting conditions.

Adding to the problem were large quantities of poor quality seed produced last fall when soybean seed was harvested after a drought at abnormally low seed moisture. Dry soybeans are prone to have cracked seed hulls, which reduces germination.

Norberg used commercially available seed.

“Bin-run seed that had not been managed up to seed-industry standards may have had even bigger problems this year.”

“Bottom line from this study is that excellent quality seed is needed,” Norberg said. “If the warm-germination test is below 90%, than other tests will be more helpful for estimating field emergence.”

Duane Daily; University of Missouri Extension Press Release

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

<table>
<thead>
<tr>
<th>Crop growth stage</th>
<th>Approximate days to maturity</th>
<th>Water use to maturity (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning dent</td>
<td>24</td>
<td>5.0</td>
</tr>
<tr>
<td>Full dent</td>
<td>13</td>
<td>2.5</td>
</tr>
<tr>
<td>Black layer</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Grain sorghum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft dough</td>
<td>23</td>
<td>5.0</td>
</tr>
<tr>
<td>Hard dough</td>
<td>12</td>
<td>2.0</td>
</tr>
<tr>
<td>Black layer</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Soybeans</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning seed fill</td>
<td>29</td>
<td>6.5</td>
</tr>
<tr>
<td>Full seed fill</td>
<td>18</td>
<td>3.5</td>
</tr>
<tr>
<td>Leaves begin to yellow</td>
<td>10</td>
<td>1.9</td>
</tr>
<tr>
<td>Beginning maturity</td>
<td>0</td>
<td>0.0</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.
Avoid downtime

Prepare grain bins, equipment before harvest

With harvest rapidly approaching, now is the time to prepare grain bins and harvesting equipment to help ensure that grain going into storage remains in good condition. Don't wait until the middle of harvest to discover that a bin foundation is severely cracked, or find even later that insects from grain that was left in the combine last fall have become a problem in a bin of new grain.

Harvesting equipment

Remove all traces of old grain from combines, truck beds, grain carts, augers, and any other equipment used for harvesting, transporting, and handling grain. Even small amounts of moldy or insect-infested grain left in equipment can contaminate a bin of new grain.

Site

Check the bin site and remove any items or debris that would interfere with safe, unobstructed movement around the bin. Remove any spilled grain and mow the site to reduce the potential for insect or rodent infestation. If necessary, regrade the site so that water readily drains away from bin foundations.

Electrical

Wiring for fans and other electrical components should be inspected for corrosion and cracked, frayed, or broken insulation. Exposed wiring should be run through waterproof, dust-tight conduit. Avoid kinking the conduit, and make sure all connections are secure. Check control boxes for rodent damage. If rodent damage is found, clean and repair or replace damaged wiring, relays, and other components and seal over openings that allowed rodent entry. An aeration system breakdown with a bin of high moisture corn can become a serious problem in only a few days, depending on the moisture and temperature of the grain. Preventative maintenance now can prevent downtime during harvest.

Aeration systems

Check fans, heaters, transitions, and ducts for corrosion and damage. Remove any accumulated dust and dirt that will reduce the operating efficiency. Be sure all connections are tight.

Bins

Inspect bins and foundations for structural problems. Inspect the bin roof and sides, inside and out, for leaks, loose or sheared bolts, corrosion, etc. Check the roof vents and access hatch, and caulk any cracks where flashing meets the roof line. Be sure the access ladder is complete and securely fastened to the bin. Repair or replace any deteriorated components.

Ensure that the bins are clean. Remove any old grain with brooms and shop vacuums. Never put new grain on top of old. Don't forget to clean bins not being used for storage this year as these can be a source of insects that will migrate to other bins.

If long-term storage (over 10 months) is anticipated, consider treating the cleaned bin with protective insecticides at least two weeks before adding any grain. Apply the spray to the point of runoff to as many interior surfaces as possible, especially joints, seams, cracks, ledges, and corners. Also spray outside the bin at the foundation and near doors, vents, ducts, and fans. Malathion, methoxychlor, Tempo, Reldan (stored sorghum only), or diatomaceous earth can be used for treating bin surfaces. Methoxychlor and Tempo should not be applied directly to the grain. As with all pesticides, read and follow product label instructions for handling, dilution, mixing, and application directions.

Note: Do not spray bins where soybeans will be stored. Stored soybeans rarely experience insect problems and few insecticides are labeled for use on soybeans.

It is generally impossible to thoroughly clean under perforated drying floors; however, much of the debris can be removed if the drying fan is removed and an extension pipe and grain vacuum are used. The bin should then be fumigated with chloropicrin. (Chloropicrin is a restricted use pesticide sold under several brand names and requires gas monitoring devices and respirator protection.)

Stored grain represents a major investment. Precautions taken before grain is put into the bin can pay dividends later by helping to assure that quality is maintained.

Disclaimer: Use of brand names is for clarity only and not intended as an endorsement of one product over another. Read and follow product label directions.

Tom Dorn, Extension Educator and Stored Grain Specialist
Grasshoppers damaging alfalfa seedlings; insecticides may still provide aid

Grasshoppers are feeding heavily on alfalfa seedlings and regrowth in many areas, sometimes with devastating results.

New seedlings are extremely susceptible; just one bite in the right place can kill a plant. Regrowth after harvest isn’t much better. Plants may not be killed outright by grasshopper feeding but they often are weakened so much that they die over winter.

Bricks or spraying

When grasshoppers are as large as they are right now, about the only surefire way to kill them is crushed between a couple of bricks. Still, some insecticides might be worth trying. In all cases, limit the amount of area sprayed to help keep cost down and reduce environmental and health risks.

In fields not yet harvested, the best strategy might be to leave uncut several mower-width strips in the field to serve as traps for the grasshoppers to move into after cutting. After hay is removed, spray the strips with a high rate of Lorsban or Furadan. If fields already are cut, spraying field margins where grasshopper populations are highest might be the only option.

Spraying field margins also may be best for new seedings. Since new seedlings are so sensitive to grasshopper feeding, though, repeat treatments every seven to ten days might be needed. If you do repeat treatments, change to a different insecticide because both Lorsban and Furadan restrict use to one application per cutting. And be sure to follow all label directions regarding rates and harvest restrictions.

Bruce Anderson
Extension Forage Specialist

Planning the last alfalfa cutting

When you take your last harvest of alfalfa affects its winter survival and next spring’s vigor. Alfalfa needs about six weeks of uninterrupted growth in the fall to become fully winterized. This winterizing generally begins about three weeks before the average date of first frost. Your last harvest can occur anytime before winterizing begins or after it ends with little worry about affecting stand life. Harvest during winterizing, however, can be risky.

The level of risk depends on how much stress your alfalfa experienced this year. The most important factor is the number of cuts you took this year. Fields cut four or five times are more susceptible to winter injury than fields cut three or fewer times. Also, young stands of winterhardy, disease-resistant varieties are less stressed and can be harvested during winterizing with less risk than older stands of disease-susceptible varieties that are only moderately winter hardy.

Also consider your need for extra alfalfa or its value as a cash crop. Hay is short in some areas, so the extra hay you cut from this final harvest may be worth the risk of lowering next year’s yield. If you have plenty of winter forage and don’t have a good market for any extra alfalfa, the risk may be too high. Remember, you also can cut after winterizing with less risk.

Bruce Anderson
Extension Forage Specialist

Introductory precision ag clinic Sept. 5 at ARDC

A Precision Farming Management and Technologies Clinic will be held this Wednesday, Sept. 5, at the NU Agricultural Research and Development Center near Mead. Topics will include:

- Introduction to precision ag/GPS, GIS, including guidance systems, electronic conductivity, satellite imagery, technology/hardware, and software
- Yield monitor set-up
- Calibrating yield monitors in-field.
- Understanding and interpreting yield maps
- Digital soil survey information and crop production impact
- On-site soil information and management implications and historical yield information; and
- Issues/concerns and economic implications of precision agriculture technology

Participants will meet at the ARDC Research and Education Building at 7:45 a.m. rain or shine. Bring rain gear. The fee of $165 for registrations received after Aug. 29 includes training, lunch and reference materials.

All registrants will be sent a confirmation letter (with receipt) and a finalized schedule. Space is limited.

It’s expected that six CEU credits will be available for this course: five for crop production and one for soil fertility.

For more information contact the University of Nebraska Cooperative Extension (402-624-8030) or to register on-line, go to http://ardc.unl.edu/CMDCRegistration.htm

Dave Varner
Extension Educator
Don’t delay making silage from drought-injured corn

Heat and lack of rain have caused dryland corn to dry rapidly the past few weeks. If the corn is to be made into silage, the fields may be ready to chop now, a University of Nebraska forage specialist said.

More than 200,000 acres of Nebraska corn are chopped for silage each year. This year, dryland corn, particularly in southern Nebraska, has suffered significant drought damage, which leads to lower grain potential.

Lowering energy and protein content at chopping is the most critical factor influencing corn silage fermentation,” Bruce Anderson, NU forage specialist, said. “Wet silage will run or seep, carrying away valuable nutrients, and it often has a sour, smelly, unpalatable fermentation. Dry silage often heats and molds, lowering energy and protein digestibility, because dry silage is difficult to pack, which allows more oxygen to remain inside the silage.”

If producers find that they waited too long to chop and the silage is dry, adding water is not a good solution, the Institute of Agriculture and Natural Resources specialist said. It takes about 7 gallons of water for each ton of silage to raise the moisture content by 1 percentage point.

“A better solution is to blend a wetter feed, like fresh alfalfa, forage sorghum or green soybeans with dry corn,” he said. “If you get the right combination it can produce excellent silage.”

Minimizing oxygen levels in silage is important. Anderson suggested that producers adjust knives to cut finer as silage gets dry to make it easier to pack tighter.

“It may be wise to do some extra packing, even if the silage seems to spring back up at you,” he said. “Do anything you can to force air out. It helps to put a foot or two of really wet silage on top to add weight and seal out air better.”

Always cover dry silage with plastic, Anderson said.


Heather Corley
IANR News Release

Central Nebraska twilight tour, fry

A burger fry and twilight tour of corn and soybean fields will be held Thursday, Sept. 6 beginning at 6 p.m. near Holdrege.

The tour will start at a field of irrigated soybeans one mile straight south and one mile west of the junction of Highways 183, 6 and 34 in Holdrege. Information on irrigating soybeans early and late and management of the painted lady butterfly/thistle caterpillar in soybeans will be presented.

Fertilization of corn will be discussed at the second stop at 7 p.m. at a corn field 1.25 miles east of Holdrege on 18th St. at Cemetery Road.

The last stop will be at 8 p.m. at a field three miles north of the junction of highways 183, 6 and 34 and one mile west and one-fourth mile south. The site includes six test plots assessing how gray leaf spot affects corn under various conditions.

Information on managing gray leaf spot will be shared during a burger fry at this site.

For more information, contact Gary Hall, Extension Educator in Phelps and Gosper counties at 308-995-4222.

NU sorghum research to be featured during tour

Visitors can view a spectrum of sorghum field research during a Nebraska Grain Sorghum Board tour Sept. 6 in eastern Nebraska.

The board’s meeting will convene at 8 a.m. in Lincoln with a tour of research plots on UNL’s East Campus and at the NU Havelock Seed Farm. It will continue at 11:15 a.m. at the NU Agricultural Research and Development Center near Mead with a field tour of more than 2,000 lines of sorghum from around the world.

Participants will be able to view a progression from introduction of a plant line through evaluation and testing, according to USDA Researcher Jeff Pedersen. The lines represent a range of hybrids, races, colors and physical attributes, which are being screened for useful characteristics. The field includes early generation families being segregated for useful types; mid generation families selected for further evaluation; mid to late generation families being used for test crosses; and advanced lines in hybrid yield trials.

The tours will be followed by a board meeting at 1:30 p.m. at the ARDC Ag Research Building. The board will hear reports on program activities related to market development, research, producer education, and federal legislative issues.

For more information about the tour and meeting, both of which are open to the public, contact the Nebraska Grain Sorghum Board at 402-471-4276.