1. Wheat seeding tips for good stand establishment

Soils remain very dry in many parts of western and southern Kansas, which may have producers thinking about how to get a stand of wheat under these conditions. Whatever the soil conditions, there are a few important steps producers can take to improve their chances of getting a good stand of wheat:

* Proper tractor speed. It is best to use a tractor speed of between 5 and 6 miles per hour in most cases when drilling wheat, depending on the amount of down pressure on the openers. If higher speeds are used, the openers can tend to “ride up” in the soil every now and then if down pressure is insufficient, similar to the effect of a speedboat pulling a water skier. At slow speeds, the water skier sinks into the water a bit; but once the boat picks up speed the water skier lifts up onto the surface of the water. The same principle applies to a tractor pulling a grain drill.

* Proper, uniform seeding depth. The ideal planting depth for wheat in most cases is about 1.5 inches. When planting early into very warm soils, it is especially important not to plant too deeply since coleoptile lengths are shorter than normal under warm conditions. On the other extreme, producers should also be especially careful not to plant too deeply when planting later than the recommended time into very cool soils. Getting a uniform seeding depth is also important. Where producers are planting into fields with heavy residue, or where there is uneven distribution of chaff from the previous crop, uneven planting depth can be a serious problem. In those situations, it is common to end up with poor stand establishment in areas of the field where the drill opener rode up over the residue or chaff, and was unable to penetrate the soil to the same depth as in other areas of the field.
* Firm seedbed. One of the most common problems in wheat stand establishment is planting into loose, fluffy soils. This problem tends to occur most often where soils have been tilled repeatedly during the summer. When seeds are planted into loose soils, rains in the fall will settle the soil and leave the crowns of the seedlings too close to the soil surface. Having a good closing system behind the drill openers, with adequate down pressure, should help.

* Plant during the optimum time. In general, wheat should be planted somewhere around the Hessian fly-free date. There may be good reasons to plant some wheat before the fly-free date, such as planting for pasture or time pressures from having considerable acreage to plant. But stand establishment and ultimate grain yields are usually best when wheat is planted after the fly-free date and before deadlines set by crop insurance. Planting more than three weeks after the fly-free date can be risky. Late-planted wheat often does not develop an adequate root system before winter, and forms fewer productive fall tillers. When planting late, seeding rates should be increased by 25 to 50 percent (up to a maximum of 120 lbs/acre) to help ensure an adequate stand and compensate for the lack of tillering.

* Adequate soil fertility. In general, producers should apply at least part of their nitrogen before or at planting time to get the plants off to a strong start. Nitrogen rates of 20-30 lbs can help with fall establishment and tillering. If the soil is low or very low in phosphorus or potassium, these nutrients should be applied at planting time as well so that the plants benefit early in their development. Starter phosphorus with the seed or band-applied close to the seed can also help with fall early growth and establishment, particularly in low testing soils. Low soil pH can be a concern particularly early in the season when root systems are mostly near the surface, which is often an area of lower pH. Soil tests will determine the need for pH adjustment, and potential for aluminum toxicity. Lime application, variety selection, and phosphorus application with the seed are potential management strategies for low pH and aluminum toxicity issues.

* Using a seed treatment. Fungicide seed treatments may help with stand establishment in certain situations. For seed production fields, a systemic seed treatment is highly recommended to help keep seedborne pathogens such as bunt and loose smut out of seed stocks. In addition, seed treatments sometimes improve stands. Due to the high value of the seed produced, even small yield increases can justify the use of seed treatments. For grain production fields, seed treatment economics are less certain. Conditions favoring use of standard seed treatments in grain production fields include: 1) high yield potential field, 2) seed saved from field with loose smut, bunt, or Fusarium head blight last year, 3) expensive seed, 4) low planting rates, 5) planting under poor germination conditions, especially very early or late planting, or 6) poor quality or old seed. If planting that late or into heavy residue, it’s probably a good idea to use a fungicide seed treatment, even on seed that has high test weight and good germination. Insecticide seed treatments may be needed for control of soil insects (see separate article in this issue).

* Make adjustments for planting into row crop stubble. When planting wheat into grain sorghum stubble, producers will need an extra 30 lbs N per acre over their normal N rate. Also, it is important to make sure the sorghum is dead before planting wheat. When planting wheat into soybean stubble, producers should not reduce their N rates since the N credit from soybeans doesn’t take effect until the following spring. If the wheat is being planted no-till after row crop harvest, N rates should be increased by 20 lbs N per acre over the normal N rate. Seeding rates should be increased when planting wheat late after row crop harvest. It’s best to use a seeding rate of 90 to 120 lbs per acre in central and eastern Kansas, and 75 to 100 lbs per acre in western
Kansas. When planting more than three week’s after the Hessian fly-free date, producers should use a seeding rate of 120 lbs per acre.

* Watch out for potential disease issues when planting into corn residue. The risk of some diseases may be higher when wheat is planted into fields with large amounts of corn residue left on the soil surface. Fusarium head blight (scab) of wheat, for example, is caused by a fungus that is known to cause a stalk rot of corn. This elevated risk of Fusarium head blight is best countered with wheat varieties with genetic resistance to disease. Wheat varieties with moderate levels of resistance to Fusarium include Everest, Hitch, and Overland. Other wheat varieties should be considered susceptible to head blight.

-- Jim Shroyer, State Extension Agronomy Leader
jshroyer@ksu.edu

-- Dorivar Ruiz Diaz, Nutrient Management Specialist
ruizdiaz@ksu.edu

-- Erick DeWolf, Extension Plant Pathology
dewolf1@ksu.edu

2. Insecticide seed treatments for wheat

Is it worth the money to have wheat seed treated with an insecticide seed treatment? There’s no simple answer to this questions.

Our experience with wheat seed treatments suggests that they work well to protect the seed and seedling 21-28 days after planting from wireworms, white grubs, flea beetles, grasshoppers, and aphids. If used at the appropriate rate, they will also protect seedlings from Hessian fly if infestations occur within that time frame and densities are not too great. Remember, Hessian fly infestations can occur in the spring also. Greenbugs and bird cherry-oat aphids have been controlled into the spring when the highest labeled rate of an insecticide seed treatment is used.

<table>
<thead>
<tr>
<th>2010 Bird Cherry-Oat Aphid Seed Treatment Efficacy Trial: Riley County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Untreated</td>
</tr>
<tr>
<td>Cruiser @ 2 fl oz/cwt</td>
</tr>
<tr>
<td>Gaucho XT @ 3.4 oz/cwt</td>
</tr>
<tr>
<td>Infestation date: Dec. 22, 2010</td>
</tr>
<tr>
<td>Source: Jeff Whitworth, Holly Davis, K-State Research and Extension Entomologists</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2009 Greenbug Seed Treatment Efficacy Trial: Greenhouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Untreated</td>
</tr>
<tr>
<td>Vitaflor 280 @ 4.4 oz/cwt + Attendant 480 @ 3.3 oz/cwt</td>
</tr>
<tr>
<td>Dividend XL RTA @ 5.5 oz/cwt + Cruiser 5FS @ 0.9 oz/cwt</td>
</tr>
<tr>
<td>Gaucho XT @ 3.7 oz/cwt</td>
</tr>
<tr>
<td>Infested 14 days post-emergence</td>
</tr>
<tr>
<td>Source: Jeff Whitworth, Holly Davis, K-State Research and Extension Entomologists</td>
</tr>
</tbody>
</table>
### 2005 Hessian Fly Seed Treatment Efficacy Trial: Hesston

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of larvae/plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>8.45</td>
</tr>
<tr>
<td>Cruiser 600 FS @ 0.75 fl oz/cwt</td>
<td>0.80</td>
</tr>
<tr>
<td>Gaucho 480 @ 1.0 fl oz/cwt</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Wheat planting date: Sept. 30, 2005  
Plants transplanted to 4-inch pots on 10/21/05 and brought to greenhouse  
Infested with 10 female adults/pot on 10/21/05 for 4 days  
Larvae counts made on 11/10/05  
Source: Gerald Wilde, K-State Research and Extension Entomologist

These charts include only selected treatments with products labeled for wheat, and do not include the standard errors involved in each trial. For full details, see:  

On the other hand, insecticide seed treatments are not effective, again from our experience, against false wireworms, fall armyworms, or army cutworms even if infestations occur within 21-28 days after planting.

Insecticide seed treatments are most likely be needed in conditions under which wireworms, white grubs, flea beetles, grasshoppers, Hessian fly, or aphids are favored. In general, the following guidelines apply to those insects Kansas:

* Wireworms and white grubs are more likely to occur under no-till conditions.
* Flea beetles can occur under almost any conditions.
* Grasshoppers can also occur under many different conditions, but are a little more common where wheat is planted next to a field that has grass or grain sorghum under late-season stress.
* Hessian fly is most likely to be a problem when wheat is planted early and in continuous, no-till wheat.
* Aphids can be a problem under many different conditions, but are a little more likely to be a problem on earlier-planted wheat.

Where these conditions do not exist, we generally have found that insecticide seed treatments do not result in any wheat yield response. K-State has conducted some trials that demonstrate this. In these trials (see charts below), there was little or no aphid, greenbug, or Hessian fly pressure.

### 2005 Insecticide Seed Treatment Trial on Wheat: Riley County

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>29.23a</td>
</tr>
<tr>
<td>Gaucho 480 @ 48 GA/100Kg</td>
<td>31.85a</td>
</tr>
<tr>
<td>Cruiser @ 39 GA/100Kg</td>
<td>30.25a</td>
</tr>
</tbody>
</table>

Wheat planting date: Sept. 14, 2004 (4 replications)  
Yields followed by the same letter indicate no significant difference.  
Source: Gerald Wilde, K-State Research and Extension Entomologist

### 2011 Insecticide Seed Treatment Trial on Wheat: Dickinson County #1

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>61.56</td>
</tr>
<tr>
<td>Nitro Shield (48.7% imidacloprid) @ 2.4 oz/cwt</td>
<td>60.01</td>
</tr>
</tbody>
</table>

Wheat planting date: Oct. 16, 2010  
Plot size = 30 acres  
Source: Jeff Whitworth, K-State Research and Extension Entomologist
### 2011 Insecticide Seed Treatment Trial on Wheat: Dickinson County #2

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armour</td>
<td>34.36</td>
</tr>
<tr>
<td>Armour</td>
<td>39.53</td>
</tr>
<tr>
<td>Armour Gaucho XT @ 3.4 oz/cwt</td>
<td>37.13</td>
</tr>
<tr>
<td>Everest</td>
<td>42.60</td>
</tr>
<tr>
<td>Everest Gaucho XT @ 3.4 oz/cwt</td>
<td>40.28</td>
</tr>
</tbody>
</table>

Wheat planting date: Oct. 21, 2010  
Plot size = 0.4 acre  
Source: Jeff Whitworth, K-State Research and Extension Entomologist

For more information on the insects mentioned above, see:  

-- Jeff Whitworth, Extension Entomology  
jwhitwor@ksu.edu

### 3. Stalk rots in grain sorghum

A lot of attention has been given to stalk rot and other lodging problems in corn this year. Producers should keep in mind that stalk rot can be an even bigger problem in grain sorghum due to a generally thinner stalk.

Annual losses are difficult to determine, because unless lodging occurs, the disease goes mostly unnoticed. The best estimates are that at least 5 percent of the sorghum crop is lost each year to stalk rot. The incidence of stalk rot in individual fields may reach 90 to 100 percent with yield losses of 50 percent. The most obvious losses occur when plants lodge. More important may be the yield losses that go unnoticed.

In sorghum, these losses are caused by reduced head size, poor filling of grain, and early head lodging as plants mature early.

In grain sorghum, the two most common types of stalk rot are charcoal rot and Fusarium stalk rot. Although caused by many different organisms, the symptoms of the various stalk rots are somewhat similar. Symptoms generally appear several weeks after pollination when the plant appears to prematurely ripen. The leaves become dry, taking on a grayish-green appearance similar to frost injury. The stalk usually dies a few weeks later. Diseased stalks can be easily crushed when squeezed between the thumb and finger and are more susceptible to lodging during wind or rainstorms. The most characteristic symptom of stalk rot is the shredding of the internal tissue in the lowest internodes of the stalk, which can be observed when the stalk is split. This shredded tissue may be tan colored (Fusarium stalk rots); red or salmon, (Fusarium and Gibberella stalk rots); or grayish-black (charcoal rot).

#### Charcoal rot

Hot, droughty weather with soil temperatures in the range of 90 degrees or more are ideal for the development of charcoal rot. Drought does not cause the problem, but it weakens the plants’ defenses to the disease. Charcoal rot is usually less severe if drought stress is reduced.
While it is difficult to separate the effects of charcoal rot from simple drought stress, a good rule of thumb is that plants infected with charcoal rot will die about two weeks earlier from dry weather than plants that do not have charcoal rot. Grain fill that would have occurred during this period is the amount of yield loss that can be attributed to charcoal rot.

The plants will die prematurely. When stalks are split, the typical shredded appearance in the lower stalk associated with all stalk rots will be present. Additionally, there will be a gray to black discoloration of the inner stalk caused by numerous sclerotia (small, black reproductive structures of the fungus) forming on the vascular bundles and decaying tissue.
Fusarium stalk rot

Fusarium root and stalk rot is generally found in the same areas where charcoal rot develops. The pith of Fusarium stalk rot infected plants will have a shredded appearance and is typically tan in color, but in some hybrids the pith in the lower stalk may be pink to red in color. Plants may die prematurely or lodge.

Fusarium stalk rot is favored by dry conditions early in the season, which decreases nutrient solubility, making the nutrients unavailable to the plant. Later in the season, following pollination, warm (82 to 86 degrees), wet weather can leach remaining nutrients from the soil resulting in late-season nitrogen stress and an increase in stalk rot.
Stalk rot is a stress-related disease. Any stress on a crop can increase both the incidence and severity of stalk rot. Research has indicated that when the carbohydrates used to fill the grain become unavailable due to nutrient shortage, drought stress, leaf loss from insects, hail, disease or reduced sunlight, the plant uses nitrogen and carbohydrate reserves stored in the stalk to complete grain fill. This loss of nitrogen and carbohydrate reserves weakens stalk tissues and results in increased stalk rot susceptibility. Early maturing hybrids are generally more susceptible than full-season hybrids.

Other than irrigation or rain, there is little that can be done to prevent stalk rot by late summer. No hybrid has complete immunity to the stalk rotting pathogens. When choosing a hybrid, a grower should select a hybrid that is not only a high yielder, but one that has good standability and “stay-green” characteristics. This will help assure that if stalk rot does occur, losses due to lodging will be minimal. A balanced nutrition program based on soil tests should be used. Overall fertility levels should be adjusted to fit the hybrid, plant population, soil type, environmental conditions and management program. An excess as well as a shortage of nitrogen can lead to increased stalk rot problems.

Producers can check their sorghum for stalk rots by squeezing the lower stem with their thumb and fingers. If the stalks crush easily, they are probably infected with one of the stalk rot organisms and may lodge at any time. Check 100 plants across the field to determine the percent of affected plants. If the percentage of stalk-rot-infected plants is high, sorghum should be harvested as soon as possible, even if it hasn’t dried down adequately in the field. If the stalks are firm, the plants will probably be able to stand just fine in the field for several more weeks if necessary.

Rotation with nonsusceptible crops, such as small grains and alfalfa will reduce the severity of stalk rot but will not eliminate it. A good insect control program is a must in limiting losses to stalk rot. Pathogens may enter stalks or roots through wounds created by insects. Hail damage will generally increase the amount of stalk rot damage.
4. Nutrient management after a failed corn crop

Where the corn crop failed in 2011, farmers are asking questions on the best ways to handle their nutrient management programs for 2012. In most cases, the vast majority of the fertilizer that was applied to unharvested, failed corn should still be there in 2012 – either in the soil or in the crop residue. Farmers will need to do some soil testing to know for sure the nutrient status of fields with failed corn. Farmers will also want to have some idea of the amount of nutrients present in the corn residue remaining, and how quickly those nutrients will become available to crops.

There are a number of potential sources of nutrients other than applied fertilizers that could contribute to a 2012 wheat, corn, sorghum, or soybean crop. These include:

- Nitrate, sulfate, and chloride in the soil profile
- Phosphorus, potassium, and zinc in the surface soil
- Nutrients in crop residues

The first category consists of mobile nutrients, and the second category consists of immobile nutrients. The difference is important. Mobile nutrients are able to dissolve in soil water and can move through the soil in water, while immobile nutrients generally stay where applied. Of the 14 essential mineral elements, the common mobile nutrients we apply as fertilizer are N, S, and Cl, and the common immobile nutrients we apply as fertilizer are P, K, and Zn.

Mobile nutrients in the soil after failed corn

A very large portion of those mobile nutrients that were not taken up by the 2011 corn and/or wheat crops are likely still present in the top foot or two of soil. With the low rainfall in most of the state south of I-70, very little of the N will have been lost. In the K-State Soil Testing Lab, we are already seeing higher-than-normal soil test levels for N, reflecting an accumulation of unused nitrate N in the soil. Any unused sulfur (S) or chloride (Cl) would also be present in that top foot or two of the soil profile.

So the first tool a farmer should think about when planning his 2012 fertilizer program is a deep profile soil test for N, S, and Cl.

Immobile nutrients in the soil after failed corn

What about P, K, or Zn? Where these nutrients were applied to the 2011 corn crop, will they still be available for crops in 2012? When immobile nutrients such as P, K, and Zn are applied to the soil, they interact with different portions of the soil and are retained. Note the word “retained,” not “fixed.”
**Phosphorus.** Phosphorus reacts with the clay surfaces and the iron and aluminum coatings found on the soil particles and is sorbed to those surfaces. Sorption reactions occur in stages, and the initial stages are highly reversible. Sorbed phosphorus can be desorbed and go into soil solution, replacing the P taken up by plants. This is a buffering system which maintains a constant small quantity of P in the soil solution and supplies the P needed for good crop growth. This is how we store P in the soil and build soil test values, with little worry about that P being lost. Sorbed P is the primary P fraction in soils measured by a soil test. But the soil test only reflects a fraction of the total P present in the soil. In most Kansas soils, we have an 18:1 buffer factor. If we add 18 pounds of P₂O₅ and it reacts with the soil, becoming sorbed to the clays and other minerals present, the soil test will increase 1 ppm. If we remove 18 pounds P₂O₅ through crop uptake, the soil test value will drop 1 ppm.

So how does this relate to planning for 2012? Any P applied in 2010 or 2011 for this year’s crop that was not taken up by the corn was sorbed onto clays and other minerals. This creates a new equilibrium in the soil, and will increase the soil test values for P. The higher soil test values will result in a lower P fertilizer recommendation.

**Potassium.** Potassium is a charged cation, K⁺, which is attracted to and retained on the soil’s cation exchange capacity (CEC). Like sorbed P, exchangeable K maintains a constant supply of K in the soil solution to support plant growth. Also like P, this exchangeable K can be measured by a soil test, and it is a highly buffered system. With K, every 4-8 pounds K₂O added will increase the soil test 1 ppm, and every 4-8 pounds removed will lower the soil test 1 ppm. The buffer factor is a function of CEC and soil minerals present. On low-CEC sandy soils this factor is closer to 4, while on high-CEC silty clay loams the value will be closer to 8. Any K applied and not taken up by the 2011 corn crop would have been retained on the CEC in the surface soil and remains available for 2012. And, the higher K soil test values will result in lower K fertilizer recommendations for 2012.

**Zinc.** With zinc, a third mechanism, chelation, occurs and retains applied zinc. Soil organic matter is a strong natural chelating agent, much like some of the synthetic compounds we buy as fertilizer sources. Zinc sulfate added to soil slowly dissolves. A portion reacts with the organic matter and is retained in soluble, natural organic matter chelates. The vast majority of the zinc that moves to plant roots for uptake is present as a natural soil organic matter chelate. Again, this can be measured by a soil test, and there is a common buffer factor of about 10:1 with our DTPA soil test. If we add 1 pound of Zn, the DTPA soil test value will increase by about 0.1ppm.

**Testing for soil nutrients**

The bottom line for soil nutrients is that any N, P, K, S, Zn, and Cl added as fertilizer and not taken up by crops is still likely there, and can be measured by soil tests. The mobile nutrients (N, S and Cl) will need to be measured using a deep profile test, while the immobile nutrients (P, K, and Zn) can be measured using a surface sample.

**What about the nutrients taken up by the 2011 crop?**

We sampled 15 fields across the eastern two-thirds of Kansas in mid-July to determine the actual condition of the 2011 corn crop, yield potential, and nutrient content of the corn plants. These fields ranged from those that had essentially died prior to tasseling to some with the potential for
outstanding yield. The full results from these measurements can be found in e-Update 312, from August 18, 2011 (see: http://www.agronomy.ksu.edu/extension/p.aspx?tabid=58).

The plants fell into three basic groups. The corn from Edwards and Reno counties was the most severely stressed of those sampled, with only 1,200 to 4,500 pounds of dry matter present. The plants from Franklin and Cherokee counties had more normal vegetative growth, but little or no grain yield due to poor pollination. The remaining sites from Riley, Shawnee, and Republic counties had varying levels of growth and yield, but took up normal or slightly reduced levels of nutrients.

The severely damaged samples from Reno and Edwards counties had high nutrient concentrations but very low total nutrient uptake per acre because of the low level of dry matter produced. In those fields a large portion of the applied nutrients are likely still present in the soil, and potentially available for the 2012 crop. The fields in the other areas had varying levels of dry matter and grain yield, and in many cases near-normal nutrient uptake per acre. In this situation, residual nutrients in the soil would likely be elevated, but not to the degree found in the extreme drought areas in south central and southwest Kansas.

The majority of the nitrogen, phosphorus, and sulfur in plant material is present as protein and other organic compounds. For these nutrients to become available to plants, these compounds must be broken down and the N and P mineralized. This process will normally take three or more years to run to completion, with the C:N ratio being the primary factor controlling the rate of release. Corn stalks are normally a very high C:N material, with a C:N ratio around 60:1. In high C:N materials, very little net N mineralization will occur until the organisms utilizing this material as a food stuff reduce the carbon content of the residue to a C:N ratio of roughly 25:1.

In the drought-damaged crops, especially the severely damaged ones with reduced vegetative growth, the N content is much higher than normal, since there is little or no grain present. The C:N ratio in many of these severely damaged crops is less than 35:1. As a result, net mineralization will occur much more quickly -- a matter of months rather than years. In very severely damaged corn where N content is around 2% or more, such as at the Edwards and Reno county sites, roughly half of this N, P, and S is likely to be available for a summer crop planted next spring. In the fields with more normal vegetation but little or no grain yield (Cherokee and Franklin counties), the N will remain in the vegetation and enhance decomposition -- but likely not as quickly as where vegetative growth was more severely damaged by drought.

Potassium and chloride exist in plant cells as free ions. When the plant dies and those cells rupture, the K and Cl rapidly leach from the crop residues and return to the soil to be “recycled” in the next crop. These two nutrients will likely be available quickly for the 2012 crop and can be measured by soil tests later this winter and next spring. If the crop was taken off for silage or forage, these nutrients will have been removed.

Wheat planted this fall into these residues will not benefit nearly as much from the N, P, and S present in the corn vegetation as will next summer’s corn or sorghum crops. With wheat, there is not as much time for soil organisms to break down the residues and mineralize these nutrients.
Measuring nutrient levels on fields of failed corn

For those planting wheat this fall in these failed crop fields, a profile soil test for N, S, and Cl is a must. P and K applications should also be made based on a surface soil sample. For those planting corn or sorghum next spring, it would be best to wait until late winter or early spring to take the profile sample to get a better feel for the amount of the residual N which will be remaining in the soil. Mobile N can be moved below the root zone, especially in sandy soils if we get a wet winter.

Another potentially valuable tool to consider is the use of a crop sensor to help estimate the amount of the N being mineralized from the 2011 crop residues. Kansas has good recommendation systems for both wheat and sorghum to help interpret sensor data. The rate of mineralization will depend greatly on soil moisture and soil temperatures during March through June. A sensor-based N management system can help take some of the risk out trying to take credit for mineralized N.

Summary

A significant amount of residual nutrients will be present in many fields where this year’s crops failed. In severe situations, only a fraction of the nutrients applied were actually taken up by this year’s crop. Many of the nutrients remain in the soil and can be measured using soil tests. This is especially true for the mobile nutrients such as N, S, and Cl. But to get a good estimate of the amounts present, a profile soil test to a depth of 24 inches will be required.

Many of the nutrients taken up by this year’s crop will also be available, especially the K and Cl which are not incorporated into organic compounds. However the N, P, and S must be mineralized as the vegetation decays. This process will be likely be faster than normal, and will increase the availability of these nutrients. But the exact rate of mineralization will depend on the weather, and is difficult to estimate. Crop sensors can help take some of the risk out of crediting these mineralized nutrients.

-- Dave Mengel, Soil Fertility Specialist
dmengel@ksu.edu

5. Radishes, turnips, and base acres: Understanding the USDA Farm Service Agency rules

There’s some confusion about whether or not radishes and turnips can be planted on cropland, since they are technically vegetables. Here are some answers to frequently asked questions on this topic.

* What are base acres? Base acres are the number of acres that a producer receives direct payments on.

* Can I plant radishes and turnips as a cover crop on my base acres? The 2008 Farm Bill says that farmers have the freedom to plant whatever crops they choose on their base acres except for fruits and vegetables. However …

Some producers might have acres on their farms that are not fully based, and so they could grow radishes and turnips on (up to) that number of acres. Or…
If the crop is grown on the base acres strictly as a cover crop and it is not the first crop of the year, and it is not mechanically harvested or grazed, that is acceptable. So if you have planted radishes and turnips after you harvested wheat this summer, and plan to destroy them with herbicide or let the frost kill them, you’re in compliance. But…

If radishes or turnips are planted and are going to be grazed, you need to pay a measurement service fee to have someone from the FSA office come out and look at the field to make sure that you’re not harvesting the vegetables as produce. In Riley County, for example, the fee is typically around $54, but depends on how far your farm is from the local FSA office. And this same rule applies if the radishes and turnips are the first crop of the year on your base acres. Remember…

Producers are required to certify all cropland, and for some USDA programs all farmland, at the FSA office on an annual basis. Failure to provide a complete and accurate acreage report can result in loss of DCP payments and may result in other noncompliance determinations depending on programs the producer participates in with USDA.

* So it sounds like it is possible to plant radishes and turnips on my cropland, but I really should go talk to my local USDA-FSA office first, right? Definitely. They will work with you to determine your options. The FSA realizes that cover crops have a tremendous value in terms of improving soil quality and protecting natural resources, so they are very willing to work with producers who want to plant radishes and turnips as a cover crop or for grazing.

* Should I test the radish and turnip tops before grazing? Definitely, because they are brassica species and brassicas are nitrate accumulators. You’ll want to test them for nitrates before feeding to livestock. See [http://www.ksre.ksu.edu/library/crpsl2/mf3029.pdf](http://www.ksre.ksu.edu/library/crpsl2/mf3029.pdf) for more information on nitrate toxicity. Contact your local extension office for assistance in submitting samples to the K-State Soil Testing Lab or go to [http://www.agronomy.ksu.edu/soiltesting/](http://www.agronomy.ksu.edu/soiltesting/)

-- DeAnn Presley, Soil Management Specialist
deann@ksu.edu

-- Tamie Buckley, County Executive Director, Riley-Geary Farm Service Agency
tamie.buckley@ks.usda.gov

6. Comparative Vegetation Condition Report: August 16 – 29

K-State’s Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:
[http://www.youtube.com/watch?v=CRP3Y5NIggw](http://www.youtube.com/watch?v=CRP3Y5NIggw)
[http://www.youtube.com/watch?v=tUdOK94efxc](http://www.youtube.com/watch?v=tUdOK94efxc)

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 21-year average. The report is used by
individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

The maps below show the current vegetation conditions in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:

Map 1. The Vegetation Condition Report for Kansas for August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the most active area of photosynthetic activity has pulled back to the northeastern area of the state. Some moderate activity can still be seen in southeastern Kansas, and in Pawnee and Kearny counties.
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the northern third of the state is seeing a greater level of photosynthetic activity. Pockets of conditions better than last year at this time can also be seen in northern Haskell and eastern Greeley counties, where rainfall has been closer to average in late August. Poor conditions are most notable in the Flint Hills region. Last year these areas experienced near normal rainfall and temperatures, in contrast to the above-average temperatures and low rainfall totals for the current period.
Map 3. Compared to the 22-year average at this time for Kansas, this year’s Vegetation Condition Report for August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that much-below-normal photosynthetic activity continues to dominate the southwestern portion of the state. The same situation is also very noticeable in the central Flint Hills region. Some increased photosynthetic activity can be seen along the Cowley/Sumner county line and in Montgomery County. Isolated locations in these areas had almost 5 inches of rain in August.
Map 4. The Vegetation Condition Report for the Corn Belt for August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that pockets of reduced photosynthetic activity continue to expand in the previously wet areas. Some areas of reduced photosynthetic activity can be traced to hail damage. Most of these areas are in response to the heat, and the quick drop in soil moisture levels.
Map 5. The comparison to last year in the Corn Belt for the period August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that most of the region has similar levels of photosynthetic activity. The northern areas of the Corn Belt continue to benefit from the wet spring, while the areas affected by drought continue to expand into eastern Kansas and southern Missouri.
Map 6. Compared to the 22-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows North and South Dakota continue to see much-above-average photosynthetic activity. Crop progress in this area is running two weeks behind the average.
Map 7. The Vegetation Condition Report for the U.S. for August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the Eastern U.S. continues to have very high biomass production, while the Southwestern U.S. is experiencing very little. The area of low photosynthetic activity is beginning to expand in the western High Plains.
Map 8. The U.S. comparison to last year at this time for the period August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the differences between the two years are most notable in the Central region. Greater levels of photosynthetic activity can be seen in the Northern Plains, while lower productivity is evident in the Southern Plains. In Oklahoma, 92 percent of the pastures are reported to be in poor to very poor condition.
Map 9. The U.S. comparison to the 22-year average for the period August 16 – 29 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that from southeastern Colorado to the Texas Gulf Coast photosynthetic activity is greatly reduced. Low photosynthetic activity can also be seen in the southern sections of Florida, where a mix of standing water and low soil moisture is present.

Note to readers: The maps above represent a subset of the maps available from the EASAL group. If you’d like digital copies of the entire map series please contact us at kprice@ksu.edu and we can place you on our email list to receive the entire dataset each week as they are produced. The maps are normally first available on Wednesday of each week, unless there is a delay in the posting of the data by EROS Data Center where we obtain the raw data used to make the maps. These maps are provided for free as a service of the Department of Agronomy and K-State Research and Extension.

-- Mary Knapp, State Climatologist
mknapp@ksu.edu

-- Kevin Price, Agronomy and Geography, Remote Sensing, Natural Resources, GIS
kpprice@ksu.edu

-- Nan An, Graduate Research Assistant, Ecology & Agriculture Spatial Analysis Laboratory (EASAL)
nanan@ksu.edu

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you’d like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu