1. Effect of wheat stubble height on corn/sorghum yields in no-till rotations

In a wheat/corn/fallow or wheat/sorghum fallow dryland no-till rotation in western Kansas, one of the management decisions is how high to set the combine when harvesting wheat. Combine height can have a direct effect on how much grain is harvested. But it can also have several indirect effects throughout the entire rotation due to the height of the remaining stubble.

One of the hidden effects of stubble height in wheat is the effect it has on the following corn or grain sorghum crop. Wheat residue provides numerous benefits, including evaporation suppression, delayed weed growth, improved capture of winter snowfall, and reduced soil erosion. Stubble height affects wind velocity profile, surface radiation interception, and surface temperatures, all of which affect evaporation suppression and winter snow catch. Taller wheat stubble is also beneficial to pheasants in postharvest and overwinter fallow periods. Using stripper headers increases harvest capacity and provides taller wheat stubble than previously attainable with conventional small grains platforms.

To study the effects of wheat stubble height on row crop yields in this cropping system, we conducted a study from 2007 through 2010 at the Southwest Research-Extension Center dryland station near Tribune.

Methods

In this study, corn and grain sorghum were planted into standing wheat stubble of three heights: optimal, short, and stripped. Optimal cutter bar height is the height necessary to maximize both grain harvested and standing stubble remaining (typically two-thirds of total plant height). The short cut treatment was half of optimal cutter bar height. The third treatment was stubble
remaining after stripper header harvest. In 2007, these heights were 7, 14, and 22 in. In 2008, heights of 10, 20, and 30 in. were obtained. In 2009 the heights were 7, 14, and 23 in. In 2010 the stubble measured 8, 16, and 25 in.

Corn was seeded at the rate of 15,000 seeds/acre. The seeding rate for grain sorghum was 33,000 seeds/acre (with a 41,000 treatment added in 2010). Nitrogen was applied to all plots at a rate of 80 to 100 lb/a N. Starter fertilizer (10-34-0) was applied in-row at rates of 7 gallons/acre for corn and 9 gallons/acre for sorghum.

**Results**

Corn. Over the 4 years, corn grain yield increased from 80 to 92 bu/a as stubble height increased. Increased grain yields are the result of the effect of stubble height on one primary yield component, kernels per ear, which increased with increasing stubble height from 467 for the low cut to 521 for the stripped stubble treatment. Another key yield component, ear population, also increased numerically with increasing stubble height, suggesting that increasing stubble height also may reduce in-season plant mortality and ear abortion. Corn grown in stripped or tall cut stubble resulted in higher water use efficiency (WUE), which increased from 305 lb/in. in short cut stubble to 361 lb/in. in the stripped stubble treatment.

Grain sorghum. Over the 4 years, sorghum grain yields exhibited a quadratic response to stubble height with high cut stubble producing grain yields 4 to 5 bu/a higher than either the stripped or short cut treatment. An examination of yield components revealed that kernels per head generally increased with increasing stubble height. Although no statistical differences were observed, heads per plant exhibited a positive response to increasing stubble height. Future efforts in this study will involve more emphasis on yield components, specifically tillers per plant, in an effort to identify any interaction between tillering and the production environment created by stripped stubble.

**Summary**

Increasing stubble height has improved subsequent corn grain yields and WUE. The impact of stubble height on grain sorghum yields is less apparent at this time and requires further study. Surprisingly, this study has found little impact of stubble height on profile available soil water. This is in direct contrast to other studies and anecdotal field observations. Corn grain yield differences in the absence of differences in available soil water at planting indicate a more pronounced impact of stubble harvest height on in-season plant-water dynamics than previously thought.
For more information, and complete details of the study, see Southwest Research-Extension Center Field Day 2011, K-State publication SRP 1052: http://www.ksre.ksu.edu/library/crpsl2/srp1052.pdf

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-- Alan Schlegel, Agronomist-in-Charge, Southwest Research-Extension Center, Tribune schlegel@ksu.edu

2. Nitrogen fertilization of nitrogen-stressed soybeans

Soybeans do not normally respond to applications of nitrogen (N) fertilizer, as long as they are well nodulated with rhizobia bacteria. When soybeans are planted into ground that has no history of soybean production, or when it’s been a long time since soybeans were last planted, adequate rhizobia may not be present for successful nodulation and N fixation. This is usually overcome by inoculating the seed with rhizobia. These inoculations are not always successful, however. Poorly nodulated, N-deficient soybean can result.

In both 2009 and 2010, a number of fields planted into “virgin” soybean ground or into returned Conservation Reserve Program ground in north central Kansas were observed to be poorly nodulated and N-deficient even though the seed was commercially inoculated. A field study was conducted in 2009 and continued at a different location in 2010 to determine whether these poorly nodulated, N-deficient soybean would respond to applied N fertilizers, and, if so, how much N could successfully be used.

Methods

The 2009 study was conducted on a farmer’s field near Solomon that had noticeably N-deficient soybean. Soybean variety NK S39-A3 was planted no-till into sorghum residue from the previous year on May 20, 2009, at 140,000 seeds/acre. A liquid inoculant was sprayed on the soybean seeds as they were loaded into the planter. This field had no history of soybean production. Nitrogen fertilizer was applied on July 20, 2009, to soybeans displaying N-deficiency symptoms at the R1 to R2 growth stages. The N was applied as urea co-granulated with a urease inhibitor and nitrification inhibitor (Super-U) by surface banding the material between the soybean rows. Rainfall occurred within a few hours of N application.

The 2010 study was conducted on a farmer’s field near Gypsum that had poorly nodulated, N-deficient soybean. The soybean variety P93Y70 was planted into conventional tilled soil at 130,000 seeds/acre on June 19, 2010. Soybean seed was treated with Optimize Inoculant prior to planting. This field also had no history of soybean production. The N was again broadcast-
applied as urea co-granulated with a urease inhibitor and nitrification inhibitor (Super U) on July 22, 2010. Rainfall did not occur until 14 days after treatments were applied.

**Results**

The results from both studies for 2009 and 2010 are summarized in the table below. In 2009, response to the highest rate, 120 lb N/acre, was near-linear and highly significant, with a 21 bu/acre advantage over the control.

Yields at Gypsum in 2010 were lower due to dry weather; however, similar results were obtained, with an 11-bu response to the first 120 lb of N/acre compared to the control. No additional response was obtained to the 150-lb rate applied in 2010 compared to 120 lb N/acre in 2009. When averaged across years, the data show a clear linear response to N, with highest yields obtained at 120 lb N/acre.

The data from these studies show that applying N fertilizer to poorly nodulated, N-deficient soybean enhances yield. Applying up to 120 lb N/a has been effective in each of the past two years. At current fertilizer and commodity prices these responses would provide a good return on investment, even on the modest yields obtained in 2010. Additional research will be conducted to further refine appropriate N rates if opportunities develop in the future.

<table>
<thead>
<tr>
<th>N rate (lb/acre)</th>
<th>Solomon 2009</th>
<th>Gypsum 2010</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>28d</td>
<td>18c</td>
<td>23d</td>
</tr>
<tr>
<td>30</td>
<td>37c</td>
<td>23b</td>
<td>30c</td>
</tr>
<tr>
<td>60</td>
<td>42b</td>
<td>26b</td>
<td>33cb</td>
</tr>
<tr>
<td>90</td>
<td>43b</td>
<td>26b</td>
<td>34b</td>
</tr>
<tr>
<td>120</td>
<td>49a</td>
<td>29a</td>
<td>39a</td>
</tr>
<tr>
<td>150</td>
<td>N/A</td>
<td>29a</td>
<td>N/A</td>
</tr>
</tbody>
</table>

This study was conducted in cooperation with Tom Maxwell, Central Kansas District Extension Agent, along with Antonio Asebedo and Andrew Tucker, graduate students in agronomy.

While N applied to N-deficient soybeans at the pod development or early pod fill stages of growth can increase yields, there are risks:

* Leaf burn. It would be much safer to apply urea than UAN solution.
* Volatilization. Urea applied to the soil surface under warm, damp, windy conditions may volatilize if it is not worked into the soil by rainfall. This risk can be minimized by having the urea treated with Agrotain.
* Dry weather after application. If it doesn’t rain after the N application, the N may not get down into the soil in time to benefit the plants.
* Plant damage during the application process. At this time of year, making a fertilizer application with ground equipment could damage some of the plants. Whether the benefits would outweigh the amount of plant damage is a judgment call.

Irrigated soybeans with high yield potential may respond to N applications, even if they are not N deficient. There was some K-State research several years ago on late-season applications of N to soybeans, conducted by Ray Lamond, former K-State soil fertility specialist, and colleagues. This research was on irrigated soybeans with high yield potential, and the plants were not
showing N deficiency at the time of application. Lamond applied 20 and 40 pounds of N per acre to the beans at the R3 stage, using UAN, ammonium nitrate, urea, and urea + the urease inhibitor NBPT, the active ingredient in Agrotain. The N increased yields at most locations. The yield increases ranged from about 6 to 10 bushels per acre – or about 5 to 10 percent. The high rate (40 lbs N/acre) of UAN caused severe leaf burn. Lamond concluded that late-season supplemental N at a rate of 20 lbs/acre should be applied to irrigation soybeans with high yield potential at the R3 growth stage.

For complete details of the study at Solomon and Gypsum, see 2010 Kansas Fertilizer Research, K-State publication SRP 1049: http://www.ksre.ksu.edu/library/crpsl2/srp1049.pdf

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-- Dorivar Ruiz-Diaz, Nutrient Management Specialist
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3. Glume blotch on wheat

There have been many reports this year of glume blotch on wheat, from southeast Kansas through north central Kansas. Glume blotch can be caused by the same fungus that causes Stagonospora nodorum blotch or the fungus that causes speckled leaf blotch. Initial symptoms of glume blotch are small brown spots on the glumes or awns. These expand to dark blotches, darkening the head. As lesions age, they may become tan and contain very small caramel-colored round fungal structures (visible with magnification).

Glume blotch in wheat. Photo by Jim Shroyer, K-State Research and Extension.
The septoria leaf and glume blotch pathogen survives within infested straw, seed, and on volunteer wheat. Infections on these sources serve as the source of inoculum to start off the disease cycle in the new crop of wheat. The disease is favored by splashing rain, high humidity, and temperatures between 68 and 82 degrees F. Where those conditions have occurred over the past month, glume blotch is now being found.

The disease characteristically moves upward from infection initiated on the low leaves within the crop canopy. If weather remains favorable, the disease will often spread to the heads. Foliar fungicides will protect wheat against glume blotch, but must be applied shortly after head emergence. Current fungicide labeling prevents application beginning at flowering or within 30 days of harvest. There are varietal differences in susceptibility to glume blotch; however, high levels of resistance are rare.

Glume blotch can result in yield losses between 10 and 20 percent. The greatest losses occur when the disease damages both the leaves and the heads. The grain produced in heads damaged by glume blotch is often small and shriveled.

Kernels on the left are from wheat infected with glume blotch. The kernels on the right are from normal, healthy wheat. Photo by Doug Shoup, K-State Research and Extension.

The fungus that causes glume blotch can survive in wheat residues. Fields with severe disease this year should not be planted to wheat this fall. The fungus can also survive in grain that is saved for seed. These seed infections can reduce the effectiveness of crop rotations and allow the disease to get established early in the growing season. Growers wanting to save seed from affected fields should have grain cleaned to remove the small heavily infected seeds, and use a fungicide seed treatment such as Dividend or Raxil.

-- Erick DeWolf, Extension Plant Pathology
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4. Plant analysis for corn

With corn, plant analysis can be especially valuable for managing secondary and micronutrients which don’t have high quality soil tests available, and providing insight into how efficiently you are using applied nutrients.

What and when should producers sample? For general monitoring or quality control purposes, 15-20 ear leaves or the leaf below and opposite the ear, should be collected at random from the field at silk emergence, before pollination, and the silks turning brown. Sampling under stress conditions for monitoring purposes can give misleading results, and is not recommended.

How should samples be handled, and where should producers send the samples? The collected leaves should be allowed to wilt over night to remove excess moisture, placed in a paper bag or mailing envelope, and shipped to a lab for analysis. Do not place the leaves in a plastic bag or other tightly sealed container, as they will begin to rot and decompose during transport, and the sample won't be usable. Most of the soil testing labs working in the region provide plant analysis services, including the K-State lab.

What nutrients should producers analyze for? In Kansas nitrogen (N), phosphorus (P), potassium (K), sulfur (S), zinc (Zn), chloride (Cl) and iron (Fe) are the nutrients most likely to be deficient. Recently questions have been raised by consultants and others concerning copper (Cu), manganese (Mn) and molybdenum (Mo). Most labs can analyze for most of these. Normally the best values are the “bundles” or “packages” of tests offered through many of the labs. They can be as simple as N, P and K, or can be all of the 13 mineral elements considered essential to plants.

The data returned from the lab will be reported as the concentration of nutrient elements, or potentially toxic elements in the plants. Units reported will normally be in percent for the primary and secondary nutrients (N, P, K, Ca, Mg, S, and Cl) and ppm or parts per million, for the micronutrients (Zn, Cu, Fe, Mn, B, Mo, and Al).

Most labs/agronomists compare plant nutrient concentrations to published sufficiency ranges. A sufficiency range is simply the range of concentrations normally found in healthy, productive plants during surveys. It can be thought of as the range of values optimum for plant growth. The medical profession uses a similar range of normal values to evaluate blood work. The sufficiency ranges change with plant age (generally being higher in young plants), vary between plant parts, and can differ between hybrids. So a value slightly below the sufficiency range does not always mean the plant is deficient in that nutrient, but it is just an indication that the nutrient is relatively low. Values on the low end of the range are common in extremely high yielding crops. However, if that nutrient is significantly below the sufficiency range, then one should ask some serious questions about the availability and supply of that nutrient.

The following table gives the range of nutrient content considered to be "normal" or “sufficient” for corn early in the season (less than 12" tall) and later in the season, at silking. Keep in mind that these are the ranges normally found in healthy, productive corn.
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Units</th>
<th>Whole plant, less than 12&quot; tall</th>
<th>Ear leaf at green silk stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>%</td>
<td>3.5-5.0</td>
<td>2.75-3.50</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>%</td>
<td>0.3-0.5</td>
<td>0.25-0.45</td>
</tr>
<tr>
<td>Potassium</td>
<td>%</td>
<td>2.5-4.0</td>
<td>1.75-2.25</td>
</tr>
<tr>
<td>Calcium</td>
<td>%</td>
<td>0.3-0.7</td>
<td>0.25-0.50</td>
</tr>
<tr>
<td>Magnesium</td>
<td>%</td>
<td>0.15-0.45</td>
<td>0.16-0.60</td>
</tr>
<tr>
<td>Sulfur</td>
<td>%</td>
<td>0.20-0.50</td>
<td>0.15-0.50</td>
</tr>
<tr>
<td>Chloride</td>
<td>%</td>
<td>not established</td>
<td>0.18-0.60</td>
</tr>
<tr>
<td>Copper</td>
<td>ppm</td>
<td>5-20</td>
<td>5-25</td>
</tr>
<tr>
<td>Iron</td>
<td>ppm</td>
<td>50-250</td>
<td>30-200</td>
</tr>
<tr>
<td>Manganese</td>
<td>ppm</td>
<td>20-150</td>
<td>20-150</td>
</tr>
<tr>
<td>Zinc</td>
<td>ppm</td>
<td>20-60</td>
<td>15-70</td>
</tr>
<tr>
<td>Boron</td>
<td>ppm</td>
<td>5-25</td>
<td>4.0-25</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>ppm</td>
<td>0.1-10</td>
<td>0.1-3.0</td>
</tr>
<tr>
<td>Aluminum</td>
<td>ppm</td>
<td>&lt;400</td>
<td>&lt;200</td>
</tr>
</tbody>
</table>

Keep in mind also that any plant stress (drought, heat, soil compaction etc) can have a serious impact on nutrient uptake and plant tissue nutrient concentrations. So a low value in the plant doesn’t always mean the nutrient is low in the soil and the plant will respond to fertilizer, rather that the nutrient may not be available to the plant.

Levels above sufficiency can also indicate problems. High values might indicate over fertilization and luxury consumption of nutrients. Plants will also sometimes try to compensate for a shortage of one nutrient by loading up on another. This occurs at times with nutrients such as iron, zinc and manganese. Plants will load up on iron at times, in an attempt to compensate for low zinc. In some situations very high levels of a required nutrient can lead to toxicity. Manganese is an example of an essential nutrient which can be toxic when present in excess. This can occur at very low soil pH, generally well below 5.

Plant analysis is also an excellent diagnostic tool to help understand some of the variation seen in the field. When using plant analysis to diagnose field problems, try to take comparison samples from both good/normal areas of the field, and problem spots. Also collect soil samples from the same good and bad areas since physical problems such as soil compaction often limits the uptake of nutrients present in adequate amounts. Don’t wait for tasseling or silking to sample. Early in the season (prior to the 6-7th leaf, or roughly a foot high) collect whole plants from 15 to 20 different places in your sampling area. Later in the season, but prior to tasseling, collect 15-20 top, fully developed leaves (those with leaf collars visible). Handle the samples the same as those for monitoring, allowing them to wilt to remove excess moisture and avoiding mailing in plastic bags.

-- Dave Mengel, Soil Fertility Specialist
dmengel@ksu.edu
The 7th Annual Dr. Ray E. Lamond Scholarship Golf Outing will be held on Thursday July 7, 2011 at Stagg Hill Golf Course in Manhattan. This event generates money for the Ray E. Lamond Scholarship Fund to benefit graduate students in K-State’s Department of Agronomy.

Tee times will begin at 7:30 am with a better-ball arrangement. Please organize a foursome and enter a team by emailing the information below. Everyone is encouraged to participate. Individual entrants will be assigned to a team based on need. If you are putting a team together, please indicate all players’ names on the entry form and provide an email address so we can contact all participants.

An entry fee of $50.00 per person will be collected to cover each participants green fee, one-half cart fee, and some prizes. As in the past, any leftover collections will be added to the scholarship fund. For those interested in donating to the scholarship fund, checks should be made payable to Ray E. Lamond Scholarship Fund. Donations can be made at the tournament or submitted prior to the tournament. The mailing address is: Ray E. Lamond Scholarship Fund, Department of Agronomy, Kansas State University, 2004 Throckmorton Hall, Manhattan, KS 66503.

We need to know your intentions by Thursday, June 30 in order to decide if we need to release or get more tee times. Please complete this form and return to Gerard Kluitenberg via email (gjk@ksu.edu) by June 30, 2011. For questions, contact Gerard Kluitenberg, at gjk@ksu.edu or (785) 532-7215. Other contacts for the outing are Dale Leikam, dale.leikam@sbcglobal.net, and Dana Minihan, prplpwr@ksu.edu.

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<table>
<thead>
<tr>
<th>Ray E. Lamond Scholarship Fund Golf Outing - ENTRY FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ YES, I PLAN TO ATTEND</td>
</tr>
<tr>
<td>_____ Fee $50.00</td>
</tr>
<tr>
<td>_____ Yes, I will need to reserve a cart – How many?</td>
</tr>
<tr>
<td>_____ YES, I PLAN TO PUT A TEAM TOGETHER (see names below)</td>
</tr>
<tr>
<td>_____ NO, I WILL NOT BE ABLE TO ATTEND or RSVP Via Email (<a href="mailto:gjk@ksu.edu">gjk@ksu.edu</a>)</td>
</tr>
</tbody>
</table>

TEAM Participants (we will help individuals find a team)

<table>
<thead>
<tr>
<th>Team Member Names</th>
<th>PHONE NUMBER/EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>
Will you have any Tee Time preferences? If so, please note below. We will try to accommodate if possible. Starting at 7:30 a.m., and following at 8 minute increments.

_______ early _______ middle _______ late

-- Gerard Kluitenberg, Soil Physics
gjk@ksu.edu


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=CRP3Y5N1ggw
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 May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the north/south and east/west divide in the rainfall. The eastern third of the state experienced generally beneficial rains, and the vegetation is very active. In the central third, the northern half had the rains, while the southern half didn’t. Vegetation showed the expected response.
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the level of photosynthetic activity is generally much lower than last year. The exception can be seen in parts of the Flint Hills where moisture was more timely.
Map 3. Compared to the 22-year average at this time for Kansas, this year’s Vegetation Condition Report for May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that much of the western and south central divisions have well below-normal photosynthetic activity. Also noteworthy are parts of northeast Kansas along the Nebraska border, where below-average photosynthetic activity can be seen. While parts the northeast division experienced excessive moisture, this region as a whole experienced very little rainfall.
Map 4. The Vegetation Condition Report for the Corn Belt for May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the slow response to the cold, wet soils in much of the Northern Plains, Iowa, Illinois, Indiana, and western Ohio continue. This is also notable in eastern Nebraska. In western Kansas, the low level of photosynthetic activity continues to be driven by the extreme drought conditions in the region.
Map 5. The comparison to last year in the Corn Belt for the period May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the northwestern portions of the Corn Belt have greater levels of photosynthetic activity than last year. This area has experienced favorable winter moisture, and spring temperatures. Also noticeable for the increased photosynthetic activity are areas of Minnesota and Wisconsin, where moisture levels are more favorable than last year. The heart of the Corn Belt continues to lag. In Ohio, only 57 percent of the corn was emerged by June 12, compared to 96 percent last year.
Map 6. Compared to the 22-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the northern portions are showing greater levels of photosynthetic activity than average. Along the river systems, and through the central portions of the Corn Belt, saturated soils have reduced activity. In southwest and south central Kansas, drought is the main feature.
Map 7. The Vegetation Condition Report for the U.S. for May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the most photosynthetically active region is in the Mid-Atlantic states, particularly West Virginia and Pennsylvania. The impact of the flooding along the Mississippi can also still be seen.
Map 8. The U.S. comparison to last year at this time for the period May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows despite the greenness visible on the previous map, much of the nation has lower levels of photosynthetic activity than last year. Notable exceptions are in the Inner Mountain West, as the heavier-than-average snowpack retreats, photosynthetic activity has been greater than last year.
Map 9. The U.S. comparison to the 22-year average for the period May 31 – June 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the impact of the drought. Most notable is the reduced photosynthetic activity in southeast Colorado, southwest Kansas, and into Texas. Note, also, the reduced photosynthetic activity along the Gulf Coast and into the Florida Panhandle. Across the northern U.S., saturated soils are the primary deterrent to photosynthetic activity.

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.

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-- Nan An, Graduate Research Assistant, Ecology & Agriculture Spatial Analysis Laboratory (EASAL)
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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