1. Soybeans: Green leaves, green stems, brown pods

In parts of the state, there are many fields of soybeans in which the pods are brown and the seed is at 13-14% moisture, but the leaves and stems are still green. A hard freeze will kill the leaves and stems, but it still may take a while for the leaves to drop.

Producers can either harvest these soybeans now if the seed moisture is dry enough, or wait until the leaves have dropped. In most cases, it would be best to harvest sooner rather than later to reduce losses from shattering and lower seed quality. Harvesting beans before the leaves have dropped can be messy and gum up the combine, but at least the yield level will be maintained. Make sure harvesting equipment is sharp and in top condition, and take it slow in the field.

What caused this unusual situation this year? It’s most likely due to a combination of stress, low pod counts, and late rains.

In a normal situation, soybeans will accumulate carbohydrates and proteins in the leaves and stems up until seeds begin to form (R5). The leaves provide the photosynthates needed by the newly formed seeds as they begin filling. As the seeds continue to get bigger, their need for photosynthates will eventually become greater than what the leaves can provide through normal photosynthesis. As this happens, the plants will move carbohydrates and proteins from the leaves and stems into the seeds. This can be referred to as “cannibalization” of the vegetative tissue, but it’s a normal process. This eventually causes leaves to turn yellow and drop, and the stems to turn brown and die.

This year, however, some fields had far fewer pods than normal. Stress conditions around flowering caused flower drop or pod abortion. Corn earworms and other insects can also cause low pod counts. When pod counts are unusually low, the demand for carbohydrates and proteins by developing seeds is low enough that plants may not need to cannibalize the leaves and stems as extensively as normal.
As a result, the leaves and stems retain their photosynthates longer, and can remain green even up through physiological maturity of the beans. Late-season rainfall can make the problem worse by keeping the plants alive as the seeds have dried down. It will take either a frost or a desiccant to kill the leaves and stems in this situation.

If the leaves are still green and intact when pods have turned brown and have reached 13-14% moisture, it’s almost always an indication of mid-season stress around flowering/pod set and low yield potential – at least relative to the amount of foliage produced.

-- Bill Schapaugh, Soybean Breeder
wts@ksu.edu

-- Kraig Roozeboom, Cropping Systems Agronomist
kraig@ksu.edu

2. Estimating yield reductions from fall freeze damage in grain sorghum and soybeans

A significant acreage of grain sorghum and soybeans in Kansas may be subject to freezing temperatures before they reach maturity this year. This is due mostly to delayed development and late bloom due to drought and heat stress. The minimum temperature and length of time at that temperature will determine if freezing temperatures are severe enough to reduce yields. The minimum temperature needed to injure a plant is not the same for all crops.

**Sorghum**

Sorghum grain weight is not reduced by temperatures of 32°F. However, as the air temperatures decrease below freezing, the amount of damage to a sorghum plant may increase and seed weight decrease, depending on the stage of grain development at the time of the freeze. Maximum damage occurs when plants are exposed for 2 hours or more at a temperature of 28°F or lower at the soft dough stage or before. Damage will not be as severe if plants are exposed for less than 2 hours. Research indicates that grain sorghum exposed to air temperatures of 28°F or lower, is unable to continue filling grain from carbohydrates stored in the stem or remaining leaves. The estimated yield loss at various stages of sorghum grain development when the freeze occurs is in the chart below:

<table>
<thead>
<tr>
<th>Stage of Sorghum Grain Development</th>
<th>Estimated Yield Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft-Dough – kernel is filled with a soft pasty substance</td>
<td>38 to 52</td>
</tr>
<tr>
<td>Hard-Dough – kernel endosperm has a chalky consistency</td>
<td>2 to 27</td>
</tr>
<tr>
<td>Physiological Maturity – black spot evident at point of kernel attachment; kernel weight is at a maximum, grain moisture is approximately 30%</td>
<td>0</td>
</tr>
</tbody>
</table>

**Soybeans**

Soybean tops are damaged at temperatures in the range of 30 to 32 degrees F. The colder the temperatures, the greater the extent of damage to leaves. Wisconsin data reported that 80% of soybean leaves were damaged at 26 degrees F for five minutes. These numbers are generalizations as freeze tolerance may be slightly higher in thick stands and narrower rows. Wisconsin research
showed that when frost occurred at or before R7 (seed fills the pod cavity at one of the four uppermost nodes), yields were reduced. The most sensitive growth stage for economical yield loss was found to occur at the R5 (seed 0.3 cm long at one of four uppermost nodes) growth stage. Yield reductions are a result of a reduction in number of beans per plant and reduced bean size. The maturity of freeze-damaged soybeans is never delayed, but can be accelerated.

After a freeze has occurred, visual inspection of the plants will determine to what extent leaf damage has occurred. Check for leaf burn into the middle of the canopy. If little or no leaf damage has occurred or if leaf damage is confined to the upper or outer leaves, then the soybean plants were probably not exposed to cold enough temperatures to damage the plant and reduce yields. If the leaves are damaged close to the stem, then the amount of leaf damage and stage of grain development will determine the amount of yield loss. Indeterminate soybean varieties may have seed at two or more different stages of development on the same plant. For example, a plant may have pods beginning to mature (R7) at the mid to lower nodes and may also have pods at full seed (R6) at the top nodes. Such a plant may be designated as being at stage R6.5 rather than only R6 or R7.

<table>
<thead>
<tr>
<th>Stage of Soybean Grain Development</th>
<th>Soybean Growth Stage</th>
<th>Estimated Yield Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Seed – seed 1/8” inch long in pod at one of 4 uppermost nodes</td>
<td>R5.0</td>
<td>65.4</td>
</tr>
<tr>
<td>Full Seed – seed fills pod cavity at one of 4 uppermost nodes, leaves beginning to yellow</td>
<td>R5.5</td>
<td>51.0</td>
</tr>
<tr>
<td></td>
<td>R6.0</td>
<td>37.1</td>
</tr>
<tr>
<td></td>
<td>R6.5</td>
<td>23.9</td>
</tr>
<tr>
<td>Beginning Maturity – 1 pod on main stem has reached mature color, 50% of leaves yellow</td>
<td>R7.0</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>R7.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Full Maturity – 95% of pods are mature color, leaves have dropped</td>
<td>R8.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Soybean seeds that are soft and green at the time of the freeze will shrivel, but those in pods that have turned yellow may still mature normally. Clearly green soybeans are undesirable because of low seed quality and yield, but also have poor end-use qualities (see next article).

**Sunflowers**

Once the sunflower plant has reached the R7 stage, approximately 10 to 14 days after petal drydown, a sunflower plant can withstand temperatures as low as 25°F with little damage.

For more information, including a detailed discussion of calculating heat units and expected yield losses from freezes at different levels of heat unit accumulation in sorghum, and information about harvest options after a freeze, see Extension publication MF-2234 “Fall Freeze Damage in Summer Grain Crops” [http://www.ksre.ksu.edu/library/crpsl2/MF2234.PDF](http://www.ksre.ksu.edu/library/crpsl2/MF2234.PDF)

-- Kraig Roozeboom, Cropping Systems Agronomist

[kraig@ksu.edu](mailto:kraig@ksu.edu)
3. Utilization and storage of green soybeans

Green soybeans at harvest time can occur any time plants die prematurely before the seeds are fully developed. Usually this is due to a hard freeze before the beans are mature. Occasionally there can be other causes, such as late flooding, that kill the plants before the beans are fully developed.

Even though soybeans may be “shut down” by dry weather or an early freeze, immature soybean seeds can continue to mature if conditions are favorable -- although seed weight may be reduced. Research has shown that the rate of drydown for immature soybean seed can influence both chlorophyll content (greenness) and viability (germination %). Immature seed that dries down rapidly (most likely in hot, dry weather) maintains greater chlorophyll content and is much less viable than immature seed that dries more slowly. Immature seed that dries more slowly is metabolically active, resulting in lower chlorophyll content and greater seed viability.

Green beans are undesirable to processors because they can affect the color of oil and meal. Processors will discount green soybeans based on the color definition in the U.S. Grades. The green color from immature beans has to be refined out of the oil. Not only that, but oil from immature beans often contains high levels of free fatty acids, which are causes of rancidity.

**Livestock feed**

Processors may not like to receive green beans, but cattle don’t mind. Green soybeans can be used as cattle or swine feed under certain conditions.

If they are not moldy, they can be fed to beef cattle if introduced slowly. They should not be fed to young calves that do not have a functional rumen, but can make up to 7% of the diet for growing calves and 5% percent for finishing calves, or to the amount needed to meet the animals’ protein needs, whichever is less. In a roughage diet, the fat content should be limited to less than 4%, which is key in feeding green soybeans to cattle.

For swine, raw soybeans contain high quantities of trypsin inhibitor, which blocks normal protein digestion in pigs. Therefore, the most efficient manner to use green beans for swine is to have them extruded. The heat processing with extrusion will deactivate the trypsin inhibitor, making green soybeans a relatively high-quality feed ingredient. Once they have been extruded, they can then be substituted for soybean meal on an equal protein (lysine) basis.

Oil content is usually lower in immature, green soybeans than in mature beans because oil is one of the last constituents to be put into the seed during a normal growing season. Otherwise, there is no nutritional difference between green soybeans and regular soybeans, both on a raw and roasted basis.

It is recommended that any soybeans be analyzed prior to feeding and that the rations be balanced with the help of a knowledgeable nutritionist.

**Storage considerations**

If soybeans are not sold or fed to livestock, they must be stored. Special considerations must be taken when storing green soybeans. First note that the green color will not be lost from the soybeans, it will simply be camouflaged by the mixing with other beans. Aeration does not affect the internal
green color of the soybeans, but it is very important to aerate the soybeans quickly. This is important because the spoilage risk from mold or insects in storage is greater with green beans.

During aeration, the grain temperature should be reduced to below 40°F as soon as possible. With these smaller, immature beans, note that it will take longer to aerate them, and make adjustments accordingly. Storage risks are the same for green as for yellow soybeans as long as they are stored at the recommended 18% moisture.

-- Kraig Roozeboom, Cropping Systems Agronomist
kraig@ksu.edu

-- Dale Blasi, Beef Cattle Nutrition Specialist
dblasi@ksu.edu

-- Bob Goodband, Swine Nutrition Specialist
goodband@ksu.edu

4. Glyphosate use in Roundup Ready alfalfa

When planting Roundup Ready alfalfa, when should the first application of glyphosate be made? Strictly speaking, any time will work because Roundup Ready alfalfa is tolerant to glyphosate at all stages of growth. That means producers can make the first application as early as they’d like.

The label on Roundup PowerMax and WeatherMax recommends that the first application of Roundup be made early – at or before the four trifoliate stage. The reason is that up to 10% of the seed in Roundup Ready alfalfa actually may not be Roundup Ready. Alfalfa is primarily a cross-pollinated crop, pollinated by insects, so it is nearly impossible to get 100 percent genetic purity in a seed lot. Thus, it is important that producers kill off the non-Roundup Ready alfalfa plants early before they become established so they are not competing with the Roundup Ready plants as stands are being established.

In fall-seeded alfalfa, the main weeds present after emergence will be winter annuals such as henbit, mustards, volunteer wheat, and cheatgrasses -- assuming the alfalfa was planted into a weed-free seedbed. If the appropriate rate of glyphosate and proper adjuvants are used at this time, glyphosate should be able to control all of these problems.

In spring-seeded alfalfa, the main weeds present after emergence will most likely be summer annuals such as pigweeds, velvetleaf, and crabgrass. If these weeds are treated when they are seedlings or very young, glyphosate at the appropriate rates and with the proper adjuvants should be able to control them. There may also be winter annuals present, but these should be controlled before the alfalfa is seeded.

Of course, glyphosate is a non-residual herbicide, so repeat applications may be needed.

Once Roundup Ready alfalfa is established, there may be an advantage to making a dormant-season application with a different herbicide, or combination of herbicides, with different modes of action to help prevent the development of glyphosate-resistant weeds.
One final note of caution: Not all glyphosate products are currently labeled for use on Roundup Ready alfalfa. Be sure to check the labels.

-- Dallas Peterson, Weed Management Specialist
dpeterso@ksu.edu

5. Canada thistle control

(Note: The following article is largely from a Colorado State University fact sheet by K.G. Beck, CSU Weed Science Specialist, available at http://www.ext.colostate.edu/pubs/natres/03108.html)

Canada thistle (Cirsium arvense) is an aggressive, creeping perennial weed that infests crops, pastures, rangeland, roadsides, and noncrop areas. Introduced from Eurasia, Canada thistle is one of 12 state-wide noxious weeds in Kansas. The acres infested with Canada thistle in Kansas have doubled since 2002.
Generally, infestations start on disturbed ground, including ditch banks, overgrazed pastures, tilled fields or abandoned sites. Canada thistle reduces forage consumption in pastures and rangeland because cattle typically will not graze near infestations.

One plant can colonize an area 3 to 6 feet in diameter in one or two years. Canada thistle grows in a variety of soils and can tolerate up to 2 percent salt content. It is most competitive in deep, well-aerated, productive, cool soils. It usually occurs in 17- to 35-inch annual precipitation zones or where soil moisture is adequate. It is less common in light, dry soils.

![Emerged Canada thistle rosettes from roots in early spring. Photos by Colorado State University.](image)

**Emergence**

Canada thistle develops from seed or vegetative buds in its root system. Horizontal roots may extend 15 feet or more and vertical roots may grow 6 to 15 feet deep. Canada thistle emerges from its root system in mid- to late spring (late April through May) and forms rosettes.

The greatest flush of root-derived plants occurs in spring, but another flush occurs in fall. A flush can occur anytime during the growing season when soil moisture is adequate. This is particularly a problem when Canada thistle growth is disturbed by tillage or herbicides. This feature can be manipulated to the land manager’s advantage.

Plants that germinate from seed do so at about the same time as root-derived shoots. Seedlings grow slowly and are sensitive to competition, particularly if shaded. Canada thistle seedlings develop a perennial habit (the ability to reproduce from their root systems) about seven to eight weeks after germination.

**Reproduction and spread**

Canada thistle begins to flower in late spring to early summer in response to 14- to 16-hour days. Plants are male or female (dioecious) and grow in circular patches that often are one clone and sex. Female flowers produce a sweet odor and insects readily pollinate different sexed patches up to 200 feet apart.
Canada thistle in flowering growth stage.

Canada thistle develops seed sparingly. It may produce 1,000 to 1,500 seeds per flowering shoot. Generally, vegetative reproduction from its root system contributes to local spread and seed to long distance dispersal. Seed may be transported long distances by water, or attached to animals, clothing, farm equipment and other vehicles, and in contaminated crop seed. Also, wind may help disperse seed, but most often, the feathery pappus breaks off, leaving the seed attached to the parent plant to be dispersed by other means. Seed can remain viable in soil up to 22 years, and deep burial promotes survival longevity.

Canada thistle allocates most of its reproductive energy into vegetative propagation. New shoots and roots can form almost anywhere along the root system of established plants. Tillage segments roots and stimulates new plants to develop. Shoots emerge from root and shoot pieces about 15 days after disturbance by tillage. Small root pieces, 0.25 inch long by 0.125 inch in diameter, have enough stored energy to develop new plants. Also, these small roots can survive at least 100 days without nutrient replenishment from photosynthesis.

**Management**
The key principle to Canada thistle control is to stress the plant and force it to use stored root nutrients. Canada thistle can recover from almost any stress, including control attempts, because of root nutrient stores. Therefore, returning infested land to a productive state occurs only over time. Success requires a sound management plan implemented over several years.

**Cultural control.** Grasses and alfalfa can compete effectively with Canada thistle if their growth is favored by good management. Maintain fertility and, if possible, moisture at optimum levels to favor grass or alfalfa growth. Soil analysis can easily determine fertility needs. Be cautious with nitrogen fertilizers, because excess available soil nitrogen may favor weed growth.

These are essential management steps to ensure optimum desirable plant growth and competition. However, competition alone seldom is effective against Canada thistle.

**Chemical control.** Read the label, follow directions and use precautions. Research at Colorado State University shows that Tordon 22K (picloram), Milestone (aminopyralid), Transline (clopyralid), Banvel/Vanquish/Clarity (dicamba), and Telar (chlorsulfuron) are effective against Canada thistle. Canada thistle is difficult to control and re-treatment for one to three or more years after the initial application is common. Refer to the table below for use rates and application timing. These herbicides are most effective when combined with cultural and/or mechanical control.
Herbicide to control Canada thistle in pastures, rangeland, natural and noncrop areas.

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate (Production/A)</th>
<th>Application timing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tordon</td>
<td>1 quart</td>
<td>Anytime when weeds are rapidly growing</td>
<td>Fall applications consistent results; may need re-treatment 1 to 2 years</td>
</tr>
<tr>
<td>Milestone</td>
<td>5 to 7 fl oz</td>
<td>Spring at prebud growth stage; or fall</td>
<td>Use higher rate for older or dense stands; Milestone may be used to edge of ponds or streams; may need re-treatment 1 to 2 years</td>
</tr>
<tr>
<td>Transline</td>
<td>0.67 to 1.33 pints</td>
<td>Spring after all shoots have emerged, rosette to early bud growth stages; or fall</td>
<td>Apply 1 pint/A or more in fall; may need re-treatment 1 to 3 years</td>
</tr>
<tr>
<td>Telar</td>
<td>1 oz</td>
<td>Spring bolting to bud growth stages; or fall</td>
<td>Fall applications most consistent results; essential to use non-ionic surfactant at 0.25% v/v; may need re-treatment 1 to 2 years</td>
</tr>
<tr>
<td>Banvel, Vanquish, or Clarity (dicamba)</td>
<td>2 quarts</td>
<td>Spring rosette growth stage; or fall</td>
<td>Fall applications most consistent results; may need re-treatment 2 to 4 years</td>
</tr>
</tbody>
</table>

Colorado State University data also indicate that Banvel/Vanquish/Clarity or Telar are effective when combined with 2,4-D as a split-season application.

Apply 2,4-D, 2 quarts per acre, in spring when Canada thistle is 10 to 15 inches tall, in pre-bud to early bud growth stages. Re-treat in fall with Banvel/Vanquish/Clarity (2 quarts/acre) or Telar (1 ounce/acre) to re-growth. Use a surfactant (0.25 percent to 0.5 percent v/v; equivalent to 1 to 2 quarts of surfactant per 100 gallons of spray solution) with Telar for adequate control.

Curtail is clopyralid plus 2,4-D and is effective on Canada thistle but control tends to be less than from Transline. Recent research at Colorado State University shows that the performance of Curtail to control Canada thistle can be improved when preceded by two or three mowings. When Canada thistle infestations occur in situations where root growth would be restricted, such as habitats with high water tables, begin mowing when it is 12 to 15 inches tall. Repeat mowings at about one month intervals. Apply Curtail at 2 to 3 quarts/acre in October or about one month after the third mowing. Follow this regimen for two consecutive years.

**Mechanical control**

Mowing hay meadows can be an effective tool if combined with herbicide treatments. Mowing alone is not effective unless conducted at one-month intervals over several growing seasons. Always combine mowing with cultural and chemical control. Mowing at hay cutting stimulates new Canada thistle shoots to develop from its root system.

In irrigated grass hay meadows, fall herbicide treatments that follow mowing can be an effective management system because more Canada thistle foliage is present after cutting to intercept herbicide. Additionally, root nutrient stores decrease after mowing because the plant draws on them to develop new shoots.

If a Canada thistle infestation exists in a field that will be rotated to alfalfa, control the weed before seeding alfalfa. Alfalfa is an effective competitor only after it is established. It will not adequately establish in a well-developed Canada thistle infestation. A Canada thistle management system can
start with crop or grass competition combined with herbicides, with the field rotated to alfalfa when the management plan ends.

Additional information about Canada thistle management and control can be found at the Kansas Department of Agriculture web site: http://www.ksda.gov/plant_protection/content/49/cid/895. Current recommendations on chemical control of Canada thistle in Kansas can be in the 2012 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland SRP 1063 publication available at your local county extension office or online at: http://www.ksre.ksu.edu/library/crpsl2/SRP1063.pdf.

-- Walt Fick, Range and Pasture Management Specialist
whfick@ksu.edu

6. Mycotoxin, storage webcasts reopened for corn industry

Mycotoxins of corn can affect human and livestock health, as well as threaten production. And with many of the corn-growing regions experiencing a hot, dry summer, there is potential for ear rot diseases and mycotoxin contamination to threaten this year’s corn supply even further.

In response, the Plant Management Network, publisher of the Focus on Corn webcast resource, is reopening two webcasts through December 31, 2012: “Ear and Kernel Mold Biology and Management” by Dr. Charles Woloshuk at Purdue University and “Corn Storage” by Dr. Ken Hellevang at North Dakota State University.

“Ear and Kernel Mold Biology and Management” (http://bit.ly/RlmtmH) helps corn growers and crop consultants learn how to recognize the important ear rot diseases of corn; grasp the relationship between ear rot diseases and mycotoxin contamination; learn the basic principles of ear rot disease management; and understand how to reduce the risk of spoilage.

The “Corn Storage” webcast (http://bit.ly/MqUkWz) helps guide the user through proper corn storage management practices, including preparation, monitoring, and aeration.

Other Focus on Corn presentations can be viewed at http://www.plantmanagementnetwork.org/foc.

Focus on Corn is a publication of the Plant Management Network (PMN), a nonprofit online publisher whose mission is to enhance the health, management, and production of agricultural and horticultural crops. It achieves this mission through applied, science-based resources. PMN is jointly managed by the American Society of Agronomy, American Phytopathological Society, and Crop Science Society of America.

-- Phil Bogdan, Plant Management Network
pbogdan@scisoc.org
7. Comparative Vegetation Condition Report: September 18 – October 1

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=CRP3Y5Nggw
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.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you’d like digital copies of the entire map series please contact Kevin Price at kpprice@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.

The maps in this issue of the newsletter 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 September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that photosynthetic activity continues to decrease as vegetation approaches dormancy. Forty-one percent of the sorghum is rated mature.
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows slightly greater NDVI values in areas of southwest and eastern Kansas. These are regions that had more favorable moisture this year than last. The northwest and west central, in contrast, have much lower photosynthetic activity than last year. In northwest Kansas the growing season moisture (April-September) averaged 78 percent of normal last year. This year the average is only 56 percent of normal.
Map 3. Compared to the 23-year average at this time for Kansas, this year’s Vegetation Condition Report for September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that most of the state has well-below-average productivity. The south central region has the greatest decrease. Back-to-back years of extreme drought have had a cumulatively negative effect on vegetation.
Map 4. The Vegetation Condition Report for the Corn Belt for September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the southeastern portions of the region have the highest biomass production. Southern Missouri, Kentucky, and eastern Ohio continue to show benefits from the recent moisture, although it is too late in the season to have much benefit for the current row crops. In Kentucky, 80 percent of the corn crop is reported to be in poor to very poor condition.
Map 5. The comparison to last year in the Corn Belt for the period September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the north/south divide continues. Last year at this time, most of the northwest portion of the region was just entering into the drought. In contrast, this year conditions are improving in the southern areas. However, this improvement is too late to benefit most row crops. The biggest improvement will be in pasture conditions.
Map 6. Compared to the 23-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the northern areas continue to show below-average productivity. Most vegetation is well ahead of normal maturity. For example, in Nebraska 48 percent of the soybeans were harvested by October 1, compared to a five-year average of 16 percent by this time.
Map 7. The Vegetation Condition Report for the U.S. for September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the east and the Pacific Northwest continue to have the highest NDVI values. Low values are particularly noteworthy in southwestern Minnesota and northwestern Iowa, where drought conditions are extreme.
Map 8. The U.S. comparison to last year at this time for the period September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the impact from the switch in precipitation patterns. Last year, the Northern Plains was entering a drying pattern after a favorable summer season. This year, most of the South had favorable moisture in September, lessening the drought impact in the region.
Map 9. The U.S. comparison to the 23-year average for the period September 18 – October 1 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the biomass productivity in the Southeast is slightly above average, while productivity in the Plains is much below average. Below-average productivity in eastern Pennsylvania can be attributed to early crop development. Harvest of crops in Pennsylvania is running 10 to 40 percent ahead of normal.

-- 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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompson@ksu.edu.