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Extension Agronomy

eUpdate

10/21/2016

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 Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Fall control strategies for marestail in soybeans

Herbicide effectiveness on marestail depends largely on the stage of growth and size of the plants. Marestail generally is most susceptible to herbicides when it is small and still in the rosette stage of growth. Once marestail starts to bolt and exceed 4 to 6 inches tall, it becomes very difficult to kill with most herbicides. Since marestail can germinate throughout much of the year, a single herbicide application probably will not provide season-long control, particularly in no-till.

The most effective marestail control program should start with fall treatments, especially in fields with a history of marestail problems or fields that we can see now with adult plants setting seed. A number of different herbicides can be applied in the fall for marestail control ahead of soybeans, such as 2,4-D, dicamba, Clarity, Sharpen, Canopy EX, Autumn Super, or Valor XLT. The addition of glyphosate helps control grasses and other broadleaf weeds, and can even help on glyphosate-resistant marestail.

Fall applications can be effective even into December as long as applications are made to actively growing weeds during a stretch of mild temperatures. In fact, for fall applications, it may be better to wait until November to allow most of the fall-germinating winter annuals to emerge.

A residual herbicide such as metribuzin-, Valor- or Classic-containing products (unless the marestail is ALS resistant) can be added to help control marestail through winter and early spring. But don't expect a residual herbicide applied in the fall to provide good residual weed control through the spring and summer of the next year. If a fall treatment isn't made, early spring treatments in March to early April should be applied to help control fall-germinated marestail.

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2. Kansas soil moisture conditions

Soil moisture is an important variable controlling multiple hydrological processes (e.g. runoff, flooding, recharge of surface water reservoirs, etc.) and agricultural management decisions (e.g. crop rotation, tillage practices, planting and harvesting date, timing of fertilizer application, and field traffic conditions).

At this time of the year, farming operations across Kansas are concentrated around wheat planting and summer crop harvesting, two activities significantly affected by soil moisture conditions.

One way to assess the current state and implications of root-zone soil moisture conditions across the state is by using information from the recently launched Soil Moisture Active Passive (SMAP) satellite mission by NASA. The sequence of maps in Figure 1 clearly shows a mild drought in western Kansas and signs of excess soil moisture in central Kansas (particularly near Wichita area), a strong dichotomy that closely matches the precipitation pattern in Figure 2.

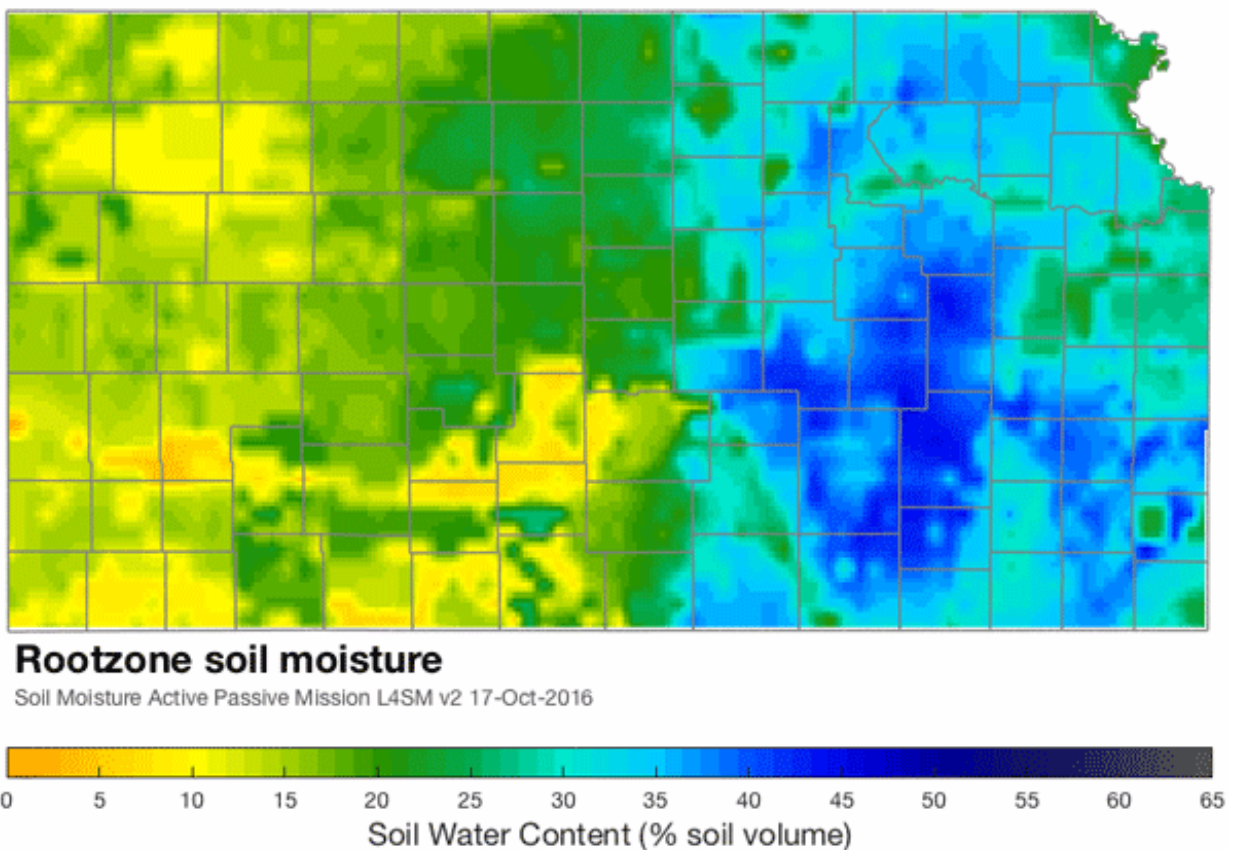


Figure 1. Kansas rootzone soil moisture dynamics from October 1-17, 2016. Many Kansas soils can usually hold a maximum of 50% soil water content water (saturated conditions).

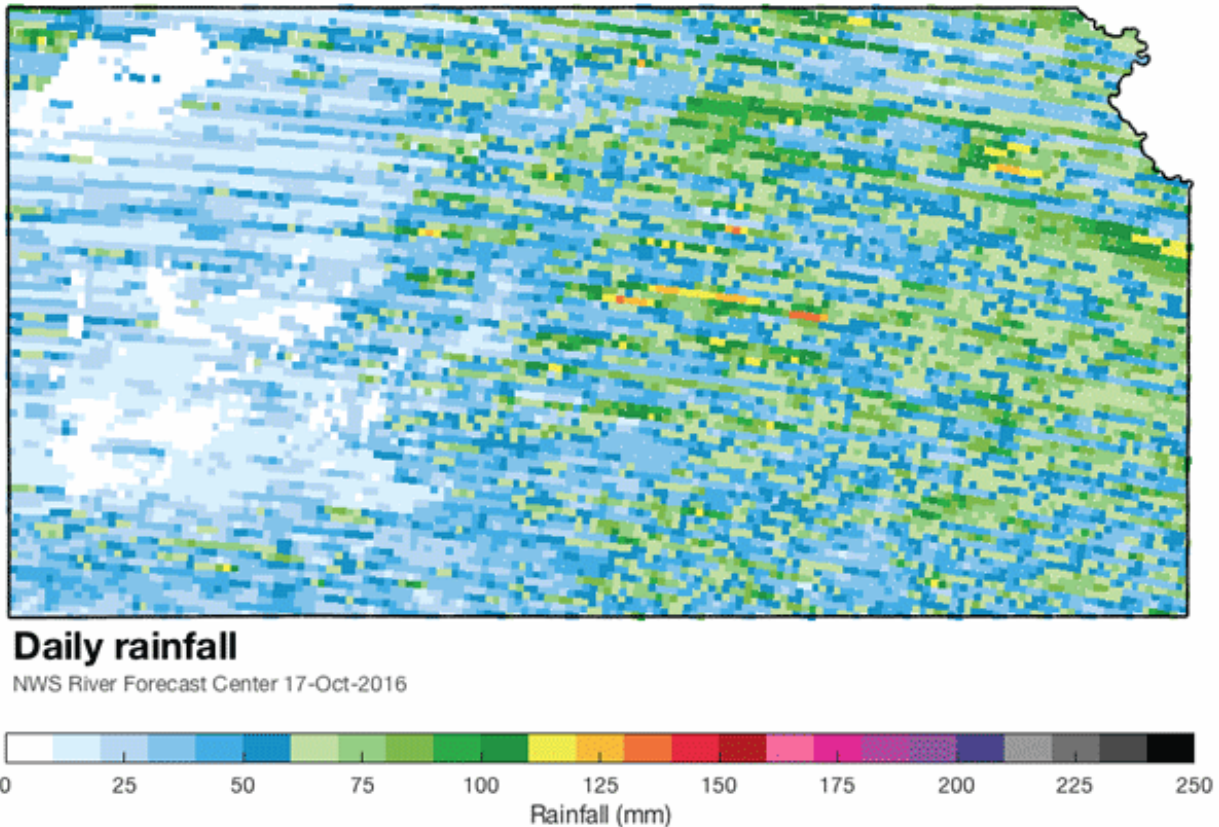


Figure 2. Statewide cumulative precipitation from October 1-17, 2016. A value of 25 mm is approximately equivalent to 1 inch.

Wheat: The wet conditions throughout mid-October in the central and eastern part of the state ensured good stand establishment despite causing a slight delay for wheat sowing compared to 2015. In southwest Kansas, producers who started sowing in early September took advantage of available soil moisture and consequently also have a good stand. However, producers in southwest Kansas who waited for the optimal sowing window had to dust-in the crop, which resulted in several fields with sub-optimal stand establishment. Many fields in southwest Kansas sown after October 10 have not yet started to germinate due to the lack of soil moisture.

Summer crops: Overall, late-season wet conditions slowed down harvesting progress in summer row crops. For corn, late-season precipitation increased fungal colonization of corn ears (e.g. Diplodia issues), and reduced final test weight and grain quality. For both soybeans and sorghum crops, wet conditions are affecting the drydown grain rate and final maturity.

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3. Establishing and managing native prairie plants in small areas

(Note: The following is from K-State Research and Extension publication MF3233, [Establishing and Managing Native Prairie Plants in Small Areas](#). -- Steve Watson, Agronomy eUpdate Editor)

Native plants are a beautiful alternative to typical commercial horticultural plants. They bring a bit of the prairie to your overall landscaping. Native plants often thrive with low water and fertilizer inputs, and with little maintenance.



Figure 1. Mixture of native prairie plants. Source: K-State Research and Extension publication MF3233, [Establishing and Managing Native Prairie Plants in Small Areas](#).

As a bonus, these plants may provide wildlife habitat or flowering dicots (broadleaf plants) for honeybees, birds, and butterflies. Because revegetation is a requirement of land conservation programs such as the Conservation Reserve Program, there is a readily available source of plant materials for all areas in Kansas. This article focuses on planting small areas rather than seeding large acreages. For establishment on large acreages, refer to K-State Research and Extension publication [Establishing Native Grasses](#), MF2291.

Plant materials

Plants genetically adapt to local environments to survive the climate and its inherent variability. Planting a genotype that evolved in an area far removed from a local area often leads to failure. The source of seed should not be more than 250 to 400 miles south or 100 to 150 miles north of the intended planting location.

To avoid these problems, it is best to plant named varieties or cultivars adapted to your area. Planting a species from a southerly location may result in winterkill of perennials. Conversely, planting a

species from a more northerly location may result in poor or stunted growth. It is critical that you select locally adapted species. For example, cultivars with an eastern Kansas genetic origin are not likely to survive the lower rainfall of western Kansas.

Sources for native plant seeds can be found at:

www.kansasnativeplantsociety.org/plant_seed_sources.php

Adapted native forbs can be found at the Kansas Native Plant Society:

www.kansasnativeplantsociety.org/gallery_plant.php

Since this guide addresses small-area plantings, gathering seeds locally is an option. One pitfall of gathering local seed is the lack of information regarding germination percent and purity.

Not all seeds will germinate. Seeds of native plant species purchased from seed dealers are tagged with germination and purity information, so the proper amount of seed can be planted. Purity refers to the amount of bare seeds or the percentage of seed by weight you want to plant. Grasses may have non-seed spikelet parts that add weight but do not contribute to the pure live seed amount. Other contaminants in a seed lot may be labeled as inert, weed seed, or other crop seed.

Germination percentage multiplied by purity percentage gives pure live seed percentage (PLS). For example, 80 percent germination times 90 percent purity gives 72 percent pure live seed. Age of the seed also affects germination. Native plants usually have an after-ripening dormancy that reduces germination. As the seed ages, after-ripening dormancy declines and germination increases. Typically, 2-year-old grass seed has the highest germination percentage; however, after this point germination declines with seed age.

Establishment of native prairie plants

Seedbed preparation

A seedbed relatively free of competitive weedy annual grasses and annual herbaceous broadleaf plants is ideal. There should be no live perennial plants in the seedbed. If perennial plants are present, a nonselective herbicide such as glyphosate should be used. If the area to be planted has been tilled or disturbed during construction, the green, annual plant growth should be killed with a nonselective herbicide before plants shed seeds. This reduces competing vegetation and increases seeding success.

Because small areas are not likely to be planted with a grassland drill, clean tillage is required to ensure seed incorporation into the soil. On larger areas, a grassland drill should be used, and no tillage should occur before planting. Disturbing the soil with tillage exposes annual weed seeds to light and increases their germination and establishment rates. These weeds then provide competition for the planted native species.

Till the area and allow weedy species to germinate and grow. Kill those plants before seed set. Then, till small areas and incorporate the seed. If you are planting a large area with no soil tillage before planting, use a grassland drill.

Under no circumstances should you apply fertilizer to the area to be seeded. Weedy annuals are much more competitive than native species and will use the fertilizer to increase growth rates,

leading to increased competition and possible stand failure.

Seeding methods

For small areas, it is impractical to use a grassland drill. Broadcasting seed on a newly tilled surface is the most efficient way to seed those areas. The seeds should then be incorporated into the soil. A garden rake or a harrow pulled behind a garden tractor will bury a high percentage of the seeds. Native plant seeds are small, and it is important that they are not covered with too deep a soil layer. Ideally, they should be incorporated no more than an inch deep.

A firm seedbed is better for establishment. If practical, roll the area with a compaction roller after seed incorporation to increase seeding success. A light compaction is better than one that severely compresses the soil. Compaction ensures that seed is in contact with moist soil and moisture can move to the surrounding soil through capillary action, much the same as a paper towel wicks water.

On larger areas where a grassland drill is used, the drill provides compaction through spring-loaded press wheels. Seeding success is primarily related to adequate soil moisture for the first 2 months following seed germination and emergence. Perennial grasses establish on a seed root system that lasts for 4 to 6 weeks before dying. The permanent, perennial root system develops from stem tissue at the crown area. For warm-season grasses, which are the dominant grasses in Kansas, the crown area is at the soil surface, and the roots that develop there are called adventitious roots.

Adventitious roots will not develop in dry soil, so it is important for establishment to occur when there is the greatest chance for frequent rainfall. On small areas, irrigation enhances seeding success for that reason. The soil surface may be kept moist by applying a continuous, light mulch of prairie hay or wheat straw.

Because small seeds of native plants do not store much energy, avoid leaving litter on the surface, which may prevent plants from emerging before stored energy is depleted.

Seeding date

As the saying goes, the best time for planting is before a long, wet spell. In Kansas, the chances of that happening are best in April and early May. Seeding date trials have shown that plantings during this time have the greatest chance of success. Germination and emergence are more likely with June plantings, but many of those plants will not survive the winter. Plants require sufficient time to grow and store energy to survive the winter and emerge the next year.

Seeding rate

Native grasses are notoriously poor in seedling establishment. Unfortunately, that cannot be overcome by sowing more seed. Exceeding the recommended rate will not increase stand establishment. For small areas and broadcast seeding, the total seeding rate should be 9 to 12 pounds pure live seed per acre of the seeding mix. If a grassland drill is used, 6 to 8 pounds pure live seed per acre is adequate. Recommended percentages for the various species are listed in the tables below.

Recommended Native Plant Species

Tallgrass Prairie Mixture: Eastern and Central Kansas*

Plant	Pounds of pure live seed per acre	
	Drilled	Broadcast
Kaw Big Bluestem	1.5 – 1.75	2.5 – 3.75
Osage or Cheyenne Indiangrass	1.5 – 1.75	2.5 – 3.75
Aldous or Cimarron Little Bluestem	1.0 – 1.30	1.75 – 2.5
El Reno Sideoats Grama	1.5 – 1.75	2.5 – 3.75
Blackwell Switchgrass	0.5 – 0.65	0.7 – 0.85
Native Forbs**	0.5 – 0.65	0.7 – 0.85
* This mixture also works well for sandy regions in western Kansas, but sand bluestem is preferred over big bluestem and sand lovegrass could be added to the mix at 0.5 pound pure live seed per acre. If irrigation can be supplied, this mixture will work well throughout Kansas.		
** Forbs are broadleaf plants with an annual top. They vary greatly in seed size, so forb mixes should be based on seed size, with larger seeds having a greater percentage of the weight. Sources for native plant seeds can be found at www.kansasnativeplantsociety.org/plant_seed_sources.php Forb seed availability is quite diverse. The goal is to have a mix of both annual forbs and native grasses. Adaptive native forbs can be found at the Kansas Native Plant Society: www.kansasnativeplantsociety.org/gallery_plant.php .		

Recommended Native Plant Species		
Shortgrass Prairie Mixture: Western Kansas***		
Plant	Pounds of pure live seed per acre	
	Drilled	Broadcast
Lovington or Alma Blue Grama	1.5 – 1.75	2.5 – 3.75
Sharp's Improved or Texoka Buffalograss	1.5 – 1.75	2.5 – 3.75
Barton Western Wheatgrass	1.0 – 1.30	1.75 – 2.5
El Reno Sideoats Grama	1.5 – 1.75	2.5 – 3.75
Cimarron Little Bluestem	0.5 – 0.65	0.7 – 0.85
Native Forbs	0.5 – 0.65	0.7 – 0.85
*** This mixture should be planted on fine-textured soils in the absence of supplemental irrigation. On soils that are ca surface, the Tallgrass Prairie mixture will likely be best.		

Brand names are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not named.

Management following seeding

Management of initial stand establishment

The general rule for managing a native plant seeding is to do nothing. In the summer following seeding, the area will look like a weed patch. The tendency is to believe the native plant stand is a

failure. Controlling the weeds by mowing or using a herbicide will not improve the chances for a successful seeding. Those weed control methods will likely reduce the native plant establishment.

After seeding, old growth should be removed each spring in mid-March. Mowing and removing old growth speeds establishment of the native species. Mowing later than mid-March reduces the native forbs in the mixture.

By the end of the third year, the native warm season grasses will be the dominant plants. Not seeing native grasses does not mean they are not there. They take time to fully establish. Old growth should be removed each spring in mid-March. Do not mow any other time during the first 3 years. In early March of the second year and in following years, fire can be used instead of mowing, obeying any local fire restrictions. It is imperative that the area not be fertilized. Nitrogen fertilization causes an invasion of annual and perennial cool-season grasses as well as annual broadleaf weeds.

Management of an established stand

After the first 3 years, the greatest threat to the stand is allowing too much old growth to accumulate. This causes the stand to thin and allows erosion between established plants. Old growth should be removed to allow sunlight to reach the base of the perennial grasses. This stimulates tillering, which thickens the stand and protects against erosion.

Plants grow by using carbon compounds captured by the leaves. If an area is mowed frequently, weedy grasses and herbaceous dicots replace native species. The area can be mowed once before mid-July, but should be allowed to grow during the last half of the summer. Native plants store food reserves in late summer for next year's growth. If the area is mowed in mid-August to mid-September, the reserves will be used to grow new leaves in late summer and fall and native grasses will go into the winter with low reserves. This may kill plants or slow growth the following spring and leave them unable to compete with weeds.

To keep from being invaded by woody plants, spot treat with herbicide while few plants are present. Once woody plants have colonized, they are difficult and expensive to kill. Do not foliarly apply a nonselective herbicide, such as glyphosate, which will kill native grasses and wildflowers. To control individual woody plants, cut them at ground level and treat the stump with an appropriate herbicide. Contact your local K-State Research and Extension agent for herbicide recommendations unless you can identify the invasive plant and know how to deal with it.

Fire is a natural part prairie development. Control of sprouting woody species occurs when they are at the low point in their stored food reserves. That is almost always much later than the early March date when fire should occur to preserve prairie wildflowers. Fire at any time in the dormant season before early March will kill eastern redcedar, a nonsprouting species.

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The newly revised edition of the [Soybean Production Handbook](#) from K-State Research and Extension, publication C449, is now available online.

K-STATE
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Soybean Production Handbook



Kansas State University Agricultural Experiment Station and Cooperative Extension Service

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5. Comparative Vegetation Condition Report: October 11 - 17

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

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 27-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 Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography. His pioneering work in this area is gratefully acknowledged.

The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

Kansas Vegetation Condition

Period 42: 10/11/2016 - 10/17/2016

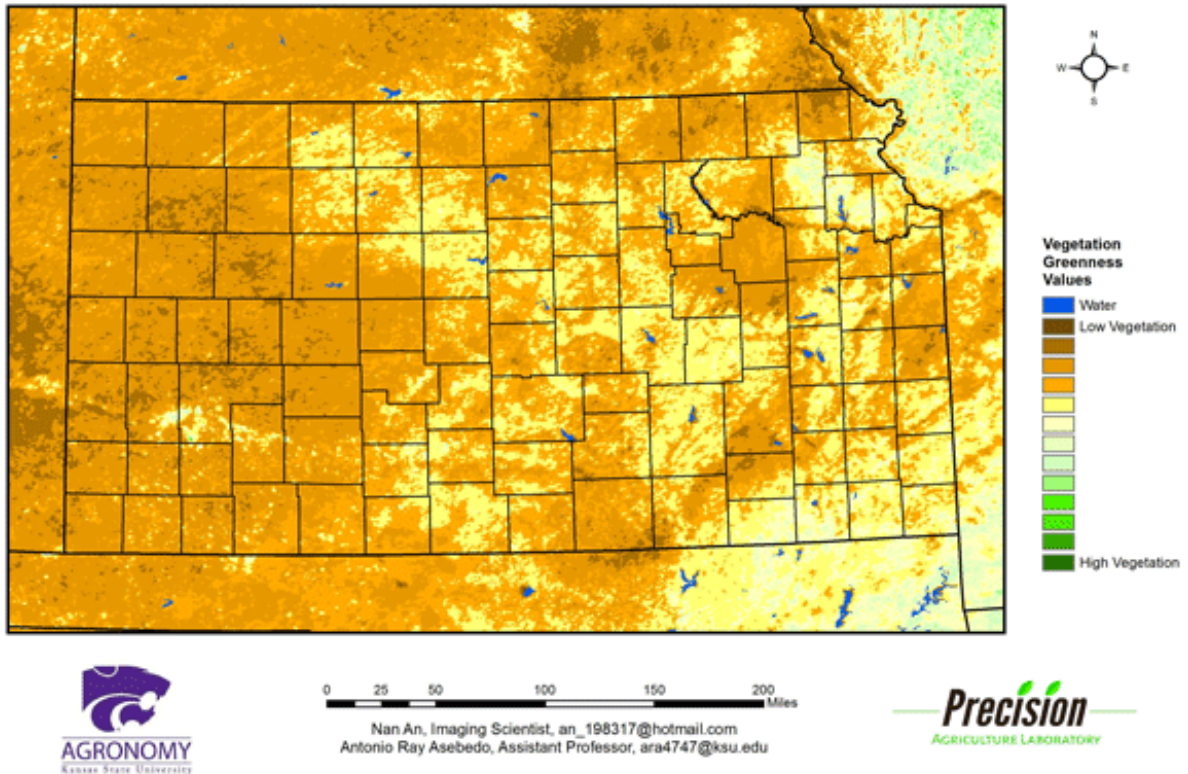


Figure 1. The Vegetation Condition Report for Kansas for October 11 – October 17, 2016 from K-State’s Precision Agriculture Laboratory shows only light photosynthetic activity. As the growing season comes to an end more vegetation is moving into dormancy.

Kansas Vegetation Condition Comparison Mid-October 2016 compared to the Mid-October 2015

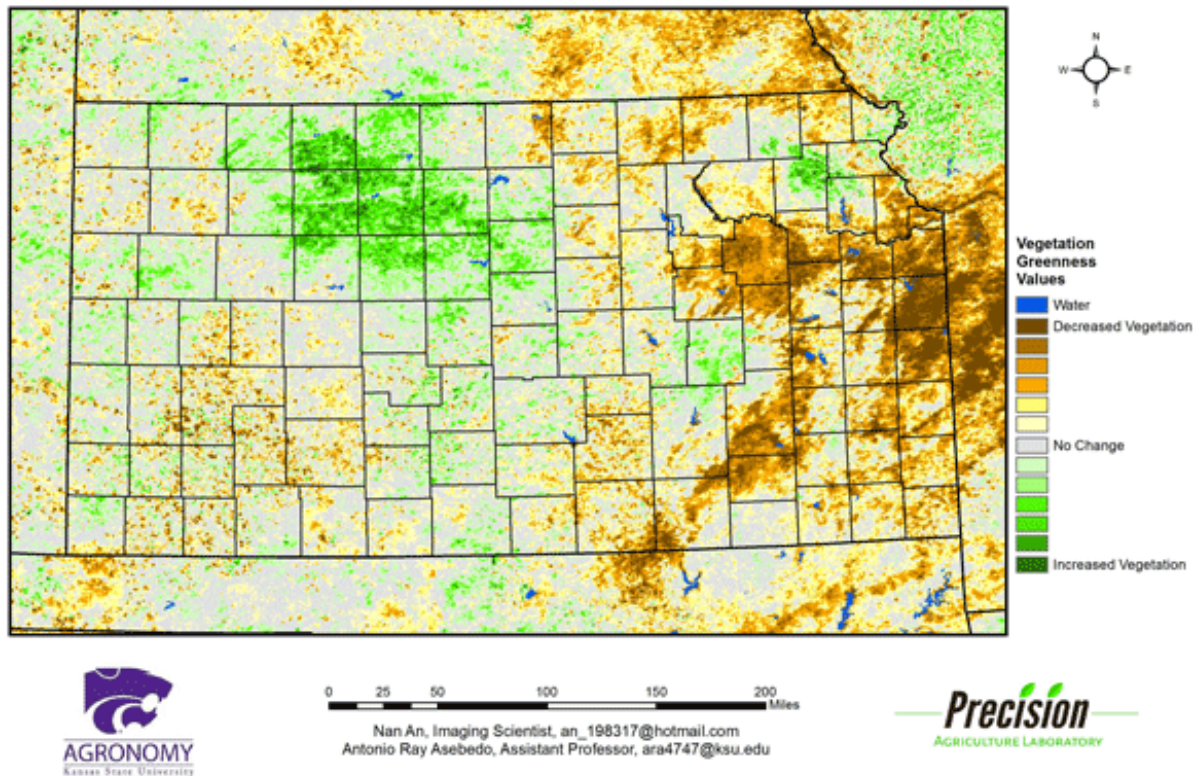


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for October 11 – October 17, 2016 from K-State’s Precision Agriculture Laboratory shows the largest area of higher vegetative activity is in north central Kansas. The delay in sorghum development this year continues to be the major contributor to the higher NDVI values. Slow establishment of winter wheat in the Southwest Division is visible as reduced NDVI values there.

Kansas Vegetation Condition Comparison Mid-October 2016 compared to the 27-Year Average for Mid-October

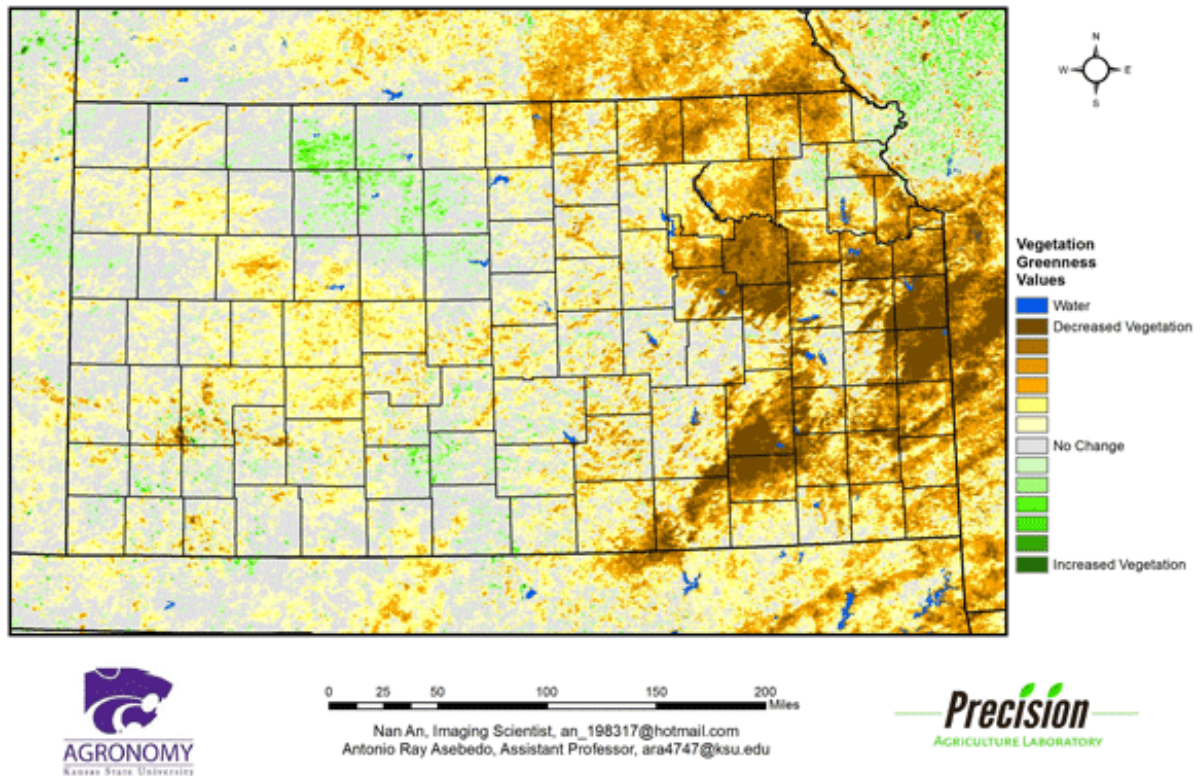
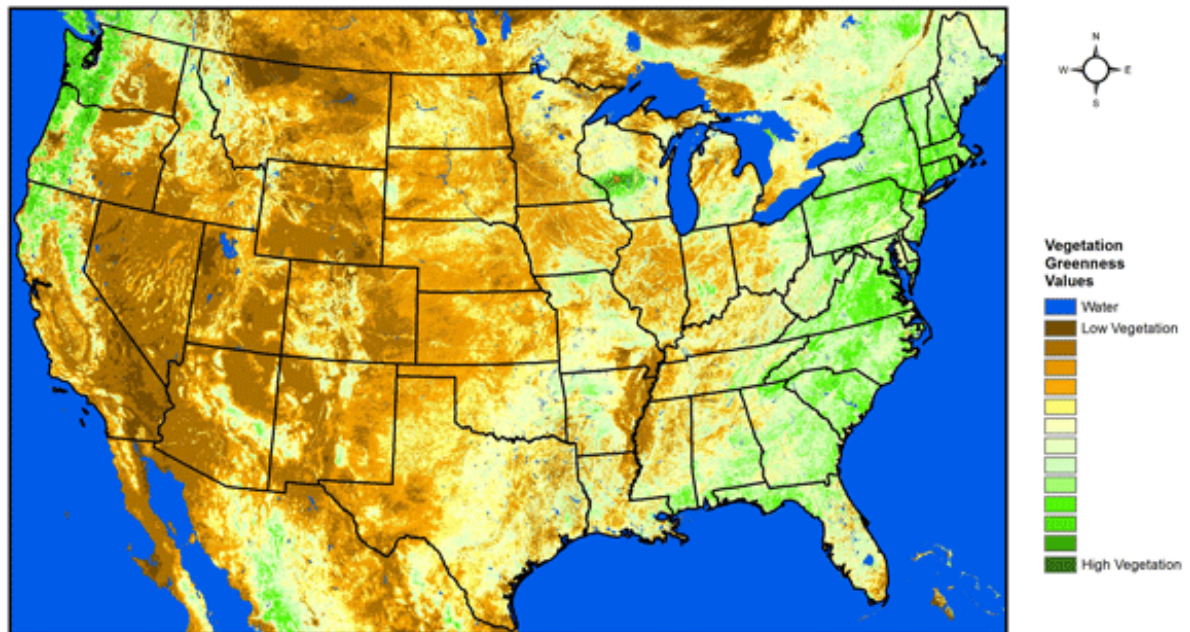


Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for October 11 – October 17, 2016 from K-State's Precision Agriculture Laboratory shows a large area of below-average NDVI values in eastern Kansas. This is the result of persistent cloud cover in that area. The below-average vegetative activity in the western half of the state is due to increasing dryness impacting winter wheat establishment.

Continental U.S. Vegetation Condition

Period 42: 10/11/2016 - 10/17/2016



0 180 360 720 1,080 1,440 Miles

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Antonio Ray Asebedo, Assistant Professor, ara4747@ksu.edu



Figure 4. The Vegetation Condition Report for the U.S for October 11 – October 1, 2016 from K-State’s Precision Agriculture Laboratory shows the area of highest NDVI values is along the coasts where mild temperatures and rains have extended the growing season. Low NDVI values are visible in the Corn Belt and along the Mississippi River Valley, where crop maturity is slightly ahead of average, but harvest has been delayed by wet soils.

Continental U.S. Vegetation Condition Comparison
Mid-October 2016 Compared to Mid-October 2015

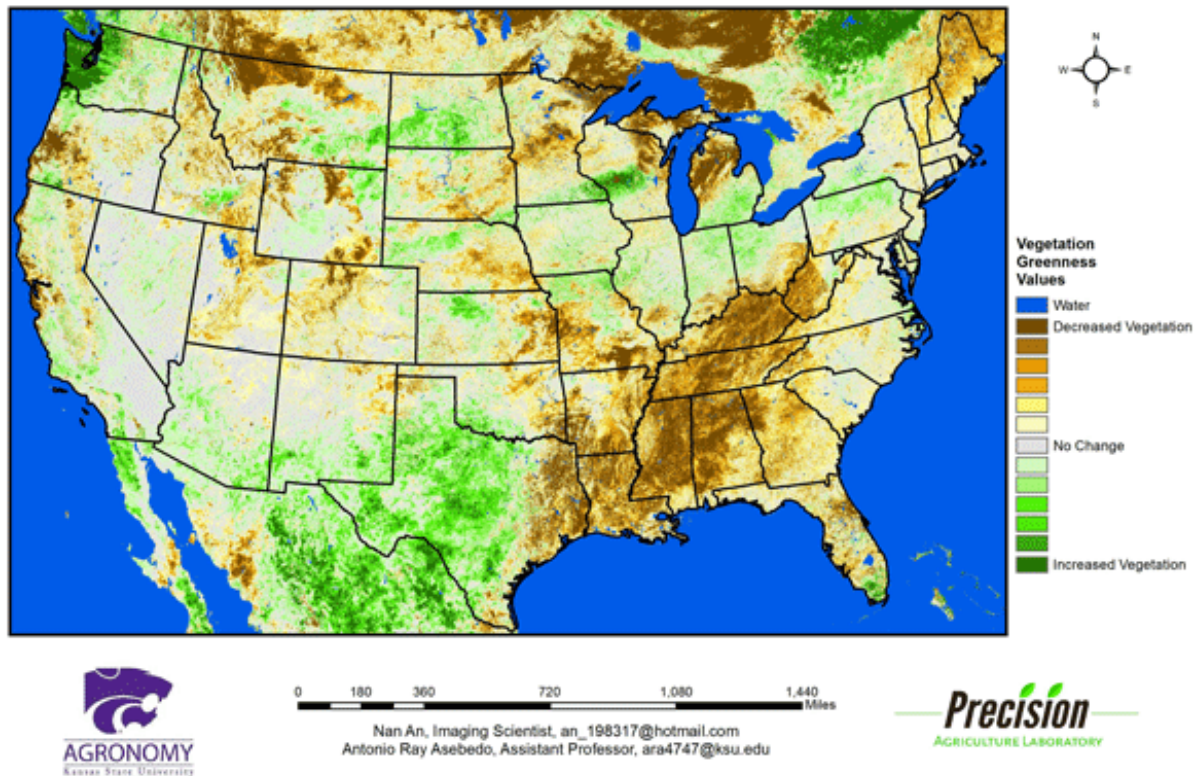


Figure 5. The U.S. comparison to last year at this time for October 11 – October 17, 2016 from K-State’s Precision Agriculture Laboratory shows that lower NDVI values are most prominent in the South where drought continues to be an issue. This region missed out on the recent tropical systems.

Continental U.S. Vegetation Condition Comparison
Mid-October 2016 Compared to 27-year Average for Mid-October

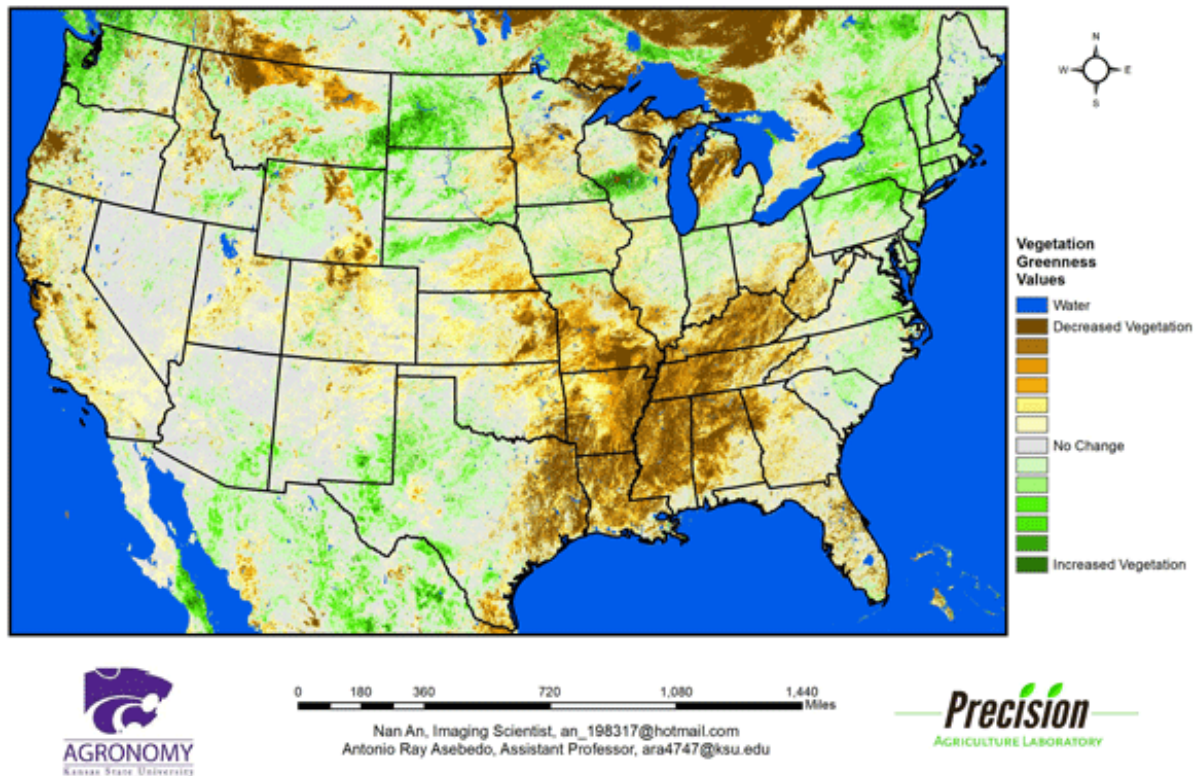


Figure 6. The U.S. comparison to the 27-year average for the period October 11 – October 17, 2016 from K-State’s Precision Agriculture Laboratory shows the most prominent area of below-average photosynthetic activity is in the South. While the northern areas of this region had rains during this period, the deep South continues to have persistent drought conditions.

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