



Extension Agronomy

eUpdate

07/10/2015

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 cthompso@ksu.edu.

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1. Control weeds in wheat stubble before they set seed

Because of the excessively wet weather in May, among other reasons, many fields of wheat stubble in Kansas have rather large broadleaf and grassy weeds actively growing at this time. These weeds are utilizing moisture and nutrients that would be available for a subsequent crop. It is a good idea to control these weeds while there is moisture and active growth, and before they set seed.

Kochia and Russian thistle are daylength sensitive and will begin to flower toward the end of July and into August, thus will need to be controlled very shortly. Controlling kochia and Russian thistle by mid-July July is very important to prevent seed production.

Weeds growing now in wheat stubble fields, without crop competition, set ample seed -- which will be likely to cause a problem in following crops. It is especially important to prevent seed production from happening on fields that will be planted to crops with limited options for weed control, such as grain sorghum, sunflower, or annual forages. It is especially difficult to control broadleaf weeds in sunflower and grassy weeds in sorghum that emerge after crop emergence. Preventing weed seed production ahead of these crops is essential. Seed of some weed species can remain viable for several years, so allowing weeds to produce seed can create weed problems for multiple years.

If the field will be planted to Roundup Ready corn or soybeans, producers may decide they can just wait and control any weed and grass seed that form now and emerge next season with a postemergence application of glyphosate in the corn or soybeans. However, with the increasing concerns over the development of glyphosate-resistant weeds, kochia, Palmer amaranth, and waterhemp, it would be far better to control these weeds now in wheat stubble. That way, other herbicides with a different mode of action can be tank-mixed with glyphosate to ensure adequate control.

Producers should control weeds in wheat stubble fields by applying the full labeled rate of glyphosate with the proper rate of ammonium sulfate additive. As mentioned, it is also a good idea to add 2,4-D or dicamba (unless there is cotton or other susceptible crops in the area) to the glyphosate. Do not apply the growth regulator herbicides around cotton. Tank mixes of glyphosate and either 2,4-D or dicamba will help control weeds that are difficult to control with glyphosate alone, and will help reduce the chances of developing glyphosate-tolerant weed populations.

Often dicamba or 2,4-D tankmixes with glyphosate may not perform well under the drier conditions of western Kansas, especially on kochia and Russian thistle; however this year with the improved moisture conditions, we may find glyphosate tank mixes will work well. If drought and heat stress set in, however, utilizing Gramoxone with atrazine (atrazine is synergistic with Gramoxone) has been a more effective treatment than glyphosate/dicamba or glyphosate/2,4-D.

If wheat is to be planted this fall, do not use atrazine or metribuzin in the tank mix. We observed significant injury to wheat in the spring of 2015 following a July 2014 application of 3/8 lb ai metribuzin tankmixed with gramoxone (Figure 1). Perhaps utilizing Sharpen would be a safer and better option if the field is to be returned to wheat. Sharpen can be used in other tank mixtures and could help control glyphosate-resistant kochia.

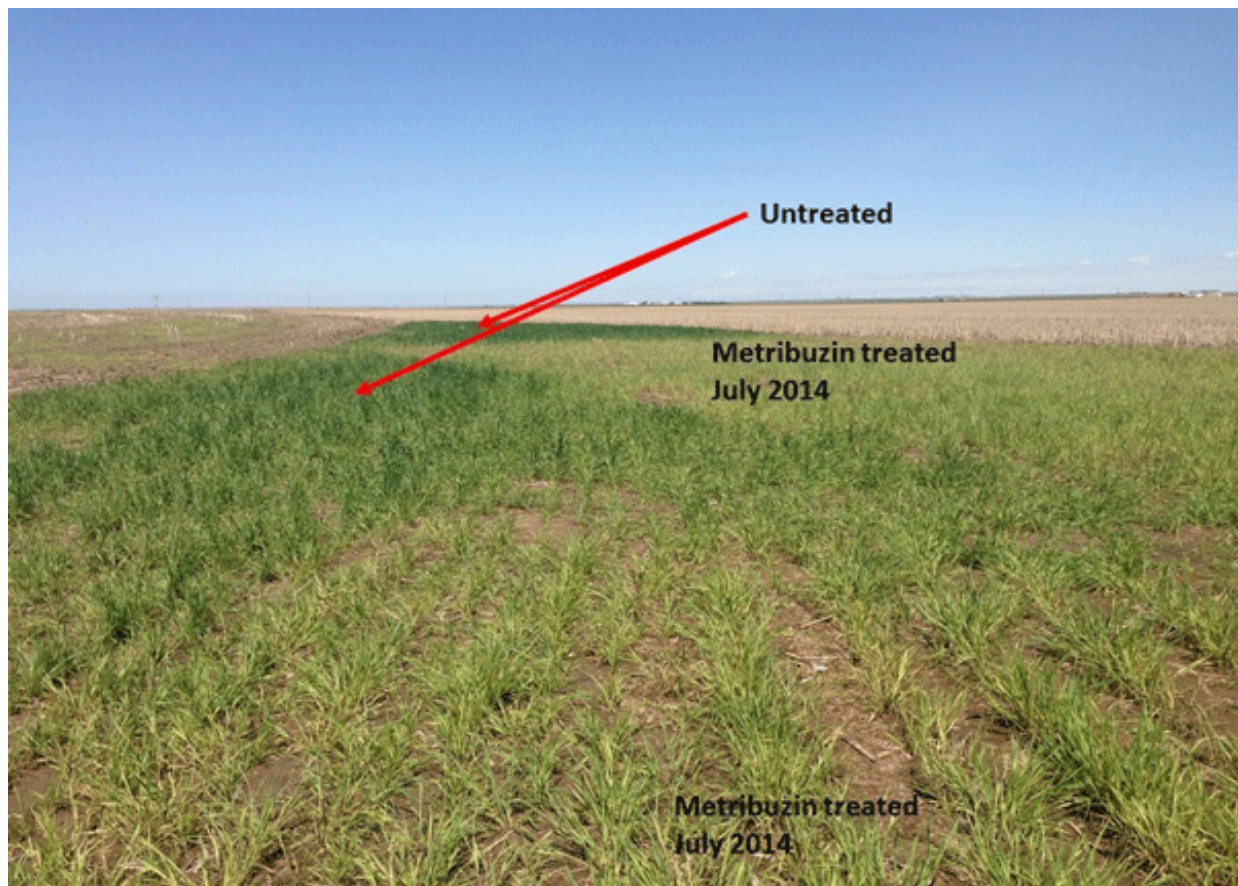


Figure 1. Metribuzin applied with Gramoxone on fallow July 2014. Wheat planted October 2014 and injury observed only during the spring (untreated areas are greener). Photo by Curtis Thompson, K-State Research and Extension.

Several have asked about the addition of atrazine for residual weed control in fallow. Although atrazine provides residual control of weeds, it is best applied later in the fall (November). At this time of year, atrazine residual is quite short and will not provide adequate control of fall-emerged weeds/winter annuals. An application of atrazine needs to be made in the fall (mid-October through November), depending on the weeds being targeted. Also, keep in mind that atrazine antagonizes glyphosate – just the opposite of the synergistic effect of atrazine and Gramoxone. Do not apply atrazine with reduced rates of glyphosate.

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2. Preharvest sprouting in wheat

Preharvest sprouting of wheat is possible in parts of Kansas this year due to the excessively wet conditions at harvest time. Wheat in Kansas usually ripens under warm, dry conditions that favor development of excellent grain for bread making. However, the ripe grain can sprout in the spike when moist conditions delay harvest and promote germination. Severely sprouted kernels usually have slightly to significantly lower test weight than normal kernels, depending on the degree of sprouting.

The extent of preharvest sprouting depends on the duration and severity of moist conditions, the stage of ripening of the grain, and the inherent level of dormancy of the variety. Sprouting begins as the kernels absorb moisture and swell, which activates a number of enzymes that break down starch, proteins, and other constituents for respiration and growth. The seedling roots and leaves then split the seed coat and grow from the embryo (germ), giving the upper canopy of fields a green appearance if moist conditions continue.

Flour milled from the endosperm of sprouted wheat produces bread that is porous and sticky and has a low loaf volume. The grain has little value to the milling and baking industries and is discounted heavily.

More than 4% damaged kernels -- including sprouted kernels -- causes grain to be rated Grade 3 or lower and unacceptable for bread making. Grain that is slightly sprouted might be blended with sound grain for making flour, but grain that is severely sprouted usually is used for livestock feed.

Ripe grain is dormant and must pass through a period of dormancy after ripening before it can germinate, even under favorable conditions. The length of the after-ripening period is highly variable, ranging from a few days in some varieties to a month or longer in others. Differences in the length of the after-ripening period, or dormancy, greatly affect susceptibility of wheat varieties to preharvest sprouting.

Many hard red winter and newer hard white winter varieties are relatively resistant to preharvest sprouting due to their long post-harvest dormancy requirements. However, even with good resistance to sprouting, many winter wheat varieties can still sprout in the spike when conditions are particularly favorable.

Where preharvest sprouting has occurred, producers have three choices:

1. Take the grain to an elevator and accept the price discounts – if the elevator will take it at all.
2. Use the grain for cattle feed.
3. Use the grain as seed this fall.

Cattle feed

Sprouted, low-test-weight wheat be satisfactorily used as cattle feed, provided suitable precautions are taken regarding storage and the feeding of wheat to cattle. The following are excerpts from [K-State publication MF2659, *Feeding Low-Test-Weight and Sprouted Wheat*](http://www.bookstore.ksre.ksu.edu/pubs/MF2659.pdf), at: <http://www.bookstore.ksre.ksu.edu/pubs/MF2659.pdf>

A small amount of energy is lost during germination (of the wheat kernel), which produces heat, carbon dioxide, and moisture. In most cases, germination does not appear to reduce the nutritive value of the grain. In some cases, sprouting may actually improve the feeding value. As sprouting increases to substantial levels, nutritive value of the grain diminishes, but moderate levels appear to have little effect.

Damaged wheat should be stored carefully. Moisture content should be low enough to ensure that mold does not grow within the storage structure. If the wheat must be stored at high moisture content, then it should be dried, aerated, preserved with a storage additive, or ensiled in an anaerobic state (like silage).

Molds may produce toxins that affect feeding value through reduced palatability, intake and performance. Toxins may increase morbidity and abortions in pregnant cattle and, in some cases, may even cause death. If mold is present on kernels, a sample should be sent to a diagnostic laboratory for testing. Young animals, reproductive females and animals under nutritional stress are most vulnerable.

Feeding recommendations:

- Damaged wheat and normal corn have similar feeding values, but damaged wheat contains more protein and rapidly fermented starch than corn or grain sorghum.
- Wheat should be coarsely processed to optimize digestibility in ruminants and ground to 700 microns in swine rations.
- Limit wheat to 30 to 50 percent of the complete diet for backgrounding and finishing cattle.
- Adapt ruminant animals to wheat-based diets incrementally, starting with low levels and adjusting the wheat content slowly to desired levels.
- Ionophores should be included in wheat-based finishing diets to improve feed efficiency and reduce the risk of acidosis.
- Buffers like limestone and sodium bicarbonate may be useful to reduce digestive upsets in ruminants.
- Feeding wheat to cattle on moderate- or low-quality forage-based diets should be carefully monitored.
- Inventory should be controlled so that wheat will be included in rations throughout the entire feeding period.
- Feed by weight not by volume.

- The value of damaged wheat is a simple relationship between corn and soybean meal prices (92 plus 8 percent, respectively). This means that 100 pounds of sprouted wheat should be priced the same as 92 pounds of corn and 8 pounds of 48% soybean meal. This value is determined from the quality of the sprouted wheat.
- Proper storage will preserve the feeding value of damaged wheat.

Seed

Several years ago, scientists at K-State and the Kansas Crop Improvement Association did a study on the suitability of using sprouted wheat as seed. This research was published in the K-State Agricultural Experiment Station publication Keeping Up With Research 115, *Planting Wheat Seed Damaged By Sprouting Before Harvest*: <http://www.ksre.k-state.edu/historicpublications/Pubs/SRL115.pdf>

The authors of the publication concluded:

1. Seedlots that have suffered preharvest sprouting at the level that might occur in Kansas are acceptable for planting if they meet standards for test weight and germination and do not have exposed seedling parts.
2. Sprouted seed may not perform well when planted under adverse conditions.
3. Germination of seed should be measured before planting, especially if it has been stored.

Another publication of interest, although discussing older varieties, is K-State Keeping Up With Research 124, *Preharvest Sprouting of Hard Red and Hard White Wheats in Kansas*: <http://www.ksre.k-state.edu/historicpublications/Pubs/SRL124.pdf>

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3. Preliminary look at the value of genetic resistance to stripe rust in 2015

The 2015 growing season was challenging for wheat producers in many areas of the state. Drought early, excessive rain and heavy disease pressure were just a few of the issues facing this year's crop. As growers wrap up harvest, thoughts often turn to planning for the next season. Selecting which varieties to grow next year is one of the most important decisions in this planning process. At some fundamental level we are all drawn to the varieties with the highest yields. Keep in mind, however, that there are many factors supporting the productivity of a variety. The 2015 season serves as a valuable reminder about the value of disease resistance in wheat varieties.

K-State just released an updated version of the annual publication that summarizes the reaction of wheat varieties to the most common disease and insect problems in the state. This publication incorporates disease observations from more than 30 locations around the state, including county variety demonstration plots and variety performance tests. This year's revision focuses on improved ratings for stripe rust, leaf rust, wheat streak mosaic, and Fusarium head blight (head scab).

A comparison of the yield of varieties with different levels of stripe rust resistance suggests that genetic resistance is very important when the disease pressure is high. Having a variety with genetic resistance can result in a yield advantage of 20 bushels per acre. Of course, there is more to a good wheat variety than disease resistance, but in years like this the value of the genetic resistance is clear.

You can access the revised publication *Wheat Variety Disease and Insect Ratings, 2105* at:
<http://www.bookstore.ksre.ksu.edu/pubs/MF991.pdf>

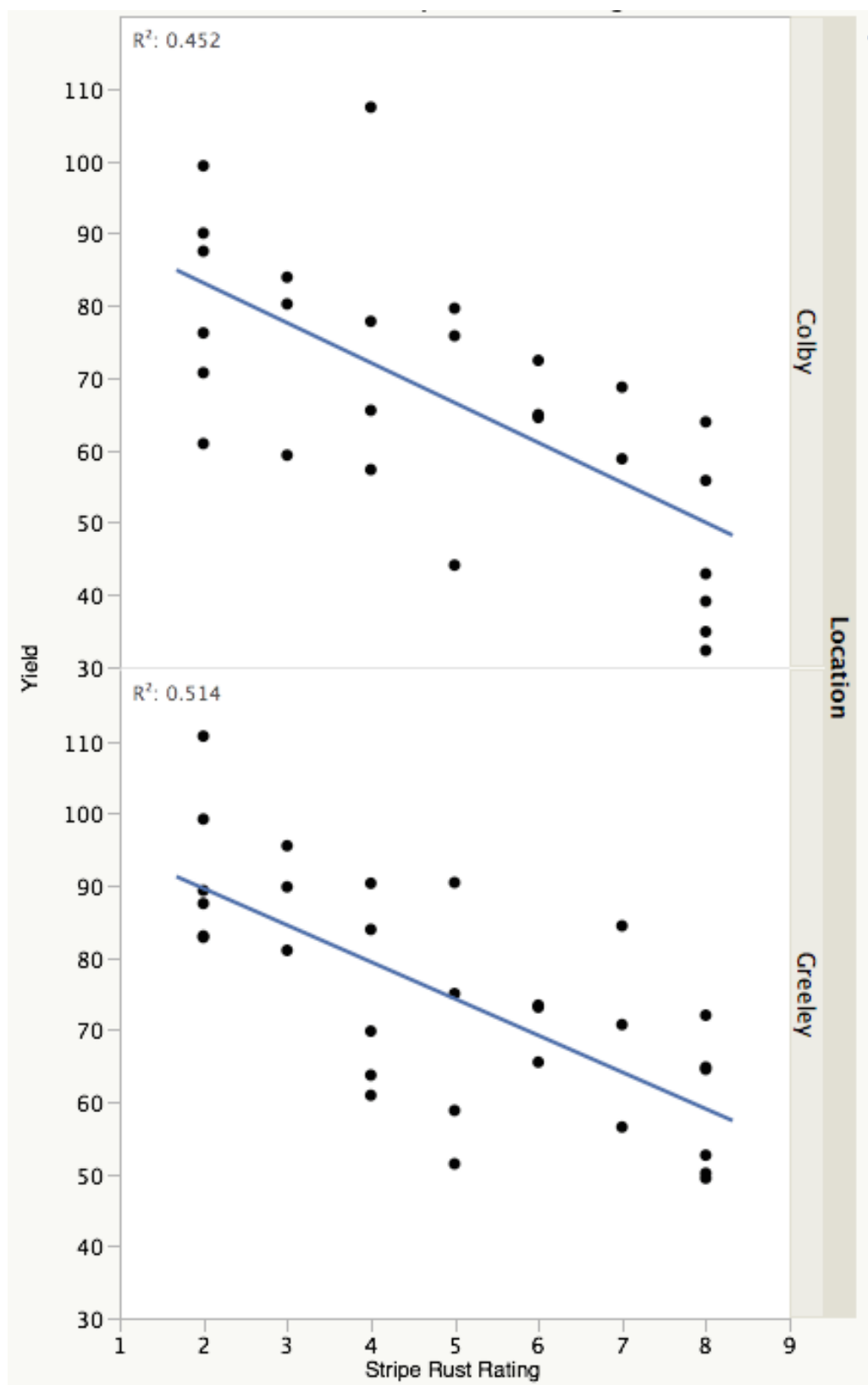


Figure 1. A comparison of yield (bu/acre) for wheat varieties with different levels of genetic resistance to stripe rust. Varieties with a rating of 1-2 are highly resistant to stripe rust. These data are from the K-State variety performance tests in Greeley and Thomas counties. The Greeley County location was dryland and the Thomas County location was irrigated.

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4. Canola conference set for July 14, 15; Canola schools set for August 5, 6

Four in-depth educational opportunities for area producers on winter canola production and marketing are on tap for this summer.

July 14 and 15. The 11th Annual Winter Canola Conferences are scheduled for:

- July 14 in Enid, Oklahoma at the Enid Convention Center, and
- July 15 in Vernon, Texas at the Wilbarger County Auditorium.

These conferences are hosted by K-State Research and Extension, Oklahoma State University Extension Service, and Texas A&M AgriLife Extension. Registration begins at 8 a.m., with the program scheduled to start at 8:50 a.m. Topics include:

- What to do and what not to do in canola production
- Variety and hybrid performance
- No-till stand establishment and winter survival
- Soil fertility and nutrient uptake
- Canola seed handling and storage
- Updates from the Great Plains Canola Association, the U.S. Canola Association, and a grower panel

There is no RSVP required for either conference.

August 5 and 6. K-State Research and Extension will be hosting two pre-plant canola risk management schools in August. The first will be August 5 in Wichita at the Sedgwick County Extension Center. The meeting will begin at 10 a.m. The second will be August 6 in Garden City at the Southwest Research-Extension Center beginning at 9 a.m.

The purpose of the schools is to give new and experienced producers the information needed to make an informed decision about planting winter canola this fall.

Topics at the pre-plant meeting on Aug 5 include drill calibration, insect management, canola varieties and winter survival, on-farm establishment research, and marketing. Topics at the Aug 6 meeting include planting date and establishment methods, intensive management under limited irrigation, variety performance and winter survival, insect management, and marketing.

Lunch will be provided at each venue. Participants are asked to RSVP by August 3 for the Wichita school by contacting Jackie Fees, Sedgwick County Extension office, at jfees@ksu.edu or 316-660-0143. Participants can register online at: [Canola School link](#). Or, see the Sedgwick County Extension office website at www.sedgwick.ksu.edu

For the Garden City school, participants are asked to RSVP by July 30 to Ashlee Wood, at awood22@ksu.edu or 620-276-8286.

Mike Stamm, Canola Breeder
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5. Comparative Vegetation Condition Report: June 23 - July 6

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=CRP3Y5Nlggw>

<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 26-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 Nan An at nanan@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 state of photosynthetic activity in Kansas, the Corn Belt, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

Kansas Vegetation Condition

Period 27: 06/23/2015 - 07/06/2015

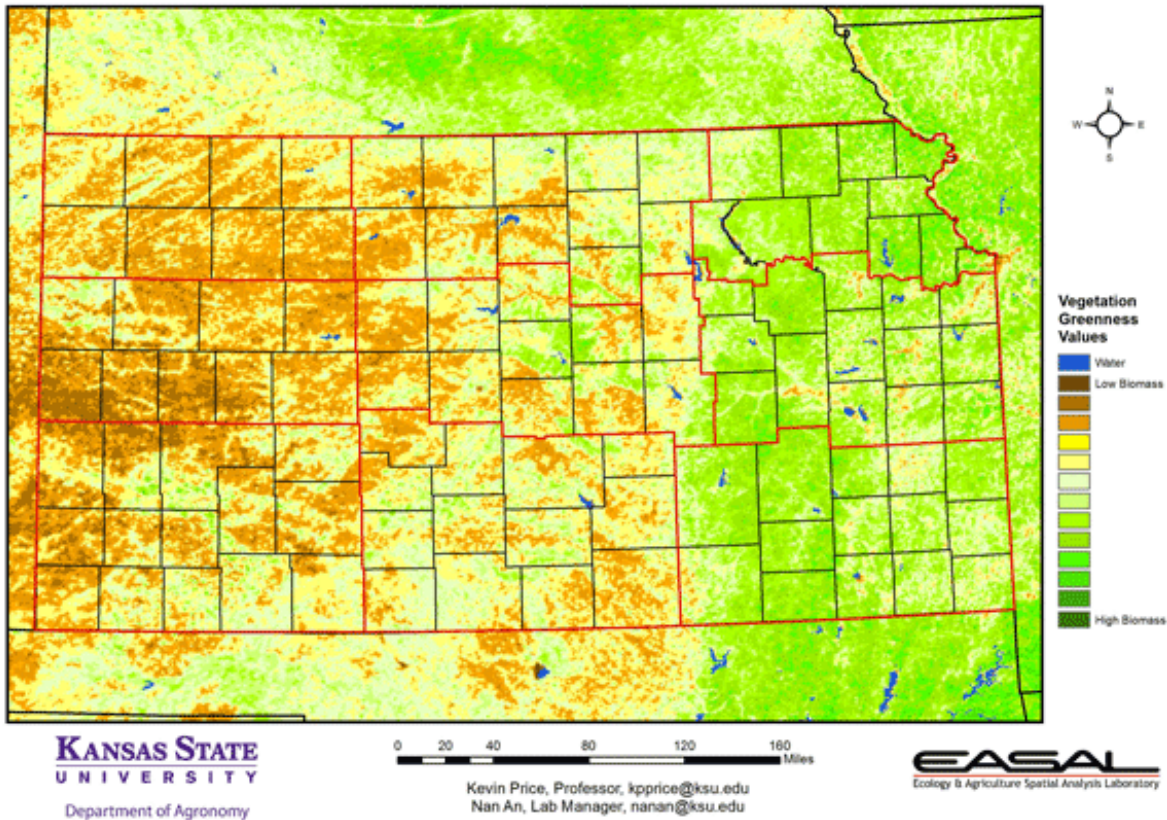


Figure 1. The Vegetation Condition Report for Kansas for June 23 - July 6 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that vegetative activity remains highest in the eastern third of the state and along and south of the Arkansas River Valley in southwest Kansas. The highest NDVI values in western Kansas are visible along the stream beds where favorable moisture continues to spur plant development. Low photosynthetic activity is most visible in west central Kansas, where high temperatures and low rainfall are stressing vegetation.

Kansas Vegetation Condition Comparison

Late-Jun/Early-Jul 2015 compared to the Late-Jun/Early-Jul 2014

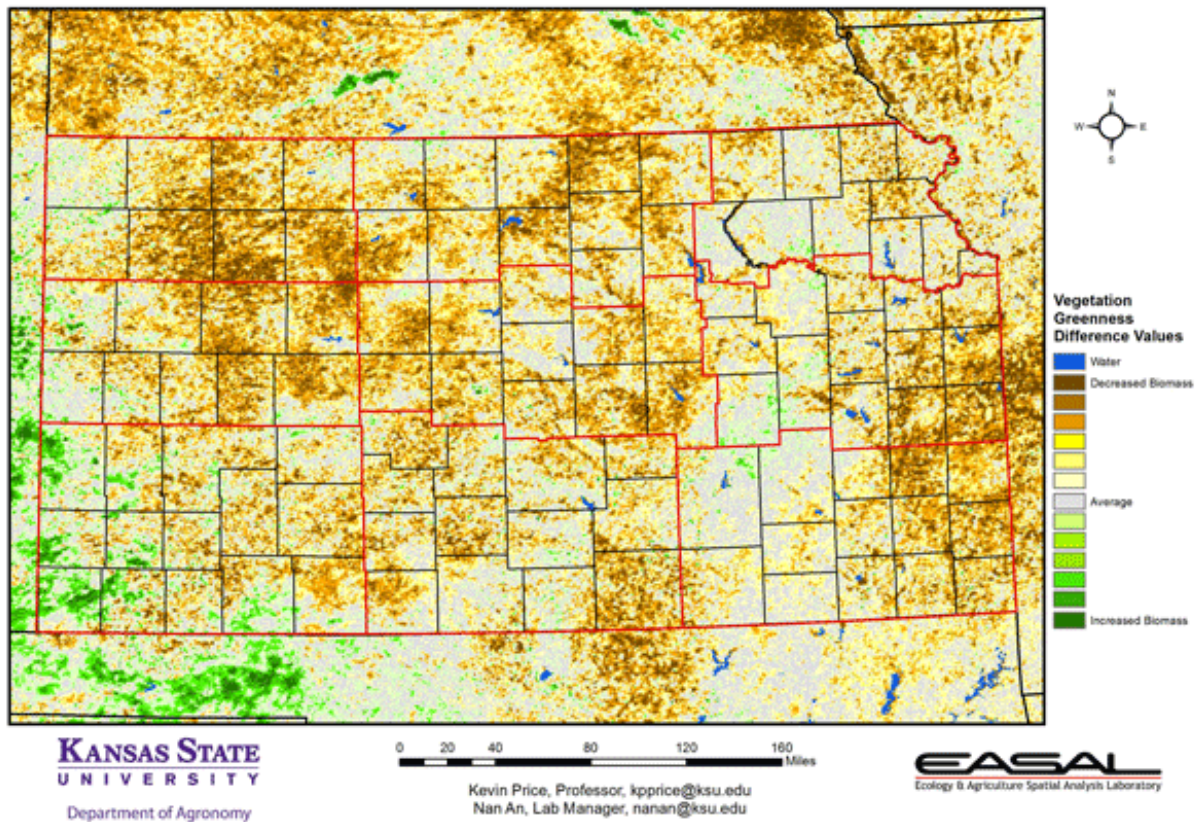


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for June 23 – July 6 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows biomass production is lower across much of the western parts of the state. The exception is in the extreme southwestern areas from Hamilton County to Stevens County. Last year an extremely wet June favored vegetative growth, while this year many areas of the state had lower-than-normal June rainfall. Poor root development is hampering plant development in areas that switched rapidly from excessive moisture to little precipitation.

Kansas Vegetation Condition Comparison

Late-Jun/Early-Jul 2015 compared to the 26-Year Average for Late-Jun/Early-Jul

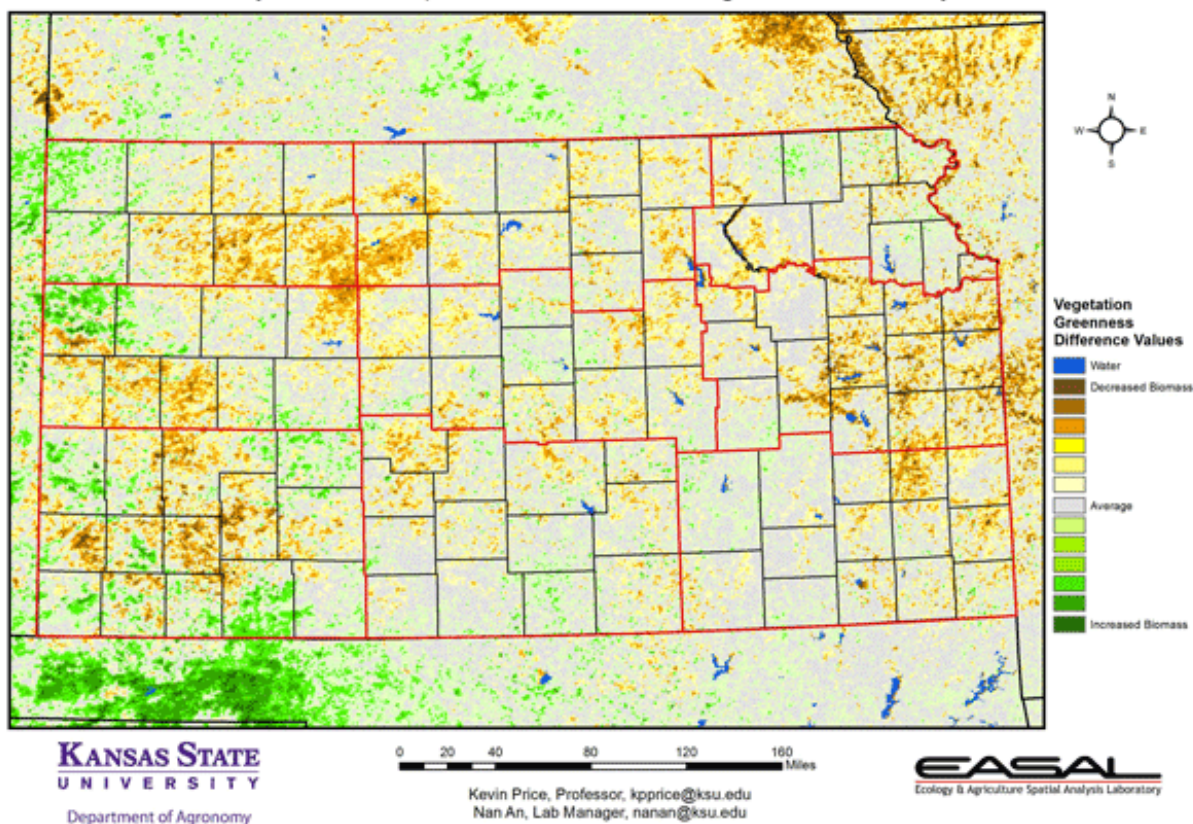


Figure 3. Compared to the 26-year average at this time for Kansas, this year's Vegetation Condition Report for June 23 - July 6 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that most of the state has fairly average photosynthetic activity. The western divisions have the greatest increase over normal photosynthetic activity. Precipitation in this region is close to normal, and has favored plant development. Lower NDVI values are seen in Sheridan, Graham, Rooks and Trego counties, where moderate drought persists. In contrast, the lower NDVI values in the East Central Division are due to continued higher-than-normal precipitation. The divisional average for the last week was 2.21 inches or 213 percent of normal.

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U.S. Corn Belt Vegetation Condition

Period 27: 06/23/2015 - 07/06/2015

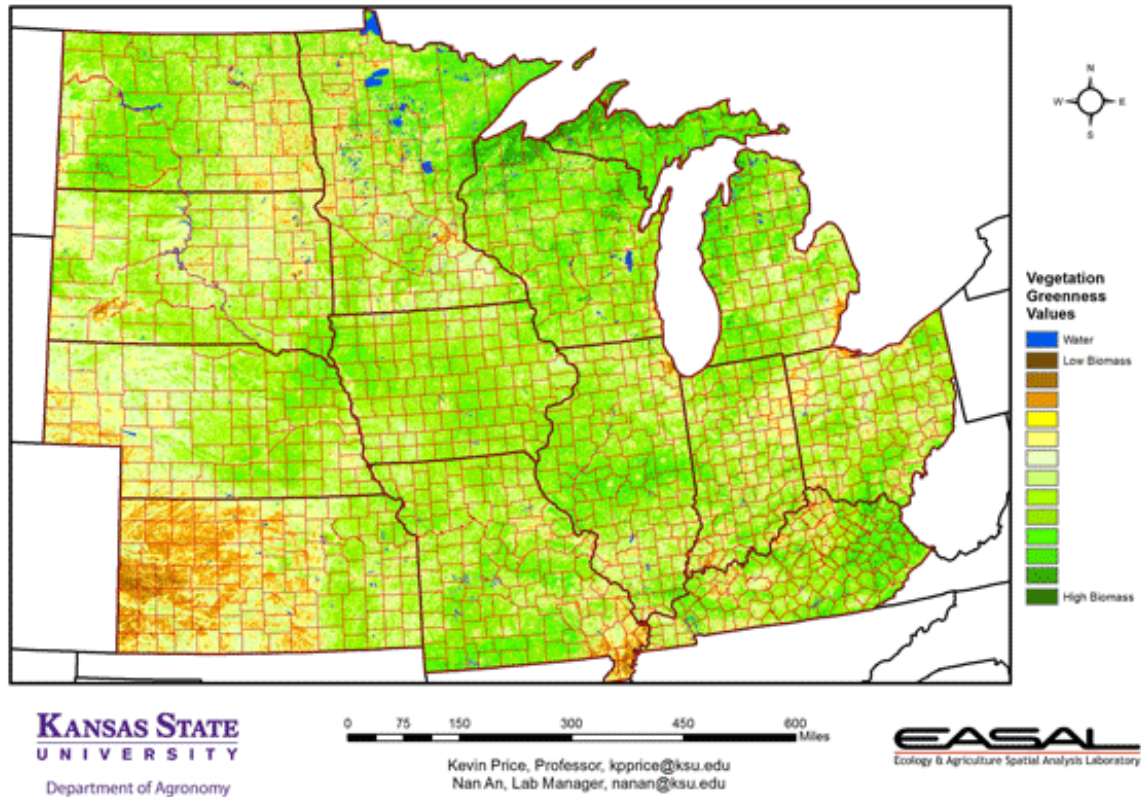


Figure 4. The Vegetation Condition Report for the Corn Belt for June 23 – July 6 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that most of the region has high NDVI values. The highest photosynthetic activity is across the northern areas of the region from Minnesota through northern Michigan. Favorable temperatures and moisture have continued to favor biomass production. The lowest values are in western Kansas, where a rapid switch to low precipitation is hampering vegetative development.

U.S. Corn Belt Vegetation Condition Comparison
Late-Jun/Early-Jul 2015 Compared to Late-Jun/Early-Jul 2014

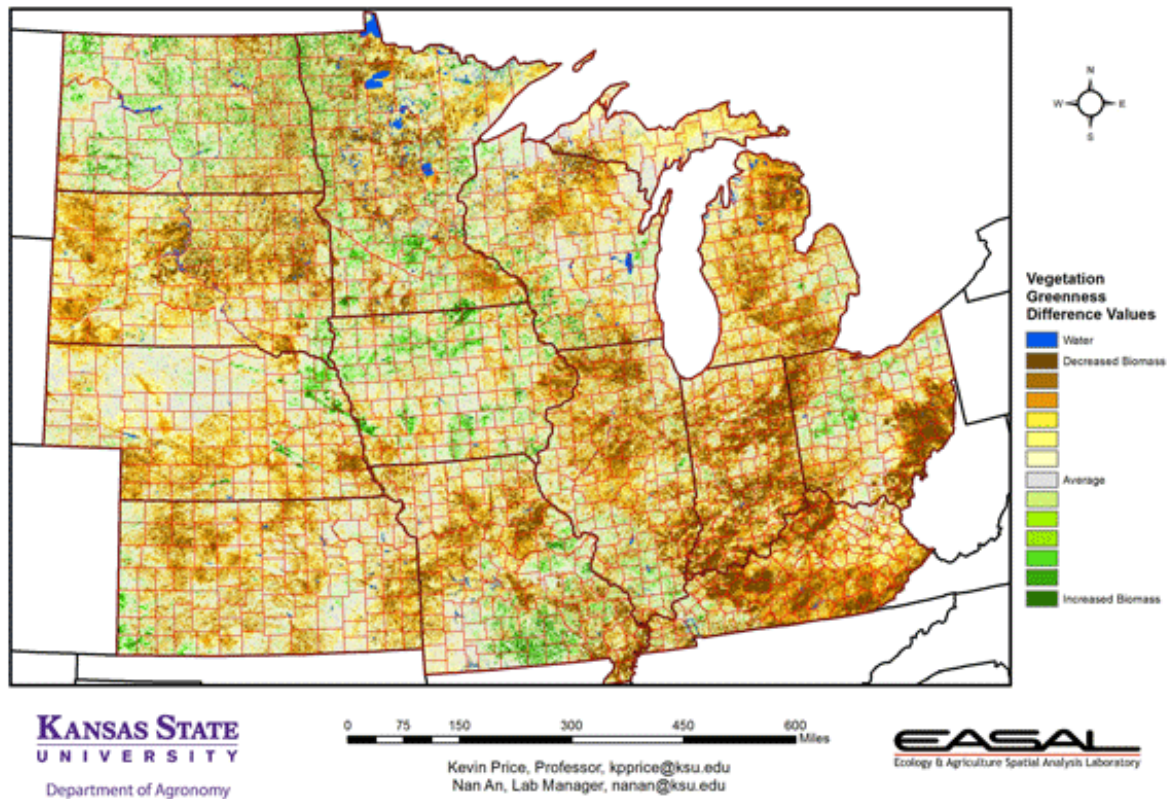


Figure 5. The comparison to last year in the Corn Belt for the period June 23 - July 6 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows a large increase in biomass production in North Dakota. Rainfall and temperatures continue to be favorable, accelerating plant growth in the area. In contrast, South Dakota has seen less favorable conditions this year.

U.S. Corn Belt Vegetation Condition Comparison
Late-Jun/Early-Jul 2015 Compared to the 26-Year Average for Late-Jun/Early-Jul

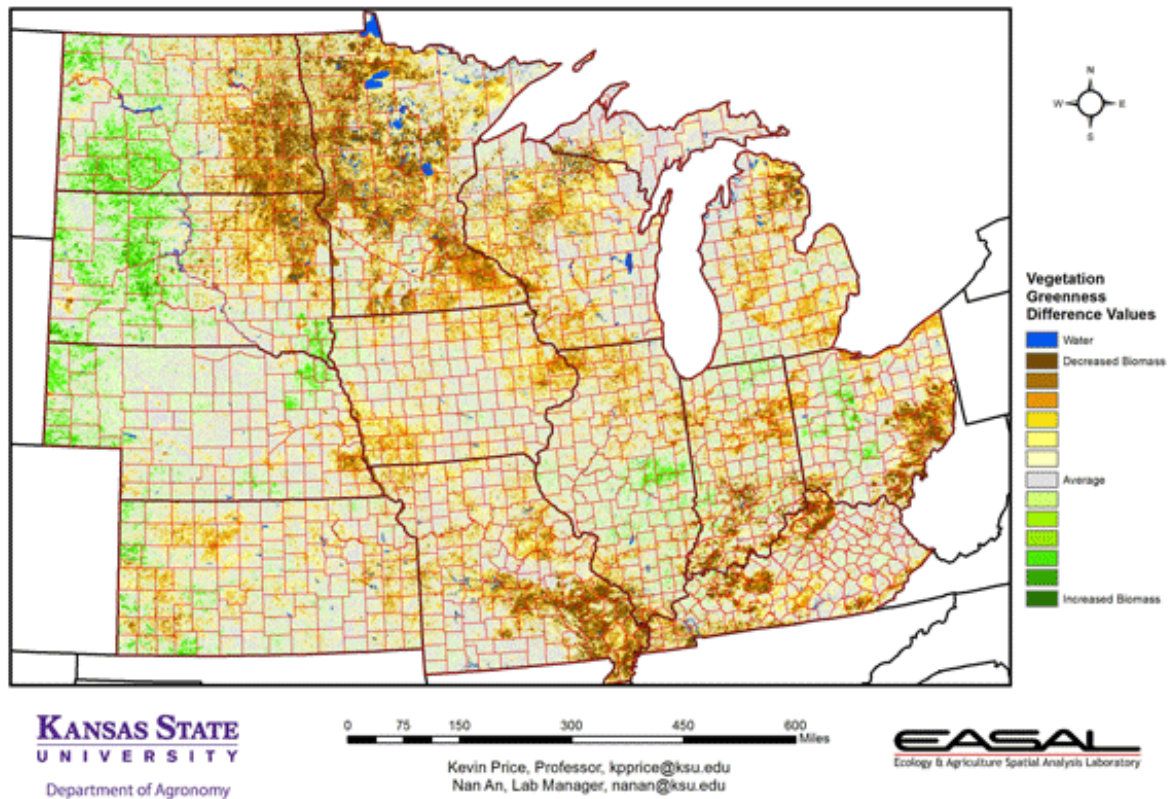


Figure 6. Compared to the 26-year average at this time for the Corn Belt, this year's Vegetation Condition Report for June 23-July 6 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows the greatest decrease in biomass production is centered in Minnesota, extending westward. Another area of much lower-than-average photosynthetic activity extends along the Ohio River Valley into Southeastern Missouri. Excess moisture continues to slow plant development in these areas.

Continental U.S. Vegetation Condition

Period 27: 06/23/2015 - 07/06/2015

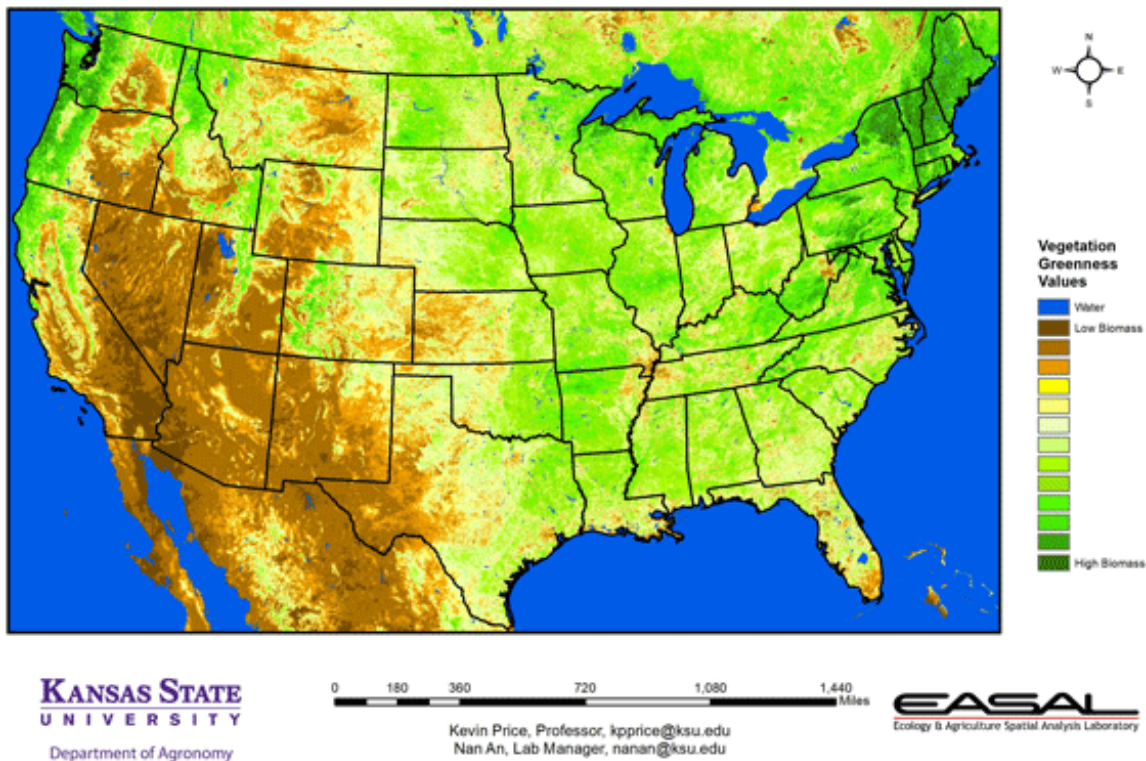


Figure 7. The Vegetation Condition Report for the U.S. for June 23 - July 6 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that highest level of photosynthetic activity continues to be in the New England area and along the mountains of the Pacific Northwest. Plant development has been favored by the warmer-than-normal temperatures. There is also an area of high biomass production in western Colorado. Lower biomass production is notable in eastern Montana, eastern Colorado, and western Kansas.

Continental U.S. Vegetation Condition Comparison
Late-Jun/Early-Jul 2015 Compared to Late-Jun/Early-Jul 2014

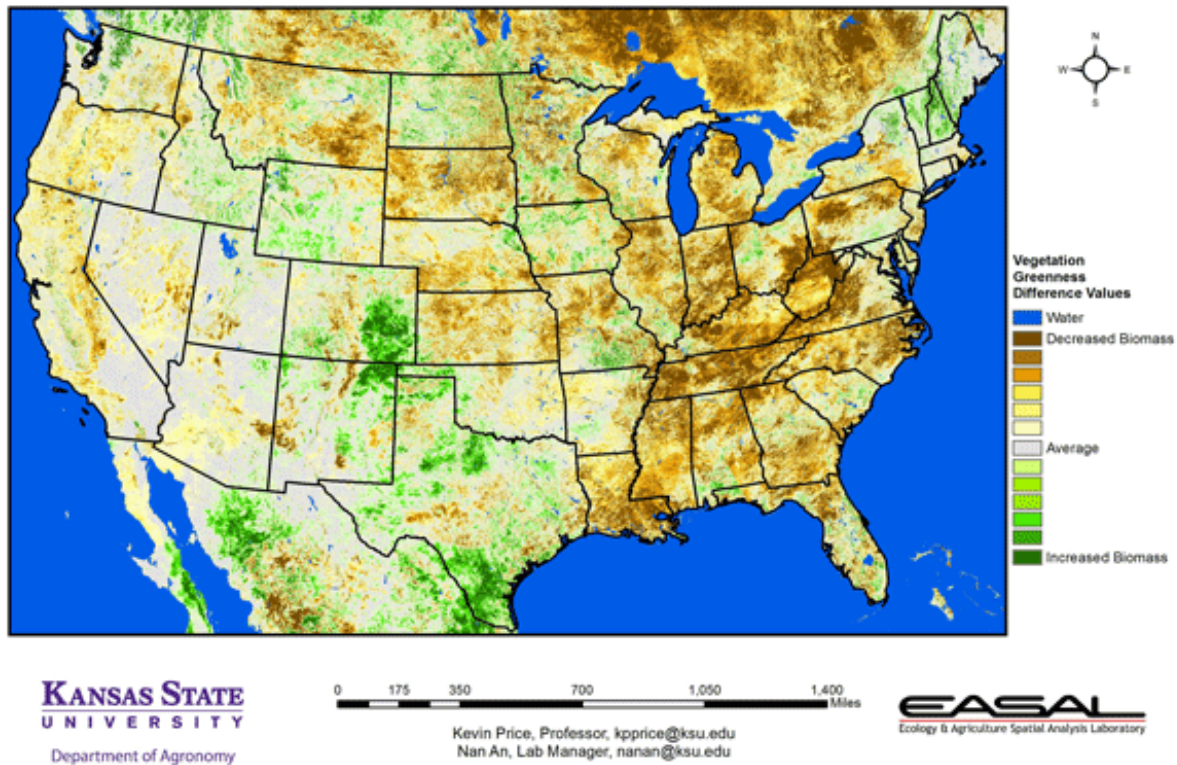


Figure 8. The U.S. comparison to last year at this time for the period June 23 – July 6 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows lower photosynthetic activity in across much of the Eastern U.S. Conditions in June of 2014 were much more favorable than this year, where cool, wet weather continues to hamper plant development. Higher biomass production is visible in the central and southern High Plains from southeastern Colorado through western Texas, where drought conditions have improved greatly. In the West, from Oregon through California, the changes have been minimal. Conditions were poor last year and continue to be poor this year.

Continental U.S. Vegetation Condition Comparison
Late-Jun/Early-Jul 2015 Compared to 26-year Average for Late-Jun/Early-Jul

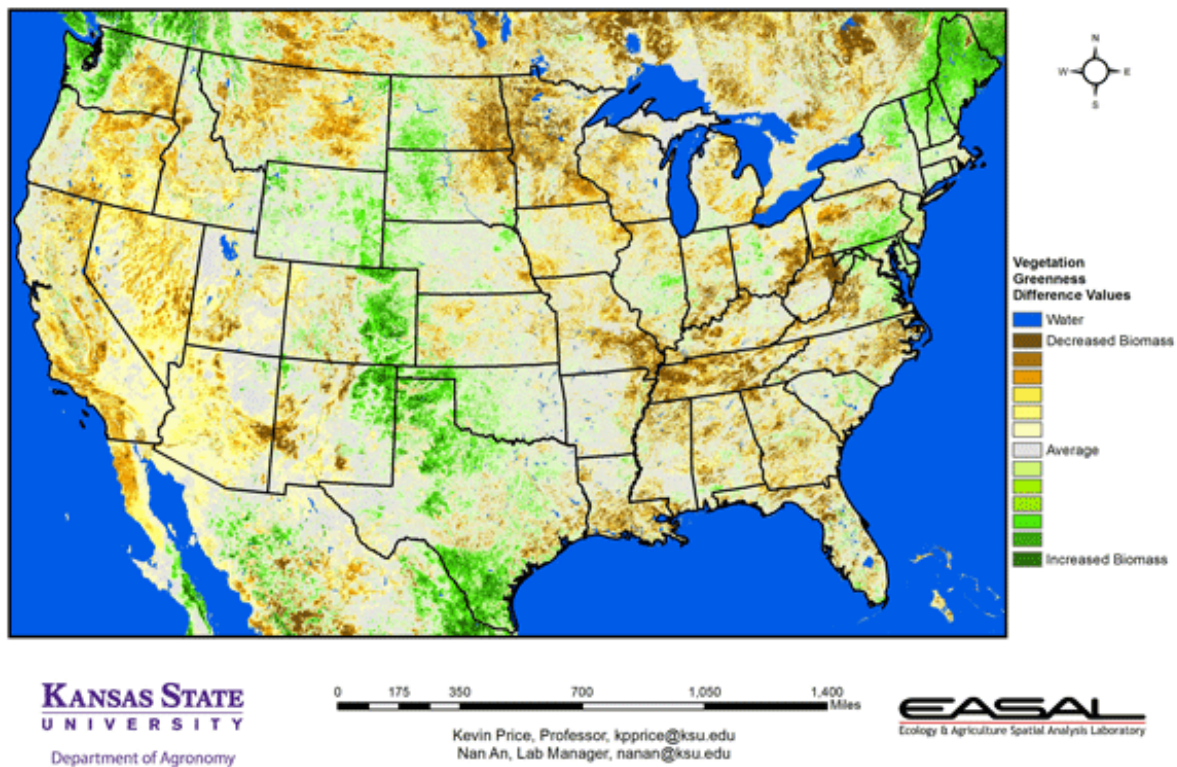


Figure 9. The U.S. comparison to the 26-year average for the period June 23 – July 6 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows much of the country has closeto-average photosynthetic activity. Washington stands out with higher-than-average biomass production, as early season moisture has reduced some of the drought impacts. Favorable moisture in the eastern Plains of Colorado into the Panhandle of Texas continues to generate higher-than-average biomass production in this area as well. Lower-than-average production is concentrated in the Ohio River Valley, where cooler temperatures and saturated soils have slowed plant development.

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