



K-STATE
Research and Extension

Extension Agronomy

eUpdate

06/20/2014

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.

1. Green snap in corn.....	3
2. Evaluating non-uniform sorghum stands.....	6
3. Comparative Vegetation Condition Report: June 3 - 16.....	10

1. Green snap in corn

Some of the storms and extremely high winds this spring have caused significant stalk breakage in some corn fields. In these kinds of storms, it is not unusual to have up to 40% of stalks in some fields broken off at ground level. We see this type of damage somewhere every year. It is usually referred to as “green snap,” “brittle corn,” or “brittle snap.”

Green snap occurs when rapidly elongating corn stalks are subjected to high winds. Corn stalks are elongating rapidly between about V8 to tassel. Typically, corn is most susceptible to green snap in the two- or three-week period from late vegetative until silking. The stalks are growing rapidly and have enough height to catch more wind. These high winds will cause stalks to break in the section close to the lower nodes.

A number of factors can affect the severity of green snap. Anything that contributes to rapid, vigorous growth may make corn more susceptible to this problem. Such contributing factors include high nitrogen fertilizer rates, rotation after soybeans, higher plant densities (promoting early competition and elongation, and thinner stalks) and early planting. Unfortunately, these are all recommended best management practices for corn production.

Timing has a huge impact on the severity of green snap, with much less damage usually evident in younger corn (Figure 1) or in fields that have tasseled and silked. The factor that can be addressed most readily is hybrid selection. Although no hybrid is immune to the problem, some hybrids are more susceptible to green snap than others.



Figure 1. Corn showing effects of wind damage, “green snap,” early during the vegetative period. Photo by Ignacio Ciampitti, K-State Research and Extension.



Figure 2. Green snap in corn at a later, more vulnerable vegetative stage of growth. Photo by Kraig Roozeboom, K-State Research and Extension.

What are the implications of all those broken plants for the current crop? Damaged plants are broken completely in two, so there is no hope for recovery. Even so, the yield loss in an affected field usually will be much less than the stand loss. Before tasseling, surviving corn plants can respond to the additional resources made available by the removal of damaged plants by maintaining larger ears or setting additional ears, or increasing final kernel weight. With 10% or fewer broken stalks, it may be hard to detect a significant yield loss if stands were adequate before the storm.

Yield losses will increase with “patchy” stand losses because surviving plants are too far apart to compensate for lost plants. If large patches are damaged, or if stand losses are significant, there may still be an opportunity to cut the worst areas with a swather or crimper to salvage some forage if it can be utilized. It is not too late to plant sunflower, soybeans, or grain or forage sorghum if the stand is a total loss, depending upon the herbicide program used on the damaged corn crop.

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2. Evaluating non-uniform sorghum stands

Some fields of sorghum may have problems with non-uniform emergence for various reasons. In some cases, the surface soil was dry and some of the sorghum did not emerge immediately, or may not have emerged at all. In other cases, cool, wet soils slowed or reduced emergence on early-planted sorghum. Insect damage can also cause emergence problems.

There are really two aspects to this situation: (1) sorghum stands with plants that are at different stages of development, and (2) sorghum stands that have fewer plants than desired.

Plants at different stages of development

If the stand has not been reduced substantially, there is seldom cause for concern with sorghum (Fig. 1). This is in contrast to corn. With corn, if some plants are developmentally ahead of others, this can lead to yield reductions. Plant-to-plant uniformity is a critical aspect in corn production systems. But there is little data to document severe yield reductions in sorghum, provided the plants have emerged within a period of 10-14 days of each other.

Sorghum often has tillers that act something like late-emerging plants. Usually these early tillers contribute a significant portion of the grain yield. Late-emerging plants may head and bloom slightly later than the early-emerging plants, but the difference typically is not nearly as great as the difference in emergence dates. As long as the sorghum does not lodge and is not killed by an extremely early frost, these later heads will fill adequately and mature in time for a normal harvest.

We would rather see a nice uniform field, but it is probably not worthwhile to destroy a stand and replant just because a significant percentage of plants emerged several days later than the others.



Figure 1. Sorghum presenting differences in size and development (number of leaves), Shawnee County. Photo by Ignacio Ciampitti, K-State Research and Extension.

Fewer plants than desired

The second result of delayed or reduced emergence may be a reduction in stand, often in a non-uniform manner (Figure 2). Sorghum is notoriously non-responsive to changes in stand within a fairly wide range for a given environment. Often it takes a reduction of more than 25 to 30% before yield is reduced, as long as the plant spacing is relatively uniform.



Figure 2. A field of sorghum with differences in emergence, Riley County. Photo by Ignacio Ciampitti, K-State Research and Extension.

Several years ago Richard Vanderlip, K-State crop physiologist, examined the impact of reductions in stand and the number and size of gaps in sorghum plantings in experiments at Manhattan and St. John. Some conclusions from that work:

1. Plants within the row containing skips and in adjacent rows compensated for missing plants by producing more heads per plant, more seeds per head, and – to a lesser extent – heavier seeds.
2. Differences in tillering ability of hybrids did not influence grain yield. Hybrids that tillered less compensated by increasing head size (seeds/head).
3. Yield compensation increased as plant spacing uniformity improved. Yield reductions were more likely or severe where skips resulted in severe lack of uniformity within the plant spacing and there were large gaps side-by-side in adjacent rows.

Every field will be different, but the research seems to indicate that stand reductions must be at least 25% to 30% or more before yields are affected, even with occasional gaps up to 9 feet long. Gaps of less than 9 feet likely will not reduce yield provided adjacent rows have no gaps and stands are not reduced by more than 25%.

Sorghum has a great capacity to compensate for stand reductions, which reduce the impact on non-

uniform stands on the crop yield. Keeping an established stand is usually the better choice than spending the money and facing the risks associated with destroying the stand and replanting, provided the stand has not been reduced too much and does not contain too many large gaps. Risks of yield reductions with replanting will increase as the season progresses and planting dates get later.

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3. Comparative Vegetation Condition Report: June 3 - 16

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

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:

<http://www.youtube.com/watch?v=CRP3Y5NIggw>

<http://www.youtube.com/watch?v=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 25-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, service climatologist:

Kansas Vegetation Condition

Period 24: 06/03/2014 - 06/16/2014

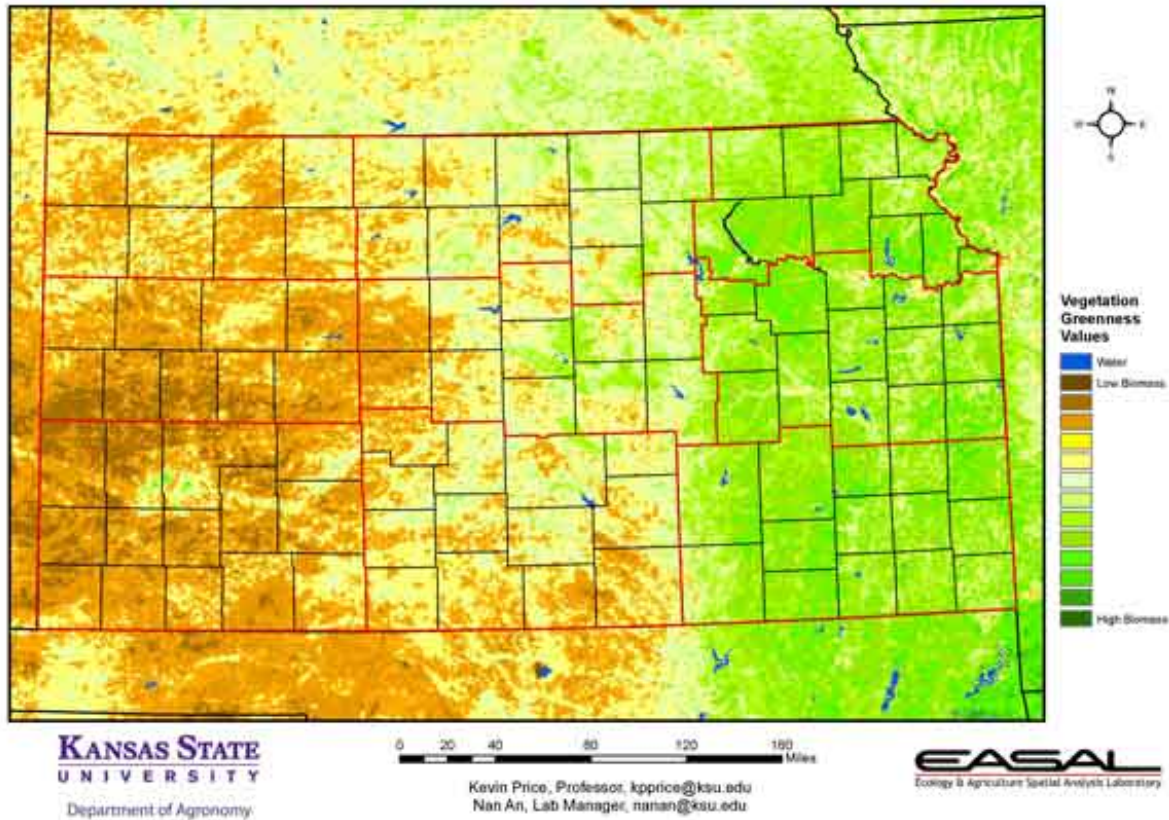


Figure 1. The Vegetation Condition Report for Kansas for June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that vegetative activity is highest in the eastern third of the state. High photosynthetic activity is also evident in Ellsworth and McPherson counties in central Kansas.

Kansas Vegetation Condition Comparison

Early-June 2014 compared to the Early-June 2013

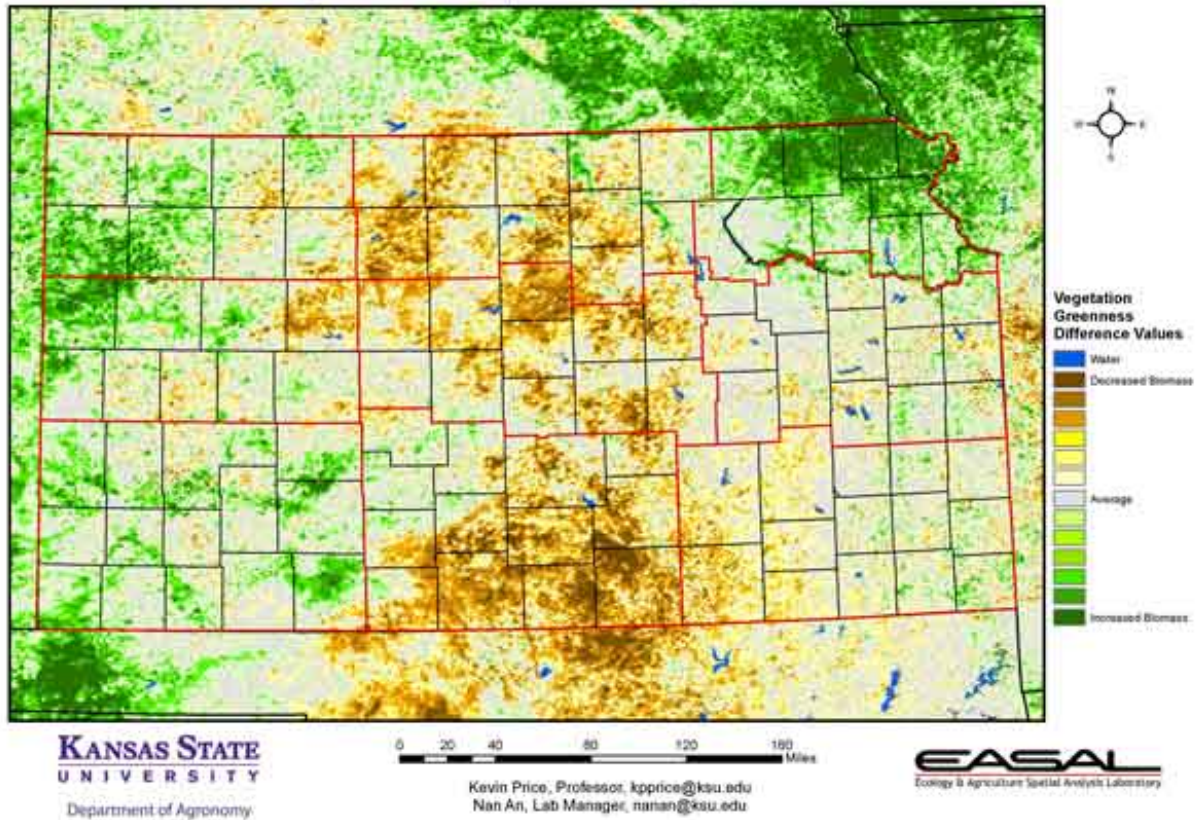


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the biggest decrease in plant production is across the center of the state. In particular, Harper and Sumner counties in south central Kansas have much lower levels of photosynthetic activity. In contrast, Sherman and Wallace counties in western Kansas and Nemaha, Brown, and Doniphan counties in northeast Kansas have much higher levels of photosynthetic activity. In the northeast, favorable weather conditions have accelerated growth. In the west, extremely poor conditions last year mean that even slight improvements this year are noticeable.

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Kansas Vegetation Condition Comparison
Early-June 2014 compared to the 25-Year Average for Early-June

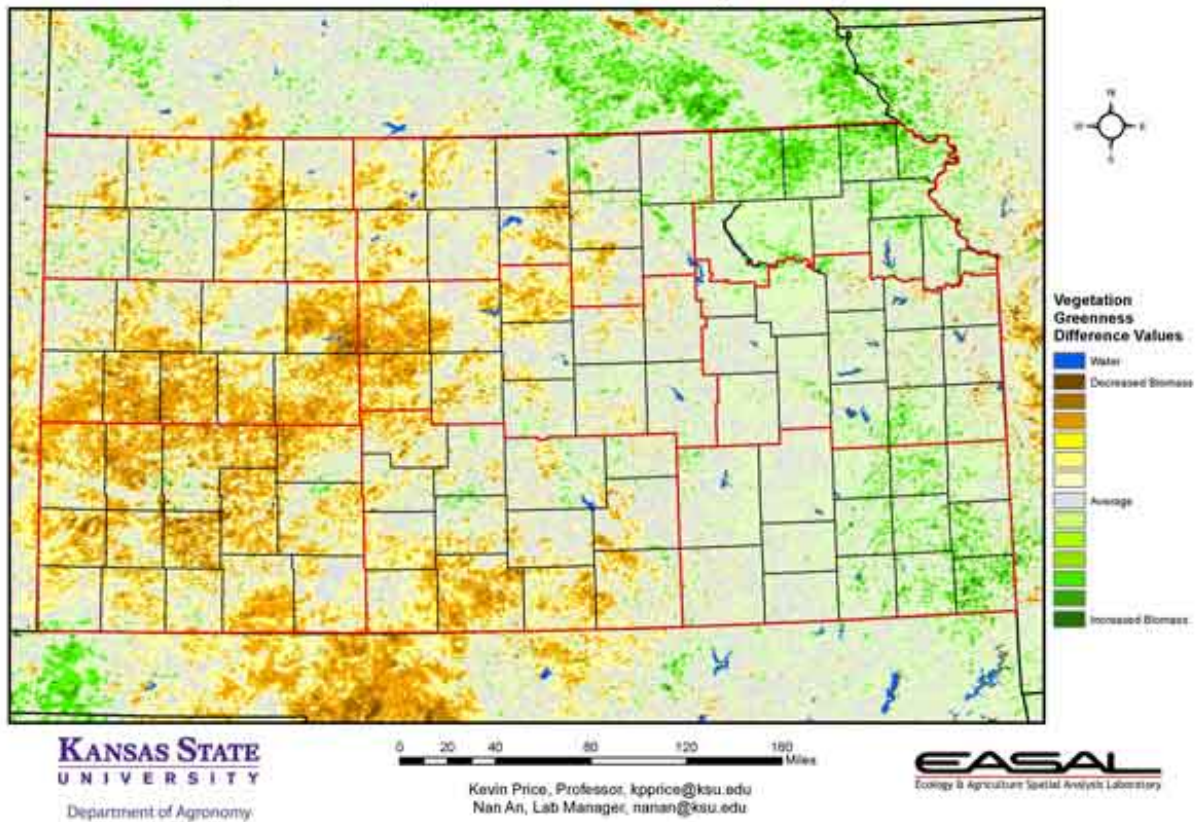


Figure 3. Compared to the 25-year average at this time for Kansas, this year's Vegetation Condition Report for June 3 – 16 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows lower-than-average production in the southwest, through Trego and Ellis counties in the West Central and Central Divisions. Continued drought is the major culprit, although flooding was an issue in parts of central Kansas due to heavy rains during the period.

U.S. Corn Belt Vegetation Condition

Period 24: 06/03/2014 - 06/16/2014

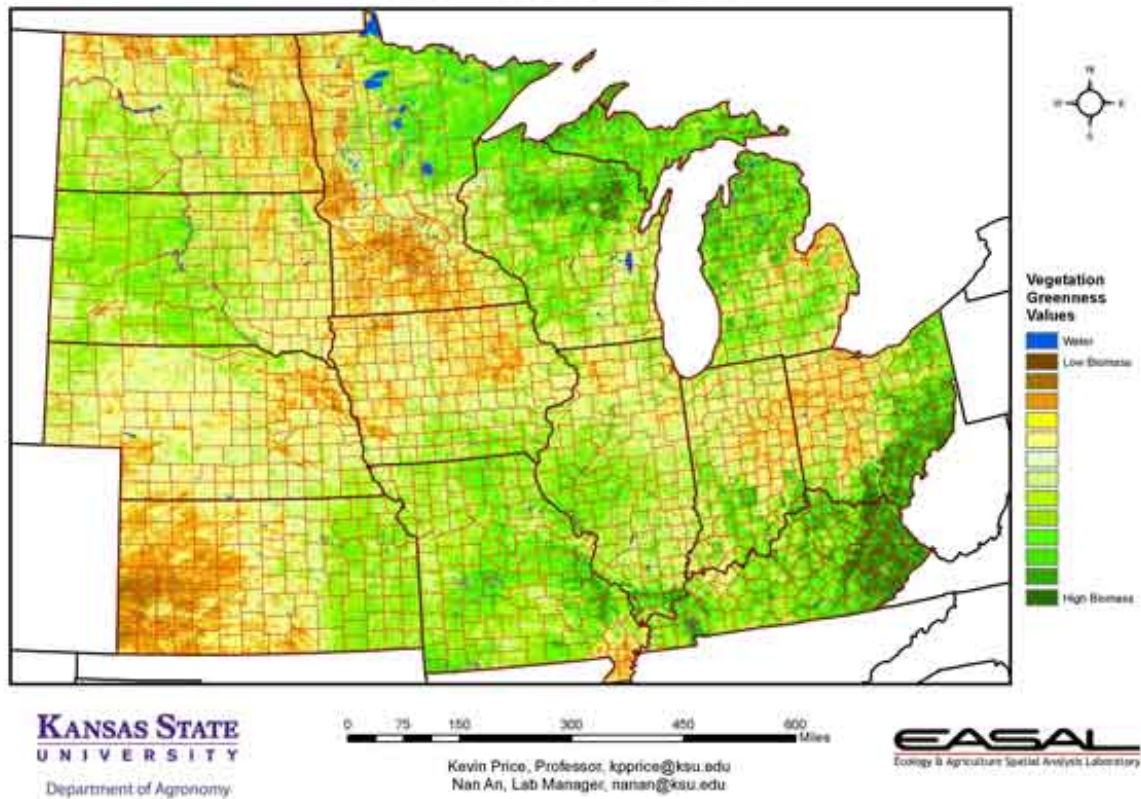


Figure 4. The Vegetation Condition Report for the Corn Belt for June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that high NDVI values are most concentrated in the eastern portions of the region, as well in northern Wisconsin and the Upper Peninsula of Michigan. Balanced moisture has favored plant development in these areas. For Kentucky, crops and pastures are generally 70 percent good to excellent; while the amount reported in poor condition is in single digits. There is a significant area of low photosynthetic activity from North Dakota through Iowa and northeastern Nebraska. Excessive rainfall is a problem in these areas. Extreme to severe drought continues to hamper plant development in western Kansas.

U.S. Corn Belt Vegetation Condition Comparison
Early-June 2014 Compared to Early-June 2013

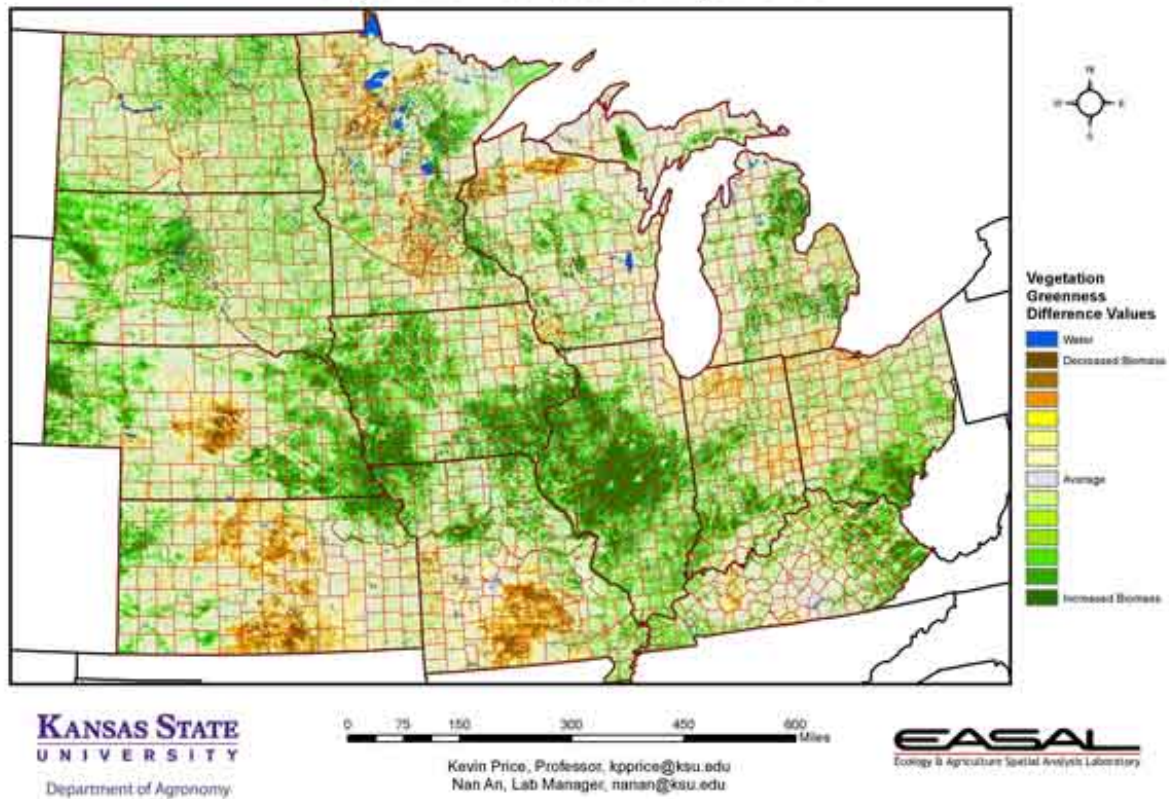


Figure 5. The comparison to last year in the Corn Belt for the period June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that much of the region has higher levels of plant production than last year at this time. Most noticeable is the activity in western and central Illinois. This year, planting and emergence were closer to the average than last year.

U.S. Corn Belt Vegetation Condition Comparison
Early-June 2014 Compared to the 25-Year Average for Early-June

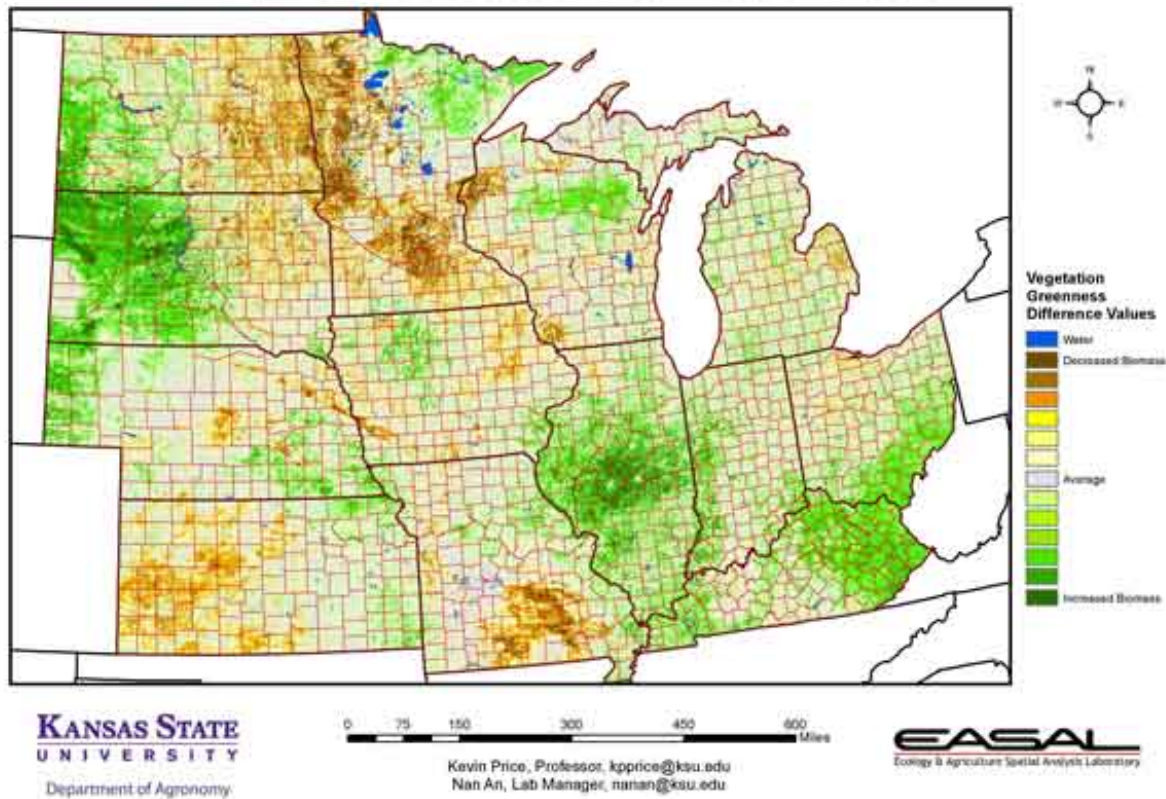


Figure 6. Compared to the 25-year average at this time for the Corn Belt, this year's Vegetation Condition Report for June 3 – 16 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that western South Dakota and central Illinois have above-average biomass production. Western South Dakota has had favorable temperatures and moisture, avoiding the excessive rains of eastern South Dakota. Similarly, central Illinois has had generally favorable weather conditions. Soil moisture in the Central Division of Illinois is 80 percent adequate and only 6 percent surplus. In contrast, southeastern Illinois reports soil moisture at 48 percent surplus.

Continental U.S. Vegetation Condition

Period 24: 06/03/2014 - 06/16/2014

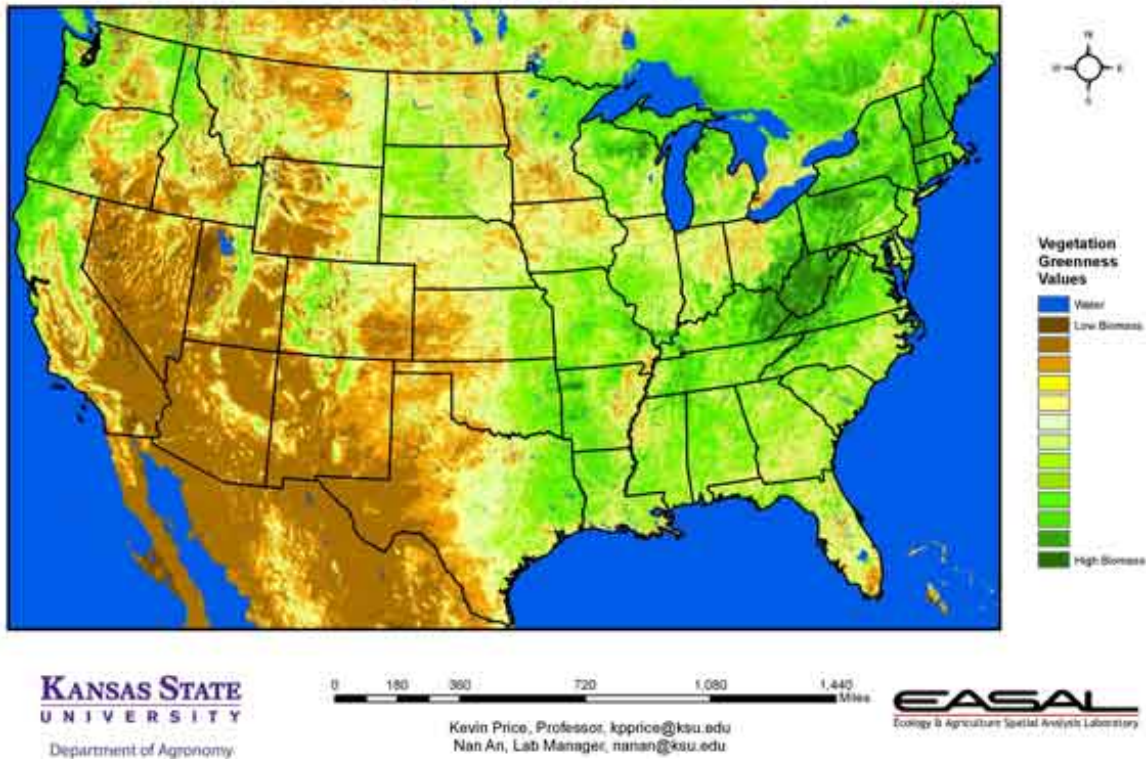


Figure 7. The Vegetation Condition Report for the U.S. for June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that highest biomass production is centered around West Virginia, and continues along New England. Soil moisture in West Virginia is reported at 86 percent adequate.

Continental U.S. Vegetation Condition Comparison
Early-June 2014 Compared to Early-June 2013

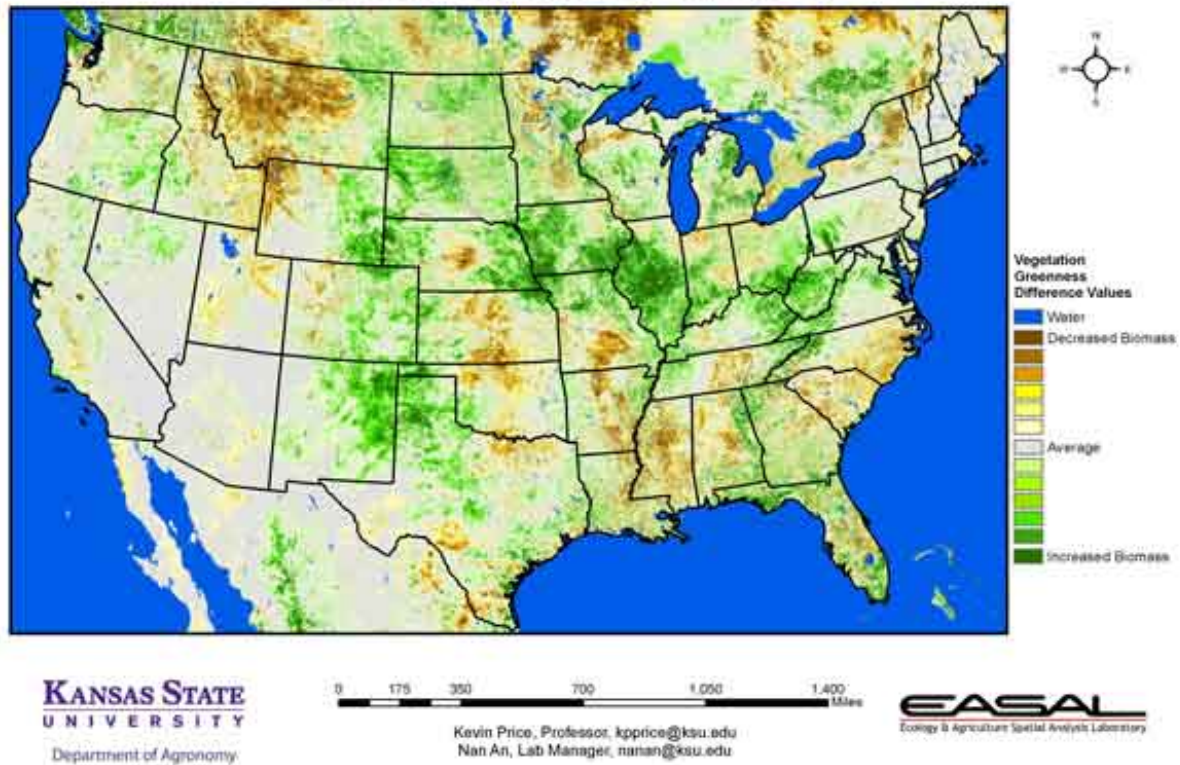


Figure 8. The U.S. comparison to last year at this time for the period June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that increased biomass production is prominent in the parts of the Central U.S. from Illinois to eastern New Mexico. In the West, while the increased productivity is welcome, it is primarily a reflection of the extremely poor conditions that prevailed last year.

Continental U.S. Vegetation Condition Comparison
Early-June 2014 Compared to 25-year Average for Early-June

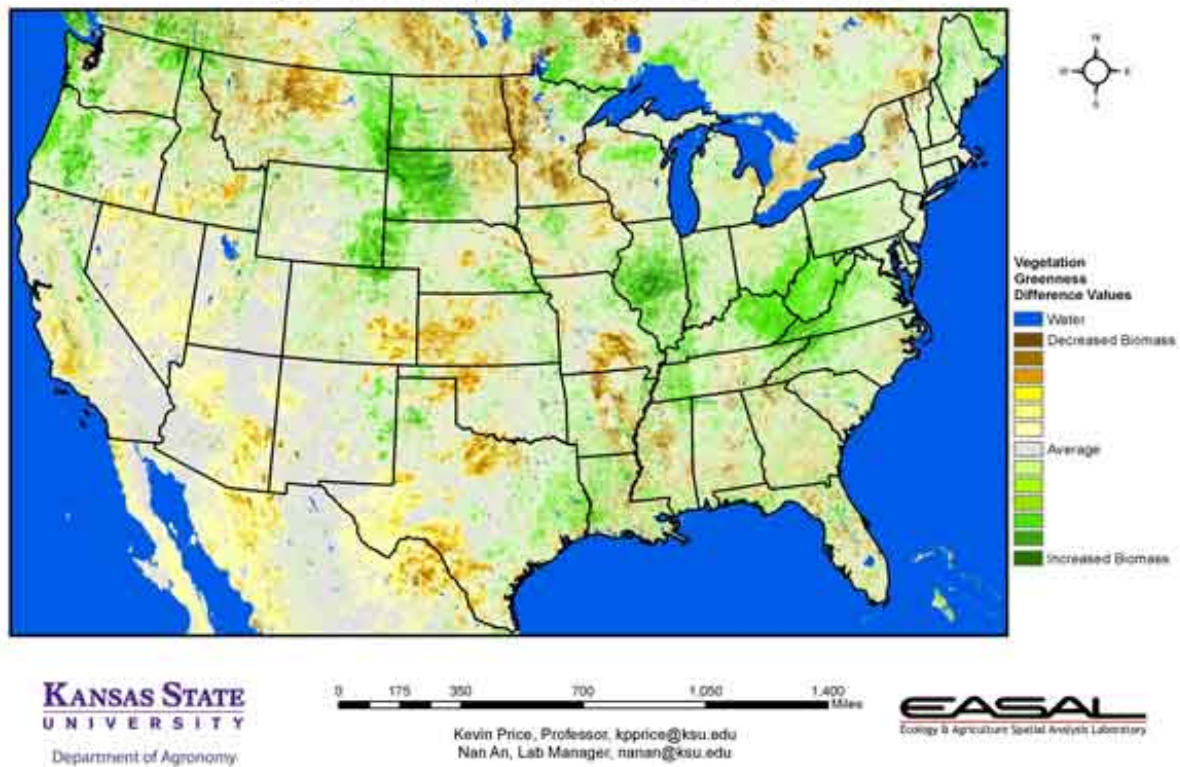


Figure 9. The U.S. comparison to the 25-year average for the period June 3 – 16 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the biggest region of above-average photosynthetic activity is in the western part of the Northern Plains and in the Ohio River Valley. Along the upper Missouri Basin, excessive rains have limited field work and plant development. The NWS Forecast Office in Sioux Falls, South Dakota has reported 14.69 inches so far in June, which puts it on track for the wettest June on record.

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