



## Extension Agronomy

# eUpdate

---

*07/17/2015*

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](mailto:swatson@ksu.edu), Jim Shroyer, Crop Production Specialist 785-532-0397 [jshroyer@ksu.edu](mailto:jshroyer@ksu.edu), or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 [cthompso@ksu.edu](mailto:cthompso@ksu.edu).

---

eUpdate Table of Contents | 07/17/2015 | Issue 520

<b>1. Evaluate damaged and weakened alfalfa stands this summer.....</b>	<b>3</b>
<b>2. Evaluate damaged and weakened alfalfa stands this summer.....</b>	<b>4</b>
<b>3. Liming prior to fall seedings of alfalfa .....</b>	<b>5</b>
<b>4. Plant analysis for testing nutrient levels in soybeans.....</b>	<b>7</b>
<b>5. Forecasted corn yield potential and attainable yields for 2015.....</b>	<b>10</b>
<b>6. Canola schools set for August 5, 6.....</b>	<b>14</b>
<b>7. Comparative Vegetation Condition Report: June 30 - July 13.....</b>	<b>15</b>

## 1. Evaluate damaged and weakened alfalfa stands this summer

Some alfalfa stands may be damaged or depleted this summer, and no longer as productive as desirable. This could be due to a combination of factors: freeze injury, winterkill, early-season alfalfa weevil, diseases, flooding, or pea aphids.

If the stand appears to be recovering slowly or too thin to be worth saving, producers may want to kill the stand this summer, plant the field to wheat or oats this fall, and replant to alfalfa in the fall of 2016. It would be best to rotate the field out of alfalfa for a year before replanting due to allelopathy and disease concerns.

Evaluating the stand this summer is better than waiting until fall because it gives producers more time to plan out what they want to do with the stand.

Producers should count the number of stems per square foot at several locations in the field. Only stems over two inches tall should be counted. Research at the University of Wisconsin has found that a stem count is a much more accurate method of estimating the yield potential of an alfalfa field than plant count. Plant density is a poor estimator of yield potential because an individual plant may have few shoots and contribute little to yield. A stand of alfalfa should have at least 20-25 healthy stems per square foot to justify keeping it for another year. If a stand has 20 stems per square foot or less, producers should consider destroying it.

When evaluating the stand, producers should also dig up some plants and examine the crowns for size, symmetry, and the number of shoots present. Roots should be cut lengthwise to check for rot or discoloration in the crown and root. Healthy stands have fewer than 30 percent of the plants with significant discoloration or rot.

To kill an alfalfa stand, producers should spray when the plants have about 8-12 inches of regrowth. At that point, the flow of carbohydrates is moving down again, into the root systems, so herbicide uptake will be increased. If the herbicide is applied before that time, carbohydrates are still moving upward from the root reserves into topgrowth.

Producers could also wait until fall to kill the stand. A light frost in the fall won't affect alfalfa growth or herbicide uptake significantly, but a hard freeze will. So herbicides should be applied before a hard freeze, when temperatures get down into the mid-20's.

To kill an alfalfa stand, it's best to use 1 quart of 2,4-D ester and a half-pint of dicamba. Producers could also use two quarts of 2,4-D alone, but that's generally not as effective as the 2,4-D/dicamba combination. Mixing glyphosate with the 2,4-D or dicamba can also provide good alfalfa control, as well as control any grasses that may also be present in the field.

Jim Shroyer, Crop Production Specialist Emeritus  
[jshroyer@ksu.edu](mailto:jshroyer@ksu.edu)

Dallas Peterson, Weed Management Specialist  
[dpeterso@oznet.ksu.edu](mailto:dpeterso@oznet.ksu.edu)

## 2. Evaluate damaged and weakened alfalfa stands this summer

Some alfalfa stands may be damaged or depleted this summer, and no longer as productive as desirable. This could be due to a combination of factors: freeze injury, winterkill, early-season alfalfa weevil, diseases, flooding, or pea aphids.

If the stand appears to be recovering slowly or too thin to be worth saving, producers may want to kill the stand this summer, plant the field to wheat or oats this fall, and replant to alfalfa in the fall of 2016. It would be best to rotate the field out of alfalfa for a year before replanting due to allelopathy and disease concerns.

Evaluating the stand this summer is better than waiting until fall because it gives producers more time to plan out what they want to do with the stand.

Producers should count the number of stems per square foot at several locations in the field. Only stems over two inches tall should be counted. Research at the University of Wisconsin has found that a stem count is a much more accurate method of estimating the yield potential of an alfalfa field than plant count. Plant density is a poor estimator of yield potential because an individual plant may have few shoots and contribute little to yield. A stand of alfalfa should have at least 20-25 healthy stems per square foot to justify keeping it for another year. If a stand has 20 stems per square foot or less, producers should consider destroying it.

When evaluating the stand, producers should also dig up some plants and examine the crowns for size, symmetry, and the number of shoots present. Roots should be cut lengthwise to check for rot or discoloration in the crown and root. Healthy stands have fewer than 30 percent of the plants with significant discoloration or rot.

To kill an alfalfa stand, producers should spray when the plants have about 8-12 inches of regrowth. At that point, the flow of carbohydrates is moving down again, into the root systems, so herbicide uptake will be increased. If the herbicide is applied before that time, carbohydrates are still moving upward from the root reserves into topgrowth.

Producers could also wait until fall to kill the stand. A light frost in the fall won't affect alfalfa growth or herbicide uptake significantly, but a hard freeze will. So herbicides should be applied before a hard freeze, when temperatures get down into the mid-20's.

To kill an alfalfa stand, it's best to use 1 quart of 2,4-D ester and a half-pint of dicamba. Producers could also use two quarts of 2,4-D alone, but that's generally not as effective as the 2,4-D/dicamba combination. Mixing glyphosate with the 2,4-D or dicamba can also provide good alfalfa control, as well as control any grasses that may also be present in the field.

Jim Shroyer, Crop Production Specialist Emeritus  
[jshroyer@ksu.edu](mailto:jshroyer@ksu.edu)

Dallas Peterson, Weed Management Specialist  
[dpeterso@oznet.ksu.edu](mailto:dpeterso@oznet.ksu.edu)

### 3. Liming prior to fall seedings of alfalfa

Correcting acid soil conditions through the application of lime can have a significant impact on crop yields, especially alfalfa. Since seeding alfalfa is expensive and a stand is expected to last for several years, getting lime applied and acidity corrected before seeding is critical. Liming is one of the most essential, but often overlooked, management decisions a producer can make.

Unfortunately lime is not always available close to where it may be needed. In many cases trucking and spreading costs may be more than the cost of the lime itself. Lime quality can also vary widely and no one wants to apply more than is necessary. So to make the best decisions on how much and what kind of lime to apply, it is useful to know how lime recommendations are made.

#### **How lime recommendations are made by K-State**

A routine soil test will reveal the pH level of the soil, and this will determine whether lime is needed on the field. Generally, east of the Flint Hills, lime is recommended for alfalfa if the pH drops below 6.4, with a target pH for liming of 6.8. In the Flint Hills and west, lime is recommended for alfalfa and all other crops when the pH drops below 5.8, with a target pH of 6.0. Target pH is simply the pH goal once the lime reacts with the soil.

Why are the target pHs different for the two areas of Kansas? They differ because of the pH of the subsoil. East of the Flint Hills, especially south of the Kansas River, the subsoil tends to be acidic, and a higher target pH is used to assure adequate pH conditions in the root zone, and provide sufficient amounts of calcium and magnesium. From the Flint Hills west, most soils have high-pH, basic subsoils that can provide additional calcium and magnesium to meet crop needs.

Soils with more clay and organic matter will have more reserve acidity at a given pH, and will require more ECC (effective calcium carbonate) to reach a target soil pH, than will a sandy soil. This is why two soils may have the same soil pH but have quite different buffer pHs, and different lime requirements.

#### **Calculating lime rates**

Lime rates are given in pounds of effective calcium carbonate, ECC, per acre, but how does that relate to agricultural lime and how much lime to apply? Lime materials can vary widely in their neutralizing power. All lime materials sold in Kansas must guarantee their ECC content and dealers are subject to inspection by the Kansas Department of Agriculture.

The two factors that influence neutralizing value are the chemical neutralizing value of the lime material relative to pure calcium carbonate, and the fineness of crushing, or particle size, of the product. These two factors are used in the determination of ECC. The surface area of the particles is critical for neutralizing to occur. Expressing recommendations as pounds of ECC allows fine-tuning of rates for variation in lime sources, and avoids under- or over-applying lime products.

#### **Lime sources**

Research has clearly shown that a pound of ECC from agricultural lime, pelletized lime, water treatment plant sludge, fluid lime, or other sources is equal in neutralizing soil acidity. Therefore

under most circumstances, the cost per pound of ECC applied to your field should be a primary factor in source selection. Other factors such as rate of reaction (fineness), uniformity of spreading, and availability should be considered, but the final pH change, and subsequent alfalfa growth, will depend on the amount of ECC applied.

### **Application methods**

All lime sources have a very limited solubility and when planting alfalfa, best performance is obtained when lime is incorporated and given time to react with and neutralize the acidity in the soil. When surface applied and not incorporated, as in no-till systems, the reaction of lime is generally limited to only neutralizing the acidity and raising the pH in the top 2 to 3 inches of soil. Surface applications are adequate in slightly acidic soils, but may not provide as good a soil environment for nodulation and nitrogen fixation in the extremely acid soils, pH below 5.0, currently found in some soils in Kansas.

In no-till or limited-till systems, where no incorporation of lime is planned, lower rates of lime application are normally recommended to avoid over-liming and raising the pH higher than needed in the surface 2-3 inches of soil. Over-liming can also reduce the availability of micronutrients such as zinc, iron, and manganese, and trigger deficiencies in some soils. Current K-State lime recommendations suggest that “traditional” rates designed for incorporation and mixing with the top 6 inches of soil should be reduced by 50 to 60 percent when surface applied in no-till systems, or when applied to existing grass or alfalfa stands.

### **Calcium and magnesium contents**

What about the calcium and magnesium contents? Most agricultural limes found in Kansas contain both calcium and magnesium, though the relative concentrations of the two essential plant nutrients varies widely. While the advantages and disadvantages of using a dolomitic (magnesium-containing) lime versus a calcitic (low-magnesium, high-calcium) lime have been cussed and discussed for years, the differences are very, very slight in most cases. The exception is on soils deficient in magnesium, in which case a dolomitic lime source is needed. In Kansas, both dolomitic lime and calcitic lime are suitable for use on cropland.

For more information, see K-State publication *Soil Test Interpretations and Fertilizer Recommendations*, MF-2586: <http://www.bookstore.ksre.ksu.edu/pubs/MF2586.pdf>

Dave Mengel, Soil Fertility Specialist  
[dmengel@ksu.edu](mailto:dmengel@ksu.edu)

Dorivar Ruiz Diaz, Nutrient Management Specialist  
[ruizdiaz@ksu.edu](mailto:ruizdiaz@ksu.edu)

#### 4. Plant analysis for testing nutrient levels in soybeans

Soybean acres continue to increase in Kansas. With delayed planting in many areas of the state this year, many fields still look a little rough and variable. One of the questions commonly asked is whether this is due to a nutrient problem. An excellent tool that can be used to answer this question is plant analysis or tissue testing.

As with corn, wheat, and other crops, there are two primary ways plant analysis can be used: as a routine monitoring tool to ensure nutrient levels are adequate in the plant in normal or good looking crops, and as a diagnostic tool to help explain some of the variability and problems we see in soybean growth and appearance in fields.

##### **Plant analysis as a routine monitoring tool**

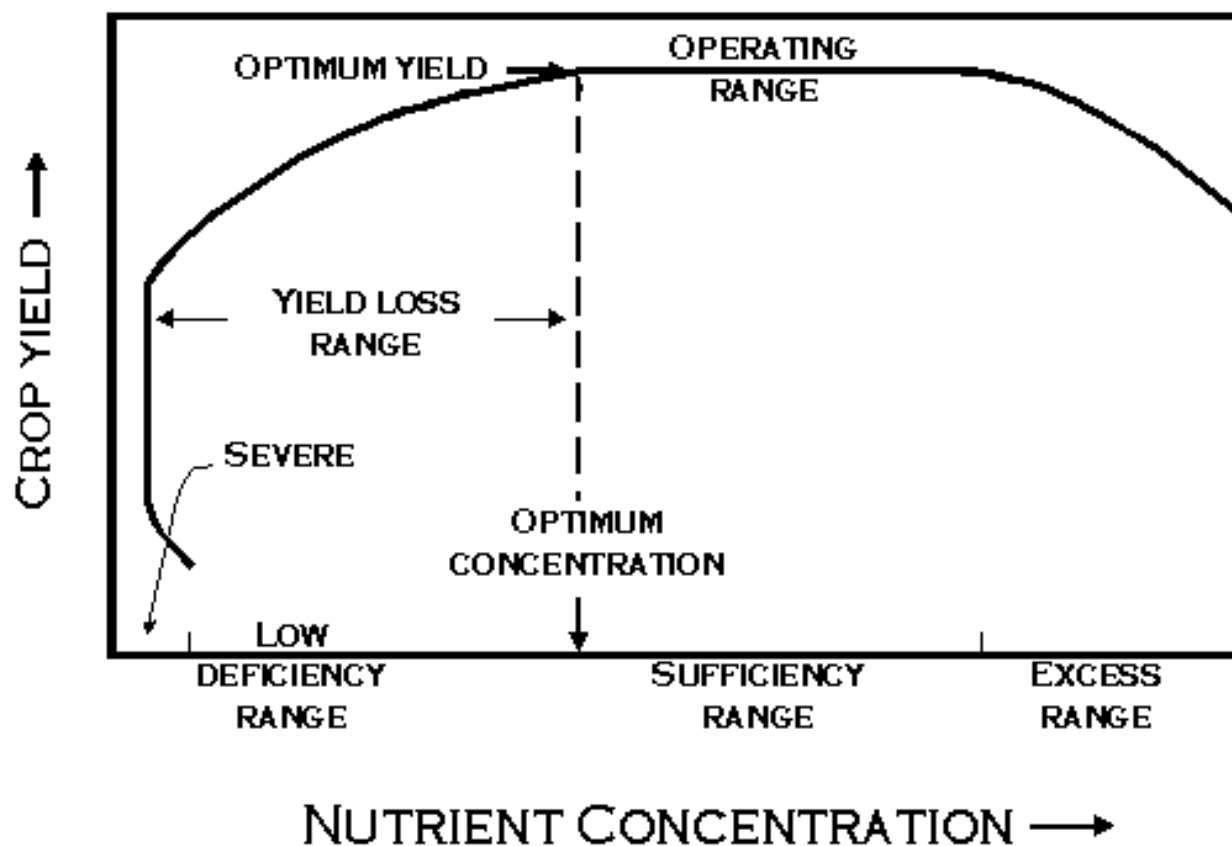
For monitoring nutrient levels purposes, collect 20-30 sets of the upper, fully developed trifoliate leaves, less the petiole, at random from the field anytime between flowering and initial pod set (growth stages R1-4). The top fully developed leaves are generally the dark green leaves visible at the top of the canopy, which are attached at the second or third node down from the top of the stem.

Sampling later, once seed development begins, will give lower nutrient contents since the soybean plant begins to translocate nutrients from the leaves to the developing seed very quickly. Sampling leaf tissue under severe stress conditions for monitoring purposes can also give misleading results and is not recommended.

The sampled leaves should be allowed to wilt overnight to remove excess moisture, placed in a paper bag or mailing envelope, and shipped to a lab for analysis. Producers should not place the leaves in a plastic bag or other tightly sealed container, as they will begin to rot and decompose during transport, and the sample won't be usable.

For what nutrients should you request analysis? In Kansas nitrogen (N), phosphorus (P), potassium (K), sulfur (S), zinc (Zn) and iron (Fe) are the nutrients most likely to be deficient in soybeans. Normally the best values are the "bundles" or "packages" of tests offered through many of the labs. The packages can be as simple as N, P and K, or can consist of all of the 14 mineral elements considered essential to plants. K-State offers a package that includes N, P, K, Ca, Mg, S, Fe, Cu, Zn, and Mn for \$23.75.

The data returned from the lab will be reported as the concentration of nutrient elements, or potentially toxic elements in the plants. Units reported will normally be in terms of "percent" for the primary and secondary nutrients (N, P, K, Ca, Mg, and S) and "ppm," or parts per million, for the micronutrients (Zn, Cu, Fe, Mn, B, Mo, and Al). Most labs/agronomists compare plant nutrient concentrations to published sufficiency ranges. A sufficiency range is simply the range of concentrations normally found in healthy, productive plants during surveys. A diagram explaining this concept is shown in Figure 1.



**Figure 1. Example of plant analysis interpretation using the concept of a sufficiency range.**

The following table gives the range of nutrient content considered to be "normal" or "sufficient" for top fully developed soybean leaves at early pod set. Keep in mind that these are the ranges normally found in healthy, productive soybeans.

Nutrient Content Considered "Normal" or "Sufficient" for Soybeans		
Nutrient	Units	Growth Stage Top, fully developed leaves at pod set
Nitrogen	%	4.25-5.50
Phosphorus	%	0.25-0.5
Potassium	%	1.70-2.50
Calcium	%	0.35-2.00
Magnesium	%	0.26-1.00
Sulfur	%	0.15-0.50
Copper	ppm	10-30
Iron	ppm	50-350
Manganese	ppm	20-100
Zinc	ppm	20-50
Boron	ppm	20-55
Molybdenum	ppm	1.0-5.0
Aluminum	ppm	<200



## **Plant analysis as a diagnostic tool**

Plant analysis is an excellent diagnostic tool to help understand some of the variation seen in the field. When using plant analysis to diagnose field problems, producers should try to take comparison samples from both good/normal areas of the field, and problem areas. Collect soil samples from the same good and bad areas, and don't wait for flowering to sample soybeans. Early in the season, when plants are 8-10 inches tall collect whole plants from 15 to 20 different places in the sampling areas. Later in the season, collect 20-30 sets of top, fully developed leaves. Handle the samples the same as those for monitoring, allowing them to wilt to remove excess moisture and avoiding mailing in plastic bags.

Soil samples are important in diagnostic work, because while a plant may be deficient in a nutrient, it may not be due to a shortage in the soil. Other factors such as soil compaction, insect or disease damage to the roots, low pH limiting nodulation or many other issues can limit nutrient uptake in soybeans.

### **Summary**

In summary, plant analysis is a good tool producers can use to monitor the sufficiency of soil fertility levels and inoculant effectiveness, and a very effective diagnostic tool. Producers should consider adding this to their toolbox.

Dave Mengel, Soil Fertility Specialist  
[dmengel@ksu.edu](mailto:dmengel@ksu.edu)

## 5. Forecasted corn yield potential and attainable yields for 2015

At this point in the season, a large proportion of Kansas corn is at flowering stage. The most recent USDA Kansas Agricultural Statistics Service crop progress report (July 12, 2015) projected 47% of Kansas' corn crop is at the silking stage, less than the percentage from last year at this time but still near the average. Overall, more than 50% of the corn crop in Kansas was classified by Kansas Agricultural Statistics as good or better. Pollination conditions around the state are generally acceptable, but high temperatures can represent a challenge in early-pollinated corn, and could potentially affect final effective grain number per ear. From now until harvest, weather will be one of the primary components driving changes and affecting corn yield potential.

### Potential corn yield estimation

Estimating potential corn yields can help us understand the maximum yield attainable if management is optimal and in absence of unmanageable adversities, such as hail or flooding. A research team based at the University of Nebraska is currently leading a project for forecasting corn yield using historical and current weather and management information in collaboration with faculty and extension educators from 10 universities across the U.S. Corn Belt (<http://cropwatch.unl.edu/hybrid-maize-july-15-forecasts>).

The corn simulation model -- Hybrid-Maize Model (<http://hybridmaize.unl.edu>) -- was developed by researchers in the Agronomy and Horticulture Department at UNL and takes into consideration several factors such as weather, plant population, hybrid relative maturity, planting date, and soil type, among other factors. The model assumes optimal management, with no limitation imposed by nutrients or biotic factors (weeds, insect pests, pathogens) and no adversities such as flooding, hail or abiotic factors (heat, drought). Thus, the model provides maximum yield if conditions are optimal. A yield gap, difference between final attainable yield and maximum yield predicted, will increase if management was sub-optimal or there were other adverse factors not accounted by the model that may reduce corn yield. Simulations can be performed to forecast current-season corn yields. Factors such as site-specific weather conditions from planting until the simulation date and historical weather information to simulate the rest of the 2015 growing season are used for the simulation. Myriad yield scenarios could be produced depending on the growing conditions from the simulation date until harvesting time, but forecasts are more accurate and reliable as the simulation time approaches corn maturity.

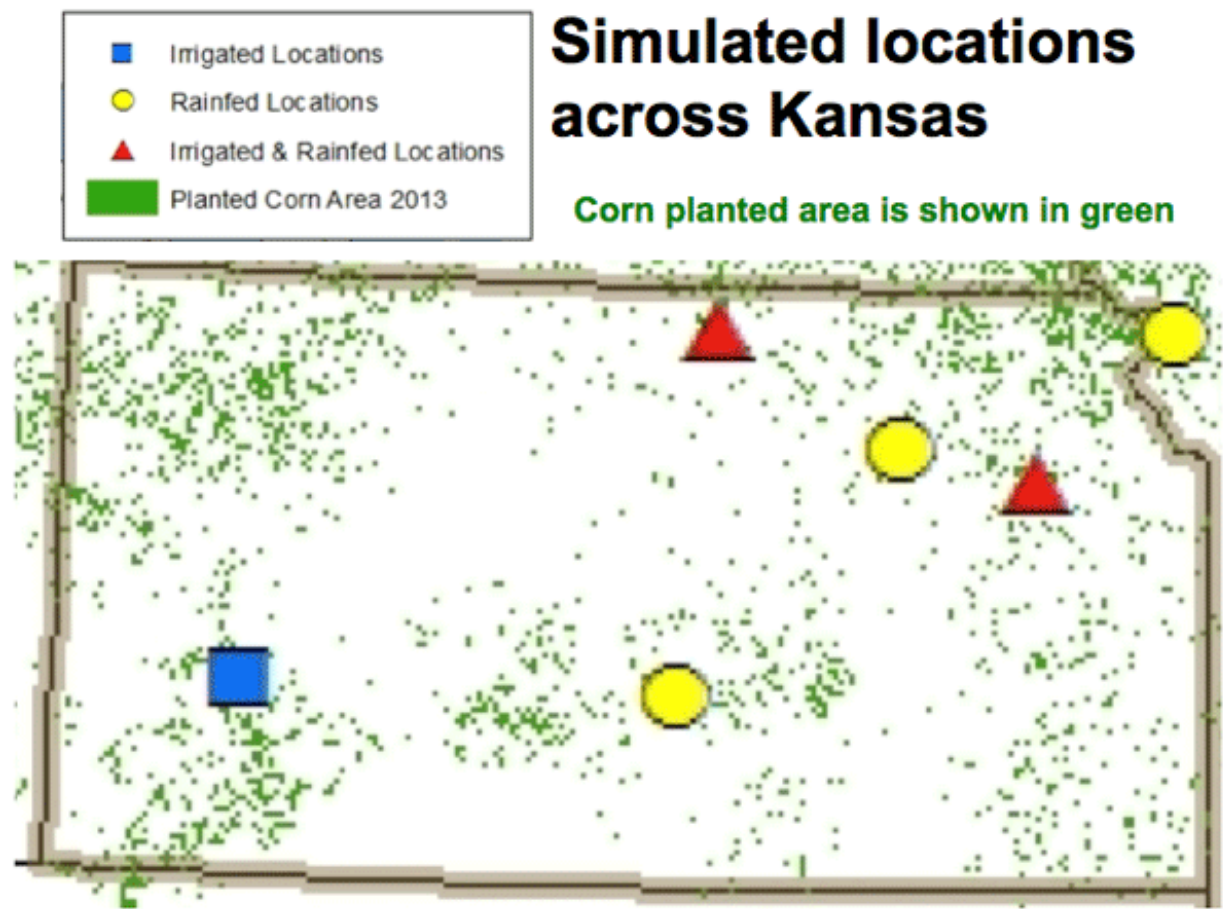
### Simulation results for Kansas

A total of 45 sites were simulated for corn yields across the U.S. Corn Belt, including 5 sites for Kansas -- rainfed, irrigated, or both water scenarios, and 1 site in Missouri (Fig. 1) that is relevant for the northeast Kansas area. Sites include Garden City, Hutchinson, Silver Lake, Manhattan, Scandia, and St. Joseph, Mo. A separate yield forecast was performed for irrigated and dryland corn for Scandia and Silver Lake, while only irrigated corn was simulated at Garden City. The dryland scenarios for corn yield forecast were Manhattan, Hutchinson, and St. Joseph, Mo.

Daily weather data used for simulating these locations were retrieved from the High Plains Regional Climate Center (HPRCC <http://www.hprcc.unl.edu/>). For Kansas, local agronomists provided

information about soil properties and crop management (hybrid maturity, plant populations, and historical and 2015 planting dates) required for the simulations (Table 1). The following agronomists should be properly acknowledged for investing their time and providing their expertise: Eric Adee, Agronomist-in charge, Kansas River Valley Experimental Research Field, Topeka; Gary Cramer, Agronomist-in charge, South Central Kansas Experimental Field, Hutchinson; and John Holman, Southwest Research-Extension Center Cropping Systems Agronomist, Garden City.

The current locations represent just a sample of the corn area in the state. More sites could be added in the coming years to increase the site-specificity of the corn yield forecast analysis.



Location	Water regime	Soil texture	Density (plants/acre)	Relative maturity (days)	2015 planting date <sup>‡</sup>
Manhattan, KS	Dryland	Silty clay loam	25,000	110	April 19
Scandia, KS	Irrigated	**	34,000	116	May 3
	Dryland	Silt loam	24,000	107	May 7
Silverlake, KS	Irrigated	Silt loam	34,000	117	April 15
	Dryland		24,000	109	April 19
Hutchinson, KS	Dryland	Sandy loam	20,000	105	April 26
Garden City, KS	Irrigated	**	26,000	113	May 10
St Joseph, MO	Dryland	Silt loam	30,000	112	May 9

<sup>‡</sup> Data were retrieved by state collaborators. \*\*Not needed for simulation of irrigated crops.

<sup>‡</sup> Approximate date at which 50% of final corn area was planted in 2015 at each location. Soil water balance was initialized around crop harvest in the previous year (2014), assuming 50% available soil water

Forecasted corn yield potential (“Yp” in Table 2) was calculated first as long-term yield potential, based on 25+ years of weather data. The model then calculated 2015-forecasted yield potential, utilizing current-season weather (link to weather conditions across 10 states: [summary](#)). The 2015 in-season yield potential forecasts for Kansas is presented in Table 2.

At almost all sites simulated in Kansas, there is close to 50% probability of achieving near average yields for the current season as relative to the long-term yield potential (Yp).

Under irrigated conditions (Scandia, Silver Lake, and Garden City), there is a greater probability of having above-average yields compared to the long-term yield potential for Scandia (34%) than for Garden City (21%) or Silver Lake (10%). Under rainfed conditions, there is a higher probability of having above-average corn yields in 2015 in the northeast corner of Kansas if planted before first week of May (Table 1). There is a fair probability ( $\geq 30\%$ ) of having above-average yields for the rest of the dryland sites as well (except for Silver Lake; 24% - Table 2). It should be emphasized that forecasted yield for corn regardless of the weather scenario looking promising overall for this growing season.

**Table 2. 2015 In-season Yield Potential Forecasts for Kansas and St. Joseph, Mo. (July 15).**

Location	Water regime	Long-term average Yp (bu/ac) <sup>‡</sup>	Range of Yp forecasts as of July 15 <sup>th</sup> (bu/ac) <sup>‡</sup>		Probability (%) of 2015 yield to be:		
			25 <sup>th</sup>	75 <sup>th</sup>	Below	Near	Above
Manhattan KS	Dryland	146	145	167	3%	67%	30%
Scandia, KS	Irrigated	218	200	243	24%	41%	34%
	Rainfed	146	147	172	7%	45%	48%
Silverlake, KS	Irrigated	204	176	213	41%	48%	10%
	Rainfed	151	135	165	31%	45%	24%
Hutchinson, KS	Rainfed	111	103	126	16%	48%	36%
Garden City, KS	Irrigated	191	182	208	14%	66%	21%
St Joseph, MO	Dryland	165	175	207	7%	27%	67%

## Summary

Stress conditions impacting corn in the coming weeks would likely reduce yields through an impact on grain number (grain abortion). As clarified in the UNL article (see link below), these predictions do

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

not assume any current or past production problems (e.g. saturated soils, replanting, hail/flooding, nitrate leaching and nutrient deficiencies) nor any influence of biotic (e.g. disease, insects) or abiotic (e.g. heat, drought) stress factors.

You can read the full paper related to forecasted yields in 45 locations around the Corn Belt at:  
<http://cropwatch.unl.edu/hybrid-maize-july-15-forecast>

Ignacio Ciampitti, Cropping Systems and Crop Production Specialist  
[ciampitti@ksu.edu](mailto:ciampitti@ksu.edu)

## 6. Canola schools set for August 5, 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 August 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](mailto: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](http://www.sedgwick.ksu.edu)

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

Mike Stamm, Canola Breeder  
[mjstamm@ksu.edu](mailto:mjstamm@ksu.edu)

## 7. Comparative Vegetation Condition Report: June 30 - July 13

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.

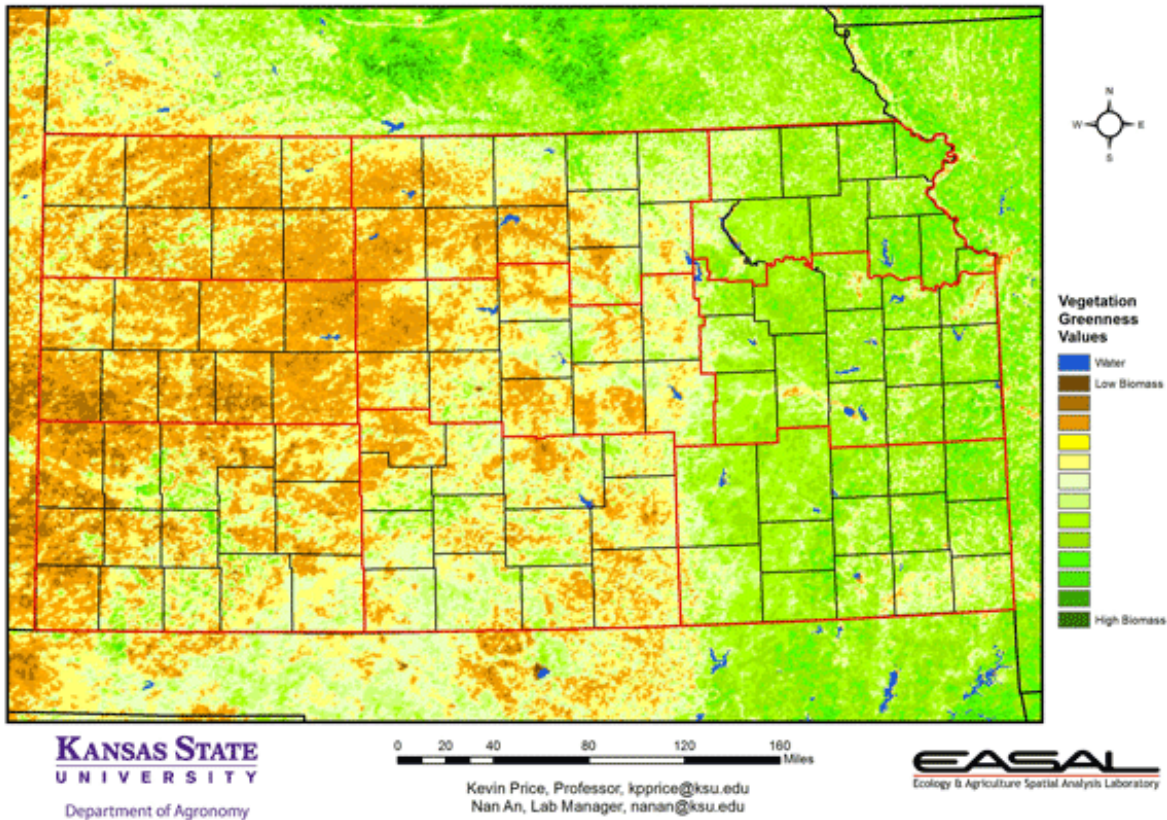
NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you'd like digital copies of the entire map series please contact Nan An at [nanan@ksu.edu](mailto:nanan@ksu.edu) and we can place you on our email list to receive the entire dataset each week as they are 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 28: 06/30/2015 - 07/13/2015



**Figure 1. The Vegetation Condition Report for Kansas for June 30 – July 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that vegetative activity continues to be higher 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 expanded into central and north central Kansas, particularly in Rooks and Ellis counties.**

Kansas State University Department of Agronomy

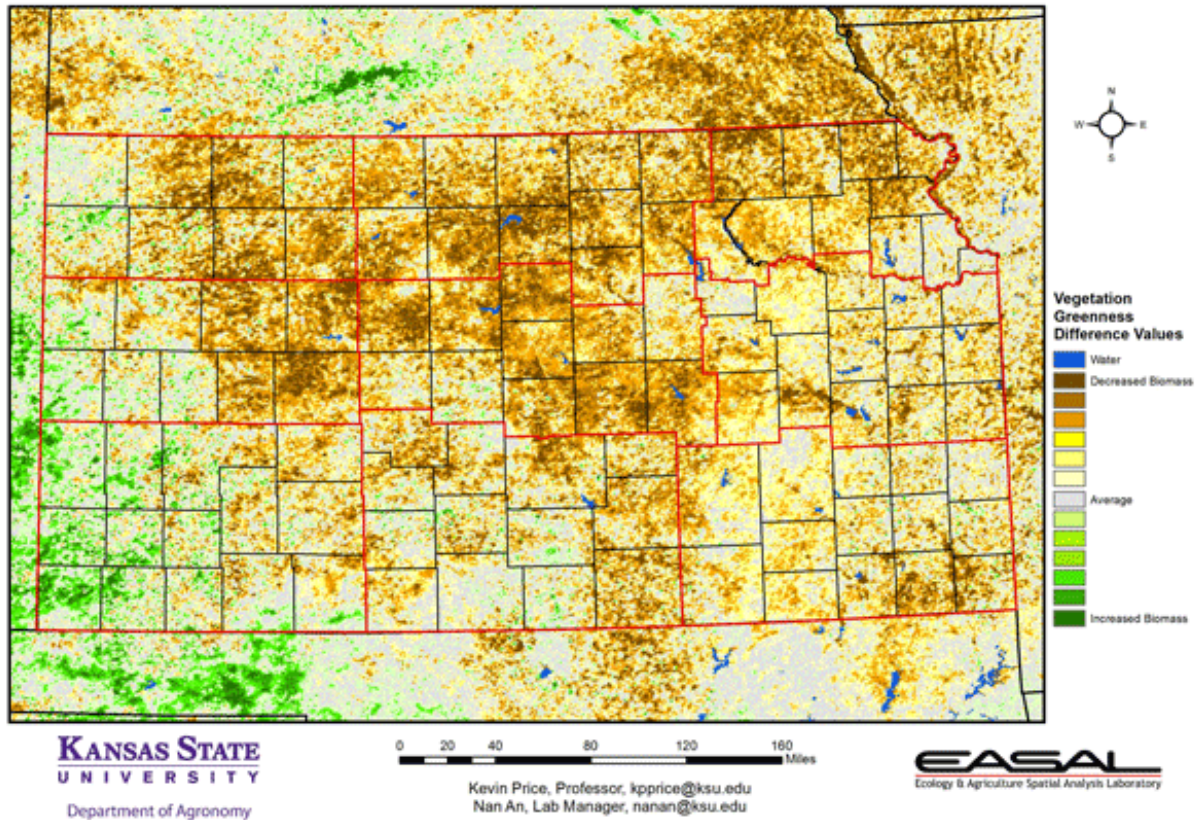
2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)



## Kansas Vegetation Condition Comparison

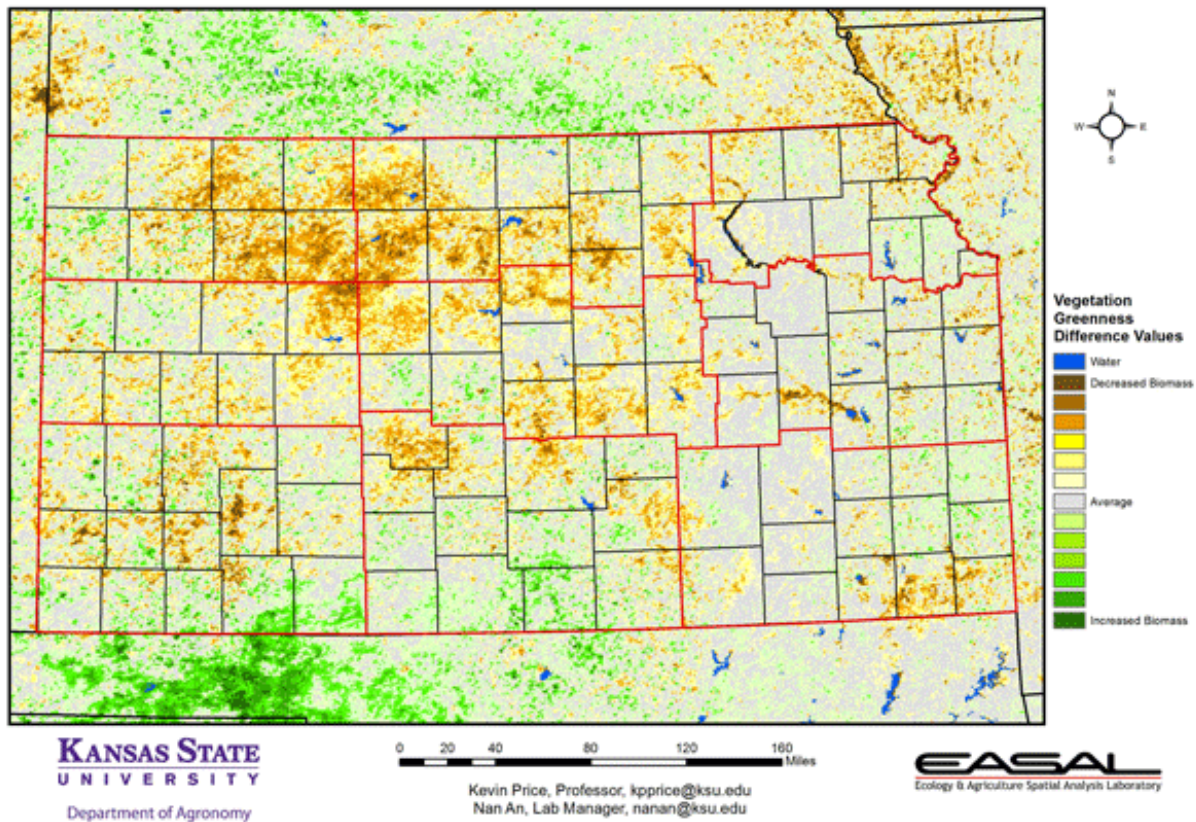
Early-July 2015 compared to the Early-July 2014



**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for June 30 – July 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows biomass production is lower across much of the north central parts of the state. Parts of extreme southwest Kansas have seen above average rainfall in the last two weeks, favoring development. 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 continues to hamper plant development in areas that have switched rapidly from excessive moisture to little precipitation.**

# Kansas Vegetation Condition Comparison

Early-July 2015 compared to the 26-Year Average for Early-July



**Figure 3. Compared to the 26-year average at this time for Kansas, this year's Vegetation Condition Report for June 30 – July 13 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, Trego, Ellis, and Rooks counties, where moderate drought persists. Abnormally dry conditions have expanded in the region. In contrast, the lower NDVI values in the East Central Division are due to continued higher-than-normal precipitation. The divisional average was 137 percent of normal.**



**Vegetation Greenness Difference Values**

- Water
- Decreased Biomass
- Average
- Increased Biomass

0 75 150 300 450 600 Miles

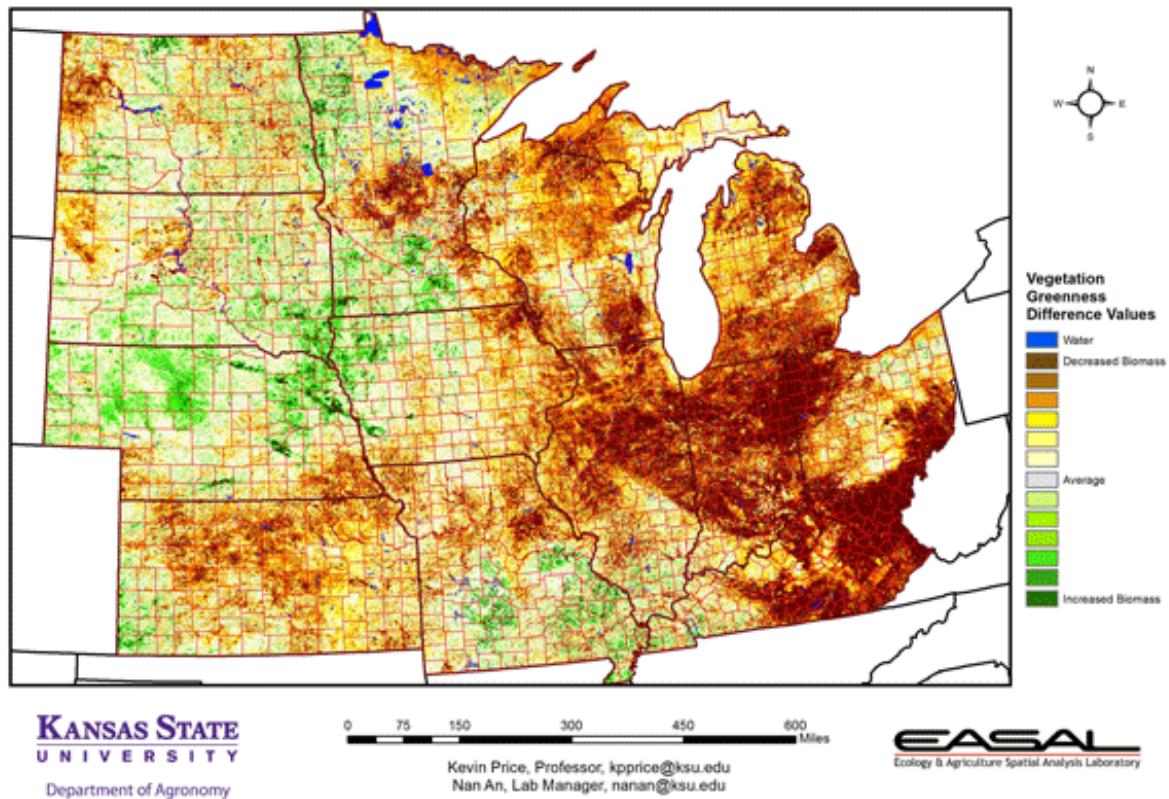
**KANSAS STATE UNIVERSITY**  
Department of Agronomy

Kevin Price, Professor, [kpprice@ksu.edu](mailto:kpprice@ksu.edu)  
Nan An, Lab Manager, [nanan@ksu.edu](mailto:nanan@ksu.edu)

**EASAL**  
Ecology & Agriculture Spatial Analysis Laboratory

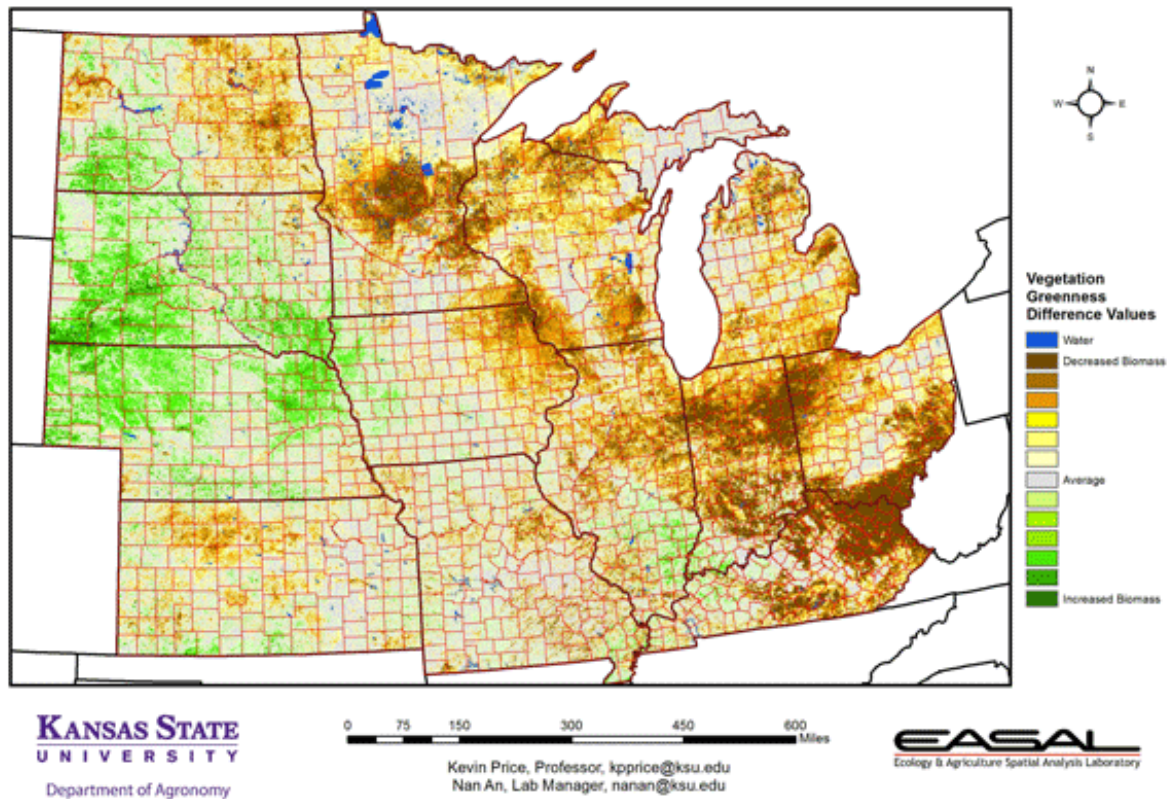
Kansas State University Department of Agronomy  
2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506  
[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

# U.S. Corn Belt Vegetation Condition Comparison Early-July 2015 Compared to Early-July 2014



**Figure 5. The comparison to last year in the Corn Belt for the period June 30 – July 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows a large portion of the eastern portion of the Corn Belt has much lower NDVI values. This means conditions are less optimal than last year. Cool, wet conditions are the major stress factor. Still, for example, in Illinois 79 percent of the pasture and 56 percent of the corn is in good to excellent condition.**

**U.S. Corn Belt Vegetation Condition Comparison**  
 Early-July 2015 Compared to the 26-Year Average for Early-July

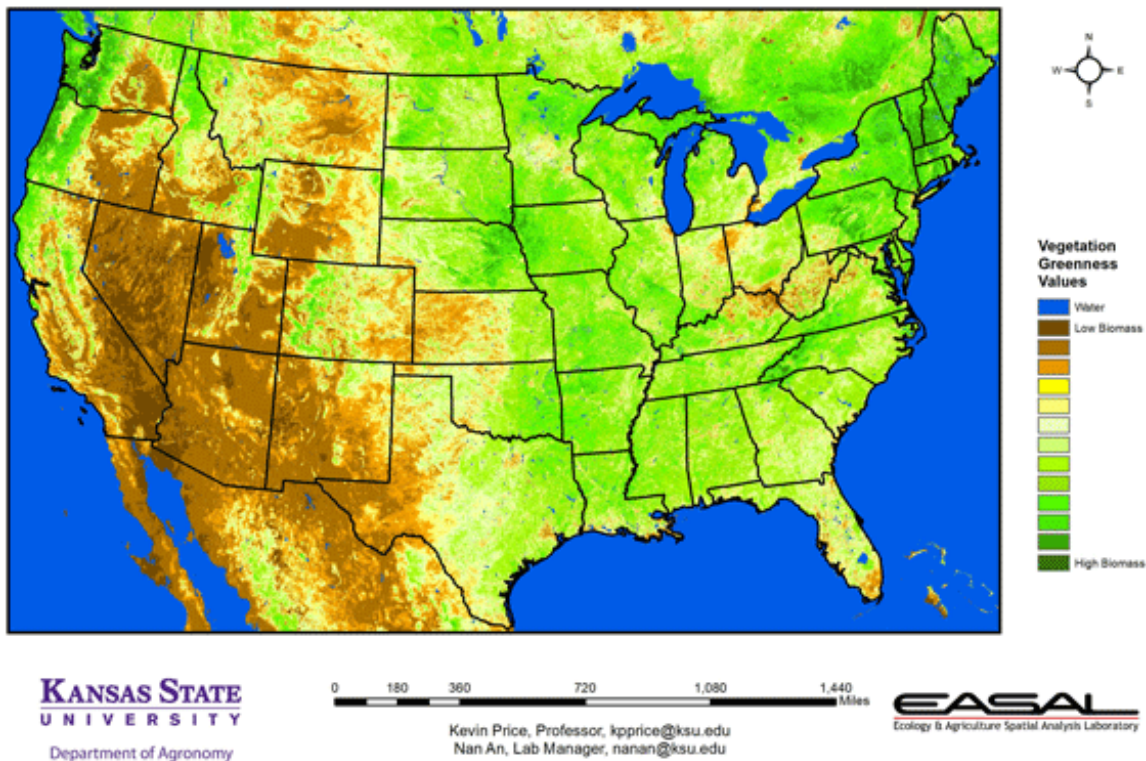


**Figure 6. Compared to the 26-year average at this time for the Corn Belt, this year's Vegetation Condition Report for June 30 – July 13 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows the greatest area of below-average biomass production is centered in central Minnesota, extending southeastward to northern Kentucky. Cool temperature and excess moisture continue to slow plant development in these areas.**



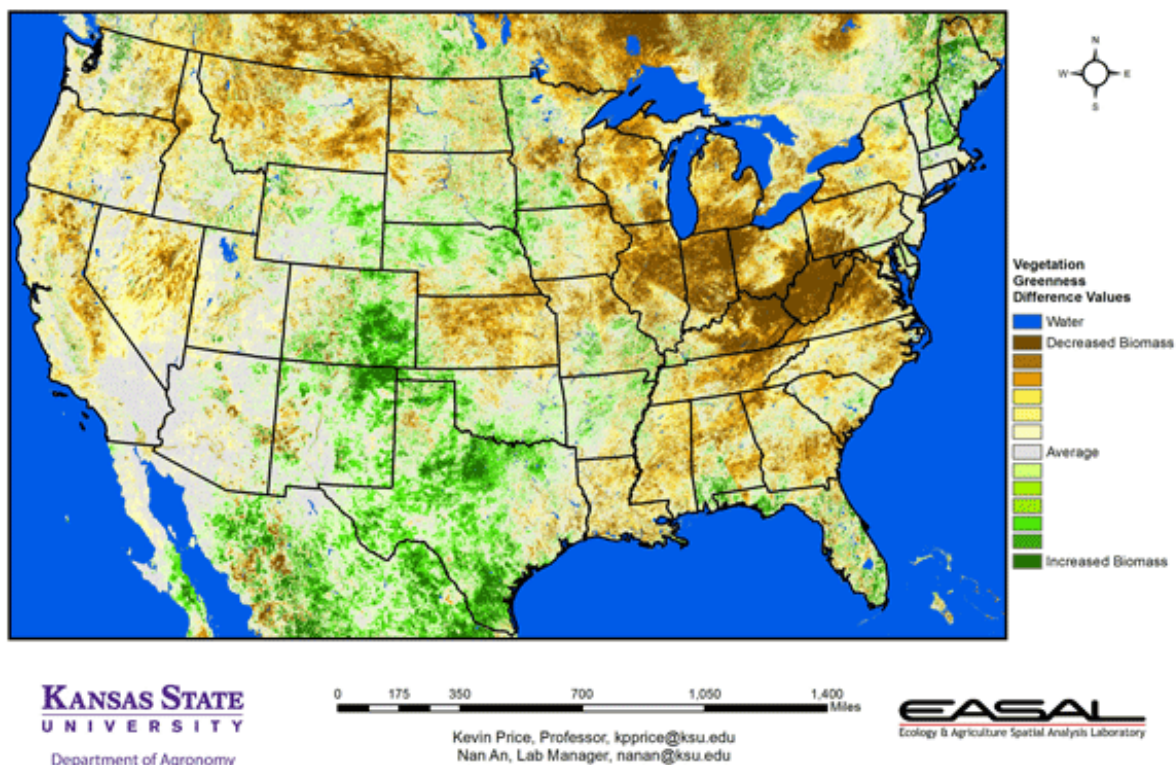
## Continental U.S. Vegetation Condition

Period 28: 06/30/2015 - 07/13/2015



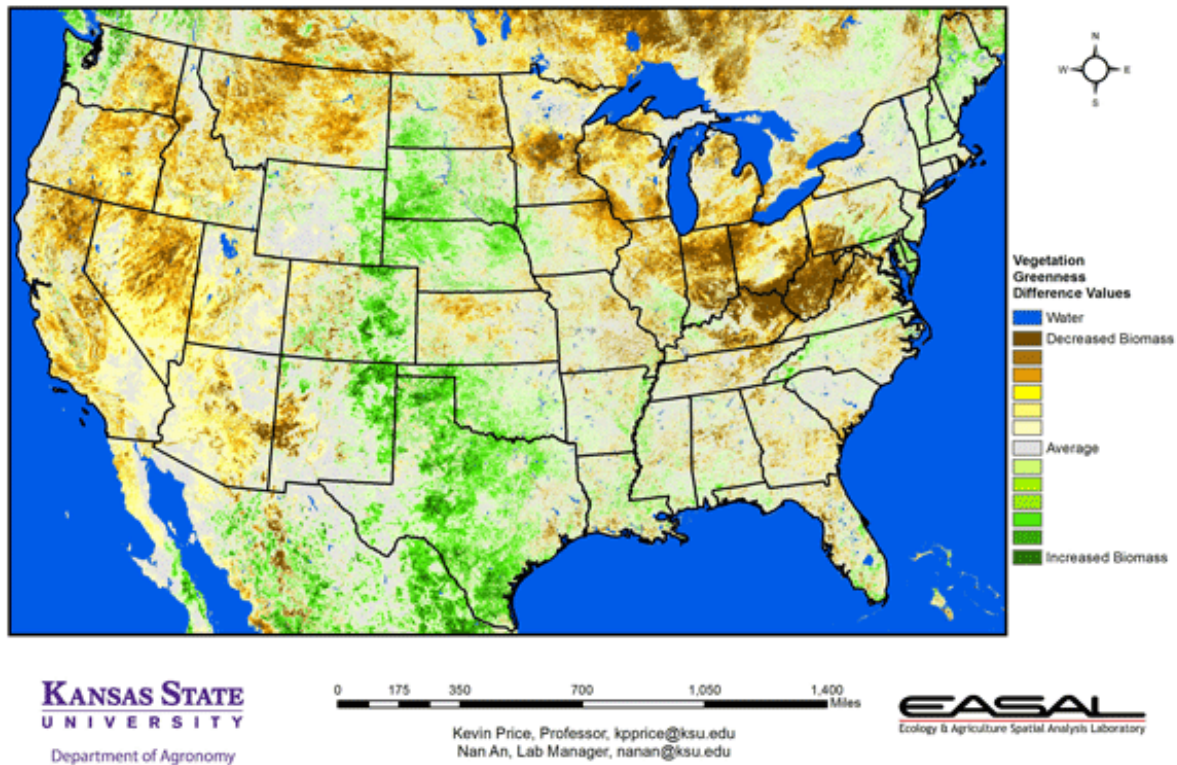
**Figure 7. The Vegetation Condition Report for the U.S. for June 30 – July 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows a high level of photosynthetic activity in the New England area and along the mountains of the Pacific Northwest. Favorable temperatures have enhanced biomass production in these areas. There is also an area of high biomass production in western Colorado. Lower biomass production is notable in the valleys of California, where drought remains intense. Pockets of low biomass production in the Ohio River Valley are due to cooler temperatures and excess moisture.**

# Continental U.S. Vegetation Condition Comparison Early-July 2015 Compared to Early-July 2014



**Figure 8. The U.S. comparison to last year at this time for the period June 30 – July 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows lower photosynthetic activity across much of the eastern U.S. In contrast to 2014, cool, wet weather continues to hamper plant development. Higher biomass production is visible in the central and southern High Plains from southeastern Colorado through west 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  
Early-July 2015 Compared to 26-year Average for Early-July



**Figure 9. The U.S. comparison to the 26-year average for the period June 30 – July 13 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the High Plains forms a dividing line between too little and too much precipitation. In the west, Washington stands out with higher-than-average biomass production, as early season moisture has reduced some of the drought impacts. In the central U.S., favorable moisture covers much of the region from western North Dakota through southern Texas, with higher-than-average biomass production as a result. Cool, wet weather from the Great Lakes through the Ohio River Valley has hampered vegetative production in these areas.**

Mary Knapp, Weather Data Library  
[mknapp@ksu.edu](mailto:mknapp@ksu.edu)

Kevin Price, Professor Emeritus, Agronomy and Geography, Remote Sensing, GIS



[kpprice@ksu.edu](mailto:kpprice@ksu.edu)

Nan An, Graduate Research Assistant, Ecology & Agriculture Spatial Analysis Laboratory (EASAL)  
[nanan@ksu.edu](mailto:nanan@ksu.edu)