



K-STATE
Research and Extension

Extension Agronomy

eUpdate

09/19/2014

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.

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1. Low temperatures: Impact on summer row crops

Based on preliminary readings, the lowest temperatures recorded in parts of Kansas this month could have an impact on grain fill and test weight of summer row crops -- especially sorghum and soybean. It is less likely to affect much of the corn crop since corn is close to 50% mature.

In the last 17 days, low temperatures have been below 35°F in several counties around the state. The county with the lowest temperature was Osborne, with 29 degrees F. In addition, Ellis, Trego, Ness, and Decatur counties had low temperatures around 30-31 degrees F (Figure 1).

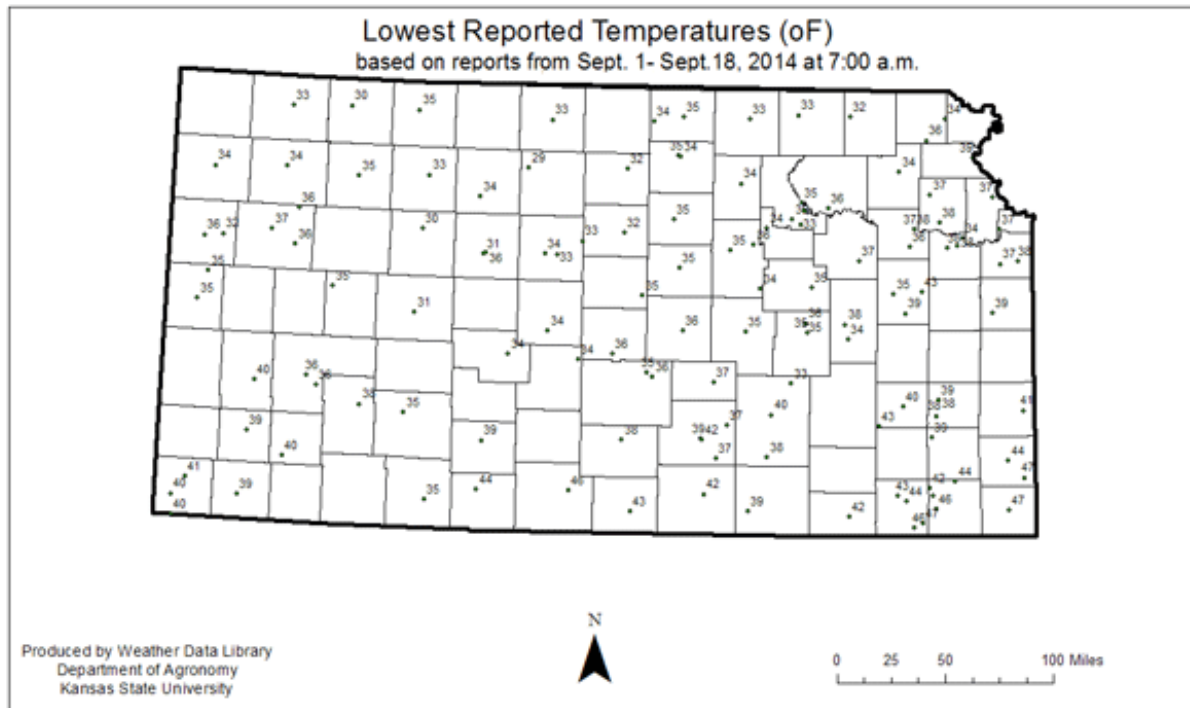


Figure 1. Lowest temperature recorded for specific weather stations from September 1 to 18, 2014.

The coldest low temperatures in Kansas during this time period were in the northwest and north central regions. The central region had temperatures as low as 33 to 37 degrees; while the coldest low temperatures in southern Kansas generally were generally above 40 degrees (Figure 2). The lowest mean temperatures for the last 17 days were located in the northwestern and north central counties (Figure 3).

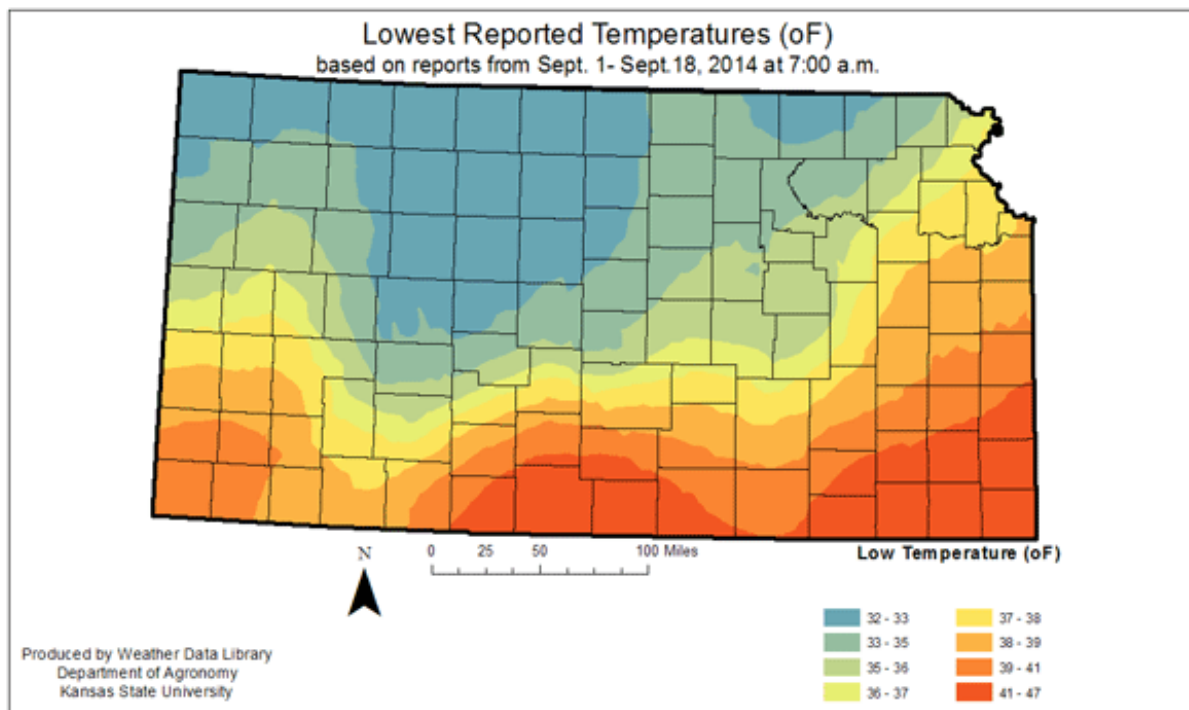


Figure 2. Generalized map of the lowest temperature recorded from September 1 to 18, 2014.

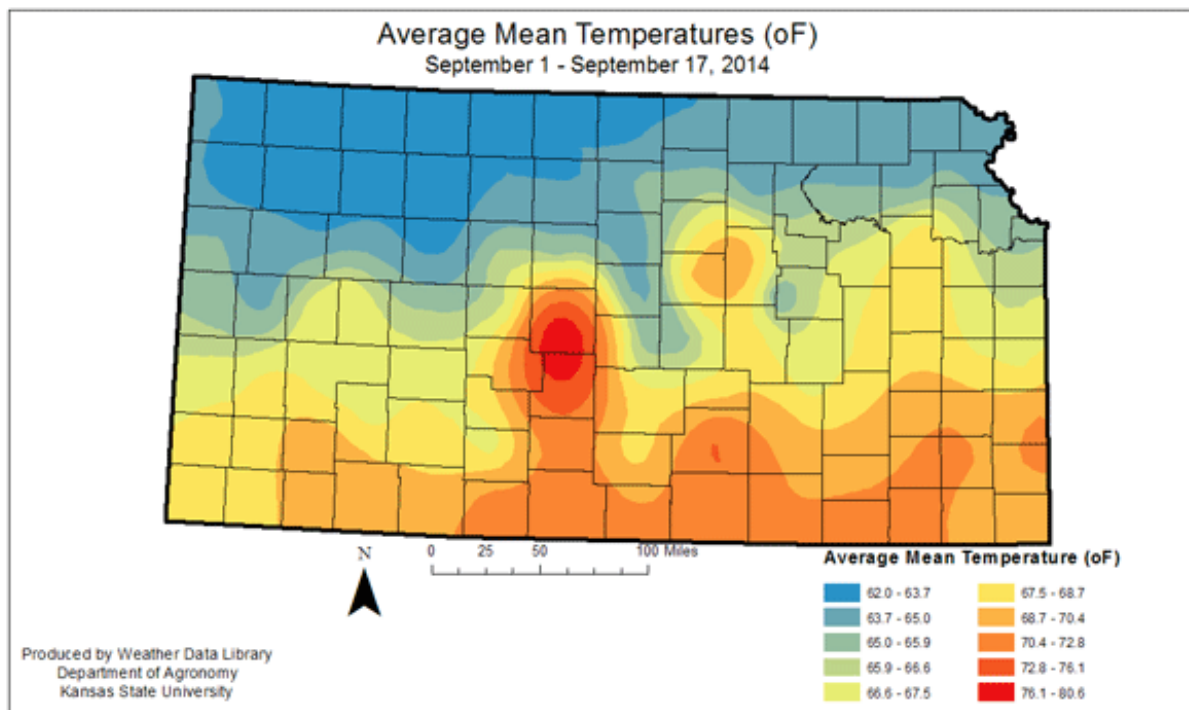


Figure 3. Generalized map of the average mean temperature from September 1 to 17, 2014.

The temperatures experienced in the last 17 days depart from the 30-year average for the entire state, except for Pawnee, Barton, Stafford, and Pratt counties (Figure 4). For the north central area, the departure was close to 7 degrees below the 30-year average, affecting primarily the counties of Smith, Phillips, Mitchell, Graham, Rooks, Osborne, and Trego.

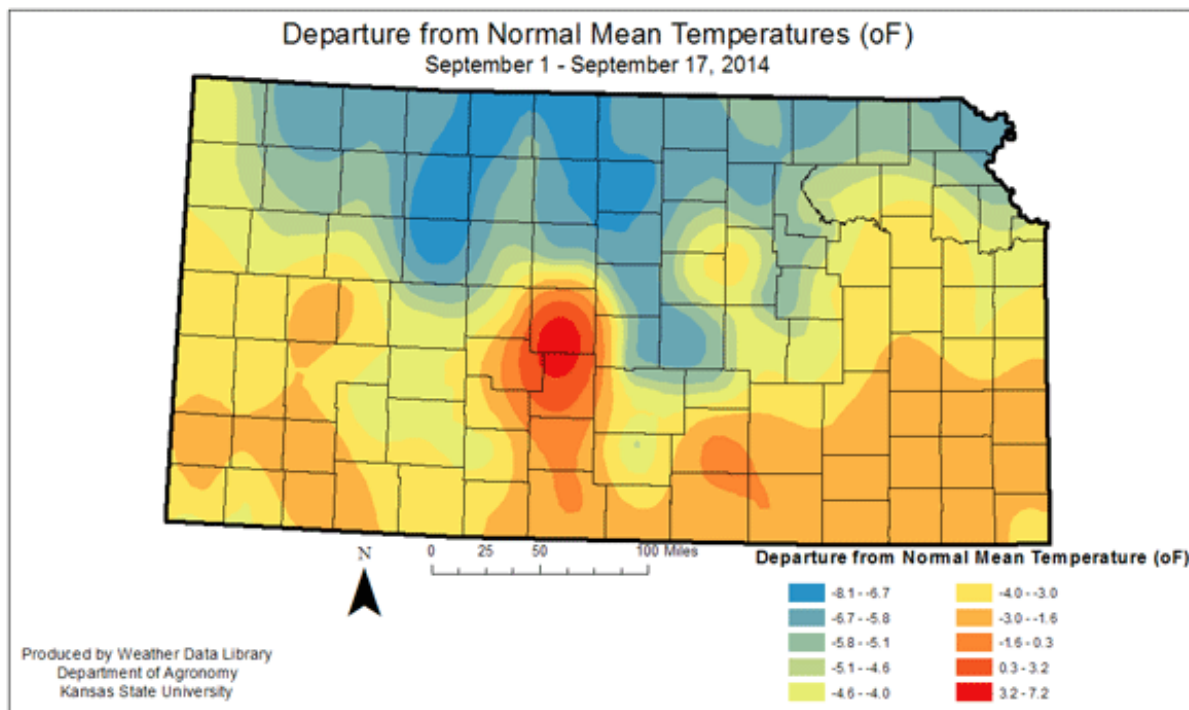


Figure 4. Departure from 30-year normal mean temperatures (1981-2010).

Effect on crops:

A) Corn:

In most of the state corn is beyond the dent stage (50% mature). Corn is affected when temperatures are below or at 32 F. The colder it is below 32 degrees, the less exposure time it takes to damage the corn. At the dent stage, information from Wisconsin shows that a light frost (affecting leaves) will produce a 5% yield reduction; while a killing frost (affecting leaf and stalk) will reduce yields in 12%. Corn is not affected at all by freeze once it reaches the black layer stage.

Clear skies, low humidity, and calm wind conditions can increase freeze damage even with temperatures higher than 32 F. Any freeze damage at this point of the season may not produce any visible symptoms, but can impact the final test weight and potentially seed quality -- depending on the growth stage.

B) Soybean:

Soybean is now in the final reproductive stages (dropping leaves) in Kansas. Temperatures below 32

F can interrupt seed fill and impact yield through lower test weight and seed quality. Necrosis of the leaf canopy is a visible symptom of freeze damage in soybeans (Figure 5). With soybean, absolute temperature is more important than the duration of the cold stress. The most severe injury occurs with temperatures less than 28 F. As the crop approaches maturity, the impact of a freeze event on soybean yields declines.



Figure 5. Effect of late-freeze on soybean near Stockton (Rooks County). Photo by Lucas Haag, K-State Research and Extension.

C) Sorghum:

More than half of the sorghum in Kansas has turned color (14% mature). Low temperatures will reduce seed growth and affect final test weight and seed quality, making the harvest process more difficult. A freeze will kill sorghum if the stalks are frozen, impairing the flow of nutrients to the grain. A freeze at the hard-dough stage (before grain matures) will result in lower weight and chaffy seeds (Figure 6).



Figure 6. Effect of late-freeze on sorghum (Osborne County). In the top part of the canopy, the leaves are all senesced. In the lower photo, the bottom part of the canopy still has green leaves. Photos by Lucas Haag, K-State Research and Extension.

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2. Late-season management decisions for alfalfa

In northern and western areas of Kansas, some fields of alfalfa may have already had a freeze. After a killing freeze, the remaining forage (if any) can be hayed safely. However, the producer should act quickly because the leaves will soon drop off.

On fields that have not yet been hit by a freeze, it's time now to start planning to make the last cutting of alfalfa for the year. Producers may be tempted to wait a few more weeks before making the last cutting in the fall, especially if the crop is still growing. But that's not a good idea. The timing of the last cutting can have a long-lasting impact on the productivity of the stand.

At this stage of the growing season, alfalfa plants need to store enough carbohydrates to survive the winter. If root reserves are not replenished adequately before the first killing freeze (24 to 26 degrees) in the fall, the stand is more susceptible to winter damage than it would be normally. That could result in slower greenup and early growth next spring.

The last cutting, prior to fall dormancy, should be made so there are 8 to 12 inches of foliage, or 4 to 6 weeks of growth time, before the average killing freeze date. This should allow adequate time for replenishment of root reserves.

For northern areas of the state, particularly northwest, late September should be the target date for the last cutting before dormancy. The last week of September should be the cutoff date for southwest Kansas. The first week of October is the cutoff for southeast Kansas.

Making one last cutting in mid-October, if significant growth has occurred, could reduce root reserves during a critical time. About the worst thing that could happen to an alfalfa stand that is cut in mid-October would be for the plants to regrow about 3 to 6 inches and then get a killing frost. In that scenario, the root carbohydrate reserves would be at a low point. That could hamper greenup next spring.

Late fall is also a great time of the year to soil sample alfalfa ground. This timing allows for an accurate assessment of available soil nutrients and provides enough time to make nutrient management decisions before the crop starts growing in the spring. Soil tests of most interest include pH, phosphorus, and potassium, and to a lesser extent sulfur and boron. When sampling for immobile nutrients, sampling depth should be six inches, while mobile nutrients (sulfur) should be sampled to 24 inches.

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3. Pre-harvest glyphosate treatment on sorghum in a no-till system

There are always questions about effective ways to manage grain sorghum to improve the performance of winter wheat planted into no-till sorghum residue following fall harvest. The technique most often asked about is applying glyphosate to the sorghum crop prior to harvest.

Most glyphosate labels require that applications be made to the sorghum crop when grain moisture is at 30% or less to minimize any possible yield reductions. Also, there is a seven-day period between time of application and harvest.

From 2011 to 2013 we established six field trials to test the effect of pre-harvest glyphosate treatments on sorghum. In 2011 to 2012, field trials were conducted at Belleville, Manhattan, and Ottawa. In 2012 to 2013 field trials were located in Belleville, Manhattan, and Hutchinson.

Sorghum response to pre-harvest glyphosate treatments to sorghum

Table 1 summarizes the effect of the pre-harvest treatments on grain sorghum. Hutchinson data is not included in the table because environmental conditions in 2012 prevented grain sorghum harvest. There were no treatment-by-environment interactions so the data below is averaged across the five field trials over the two-year period.

Table 1. Effect of pre-harvest glyphosate applications on grain sorghum (averaged across 5 locations, 2011 and 2012)		
	Glyphosate	No glyphosate
Yield (bu/acre)	98	99
Grain moisture (%)	12.1	12.3
Test weight (lbs/bu)	60.4	60.2
Seed size (300 seeds, grams)*	5.81	5.90
* 2011 only		

Glyphosate was applied to the sorghum crop when grain moisture was approximately 18-21%. The grain was harvested 7-10 days following the application. Average yield reduction to the sorghum crop when sprayed with glyphosate was about 1 bushel or roughly 1% less than untreated.

Wheat response to pre-harvest glyphosate treatments to sorghum

Wheat yield responses varied across field trials over both years, so the data in Table 2 includes wheat yields within each field trial over both years of the experiment.

Table 2. Mean winter wheat yields	
	Location and year

	Belleville (2011-12)	Belleville (2012-2013)	Manhattan (2011-2012)	Manhattan (2012-2013)	Ottawa (2011-2012)	Hutchinson (2012-2013)
Sorghum	Yield (bu/acre)					
pre-harvest treatment						
Glyphosate	40	39	45	51	54	34
No glyphosate	38	38	36	49	51	35

Averaged over all three locations in 2011-2012, when glyphosate was applied to the sorghum pre-harvest, wheat yielded 12-13% more on average than wheat following untreated sorghum. This is equivalent to an average increase of about 5-6 bushels/acre. Averaged over all three locations in 2012-2013, wheat yields following grain sorghum treated with pre-harvest glyphosate were increased by only 1% or less than a bushel.

Overall, when glyphosate was applied to the sorghum pre-harvest, wheat yielded 6-7% more on average than wheat following untreated sorghum. That is equivalent to an average increase of about 3 bushels for the wheat crop.

In 2011, applications of glyphosate, on average, were applied 22 days earlier than glyphosate treatments in 2012. The first freeze date was also 12 days later in 2011 than in 2012. As a result, the pre-harvest applications of glyphosate were applied, on average, 38 days prior to the first freeze in 2011 and only 6 days prior to the first freeze in 2012.

Summary

Applications of glyphosate to grain sorghum prior to fall harvest can help improve the performance of the following wheat crop if applied early enough in the late summer/early fall. Wheat yields following glyphosate-treated grain sorghum, on average, were 6% greater in 2011-2012 compared to 2012-2013 when glyphosate treatments were made at least 38 days prior to the first freeze date. When pre-harvest glyphosate is applied to the grain sorghum crop later than that, response of wheat yields following treated sorghum may be minimal.

It is important to follow the glyphosate label for application recommendations. Glyphosate applied at low rates or when temperatures are not adequate may reduce the effectiveness of the product.

The sorghum field should also be inspected for stalk issues prior to applying the glyphosate. If stalk rots are present, applying glyphosate may increase the chance of plant lodging if it is not harvested in a timely manner.

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4. Bur ragweed control with early fall treatments

With improved moisture conditions in much of Kansas this year, this is a good time to treat fields for perennial broadleaf weeds such as bur ragweed, bindweed, and Canada thistle.

Bur ragweed (also called woollyleaf bursage) is a perennial broadleaf weed, and is classified as a noxious weed in Kansas. It is a significant problem on nearly 93,000 acres in the western half of the state. It is adapted to low areas where water runoff collects in cultivated fields or in noncropland areas. Its ability to extract and store water and its deep perennial root system, which can reach a depth of 15 feet, allow bur ragweed to survive extended periods of drought or harsh weather. These circumstances make it very difficult to control.



Figure 1. Bur ragweed. Photo from Woollyleaf Bursage Biology and Control, K-State publication MF-2239.

2011 summary 92673 acres equal to 2008
County internal color = 2011 acres, two colors = acre change.

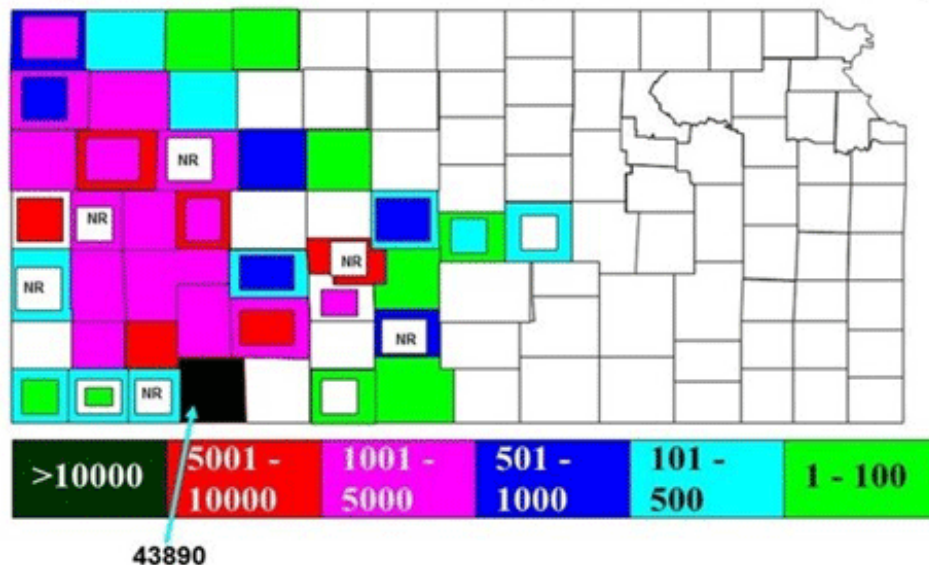


Figure 2. Distribution of bur ragweed in Kansas.

Bur ragweed is extremely competitive with crops, and can reduce grain yield by 100 percent in dry years. Even with irrigation, losses of 40 to 75 percent are common. Bur ragweed is more competitive with summer crops than with winter wheat because bur ragweed growth is minimal during much of the winter wheat life cycle. However, in dry years, bur ragweed will deplete soil moisture for fall-planted wheat and thereby reduce grain yield significantly.

Flower development begins in late July or early August. Seed contributes to the spread of bur ragweed and likely is a source of new infestations. New plants also arise from the vegetative buds, which develop on the root stocks, thus contributing to the spread of bur ragweed. Tillage also can redistribute vegetative buds, aiding the spread of bur ragweed.

Bur ragweed control is best when treated in late summer or fall, prior to a killing frost with Tordon tank mixed with dicamba or 2,4-D ester. Complete control of bur ragweed with a single treatment is unlikely. Control will not be as effective if the bur ragweed plants are under stress at the time of treatment. Bur ragweed is a difficult weed to control, and a single treatment application will usually not be sufficient. A fall treatment with the herbicides mentioned above followed by glyphosate treatments in glyphosate-tolerant crops during the growing season can help manage bur ragweed long-term. However, spring crops may be injured severely from fall applications of Tordon. Wheat has the most tolerance and can be planted 45 days following a ½ pint of Tordon 22K application. Apply each herbicide or herbicide mixture according to directions, warnings, and precautions on the product label(s).

Control of Bur Ragweed in Western Kansas with mid-September Treatments		
Treatment	Rate (lbs/acre)	% Control 11 months after treatment (2-year average)
Tordon + Banvel	0.25 + 0.5	82
Tordon + 2,4-D LVE	0.25 + 1	74
Roundup + Banvel	1.5 + 0.5	16
Roundup + 2,4-D LVE	1.5 + 1	27

Source: Woollyleaf Bursage Biology and Control, MF-2239

For more information, see *2014 Chemical Weed Control for Field Crops, Rangeland, Pastures, and Noncropland*, K-State publication SRP-1099, <http://www.ksre.ksu.edu/bookstore/pubs/srp1099.pdf> or *Woollyleaf Bursage Biology and Control*, K-State publication MF-22239, at: <http://www.ksre.ksu.edu/bookstore/pubs/MF2239.pdf>

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5. Fall control of bindweed

Field bindweed is a deep-rooted perennial weed that severely reduces crop yields and land value. This noxious weed infests just under 2 million acres, and is found in every county in Kansas. Bindweed is notoriously hard to control, especially with a single herbicide application. The fall, prior to a killing freeze, can be an excellent time to treat field bindweed -- especially when good fall moisture has been received. This perennial weed is moving carbohydrate deep into its root system during this period, which can assist the movement of herbicide into the root system.



Figure 1. Field bindweed ready for a fall treatment. Photos by Curtis Thompson, K-State Research and Extension.

The most effective control program includes preventive measures over several years in conjunction with persistent and timely herbicide applications. The use of narrow row spacings and vigorous, competitive crops such as winter wheat or forage sorghum may aid control.

Dicamba, Tordon, 2,4-D ester, and glyphosate products alone or in various combinations are registered for suppression or control of field bindweed in fallow and/or in certain crops, pastures, and rangeland. Apply each herbicide or herbicide mixture according to directions, warnings, and

precautions on the product label(s). Single herbicide applications rarely eliminate established bindweed stands.

Applications of 2,4-D ester and glyphosate products are most effective when spring-applied to vigorously growing field bindweed in mid to full bloom. However, dicamba and Tordon applications are most effective when applied in the fall. Most herbicide treatments are least effective when applied in mid-summer or when bindweed plants are stressed.

Facet L, at 22 to 32 fl oz/acre, a new quinclorac product which now replaces Paramount and QuinStar quinclorac products, can be applied to bindweed in fallow prior to planting winter wheat or grain sorghum with no waiting restrictions. All other crops have a 10-month preplant interval. Quinclorac products can be used on a sorghum crop to control field bindweed during the growing season. In past K-State tests, fall applications of Paramount have been very effective as shown in two of the tables below.

Additional noncropland treatments for bindweed control include Krenite S, Plateau, and Journey.

Considerable research has been done on herbicide products and timing for bindweed control. Although the research is not recent, the products used for bindweed control and the timing options for those products haven't changed much since this work was done. As a result, the research results in the charts below remain very useful today.

Fall vs. Spring and Summer Herbicide Application for Control of Field Bindweed in the Texas Panhandle: 1976-1982				
Season of application				
Treatment	Rate (lbs ai/acre)	Spring (April or May)	Summer (June, July, or Aug.)	Fall (Sept. or Oct.)
% Control one year after treatment				
Roundup	2.9	83	77	60
Banvel	1.0	56	41	71
2,4-D ester	1.0	65	49	55
Tordon + 2,4-D ester	0.25 + 0.5	55	56	84
Tordon + Banvel	0.25 + 0.25	47	73	87
Tordon + Roundup	0.20 + 1.6	52	73	79
% Control two years after treatment				
Roundup	2.9	67	63	32
Banvel	1.0	31	37	34
2,4-D ester	1.0	46	42	10

Source: Field Bindweed Control in Field Crops and Fallow, MF-913

<http://www.ksre.ksu.edu/bookstore/pubs/MF913.pdf>

September-Applied Treatments for Control of Field Bindweed:**Randall Currie and Curtis Thompson, Southwest Research-Extension Center 1992-1993**

Treatment	Rate	Average % Control in Spring
Banvel	4 oz	31
Banvel	8 oz	44
Banvel	1 pt	85
2,4-D	1 pt	48
Banvel + 2,4-D	8 oz + 8 oz	82
Paramount	5.3 oz	91
Paramount + Banvel	5.3 oz + 4 oz	98
Paramount + Banvel	5.3 oz + 8 oz	97

Source: 1995 Field Day Southwest Research-Extension Center, Report of Progress 739

www.ksre.ksu.edu/historicpublications/pubs/SRP739.PDF

September-Applied Treatments for Control of Field Bindweed:**Randall Currie, Southwest Research-Extension Center 1992-1997**

Treatment	Rate	Average % Control in Spring
Banvel	4 oz	19
Banvel	8 oz	65
Banvel	1 pt	89
2,4-D	1 pt	72
2,4-D	1 qt	81
Glyphosate	1 qt (IPA)	68
Paramount	5.3 oz	90
Tordon	8 oz	75
Tordon	1 pt	98

Source: 1999 Field Day Southwest Research-Extension Center, Report of Progress 837

www.ksre.ksu.edu/historicpublications/pubs/srp837.pdf

For more information on controlling bindweed, see 2014 Chemical Weed Control for Field Crops, Rangeland, Pastures, and Noncropland, K-State publication SRP-1081,

<http://www.ksre.ksu.edu/bookstore/pubs/srp1099.pdf>

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6. K-State Research and Extension to Host Field Day at Columbus September 26

K-State Research and Extension will host a field day at Columbus on September 26. The event will start at the Cherokee County 4-H building located at 114 W. Country Rd. in Columbus. Registration will begin at 8 a.m., with the program beginning at 8:30. Coffee and donuts will be furnished by the Columbus Chamber of Commerce.

Several topics will be discussed during the morning presentations by K-State faculty:

- Crop Production in Southeast Kansas - Gretchen Sassenrath, Southeast Agricultural Research Center Crop Production Agronomist
- Cover Crops and Soil Health - DeAnn Presley, Soil and Water Conservation Specialist
- Corn and Soybean Disease Update - Doug Jardine, Plant Pathology Specialist
- Annual Forage Crops for Grazing - Jaymelynn Farney, Southeast Area Beef Systems Specialist
- Grain Sorghum Management in Southeast Kansas - Doug Shoup, Southeast Area Crops and Soils Specialist

Lunch will be provided after the presentations, sponsored by Ag Choice of Weir, Bartlett Coop, Beachner Grain, DeLange Seed, Farmers Coop of Baxter Springs and Columbus Kansas, Faulkner Grain, Kansas Alliance for Wetlands and Streams, McCune Coop, Modern Ag, and DuPont Pioneer. Booths will be available to visit with the sponsors.

Following lunch, the program will move to the Southeast Agricultural Research Center Columbus experiment field located 2 miles west of the intersection of Hwy 160 and K-7 then 2.5 miles north.

Demonstrations at the experiment field will include:

- Changes in Soil Health with Management Practices - DeAnn Presley
- Cover Crops in Crop Rotations - Gretchen Sassenrath
- Grazing Preferences of Cattle - Dale Helwig, Cherokee County Research and Extension Agent
- Cattle Rumen Microbiology - Jaymelynn Farney

For more information, contact Dale Helwig, Cherokee County Research and Extension, at 620-429-3849 or dhelwig@ksu.edu.

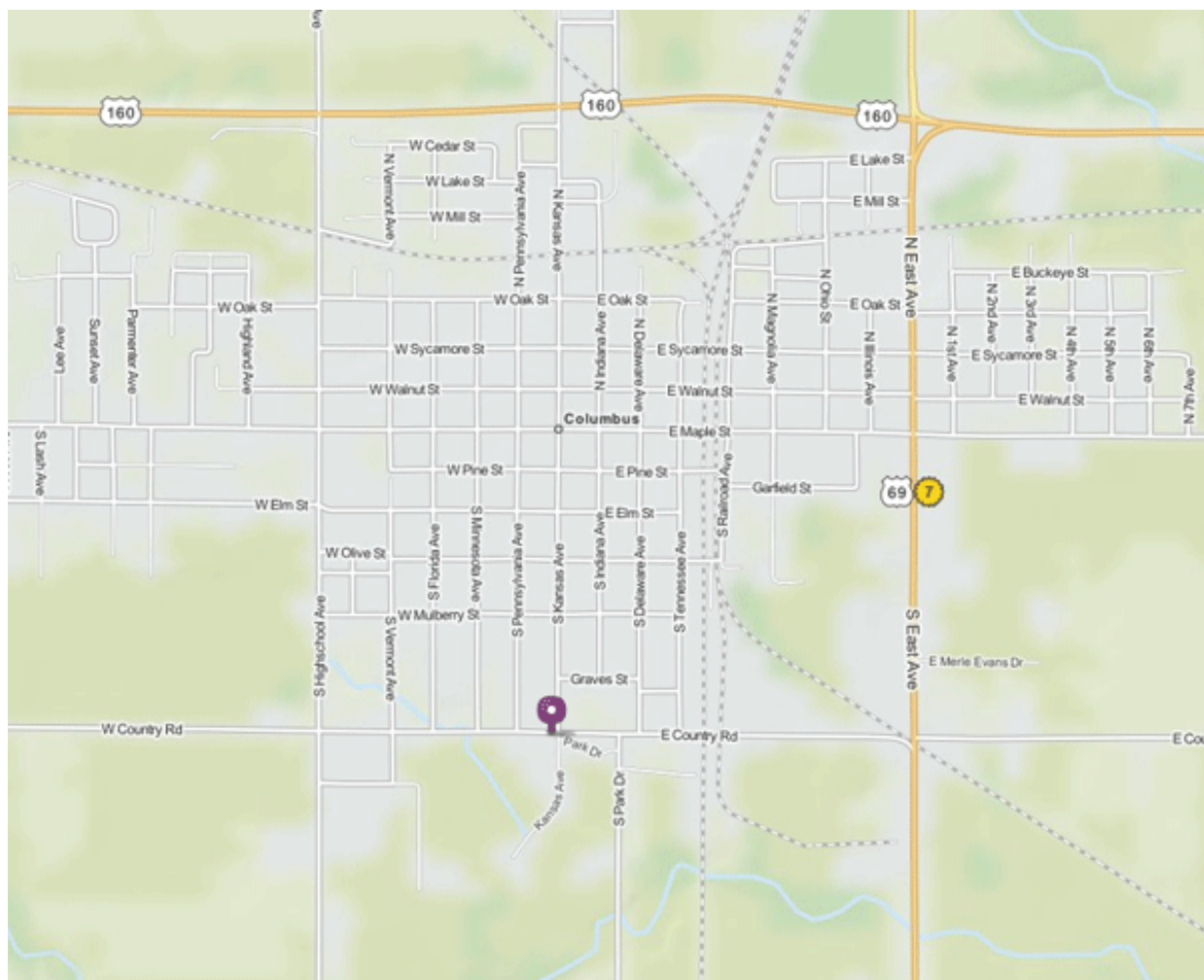


Figure 1. Map to Cherokee County 4-H building

7. Comparative Vegetation Condition Report: September 2 - 15

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 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 37: 09/02/2014 - 09/15/2014

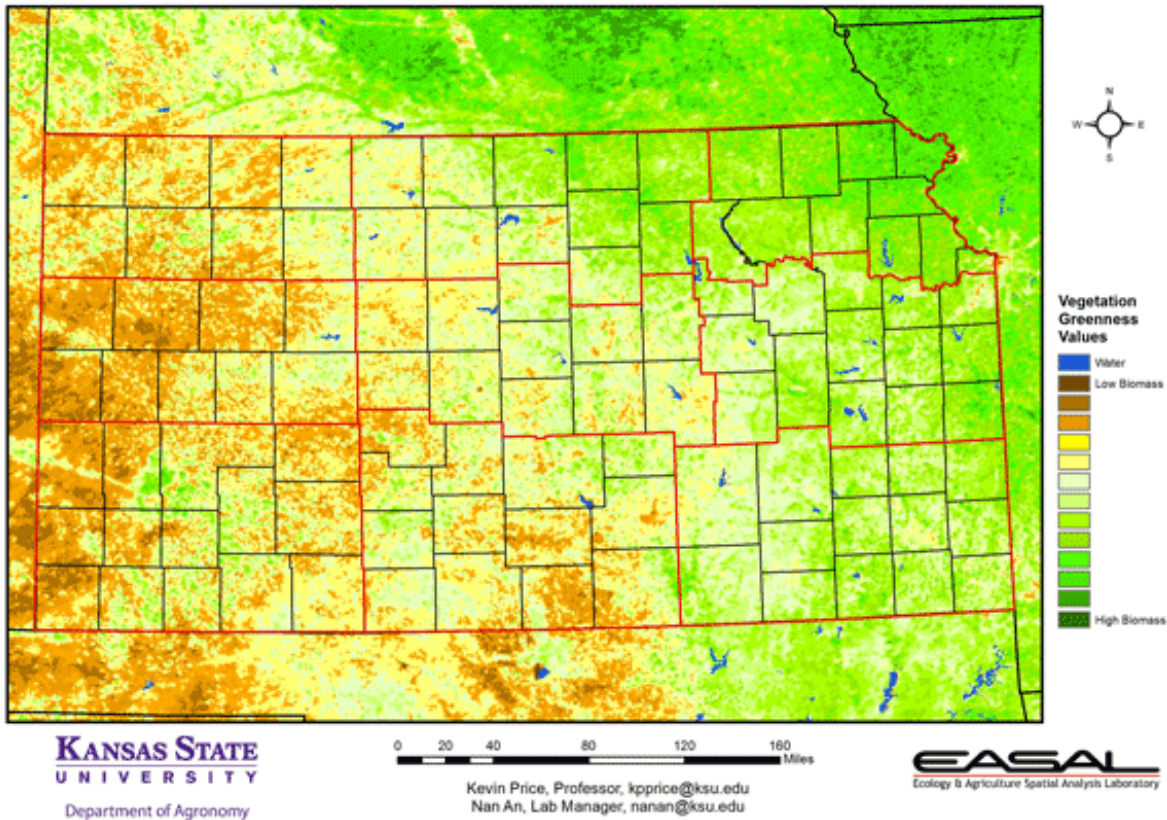


Figure 1. The Vegetation Condition Report for Kansas for September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the greatest biomass productivity continues to be in eastern Kansas. However, increased photosynthetic activity can be seen in southwest Kansas, particularly in Kearny and western Finney counties.

Kansas Vegetation Condition Comparison
Early-September 2014 compared to the Early-September 2013

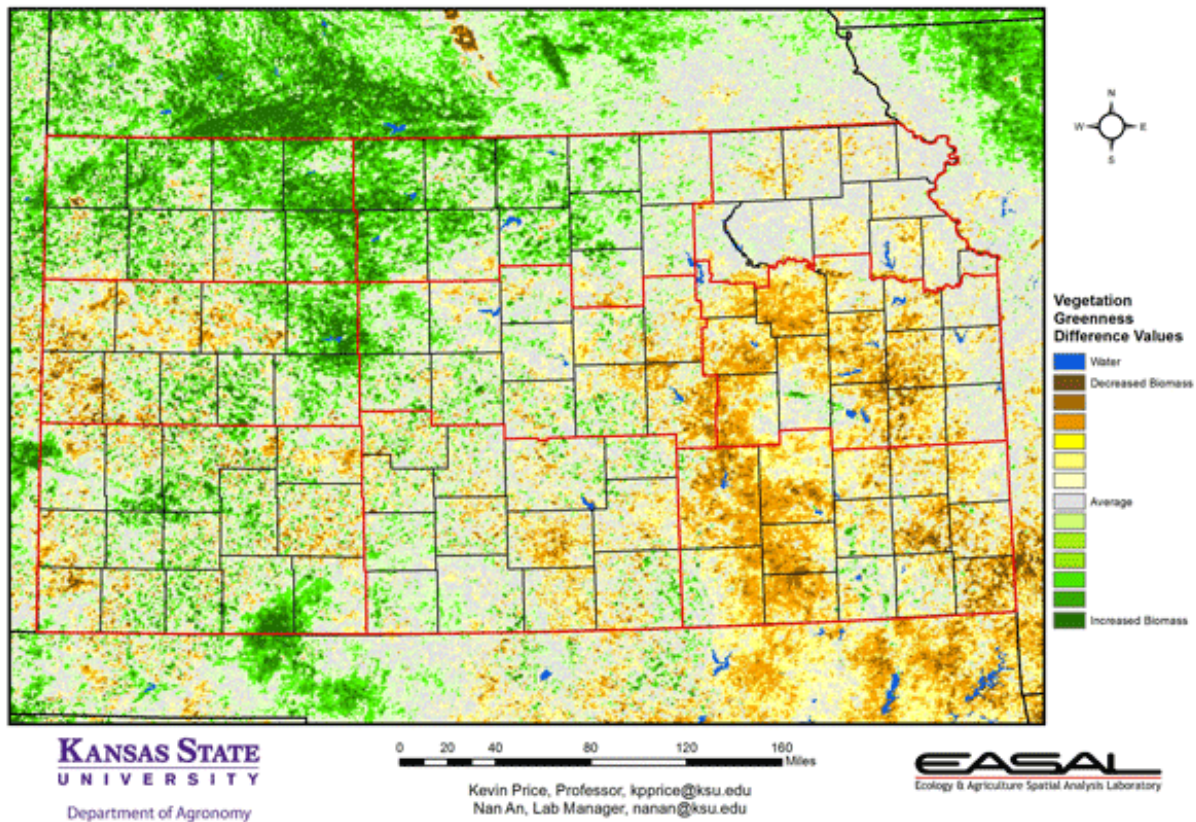


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the eastern third of the state has much lower NDVI values while the Northwest and North Central Divisions have much higher NDVI values. Last year, the Northwest and North Central Divisions were 10 to 20% lower on percent of normal moisture. Also, temperatures last year were averaging 5 to 6 degrees F warmer than normal while this year temperatures in these divisions are averaging 4 to 5 degrees cooler than normal.

Kansas Vegetation Condition Comparison

Early-September 2014 compared to the 25-Year Average for Early-September

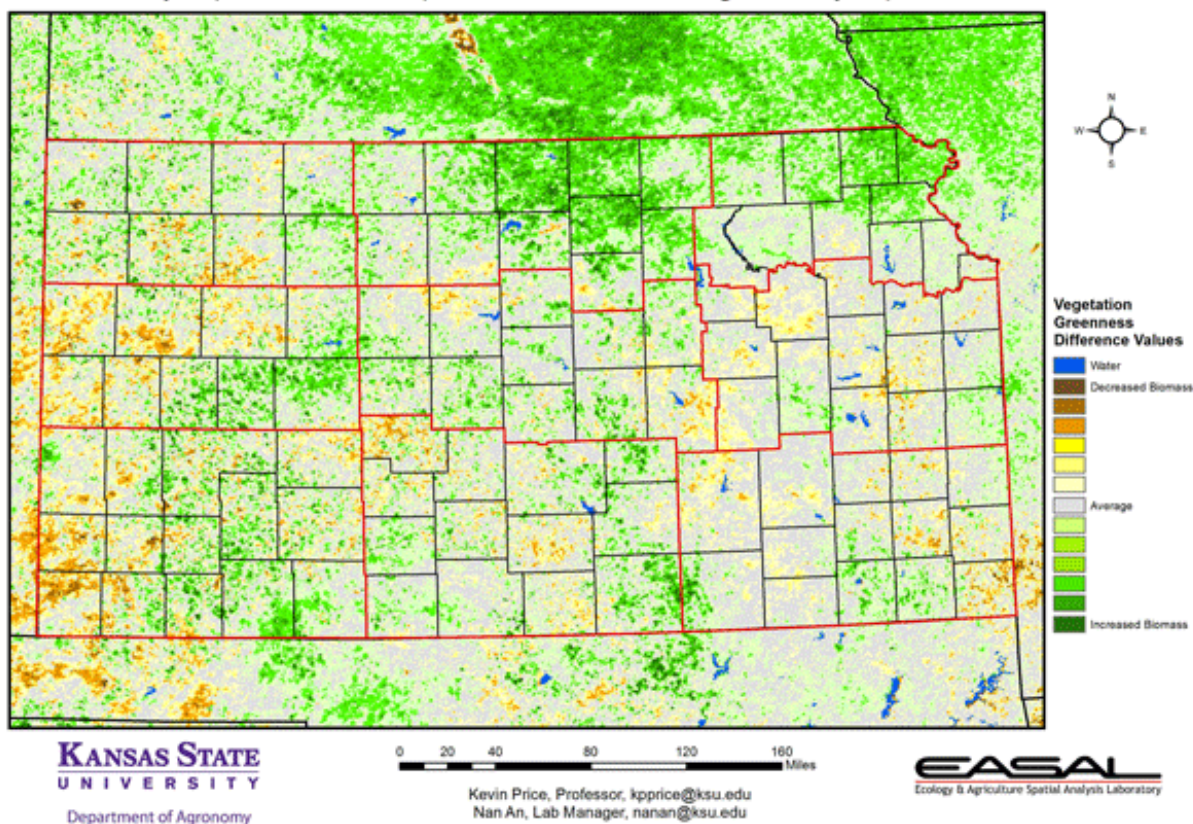


Figure 3. Compared to the 25-year average at this time for Kansas, this year's Vegetation Condition Report for September 2 – 15 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows most of the state with close-to-average biomass production. The Northwestern Division does have a large area with higher-than-average photosynthetic activity, particularly in Jewell, Republic, and Cloud counties. This active vegetation may be more susceptible to damage from the cold temperatures during the period of Sept. 12-17.

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U.S. Corn Belt Vegetation Condition

Period 37: 09/02/2014 - 09/15/2014

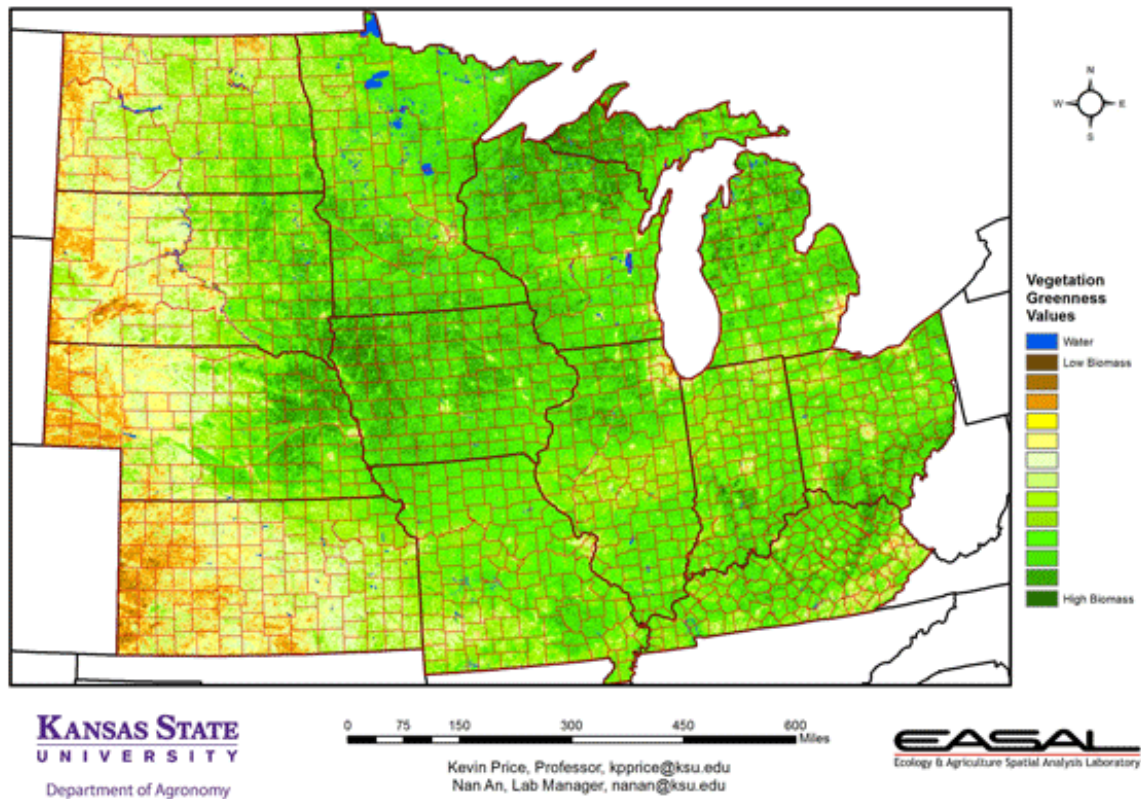


Figure 4. The Vegetation Condition Report for the Corn Belt for September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that high photosynthetic activity continues from the Missouri River Basin through Iowa to northern Wisconsin and the Upper Peninsula of Michigan. NDVI values continue to decrease on the western edges of the region.

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

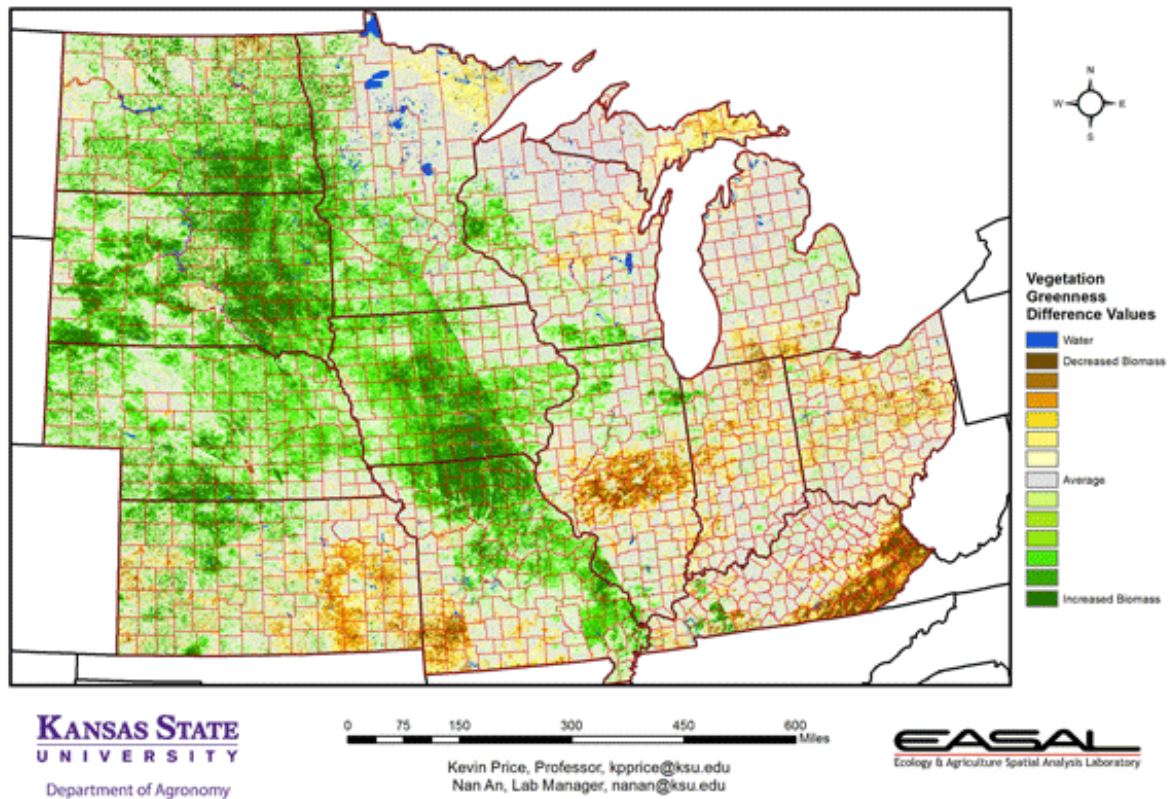


Figure 5. The comparison to last year in the Corn Belt for the period September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that, despite the noticeable splice line, higher biomass production is concentrated in the western parts of the region. In North Dakota, only 65 percent of the spring wheat has been harvested, compared to an average of 88 percent harvested by this time.

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

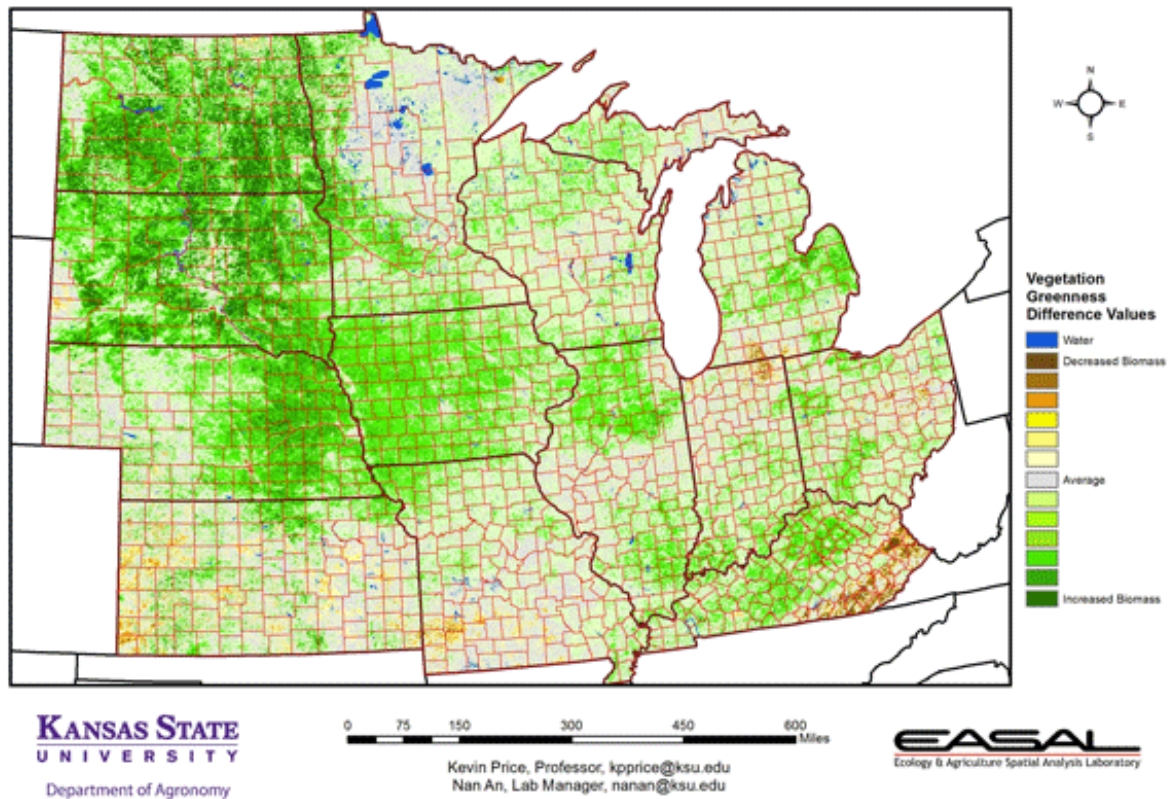


Figure 6. Compared to the 25-year average at this time for the Corn Belt, this year's Vegetation Condition Report for September 2 – 15 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the Dakotas, eastern Nebraska, and Iowa continue to have above-average photosynthetic activity. Cooler- and wetter-than-average conditions continue to slow plant development, but allow for good crop conditions.

Continental U.S. Vegetation Condition

Period 37: 09/02/2014 - 09/15/2014

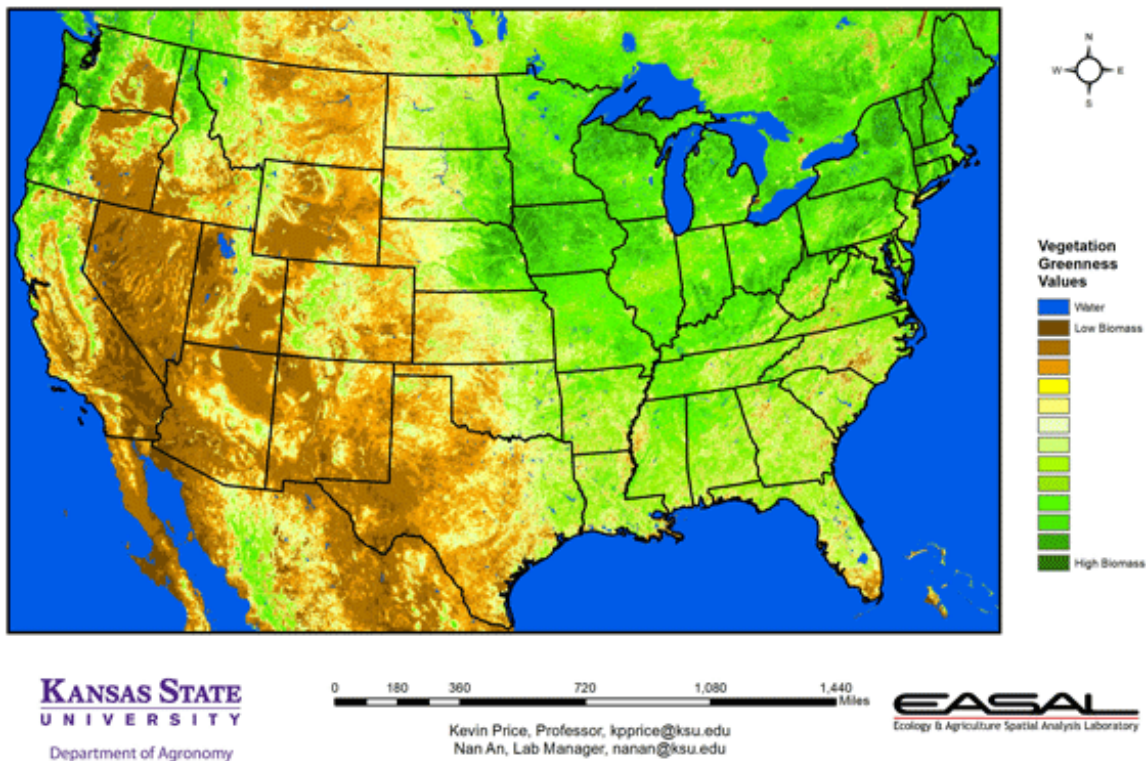


Figure 7. The Vegetation Condition Report for the U.S. for September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that New England as well as the Great Lakes regions continue to have high photosynthetic activity. Parts of the Mountain West also continue to show moderate levels of biomass production. A brief snow event in Montana, Wyoming, and the Dakotas on September 12th and 13th quickly dissipated. The annual snow mask on these maps won’t be implemented until after the 1st of October, unless a more persistent snow event occurs.

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

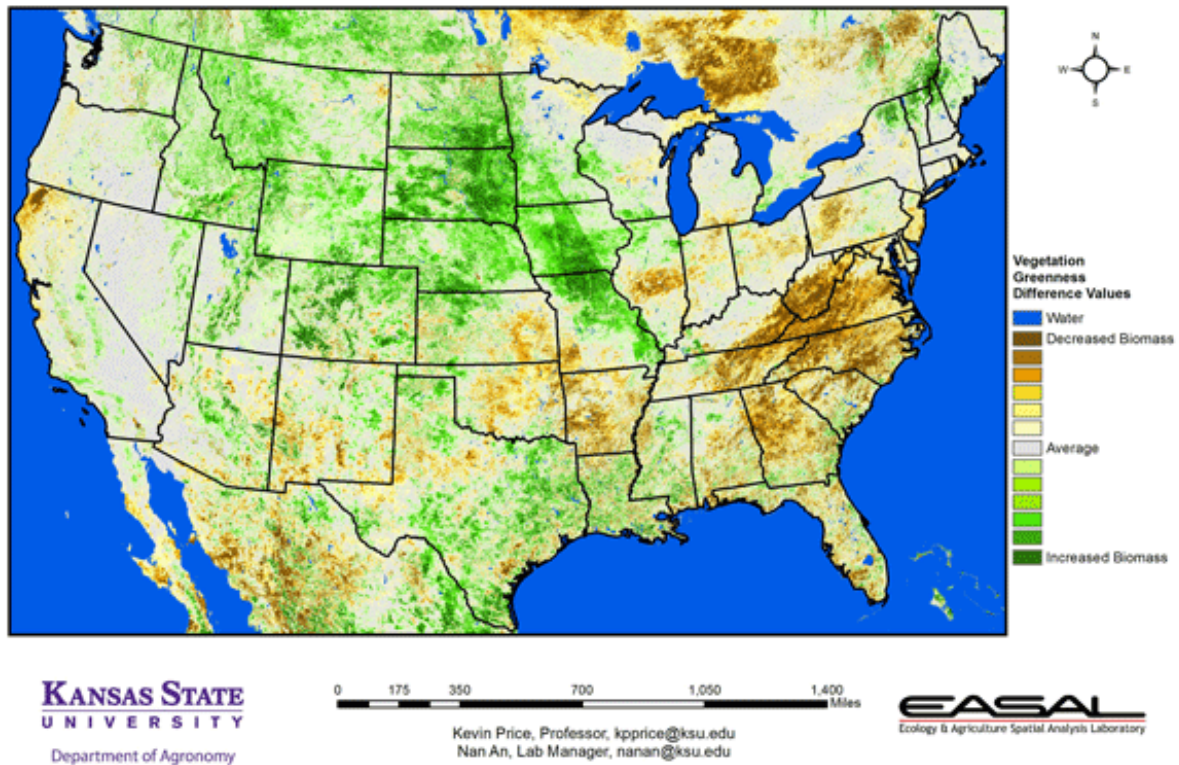


Figure 8. The U.S. comparison to last year at this time for the period September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the central part of the U.S. has mostly higher photosynthetic activity, while the mid-Atlantic states have much lower biomass production. In the High Plains, 77 percent of the area is reported as drought-free by the U.S. Drought Monitor. Last year, only 26 percent of the area was drought-free.

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

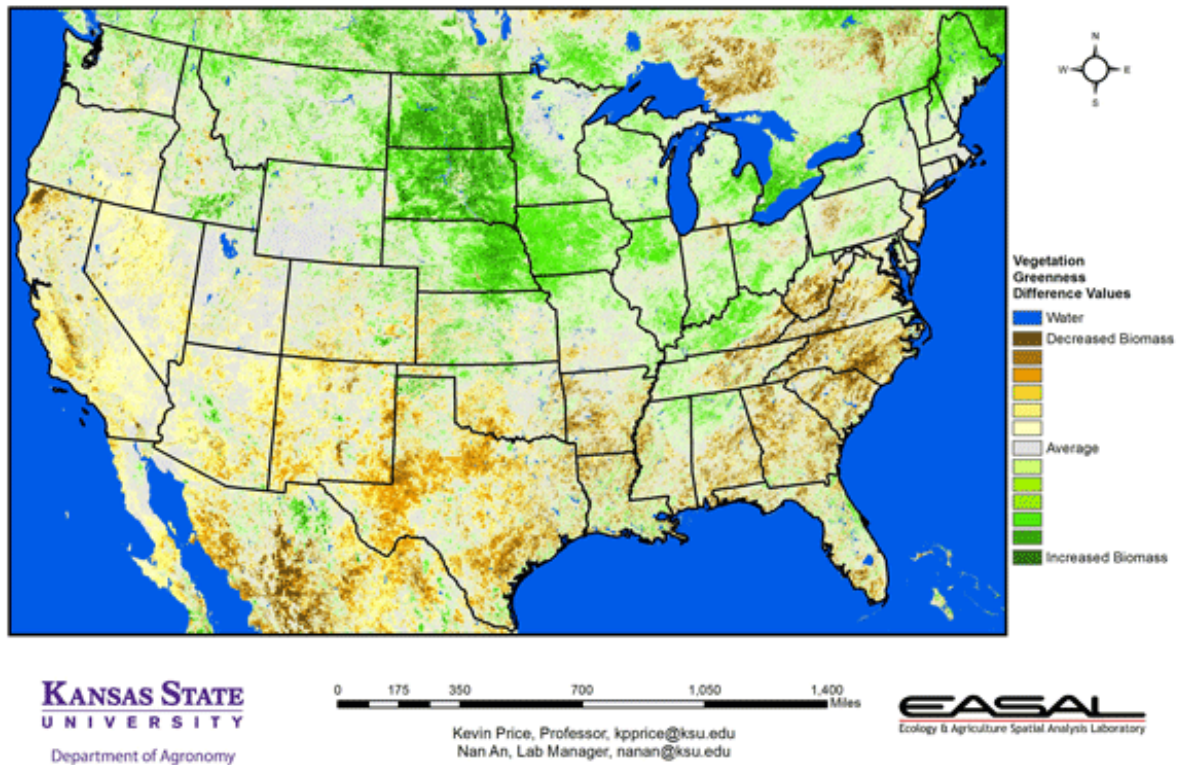


Figure 9. The U.S. comparison to the 25-year average for the period September 2 – 15 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the Northern Plains has much-higher-than-average biomass production, while the values are lower than average in the southeastern U.S. Heavy rains in North Carolina are delaying harvest.

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