



## Extension Agronomy

# eUpdate

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*10/30/2015*

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).

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<b>1. Considerations when dealing with poor emergence and uneven wheat stands .....</b>	<b>3</b>
<b>2. Late-fall insect pest update.....</b>	<b>8</b>
<b>3. The link between groundwater and surface water.....</b>	<b>13</b>
<b>4. The aquifer systems of Kansas.....</b>	<b>17</b>
<b>5. Mini-video: Kansas State University On-Farm Research Project.....</b>	<b>19</b>
<b>6. K-State Crop Production Management Schools scheduled for 2016.....</b>	<b>20</b>
<b>7. Comparative Vegetation Condition Report: October 13 - 26 .....</b>	<b>21</b>

## 1. Considerations when dealing with poor emergence and uneven wheat stands

Some regions in central Kansas had been without substantial precipitation since earlier in the summer, which led to somewhat poor and uneven wheat emergence (Figure 1). Where this scenario holds true, producers will have to decide whether to replant.



**Figure 1. Contrasting wheat emergence in north central Kansas, near Belleville. Field planted**



**during the first week of October. Photo taken Oct. 28, 2015 by Romulo Lollato, K-State Research and Extension.**

The most probable cause for uneven emergence during this fall is dry soils. However, poor seed quality may also play a role in poor wheat emergence, especially after the last growing season when wheat head scab was a major problem in some areas of Kansas. Soil crusting, seedling rot diseases, or soil insects may also be causes of poor emergence.

If dry soils are the cause of the problem, replanting will not bring many benefits unless the seed has partially germinated and perished before emerging. It is important to dig into the soil and evaluate the seed to determine the cause of poor emergence, especially where there has been some recent rainfall. Wheat that received some of last week's rain may still be germinating and emergence may occur in the next few days, depending on temperatures. Thus, if seed are still hard and viable, or if germination started to occur following last week's rainfall events and there is a very short coleoptile emerging from the seed (Figure 2), the best advice is to leave the field alone.



**Figure 2. Wheat seed with elongating coleoptile visible below ground. This field, close to Belleville in north central Kansas, received approximately an inch of rain last week and some seed is now germinating. Photo by Romulo Lollato, K-State Research and Extension.**

Where crusting has occurred, producers should determine whether the seeds or seedlings are still

viable or the coleoptiles have become bent or crinkled due to the crusting. Sometimes a light rain on crusted soil will soften the crust so seedlings can emerge. Otherwise, a rotary hoe will break up the crust, allowing them to emerge.

If there has been adequate moisture and no crusting, but little or no emergence, poor quality seed, seedling rot diseases, or soil insects are possible causes of the problem. In this case, the field will need to be replanted with good quality, treated seed.

Considerations when deciding whether to replant wheat fields are i) percent stand compared to the target stand, ii) replanting date, iii) stand uniformity, and iv) weed control.

#### i. Percent stand compared to the goal

In order to check how far actual stands are from the target stand, counting the number of emerged plants per row foot and comparing to the values on Table 1 should give a good estimate. Table 1 shows the number of target plants per row foot depending on seeding rate, seed size, and row spacing, and considering 80% emergence. If seed size is not known, 14,000 to 16,000 seeds per pound can be used for most wheat varieties in Kansas, except those with rather large or small kernels.

**Table 1. Target plants per row foot (80% emergence) based on seeding rate, seed size, and row spacing**

Seeding rate	Seed size	Row spacing (inches)				
		6	7.5	8	10	12
lb/ac	seeds/lb	Target plants per row foot (80% emergence)				
45	12,000	5	6	7	8	10
	14,000	6	7	8	10	12
	16,000	7	8	9	11	13
	18,000	7	9	10	12	15
60	12,000	7	8	9	11	13
	14,000	8	10	10	13	15
	16,000	9	11	12	15	18
	18,000	10	12	13	17	20
75	12,000	8	10	11	14	17
	14,000	10	12	13	16	19
	16,000	11	14	15	18	22
	18,000	12	15	17	21	25
90	12,000	10	12	13	17	20
	14,000	12	14	15	19	23
	16,000	13	17	18	22	26

	18,000	15	19	20	25	30
120	12,000	13	17	18	22	26
	14,000	15	19	21	26	31
	16,000	18	22	24	29	35
	18,000	20	25	26	33	40

To determine the average number of plants per foot of row, several random plant counts across the field should be taken, given a more or less uniform emergence throughout the field. If the average number of plants is about 50 percent or more of normal and the stand is evenly distributed, the recommendation is to keep the stand. Wheat's tillering ability can greatly compensate for poor stand provided soil fertility is adequate and the weather is favorable. With less than 40 percent of normal stand, the recommendation is to replant the field. If possible, replanting should be done at a 45 degree angle to the original stand to minimize damage to the existing stand.

#### i. Replanting date

Until the end of October, producers could cross-drill at the rate of 30-40 pounds per acre in western Kansas and 40-60 pounds per acre in central and eastern Kansas, using a double-disc opener drill if at all possible to minimize damage to the existing stand. If the replanting is done in November or later, increase the seeding rates to 60-75 pounds per acre in western Kansas and 75-90 pounds per acre in central Kansas. If stands are less than 30 percent of normal, increase these seeding rates by another 20-30 pounds per acre.

#### i. Stand uniformity

Where there was no emergence in all or parts of the field and large gaps are present, producers would have to use a slightly higher seeding rate than used initially — 60 to 90 pounds per acre in western Kansas and 90 to 120 pounds in eastern and central Kansas. These higher planting rates can help compensate for a late planting, so the higher end of those ranges should be used when planting in November.

#### i. Weed control

A thin wheat stand can increase the potential for weed and grass infestations. If these become severe, the wheat stand should probably be replanted or thickened. Uneven wheat stands can also influence herbicide timing due to different staging of the crop within the same field. Figures 1 and 2 exemplify a field where parts of the field will be beginning to tiller while other parts of the field will still be emerging. Herbicides such as 2,4-D and dicamba have very specific application guidelines, and attention must be paid to the herbicide label to avoid injury to the wheat crop. Paying attention to wheat leaf staging when controlling weeds can help minimize the consequences of applying these herbicides outside the labeled recommendations, which can result in trapped heads, missing florets, or twisted awns. More developed plants in the fall often hold the best yield potential. This factor might be considered if a decision needs to be taken between risking some herbicide injury to more developed plants versus those that emerged late in uneven wheat fields.

Romulo Lollato, Wheat and Forages Specialist  
[lolato@ksu.edu](mailto:lolato@ksu.edu)

## 2. Late-fall insect pest update

### Wheat pests

Fall armyworms and armyworms are still active in wheat and can be for another month, depending upon the weather. If growing conditions are good, the wheat should be able to outgrow feeding damage caused by small worms. Large worms have probably caused most of their feeding damage already, and hopefully won't be able to pupate, emerge as adults, lay eggs, and have those eggs hatch again this fall.

Winter grain mites may cause some concern in the next month or so, especially under dry conditions. However, insecticide applications are rarely warranted and these mites seldom impact wheat yields. As with worms, good growing conditions for wheat will mitigate winter grain mite feeding damage.

### Sugarcane aphids

Sugarcane aphids were still active in north central Kansas based on our observations on October 23 and 27, as were the beneficial insects (see photos below). Fields were being harvested and growers were getting acceptable yields. Growers reported yields of 80 to 160 bu/acre -- which they said was usual for the fields involved -- without much interference caused by the stickiness of the honeydew (and it is sticky).



Figure 1. Photo by Holly Schwarting, K-State Research and Extension.





Figure 2. Photo by Holly Schwarting, K-State Research and Extension.

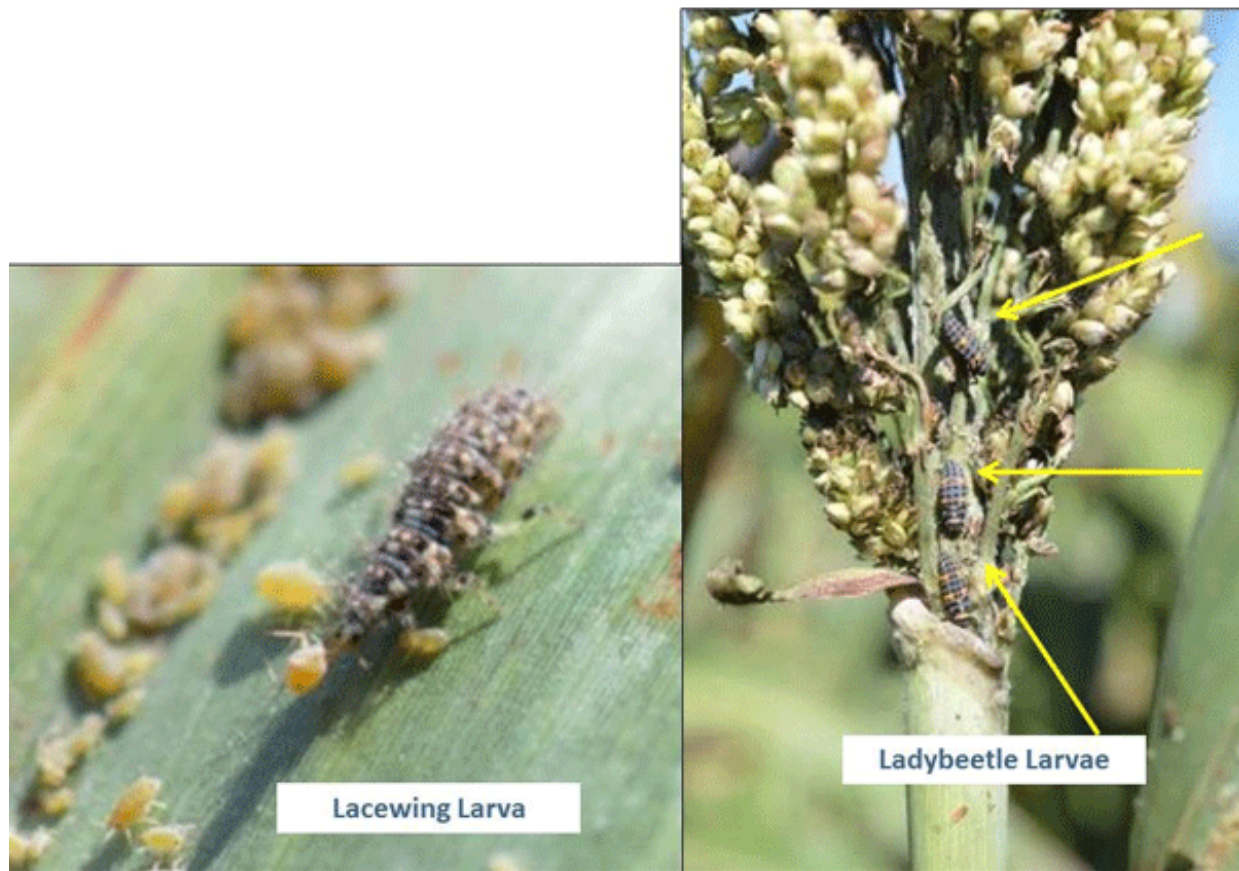
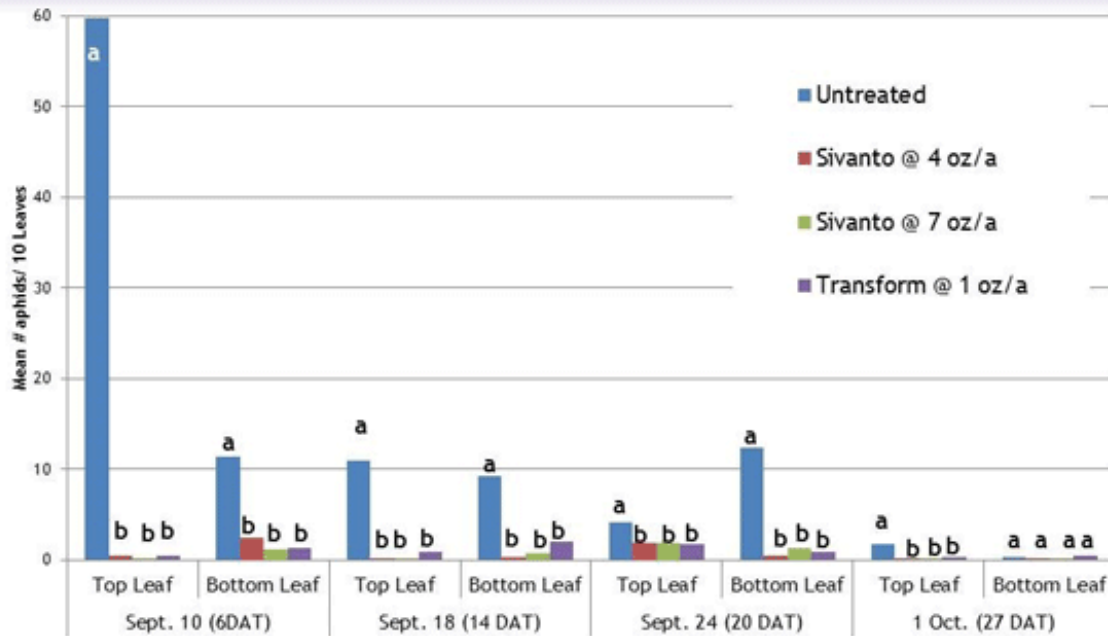


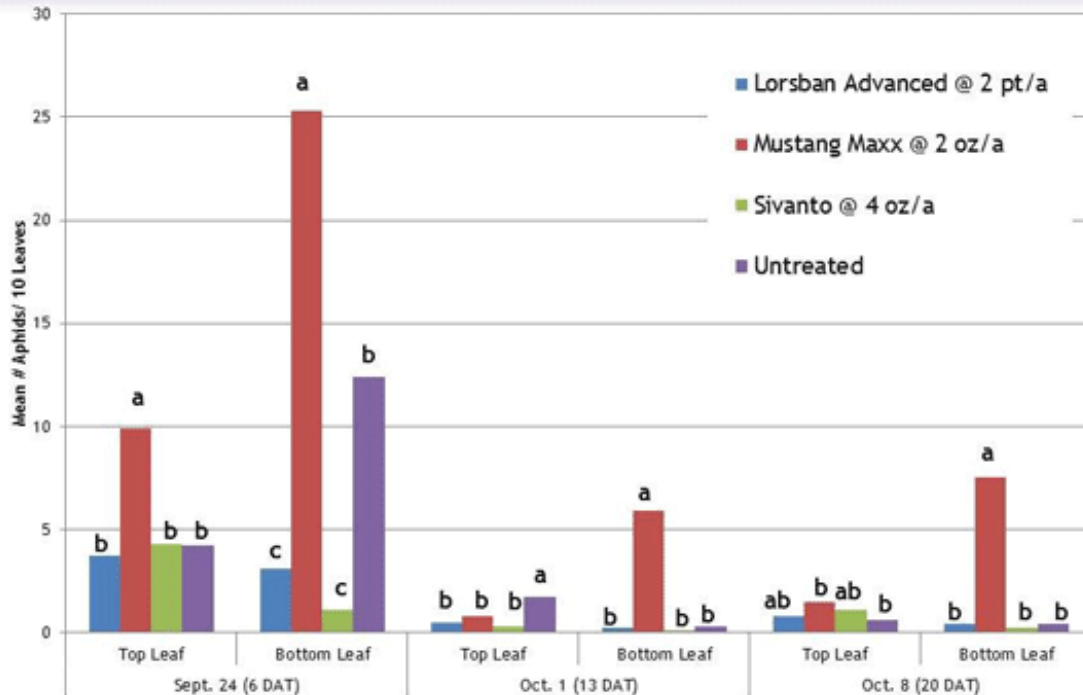
Figure 3. Photos by Holly Schwarting, K-State Research and Extension.

Below are the results of 2015 sugarcane aphid efficacy trials conducted in Saline Co. Aphid populations were, in our opinion, ideal for conducting trials of this nature because there were enough aphids to show any differences caused by the treatments, but not so many that the plants were overwhelmed or that the grower had to spray the entire field (thereby over-spraying these plots).



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for Life*

Means within a column followed by the same letter are not significantly different ( $P > 0.05$ ; PROC ANOVA; Mean comparison by LSD [SAS Institute 2003]).



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Jeff Whitworth, Extension Entomology  
[jwhitwor@ksu.edu](mailto:jwhitwor@ksu.edu)

Holly Schwarting, Research Associate, Entomology  
[holly3@ksu.edu](mailto:holly3@ksu.edu)

J.R. Ewing, Graduate Student, Entomology  
[jrewing@ksu.edu](mailto:jrewing@ksu.edu)



### 3. The link between groundwater and surface water

(Note: This article is an excerpt from *Water Primer: Part 3 Groundwater*, K-State Research and Extension publication MF-3022, by Danny Rogers, Professor, Biological and Agricultural Engineering; Morgan Powell, Professor Emeritus, Biological and Agricultural Engineering; and Kerri Ebert, Extension Assistant, Biological and Agricultural Engineering. The full publication can be accessed online at: <http://www.bookstore.ksre.ksu.edu/pubs/MF3022.pdf> -- Steve Watson, Agronomy eUpdate Editor)

Groundwater and surface water are often one closely interrelated system. Groundwater feeds springs and streams. Surface water recharges aquifers. The interaction of groundwater and surface water affects water quality and quantity.

Groundwater can be contaminated by polluted surface water, and surface water can be degraded by discharge of saline or other low-quality groundwater. Streams and their alluvial aquifers are so closely linked in terms of water supply and water quality that neither can be properly understood nor managed by itself. The total combined stream-aquifer system must be considered.

#### **Water movement in soil and geology**

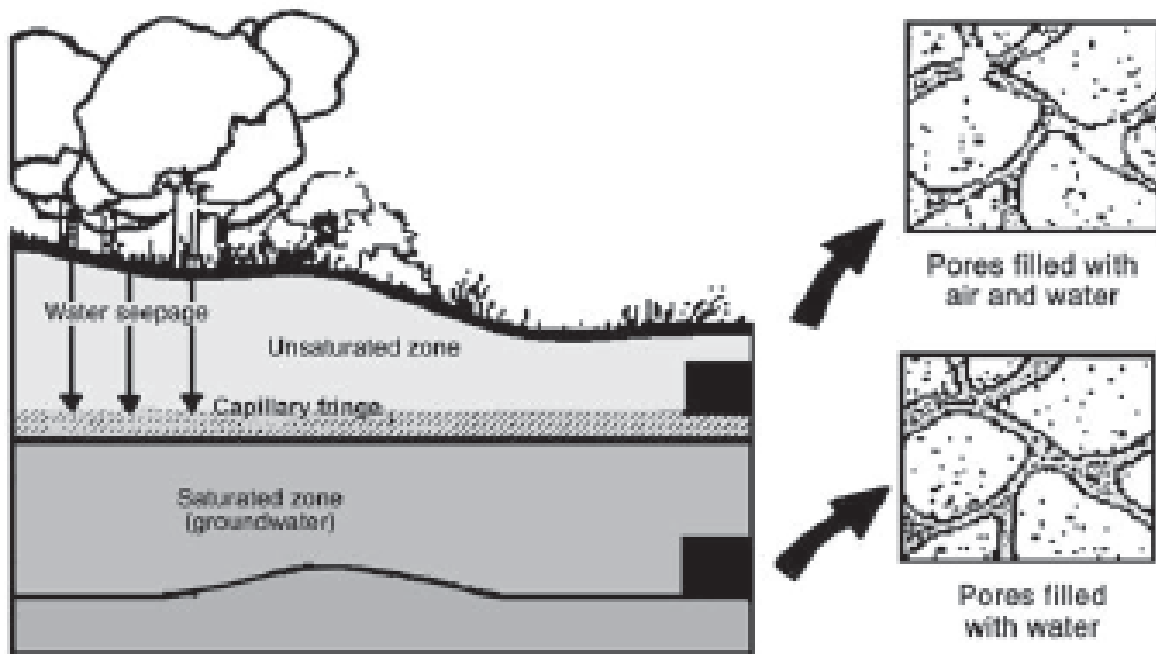
Gravity causes excess soil water to percolate (seep) through the soil and subsoils until an impervious layer is reached. Permeable soils, such as sand, hold only a small amount of water and allow quick percolation. Clay soils have extremely small openings between microscopic particles that significantly slow water movement. Many saturated clay soils are virtually impermeable. Depending on the geology of the soil or rock material, percolation rate may range from a fraction of an inch to a few feet per day.

Groundwater movement is also affected by the contour of the surface land (topography). Groundwater flows from a high-water surface elevation to a low-water surface elevation unless barriers are encountered.

Since groundwater moves toward lower elevations, a well driller often looks for water near the bottom of a hill. However, water quality should be protected by locating a well as far up the slope as possible to be away from sources of contamination such as a septic system or livestock area.

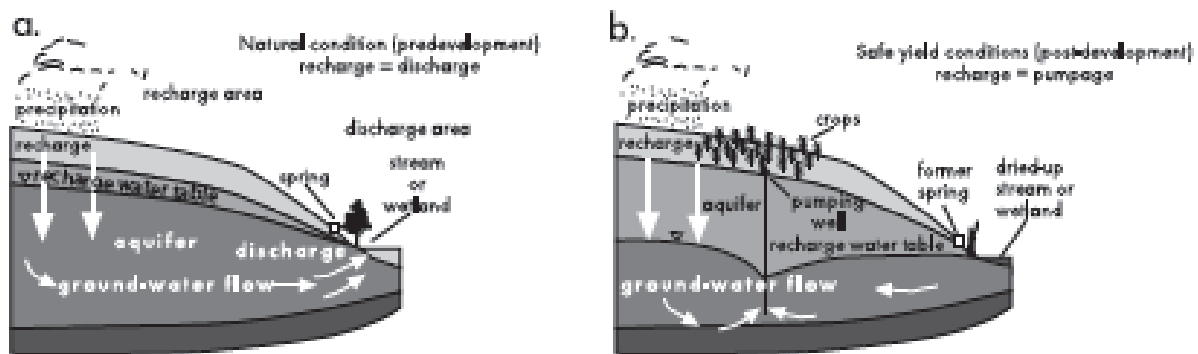
As water moves through the soil, it passes through an area above the water table known as the unsaturated, or vadose, zone (see Figure 1). This layer may be moist or wet, but the pores are only partially filled with water, leaving space for air. As water percolates through the soil it eventually reaches a zone where all the interconnected pore openings are filled with water.

This is called the saturated zone. The top of the saturated zone is the water table.



*Figure 1. Water movement from the soil surface to groundwater.*

The layer directly above the water table is the capillary fringe. In this layer groundwater moves upward from the water table by means of the capillary action of the pore spaces. Capillary action is caused by the surface tension of water. The water table rises and falls according to the season of the year, the amount of recharge, and the removal of groundwater. If groundwater is removed by pumping from wells, the water table lowers, which may change the direction of groundwater flow. As a result, sections of streams that once received groundwater decrease, and therefore, stream flow decreases (Figure 2).



*Figure 2. Stream-aquifer interaction. (Source: Sophocleus and Sawin, 1997)*

Sophocleous, Mario A. and Robert S. Sawin. Safe Yield and Sustainable Development of Water Resources in Kansas. Kansas Geological Survey Public Information Circular 9. October 1997

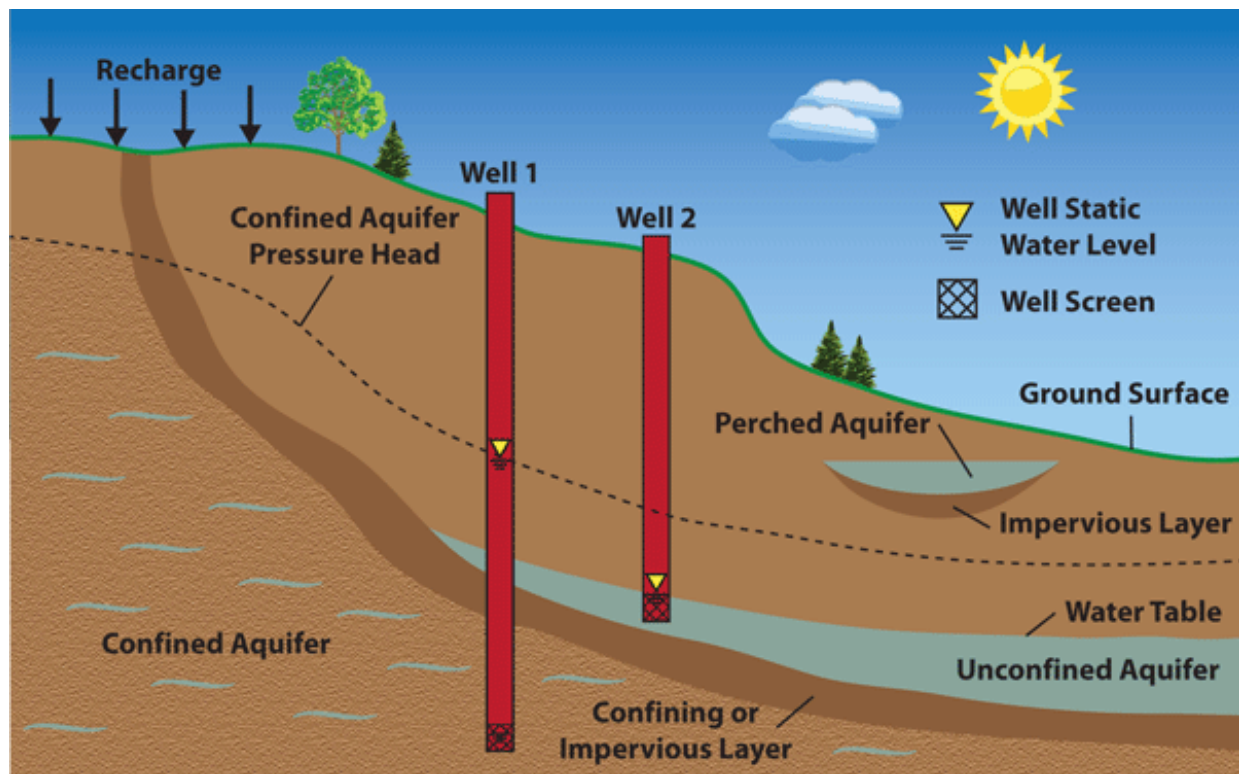
## Groundwater storage and recharge: Confined and unconfined aquifers

The storage systems for groundwater are the spaces between particles of soil, sand, gravel, or rock, as shown in Figure 1. When saturated with water that can be removed by a pump, these formations are called aquifers or groundwater reservoirs.

People often envision an underground river or lake when thinking about aquifers, but in most areas of the world, and specifically in Kansas, water is stored in the small openings between the soil and rock material and is more like a wet sponge. Aquifers may be as small as a few acres or larger than a state.

The volume of contained water depends on the size, thickness, and porosity of the aquifer as well as the recharge. Storage volume is commonly known as the number of acre-feet per acre or feet of water. An acre-foot is the volume of water (325,851 gal.) it takes to cover an acre to a depth of 1 foot.

Aquifers are classified as either unconfined or confined. Unconfined aquifers lack a restrictive layer above the water table, as shown in Figure 3. Locations where water percolates down to the groundwater system are called recharge areas. The recharge that supplies these aquifers infiltrates the soil directly above the aquifer.



Unconfined aquifers, especially shallow ones that are covered by porous (sandy) soils, are the most susceptible to contamination. These unconfined aquifers are often close to the surface, with their only protection being overlying soil and geologic material. Figure 3 illustrates both an unconfined and a confined aquifer.

A confined aquifer is a water-bearing layer between two impermeable, or confining, layers. The confining layers may be clay or rock, such as shale. The recharge area can be far away from the

geologic formation penetrated by a well, but regardless of distance the two are connected.

The greatest recharge tends to occur in areas of coarse-textured or sandy soil with low water-holding capacity. Some recharge even occurs in clay soils because when heavy rains follow dry periods, cracks in the clay may allow water to enter deeply into the soil past the root zone. Recharge also occurs where seeps, springs, wetlands, streams, lakes, or other surface water percolate down to the aquifer. Areas of recharge can be small and localized or very extensive, covering hundreds of square miles.

Water in a confined aquifer is contained or restricted similar to water in a pipe. The water can become pressurized if the confined aquifer slopes away from the recharge area. When the pressurized water rises above the top of the confining layer, a condition called an artesian well is created — illustrated in Figure 3 by Well 1. A flowing artesian well occurs where the pressure is high enough to force water to the surface, causing water to flow freely from the well without using a pump. The water table rises and falls according to the season of the year, the amount of recharge, and the removal of groundwater. If groundwater is removed by pumping from wells, the water table lowers, which may change the direction of groundwater flow. As a result, sections of streams that once received groundwater decrease, and therefore, stream flow decreases.

### **Water quality in confined and unconfined aquifers**

The material overlying the aquifer protects the water quality of an aquifer by slowing the movement of water that may carry potential contaminants and allowing biological and chemical processes to remove some contaminants. These processes, however, can be overwhelmed by pollution or contamination that cannot be easily broken down or are applied in quantities in excess of the process capacity to break them down. Many older wells are either poorly constructed or poorly maintained and allow direct entry of surface water into the aquifer.

Because aquifers are not exposed to air or sunlight, they do not have the self-oxygenating, cleansing properties of surface waters. Therefore, when groundwater becomes contaminated, the concentration (plume) of pollutants moves slowly with the aquifer water, allowing for minimal dilution or dispersion. By the time a plume reaches a well site, it may be difficult to determine where it originated, when it was released into the groundwater, and how long it will affect the well site.

Confined aquifers have greater protection from surface contamination, as long as the recharge area is protected from pollutants, because they are between layers of relatively impermeable materials. They are typically deeper underground than unconfined aquifers and have an increased measure of protection from contamination from the ground surface. However, confined aquifers can be contaminated by pollutants in the recharge area or when confining layers are penetrated by test holes, poorly constructed wells, abandoned wells, or another breach of confinement that allows pollutant entrance.

Source: *Water Primer: Part 3 Groundwater*, K-State Research and Extension publication MF-3022: <http://www.bookstore.ksre.ksu.edu/pubs/MF3022.pdf/>

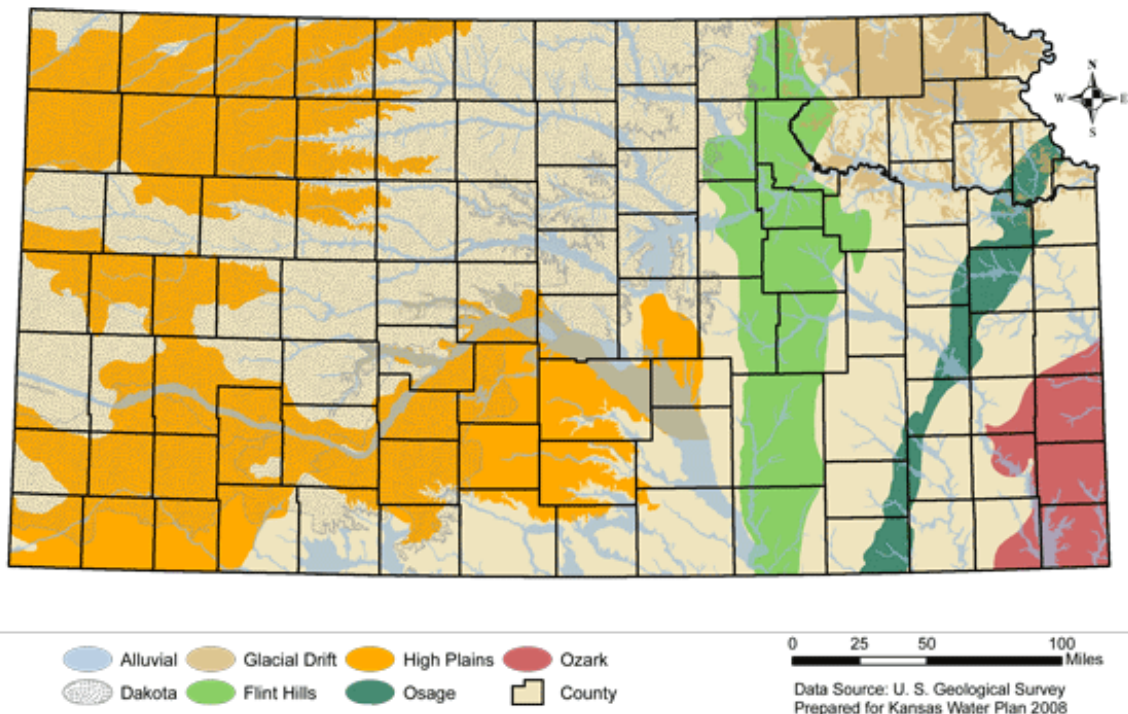


## 4. The aquifer systems of Kansas

(Note: This article is an excerpt from *Water Primer: Part 3 Groundwater*, K-State Research and Extension publication MF-3022, by Danny Rogers, Professor, Biological and Agricultural Engineering; Morgan Powell, Professor Emeritus, Biological and Agricultural Engineering; and Kerri Ebert, Extension Assistant, Biological and Agricultural Engineering. The full publication can be accessed online at: <http://www.bookstore.ksre.ksu.edu/pubs/MF3022.pdf> -- Steve Watson, Agronomy eUpdate Editor)

Kansas has seven principal groundwater aquifer systems.

### Major Kansas Aquifers



#### Alluvial aquifers

Alluvial aquifers are unconfined and associated with streams and rivers. The Kansas River Alluvial Aquifer is an important source of water for cities and irrigation along the border of the glaciated area and the Flint Hills. Other major unconfined alluvial aquifers include the Arkansas, Republican, and Pawnee rivers, on which high-yielding wells are possible (>500 gallons per minute, or gpm). Generally, the water quality of alluvial aquifers in Kansas is suitable for typical municipal, industrial, and agricultural uses, although many alluvial aquifers tend to have high enough iron and manganese concentrations to cause staining.

The water from some isolated areas of alluvial aquifers can be saline because of contact with underlying bedrock.

#### Water table aquifers

**The Glacial-Drift Aquifer** is a major source of water in northeast Kansas. The aquifer consists of unconfined, unconsolidated glacial deposits and produces wells that yield from 10 to 500 gpm with good quality water that is suitable for most uses.

**The High Plains Aquifer** is the largest, most important, and most extensively used aquifer in Kansas. This large regional aquifer extends from Texas and New Mexico, through Oklahoma, Kansas, eastern Colorado, and Nebraska, to extreme southern South Dakota. In Kansas, the aquifer is composed of three hydraulically connected but distinct formations: the Ogallala, Great Bend Prairie, and Equus Beds. The Ogallala formation is generally composed of unconsolidated sand, gravel, silt, and clay deposited by streams that historically flowed east from the Rocky Mountains. The Great Bend Prairie and Equus Bed formations are also composed of silt, clay, sand, and gravel deposits left by streams flowing through central Kansas. In some areas, these formations are in contact with each other, creating one continuous aquifer. Wells in the High Plains Aquifer yield from 500 to 1,500 gpm. The water quality is suitable for most uses.

**Great Plains Aquifer.** This aquifer is a major source of water in central and north central Kansas. This aquifer consists of Dakota and Cheyenne sandstones. It is generally unconfined in the area shown in Figure 4; however, west and north of this area the aquifer is confined but typically contains poor quality water. Wells yield from 10 to 100 gpm in the northeast and more than 1,000 gpm in the south.

**Chase and Council Grove Aquifer.** The Chase and Council Grove Aquifer is an important water source in the Osage Plains, with well yields ranging from 10 to 200 gpm. The water quality generally is suitable for most uses; however, local sulfate concentrations can be high, especially in samples taken in the western part of the aquifer. (Figure 4)

**Douglas Aquifer.** The Douglas Aquifer is small but an important source where the sandstone formation is exposed. The aquifer generally is unconfined, and wells yield from 10 to 100 gpm. The water quality is suitable for most uses, although some wells produce water with high fluoride concentrations. As in the case of the Chase and Council Grove Aquifer, the water in western areas is not used because of high mineral content.

**Ozark Aquifer.** The Ozark Aquifer is the major source of groundwater in extreme southeast Kansas. This confined aquifer consists of weathered and sandy dolomites. Dolomite is a kind of sedimentary rock, much like limestone but rich in magnesium carbonate. At the shallowest point, the top of the formation in Kansas is 300 feet below land surface. Wells yield from 30 to 500 gpm, and the water is suitable for most uses.

(Adapted from Bevans, Hugh E., Timothy B. Spruill and Joan F. Kenny. "Kansas Ground- Water Resources." *U.S. Geological Survey. National Water Summary*. pp 217-222 Water Supply Paper 2275. 1984.)

Source: *Water Primer: Part 3 Groundwater*, K-State Research and Extension publication MF-3022: <http://www.bookstore.ksre.ksu.edu/pubs/MF3022.pdf/>

## 5. Mini-video: Kansas State University On-Farm Research Project

In a short video produced by K-State Research and Extension, Ignacio Ciampitti, Crop Production and Cropping Systems Specialist, and Tom Maxwell, Central Kansas District Agriculture Agent, discuss K-State's On-Farm Research Project with a group of Saline County producers. Two of the participating producers share their thoughts on the experience in being involved with this project. The on-farm research project is a cooperative effort between K-State agronomists and producers.

Title of video: Kansas State University On-Farm Research Project

Length: 2:50 minutes

Source: Dan Donnert, K-State Research and Extension, Photographer/Videographer

The mini-video can be seen at: [ksu.ag/1HbWRAE](https://ksu.ag/1HbWRAE)

## 6. K-State Crop Production Management Schools scheduled for 2016

Eleven K-State Crop Production Management Schools will be offered from mid-January to early February 2016 across the entire state. Each school will provide in-depth training targeted for corn, soybean, or sorghum producers.

The one-day schools will cover several current crop-related topics relevant to corn, soybean, and sorghum producers in Kansas.



- Monday Jan. 11, Independence.
- Thursday Jan. 14, Garden City.
- Friday Jan. 15, Salina.



- Monday Jan. 25, Great Bend.
- Tuesday Jan. 26, Overbrook.
- Thursday Jan. 28, Beloit.
- Friday Jan. 29, Marysville.



- Tuesday Feb. 2, Scott City.
- Wednesday Feb. 3, Phillipsburg.
- Thursday Feb. 4, Ellsworth.
- Friday Feb. 5, Emporia.

Further details on final agenda (speakers/topics), schedule, registration, and contact information for each Crop School will be available in the coming weeks.

Stay tuned for more information on all Crop Schools!

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



## 7. Comparative Vegetation Condition Report: October 13 - 26

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>

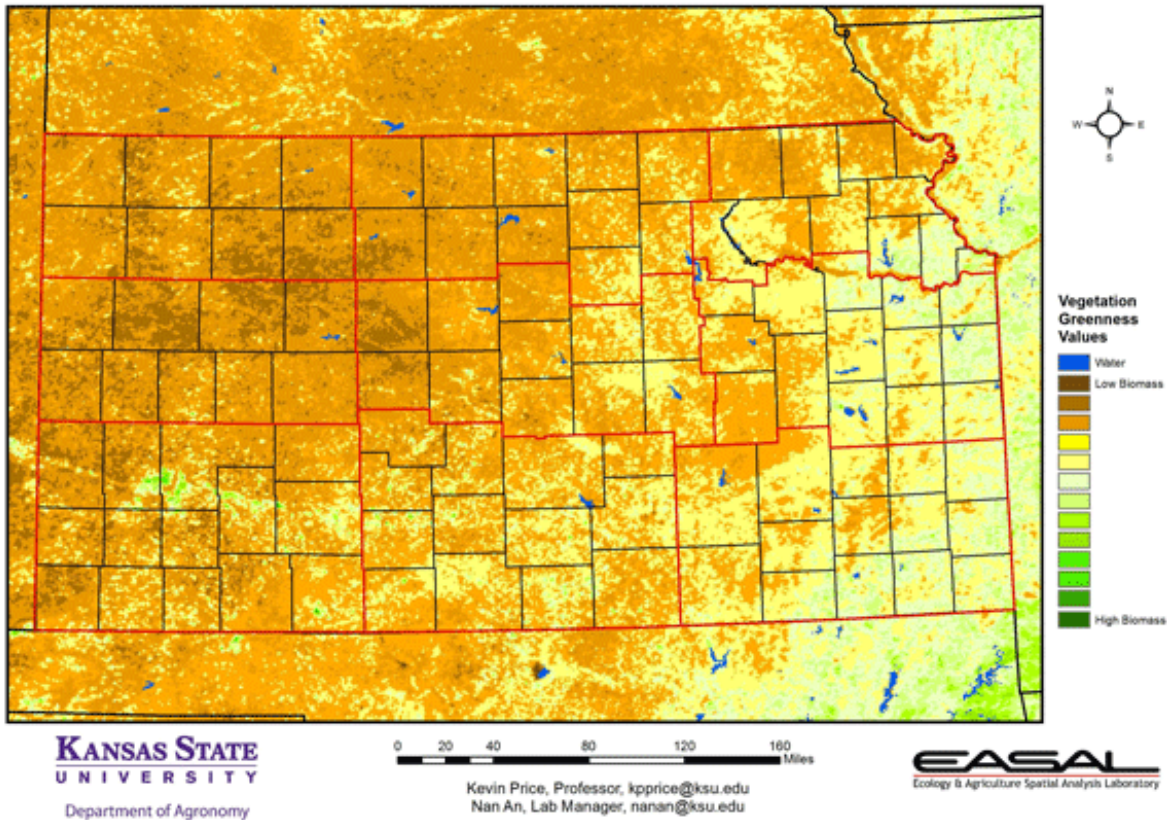
The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 26-year average. The report is used by individual farmers 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 [an\\_198317@hotmail.com](mailto:an_198317@hotmail.com) 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 43: 10/13/2015 - 10/26/2015



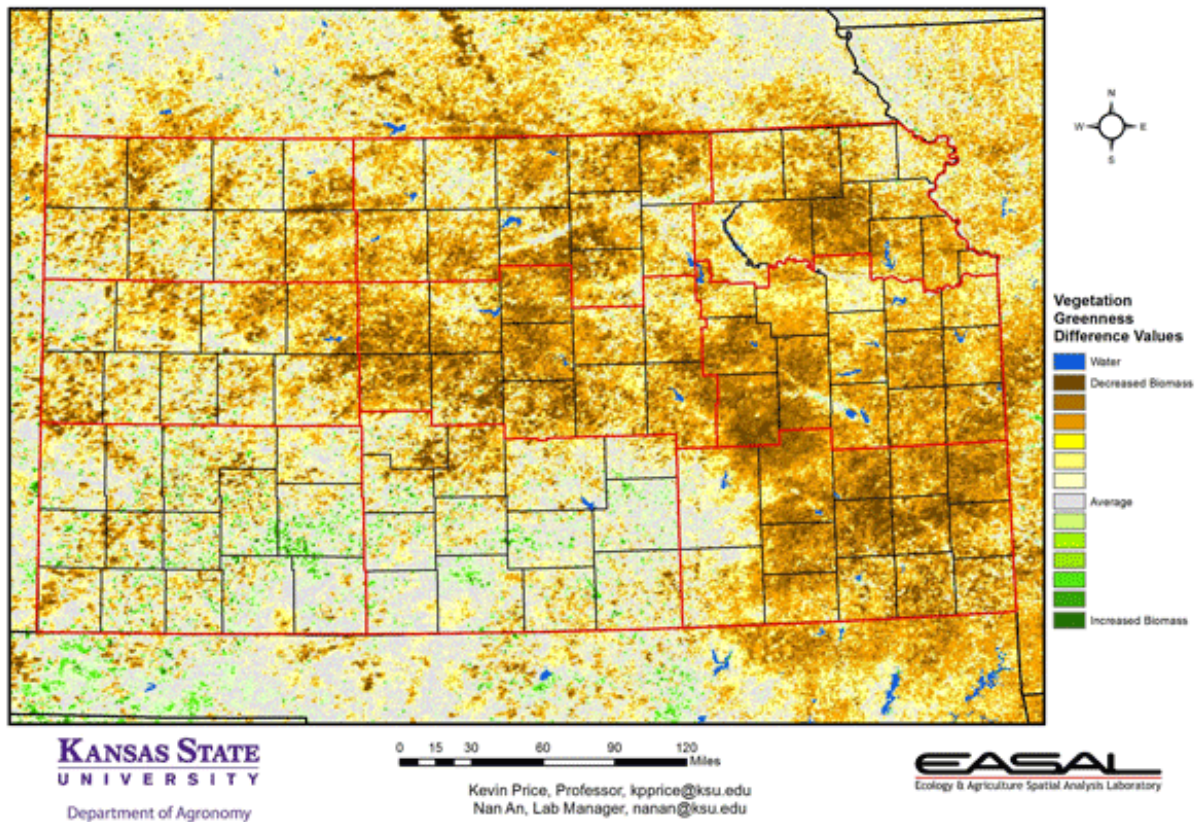
**Figure 1. The Vegetation Condition Report for Kansas for October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the highest biomass production continues to be a small pocket of activity along the Arkansas River in southwest Kansas. Irrigated alfalfa is a major product in this region. There is a small area of moderate photosynthetic activity in east central and southeast Kansas. Moderate temperatures resulted in continued biomass production in these areas. Very low NDVI values are visible in Trego, Ellis, Rush, and Ness counties, and have expanded into Pawnee and Barton counties, where drought conditions have intensified.**

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

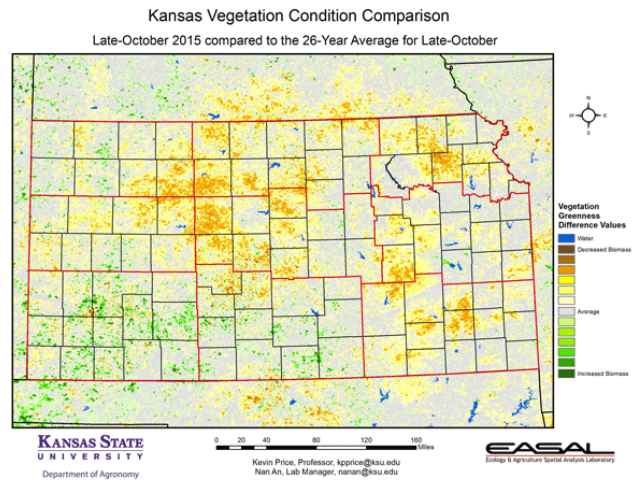
[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

Kansas Vegetation Condition Comparison  
Late-October 2015 compared to the Late-October 2014



**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows much of the state with lower photosynthetic activity. Only the Southwest and South Central Divisions have similar to slightly higher photosynthetic activity. These areas continue to have beneficial moisture, while the rest of the state has been dry. This does not show the impact of the rains that fell last week as it will take several weeks for the impacts to**





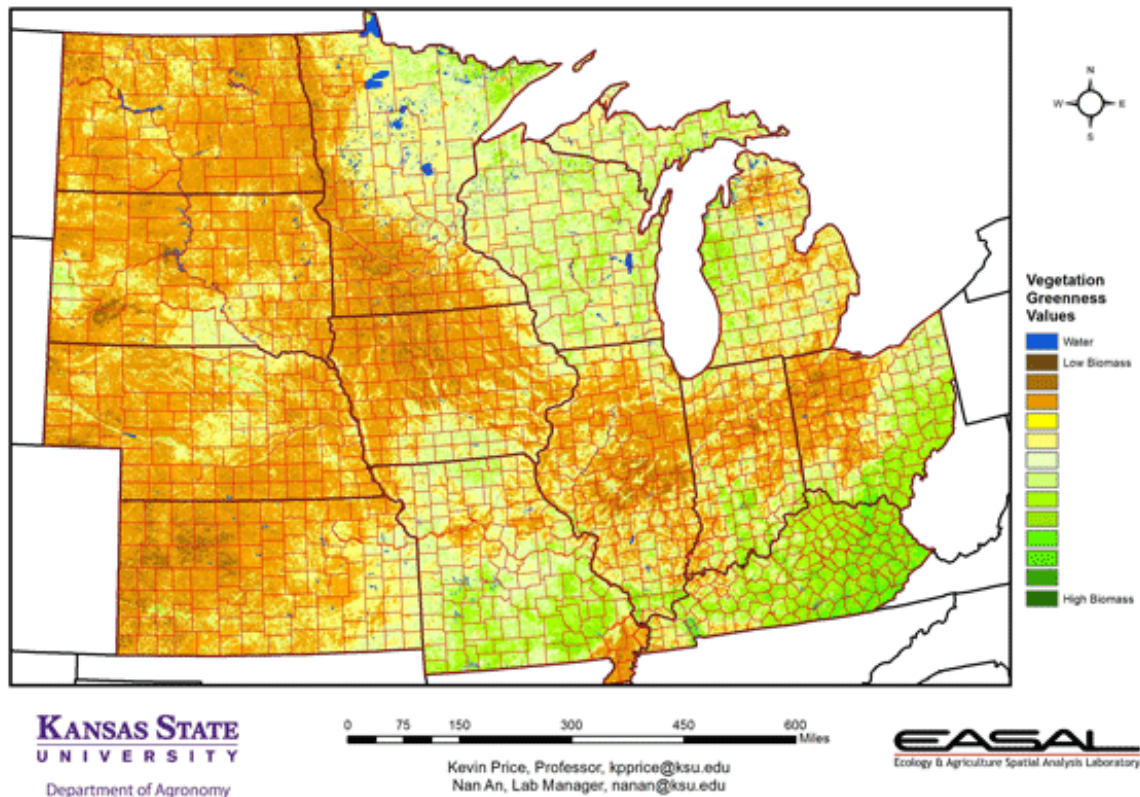
be visible, and the growing season is ending.

**Figure 3. Compared to the 26-year average at this time for Kansas, this year's Vegetation Condition Report for October 13 – 26 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that most of the state continues to show near average photosynthetic activity. The Southwest and South Central Divisions have areas of above-average photosynthetic activity as moisture continues to be above average. From central through southeast Kansas lower NDVI values dominate. These areas continue to miss most of the storm systems, and moderate drought and abnormal dry conditions continue to expand.**



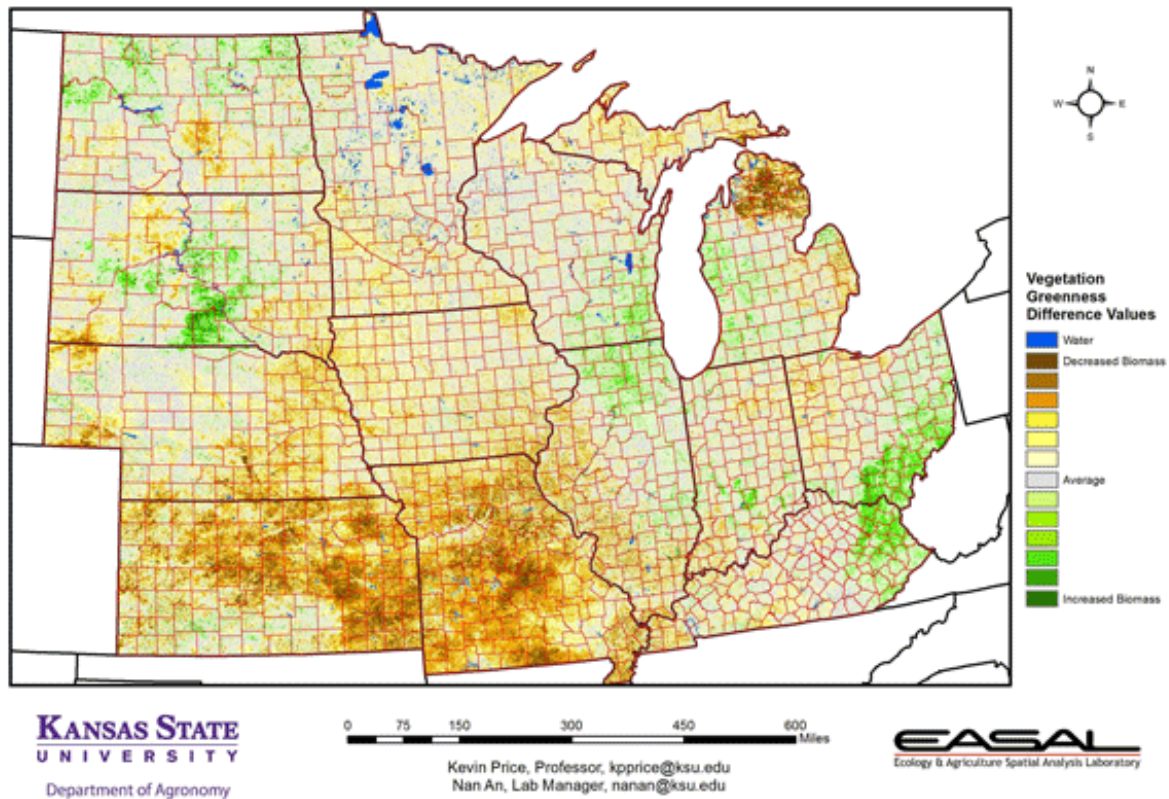
## U.S. Corn Belt Vegetation Condition

Period 43: 10/13/2015 - 10/26/2015

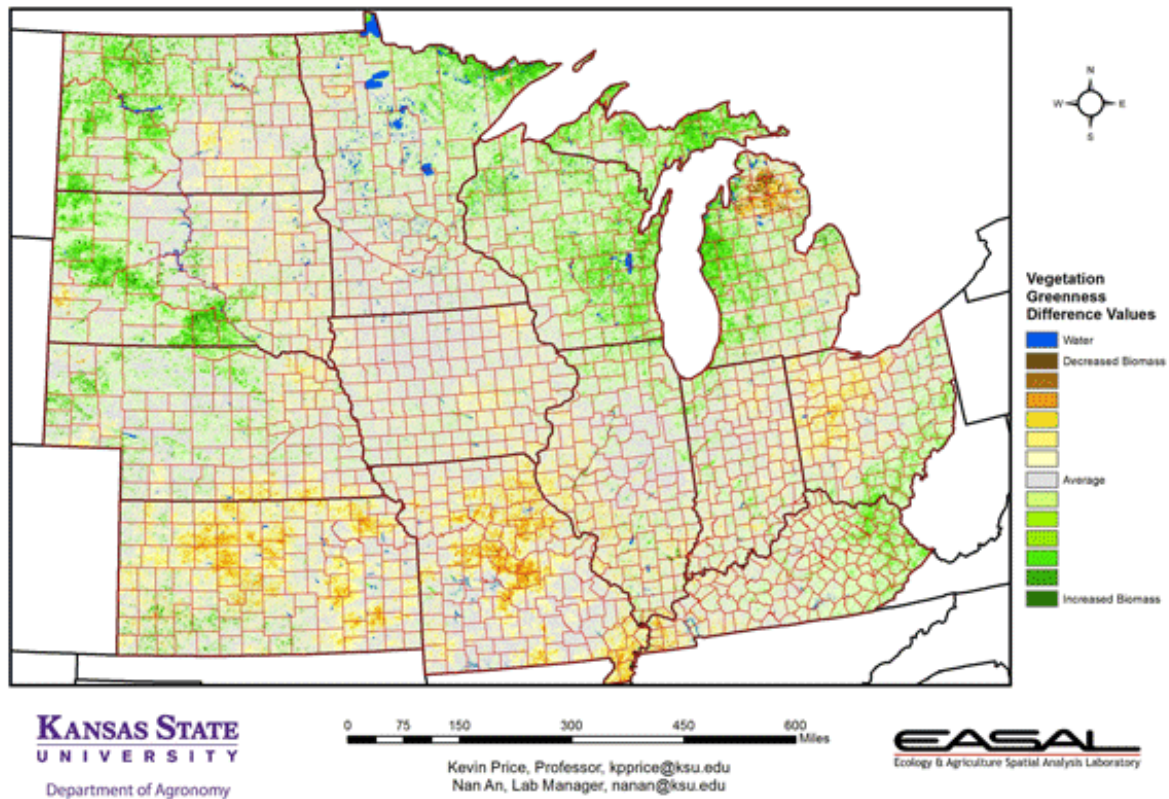


**Figure 4. The Vegetation Condition Report for the Corn Belt for October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the area of greatest photosynthetic activity is concentrated in the southern parts of the region. Favorable moisture conditions in these areas have resulted in high photosynthetic activity. Lower NDVI values are present from North Dakota through Iowa to Illinois and Ohio, as crops continue to mature and freezing temperatures end the growing season.**

# U.S. Corn Belt Vegetation Condition Comparison Late-October 2015 Compared to Late-October 2014



**Figure 5. The comparison to last year in the Corn Belt for the period for October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows lower photosynthetic activity centered the Central Plains, as an extended dry period has slowed plant development, particularly with winter grains. Drought conditions continue to expand in this area. There is a small area of higher NDVI values in central South Dakota and eastern Ohio where moisture has been more favorable this year.**

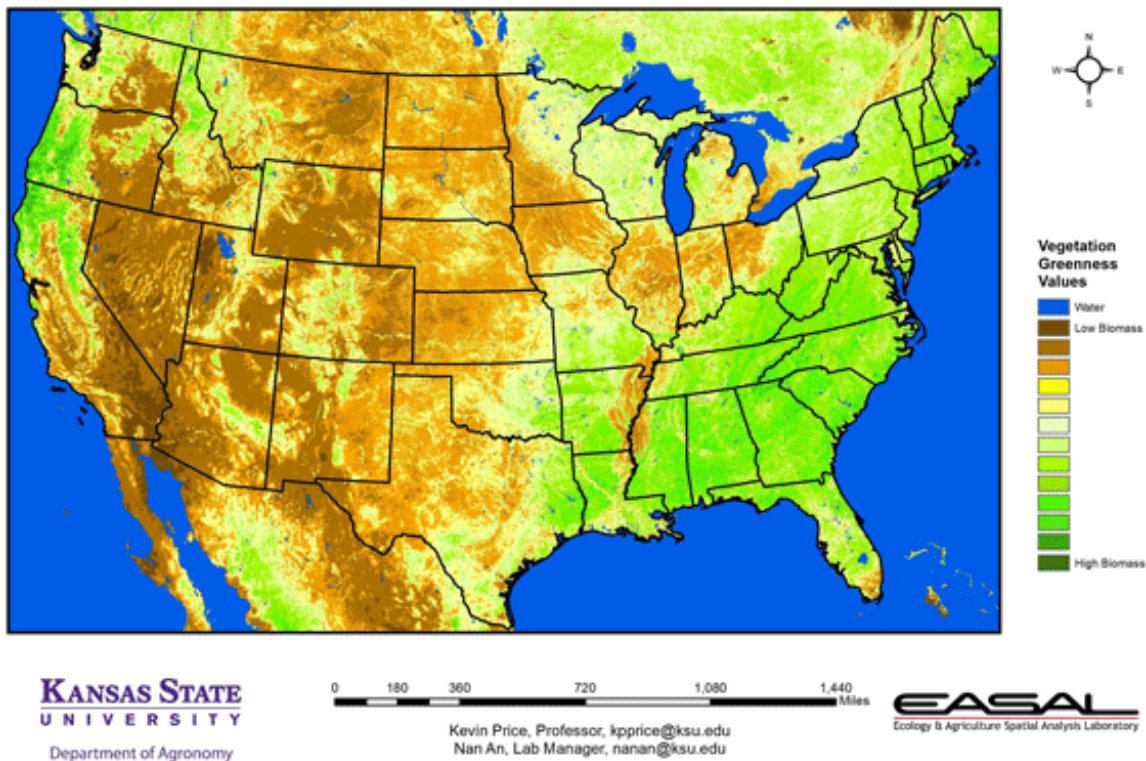


**Figure 6. Compared to the 26-year average at this time for the Corn Belt, this year's Vegetation Condition Report for October 13 – 26 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows most of the region has average biomass production. Above-average photosynthetic activity can be seen in the Northern Plains, where temperatures have continued mild and moisture has been favorable. Parts of Kansas and Missouri stand out with lower NDVI values as warmer-than-average temperatures and low precipitation stress vegetation.**



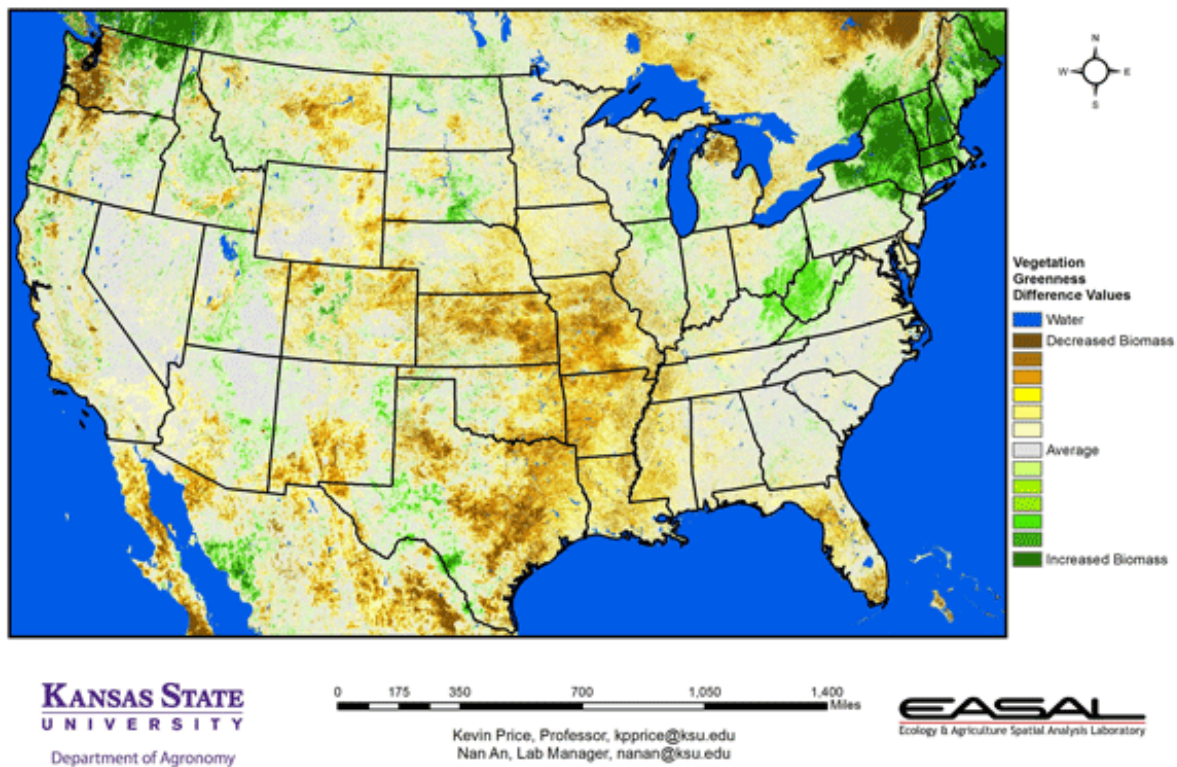
## Continental U.S. Vegetation Condition

Period 43: 10/13/2015 - 10/26/2015



**Figure 7. The Vegetation Condition Report for the U.S for October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the area of highest photosynthetic activity is east of the Mississippi River, where favorable temperatures have extended the growing season. Lower NDVI values are noticeable the Ohio River Valley and along the Mississippi River, where crops have matured early. Low NDVI values are also notable in the Inner Mountain West, as the colder temperatures begin to be felt.**

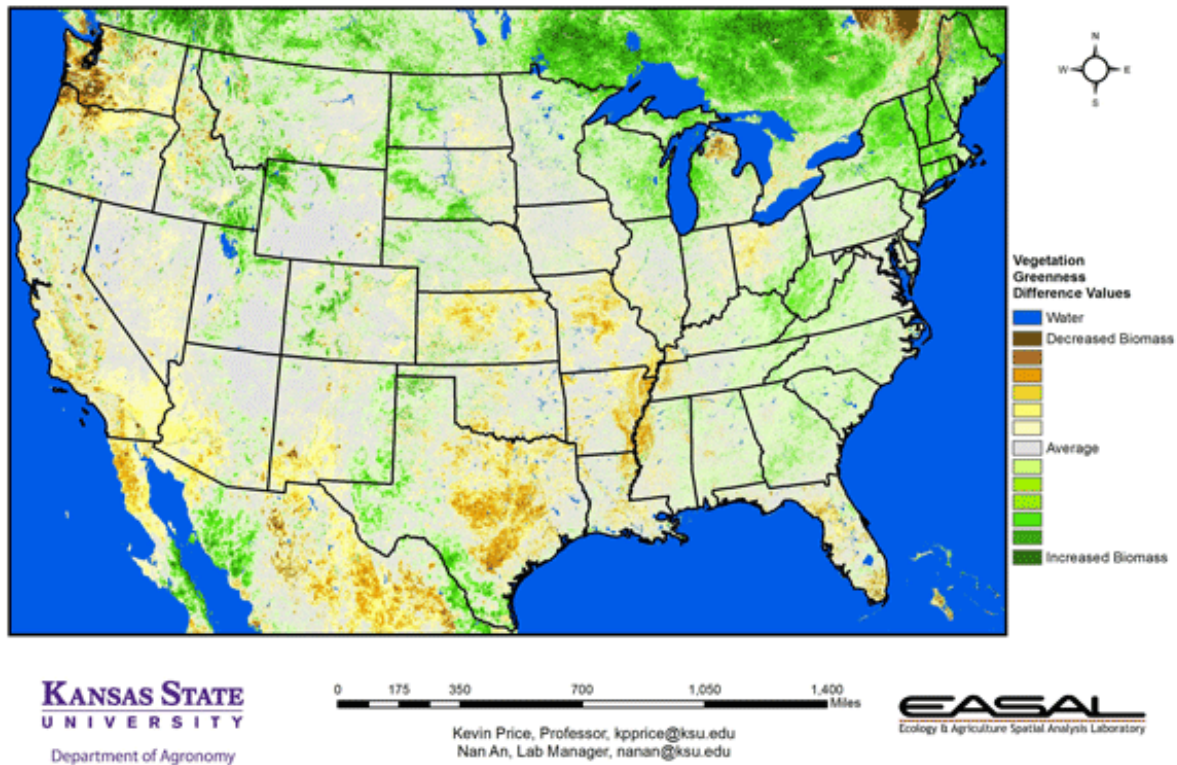
Continental U.S. Vegetation Condition Comparison  
Late-October 2015 Compared to Late-October 2014



**Figure 8. The U.S. comparison to last year at this time for the period October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that lower NDVI values are most evident from the Central Plains to the Gulf Coast. Crop development in much of the region is ahead of average, while fall moisture has been limited until this last week. In Arkansas moderate to exceptional drought had covered most of the state. Vegetation has yet to respond to the rains at the end of last week. In the West, lower NDVI values are visible in eastern Montana and much lower in western Washington, which had more favorable precipitation last year. Little change is evident in Oregon and Northern California, where drought remains unchanged from last year.**



Continental U.S. Vegetation Condition Comparison  
Late-October 2015 Compared to 26-year Average for Late-October



**Figure 9. The U.S. comparison to the 26-year average for the period October 13 – 26 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the Southern Plains have lower-than-normal photosynthetic activity, while the greatest increase in NDVI values is in New England. Mild temperatures in the Great Lakes region have extended the growing season. Much below-average NDVI values in western Washington prevail as moisture continues to be limited.**

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

Kevin Price, Professor Emeritus, Agronomy and Geography  
[kpprice@ksu.edu](mailto:kpprice@ksu.edu)

Nan An, former Graduate Research Assistant, Agronomy  
[an\\_198317@hotmail.com](mailto:an_198317@hotmail.com)