



## Extension Agronomy

# eUpdate

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*10/06/2017*

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, 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 Kathy Gehl, 785-532-3354 [kgehl@ksu.edu](mailto:kgehl@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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## 1. Green stem syndrome in soybeans

Soybean harvest is slowly starting across the state (13% complete, according to the USDA Kansas Agricultural Statistics [report](#) from October 2nd), which is slightly ahead of schedule from the 5-year average of 10% at this point in the season. Soybean seed filling conditions were quite variable across the state and greenness still remains in some fields.

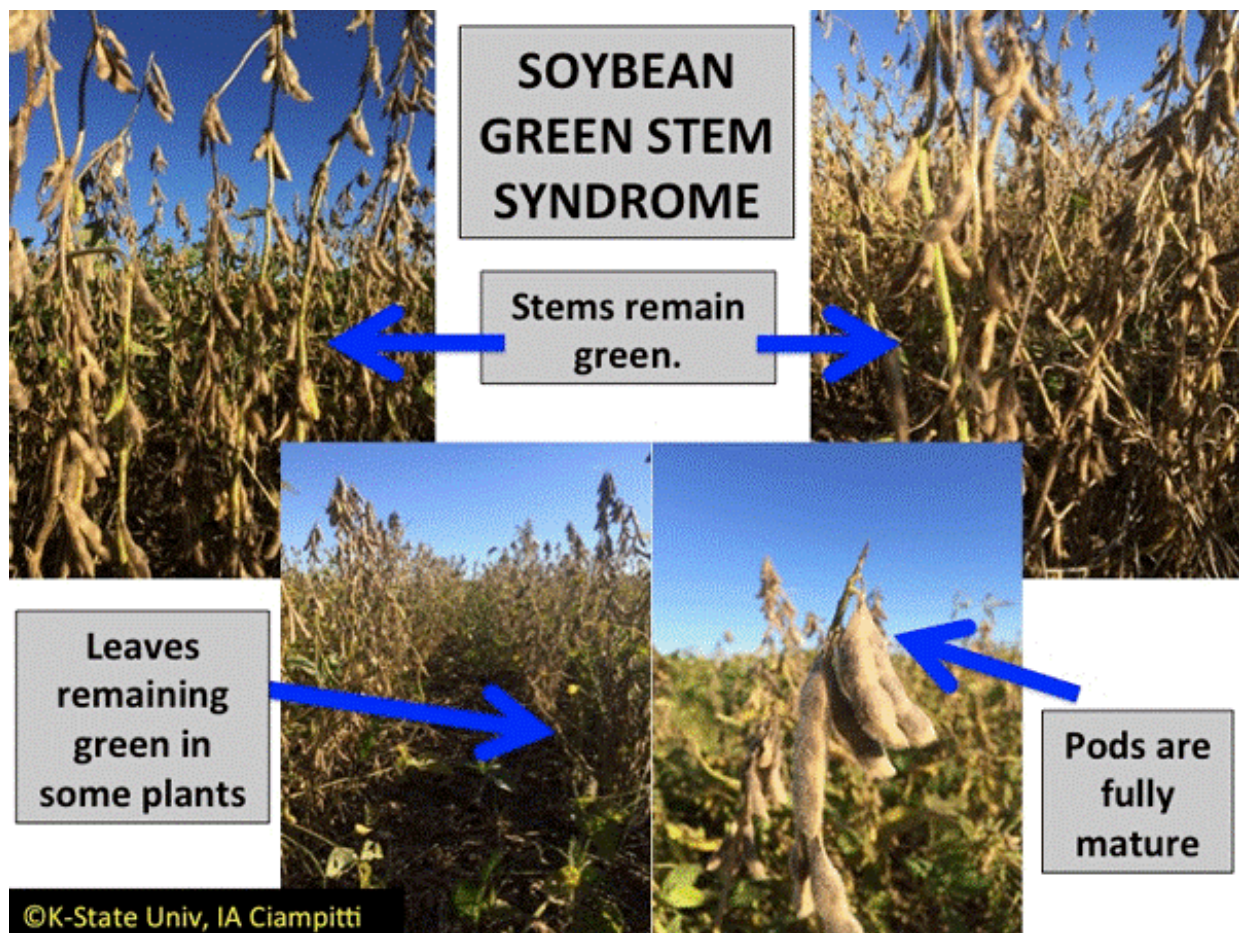
Green stem syndrome in soybean is a condition by which the stem remains green while the seeds are mature and ready to harvest. In parts of the state, there are many fields of soybeans with brown pods but green stems (Figures 1, 2, and 3). A hard freeze will kill the leaves and stems, but it still may take a while for the leaves to drop if leaves are still green.

Producers can either harvest these soybeans now if the seed moisture is dry enough, or wait until the leaves have dropped and the stems have dried down. In most cases, it would be best to harvest sooner rather than later to reduce losses from shattering and lower seed quality. Harvesting beans before the leaves have dropped can be messy and gum up the combine, but at least the yield level will be maintained. Harvesting soybeans with green stems can be challenging. Make sure harvesting equipment is sharp and in top condition, and take it slow in the field.



**Figure 1. Green stem syndrome in soybean is characterized by green stem and brown pods (seeds are mature). Infographic developed by Ignacio Ciampitti, K-State Research and Extension.**





**Figure 2. Green stem syndrome in soybeans. Infographic developed by Ignacio Ciampitti, K-State Research and Extension.**

### **Causes of green stem syndrome**

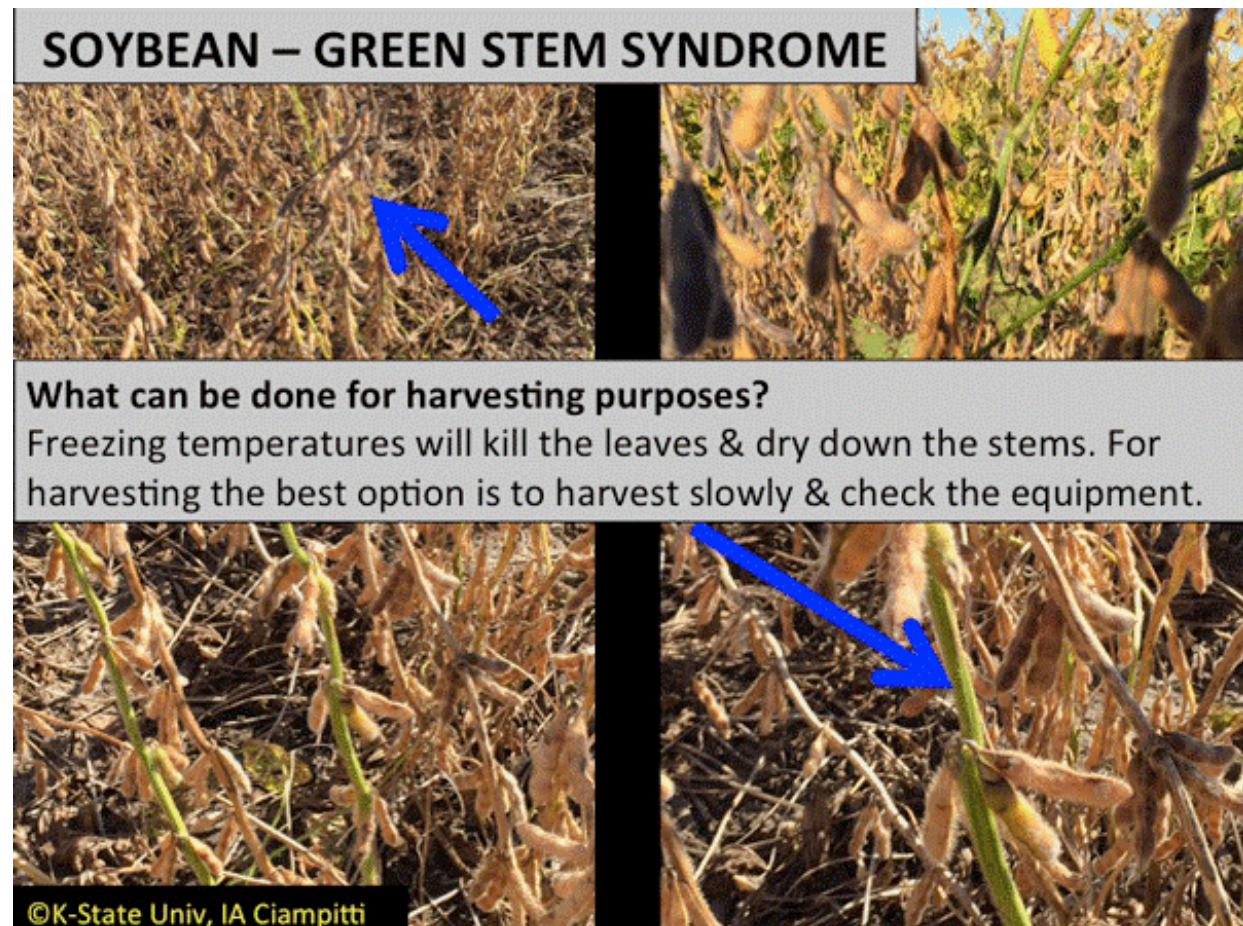
What causes this unusual situation? It's most likely due to a combination of early-season stress, low pod counts, and improved late-season growing conditions.

In a normal situation, soybeans will accumulate carbohydrates and proteins in the leaves and stems up until seeds begin to form (R5). The leaves provide the photosynthates needed by the newly formed seeds as they begin filling. As the seeds continue to get bigger, their need for photosynthates will eventually become greater than what the leaves can provide through photosynthesis. As this occurs, the plants will move carbohydrates and nutrients from the leaves and stems into the seeds. This can be referred to as "cannibalization" of the vegetative tissue (rapid senescence and defoliation), but it's a normal process. This eventually causes leaves to turn yellow and drop, and stems to turn brown and die.

The fewer the number of seeds, due to abiotic or biotic stresses, the lower the demand for photosynthates produced by leaves and stems. If demand is low enough, the leaves and stems are



never “cannibalized” for their carbohydrates and protein. As a result, the leaves and stems will remain green longer than normal, even up through physiological maturity of the beans. Late-season rainfall can make the problem worse by keeping the plants alive after the seeds have dried down. It will take either a frost or chemical desiccant to kill the leaves and stems in this situation. If the leaves are still green and intact when pods have turned brown and have reached 13-14% moisture, it’s almost always an indication of mid-season stress around flowering/pod set and low yield potential – at least relative to the amount of foliage produced.



**Figure 3. Green stem syndrome in soybeans and suggested harvesting operations. Infographic developed by Ignacio Ciampitti, K-State Research and Extension.**

### **What can be done for harvesting purposes?**

Eventually, freezing temperatures will kill the leaves and dry down the stems. Otherwise, the utilization of desiccants to kill leaves and drop the stem moisture down is a viable option, but only if the producer wants to harvest the field soon, before a freeze is likely to occur. If the stems and/or leaves are still green when the field is harvested, the best option is to harvest slowly and make sure the harvesting equipment is sharp and in excellent condition.

We recommend scouting your field right before harvest to better understand what environmental conditions led to the green stems. As always, make sure to time your harvest for the optimum seed moisture content in order to maximize the final grain volume to be sold. More information on soybean dry down rate can be found in eUpdate Issue 653 at <http://ksu.ag/2fXmws8>.

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

## 2. Fall musk thistle control

Musk thistle (*Carduus nutans*) continues to be a common and widespread noxious weed in Kansas. Musk thistle is primarily a biennial or winter annual species. Biennials take two growing seasons to complete their life cycle. Thistles that germinate in the spring will spend the entire summer as a rosette, live through the winter, and bolt the next year in May and June. Winter annual plants will germinate with moisture and warm temperatures in the fall, live through the winter, and bolt the following year.

Most people recognize musk thistle during the early summer when the plants are actively blooming (Figure 1, top photo). However, musk thistle is most easily controlled as a rosette (Figure 1, bottom photo).





**Figure 1. Musk thistle in flowering and rosette stages of growth. Photo courtesy of Walt Fick, K-State Research and Extension.**

Fall is an excellent time to spray musk thistle as all are in the rosette stage of growth. Another advantage for treatment in the fall is reduced risk of off-target drift. Waiting until most deciduous trees have lost their leaves and most crops are harvested will greatly reduce the likelihood of damage from herbicide drift. A wider window of opportunity for treating musk thistle also exists in the fall. The spraying window in the fall probably extends until the ground is frozen and the musk thistle plants have shut down activity until warmer temperatures in the spring. Freezing temperatures will start to damage musk thistle plants, with some yellowing and curling of leaves. However, the plants are susceptible to herbicides as long as green tissue exists.

Studies in Kansas indicated that a fall application of 2,4-D LVE at 2 lbs per acre was more effective (80% control) than a similar rate of 2,4-D amine (49% control). Dicamba + 2,4-D amine at 0.25 + 0.75 lbs per acre and picloram at 0.125 lbs per acre were also effective (>90% control) on musk thistle treated in the fall.

Data presented in Table 1 were collected in July 2013 following treatment on December 6, 2012. Conditions at the time of treatment were 50° F air temperature, 66% relative humidity, and 6-8 mph wind speed. Skies were overcast and cloudy. All treatments provided excellent control of rosettes present at the time of spraying (data not shown).

The data in this table reflect residual control of rosettes that germinated during spring 2013. The number of rosettes on untreated plots increased 92% between December 2012 and July 2013, indicating spring germination. The only treatment not providing nearly 100% residual control was 2,4-D LVE applied at 64 fl oz per acre. The active ingredient in Milestone is aminopyralid. Tordon 22K contains 2 lbs per gallon picloram. Chaparral contains aminopyralid and metsulfuron. These products are all labelled for use on range and pasture. Milestone, 2,4-D, and Tordon 22K are also labeled for use on non-cropland sites including roadsides, right-of-ways, and industrial sites. Opensight was not included in this test, but is a product similar to Chaparral that can be used on non-cropland sites.

**Table 1. Musk thistle control with herbicides applied on December 6, 2012.**

<b>Herbicide</b>	<b>Rate</b>	<b>% control, July 5, 2013</b>
Milestone	3 fl oz	99
Milestone	4 fl oz	100
Milestone	5 fl oz	100
Tordon 22K	10 fl oz	100
2,4-D LVE	64 fl oz	43
Chaparral	1.5 oz	100
Untreated	---	0

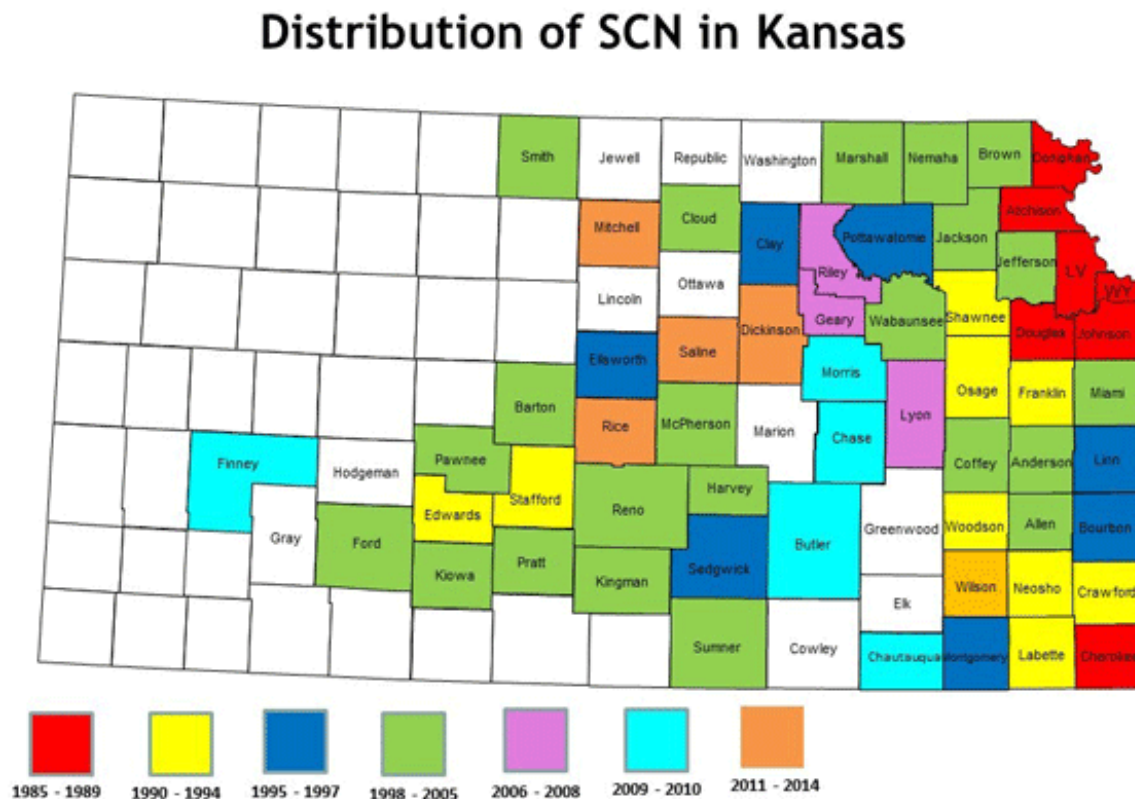


If you need to treat musk thistle this fall, herbicides exist that will not only control the rosettes at the time of application, but will carryover and control new emerging rosettes next spring. Select a warm, sunny day if possible when spraying musk thistle in the fall.

Walt Fick, Rangeland Management Specialist  
[whfick@ksu.edu](mailto:whfick@ksu.edu)

### 3. Consider sampling now for soybean cyst nematode

After harvest is an excellent time to soil sample for the soybean cyst nematode (SCN). Currently, 58 of Kansas's 105 counties are known to be infested (Figure 1).



**Figure 1. Current known soybean cyst nematode infested counties in Kansas. Map created by Doug Jardine, Extension Plant Pathologist.**

In fields currently infested, knowing your nematode population numbers is an excellent way to determine if your management plan is working. If numbers are going up, you will know that the population of nematodes in your field have overcome the resistance in the most recently planted soybean variety and that use of that variety should be discontinued in infested fields.

Sampling the soil in a known infested field is very similar to collecting a soil fertility sample. You will need a soil probe, a bucket, and a little elbow grease (Figure 2). Walk a "Z" or "W" pattern across the field. If the field was in soybeans in 2017, collect the cores from directly in the row, since that is where the nematodes are most likely to be found. One difference from fertility sampling is that the probe should be inserted to a depth of 6 – 8 inches. Collect 18 - 24 cores in the bucket. Mix the soil thoroughly, and then remove about a pint for the actual sample. Soil can be placed into the same

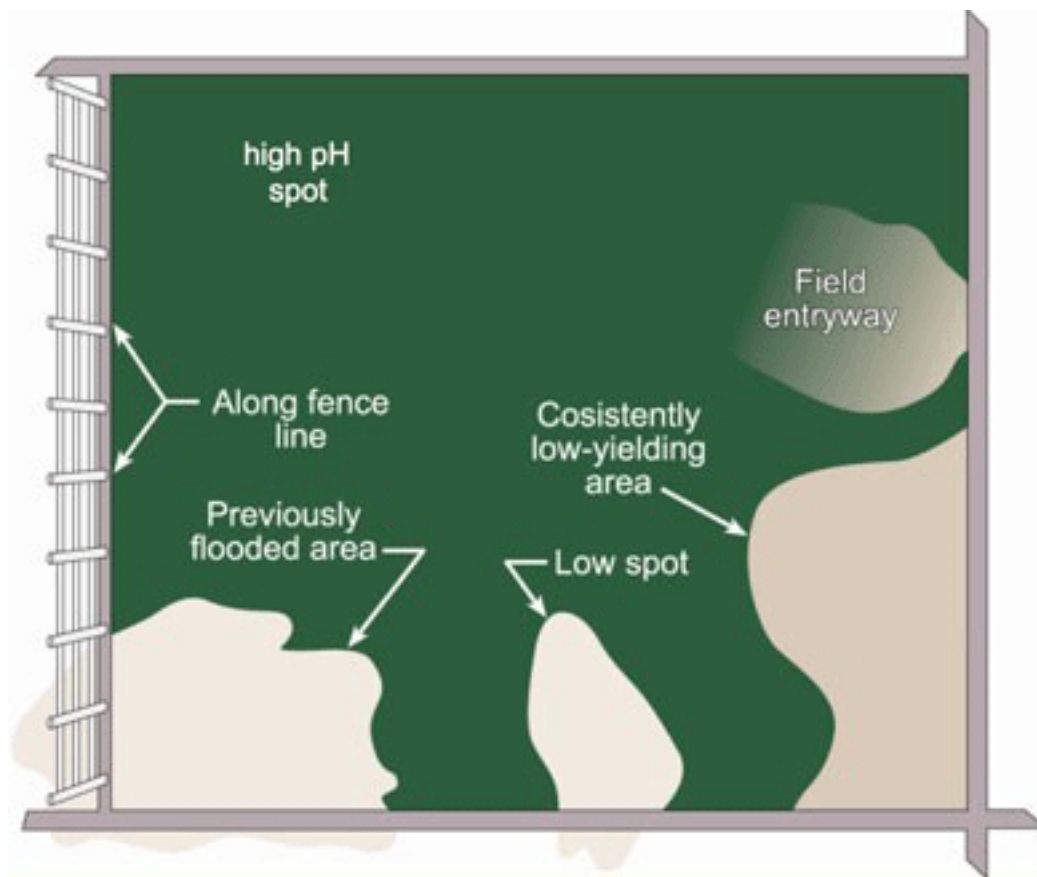
type of white sampling bag used for fertility samples or into a re-sealable, gallon-size plastic bag. Avoid freezing the soil or exposing it to excessive heat after collection.



**Figure 2. Tools needed for nematode sampling. Photo by Iowa State Extension Service.**

For fields with no history of SCN, you should concentrate on areas of the field that might be hot spots (Figure 3). Other than targeting potential hot spots, the sampling procedure is the same as outlined above.





**Figure 3. Hot spots in fields where soybean cyst nematodes are likely to be found. Photo courtesy of the Soybean Cyst Nematode Coalition.**

Samples can be taken to any K-State Research and Extension county office for shipping. They can also be sent directly to the K-State Plant Disease Diagnostic Laboratory:

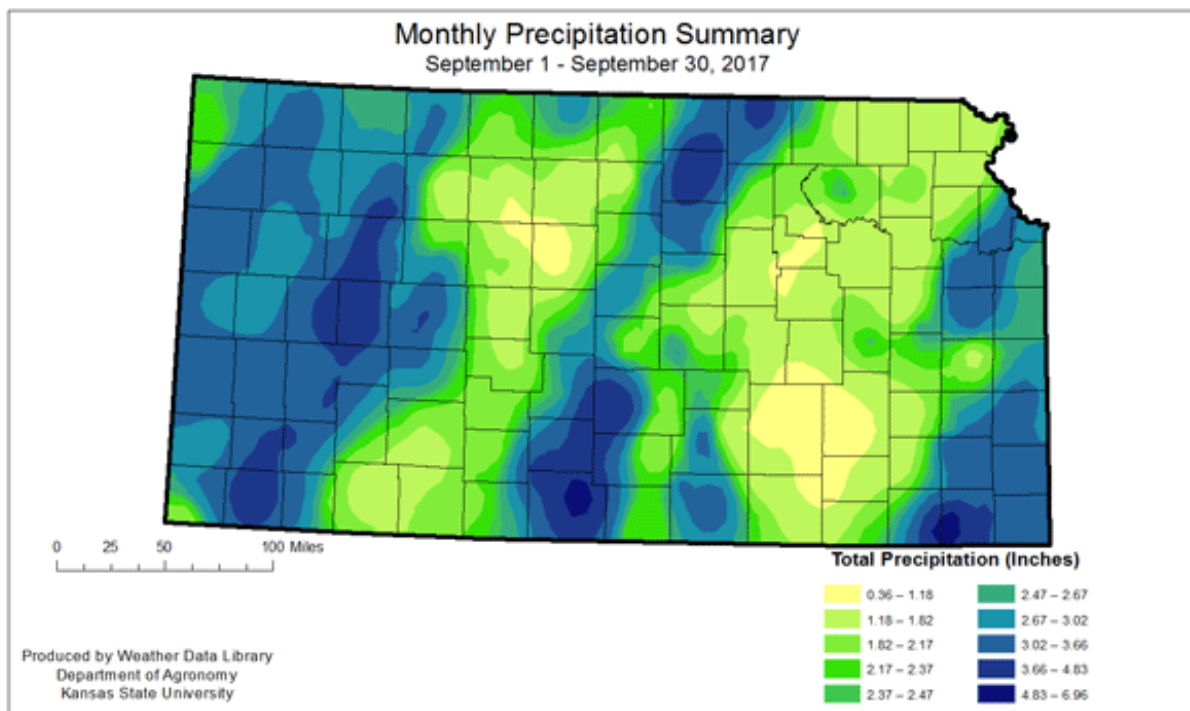
1712 Claflin Rd  
4024 Throckmorton PSC  
Manhattan, KS 66506

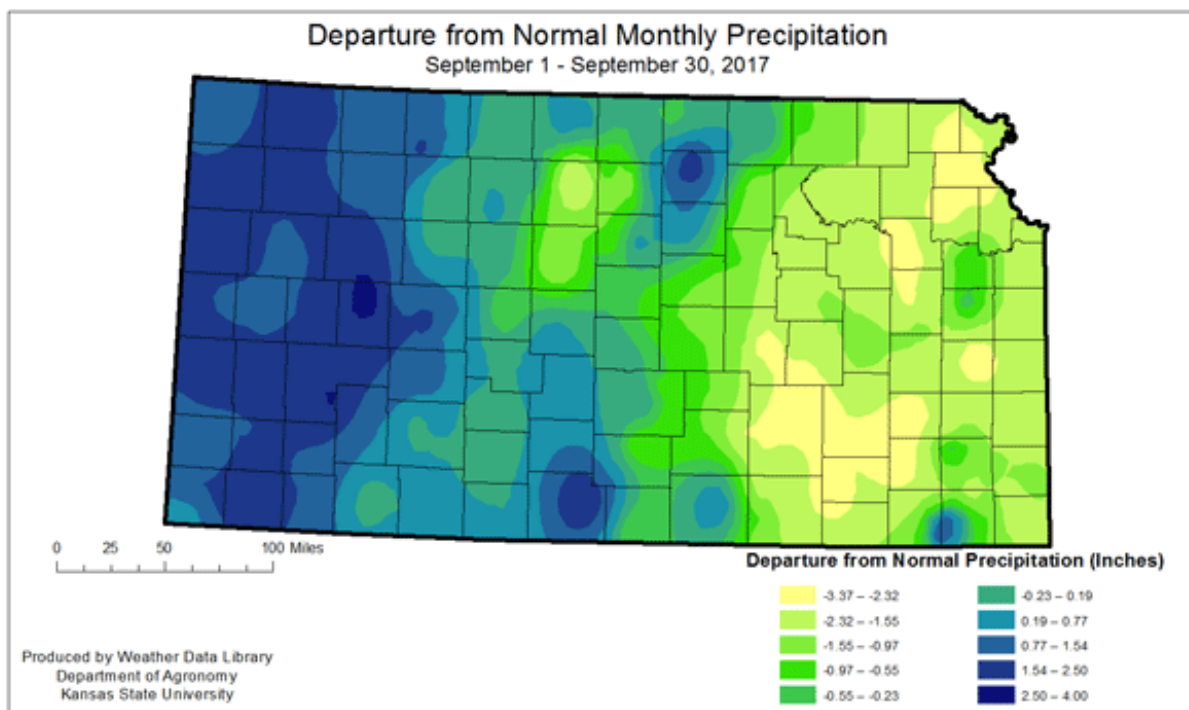
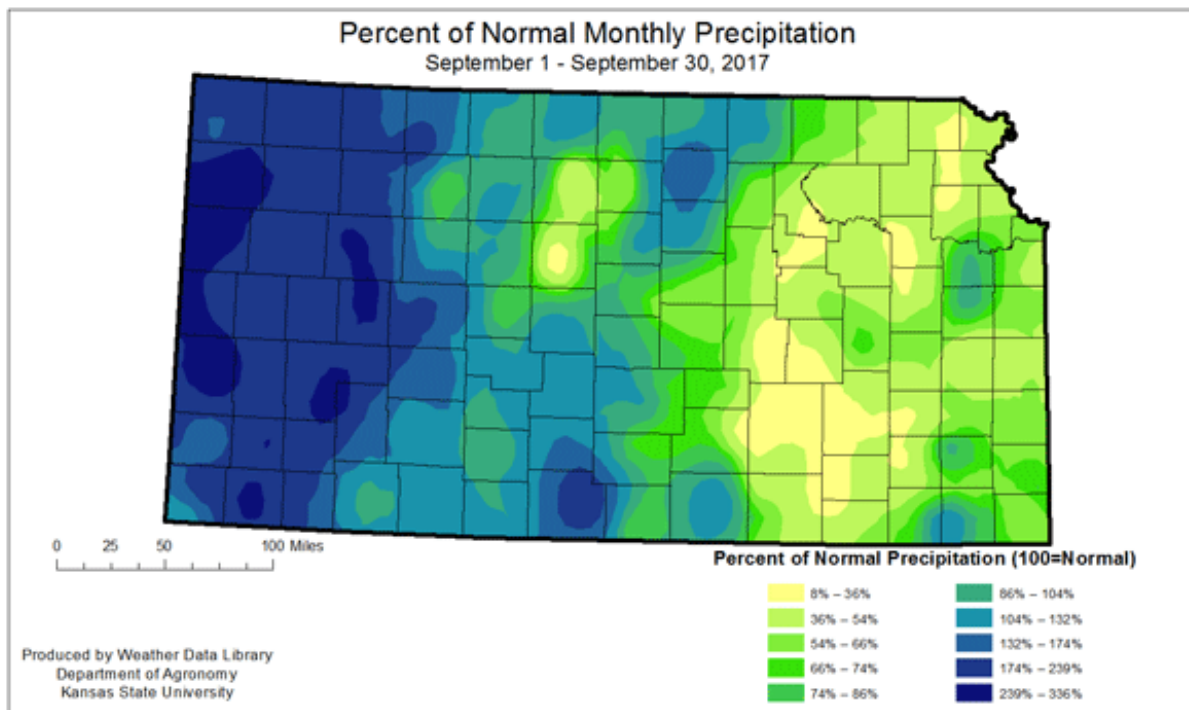
Keep in mind that if you are too busy to sample this fall, any time is a good time to sample for SCN. Unlike other nematodes that move up and down the soil profile depending on the season, the cysts are always there.

Doug Jardine, Extension Plant Pathologist  
[jardine@ksu.edu](mailto:jardine@ksu.edu)

#### 4. September weather summary: Wet for the west, drier for the east

September saw a split pattern in precipitation, with the heaviest rains in the western third of the state. All three western divisions saw greater than 100 percent of normal, as did the South Central Division. None of the eastern divisions saw even half of their normal rainfall. This wasn't as much of a challenge in the East Central Division, which saw the only heavy precipitation in August. Statewide average precipitation was 2.09 inches or 94 percent of normal. Despite the overall low precipitation in the eastern third of the state, the greatest monthly total at a National Weather Service Coop (NWS) station was 6.79 inches at Mound Valley 3WSW, Labette County. The greatest monthly total at a Community Collaborative Rain Hail and Snow (CoCoRaHS) network station was 6.98 inches at Medicine Lodge 0.4 WSW, Barber County. The greatest daily totals for each network: 5.91 inches at Mound Valley 3WSW, Labette County, on the 19th (NWS); 6.40 inches at Preston 1.2 SE, Pratt County, on the 26th (CoCoRaHS).

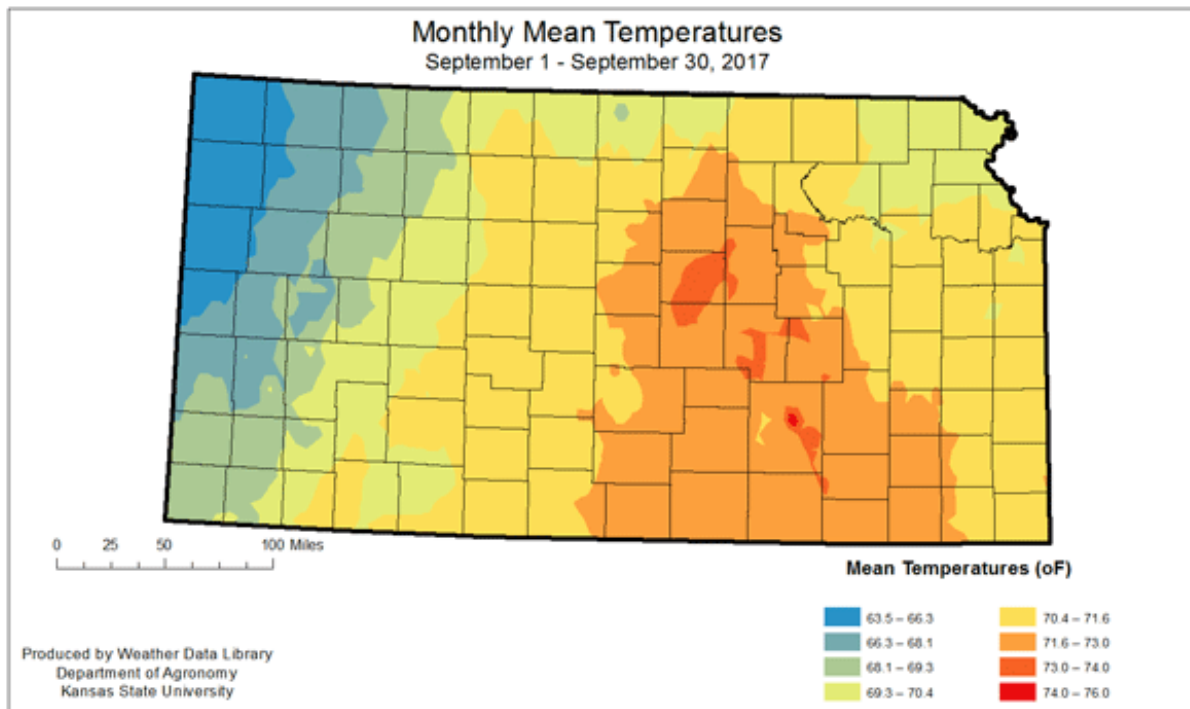


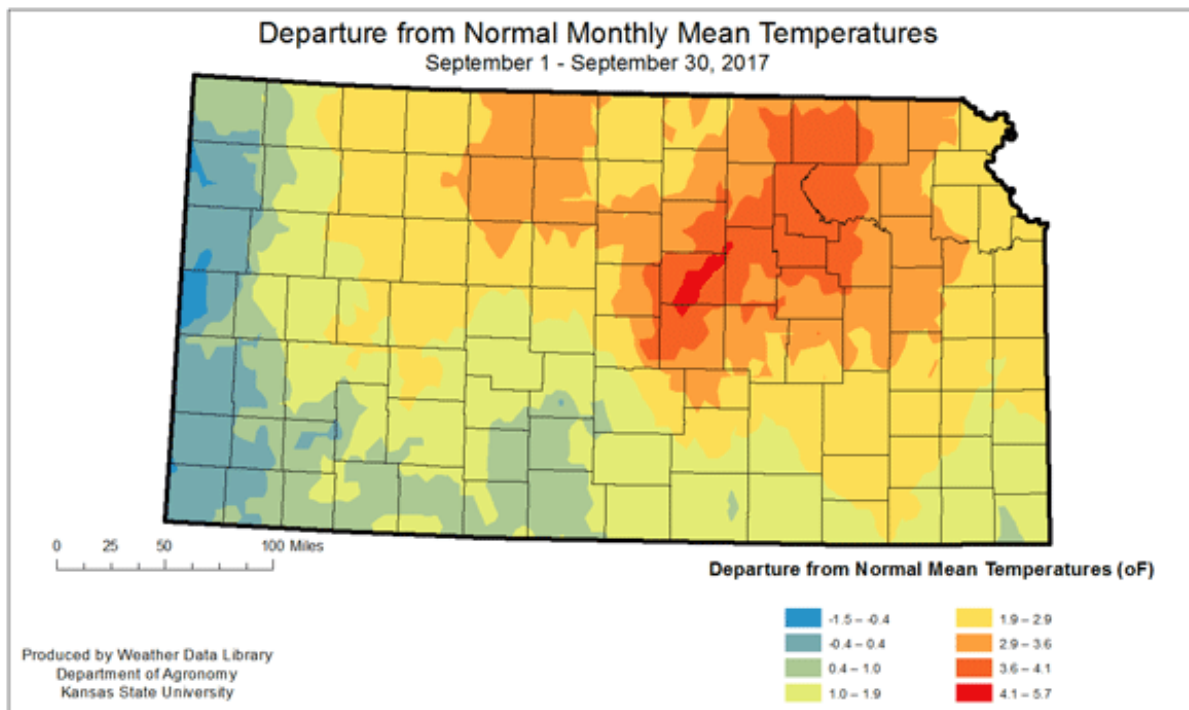


Temperatures averaged warmer-than-normal across all divisions. With all the rain, it isn't surprising that the western divisions came closest to normal for the month. The Southwest Division averaged 68.9 degrees F, or just 0.3 degrees warmer-than-normal. In contrast, the Northeastern Division averaged 70.5 degrees F or 3.2 degrees warmer-than-normal. The warmest reading for the month



was 102 degrees F recorded at multiple locations and dates. The latest of those at Alton 6ESE on the 22nd. The coldest reading was 30 degrees F reported at Brewster 4W, Thomas County on the 6th. Most of the departure from normal came on the low temperature side. There were 67 new daily records for warm minimum temperatures, and only 51 new daily records for high maximum temperatures. Despite the warmth, there were 26 new record cold minimum temperatures and 6 new record low maximum temperatures. None of these set new records for the month.





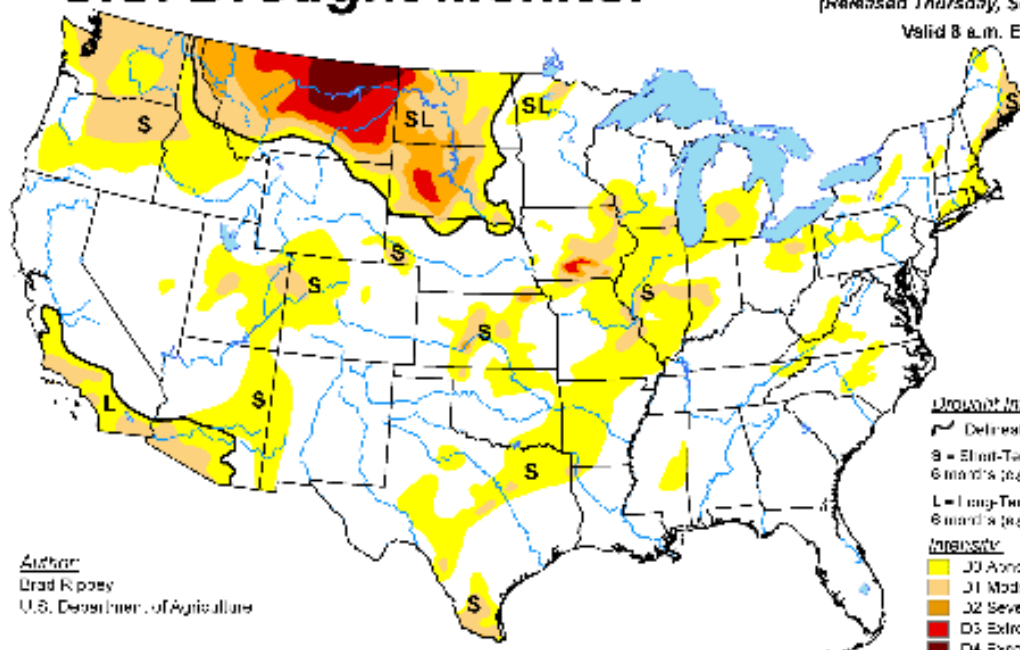
Severe weather was extremely limited this month. The Storm Prediction Center's data base only notes two hail events in September and no records of wind damage or tornadoes. The most damaging event of the month was the flooding in south central Kansas following the heavy rains from September 25-26th.

The variable precipitation coupled with warmer-than-normal temperatures resulted in expansion of the abnormally dry condition. Areas of the state with much lower-than-normal precipitation had an expansion of moderate drought.

The October outlook calls for wetter-than-normal conditions from southwest to north central Kansas, with equal chances of above- or below-normal precipitation across the rest of the state. This is coupled with increased chances of above-normal temperatures in the eastern half of the state, with equal chances of above- or below-normal temperatures across the rest of the state. The much cooler-than-normal temperatures that have started the month will reduce some of the evaporative demand and the rainy start will alleviate some of the drought.

# U.S. Drought Monitor

September 26, 2017  
(Released Thursday, Sep. 28, 2017)  
Valid 8 a.m. EDT



Author:  
Brad Kippes  
U.S. Department of Agriculture

## Drought Impact Types:

- Short-Term hydrology less than 6 months (e.g., agriculture, groundwater)
- Long-Term hydrology greater than 6 months (e.g., hydrology, ecology)
- Long-Term hydrology greater than 6 months (e.g., hydrology, ecology)

## Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on local scale conditions. Local conditions may vary. See accompanying text summary for further statements.



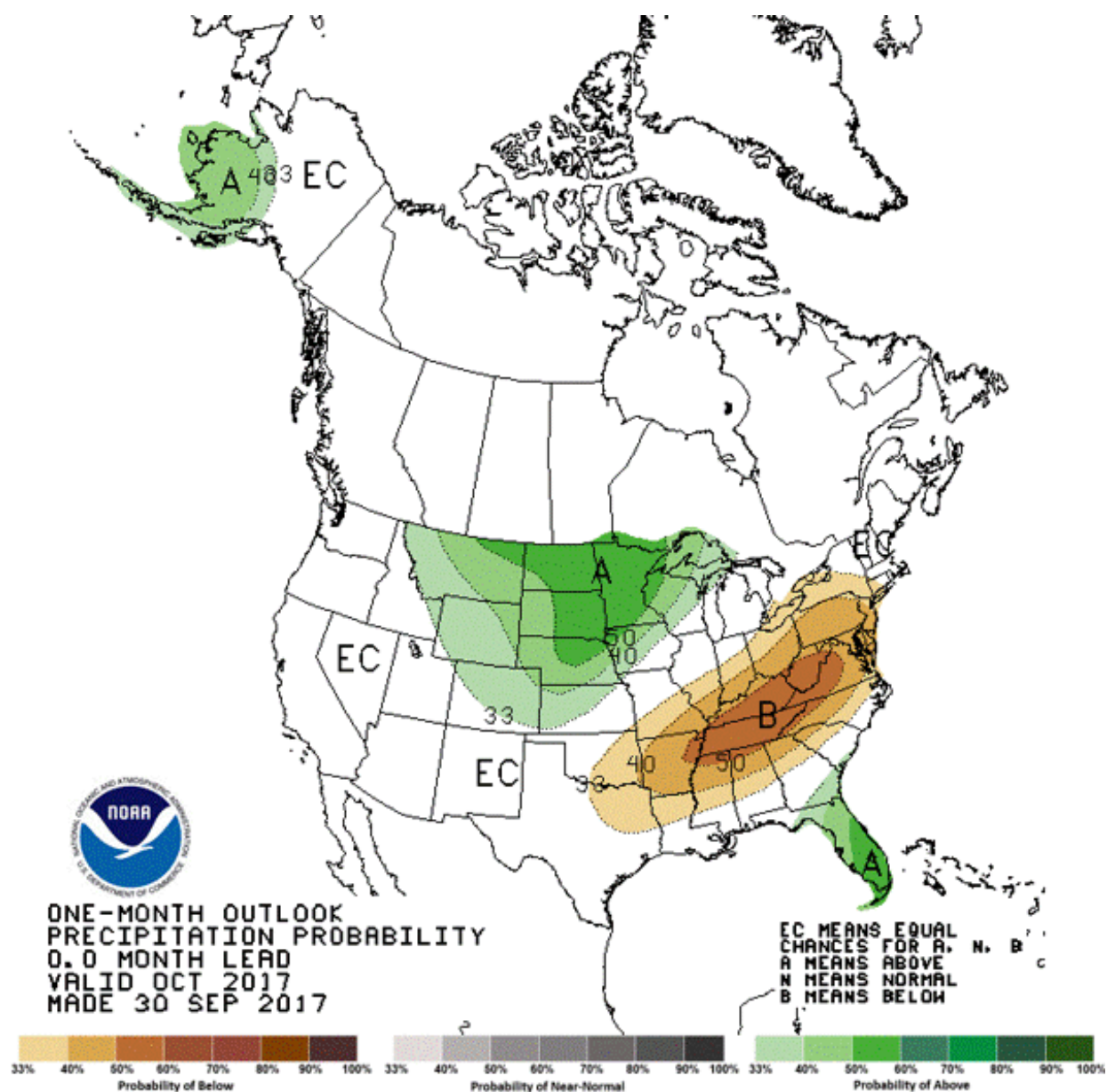
<http://droughtmonitor.unl.edu/>

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Sep-17										
Kansas Climate Division Summary										
Precipitation (inches)							Temperature (°F)			
Sep-17			2017 through September						Monthly Extremes	
Division	Total	Dep.	% Normal	Total	Dep.	% Normal	Ave	Dep.	Max	Min
Northwest	1.71	0.19	110	18.41	0.00	100	66.1	0.9	102	36
West Central	2.62	1.02	167	21.25	3.36	119	67.4	1.1	100	36
Southwest	2.45	0.83	154	23.11	6.05	136	68.9	0.3	101	42

<b>North Central</b>	2.37	-0.26	91	23.45	-0.49	97	70.9	3.1	102	41
<b>Central</b>	1.69	-0.82	70	22.85	-2.14	92	72.2	3.1	101	40
<b>South Central</b>	2.80	0.20	110	28.34	2.27	109	71.6	1.4	99	43
<b>Northeast</b>	1.44	-2.17	41	26.02	-3.25	88	70.5	3.2	94	42
<b>East Central</b>	1.74	-1.92	45	29.31	-1.95	92	70.9	2.7	96	42
<b>Southeast</b>	1.54	-2.47	37	35.84	2.42	106	71.6	2.0	98	43
<b>STATE</b>	2.09	-0.53	94	25.69	1.07	105	70.0	2.0	102	36
1. Departure from 1981-2010 normal value										
2. State Highest temperature: 102 degrees F at multiple locations/dates; latest at Alton 6ESE on the 22nd.										
3. State Lowest temperature: 30 degrees F at Brewster 4W, Thomas County, on the 6th.										
4. Greatest 24hr: 5.91 inches at Mound Valley 3WSW, Labette County, on the 19th (NWS); 6.40 inches at Preston 1.2 SE, Pratt County, on the 26th (CoCoRaHS).										
<b>Source: KSU Weather Data Library</b>										

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

## 5. The spotlight is on cover crops at the 2017 Agronomy Field Day, November 3

Exciting advances in cover crop research will be featured at the 2017 Agronomy Field Day on November 3 at the Ashland Bottoms Research Farm in Manhattan. Topics will focus on understanding the role cover crops play in water quality, weed control, soil quality, and more.

The full list of topics and K-State speakers:

- Using cover crops for weed suppression – Anita Dille, Weed Ecology
- Improving soil quality with cover crops – DeAnn Presley, Soil Management Specialist
- Protecting surface water with healthy soils, cover crops, and fertilizer management – Nathan Nelson, Soil Fertility and Nutrient Management
- Soybean yields and cover crops – Ignacio Ciampitti, Crop Production Specialist and Doug Shoup, South East Area Agronomist.
- Ten years of cover crops in a no-till wheat-sorghum-soybean rotation – Kraig Roozeboom, Cropping Systems Agronomist
- Cover crops and nitrogen management – Peter Tomlinson, Environmental Quality Specialist

The field day will begin with registration at 9 a.m. and wrap up at 1 p.m. Sessions include two concurrent one-hour tours in the morning, starting at 9:30, followed by a poster session during and after lunch.

There is no charge to attend, and a complimentary lunch will be available. Preregistration is requested by October 30<sup>th</sup> so that a lunch count can be made. To preregister online, see: <https://agron-field-day-2017.eventbrite.com>. You can also preregister by calling Troy Lynn Eckart at 785-532-5776. On-site registration will also be available.

For more information, interested persons can contact Dorivar Ruiz Diaz at 785-532-6183 or [ruizdiaz@ksu.edu](mailto:ruizdiaz@ksu.edu)



# Cover Crops Field Day

Ashland Bottoms Research Farm

November 3, 2017

## Topics and K-State speakers:

Using cover crops for weed suppression

Anita Dille

Improving soil quality with cover crops

DeAnn Presley

Protecting surface water with healthy soils, cover crops, and fertilizer management

Nathan Nelson

Soybean yields and cover crops

Ignacio Ciampitti and Doug Shoup

Ten years of cover crops in a no-till wheat-sorghum-soybean rotation

Kraig Roozeboom

Cover crops and nitrogen management

Peter Tomlinson

## Schedule:

Registration at 9 a.m. (lunch included)

Sessions include two concurrent one-hour tours in the morning

Poster session during and after lunch.

## Registration:

Please register online by October 30 at:

[agron-field-day-2017.eventbrite.com](http://agron-field-day-2017.eventbrite.com)

or by phone: 785-532-5776

For more information contact:

Dorivar Ruiz Diaz

785-532-6183 | [ruizdiaz@ksu.edu](mailto:ruizdiaz@ksu.edu)

## Directions to Ashland Bottoms Research Farm:

- From K-177 Highway (south of the Kansas River Bridge): turn west on McDowell Creek Road and follow it 7.4 miles, turn right (north) on W. 40th Ave. and travel 1.2 miles
- From Interstate 70, take Exit 307 and follow McDowell Creek Road 3.6 miles north before turning left (north) on W. 40th Ave and follow it 1.2 miles north.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Kansas State University Department of Agronomy

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## 6. Comparative Vegetation Condition Report: September 26 - October 2, 2017

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

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 28-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.

The Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography, and his pioneering work in this area is gratefully acknowledged.

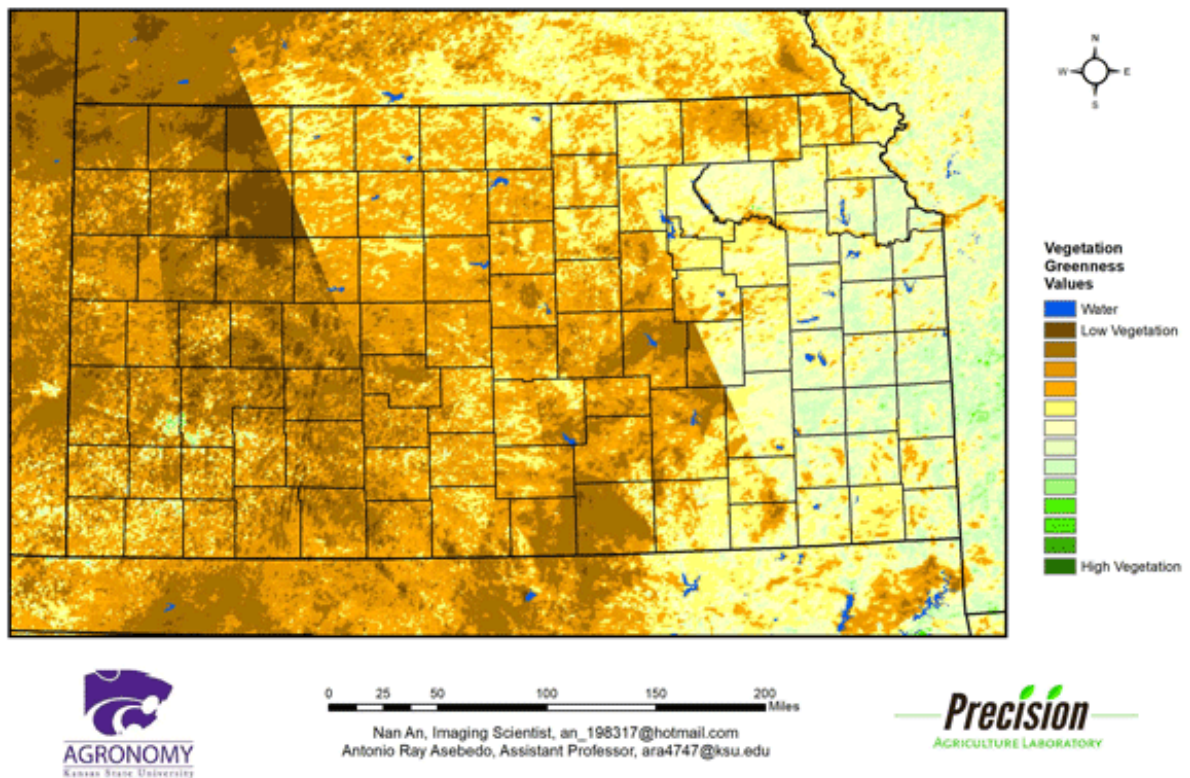
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

## Kansas Vegetation Condition

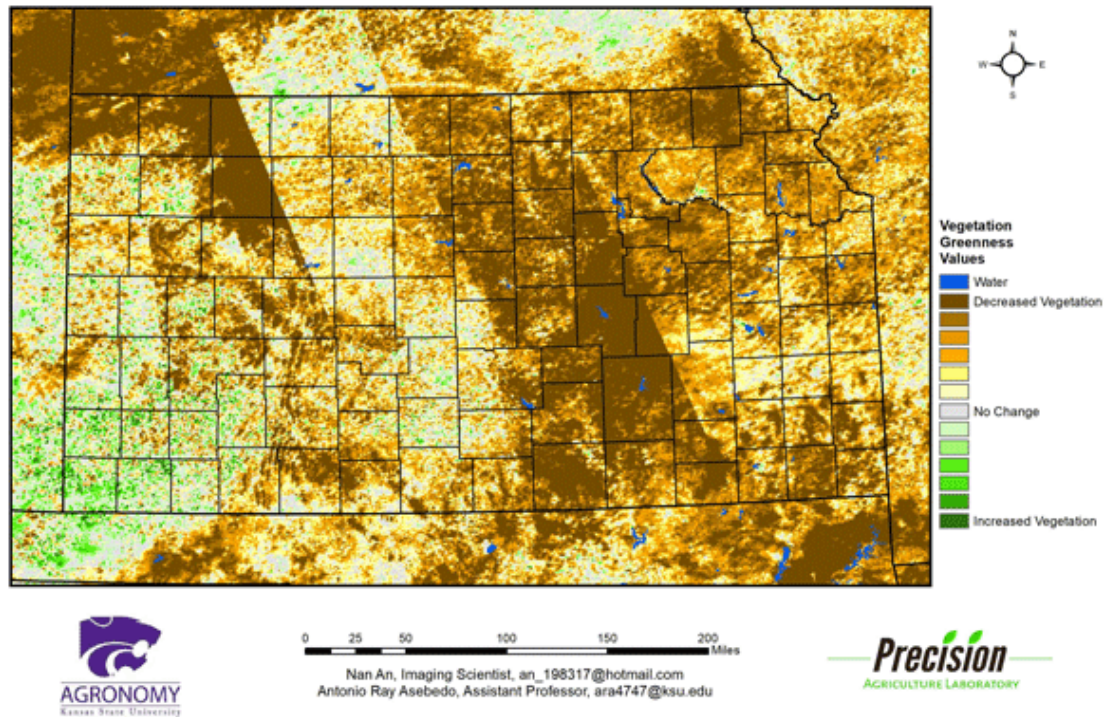
Period 40: 09/26/2017 - 10/02/2017



**Figure 1. The Vegetation Condition Report for Kansas for September 26 – October 2, 2017 from K-State’s Precision Agriculture Laboratory shows very little vegetative activity this week. The greatest area of photosynthetic activity is in southeast Kansas. Recent warm dry weather has increased crop maturity and reduced photosynthetic activity. The sharp lines are due to cloud contamination.**



Kansas Vegetation Condition Comparison  
Late-Sept/Early-Oct 2017 compared to the Late-Sept/Early-Oct 2016

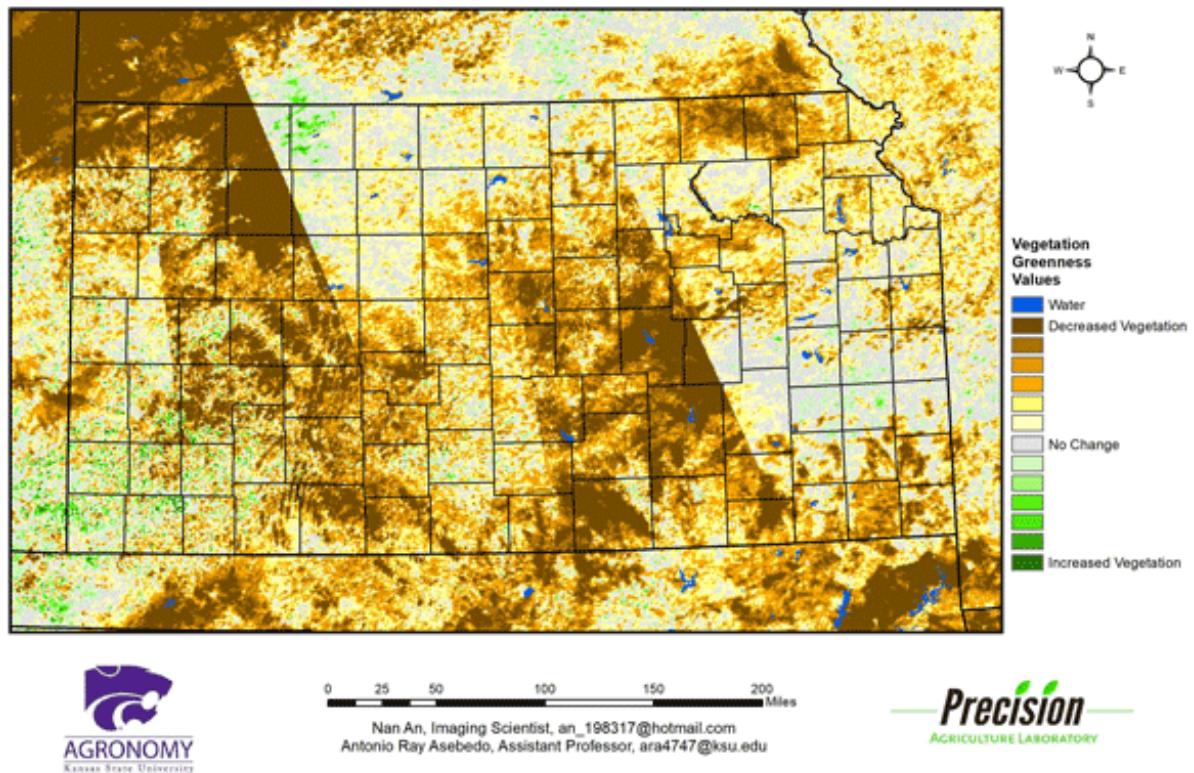


**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for September 26 – October 2, 2017 from K-State’s Precision Agriculture Laboratory shows lower vegetative activity across the eastern two thirds of the state. Much of that is due to increased cloud cover. The impact of the continued rains in southwest Kansas are visible as higher vegetative activity this year.**



## Kansas Vegetation Condition Comparison

Late-Sept/Early-Oct 2017 compared to the 28-Year Average for Late-Sept/Early-Oct



**Figure 3. Compared to the 28-year average at this time for Kansas, this year's Vegetation Condition Report for September 26 – October 2, 2017 from K-State's Precision Agriculture Laboratory above-average activity is confined to the western third of the state. Increasing drought stress has reduced vegetative activity in parts of central Kansas and in northeast Kansas, particularly in Nemaha and Marshall Counties.**

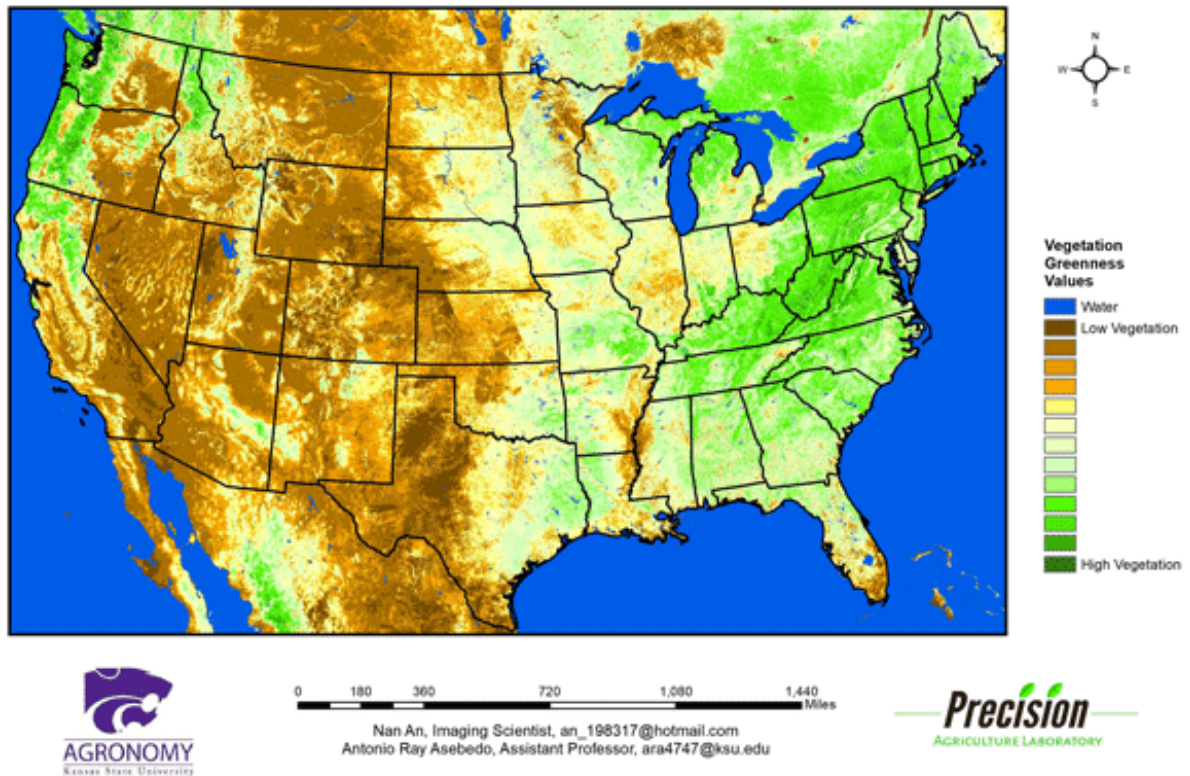
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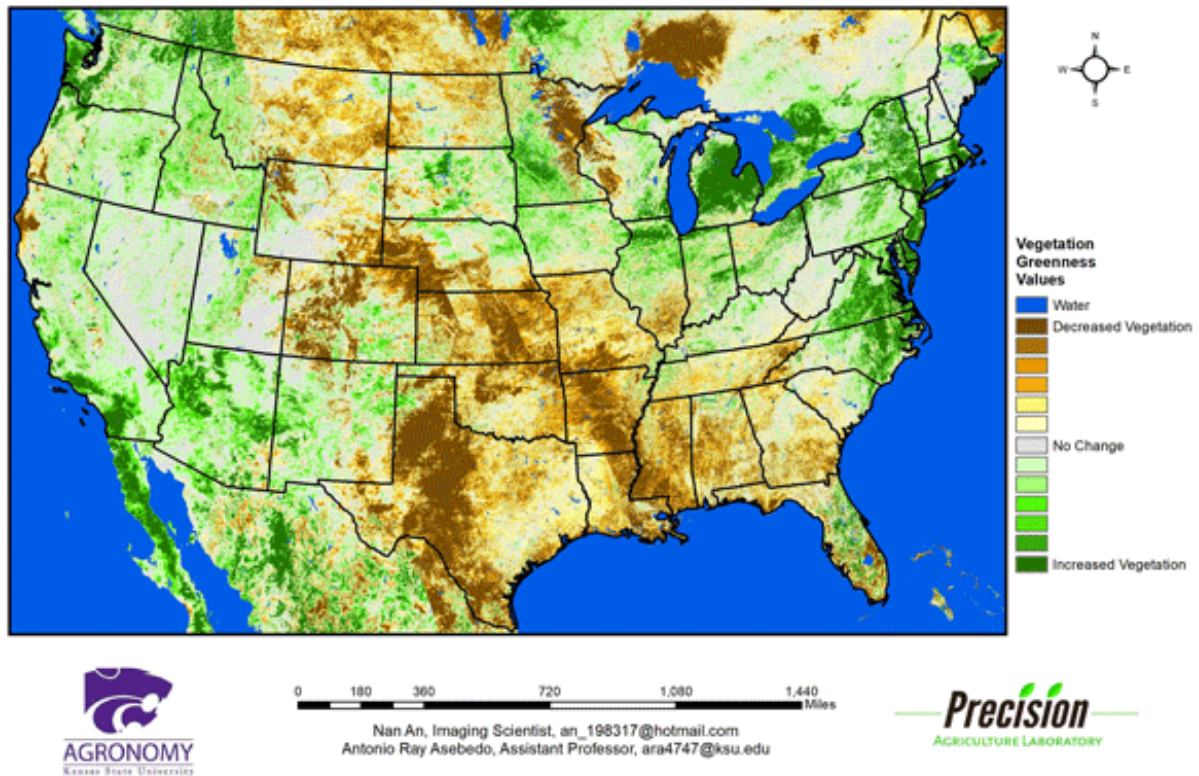
## Continental U.S. Vegetation Condition

Period 40: 09/26/2017 - 10/02/2017



**Figure 4. The Vegetation Condition Report for the U.S for September 26 – October 2, 2017 from K-State’s Precision Agriculture Laboratory shows the highest NDVI values centered across the Great Lakes into upper New England. A second area of higher vegetative activity is also visible along the Carolinas, where the recent rainfall has reduced drought stress. Extremely low NDVI values continue to highlight the severe drought in eastern Montana and western South Dakota, while the excess rainfall along the Gulf Coast is beginning to show visible impacts. The West Coast continues to have high vegetative activity.**

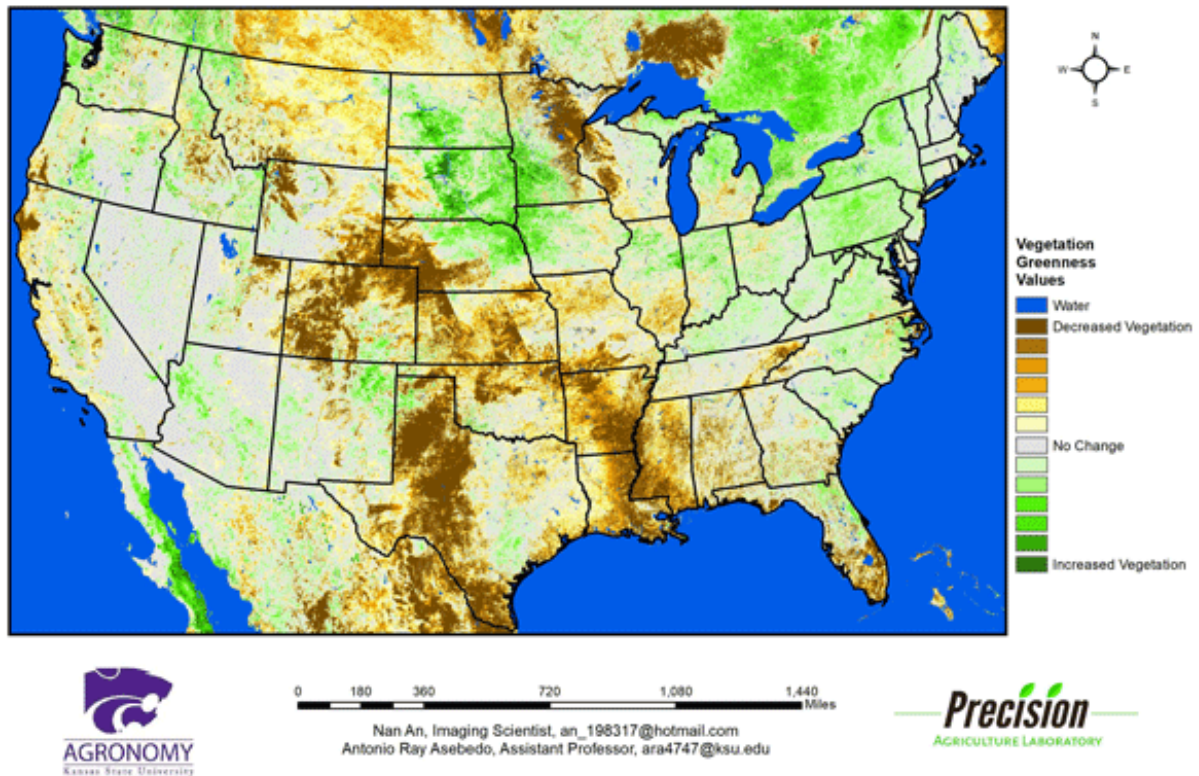
Continental U.S. Vegetation Condition Comparison  
Late-Sept/Early-Oct 2017 Compared to Late-Sept/Early-Oct 2016



**Figure 5. The U.S. comparison to last year at this time for September 26 – October 2, 2017 from K-State’s Precision Agriculture Laboratory again shows the impact that split in moisture has caused this year. Much higher NDVI values are visible across the Upper Midwest with slightly lower values in the Plains. In contrast, the desert Southwest has much higher NDVI values than last year at this time. Pockets of low NDVI values in Colorado and Wyoming are the result of early mountain snows.**



Continental U.S. Vegetation Condition Comparison  
Late-Sept/Early-Oct 2017 Compared to 28-year Average for Late-Sept/Early-Oct



**Figure 6. The U.S. comparison to the 28-year average for the period of for September 26 – October 2, 2017 from K-State’s Precision Agriculture Laboratory shows the drought impacts in the northern Plains are visible as below-average NDVI values. In Louisiana and the Ohio River Valley, below-average NDVI values are associated with cloud cover and rain from recent storm systems. Higher-than-average vegetative activity is visible in the Northern Plains where rainfall and temperatures have been favorable, in contrast to most of the summer.**

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

Ray Asebedo, Precision Agriculture  
[ara4747@ksu.edu](mailto:ara4747@ksu.edu)

Nan An, Imaging Scientist  
[an\\_198317@hotmail.com](mailto:an_198317@hotmail.com)