



## Extension Agronomy

# eUpdate

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*08/04/2017*

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), 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. Planting spring oats and turnips in the fall for forage

Most producers plant spring oats in spring. However, spring oats can be planted in late summer as well for fall and early winter grazing. Spring oats will die out after the first hard freeze in the mid 20's.

Oats are a high-quality forage, almost as good as wheat. Since oats do not have awns, cattle can graze them easily.

Is it possible to plant oats and turnip at the same time? The answer is yes. Some wildlife hunters plant oats and turnips for their deer food plots in the fall. Producers can use the same concept for beef grazing in the fall.

Forage turnip is one of forage brassicas (forage rape, turnip, kale, and swedes) and has very high nutritive value with 24 - 25% crude protein in leaves and 16-18% crude protein in the bulbs. Forage turnip has high moisture content, so it's not suitable for hay. The high moisture content of forage turnip can also be too "washy" for livestock, so it is recommended that animals have free choice of dry hay or dry forage along with the turnips.

? and turnip can be planted at the same time using a grain drill with a second, small seed box for turnip seed. If a small seed box isn't available, the turnips can be broadcast ahead of oat drilling. The soil disturbance from the drill is generally enough to get the turnip started after a rain. The seeding rate for oats is 50 to 75 pounds per acre, depending how early it's planted and moisture availability. For example, in eastern Kansas and under irrigation, seeding rates would be at the higher end of this range, or even higher. Seeding rates would also be higher when planting dates are later, although at later planting dates there will be less forage and higher seed costs. For turnip, the seeding rate is 2 pounds per acre.

Turnip is more winter hardy than oats, and can continue to grow into winter while maintaining its greenness even under snow cover. To have more growth, about 50 lbs nitrogen per acre can be applied at planting. If the oats and turnips are planted after a failed corn or sorghum crop, the oats and turnips may not need this much applied nitrogen. Both oats and turnips can accumulate high nitrates so be careful. Forage should be tested prior to grazing. Samples can be submitted for analysis through the local county Extension office.

Potential yield for an oats and turnip mixture might be 2 to 3 tons dry matter tons per acre. Depending on the soil moisture condition, producers can start grazing about 6 to 8 weeks after oats and turnips are planted.



**Figure 1. Spring oats and turnip pasture. Photo by Doug Shoup, K-State Research and Extension.**

Doo-Hong Min, Forage Agronomist  
[dmin@ksu.edu](mailto:dmin@ksu.edu)

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

Doug Shoup, Southeast Area Crops and Soils Specialist  
[dshoup@ksu.edu](mailto:dshoup@ksu.edu)

## 2. New gene for wheat streak mosaic resistance

(Note: The following is a slightly edited transcript of a short K-State Research and Extension video by Dan Donnert, KSRE videographer. The video can be seen at: <https://youtu.be/tYVer0N4Z8g> – Steve Watson, Agronomy eUpdate Editor)

Wheat streak mosaic has caused massive losses to the 2017 wheat crop, especially in the western part of the state. The complicating factor with wheat streak mosaic is that, as a virus, it does not respond to fungicides. Therefore, where it takes hold in a wheat field it can dig deeply into yields.

Kansas State University researchers have now identified a new gene that will provide resistance to the wheat streak mosaic virus. The so-called “wsm3” gene is just the third gene known to provide resistance to wheat streak and the first that can do so at temperatures of 75 degrees F and higher.

The first two genes to provide resistance to the virus were “wsm1,” which was identified by K-State scientists about 25 years ago, and “wsm2,” which was discovered by researchers at Colorado State University. But those two genes only provide protection at lower temperatures.

The technology has improved considerably since then to where scientists eventually identified wsm3, also derived from wheatgrass.

“Six years ago we had a whole arm translocation. Once we had this we used directed chromosome engineering to shorten the intermediate segment to make it smaller and finally came up with a chromosome with only a small piece of wheatgrass chromosome attached. Then integrated it into wheat. The gene involved was named wsm3,” says K-State plant pathologist Bernd Friebe.

Used in combination with wsm1 or wsm2, this warmer-weather-friendly wsm3 gene could become part of a breeding mix that could give wheat producers much-needed relief from wheat streak mosaic troubles.

“We have produced this chromosome now in much, much smaller segments and we are screening these wheat lines now to see if they have maintained the wsm3 gene. This material will then be distributed to breeding companies, which will go into cultivar development,” Friebe says.

It’s been a quarter of a century of diligent research work to get to this point.

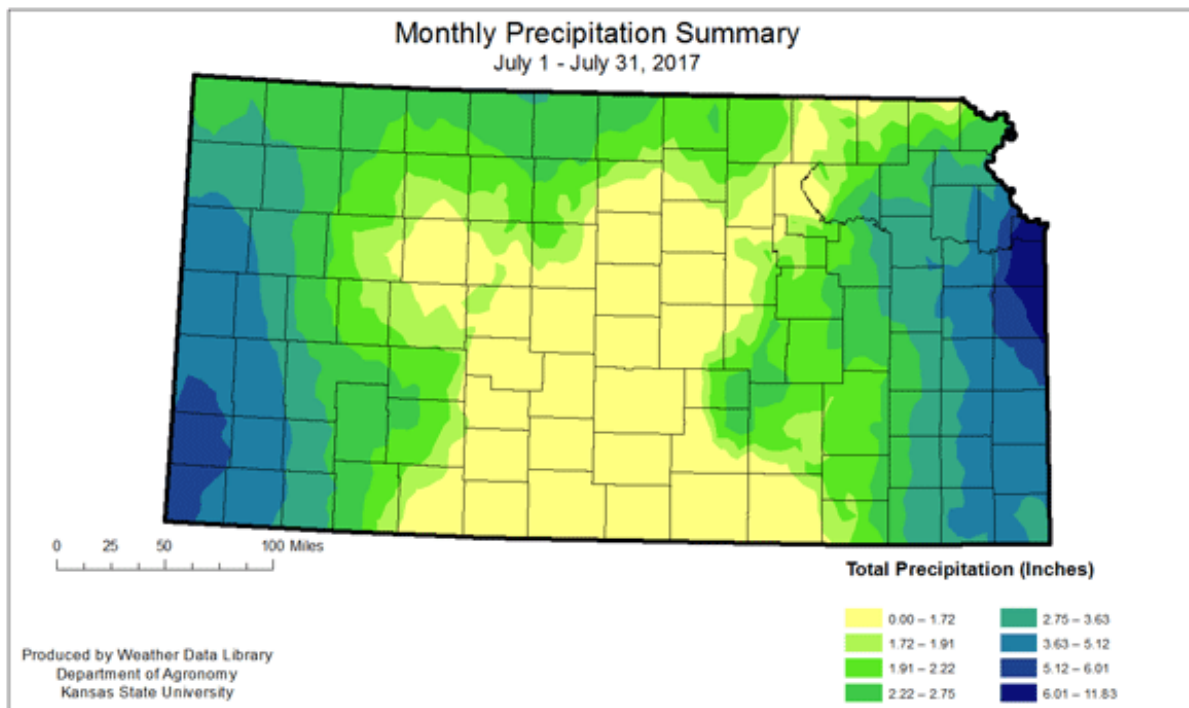


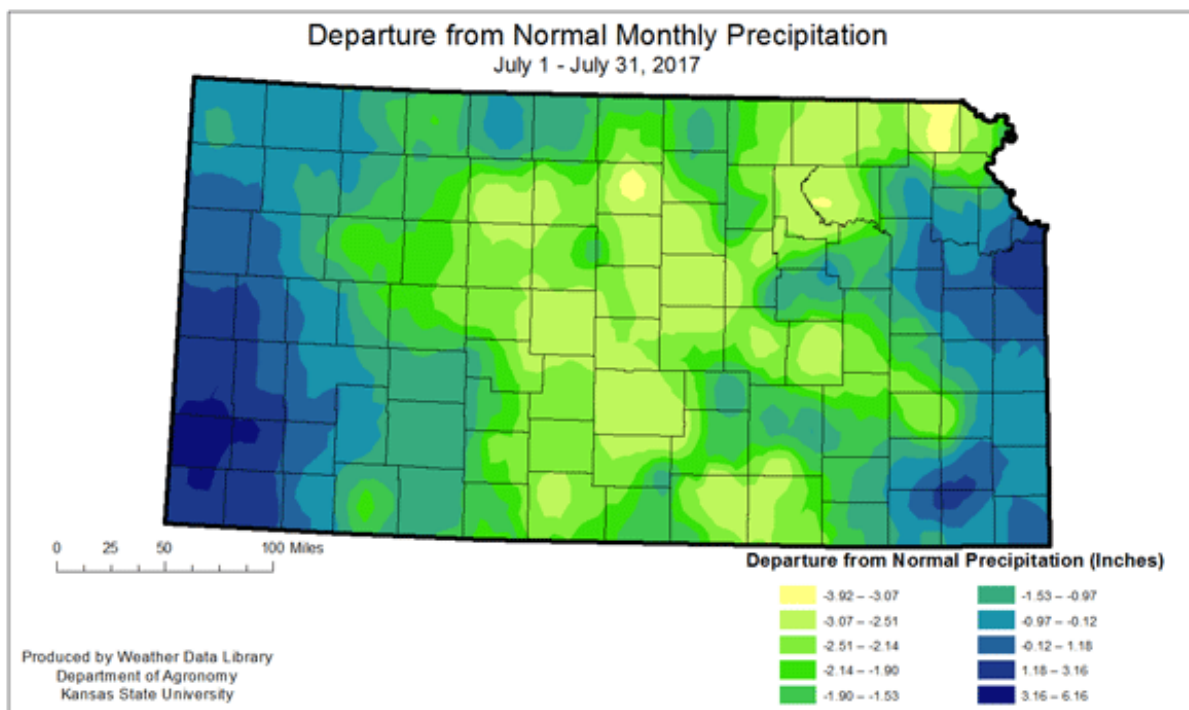
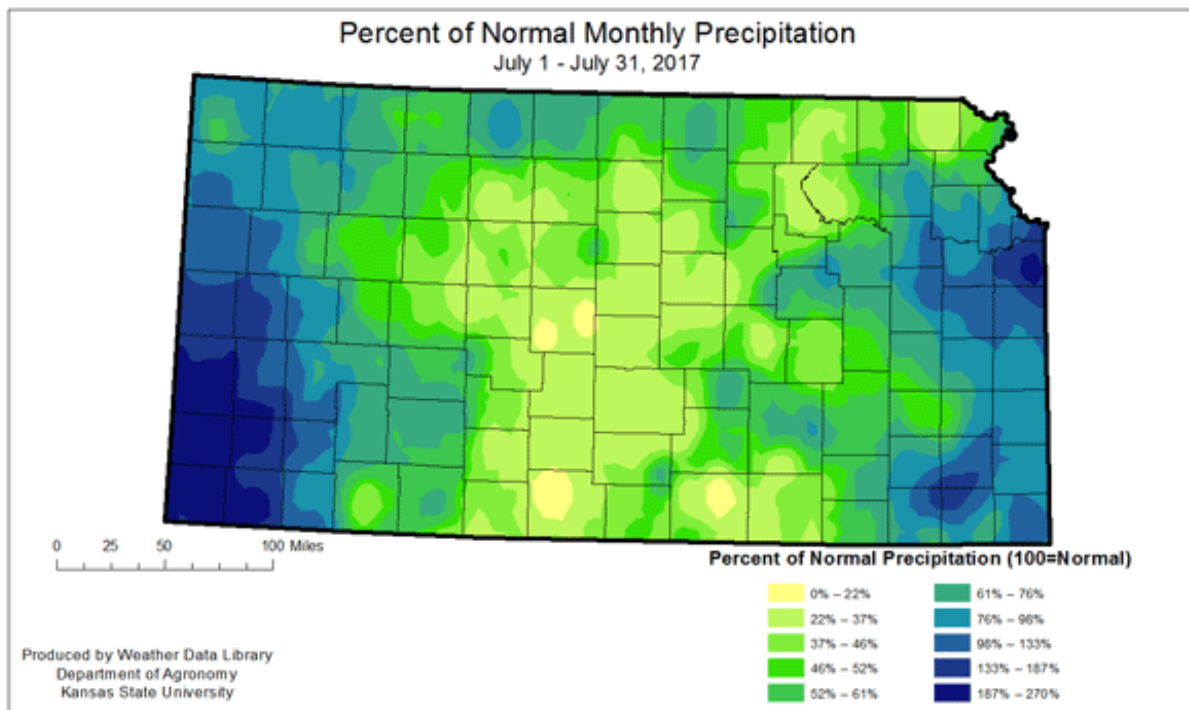


Figure 1. K-State plant pathologist Bernd Friebe talks about the discovery of a wheat gene that could well end up being the answer to wheat streak mosaic disease problems in Kansas wheat production, once it is eventually bred into commercial wheat varieties. Source: Dan Donnert, K-State Research and Extension <https://youtu.be/tYVer0N4Z8g>

### 3. Kansas weather summary for July: Dry, with areas of occasional flooding

July was drier than normal across much of the state. The statewide average precipitation was 2.32 inches, or 65 percent of normal. Only the Southwestern Division was above normal for the month. The average precipitation in that division was 3.37 inches, or 125 percent of normal. The Central Division had the least percent of normal with an average of 1.71 inches, or 43 percent of normal. The South Central Division had the lowest average at 1.53 inches, or 46 percent of normal. Year-to-date averages are still above normal in all except the Northeast and East Central divisions. The greatest monthly precipitation total for a National Weather Service (NWS) Coop station was 7.89 inches at Richfield 1 NE, Morton County. The greatest monthly total for a Community Collaborative Rain, Hail and Snow (CoCoRaHS) station was 11.69 inches at Overland Park 3.3 S, Johnson County. The highest 24-hour totals: 6.20 inches at Overland Park S87th, Johnson County, on the 27th (NWS); 6.34 inches at Lenexa 2.0 NE, Johnson County (CoCoRaHS).

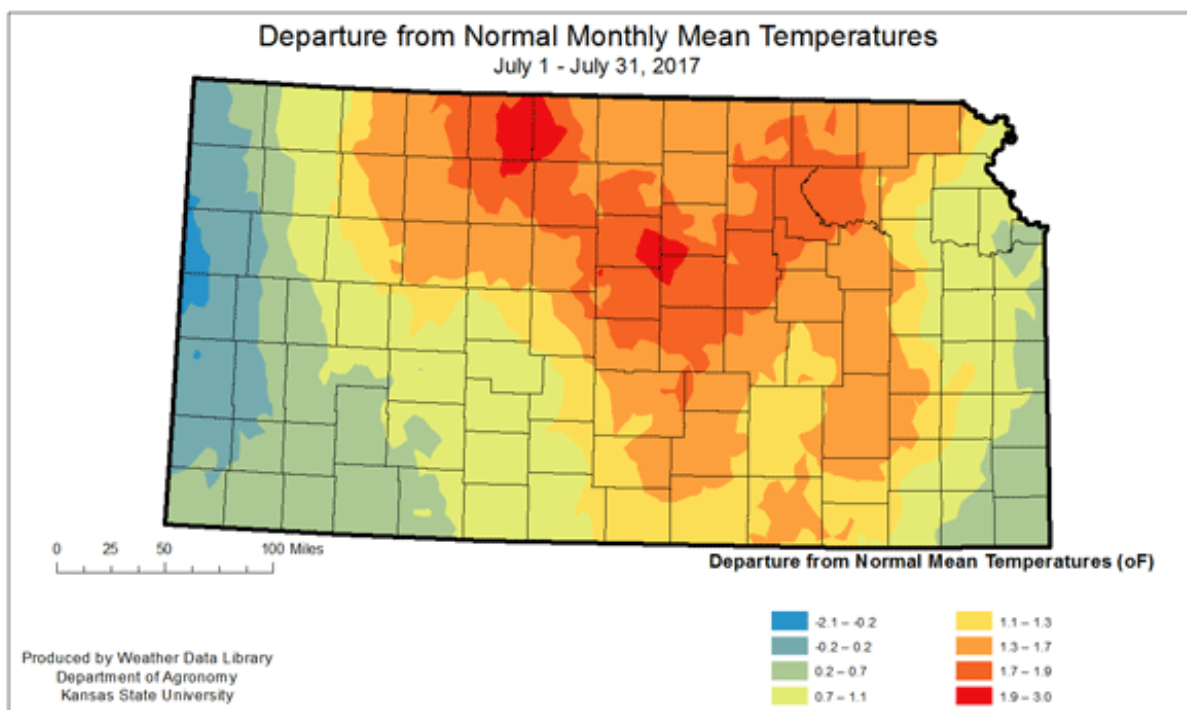
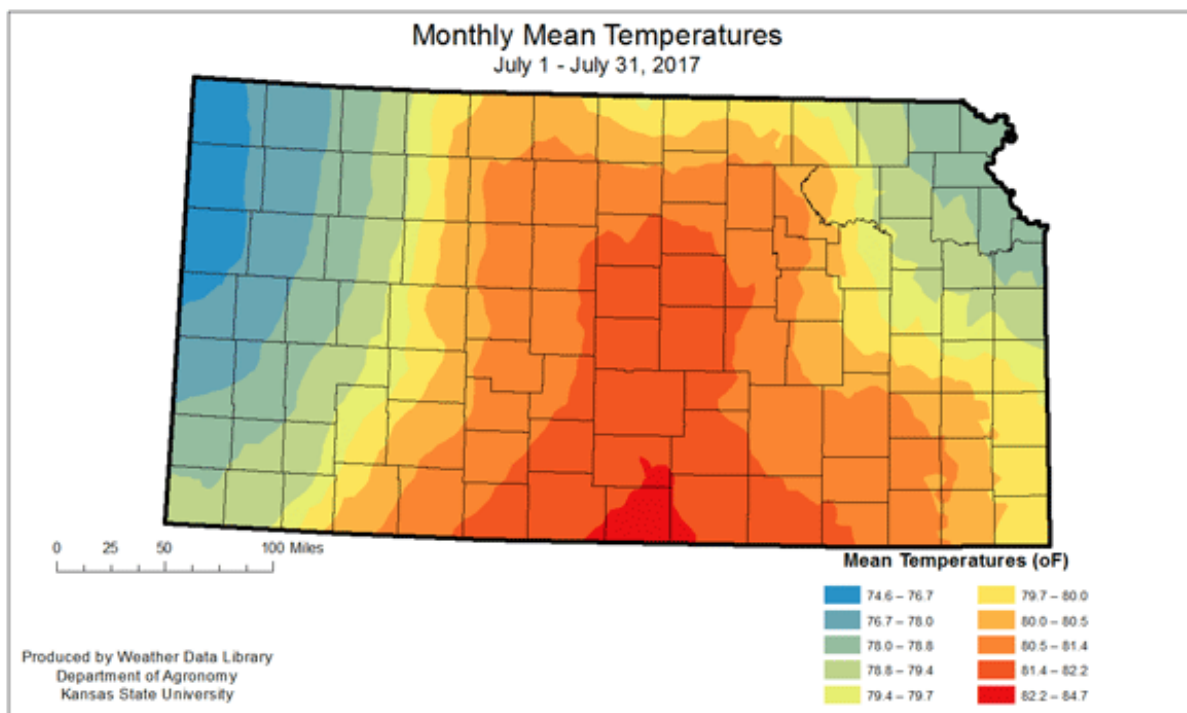




Temperatures were warmer than normal statewide, with highest temperatures in the middle of the month offset by a cooler-than-normal start and end to the month. Statewide temperatures averaged 79.8 degrees F or 1.2 degrees warmer than normal. The West Central Division averaged closest to normal with an average of 78.0 degrees F, or 0.7 degrees warmer than normal. The North Central Division had the greatest departure with an average of 80.7 degrees F, which was 1.7 degrees warmer than normal. The warmest reading for the month was 111 degrees F at the Salina Airport,

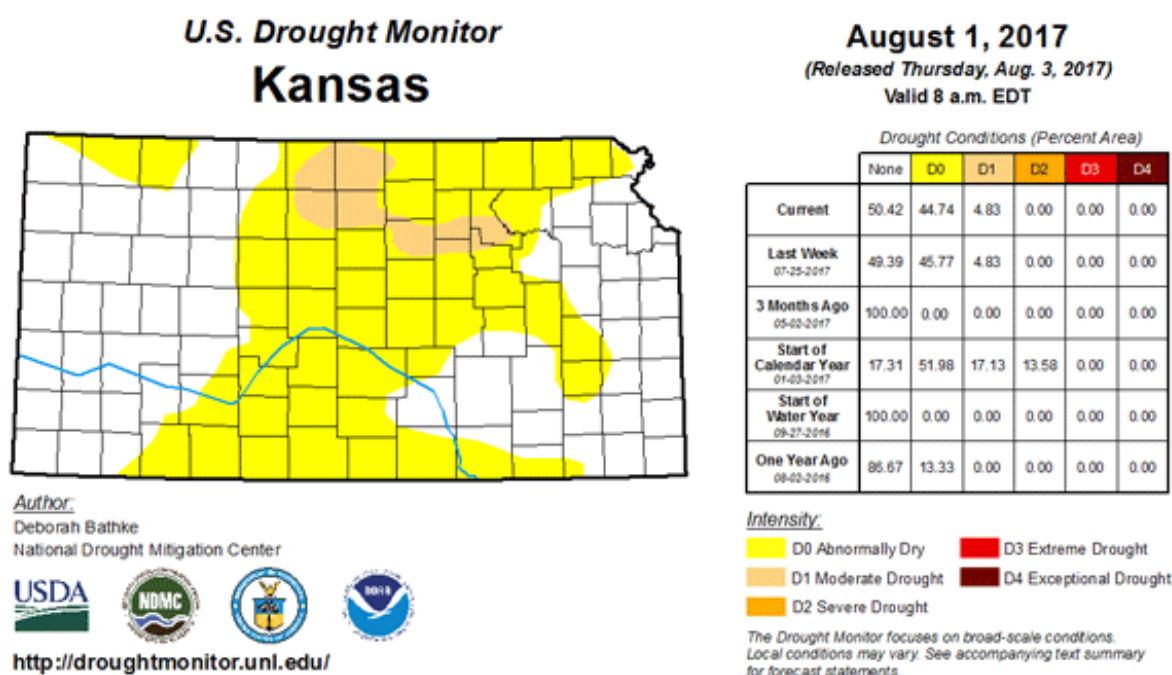


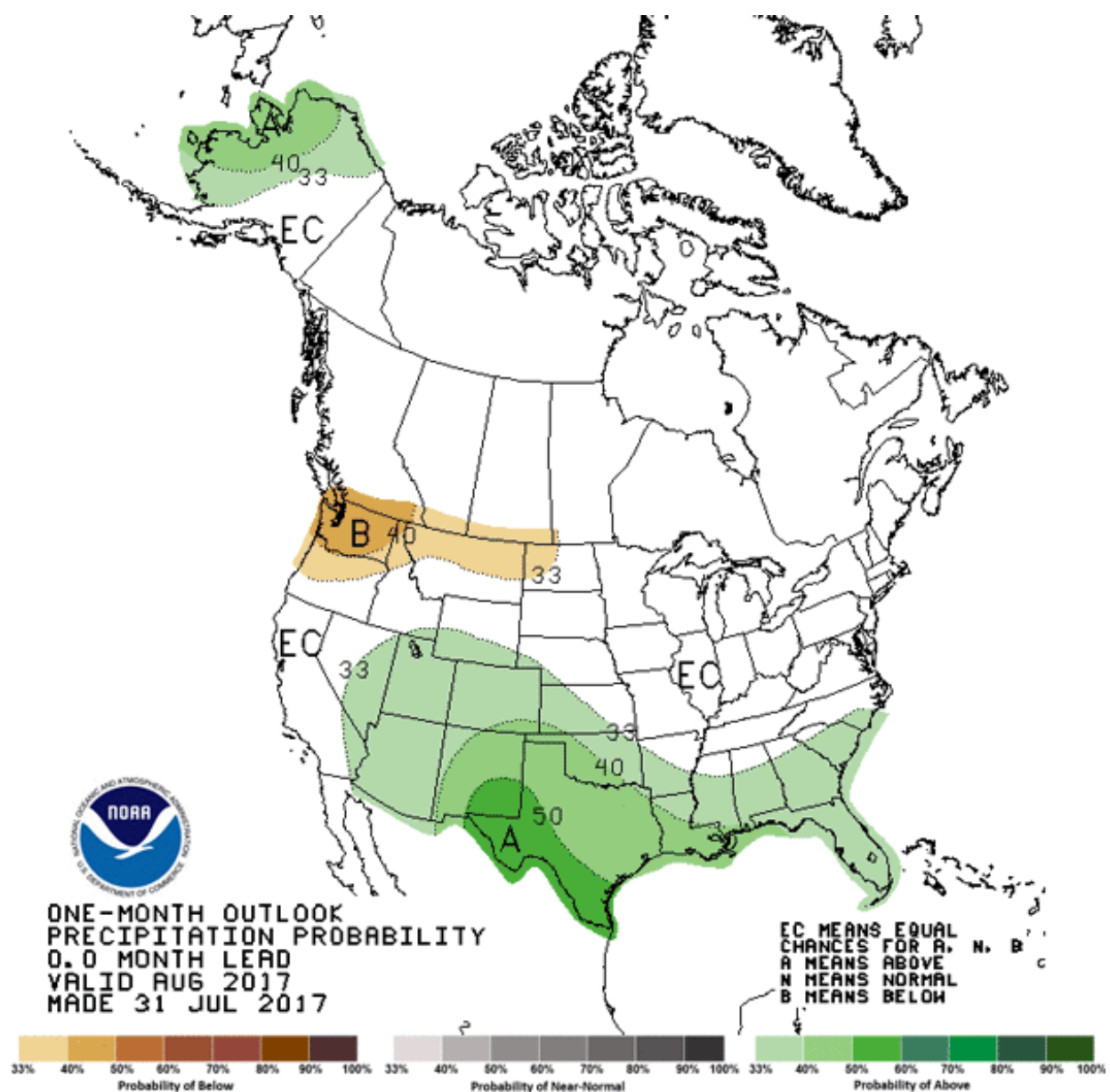
Saline County, on the 22<sup>nd</sup>. The coldest reading was 48 degrees F, recorded at Tribune 1W, Greeley County, on the 1<sup>st</sup>. Despite the warm temperatures, there were no record high maximum temperatures during the month and only 11 record high minimum temperatures. On the cold side, there were 2 new record cold maximum temperature in July and two new record low minimum temperatures. None of the temperature records set new records for the month of July. All divisions had high temperatures reach 100 degrees F or more.



Severe weather was limited in July, with most of the events in the form of hail and high winds. There was one reported tornado, which is less than the 1950-2016 average of 5 tornadoes in July. In addition to the tornado, there were 17 hail reports, and 38 high wind reports. The most damaging event of the month was the flooding in Johnson County, following the heavy rains on the 27<sup>th</sup>. Catastrophic flooding was reported along several local streams, including Indian Creek in Overland Park and Tomahawk Creek in Leawood. Numerous swift water rescues were performed across the city and surrounding areas.

The lower-than-normal precipitation with warmer-than-normal temperatures resulted in an expansion of the abnormally dry conditions and the return of moderate drought in parts of the state. The August outlook calls for a slightly increased chance of wetter-than-normal conditions across the southwest portion of the state, with equal chances of above- or below-normal precipitation across the remainder of the state. This is coupled with higher chances of below-normal temperatures. The much cooler-than-normal temperatures in the beginning of August will reduce some of the evaporative demand.





Jul 2017										
Kansas Climate Division Summary										
Precipitation (inches)							Temperature (°F)			
July 2017				2017 Jan. through July			Monthly Extremes			
Division	Total	Dep. †	%	Total	Dep. †	%	Ave	Dep. †	Max	Min

			Normal			Normal				
<b>Northwest</b>	1.64	-1.85	46	12.82	2.15	121	77.8	1.0	109	51
<b>West Central</b>	2.19	-1.25	66	14.52	4.27	142	78.0	0.7	109	48
<b>Southwest</b>	3.37	0.60	126	14.62	4.66	147	79.7	0.8	106	49
<b>North Central</b>	1.87	-2.24	45	16.08	2.18	115	80.7	1.7	109	53
<b>Central</b>	1.71	-2.23	43	17.48	2.51	118	81.5	1.6	111	51
<b>South Central</b>	1.53	-2.00	46	20.76	4.26	126	81.5	1.1	107	50
<b>Northeast</b>	2.01	-2.37	45	18.33	0.94	106	79.4	1.5	104	56
<b>East Central</b>	2.94	-1.36	68	19.25	0.04	99	79.4	1.0	107	51
<b>Southeast</b>	3.15	-0.92	77	24.67	3.07	114	80.4	1.0	106	57
<b>STATE</b>	2.32	-1.41	65	17.79	2.85	122	79.8	1.2	111	48
1. Departure from 1981-2010 normal value										
2. State Highest temperature: 111 oF at Salina Airport, Saline County on the 22nd.										
3. State Lowest temperature: 48 oF at Tribune 1W, Greeley County, on the 1st.										
4. Greatest 24hr: 6.20 inches at Overland Park S87th, Johnson County, on the 27th (NWS); 6.34 inches at Lenexa 2.0 NE, Johnson County (CoCoRaHS).										
<b>Source: KSU Weather Data Library</b>										

Mary Knapp, Weather Data Library  
mknapp@ksu.edu

#### 4. Kansas River Valley Experiment Field fall field day, August 8

The Kansas River Valley Experiment Field near Rossville will host its fall field day on Tuesday, August

8. The field day begins at 5 p.m. sharp.

Field day topics and K-State presenters include:

- Starters and Late Nitrogen Application – Dorivar Ruiz Diaz, Nutrient Management Specialist
- Field Crop Pest Activity Happening Now and in the Near Future – Jeff Whitworth and Holly Schwarting, Extension Entomology
- Getting the Most from Your Drone Experience – Ashley Lorence and Andy Newsum, Graduate Students, Precision Agriculture
- The Learning Curve During the First Year of Xtend Soybeans – Dallas Peterson, Weed Management Specialist

The field is located 1 mile east of Rossville on U.S. Hwy 24, on the south side of the road.

A BBQ meal will be provided after the field day, sponsored by Wilbur-Ellis. To pre-register, call Michelle Wilson at the Shawnee County Extension office at 785-232-0062, ext. 100 by 5 p.m. on Monday, August 7. Commercial pesticide applicator continuing education credits have been applied for.



## 5. Yield Monitor Workshop, August 14

A Yield Monitor Workshop will be held August 14 at K-State's Machinery Automation and Robotics Lab, 142 Seaton Hall. The school will run from 9 a.m. until 2 p.m.

Speakers include:

Jared Ochs, Topcon Precision Agriculture  
Justin Atwood, LandMark Implements  
Lucas Haag, K-State Northwest Area Crops and Soils Specialist  
Terry Griffin, K-State Dept. of Agricultural Economics  
Ignacio Ciampitti, K-State Crop Production and Cropping Systems Specialist  
Ajay Sharda, K-State Dept. of Biological and Agricultural Engineering  
K-State Research and Extension Precision Ag team

Topics include:

Yield monitor calibration for quality data  
Yield data cleaning  
New yield monitoring technologies  
Yield monitor setup and data extract for FMIS/Analysis  
Utilizing yield data for input prescription  
Utilizing satellite imagery for yield prediction

Registration is free for members of Kansas Ag Research and Technology Association (KARTA) and for K-State Extension agents; and is \$25 for all others. Lunch and refreshments are provided.

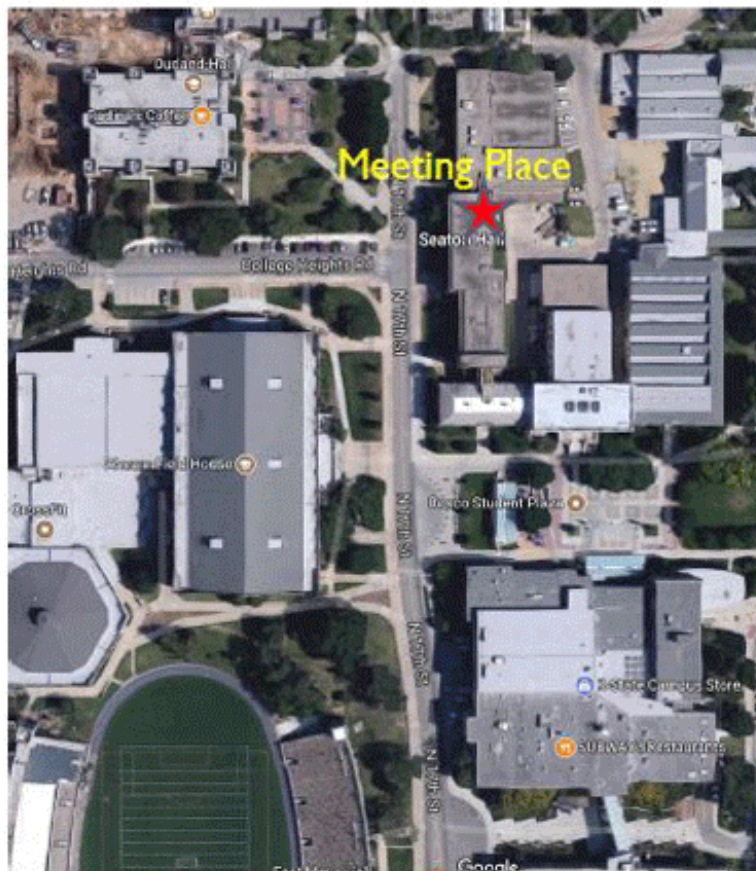
For more information or to register, contact one of the following:

Ajay Sharda, Biological and Agricultural Engineering, [asharda@ksu.edu](mailto:asharda@ksu.edu)  
Arlene Jacobson, 785-532-5825, [ajacobso@ksu.edu](mailto:ajacobso@ksu.edu)

## Yield Monitor School

August 14<sup>th</sup>, 2017

Machinery Automation And Robotics Lab  
142 Seaton Hall, Biological and Agricultural Engineering  
Kansas State University  
9:00 AM – 2:00 PM



**K-STATE**  
**PRECISION AG**

**KARTA**  
Kansas Ag Research & Technology Association

**K-STATE**  
Research and Extension

## 6. East Central Experiment Field fall field day, August 16

The East Central Experiment Field in Ottawa will host its fall field day on Wednesday, August 16. The field day begins at 9 a.m. with registration, coffee and doughnuts, and the program starts at 9:30 a.m. A complimentary lunch will be served.

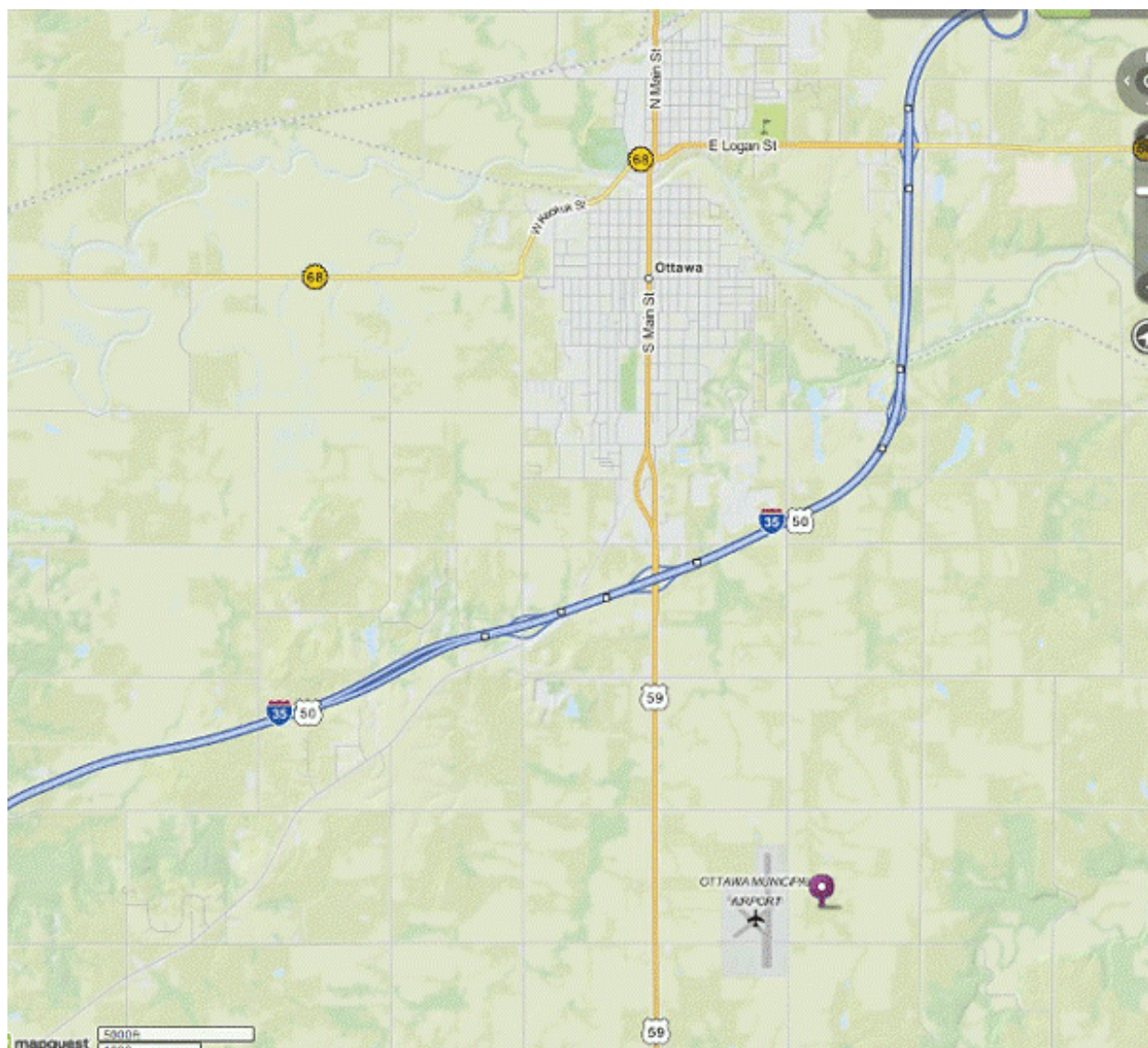
Field day topics and K-State presenters include:

- Increasing the Rate of Genetic Gain for Yield in Soybean Breeding Programs – Bill Schapaugh, Soybean Breeder
- When Corn Fungicides Are a Good Investment – Eric Adey, Agronomist-in-Charge, East Central Research Field and Kansas River Valley Research Field
- Row Crop Management Strategies – Ignacio Ciampitti, Crop Production and Cropping Systems Specialist
- New Research on Pigweed Control – Marshall Hay and Nate Thompson, Graduate Students

From I-35 at the Ottawa exit, the East Central Experiment Field is south 1.7 miles on Kansas Highway 59, then east 1 mile, and south 0.75 mile.

More information, including Certified Crop Advisor Credits, is available by contacting the East Central Experiment Field at 785-242-5616.





**Figure 1. Location of East Central Experiment Field, south of Ottawa.**

## 7. Agricultural Research Center-Hays field day, August 23

Row crops, including the latest research into crop selection, tillage and pest management, will take center stage at the Agricultural Research Center's Row Crop Roundup Fall Field Day in Hays Aug. 23.

The day starts with registration at 9 a.m. with the program beginning at 9:30 a.m. The Center is at 1232 240th Ave. in Hays. A complimentary lunch will be served.

Field tours include:

- Occasional Tillage in Long-Term No-Till
- Management of Sugarcane Aphid in Sorghum

Indoor presentations include:

- Sorghum Early Planting: Perspectives and Challenges
- Managing Palmer Amaranth in Corn and Sorghum
- Crop Selection Considerations in West Central Kansas
- Sorghum vs. Corn vs. Soybean: Economic Returns in a Challenging Market
- Selection of Wheat Varieties: Lessons from the 2017 Harvest

K-State speakers include:

- Augustine Obour, Soil Scientist, Agricultural Research Center-Hays
- JP Michaud, Entomologist, Agricultural Research Center-Hays
- Ram Perumal, Sorghum Breeder, Agricultural Research Center-Hays
- Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist
- Dallas Peterson, Weed Management Specialist
- Lucas Haag, Northwest Area Crops and Soils Specialist
- Dan O'Brien, Northwest Area Agricultural Economist
- Romulo Lollato, Wheat and Forages Specialist

More information is available at [www.hays.k-state.edu](http://www.hays.k-state.edu) or by calling 785-625-3425.



## 8. Southwest Research-Extension Center field day, August 24

The Southwest Research-Extension Center hosts its annual fall field day on Thursday, Aug. 24 at 4500 E. Mary St. in Garden City.

The field day includes field tours, seminars, and commercial exhibitor displays, plus a sponsored lunch. Registration begins at 8 a.m. with the program starting at 9:15 a.m.

One credit hour and one core hour will be available for commercial pesticide applicator licensing.

Field tour and seminar topics include:

- Corn and Sorghum Insect Control Update
- Weed Control in Irrigated Corn
- Weed Control in Dryland Sorghum
- The Effect of Humic Products on Sorghum Yield and Nitrogen Use Efficiency
- Integrating Cover Crops and Annual Forages into Wheat-Sorghum-Fallow Cropping Systems
- Wheat Health Management
- Core Hour for Commercial Pesticide License

More information is available by contacting Randall Currie at [rscurrie@ksu.edu](mailto:rscurrie@ksu.edu) or by calling the center at 620-276-8286.

## 9. Comparative Vegetation Condition Report: July 25 - 31

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 27-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.

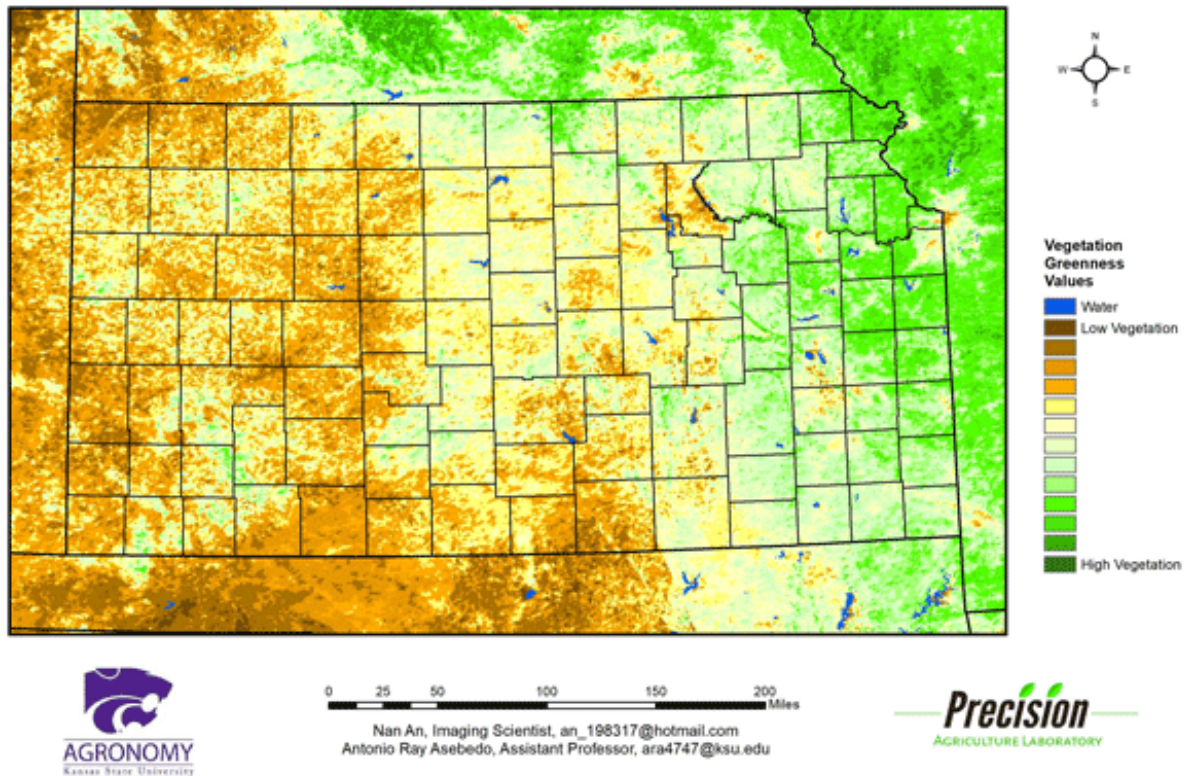
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new 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 31: 07/25/2017 - 07/31/2017



**Figure 1. The Vegetation Condition Report for Kansas for July 25 – July 31, 2017 from K-State’s Precision Agriculture Laboratory shows the greatest vegetative activity continues to be in eastern Kansas, particularly in extreme northeast Kansas. Warm weather has slowed vegetative activity in the west, but a pocket of increased activity is visible in southwest Kansas, particularly south of Garden City, where heavier showers occurred.**

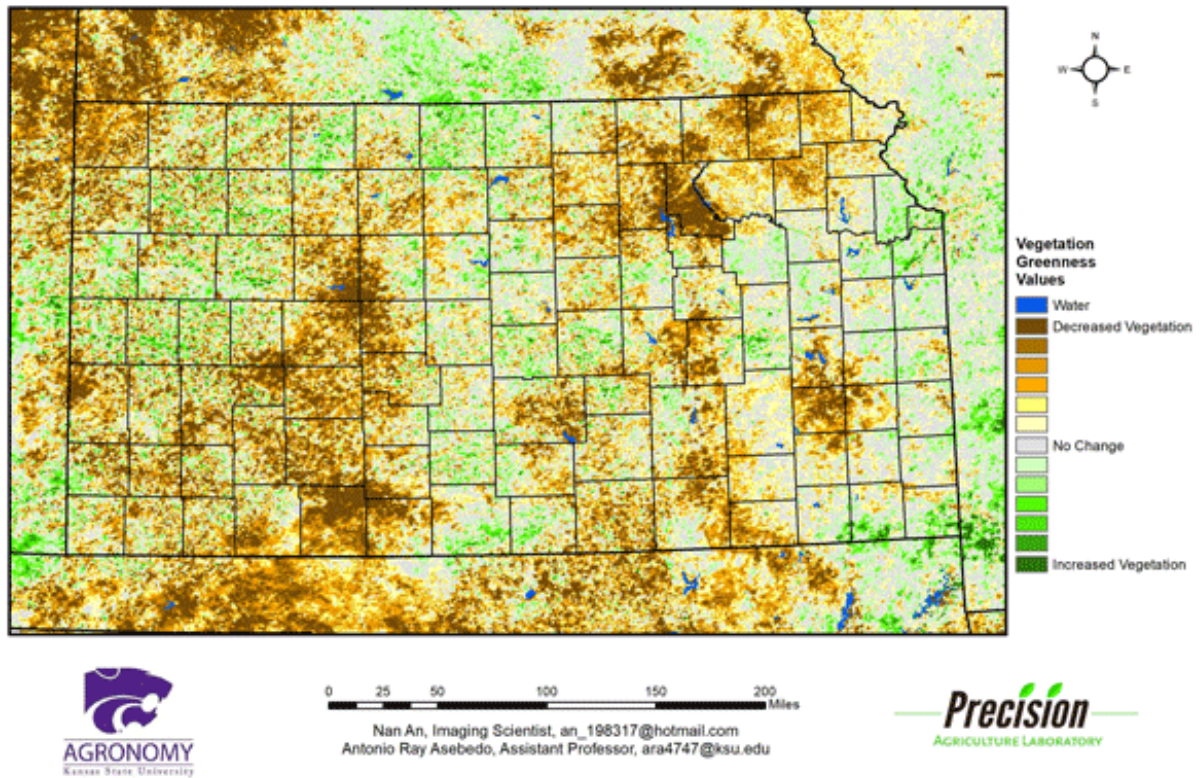
Kansas State University Department of Agronomy

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-July 2017 compared to the Late-July 2016

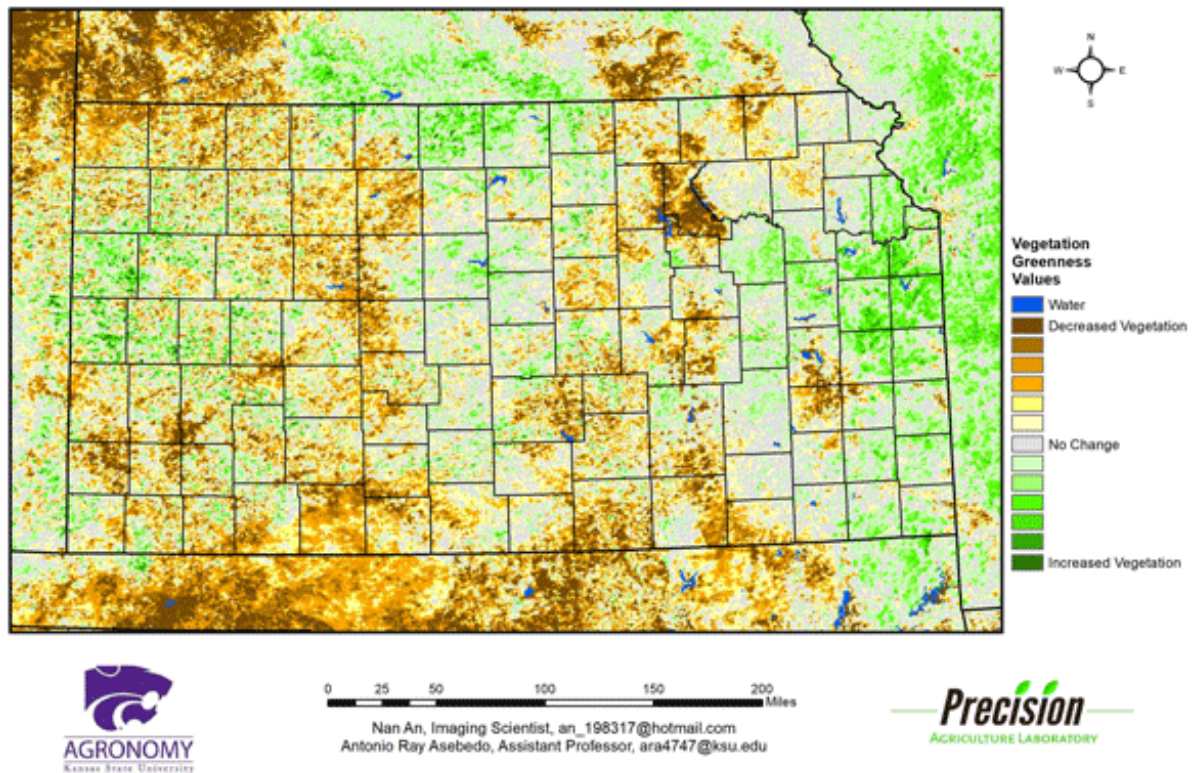


**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for July 25 – July 31, 2017 from K-State’s Precision Agriculture Laboratory shows the greatest change in vegetative activity is in the Central Division. This summer has been hotter and much drier than last and that has resulted in lower vegetative activity.**



# Kansas Vegetation Condition Comparison

Late-July 2017 compared to the 28-Year Average for Late-July

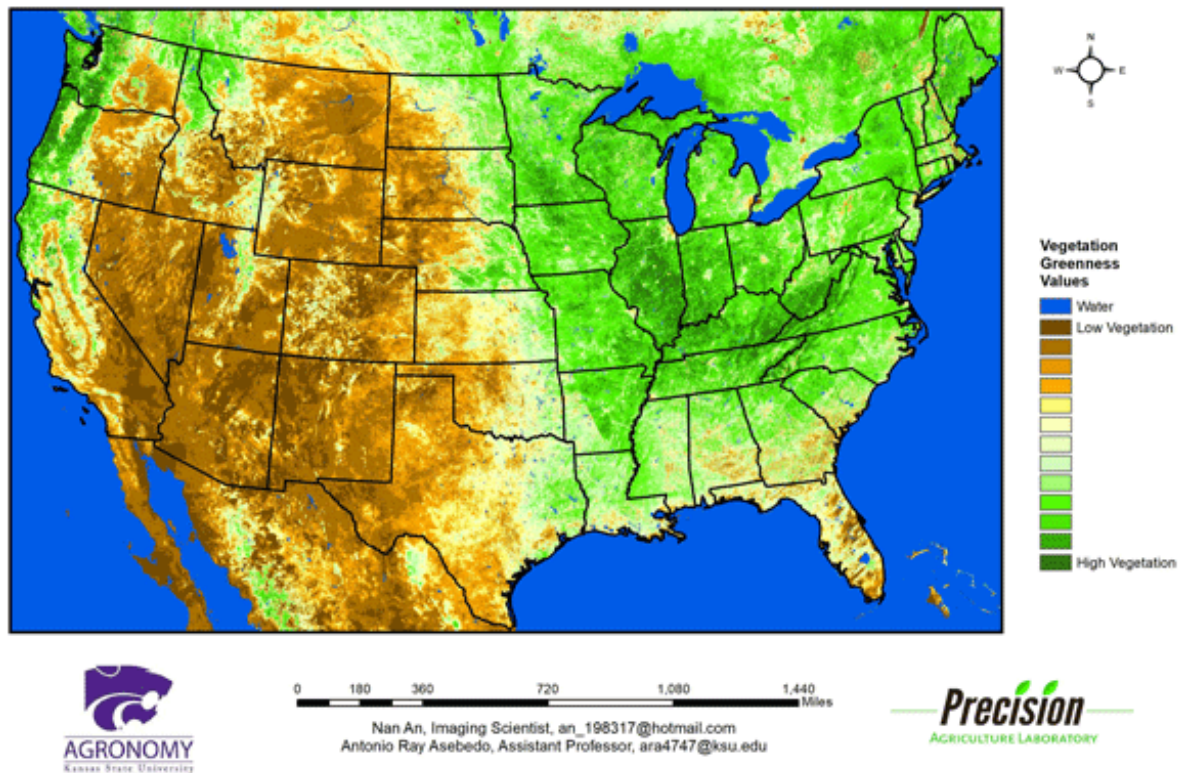


**Figure 3. Compared to the 28-year average at this time for Kansas, this year's Vegetation Condition Report for July 25 – July 31, 2017 from K-State's Precision Agriculture Laboratory there is above-average photosynthetic activity in the eastern parts of the state. Wetter-than-normal conditions have favored parts of the west, particularly Wallace County. Meanwhile continued hot, dry weather has stressed vegetation in the central parts of the state.**



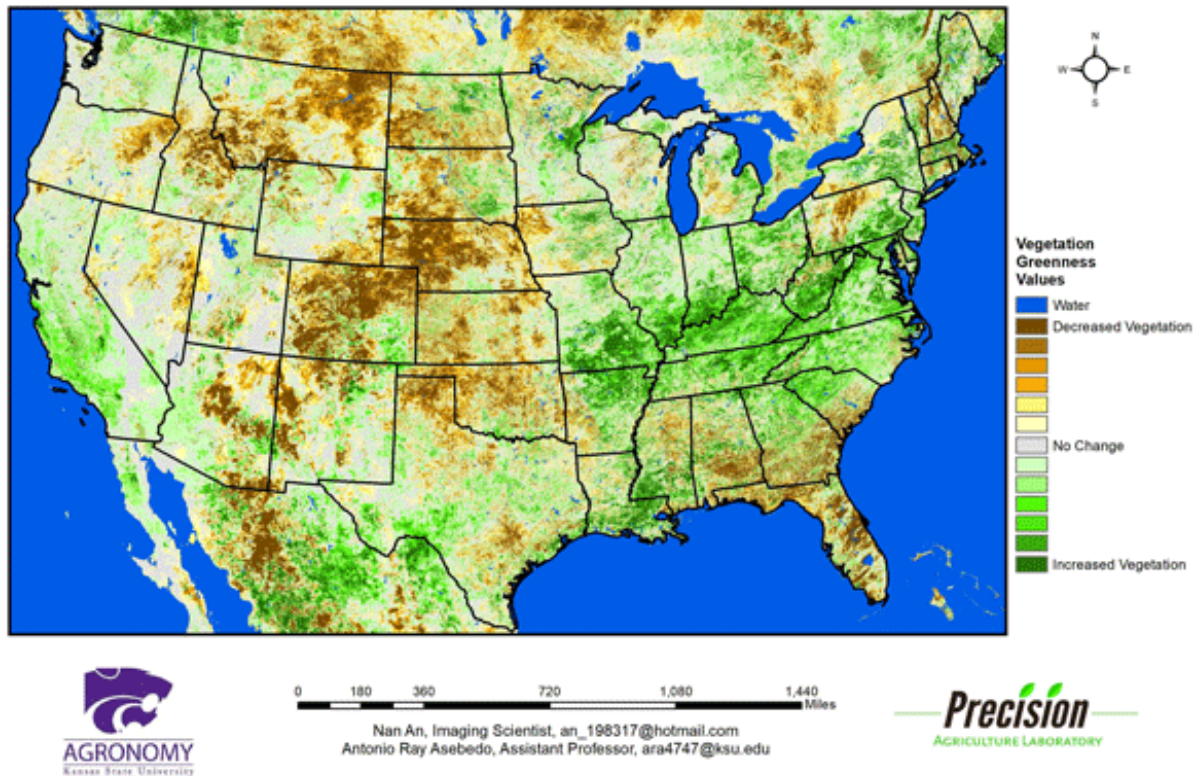
## Continental U.S. Vegetation Condition

Period 31: 07/25/2017 - 07/31/2017



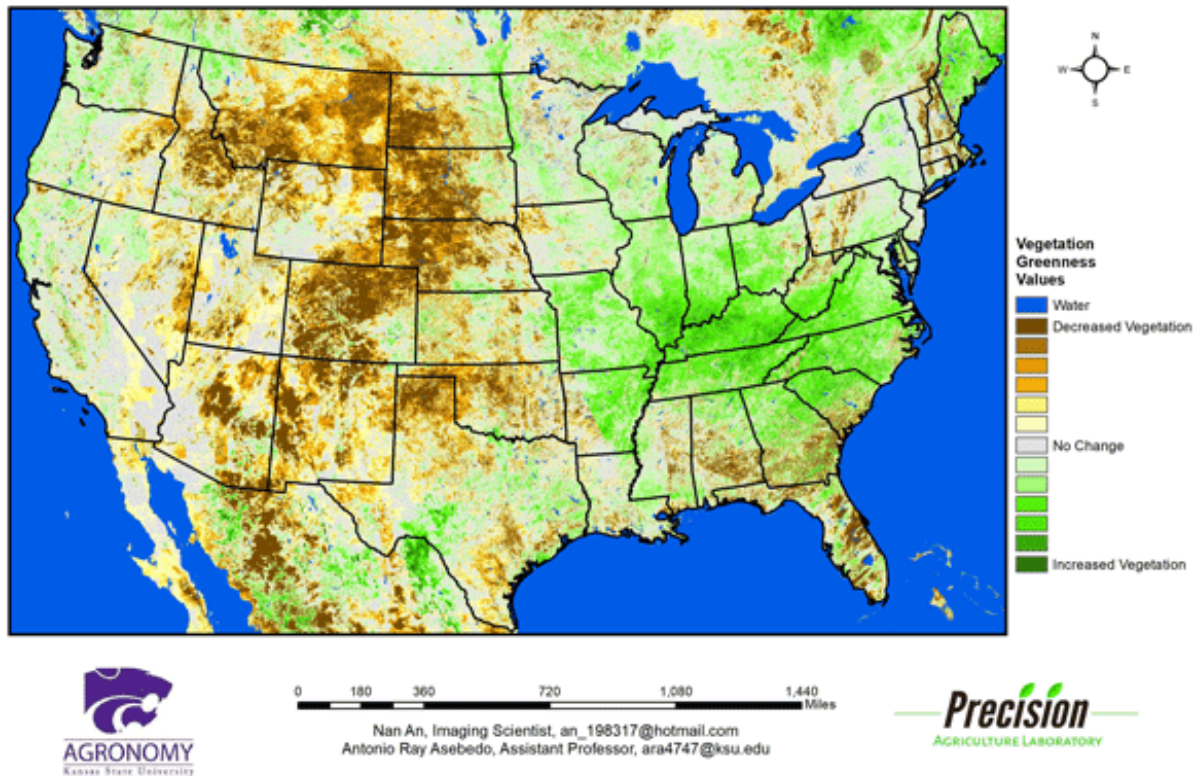
**Figure 4. The Vegetation Condition Report for the U.S for July 25 – July 31, 2017 from K-State’s Precision Agriculture Laboratory shows an area of high NDVI values centered in the Midwest, particularly in southern Missouri and central Illinois. A second area of higher vegetative activity is also visible along the West Coast, where the recent warm weather has yet to have a negative impact. Extremely low NDVI values continue to highlight the severe drought in eastern Montana and western South Dakota.**

Continental U.S. Vegetation Condition Comparison  
Late-July 2017 Compared to Late-July 2016



**Figure 5. The U.S. comparison to last year at this time for July 25 – July 31, 2017 from K-State's Precision Agriculture Laboratory again shows the impact that the split in moisture has caused this year. Much lower NDVI values are visible from eastern Montana through the Dakotas and into the Oklahoma Panhandle. In contrast, eastern Illinois and western Ohio have much higher NDVI values than last year at this time.**

Continental U.S. Vegetation Condition Comparison  
Late-July 2017 Compared to 28-year Average for Late-July



**Figure 6. The U.S. comparison to the 28-year average for the period of July 25 – July 31, 2017 from K-State’s Precision Agriculture Laboratory shows the drought impacts in the Northern Plains are visible as much below-average NDVI values. In Colorado, parts of Idaho, and the Sierra Nevada of California, the below-average NDVI values are due to monsoon moisture. Parts of the area have been under flood advisories most of the week.**

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)