



## Extension Agronomy

# eUpdate

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*07/29/2016*

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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<b>1. Kansas wheat crop wrap-up for 2016.....</b>	<b>3</b>
<b>2. Improving canola breeding with bees.....</b>	<b>5</b>
<b>3. Soil calcium and magnesium levels: Does the ratio make a difference? .....</b>	<b>7</b>
<b>4. New publication on wheat variety fall forage yield and first hollow stem dates.....</b>	<b>9</b>
<b>5. Kansas River Valley Experiment Field fall field day, August 9 .....</b>	<b>11</b>
<b>6. Winter canola preplant school, August 11 in Concordia.....</b>	<b>12</b>
<b>7. Planter School at K-State, August 15.....</b>	<b>13</b>
<b>8. East Central Experiment Field fall field day, August 17 .....</b>	<b>14</b>
<b>9. Northwest Research-Extension Center fall field day, August 23 .....</b>	<b>16</b>
<b>10. Agricultural Research Center-Hays fall field day, August 24 .....</b>	<b>17</b>
<b>11. Southwest Research-Extension Center fall field day, August 25.....</b>	<b>18</b>
<b>12. Comparative Vegetation Condition Report: July 19 - 25.....</b>	<b>19</b>

## 1. Kansas wheat crop wrap-up for 2016

(Note: The following article is a slightly edited transcript of a short K-State Research and Extension YouTube video produced by Dan Donnert, KSRE videographer. The link to this video is: <https://youtu.be/pT6TICf-3NE> – Steve Watson, Agronomy eUpdate Editor)

One of the main driving factors behind the high wheat yields we had in Kansas in 2016 is that the temperatures were normal to slightly below normal during grain fill, from May to about mid-June. Most of May we had below-normal temperatures. In addition, we had more than enough precipitation. So this year we had more than 40 days of good grain fill conditions, which is rare in Kansas. Generally if we get 28 or 32 days of good grain fill conditions, we are really happy with it.



However, that cool, moist weather led to high disease pressure, especially stripe rust. Stripe rust is management. That's where we saw a lot of difference this year. Producers seemed to be very proactive in controlling stripe rust. Research in Kansas has shown that, depending on environmental conditions and variety susceptibility, fungicides pay off in many cases. But again, if you're planting a variety that is resistant to stripe rust and the environment is not conducive to the disease, it may not pay to treat it with a fungicide.

Being ready to apply a fungicide if needed is important for wheat producers in Kansas. But I wouldn't recommend just spraying without scouting.

It's time now for producers to start planning for what varieties they'll plant this fall. Variety selection is a very important tool in successful wheat production. In selecting varieties, consider not only disease resistance but also agronomic performance.

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



## 2. Improving canola breeding with bees

(Note: The following article is a slightly edited transcript of a short K-State Research and Extension YouTube video produced by Dan Donnert, KSRE videographer. The link to this video is: <https://youtu.be/MmhSOSEQUMs> – Steve Watson, Agronomy eUpdate Editor)

Canola makes an excellent source of food for all kinds of bees. When canola is blooming, honeybees will often be brought out of the almond orchards in California to canola fields in Oklahoma and Kansas. The reason is that canola is an excellent food source. The nectar is high in sugars and the pollen provides an excellent protein source.

Canola is a crop that does not need bees to produce seed. But bees are very beneficial to canola and canola is very beneficial to bees. We often see when we introduce canola to bees that hive weights improve and the general health of bees improves.



What you see in the photo above is an example of a public-private partnership that we have with Monsanto where we are developing experimental winter canola hybrids. The reason we are using tents and bees to produce experimental hybrids is to move the pollen from the male plant to the female plant. We have to keep the bees in cages so we don't get contamination from other bees with pollen from other plants.

A canola variety that a producer would plant in his field does not need bees to pollinate it because canola is a self-pollinating crop. However, when we make these test crosses between the male fertile and the male sterile, we need bees to carry pollen from the male fertile plant to the male sterile plant to produce seed that is fertile so that the producer could plant it in the field.

We're doing this research with Monsanto to see if we can produce experimental hybrids. Then, as we move forward with the public-private relationship with Monsanto, we may someday be able to develop Roundup Ready hybrids this way for Monsanto to test in our southern Great Plains environment to see if those cultivars could then be grown by producers in the southern Great Plains.

Mike Stamm, Canola Breeder

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

### 3. Soil calcium and magnesium levels: Does the ratio make a difference?

Is it important to have the proper ratio of calcium (Ca) and magnesium (Mg) in the soil? Producers may ask this question as they have their soil tested for nutrient levels in the summer before wheat planting begins. This question may also arise at the moment of lime purchase, which can be an important source of Ca and Mg.

Calcium and Mg are plant-essential nutrients. All soils contain Ca and Mg in the form of cations (positively charged ions,  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$ ) that attach to the soil clay and organic matter; these are also the forms taken up by crops. The relative proportion of these elements, as well as the total amount in the soil, depends mainly on the soil parent material. In Kansas soils, the levels of Ca and Mg are typically high and crop deficiencies are rare.

Soils typically have higher Ca levels than Mg. Table 1 gives the amount and ratios of Ca and Mg for some soils in Kansas. Both nutrients are present in large quantities. Unusual cases of Ca or Mg deficiencies may be found in areas of very sandy soils.

Table 1. Calcium, magnesium, and Ca:Mg ratio for several Kansas soils			
	Ca	Mg	Ca:Mg ratio
Soil	cmol/kg		
Canadian-Waldeck	42	11	3.7
Carwile	22	4	5.2
Chase	198	30	6.7
Crete	111	29	3.8
Harney	202	15	13.2
Harney-Uly	200	12	16.1
Keith	127	38	3.3
Las	176	37	4.8
McCook	35	8	4.5
Onawa	163	28	5.8
Ortello	19	6	3.3
Parsons	80	23	3.5
Tully	158	38	4.2

Why would the ratio of Ca to Mg be important? The concept of an optimum Ca:Mg ratio started in the 1940s under the “basic cation saturation ratio” theory. The theory is that an “ideal soil” will have a balanced ratio of Ca, Mg, and potassium (K). According to this theory, fertilization should be based on the soil’s needs rather than crop’s needs -- focusing on the ratio of crop nutrients present in the soil. This concept of an ideal Ca:Mg ratio has been debated by agronomists over the years. The suggested ideal ratio according to the theory is between 3.5 and 6.0, but this has never proven to be of significance.

There is very little research evidence to support any effect, either positive or negative, of the soil Ca:Mg ratio on crop production and yield. What research studies have been conducted in the laboratory and in the field show no effect of Ca:Mg ratio on crop yield. Despite this, the promotion of the ratio concept persists today. Furthermore, the initial work that derived this concept did not

differentiate between crop response (alfalfa) due to the change in Ca:Mg ratio and the improvement in soil pH from lime application. It is reasonable to conclude that crop response can be expected from changes in soil pH rather than any change in the ratio of Ca:Mg.

One example of research conducted on this topic over the years is shown in Table 2. In that experiment, McLean and coworkers demonstrated the lack of relationship between Ca:Mg ratio and crop yield for several crops. The range of Ca:Mg ratios observed for the highest yields were not different from those observed for the lowest yields. The conclusion from that study was that to achieve maximum crop yield, attention should center on providing sufficient levels of these nutrients rather than attempting to find an adequate ratio. Therefore when these nutrients are present in optimum levels for plant growth, the relative ratio in the soil seems irrelevant.

Table 2. Ratio of Ca:Mg for five crop-years comparing the highest and lowest yields obtained						
	Corn	Corn	Soybean	Wheat	Alfalfa	Alfalfa
Yield level	Ca:Mg ratio					
Highest five	5.7 – 26.8	5.7 – 14.2	5.7 – 24.9	5.7 – 14.0	5.7 – 26.8	6.8 – 26.8
Lowest five	5.8 – 21.5	5.0 – 16.1	2.3 – 16.1	6.8 – 21.5	8.2 – 21.5	5.7 – 21.5

Adapted from: McLean, E.O., R.C. Hartwig, D.J. Eckert, and G.B. Triplett. 1983. Basic cation saturation ratios as a basis for fertilizing and liming agronomic crops. II. Field studies. *Agronomy Journal* 75: 635-639. A data table of Ca:Mg for five crop-years comparing the highest and lowest yields obtained to the disease produced by Dan Don

In conclusion, trying to manage the ratio of Ca:Mg should not be used for a nutrient application or liming program. The center of attention should be to ensure that levels of Ca and Mg in the soil will not limit optimum plant growth. The relative concentration of Ca and Mg in commercial ag lime can be highly variable, and application should be based on the effective calcium carbonate (ECC) to achieve a target soil pH.

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



#### 4. New publication on wheat variety fall forage yield and first hollow stem dates

A new K-State Research and Extension publication, *Wheat Variety Date of First Hollow Stem, Fall Forage Yield, and Grain Yield 2016*, MF3312, is now available. It is online at:

<http://www.bookstore.ksre.ksu.edu/pubs/MF3312.pdf>

This publication evaluated the fall forage yield, date of first hollow stem, and grain yield of current varieties in dual-purpose vs. grain-only systems at the South Central Experiment Field near Hutchinson.

**Table 3.** Fall forage yield, date of first hollow stem, plant height, and lodging under grain-only (GO) and dual-purpose (DP) systems in Hutchinson, Kansas, during the 2015-16 production year. Lodging: 1 = excellent straw strength; 9 = poor straw strength.

Variety	Source	Fall dry forage yield	First hollow stem	Plant height		Lodging	
				GO	DP	GO	DP
		lbs/acre	day of year	----- inches -----			
1863	KWA	1,531	69	36.2	34.7	2	6
Bentley	OGI	1,854	72	38.7	37.6	1	2
Danby	KWA	1,467	73	36.5	33.8	2	2
Doublestop CL Plus	OGI	1,609	73	40.9	36.7	1	2
Duster	OGI	1,662	71	36.1	32.7	1	4
Everest	KWA	1,401	70	31.5	29.8	1	2
Gallagher	OGI	1,611	69	34.7	32.6	2	4
KanMark	KWA	1,226	70	31.5	31.5	1	1
LCS Chrome	LCS	1,503	74	36.0	36.0	1	1
LCS Mint	LCS	1,504	73	38.6	38.8	2	3
LCS Pistol	LCS	1,544	69	34.7	34.3	2	3
LCS Wizard	LCS	1,583	70	35.0	34.0	1	1
Overley	KWA	1,287	69	33.7	33.8	1	2
Ruby Lee	OGI	1,419	69	37.4	36.1	1	2
SY Flint	Syngenta	1,762	70	32.8	30.4	1	2
SY Wolf	Syngenta	1,419	71	36.6	34.7	1	2
T158	LCS	1,586	72	31.5	32.2	1	2
TAM 114	TAMU	1,822	70	36.1	34.5	2	2
WB4303	WestBred	1,970	65	31.5	29.4	1	2
WB4458	WestBred	1,250	69	31.1	32.0	1	2
WB-Cedar	WestBred	1,783	65	30.5	30.8	1	1
WB-Grainfield	WestBred	1,327	70	34.4	35.3	2	3
WB-Redhawk	WestBred	1,628	67	33.8	35.1	2	2
Mean		1,554	70	34.8	33.8	1	2
Minimum		1,226	65	30.5	29.4	1	1
Maximum		1,970	74	40.9	38.8	2	6
LSD (0.05)*		375	-	2.7	3.4	1	1

Fall forage yield potential is an important trait in dual-purpose systems because it sets the potential beef production from wheat grazing in the fall, winter, and early spring. Approximately 100 pounds of beef can be produced for every 1,000 pounds of wheat forage produced in an acre. Forage production is dependent on variety selection, planting date, seeding rate, and especially on fall precipitation and temperature.

Date of first hollow stem is an important trait in dual-purpose systems. Terminating grazing at the right time is essential to maintaining the crop's grain yield potential. Grazing past first hollow stem can decrease wheat grain yields by as much as 1 to 5 percent per day. Depending on environmental conditions, varieties with a shorter vernalization requirement might reach first hollow stem up to 30 days earlier than varieties with a longer vernalization requirement. An early occurrence of first hollow stem reduces the grazing window into early spring. In photoperiod-sensitive varieties, date of first hollow stem is dependent on temperature and day length.

Grain yield following grazing is another important variety-specific trait in dual-purpose systems. Varieties that rely mostly on fall-formed tillers to produce grain yield generally show a greater yield penalty from grazing than varieties with a good spring tiller potential.

Romulo Lollato, Wheat and Forages Specialist

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

Gary Cramer, Agronomist-in-Charge, South Central Experiment Field

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

Jane Lingenfelter, Assistant Agronomist, Crop Performance Testing

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

With:

Amanda de Oliveira Silva, Agronomy Graduate Research Assistant

Rafael Maeoka, Agronomy Visiting Scientist

Brent Jaenisch, Agronomy Graduate Research Assistant

## 5. Kansas River Valley Experiment Field fall field day, August 9

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

9. The field day begins at 6 p.m. sharp.

Field day topics and K-State presenters include:

- Seed treatments update and current disease issues – Doug Jardine, Extension Plant Pathologist
- Update on planter research at K-State – Ajay Sharda, Extension Biological and Agricultural Engineering
- When does it pay to apply foliar fungicides in the Kaw River Valley? – Stu Duncan, Northeast Area Crops and Soils Specialist
- Tip dieback on corn: Cause and cure – Eric Adey, Agronomist-in-Charge, Kansas River Valley and East Central Experiment Fields

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 Joanne Domme at the Shawnee County Extension office at 785-232-0062, ext. 100 by 5 p.m. on Monday, August 8. Commercial pesticide applicator continuing education credits have been applied for.

## 6. Winter canola preplant school, August 11 in Concordia

On August 11, producers in north central Kansas can learn more about what it takes to raise a successful canola crop. The school will be held in Concordia at Heavy's Steakhouse & BBQ, 103 W. 7<sup>th</sup> Street, beginning with lunch at 11:30 a.m. The event is free but those interested in attending should RSVP by calling 785-243-8185 before August 8. Sponsors include Wilbur-Ellis and LeClair Seeds.

Winter canola has many potential advantages in cropping systems of north central Kansas, according to ongoing K-State research. We have been working diligently to introduce winter canola as an alternative broadleaf crop in north central Kansas. This includes growing variety trials at the North Central Kansas Experiment Field near Belleville and working with local producers.

There have been some ups and downs, but through these experiences we have come to understand a great deal about what kind of yields we can expect and what it is going to take to grow the crop successfully in this part of the state.

Topics for discussion at the preplant school include what to do -- and what not to do -- in canola production, planting date and establishment methods, variety and hybrid performance, winter survival, and soil fertility and insect management. Information on crop insurance and marketing of the crop will also be available.

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

## 7. Planter School at K-State, August 15

A Planter School will be held August 15 at K-State's Stanley Stout Center, 2200 Denison, Manhattan.

The school will run from 8:30 a.m. until 2:00 p.m.

Speakers include:

Paul Jasa, Extension Engineer, University of Nebraska-Lincoln

Mitch Ostgren, Precision Planting

Justin Atwood, LandMark Implements

Matt Wolters, SureFire Ag Systems

Dietrich Kastens, Kastens Farms, Inc.

Brian Sutton, Air Scout

Joe Luck, Extension Engineer, University of Nebraska-Lincoln

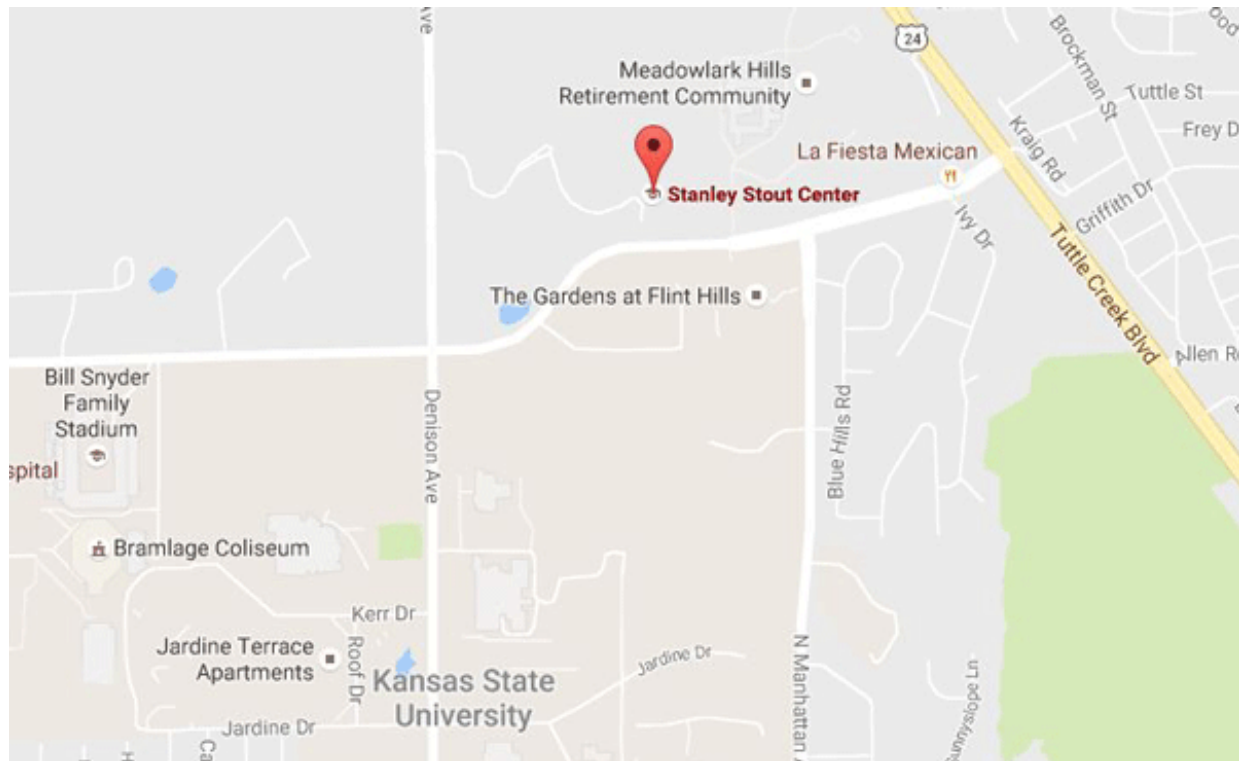
K-State Research and Extension Precision Ag team

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)

Lucas Haag, Northwest Crops and Soils Specialist, [lhaag@ksu.edu](mailto:lhaag@ksu.edu)



Kansas State University Department of Agronomy

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## 8. East Central Experiment Field fall field day, August 17

The East Central Experiment Field in Ottawa will host its fall field day on Wednesday, August 17. 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:

- Row crop disease update – Doug Jardine
- Crop insect update – Jeff Whitworth
- Mapping soil variability within your field – Gretchen Sassenrath
- Satellite imagery for nitrogen recommendations – Ray Asebedo

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.



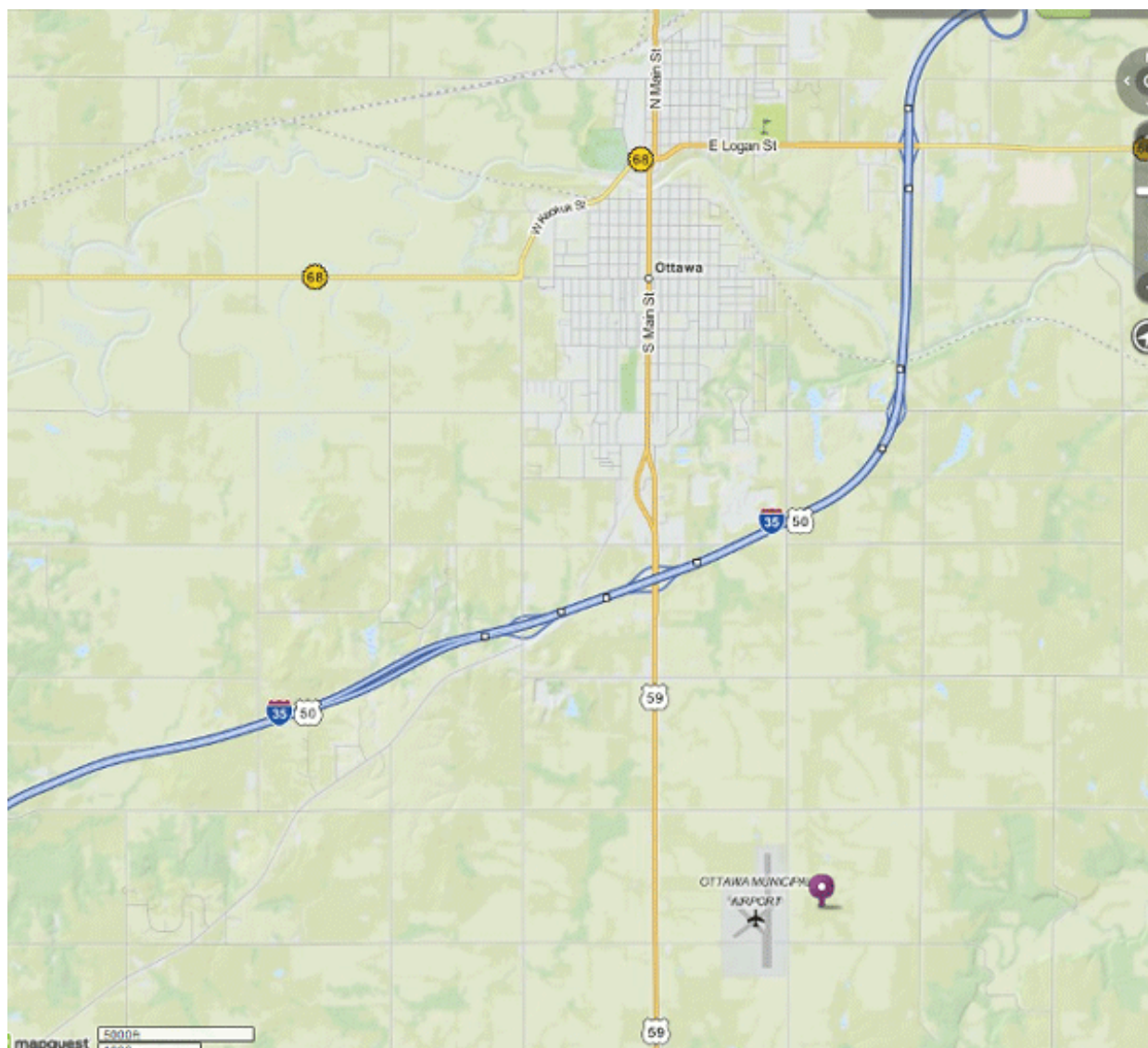


Figure 1. Location of East Central Experiment Field, south of Ottawa.

## 9. Northwest Research-Extension Center fall field day, August 23

Irrigation water efficiency will be featured at the Northwest Research-Extension Center fall field day Tuesday, Aug. 23 in Colby.

With the theme, “Just Add Water: Irrigation Science Today,” the event starts with registration 8:30-9:00 a.m. at the American Legion, 1850 W. 4<sup>th</sup> St. Transportation will be provided from there to the research station for field tours and returning to the American Legion for presentations indoors and a complimentary lunch.

Field tour topics and indoor presentations by K-State extension agronomists, engineers and entomologists include:

- Drought-tolerant corn hybrids and timing of water deficits – Rob Aiken
- Managing irrigation of modern corn hybrids under institutional constraints – Freddie Lamm
- Soil water sensors: Lessons from the field – Jonathan Aguilar
- Ear feeding pests on corn: Is resistance on the horizon? – Sarah Zukoff
- Nitrogen and phosphorus management for irrigated corn: Sustainability and profit – Lucas Haag
- Mobile drip irrigation: Hybrid hardware for hybrid corn – Isaya Kisekka
- ET-Based irrigation scheduling – Danny Rogers

More information is available by calling 785-462-6281.

## 10. Agricultural Research Center-Hays fall field day, August 24

Sugarcane aphids, sorghum hybrids, summer annual forages, and economic considerations linked to inputs are among the topics at the 2016 Fall Field Day on Aug. 24, at the Agricultural Research Center-Hays.

The field day starts with registration at 9:00 a.m. and the welcome and field tour by K-State scientists at 9:30 a.m. The tour includes:

- Development of cold tolerant grain sorghum – Ramasamy Perumal, sorghum breeder
- The search for new herbicide options in grain sorghum – Phil Stahlman, weed scientist
- Tillage x Nitrogen x Sorghum hybrid: Sorting out the Mix – Augustine Obour, soil scientist
- Summer annual forage comparisons: Production and quality – John Holman, cropping systems agronomist
- Improving pearl millet for the Great Plains – Desalegn Serba, millet breeder

Following a complimentary lunch, presentations in the auditorium include:

- Sugarcane aphid: Current status and management – JP Michaud, entomologist
- Inputs, returns and breakeven production in a challenging market – Mark Wood, agricultural economist with Kansas Farm Management Association

More information about the field day is available by calling 785-625-3425. Information about the research center is available online at [K-State Research and Extension Agricultural Research Center-Hays](#).

## 11. Southwest Research-Extension Center fall field day, August 25

Corn and sorghum will take center stage at the Southwest Research-Extension Center's fall field day Thursday, Aug. 25. The center is located at 4500 E. Mary St. in Garden City.

Registration with time to visit exhibitor booths starts at 8 a.m. The program, followed by field tours, begins at 9:15 a.m. Lunch will be served at noon, compliments of commercial exhibitors, and seminars start at 1 p.m.

One field tour includes:

- Summer annual forages
- Iron chlorosis in grain sorghum
- Weed control in irrigated corn
- Weed control in irrigated sorghum
- Impact of increasing sorghum population and fertility on weed control of ultra-low herbicide inputs

Another field tour includes:

- Mobile drip irrigation for corn production
- Soil water sensors and plant canopy temperature sensors for irrigation scheduling
- Corn and sorghum insect update

The topics of the afternoon seminars are:

- Limited irrigation research update
- Beneficial Insect Blitz (including information on laws, safety labels and environmental concerns)
- Occasional tillage in wheat-sorghum-fallow

Continuing education credits are available for attendees.

More information is available by contacting the K-State Southwest Research-Extension Center at 620-276-8286.

## 12. Comparative Vegetation Condition Report: July 19 - 25

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. His pioneering work in this area is gratefully acknowledged.

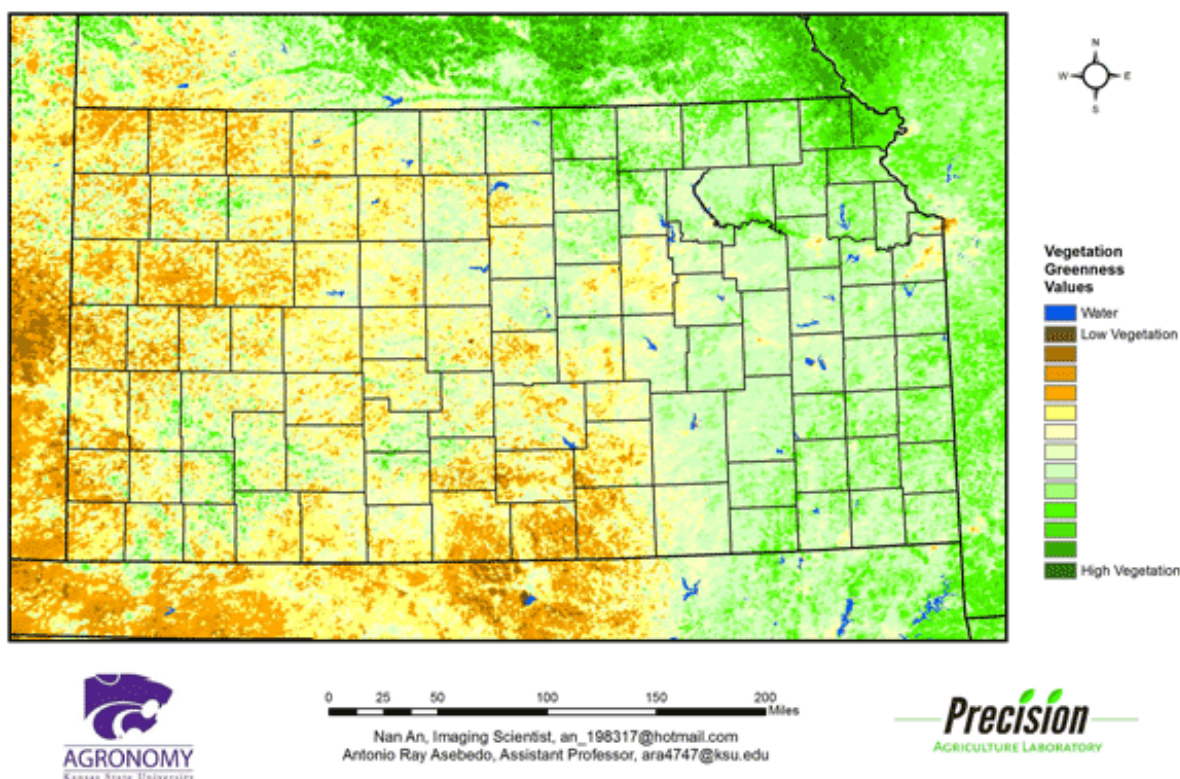
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new 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 30: 07/19/2016 - 07/25/2016



**Figure 1. The Vegetation Condition Report for Kansas for July 19- July 25, 2016 from K-State's Precision Agriculture Laboratory continues to show high NDVI values across the eastern third of the state, as well as in pockets of central and southwest Kansas. It is also interesting to see the higher NDVI values continue along the Republican River Basin in north central Kansas. The areas of lower NDVI values in parts of eastern Kansas, south of the Kansas River, are getting smaller as saturated soils dry.**

Kansas State University Department of Agronomy

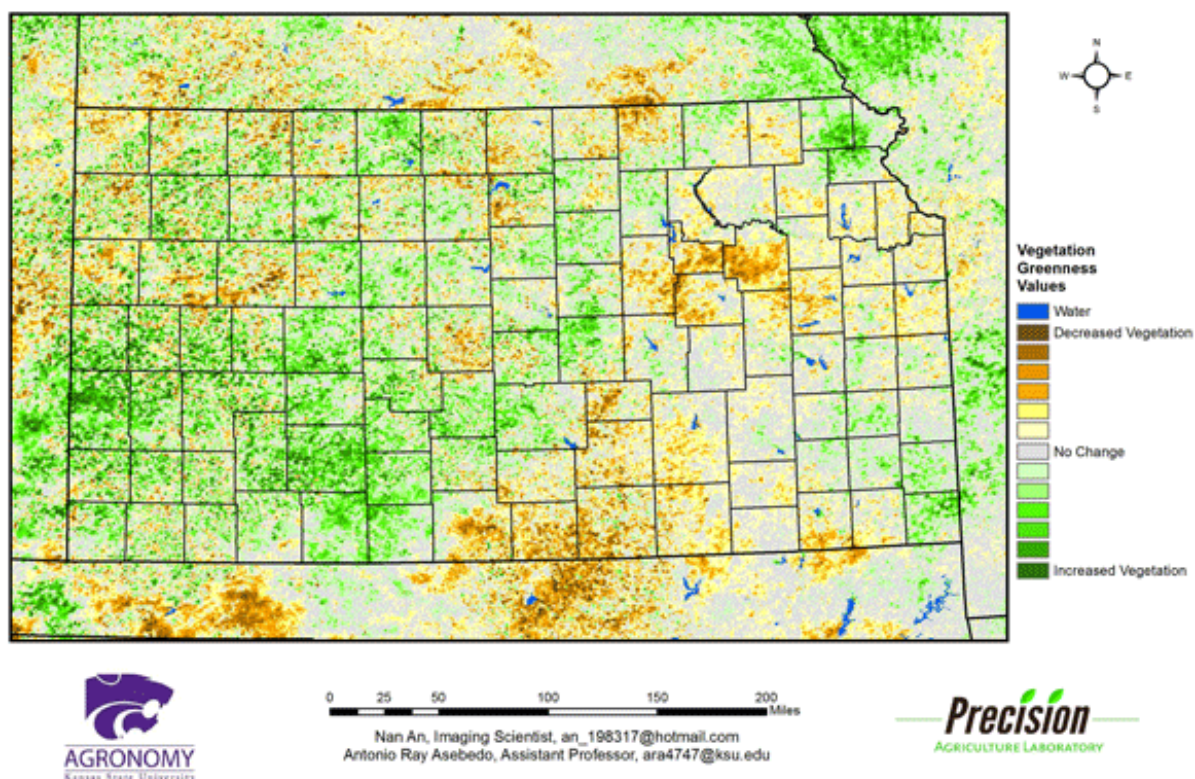
2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

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## Kansas Vegetation Condition Comparison

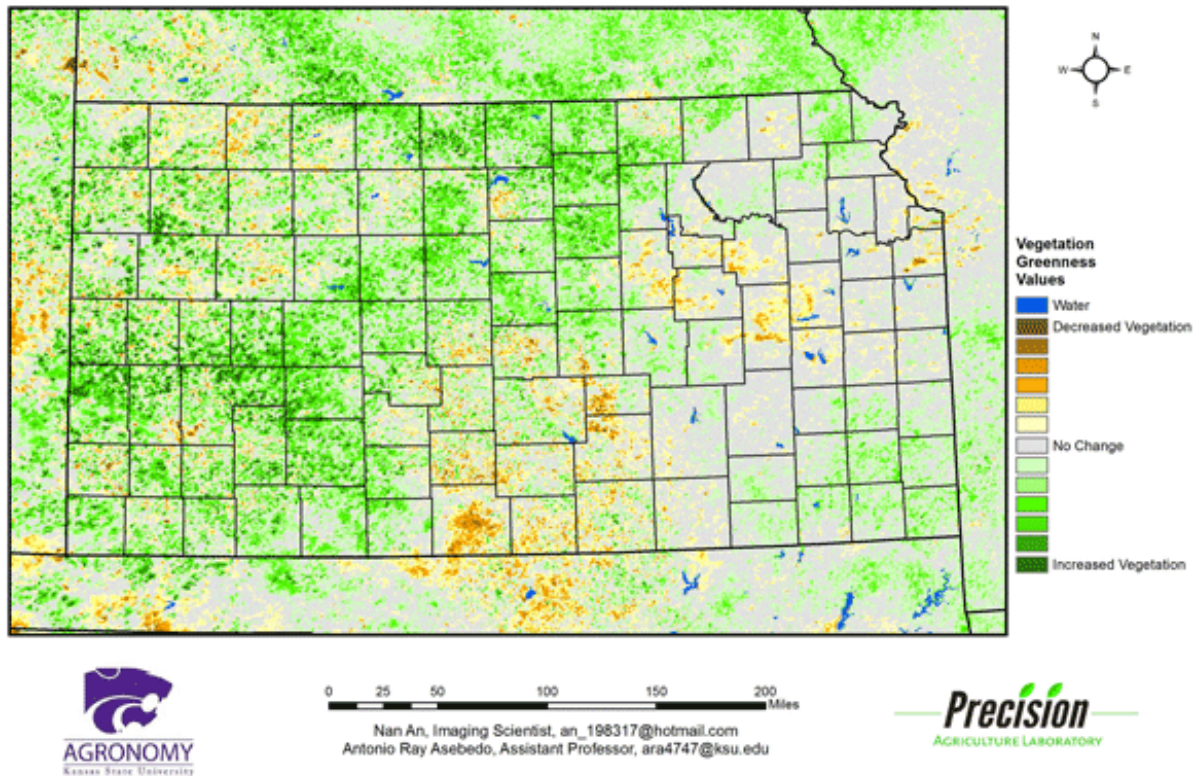
### Late-July 2016 compared to the Late-July 2015



**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for July 19 – July 25, 2016 from K-State’s Precision Agriculture Laboratory shows much higher photosynthetic activity across most of the state. The greatest increase in photosynthetic activity continues to be in western Kansas. Rainfall has been well distributed in the region and crop progress continues ahead of last year at this time. In eastern Kansas, the rapid switch from wetter conditions to hot dry conditions has had a negative impact on vegetative activity this year.**

# Kansas Vegetation Condition Comparison

Late-July 2016 compared to the 27-Year Average for Late-July

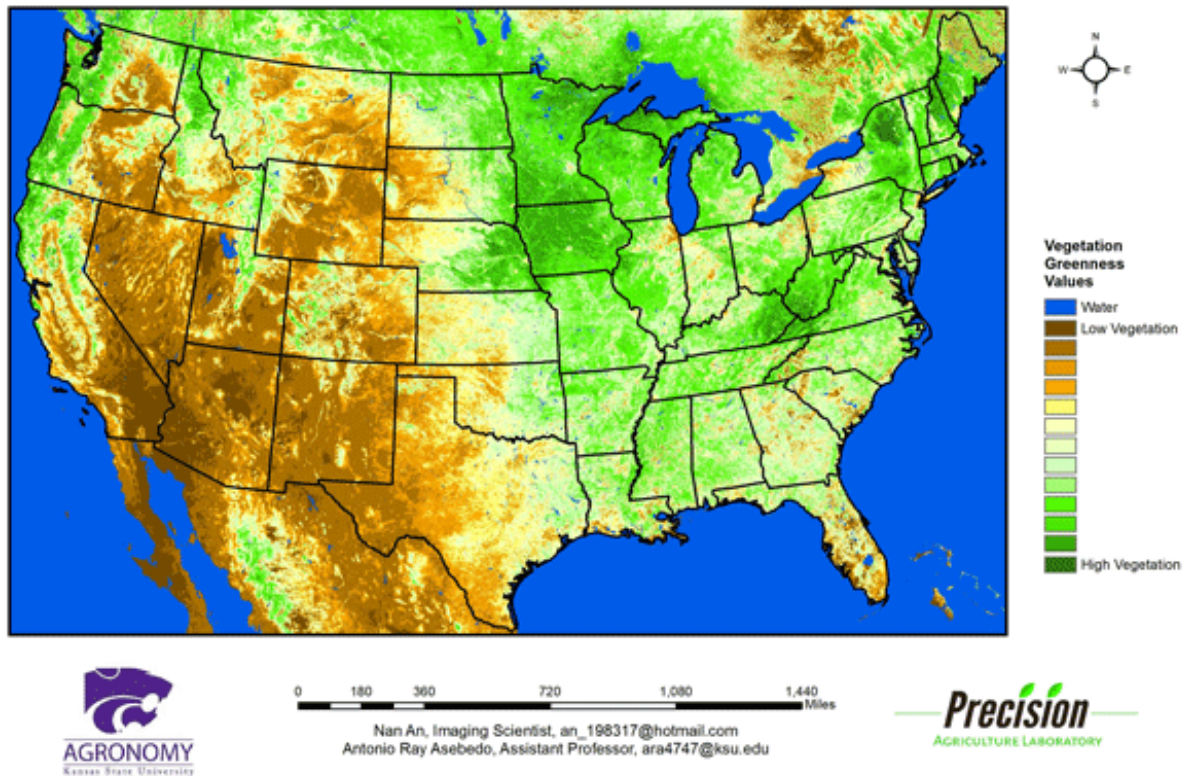


**Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for July 12 – July 18, 2016 from K-State's Precision Agriculture Laboratory shows below-average vegetative activity is confined to small pockets in the South Central and East Central Divisions. Intermittent rains and more seasonal temperatures have reduced vegetative stress.**



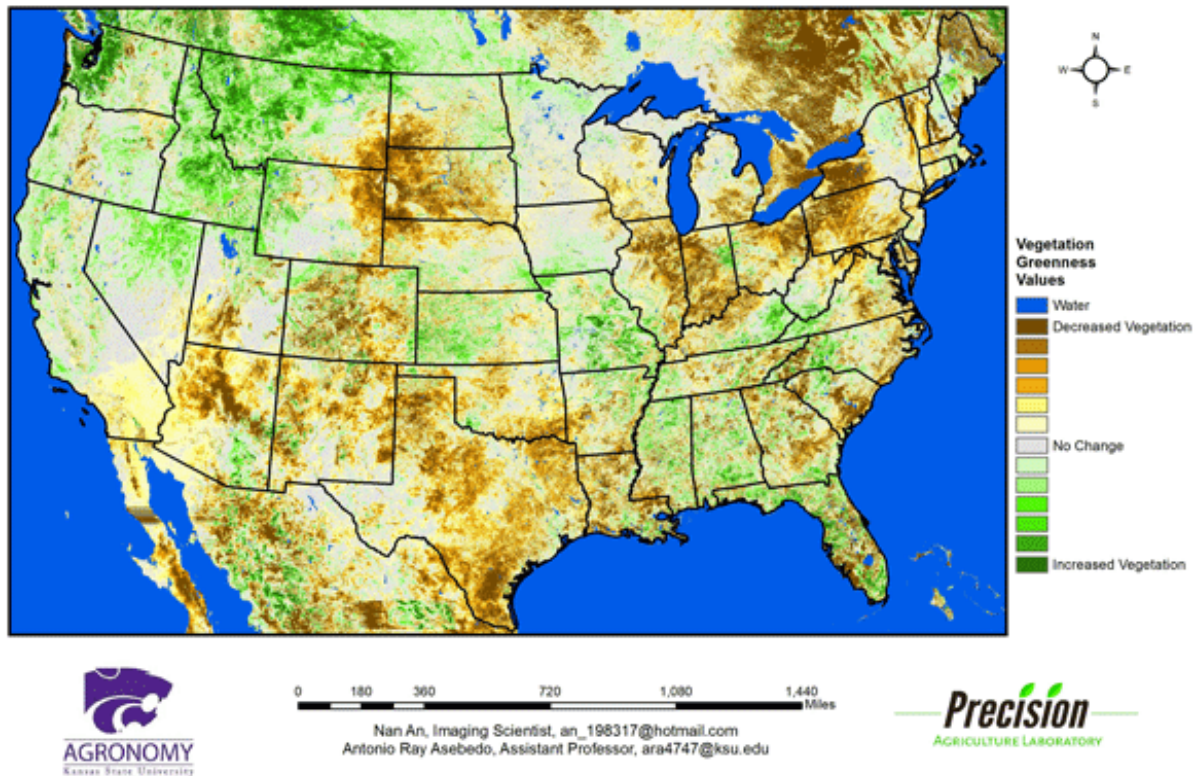
## Continental U.S. Vegetation Condition

Period 30: 07/19/2016 - 07/25/2016



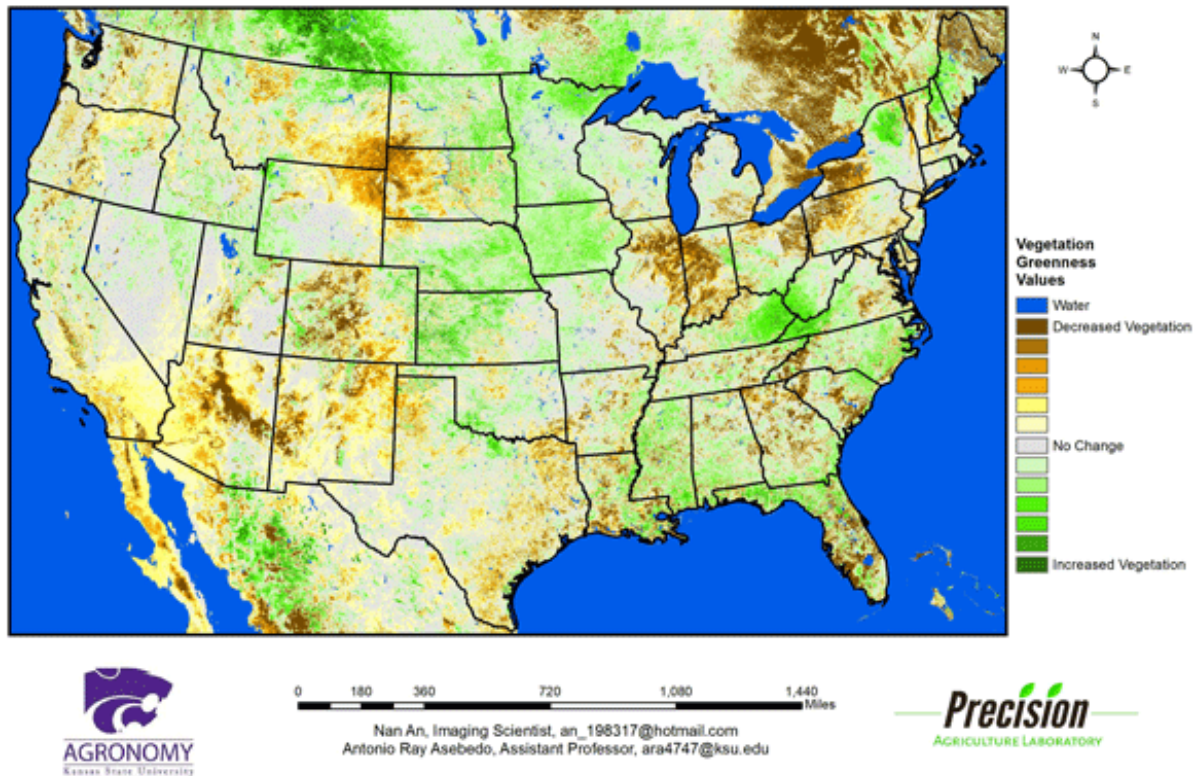
**Figure 4. The Vegetation Condition Report for the U.S for July 19 – July 25, 2016 from K-State’s Precision Agriculture Laboratory shows high NDVI values in the western Corn Belt. Favorable rainfall and more seasonal temperatures favored photosynthetic activity across the region. In contrast, the western High Plains of South Dakota, eastern Montana and eastern Wyoming have reduced vegetative activity as drought continues to intensify in these areas. Vegetative activity has recovered in Kentucky as rainfall has moderated.**

# Continental U.S. Vegetation Condition Comparison Late-July 2016 Compared to Late-July 2015



**Figure 5. The U.S. comparison to last year at this time for July 19 – July 25, 2016 from K-State’s Precision Agriculture Laboratory shows that lower NDVI values are most evident in the western High Plains where continued drier-than-average conditions, coupled with extremely hot weather, have stressed vegetation compared to last year. Warm temperatures in the east and south have also reduced vegetative activity as plants are under greater stress than last year.**

Continental U.S. Vegetation Condition Comparison  
Late-July 2016 Compared to 27-year Average for Late-July



**Figure 6. The U.S. comparison to the 27-year average for the period July 19- July 25, 2016 from K-State's Precision Agriculture Laboratory shows areas of below-average photosynthetic activity in the western High Plains and the Midwest. Drought conditions continue to expand in New England with severe drought conditions reported in western New York.**

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)