



**K-STATE**  
Research and Extension

## Extension Agronomy

# eUpdate

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*02/19/2016*

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), 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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## 1. First hollow stem update: February 19, 2016

With the warm temperatures observed during the week of Feb. 15-19 in most of Kansas, producers may be concerned their wheat crop is more advanced than it should be for this time of the year. Warmer temperatures will speed up crop development, and varieties that have already met their vernalization requirement may start greening up and expanding their hollow stem (for more information on warm winter temperatures effects on wheat, please see the article “Possible consequences of warm winter temperatures on wheat” in the Feb. 19, 2016 issue of the [Agronomy eUpdate](#)).

Cattle should be removed from wheat pastures when the crop reaches first hollow stem (FHS). Grazing past this stage can severely affect wheat yields (for a full explanation, please refer to eUpdate article “[Optimal time to remove cattle from wheat pastures: First hollow stem](#)” in the Feb. 5, 2016 issue).

The K-State Extension Wheat and Forages crew measures FHS on a weekly basis in 23 different commonly grown wheat varieties in Kansas. Ten stems are split open per variety per replication, for a total of 40 stems monitored per variety. The varieties are in a September-sown replicated trial at the South Central Experiment Field near Hutchinson, in cooperation with Gary Cramer, Agronomist-in-Charge of the Field.

The average length of hollow stem is reported in Table 1. As of Feb. 19, the more advanced varieties have between 0.06 and 0.11 cm of hollow stem and therefore are not yet close to achieving FHS, which occurs at 1.5 cm (about a half-inch). From a FHS perspective, producers grazing wheat in the south central region of Kansas do not have to worry yet about removing cattle from wheat pastures at this point, regardless of the variety. However, reports from Jeff Edwards, former Oklahoma State University Small Grains Extension Specialist, indicate that a few varieties had already reached FHS on February 16 at Stillwater, in the north central region of Oklahoma. Thus, producers near the southern board of Kansas who currently graze their wheat and intend to harvest it for grain are encouraged to check for FHS from a non-grazed area of their fields during the next few days.

**Table 1. Length of hollow stem measured on Feb. 16, 2016 of 23 wheat varieties sown Sept. 26, 2015 near Hutchinson. The critical FHS length for purposes of cattle removal is 1.5 cm.**

Variety	Hollow stem length cm
1863	0.09
Bentley	0.05
Danby	0.03
Doublestop CL Plus	0.03

Duster	0.03
Everest	0.06
Gallagher	0.06
KanMark	0.06
LCS Chrome	0.03
LCS Mint	0.05
LCS Pistol	0.06
LCS Wizard	0.05
Overley	0.11
Ruby Lee	0.08
SY Flint	0.05
SY Wolf	0.05
T158	0.03
TAM 114	0.04
WB 4303	0.11
WB 4458	0.10
WB Cedar	0.09
WB Grainfield	0.05
WB Redhawk	0.08
Variety	$p = 0.02$
LSD (0.05)	0.05

The intention of this report to is provide producers a weekly update on first hollow stem of different wheat varieties in the current growing season. Producers should use this information as a guide, but it is extremely important to monitor FHS from an ungrazed portion of each individual wheat pasture to take the decision of removing cattle from wheat pastures.

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## 2. Possible consequences of warm winter temperatures on wheat

The recent period of unseasonably warm temperatures may have producers concerned with the possible effects on their wheat crop. Short vernalization varieties such as Overley, Everest, WB-Cedar, and others, may be released from winter dormancy and maybe have been growing for a few days during this unseasonably warm period. The consequences of an early greenup on wheat yields will largely depend on spring weather conditions, and a few consequences are discussed below.

### 1. Physiological impact of a return to freezing temperatures during tillering through jointing

Winter wheat loses some of its winter hardiness each time warm temperatures breaks its dormancy, although some of its winter hardiness can be regained if temperatures gradually get colder again. The growing point is near the soil surface during the tillering stage and is protected against injury. Most freeze damage at this stage occurs to leaves. The leaves can become twisted and light green to yellow in color, and are burned at the tip within one or two days after freezing (Figure 1). A strong odor of dehydrating vegetation may be present several days after the freeze. Injury at this stage slows growth and may reduce tiller numbers, but growth of new leaves and tillers usually resumes with warmer temperatures.



**Figure 1. Wheat leaf tips damaged by cold temperatures near Hutchinson. Photo by Romulo Lollato, K-State Research and Extension.**

In the jointing stage, the developing wheat head has started to move up the stem. Even so, wheat at this stage can usually tolerate temperatures in the mid to upper 20's with no significant injury. If temperatures get into the low-20's or lower for several hours, there can be some injury to the lower stems, the leaves, or the developing head. If it is windy during the nighttime hours when temperatures reach their lows, this increases the chance of injury. Most wheat in Kansas should not have reached jointing yet. Our weekly report indicates that none of the 23 wheat varieties tested at the South Central Experiment Field near Hutchinson has reached first hollow stem at this point (please see the article "First hollow stem update: February 19, 2016" in the Feb. 19, 2016 issue of the [Agronomy eUpdate](#)).

Whether actual freeze injury takes place depends on the low temperature reached, how long the temperatures stayed that cold, temperatures gradients in the field, wind speed, canopy density, and other microclimate factors. Soil moisture is another factor that is usually important in determining freeze injury.

One general rule is that producers should not make any quick decisions about the condition of their wheat crop after a freeze. It will take several days of warm weather following the freezes to evaluate the condition of the crop and its yield potential. Even if some of the main tillers are injured or killed, producers should wait to see if enough other tillers have survived to compensate for the lost yield potential.

#### 1. Early use of soil moisture

An early green up means an early use of the much needed stored soil moisture. Wheat generally uses a relatively limited amount of water during the winter months until spring greenup, and water use increases linearly with the increase in biomass from jointing until heading. The larger the wheat's biomass or leaf area, the more water the crop will require to maintain its canopy structure. Greater water use during the winter months will reduce the amount of profile soil moisture for the spring, which might not be a problem in years with sufficient spring precipitation. However, excessive use of the current available water can play against wheat yields if the spring turns out dry.

#### 1. Potential for increased overwintering of diseases

It is still early to know whether the spring weather will favor a stripe rust epidemic (or other wheat leaf diseases) such as the one experienced in most of Kansas last growing season. Mild winter temperatures can increase the potential for a disease outbreak because of increased overwintering

of the spores, but this needs to be matched by adequate moisture conditions. Texas and Oklahoma released a few reports of active stripe and leaf rust infections in the past couple weeks, which should put Kansas wheat producers on alert as states to our immediate south are generally the source of inoculum of many leaf diseases in Kansas, including stripe rust and leaf rust. Still, K-State research has shown limited yield response to early season (Feekes 5-6) fungicide applications across most of the state; thus, in most cases it is probably too early at this point to make the decision to spray a fungicide. It is advisable that producers continue to monitor the conditions in the south and actively scout their fields.

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### 3. Agricultural Mobile Apps: A review and update of scouting apps

This article provides a review and update of some of the current “scouting apps” for agriculture. This section presents apps that can assist farmers in preparing maps, scouting, taking soil samples (geo-referencing the sampling points), calculating areas, measuring distances, and getting information about the soil type, among several other features.

While these apps can often help you make quick decisions in the field from planting to harvest operations, always make sure to check with your crop consultants, agents, and Extension specialists since this kind of specific information may vary depending on the soil types, yield potential, and environments.

Stay tuned for more in this series of annual reviews and updates on Ag-Apps from our KSUCROPS Crop Production team and the K-State Department of Agronomy! More updated lists of Ag-Apps will be included in the next several editions of the Agronomy eUpdates.

NOTE: These apps are all available as of the time this article is published. Alterations or changes in availability could occur, affecting the ability to access these apps.

For this series of articles, we have grouped Ag-Apps into the following 10 classifications:

- **ID Apps:** For identification purposes (weeds, insects, diseases, and nutrients)
- **CALC Apps:** For calculating purposes (nutrient removal calculations, tank mixes, volume to spray, etc.)
- **SCOUT Apps:** For scouting purposes or for geo-positioning (soil sampling, recording notes, soil types, etc.).
- **ECON Apps:** For checking grain prices, market evolutions, fertilizer price trends, news and finances.
- **GUIDE Apps:** For diagnosing crop production issues in the field, primarily related to field guides (crop management: insect, disease, weed, and more).
- **LIVESTOCK Apps:** Apps related to the animal side, nutrition, health, and information on markets.
- **IRRIGATION Apps:** Apps related to field crop irrigation and water application.
- **MACHINERY Apps:** Apps for associated with agricultural equipment preparation, inventory, providing information of the machine.
- **GAG Apps:** GAG (general Ag-Apps) for general use, weather-related, for meetings, for reading magazines, among several other Apps’ properties.
- **NON-AG Apps:** For general use from e-readers to calculators, email, calendar, picture editing, and more.

#### 3. Scouting Apps

These Apps are primarily utilized for scouting purposes or for geo-positioning (soil sampling, recording notes, soil types, etc.).

*MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University*

#### **Scouting Apps**

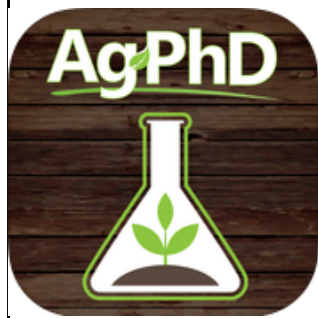
Name of App and Source	Picture	Brief description and cost
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Kansas State University Department of Agronomy

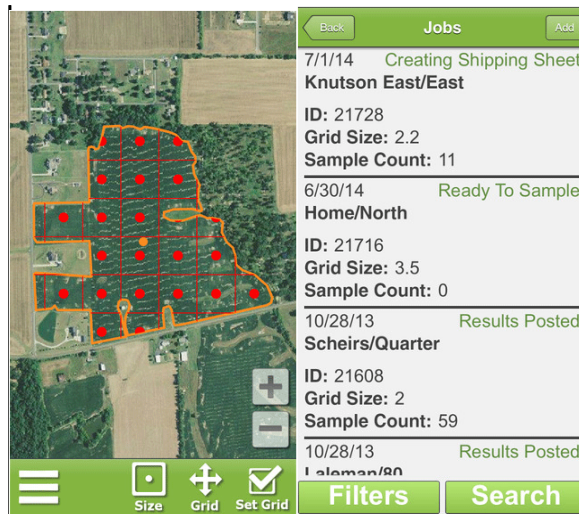
2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[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)

Ag PhD Soil Test



AG-PHD



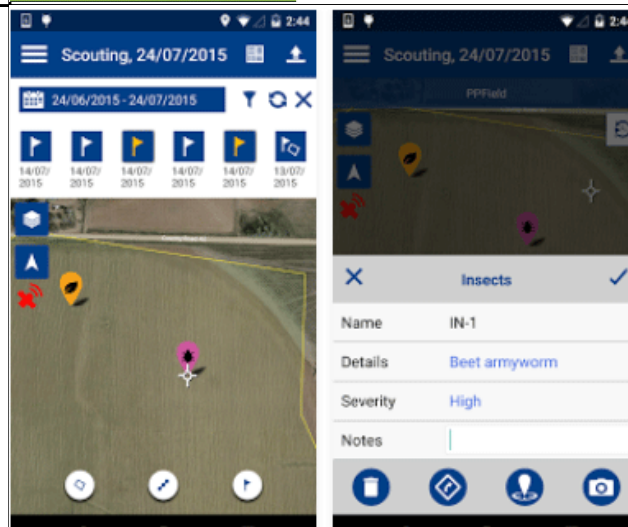
With this app you will receive high quality lab results and personalized recommendations from Ag PhD experts.

FREE

Connected Farm Scout



Trimble Navigation Limited



The scout app uses your phone's GPS for mapping field boundaries, marking flags, and entering scout information for points, lines, and polygon areas.

FREE

eCropScout 2.0



Prairie Farm Club, Inc.


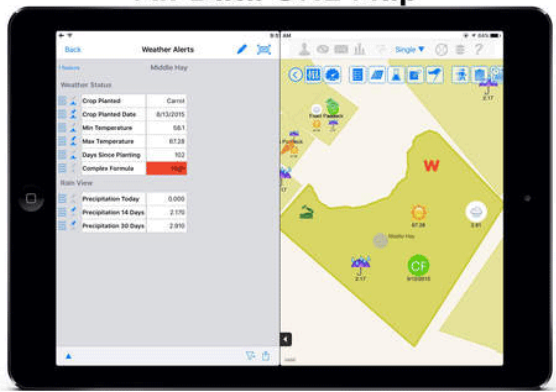



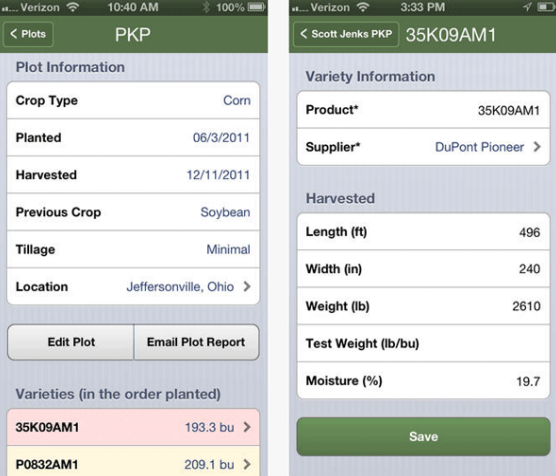


This app is designed to be used by crop consultants, farmers, seed dealers, agronomists, and Ag Professionals to deliver real-time condition maps.

FREE

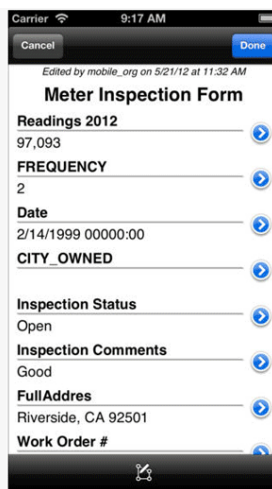
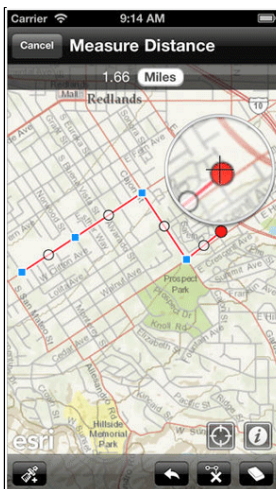
MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

**Scouting Apps**

Name of App and Source	Picture	Brief description and	cost
<p>iCropTrak</p> 	<p><b>All Data ONE Map</b></p> 	<p>This app is user customizable, capable of collecting and editing vectors, drone imagery, equipment, and more. It is a consultant in your pocket.</p>	<p>\$1-5</p>
<p>ScanControl Pioneer Field360 Notes</p> 		<p>This app pinpoints your field location via satellite imagery so you can record notes or photos on the spot. Organize your crop scouting information to save or share.</p>	<p>FREE</p>
<p>DuPont Pioneer AgPlots</p> 		<p>This app offers a simple method of calculating and storing grain yields for your corn, soybean, and wheat plots. Simply punch the numbers into your phone to compare and save.</p>	<p>FREE</p>
<p>August Knecht ArcGIS</p>		<p>With this app use your current location and discover information about what you see. Also measure distances and areas of interest, and share maps with others.</p>	



ESRI

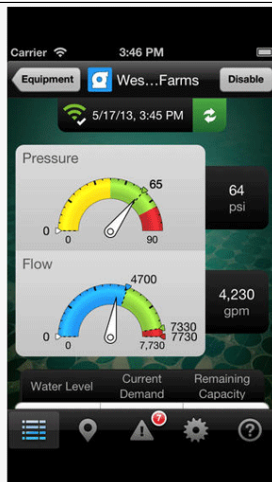
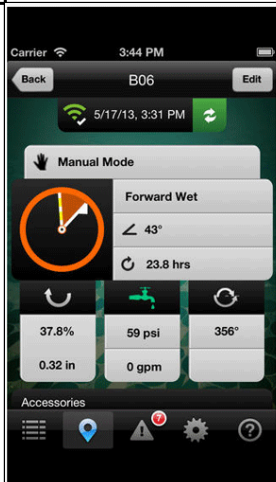


FREE

FieldNET Mobile



Lindsay Sales & Service, LLC



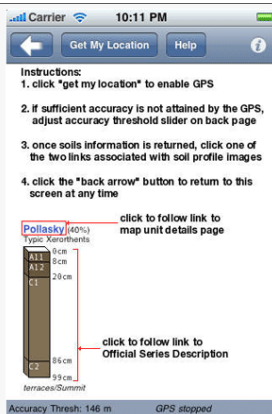
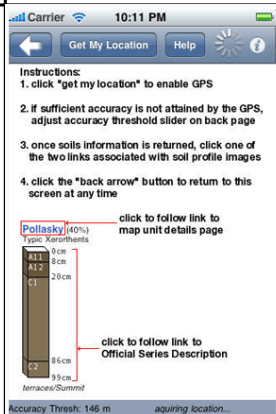
With this app, you can remotely manage your pivots, laterals, drip/micro-irrigation systems, and pumps. Users can quickly monitor and control irrigation equipment.

FREE

SoilWeb



CA Soil Resource Lab

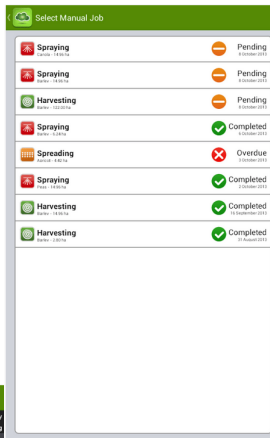


This app retrieves official soil series descriptions and summaries of soil types associated with the current geographic location.

FREE

## Scouting Apps

Name of App and Source	Picture	Brief description and	cost
<p>Sirrus</p>  <p>SST Software, Inc.</p>		<p>This app allows you to create field boundaries, soil sample, scout your crops, record field operations, create recommendations, check weather conditions, and graph rainfall estimates.</p> <p>FREE</p>	
<p>Wolf-GIS APEX</p>  <p>Wolf-Tek, Inc.</p>		<p>This app provides a simple way to manage (customize drawings, measure distance, GIS functions) and display information from any location.</p> <p>FREE</p>	
<p>AgDNA</p>  <p>AgDNA</p>		<p>AgDNA features include: farm planning, record keeping, boundary mapping, live equipment tracking, scouting observations, and data sharing.</p> <p>FREE</p>	



Each of the next seven issues of the eUpdate will feature another classification of Ag-Apps from our KSUCROPS Crop Production team and the K-State Department of Agronomy!

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#### 4. Pasture weed and brush management webinar scheduled Feb. 23



Maintaining proper weed and brush control can have a huge impact on summer pastures now, and in the future.

Walt Fick, K-State Range Management Specialist, and Doug Shoup, K-State Southeast Area Crops and Soils Specialist, will present a webinar titled “Pasture Weed and Brush Management” at 1:30 p.m. on Tuesday, Feb. 23. The webinar will be hosted by Great Plains Grazing, a U.S. Department of Agriculture-Agriculture and Food Research Initiative-Coordinated Agricultural Project grant. Fick and Shoup are Great Plains Grazing team members.

This is a free webinar, and is open to anyone interested in gaining an understanding of weed and brush control. Participants can expect to learn the following methods of weed and brush control:

- Chemical
- Mechanical
- Burning
- Grazing
- Biological

This is the seventh of a series of 12 webinars hosted monthly by Great Plains Grazing. The series aims to provide research-based information, and is targeted for producers and extension agents. Previous webinars are archived and available for viewing on the [Great Plains Grazing website](#).

To register for the pasture weed and brush management seminar on Feb. 23, visit [Upcoming Webinars](#).

K-State in cooperation with other agencies are conducting several Prescribed Burning Workshops during February to early March.

Date	Location	Address	Time	Contact
February 23	Wakefield	Wakefield Museum NE corner of 6 <sup>th</sup> and Hickory Streets	9:30 a.m.	Allie Rath  785-263-1351 x 1335  arath@pheasantsfor ever.org
February 23	Paola	Miami County Fairgrounds 401 East Wallace Park Drive	10 a.m.	Megan Westerhold  913-294-4306  mwesterhold@ksu.e du
February 24	Garnett	Community Building 709 North Lake Road	10 a.m.	Rod Schaub 785-828-4438  rschaub@ksu.edu
February 26	Stockton	Harding 4-H Hall Fairgrounds  918 S Elm	10 a.m.	Rachael Boyle  785-425-6851  rboyle@ksu.edu
February 29	Lawrence	Douglas Co. Extension office	10 a.m.	Megan Fisher 785-840-4616  mfisher@haskell.ed u
March 3	LaCrosse	Fairgrounds	10 a.m.	Anna Walkowiak- Esch  785-798-3614 x 1307  awalk@pheasantsfo rever.org

Each workshop normally lasts about 5 hours. There may be a charge for materials and lunch. Please contact the person listed in the chart above to ask about charges and register.

The smoke dispersal model should be active starting March 1, 2016 (see <http://www.ksfire.org>).



Walt Fick, Rangeland Management Specialist  
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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.

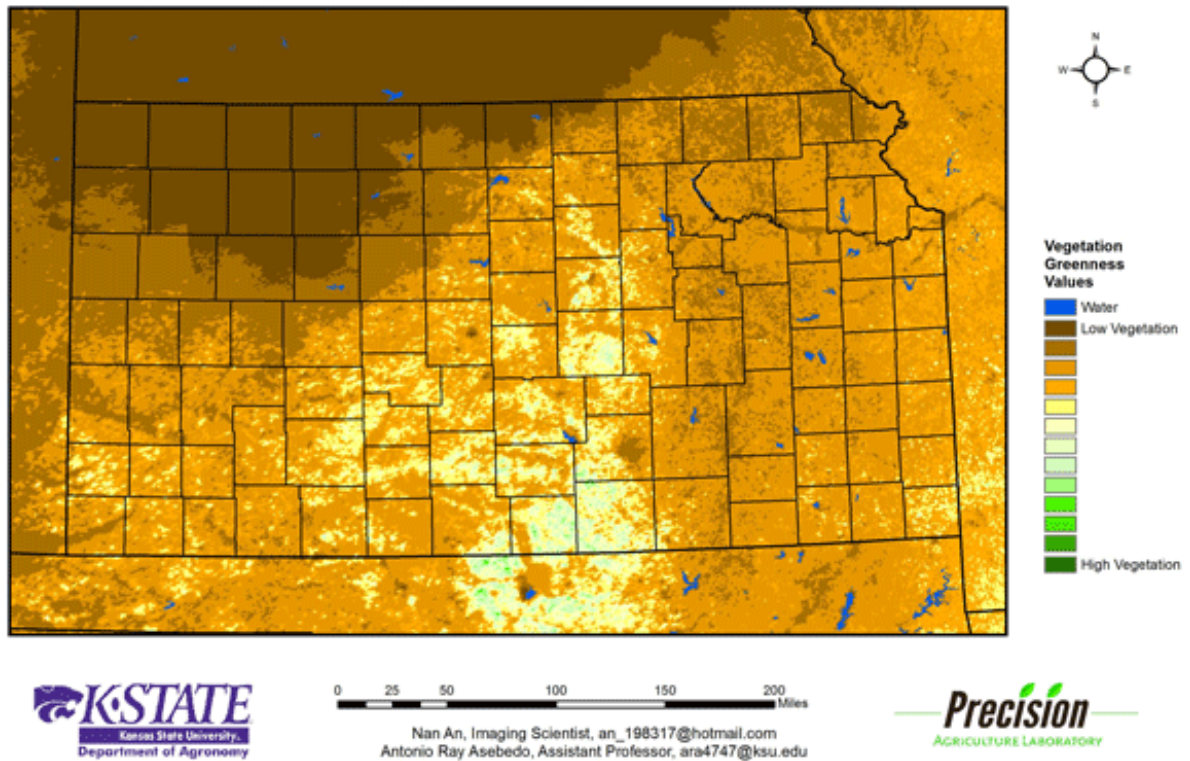
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new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

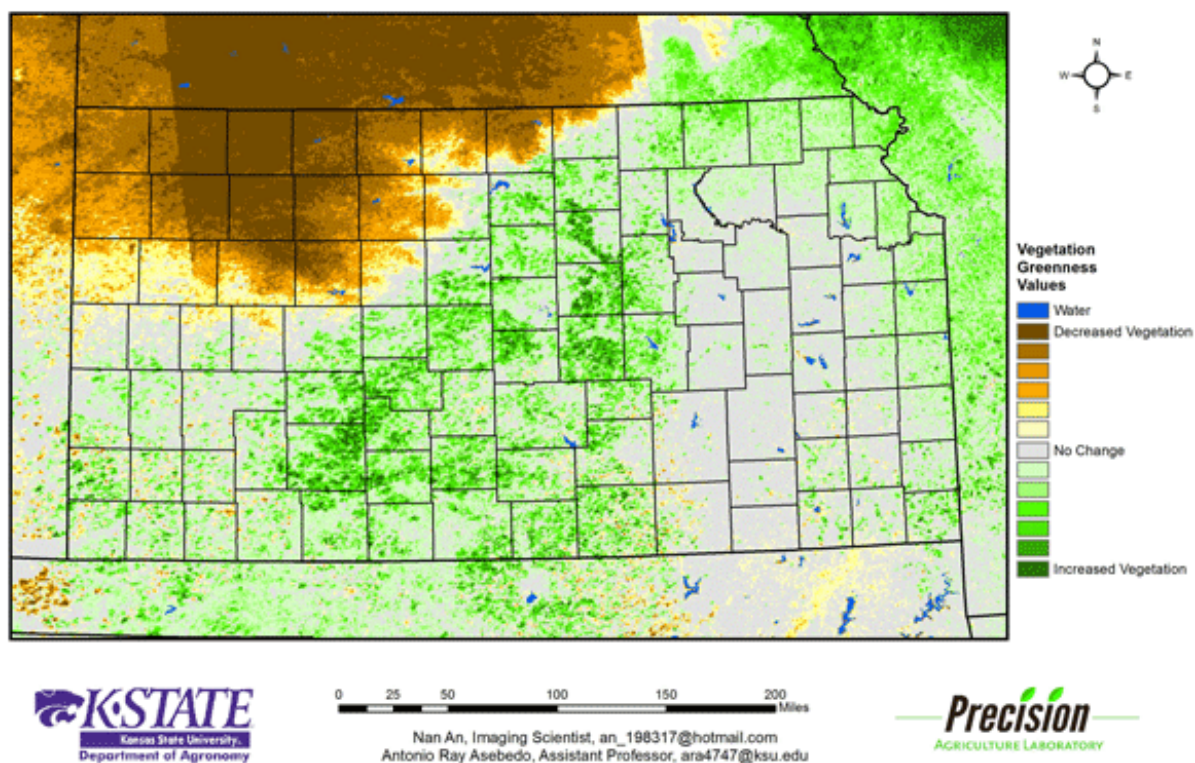
# Kansas Vegetation Condition

Period 07: 02/09/2016 - 02/15/2016



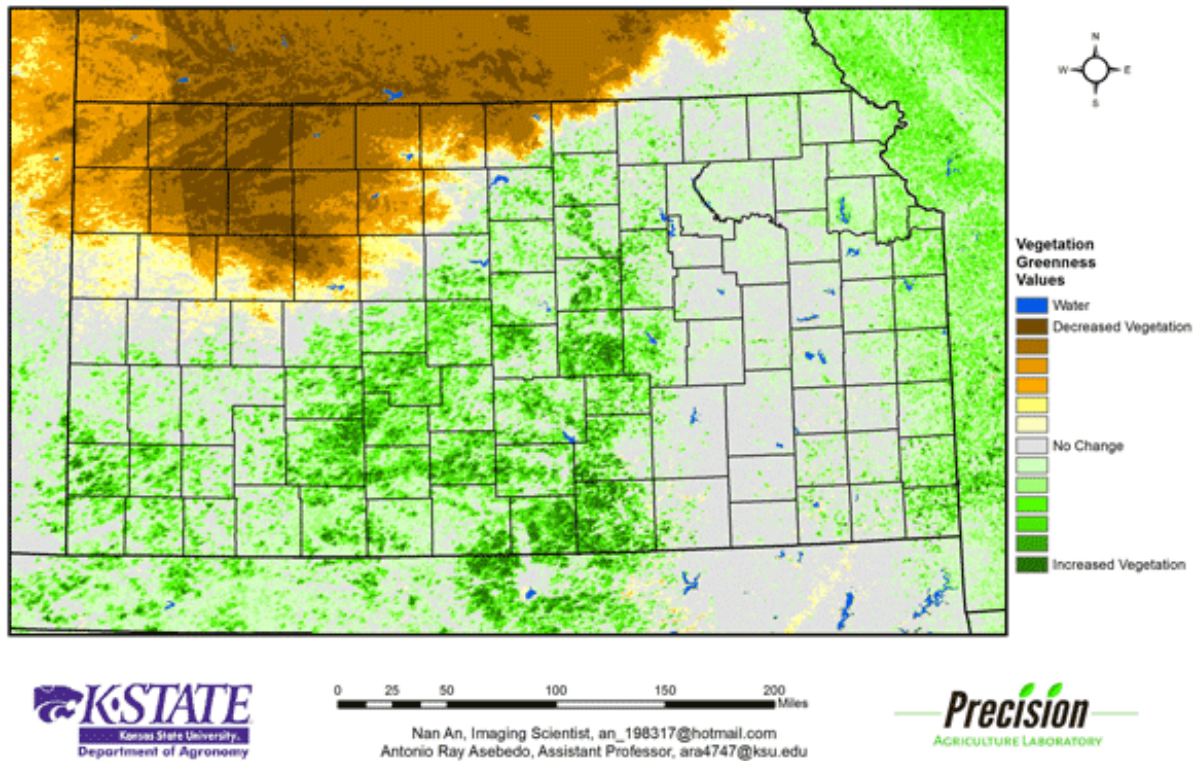
**Figure 1. The Vegetation Condition Report for Kansas for February 9 – 15 from K-State’s Precision Agriculture Laboratory shows that the area of highest biomass production continues to spread north and west from Harper and Sumner counties. Continued warmer-than-normal winter temperatures has accelerated growth in these areas. In the Northwest Division, the very low level of vegetative activity is directly related to the heavy snow in the region. The impacts from that snow continue to fade, as temperatures warm.**

## Kansas Vegetation Condition Comparison Mid-February 2016 compared to the Mid-February 2015



**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for February 9 – 15 from K-State’s Precision Agriculture Laboratory shows much of the state with higher photosynthetic activity. The largest area of decreased vegetative activity is in the Northwestern Division. This is the lingering effect of the February 3rd snowstorm.**

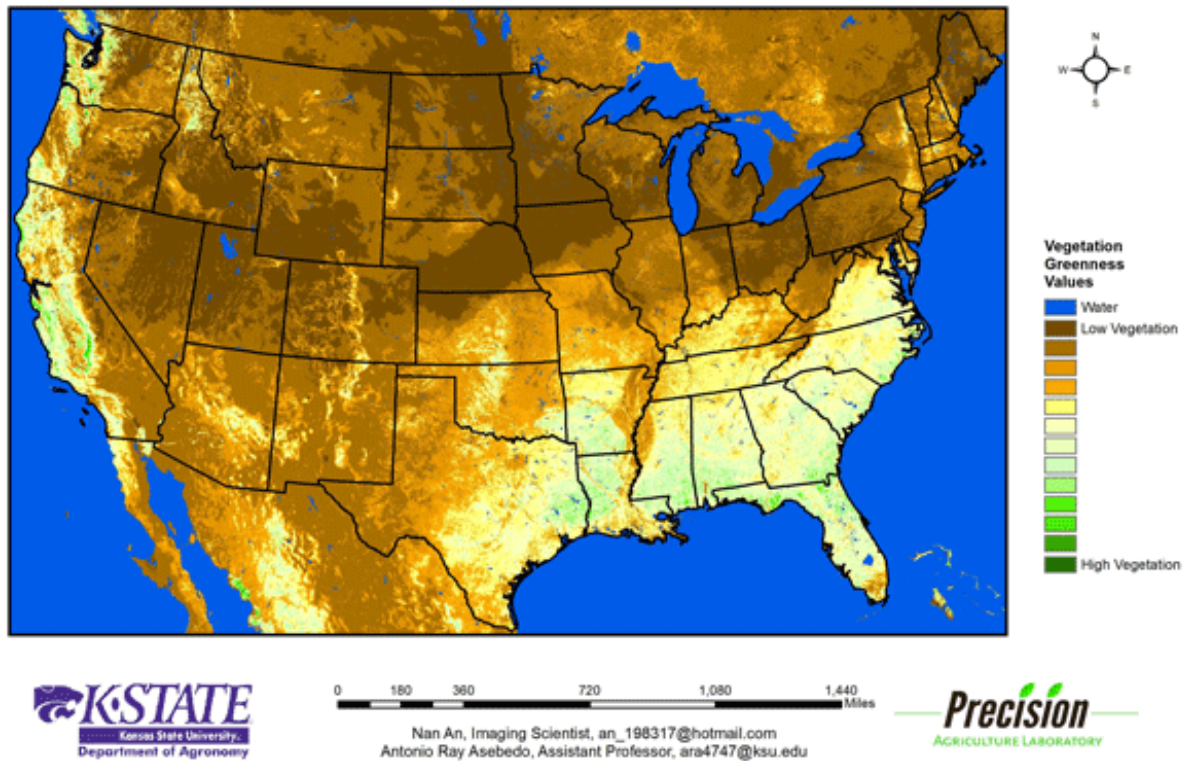
**Kansas Vegetation Condition Comparison**  
Mid-February 2016 compared to the 27-Year Average for Mid-February



**Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for February 9 – 15 from K-State's Precision Agriculture Laboratory shows that the area of above-average photosynthetic activity continues to increase. The largest areas are in central and south central Kansas. Temperatures have been close to above average across the state, with the warmest departures in the southwest. The reduced vegetative activity in northwest Kansas is due to the February 3rd snowstorm.**

## Continental U.S. Vegetation Condition

Period 07: 02/09/2016 - 02/15/2016



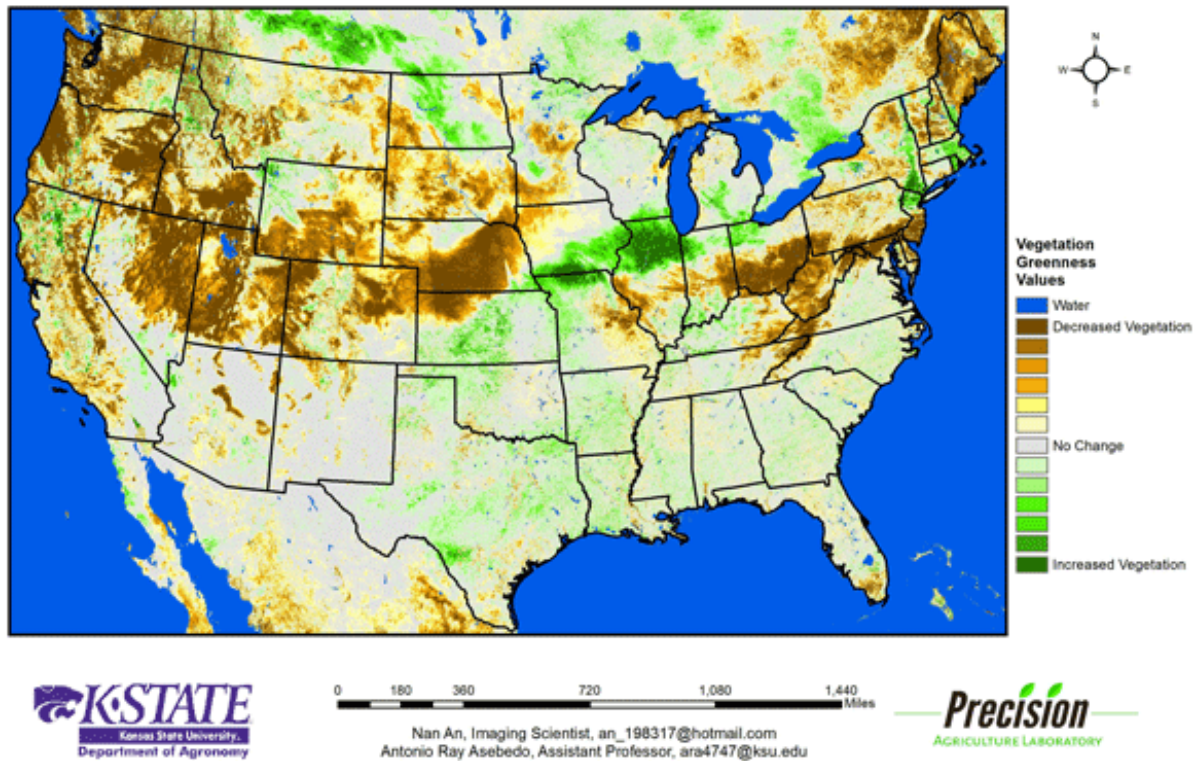
**Figure 4. The Vegetation Condition Report for the U.S. for February 9 – 15 from K-State’s Precision Agriculture Laboratory shows that the highest photosynthetic activity is in the Deep South, where favorable temperatures continue. Continued lack of vegetative activity in the Pacific Northwest is actually positive as it indicates a substantial snowpack. Lingering impacts of the December flooding are still visible in the reduced vegetative activity in the lower Mississippi River Valley.**

Kansas State University Department of Agronomy

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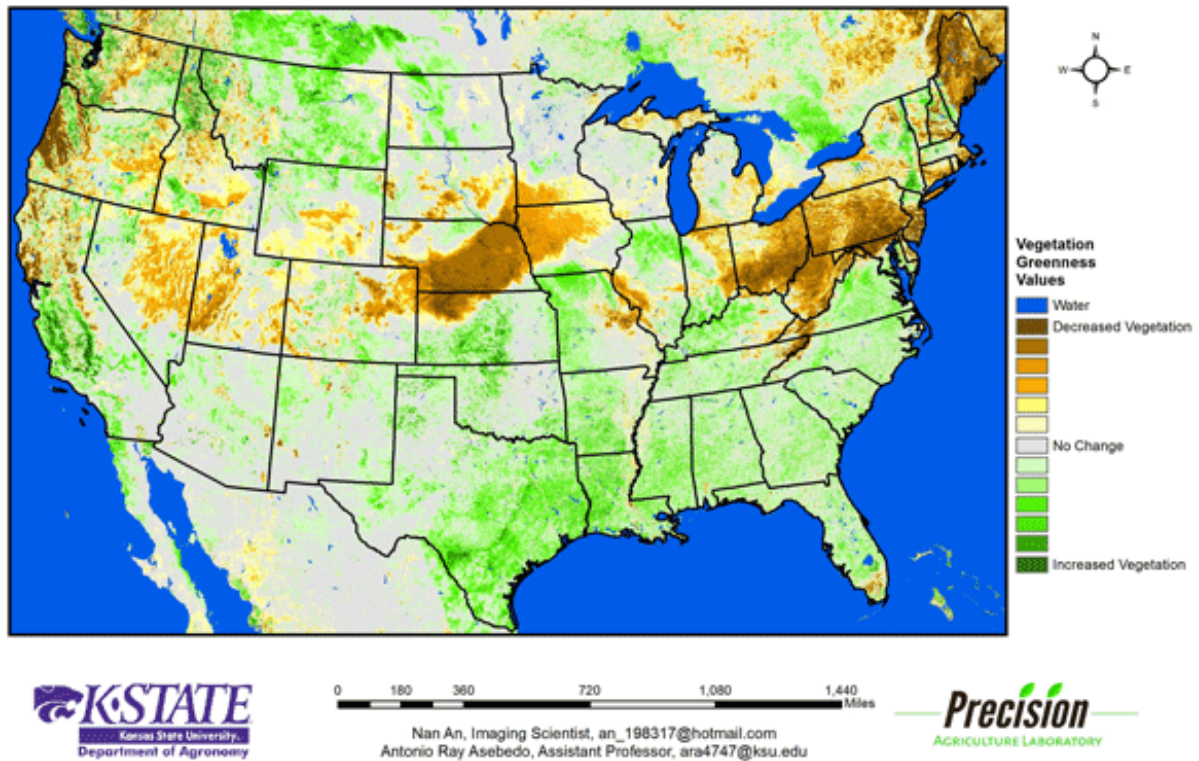
[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

Continental U.S. Vegetation Condition Comparison  
Mid-February 2016 Compared to Mid-February 2015



**Figure 5. The U.S. comparison to last year at this time for the period February 9 – 15 from K-State’s Precision Agriculture Laboratory shows that lower NDVI values are most evident from the Pacific Northwest to the Central Plains, while much higher NDVI values are visible in the Great Lakes region. Snow continues to be the major influence on both. The Great Lakes area continues to have a low-snow season, while the Pacific Northwest has a higher snow pack than last year. Similarly, the low NDVI values along the Ohio River Valley can be traced to the Valentine’s Day storm that left up to 10 inches in the area.**

Continental U.S. Vegetation Condition Comparison  
Mid-February 2016 Compared to 27-year Average for Mid-February



**Figure 6. The U.S. comparison to the 27-year average for the period February 9 – 15 from K-State’s Precision Agriculture Laboratory shows much below-average photosynthetic activity in the Central Plains and into the Mid-Atlantic states. The decreases in both of these areas are due largely lingering impacts from snow events. The February 14<sup>th</sup> storm in the Mid-Atlantic region left up to 10 inches of snow in the area. The above-average NDVI readings in eastern Montana and North Dakota is of concern. Snow pack in these areas is below average and abnormally dry conditions continue to expand in the region.**

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