Issue 554

K-STATE Research and Extension

Extension Agronomy

eUpdate

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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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

eUpdate Table of Contents | 03/11/2016 | Issue 554

1. Spring herbicide applications on winter wheat: The importance of wheat growth stage 3
2. Alfalfa weevil larvae found in north central Kansas 6
3. First hollow stem update: March 8, 2016 9
4. Starter fertilizer rates and placement for corn 12
5. Agricultural Mobile Apps: A review and update of livestock apps 15
6. On-farm research collaborative project: Non-biased, Research-based, and Grower-driven 20
7. K-State Sorghum School set for March 31 in Phillipsburg 25
8. Temperatures in Kansas continue to be much warmer than normal 27
9. Comparative Vegetation Condition Report: March 1 - 7 32

1. Spring herbicide applications on winter wheat: The importance of wheat growth stage

The unseasonably warm temperatures recently have caused wheat to green up and begin spring growth considerably earlier than normal in Kansas. Producers should pay close attention to the growth stage of their wheat before making their herbicide applications.

Dicamba can be applied to wheat between the 2-leaf and jointing stages of wheat. Application of dicamba after wheat reaches the jointing stage of growth causes severe prostrate growth of wheat and significant risk of yield loss. Dicamba is effective for control of kochia, Russian thistle, and wild buckwheat, but is not good for control of mustard species. Kochia, Russian thistle, and wild buckwheat are summer annual weeds that may emerge before or after wheat starts to joint, so timing of dicamba for control of these weeds can sometimes be difficult. Fortunately, dicamba provides some residual control of these weeds following application.

Other herbicides that must be applied prior to jointing include Agility SG, Beyond (on Clearfield varieties only), Olympus, Orion, PowerFlex, Pulsar, Rage D-Tech, and Rave.

MCPA and 2,4-D have different application guidelines. In general, MCPA is safer on wheat than 2,4-D, especially when applied prior to tillering. We recommend that 2,4-D not be applied to wheat until it is well-tillered in the spring. Application of 2,4-D prior to tillering hinders the tillering process, causes general stunting and can result in significant yield loss.

Figure 1. Stunting from an application of 2,4-D to wheat prior to tillering. Photo by Dallas Peterson, K-State Research and Extension.

2,4-D is labeled for application to wheat from the full-tiller stage until prior to the boot stage of growth, but is probably safest between full-tiller and jointing stages of growth. Wheat will sometimes exhibit prostrate growth from 2,4-D applications applied in the jointing stage of growth, but yields generally are not significantly affected if applied before the boot stage of growth.

MCPA is relatively safe on young wheat and can be applied after the wheat is in the three-leaf stage (may vary by product label) until it reaches the boot stage of growth. Consequently, MCPA would be preferred over 2,4-D if spraying before wheat is well-tillered. Neither herbicide should be applied once the wheat is near or reaches the boot stage of growth, as application at that time can result in malformed heads, sterility, and significant yield loss (Figure 2).

Figure 2. Malformed heads from an application of 2,4-D at boot stage. Photo by Dallas Peterson, K-State Research and Extension.

Both 2,4-D and MCPA are available in ester or amine formulations. Ester formulations generally provide a little better weed control than amine formulations at the same application rates, but also are more susceptible to vapor drift. Ester formulations generally are compatible for use with fertilizer carriers, while amine formulations often have physical compatibility problems when mixed with liquid fertilizer.

Other herbicides used in the spring on wheat can be applied up to the time the flag leaf is visible, or

later. Affinity BroadSpec, Affinity TankMix, Ally Extra SG, Express, Harmony + 2,4-D or MCPA, Harmony Extra, and Supremacy must be applied before the flag leaf is visible. Huskie, Weld, and WideMatch can be applied through the flag leaf stage. Herbicides that can be applied later in the spring – prior to the boot stage -- include Ally + 2,4-D, Amber, Finesse, Starane Ultra, and Starane Plus Salvo.

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2. Alfalfa weevil larvae found in north central Kansas

Alfalfa weevil larvae were first detected this year in north central Kansas on March 3. Chuck Otte, Geary County Agriculture and Natural Resources agent, also reported finding small larvae on March 5 in Geary County and Tom Maxwell, Central Kansas District Agriculture and Natural Resources agent, also reported finding small larvae and pinprick-sized holes in new alfalfa leaves on March 9 in Saline County.

So, ready or not, alfalfa weevil larvae are here and, odds are that many more will be hatching in the next few days to weeks. Alfalfa weevils will continue to hatch and larvae continue to develop any time temperatures exceed 48 degrees F, - and those temperatures have been much more common than usual over the last few weeks. Forecasts for the next 7-10 days also call for warm conditions. Thus, it looks like larvae will be emerging, and damage progressing, relatively quickly.

Whether this warm weather will compress the alfalfa weevil larval feeding period so that the damage is not as stretched out as usual remains to be seen. There are also many lady beetles present in the alfalfa fields we have checked -- as well as a few pea aphids.

Treatment thresholds we use for alfalfa weevil insecticide applications are 30-50% infestation, or 1 larva for every 2-3 stems.

For more information on alfalfa weevils, please visit:
http://www.bookstore.ksre.ksu.edu/pubs/mf2999.pdf

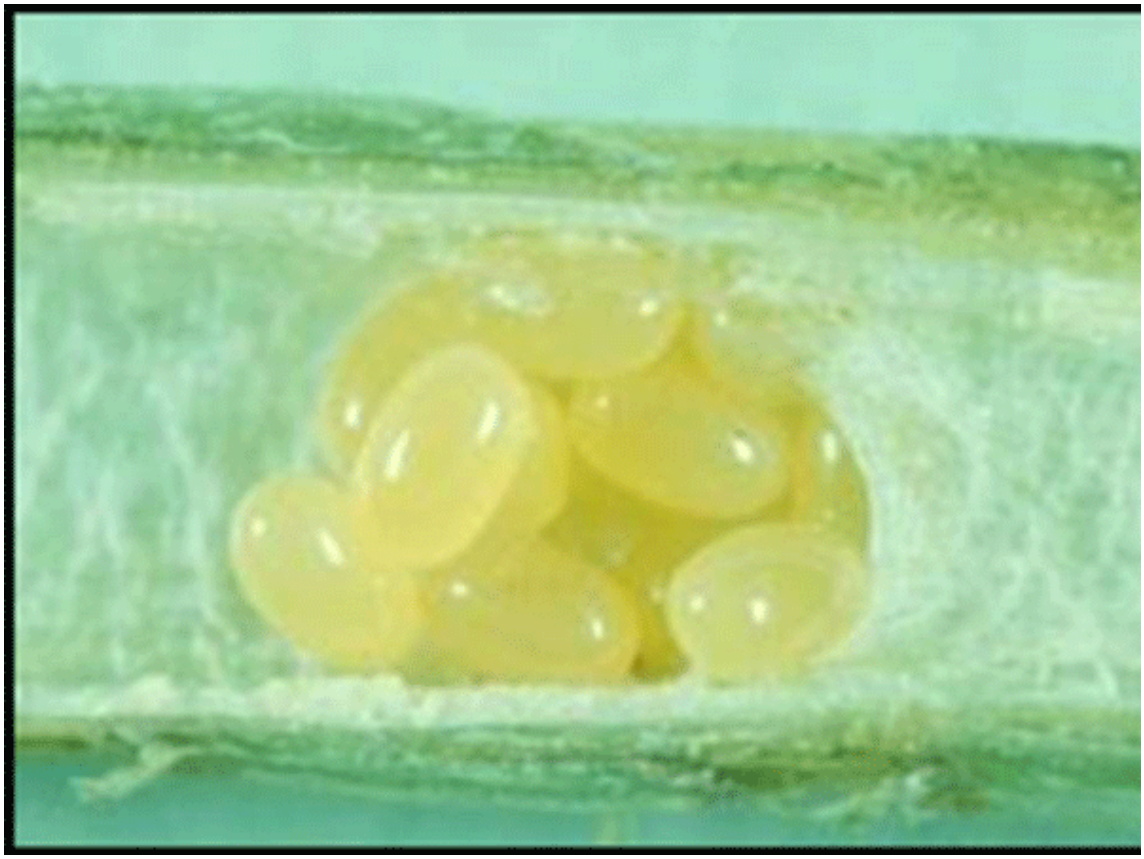

Figure 1. Overwintering alfalfa weevil eggs in stem. Photo courtesy of K-State Department of Entomology.

Figure 2. Early instar alfalfa weevil larvae. Photo by Holly Schwarting, K-State Research and Extension.

Figure 3. Pinprick feeding damage by alfalfa weevil larvae. Photo by Holly Schwarting, K-State Research and Extension.

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3. First hollow stem update: March 8, 2016

Many varieties are now past first hollow stem (FHS) in the Hutchinson region. In some cases, a few selected stems in early varieties had already one visible joint as of March 8 (Fig. 1).

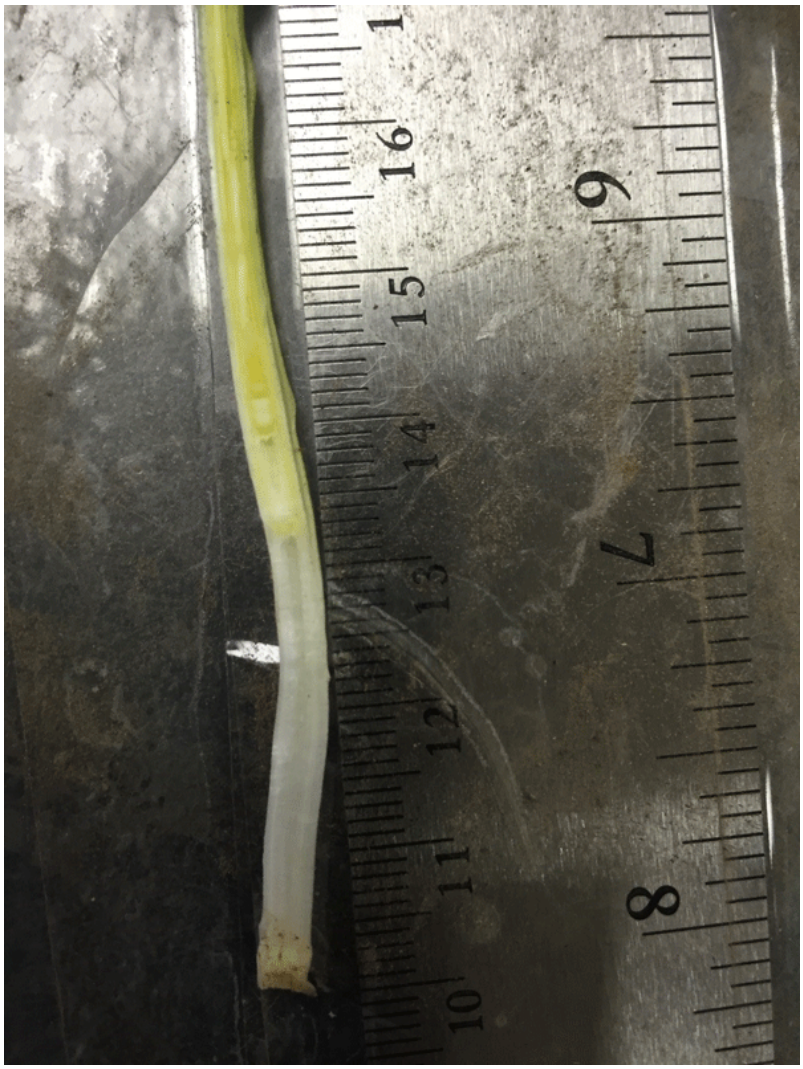

Figure 1. Some varieties already had the first joint visible by March 8. Photo by Romulo Lollato, K-State Research and Extension.

The average length of hollow stem for each variety, as well as the percentage of stems that reached FHS at time of measurements, is reported in Table 1. As of March 8, the varieties 1863, Gallagher, WB4303, WB-Cedar, and WB-Redhawk were past FHS in our test plots near Hutchinson. Varieties approaching FHS were Everest, KanMark, LCS Pistol, LCS Wizard, Overley, Ruby Lee, SY Flint, SY Wolf, TAM 114, WB4458, and WB-Grainfield. Varieties were considered to be approaching FHS when either selected stems were past FHS or when average hollow stem length was approaching 1.5 cm.

At this time, dual-purpose wheat producers who intend to harvest the wheat crop for grain should either have already removed cattle from their wheat crop or be preparing to do so for the varieties mentioned above. Grazing past FHS can severely impair wheat grain yield. Previous research in north-central Oklahoma has shown that grazing past FHS can lead to yield losses ranging from 1-5 bushels

per acre per day, depending on weather conditions at grazing termination. Hot, dry weather increases yield losses associated with grazing past FHS. Varieties that have not yet reached FHS at time of this report may allow for a few additional grazing days, but producers are encouraged to actively scout their fields for FHS and already prepare to remove cattle at this time.

For more details on how to scout for FHS, please refer to Agronomy eUpdate article "Optimal time to remove cattle from wheat pastures: First hollow stem" in the Feb. 5, 2016 issue).

Table 1. Length of hollow stem measured on March 8, 2016 of 23 wheat varieties sown Sept. 26, 2015 near Hutchinson. The critical FHS length for purposes of cattle removal is 1.5 cm. Varieties highlighted in red are past FHS. Varieties highlighted in bold are approaching FHS.

Variety	Hollow stem length	Stems at FHS
	cm	%
1863	**1.54**	**60**
Bentley	0.69	0
Danby	0.60	0
Doublestop CL Plus	0.62	0
Duster	0.74	0
Everest	**1.24**	**0**
Gallagher	**1.51**	**50**
KanMark	**1.18**	**20**
LCS Chrome	0.73	0
LCS Mint	0.70	0
LCS Pistol	**1.22**	**10**
LCS Wizard	**0.99**	**10**
Overley	**1.35**	**40**
Ruby Lee	**1.38**	**50**
SY Flint	**1.07**	**10**
SY Wolf	**0.91**	**10**
T158	0.70	0
TAM 114	**1.04**	**0**
WB4303	**2.26**	**100**
WB4458	**1.38**	**40**
WB-Cedar	**2.26**	**80**
WB-Grainfield	**1.15**	**0**
WB-Redhawk	**1.74**	**60**

Variety	$P < 0.01$
LSD (0.05)	0.52

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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4. Starter fertilizer rates and placement for corn

Many producers in Kansas could benefit by using starter fertilizer when planting corn. Starter fertilizer is simply the placement of some fertilizer, usually nitrogen (N) and phosphorus (P), near the seed -- which "jump starts" growth in the spring. It is not unusual for a producer to see an early season growth response to starter fertilizer application. But whether that increase in early growth translates to an economic yield response is not a sure thing in Kansas. How the crop responds to starter fertilizer depends on soil fertility levels, tillage system, soil temperature, and N placement method. Phosphorus source is not an important factor.

Soil fertility levels

The lower the fertility level, the greater the chance of an economic response to starter fertilizers. A routine soil test will reveal available P and potassium (K) levels. If soils test low or very low in P, below 20 ppm, there is a very good chance that producers will obtain an economic yield response to applying a starter fertilizer containing P, even in some low-yield environments. If the soil test shows a medium level of P, 20-30 ppm, it's still possible to obtain a yield response to P fertilizer. But the yield response will not occur as frequently, and may not be large enough to cover the full cost of the practice. If the soil test is high, above 30 ppm, economic responses to starter P fertilizers are rare. The chances of an economic return at high P soil test levels are greatest when planting corn early in cold, wet soils. In general, the same principles apply with K. If soil tests are low, below 130 ppm, the chances of a response to K in starter are good. The lower the soil test level, the greater the odds of a response.

All of the recommended P and/or K does not need to be applied as starter. If the soil test recommendation calls for high rates of P and K in order to build up or maintain soil test levels, producers will often get better results by splitting the application between a starter and a preplant broadcast application. As a general rule, starter fertilizer should be limited to the first 20-30 pounds of P or K per acre, with the balance being broadcast for best responses.

Phosphorus source

Does the type of phosphorus used as a starter make any difference? In particular, what about the ratio of orthophosphate to polyphosphate in the fertilizer product? This has been a concern for many producers.

Liquid 10-34-0 is composed of a mixture of ammonium polyphosphates and ammonium orthophosphates. The dissolved ammonium orthophosphate molecules are identical to those found in dry MAP (e.g. 11-52-0) and/or DAP (e.g. 18-46-0). Ammonium polyphosphates are simply chains of orthophosphate molecules, formed by removing a molecule of water, and are quickly converted by soil enzymes back to individual orthophosphates identical to those provided by MAP and/or DAP.

Polyphosphates were not developed by the fluid fertilizer industry because of agronomic performance issues. Instead, polyphosphates were developed to improve the storage characteristics of fluid phosphate products (and other fertilizers made from them) and to increase the analysis of liquid phosphate fertilizers. Ammonium polyphosphate is equal in agronomic performance to ammonium orthophosphates when applied at the same P_2O_5 rates in a similar manner. And liquid

phosphate products are equal in agronomic performance to dry phosphate products if applied at equal P_2O_5 rates in a similar manner. When polyphosphate is added to soil, a process called hydrolysis breaks down the polyphosphate chains into orthophosphates. The concern of many people is the length of time it takes for this process to occur. Previous studies indicate that **although it may take a few days to complete the hydrolysis process, the majority is completed in 48 hours.** As a result, phosphorus in soil solution will typically be similar from either source shortly after application.

Tillage system

No-till corn will almost always respond to a starter fertilizer that includes N – along with other needed nutrients – regardless of soil fertility levels or yield environment. This is especially so when preplant N is applied as deep-banded anhydrous ammonia or UAN, or where most of the N is sidedressed in-season. That's because no-till soils are almost always colder and wetter at corn planting time than soils that have been tilled, and N mineralization from organic matter tends to be slower at the start of the season in no-till environments.

In general, no-till corn is less likely to respond to an N starter if more than 50 pounds of N was broadcast prior to or shortly after planting.

In reduced-till systems, the situation becomes less clear. The planting/germination zone in strip-till or ridge-till corn is typically not as cold and wet as no-till, despite the high levels of crop residue between rows. Still, N and P starter fertilizer is often beneficial for corn planted in reduced-till conditions, especially where soil test levels are very low, or low, and where the yield environment is high. As with no-till, reduced-till corn is also less likely to respond to an N starter if more than 50 pounds of N was broadcast prior to or shortly after planting.

Conventional- or clean-tilled corn is unlikely to give an economic response to an N and P starter unless the P soil test is low.

Starter fertilizer placement

Producers should be very cautious about applying starter fertilizer that includes N and/or K, or some micronutrients such as boron, in direct seed contact. It is best to have some soil separation between the starter fertilizer and the seed. The safest placement methods for starter fertilizer are either:

-- A subsurface-band application 2 to 3 inches to the side and 2 to 3 inches below the seed, or

-- A surface dribble-band application 2 to 3 inches to the side of the seed row at planting time, especially in conventional tillage or where farmers are using row cleaners or trash movers in no-till.

If producers apply starter fertilizer with the corn seed, they run an increased risk of seed injury when applying more than 6 to 8 pounds per acre of N and K combined in direct seed contact on a 30-inch row spacing. Nitrogen and K fertilizer can result in salt injury at high application rates if seed is in contact with the fertilizer. Furthermore, if the N source is urea or UAN, in-furrow application is not recommended regardless of fertilizer rate. Urea converts to ammonia, which is very toxic to seedlings and can significantly reduce final stands.

Work several years ago at the North Central Kansas Irrigation Experiment Field near Scandia

illustrates some of these points (Table 1). In this research, former Agronomist-In-Charge Barney Gordon compared in-furrow, 2x2, and surface band placement of different starter fertilizer rates in a multi-year study on irrigated corn. Excellent responses from up to 30 pounds of N combined with 15 pounds of P were obtained with the both the 2x2 and surface-band placement. In-furrow placement however, was not nearly as effective. This was due to stand reduction from salt injury to the germinating seedlings, likely due to the high application rate of N plus K in furrow, indicating the importance of monitoring the N+K rates for in furrow application. Where no starter, or the 2x2 and surface band placement, was used, final stands were approximately 30-31,000 plants per acre. However, with the 5-15-5 in furrow treatment, the final stand was approximately 25,000. The final stand was just over 20,000 with the in-furrow 60-15-5 treatment.

Table 1. Effect of Starter Fertilizer Placement on Corn Yield at

North Central Irrigation Experiment Field

Yield (bu/acre)

Fertilizer Applied (lbs)	In-Furrow Placement	2x2 Band Placement	Surface Band Placement
Check: 159 bu	--	--	--
5-15-5	172	194	190
15-15-5	177	197	198
30-15-5	174	216	212
45-15-5	171	215	213
60-15-15	163	214	213
Average	171	207	205

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5. Agricultural Mobile Apps: A review and update of livestock apps

This article provides a review and update of some of the current "livestock apps" for agriculture.

These apps can assist farmers with animal management issues related to health, nutrition, market information, and more.

While these apps can often help you make quick decisions, always make sure to check with your crop consultants, Extension agents, and Extension specialists.

Stay tuned for more in this series of annual reviews and updates on Ag-Apps from our KSUCROPS Crop Production team (led by Dr. Ciampitti) 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:

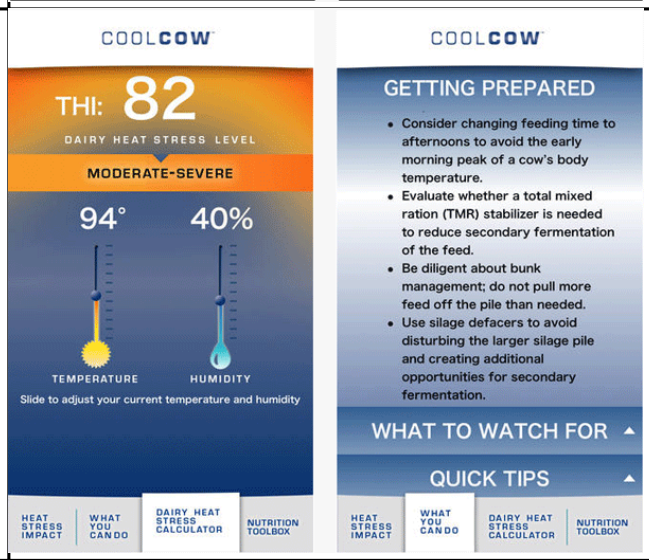
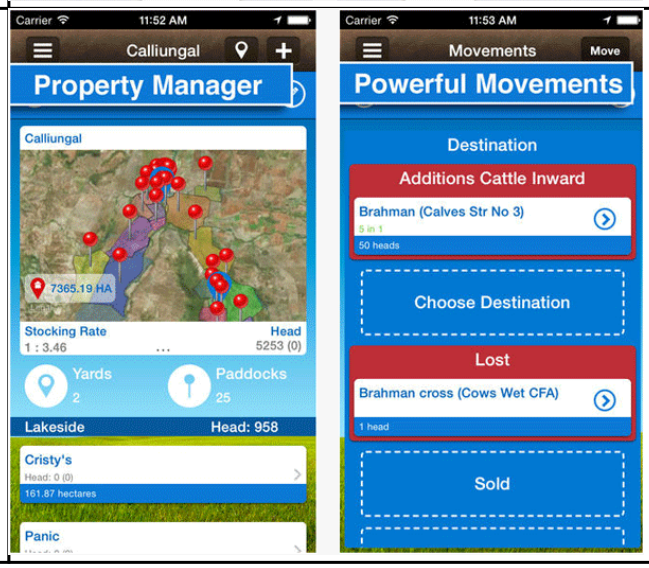
- **ID Apps**: For identification purposes (weeds, insects, diseases, and nutrients)
- **CALC Apps**: For calculating purposes (nutrient removal calculations, tank mixes, volume to spray, etc.)
- **SCOUT Apps**: For scouting purposes or for geo-positioning (soil sampling, recording notes, soil types, etc.).
- **ECON Apps**: For checking grain prices, market evolutions, fertilizer price trends, news and finances.
- **FIELD 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.
- **GENERAL AG 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.

5. Livestock Apps

Apps related to livestock management topics, such as nutrition, animal health, and market information.

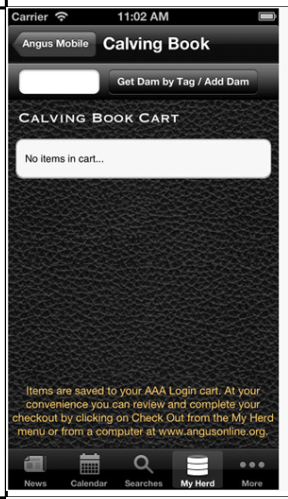
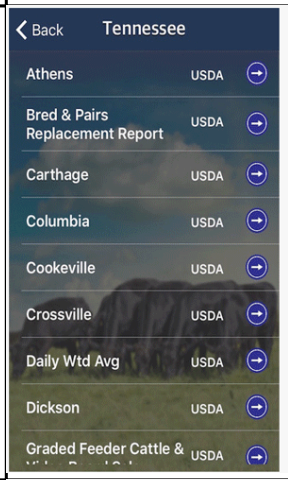
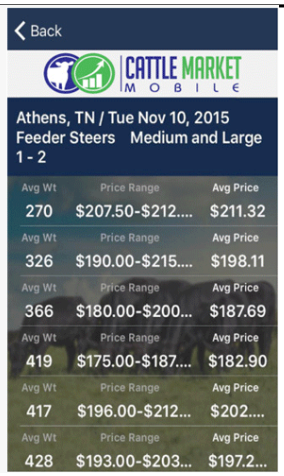
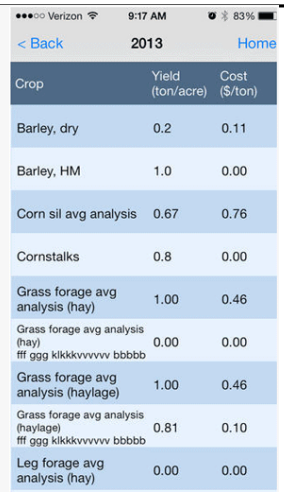
MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

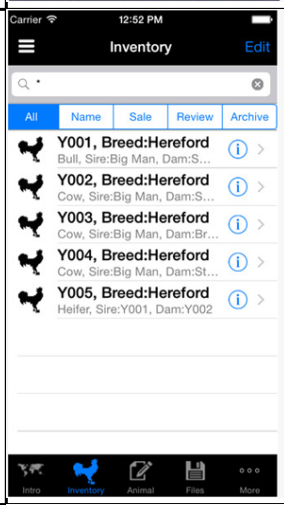
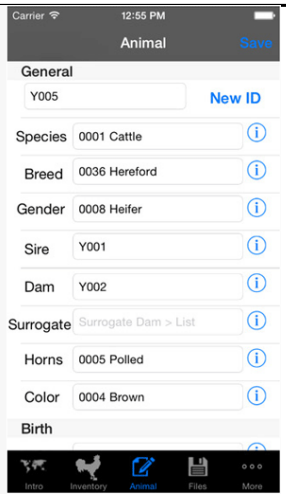
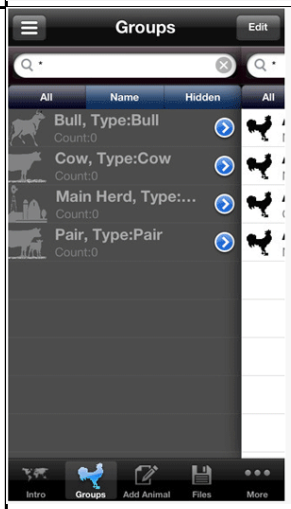
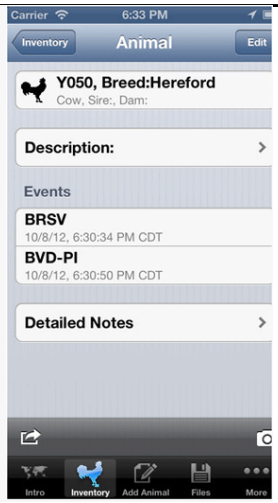
Livestock Apps

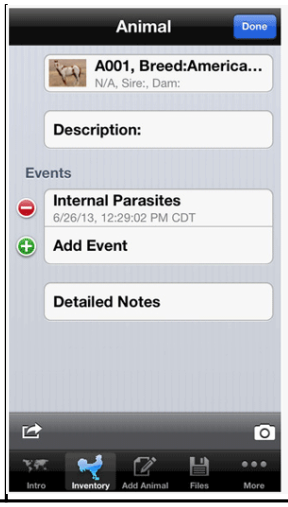
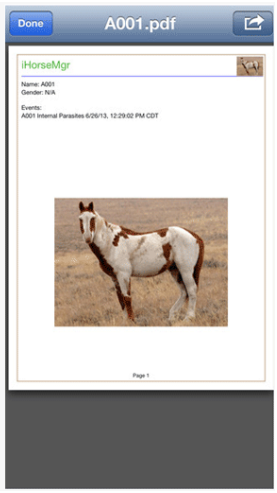
Name of App and Source	Picture	Brief description and cost
ThermalAid University of Missouri		This app provides a decision-mak tool to identify, monitor, and redu heat stress in cattle to improve an performance. FREE
Purina Cool Cow App Purina Animal Nutrition LLC		This app provides dairy producers with a tool to help manage the im of heat stress. FREE
iHerd MANDRA Ltd		iHerd app provides a design to simplify the herd management process for station owners and managers around the world. FREE

MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

Livestock Apps

Name of App and Source	Picture	Brief description and cost
Angus Mobile  American Angus Association	 	This app provides information for anyone with an interest in Angus cattle. FREE
Cattle Market Mobile  Michael Whitt	 	This app helps cattle producers monitor current auction prices. In addition, reports are also displayed. FREE
CropCents  Penn State University (AGH Incorporated)	 	This app helps calculate the cost of raised feed, which is a better approach than using market prices to calculate income over feed costs. FREE
DairyCents		This app provides a quick calculation income over feed costs and price comparison of various forages, grains and commodities.

Penn State University (AHG Incorporated)			FREE	
iCattleMgrPro  iSimpleType			This app provides a tool for management of livestock. It covers more than 90 pieces of information about animal health. $19.99	
iLivestockMgr  iSimpleType			This app provides a tool for livestock management. It focuses on livestock i general. $19.99	
iHorseMgr			This app provides a tool for horse management operations. $9.99	

 iSimpleType				

Each of the next four 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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6. On-farm research collaborative project: Non-biased, Research-based, and Grower-driven

K-State Extension state specialists, area agronomists, and county/district agents are again seeking to collaborate with producers in establishing on-farm and large-scale research plots in 2016. Last year, we had on-farm projects in diverse areas around Kansas, setting up tests involving corn, soybean, and grain sorghum.

The goal of our on-farm research collaborative project is to establish a network of on-farm research collaborators with the main purpose of providing research results on production practices at the state, regional or local scale, under a wide set of growing conditions and soil types.

There are no losers in this program. All parties will benefit. Farmers involve in this collaborative research effort will be empowered to solve their own problems and will have greater confidence in making decisions related to their production practices. The standard practice of the program involves a producer having a question, he research the answer on his farm, on his soil with a simple strip trial designed with the assistance of K-State Researchers. While, K-State extension specialist will be better able to check the validity of previous scientific findings conducted in small plots and in more controlled environments and to identify and communicate areas for future research.

The on-farm research collaborative project is farmer-run research, thus information will be produced and used by farmers. Farmer participation is the key component of this project and farmers will be the main beneficiary.

Why should I get involved in this project?

1. The project has a main goal to improve yields and/or minimizing input costs, increasing overall efficiency in the state of Kansas.

2. The project will help producers learn the best ways to design an on-farm test so they can obtain reliable information on a specific question related to their own farms.

3. The outcomes from this project will empower our producers to make sound decisions with confidence and will aid researchers in identifying and communicating areas for future research.

Who are the key players?

1. Kansans farmers: Farmers are the main players, the ones who will implement the trials, collect the data and utilize the results.

2. Extension Agricultural Agents: The agents are the “gatekeepers” of this project. They will work very closely with farmers and can assist, if needed, with information and/or help on implementing the trials.

3. K-State Extension State Specialists and Area Agronomists: K-State faculty will assist Extension agents and Kansas farmers in developing the protocols, implementing trials and analyzing the data generated at the on-farm scale.

Research data (small-plots) vs. On-farm data (large-plots): What is the main different between these concepts?

Information produced at research stations has the following features:

Small plot size = small variability ("controlled conditions")

Intensive sampling = usually related to a graduate student project, with many samples taken throughout the growing season

More complex and more treatments can be evaluated

Small sample size = measurements may be less representative of "real" farm conditions

On-farm data have the following features:

Large plot size = higher variability due to uncontrollable variation within each plot

Less intensive sampling

Less complex and fewer (two or three) treatments can be evaluated

Large sample size = measurements may more closely represent "real" farm conditions

Are the on-farm protocols the same for all environments and farmers or should they be farmer- or site-specific?

Farmers have their own interest and specific questions that need to be properly addressed. Protocols will be designed to fit each farmer's situation. Some of the diverse topics that we have discussed include: corn/ soybean/ sorghum seeding rates; corn/ sorghum hybrids; sorghum/ soybean row spacing; corn/ soybean/ sorghum planting dates; full or limited irrigation; and other topics.

Protocols:

Crops: Corn / Soybean / Sorghum / Winter Canola

Topics:

- Seeding Rates
- Planting Dates
- Row Spacing
- Hybrid/ Variety Selection
- Tillage
- Nutrient rates
- Irrigation
- Others

How many factors need to be evaluated?

The idea is to perform "simple" on-farm experiments evaluating one or two factors at a time.

How many levels for each factor?

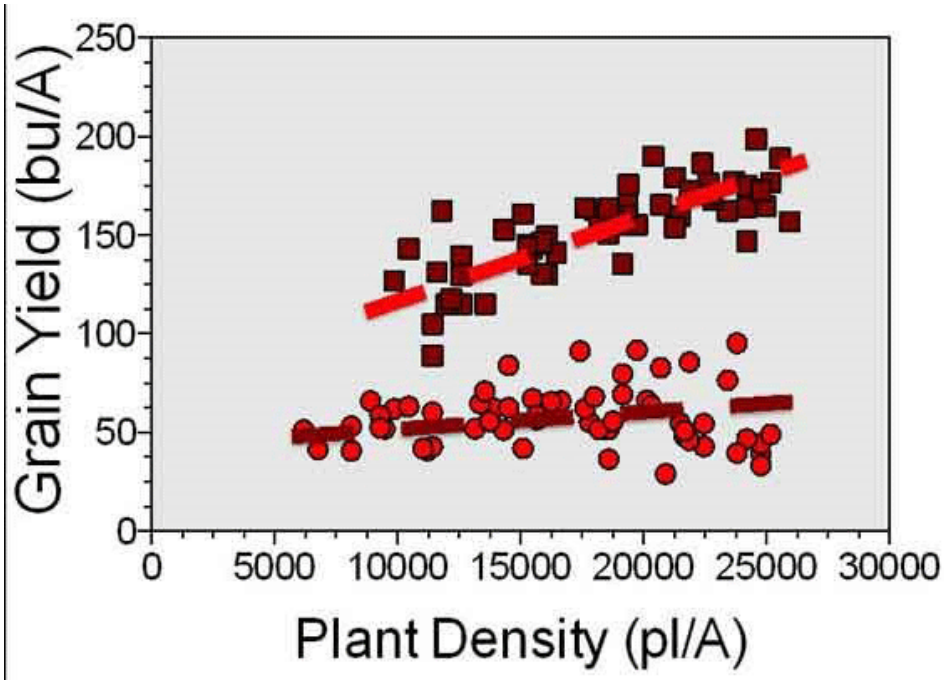
This will depend on the availability of space in the field, but to properly understand the optimum crop management level, 4 to 5 levels are usually needed. For example, if corn seeding rate is evaluated, five seeding rates will allow the grower to properly identify the optimum seeding rate for each specific farm environment. The diagram below presents an example of 5 test levels for a seeding rate study.

Replications?

To obtain statistically sound and solid recommendations, a minimum of 3 replications are recommended.

Are crop production practices environment-specific?

The example in the graphic below shows how the optimum plant density to maximize corn grain yield will vary according to different environments. For the low yielding environment (<100 bu/acre), the economically optimum plant density was about 15,000 to 20,000 plants per acre; while for the high-yielding site, economically optimum maximum plant density is about 25,000 plants per acre. Therefore, different yield potentials in different environments have different "optimum" crop production practices to maximize net returns.



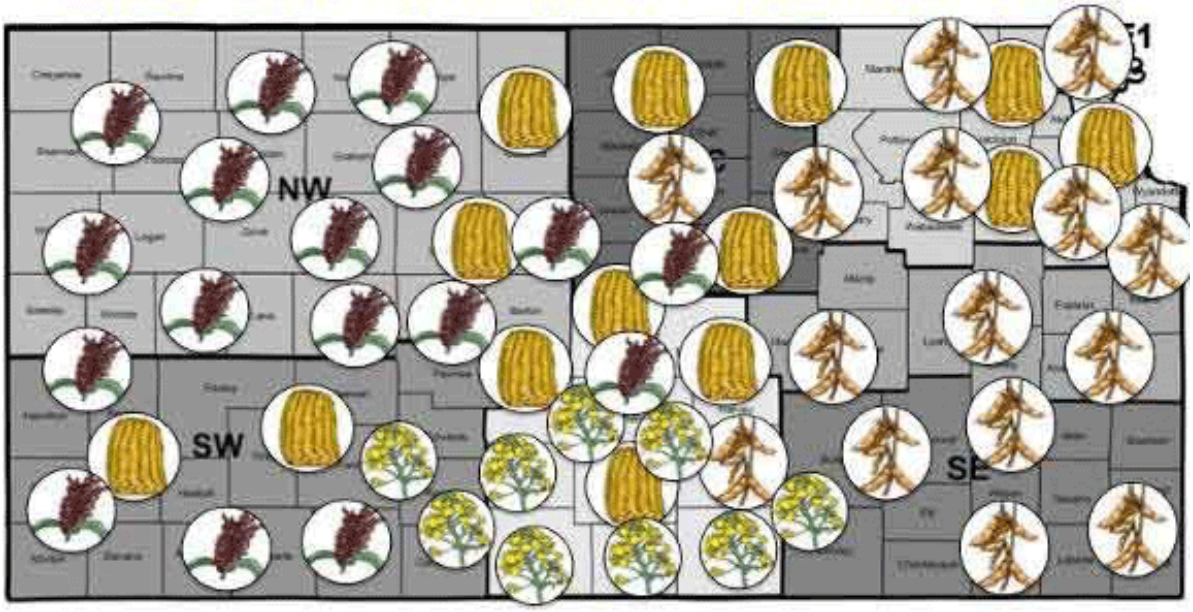
Goal for the next 5 years

This project has as a goal to establish a network of on-farm research trials with the purpose of fine-tuning crop production recommendations to local environments. The end result will hopefully be to generate practical information that will either improve yields or minimize input costs.

This is a farmer center research effort. However, for the benefits of this program to be realized, both farmers and university researchers will have to buy into the vision.

Farmers interested in participating in this project can fill out an interest form online at:
http://bit.ly/KSUONFARMPROJECT

"LOCAL" CROP MANAGEMENT RECOMENDATIONS



Ignacio Ciampitti, Cropping Systems Specialist, K-State On-Farm Research Project Coordinator

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7. K-State Sorghum School set for March 31 in Phillipsburg

K-State will hold a Sorghum School on March 31 in Phillipsburg, at the Phillips County Fair Building, 1481 U.S. Hwy 183. The school begins with registration at 9:30 a.m. and adjourns at 2:30 p.m.

The topics and speakers for the school are:

10:00 – 10:40: Sorghum market outlook and profitability prospects – Dan O'Brien

10:40 – 11:30: Sorghum insects / Sugarcane aphid – J.P. Michaud, Entomologist, KSU Ag Research Center-Hays

11:30 – Noon: MyFields/Insects – Brian McCornack and W. Johnson, Dept. of Entomology

Lunch

12:40 – 1:10: Sorghum production practices – Lucas Haag, Northwest Area Crops and Soils Specialist

1:10 – 1:40: Sorghum fertilization practices – Dorivar Ruiz Diaz, Nutrient Management Specialist

1:40 – 2:30: Weed management: New and key strategies – Curtis Thompson, Weed Management Specialist

Lunch will be provided, courtesy of the sponsors. There is no cost to attend, but participants are asked to pre-register by March 28. CEUs and Commercial Pesticide Credits will be offered. Lunch will be provided by the sponsorship of the Kansas Grain Sorghum Commission.

Online registration is available at: http://bit.ly/KSSORGHUMSchools

You can also register by emailing or calling the Phillips-Rook District Research and Extension, Phillipsburg office at 785-543-6845. For more information, contact:

Contact Information:

Cody Miller, Ag Extension District Agent, Phillips-Rooks District codym@ksu.edu

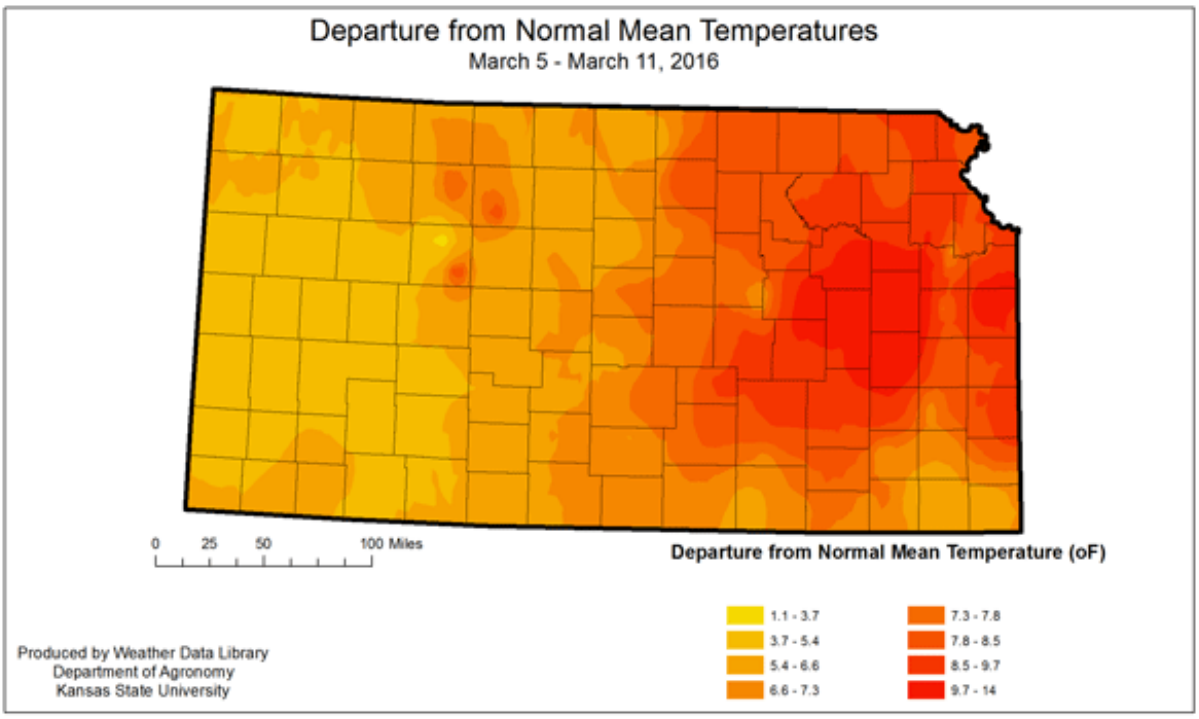
Lucas Haag, Northwest Area Crops and Soils Specialist lhaag@ksu.edu

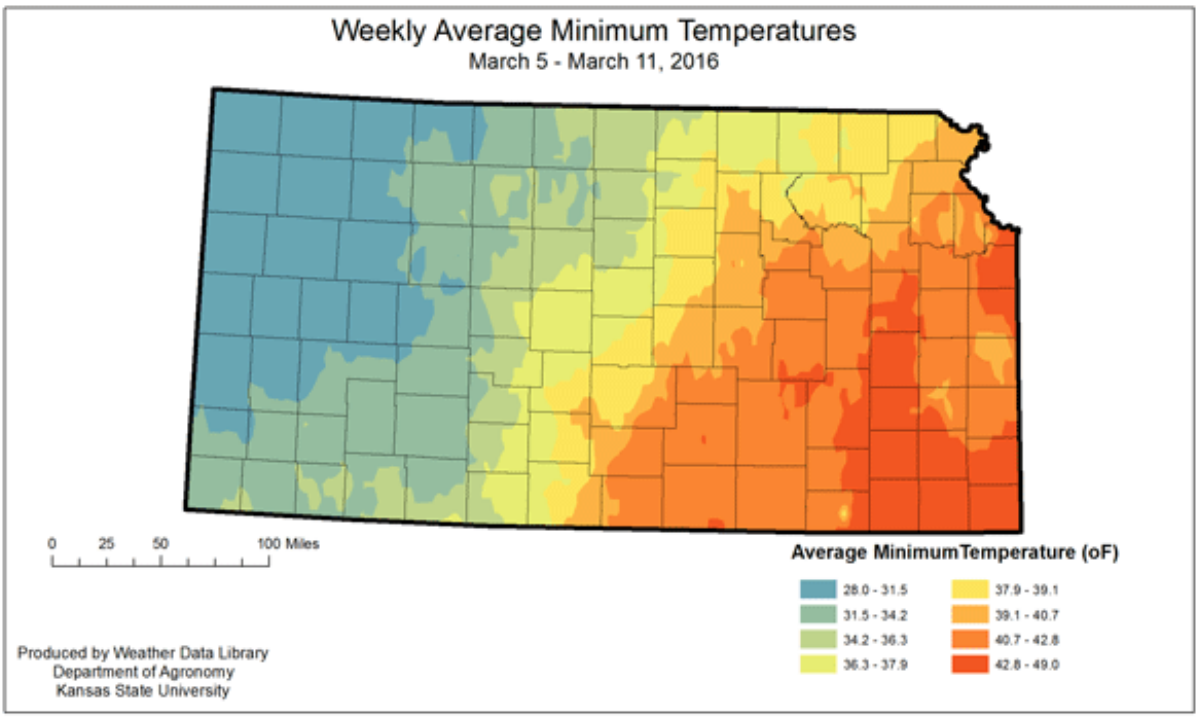
Ignacio A. Ciampitti, Crop Production and Cropping Systems Specialist Ciampitti@ksu.edu

Jill Barnhardt, Kansas Grain Sorghum Commission jill@ksgrainsorghum.org

8. Temperatures in Kansas continue to be much warmer than normal

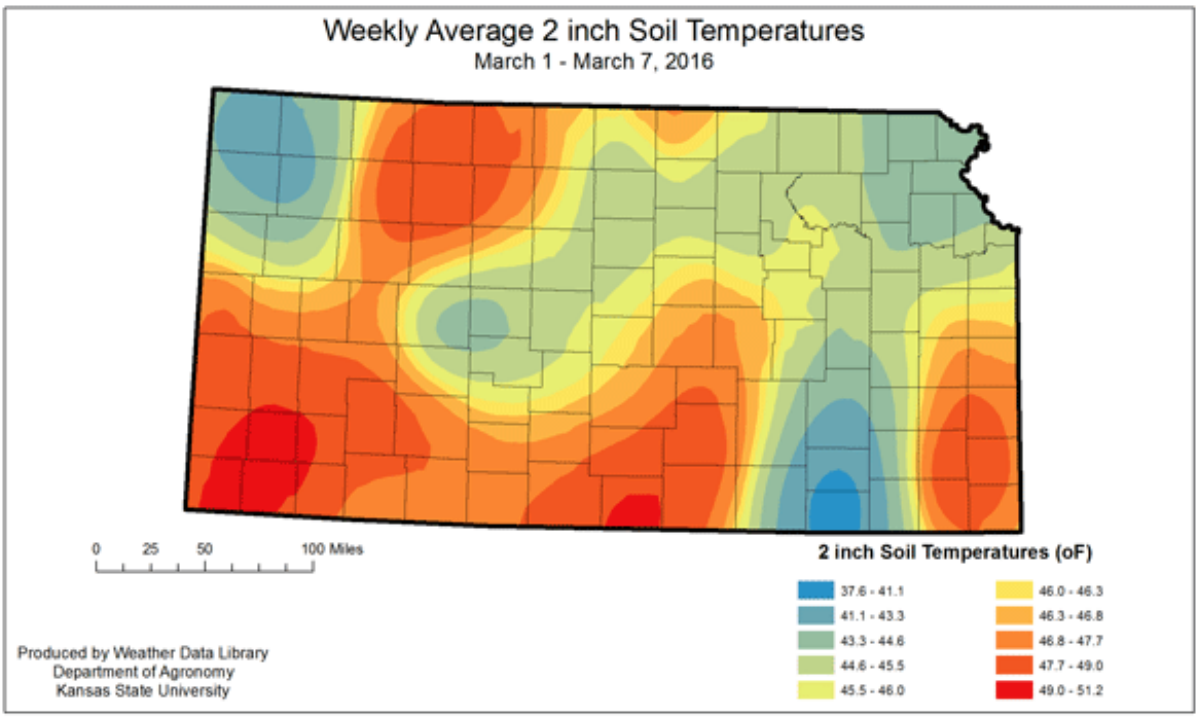
Although this past week wasn't as warm as it was at the end of February when record high temperatures were recorded, it was still much warmer than normal across Kansas. Statewide average temperatures were 7.6 degrees warmer than average. The warmest departures were in the northeast, where departures ranged from 9-14 degrees F above normal.

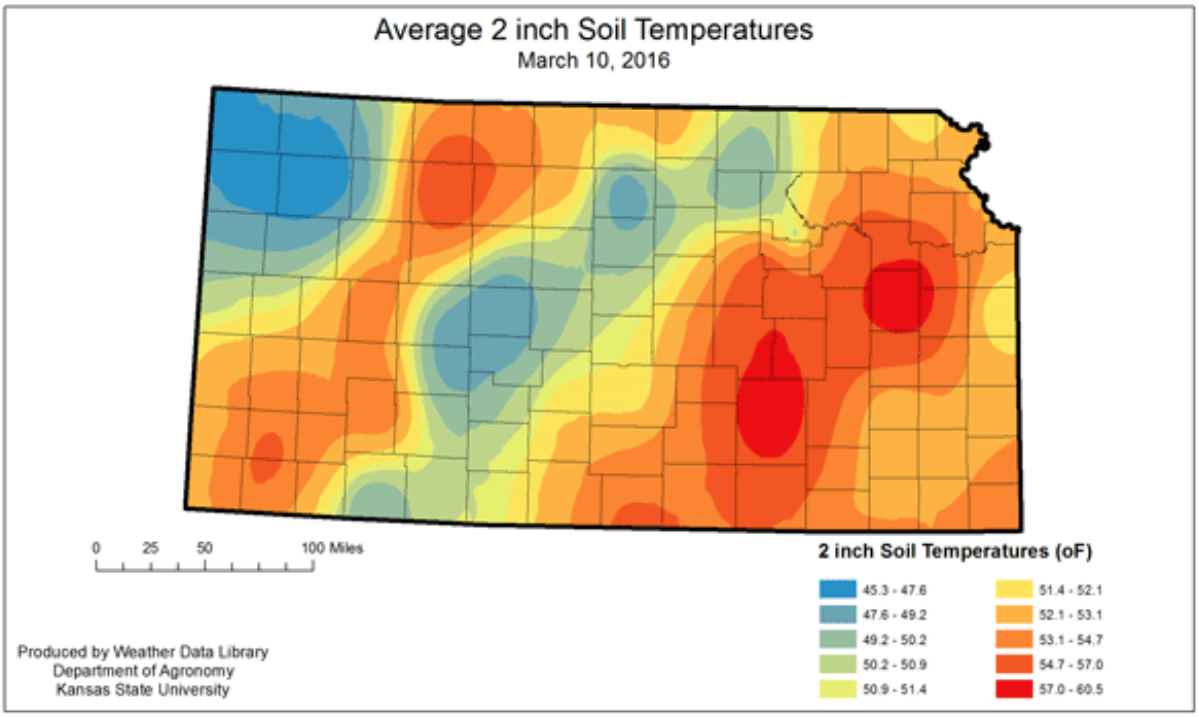




Much of that departure from normal can be attributed to warmer low temperatures. Where the minimum temperatures are staying above freezing, vegetation is becoming more active.

This continued warmth is also visible in the changes in soil temperatures. Below, the first map shows the average weekly soil temperature ending on March 7th. The next map shows the average 2-inch soil temperature as of March 10th.

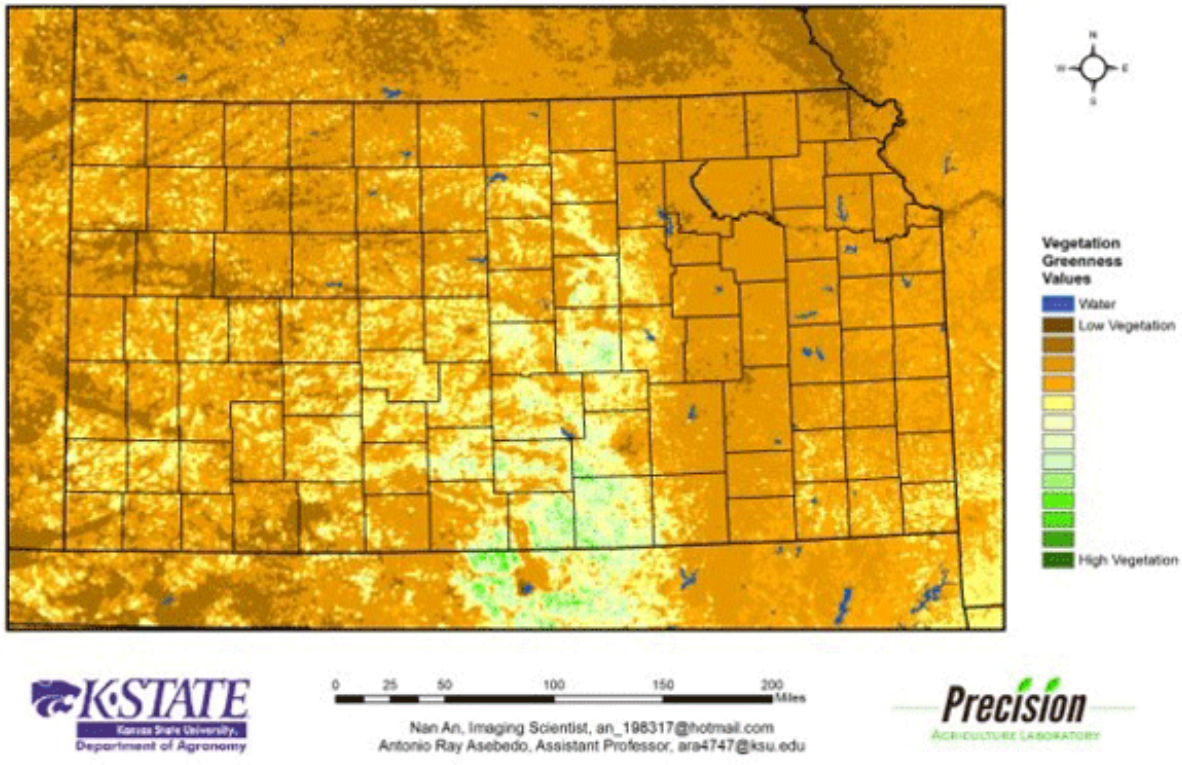




The wheat in areas where it has broken dormancy is at greatest risk of freeze injury when freezing temperatures return. Below are the current vegetative health map and a map of the average last spring freeze dates.

Kansas Vegetation Condition

Period 10: 03/01/2016 - 03/07/2016

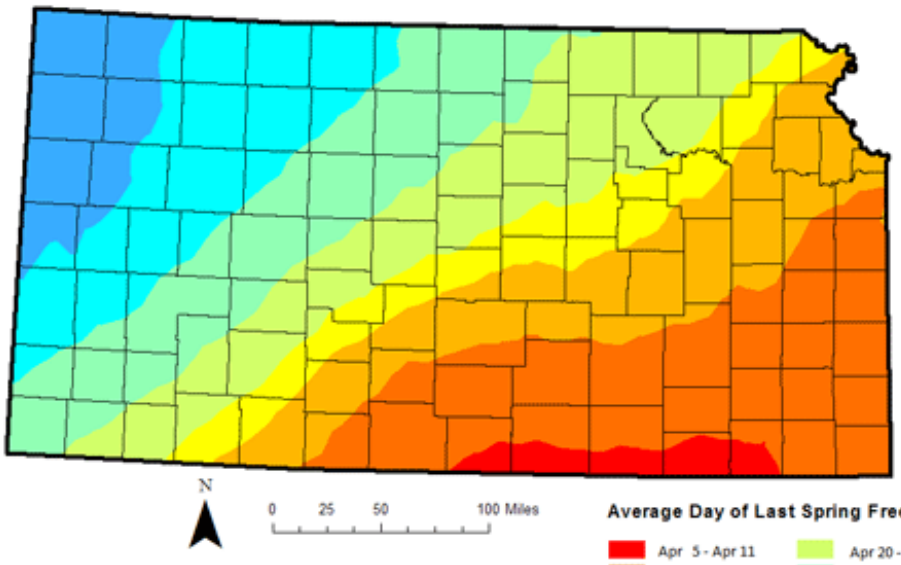


K-State Kansas State University Department of Agronomy

Nan An, Imaging Scientist, an_198317@hotmail.com
Antonio Ray Asebedo, Assistant Professor, ara4747@ksu.edu

Precision Agriculture Laboratory

Average Last Spring Freeze (32 oF)



Produced by Weather Data Library
Department of Agronomy
Kansas State University

Mary Knapp, Weather Data Library
mknapp@ksu.edu

Christopher Redmond, Weather Data Library
christopherredmond@ksu.edu

9. Comparative Vegetation Condition Report: March 1 - 7

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:

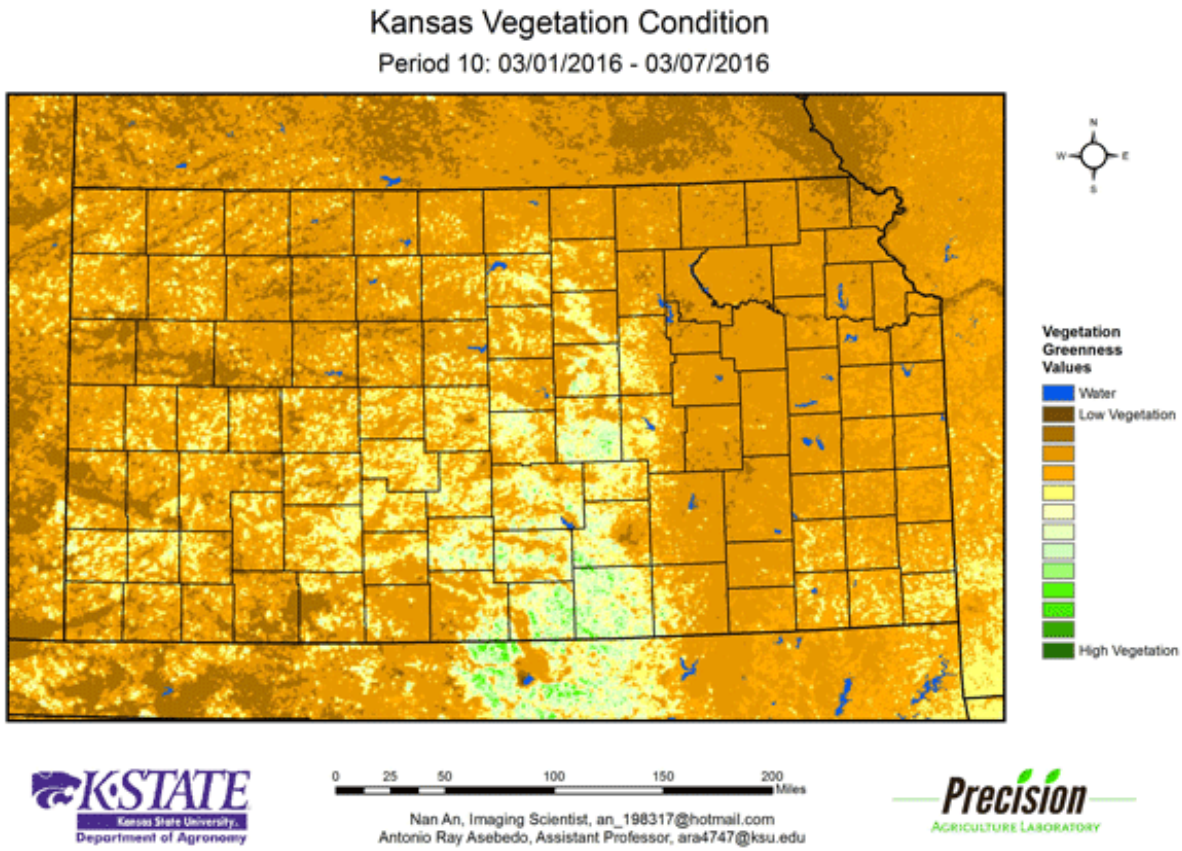


Figure 1. The Vegetation Condition Report for Kansas for March 1 – 7 from K-State's Precision Agriculture Laboratory shows increasing vegetative activity in the south central and central areas of the state. The highest NDVI values are still in Sumner and Harper counties. In the Northwest Division, the area of very low vegetative activity has been eliminated, as the impacts from the early February snow is replaced by warmer soil temperatures. This area still has the coolest average soil temperatures.

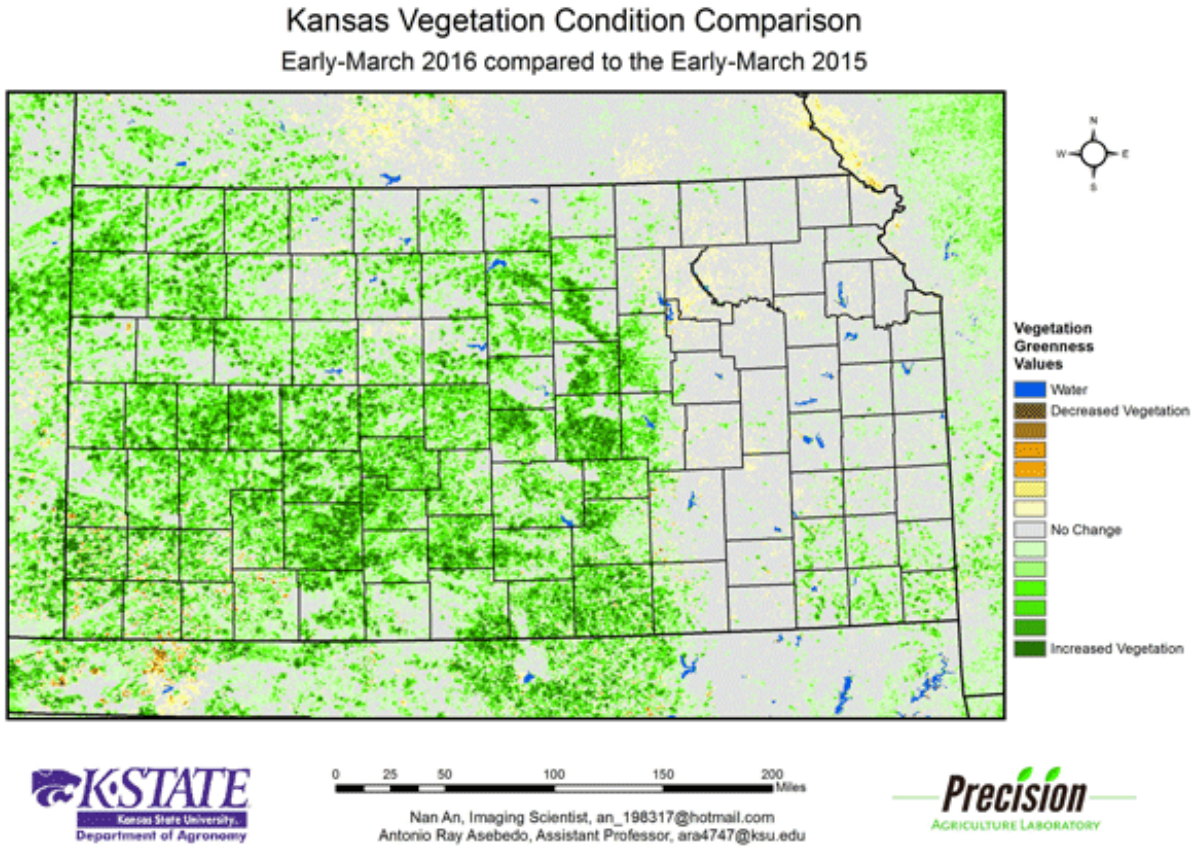


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for March 1 – 7 from K-State's Precision Agriculture Laboratory shows much higher photosynthetic activity in the western two thirds of the state. There is also a pocket of higher NDVI values in southeast Kansas where warm temperatures and recent rains have favored plant development.

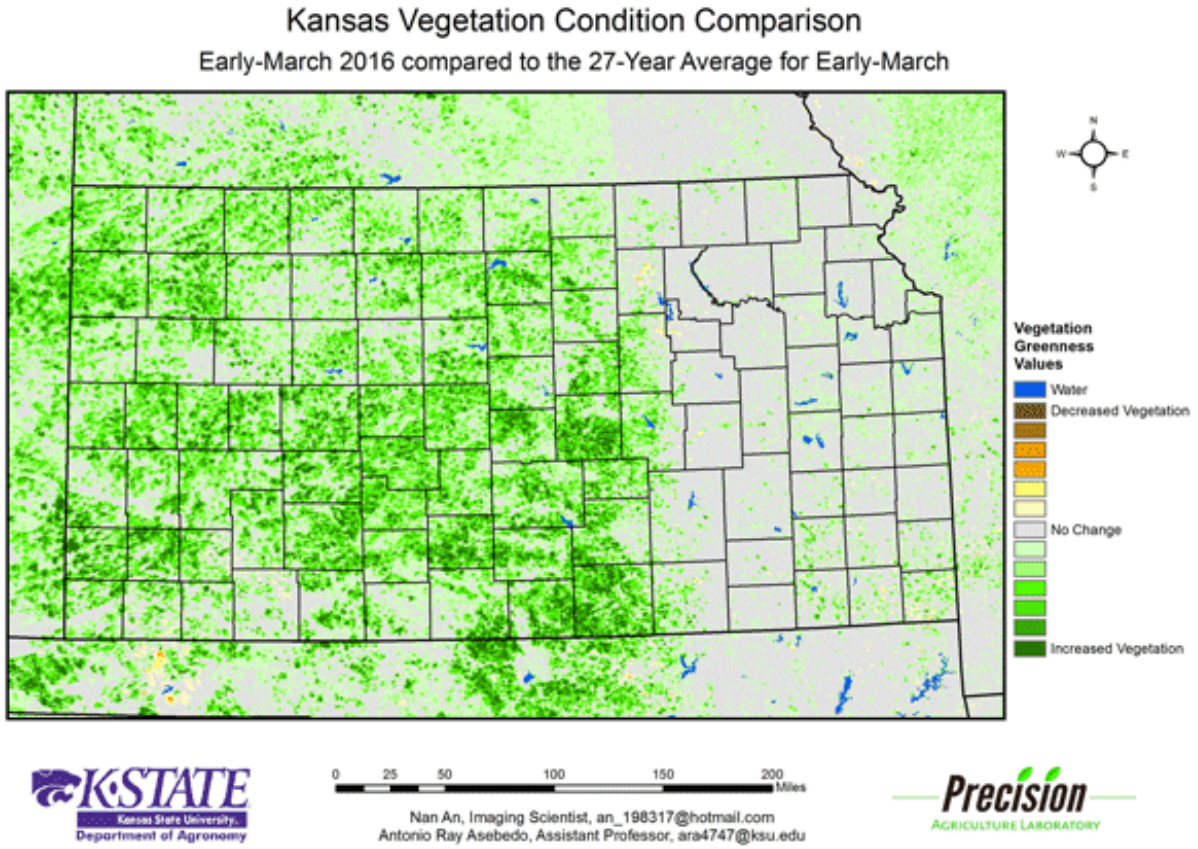


Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for March 1 – 7 from K-State's Precision Agriculture Laboratory shows that the area of above average photosynthetic activity continues to increase. The areas with the greatest increase are in central and south central Kansas. Temperatures continue above normal across the state, with the warmest departures in the southwest. Increased activity at this time of the year brings concerns about increased water demand and the potential for freeze damage to wheat, with even a normal last freeze date.

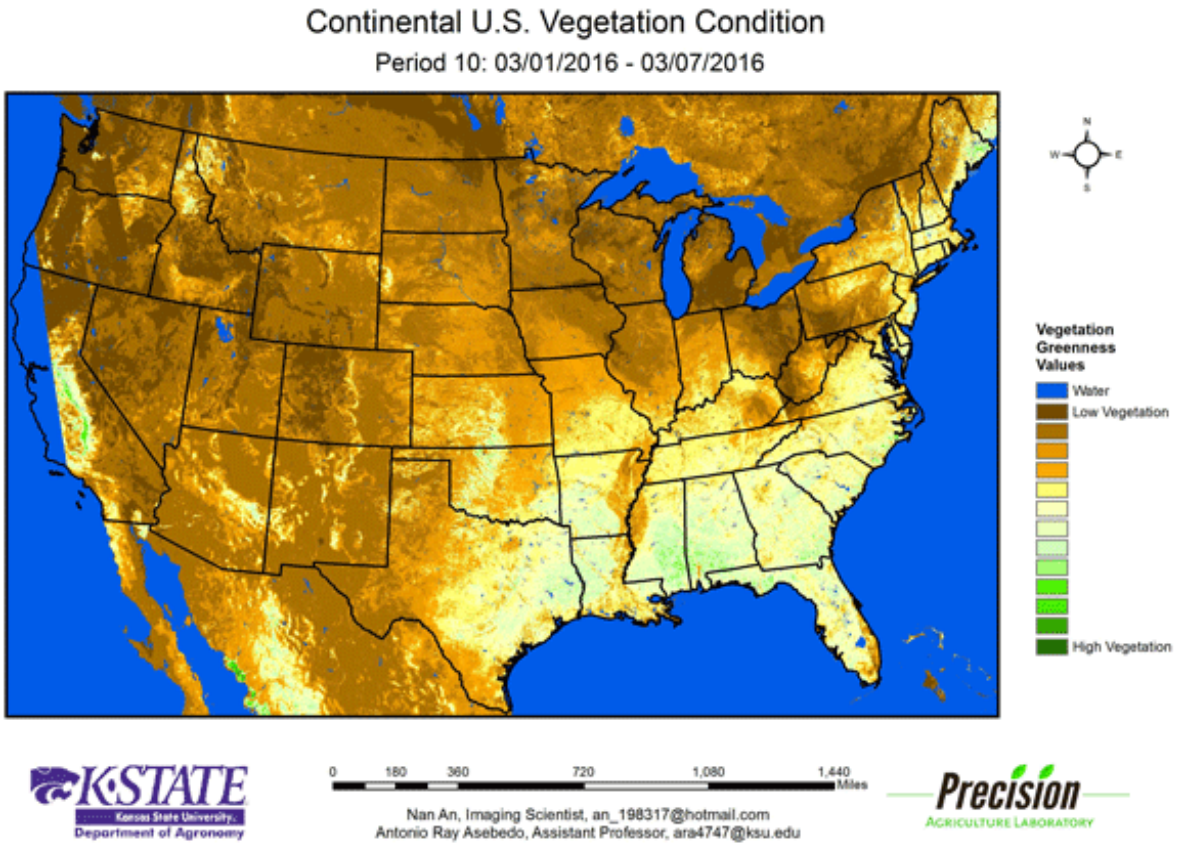


Figure 4. The Vegetation Condition Report for the U.S for March 1 – 7 from K-State's Precision Agriculture Laboratory is missing part of California, due to satellite data issues. For the rest of the continental U.S. it shows that the highest photosynthetic activity is along the Gulf Coast. Early melt of the snow pack, particularly in Idaho and Montana, bring concerns of reduced water supplies in the spring. Lingering impacts of the December flooding are still visible in the reduced vegetative activity in the lower Mississippi River Valley, although that continues to lessen. Impacts of this week's rainfall won't be visible yet in these maps.

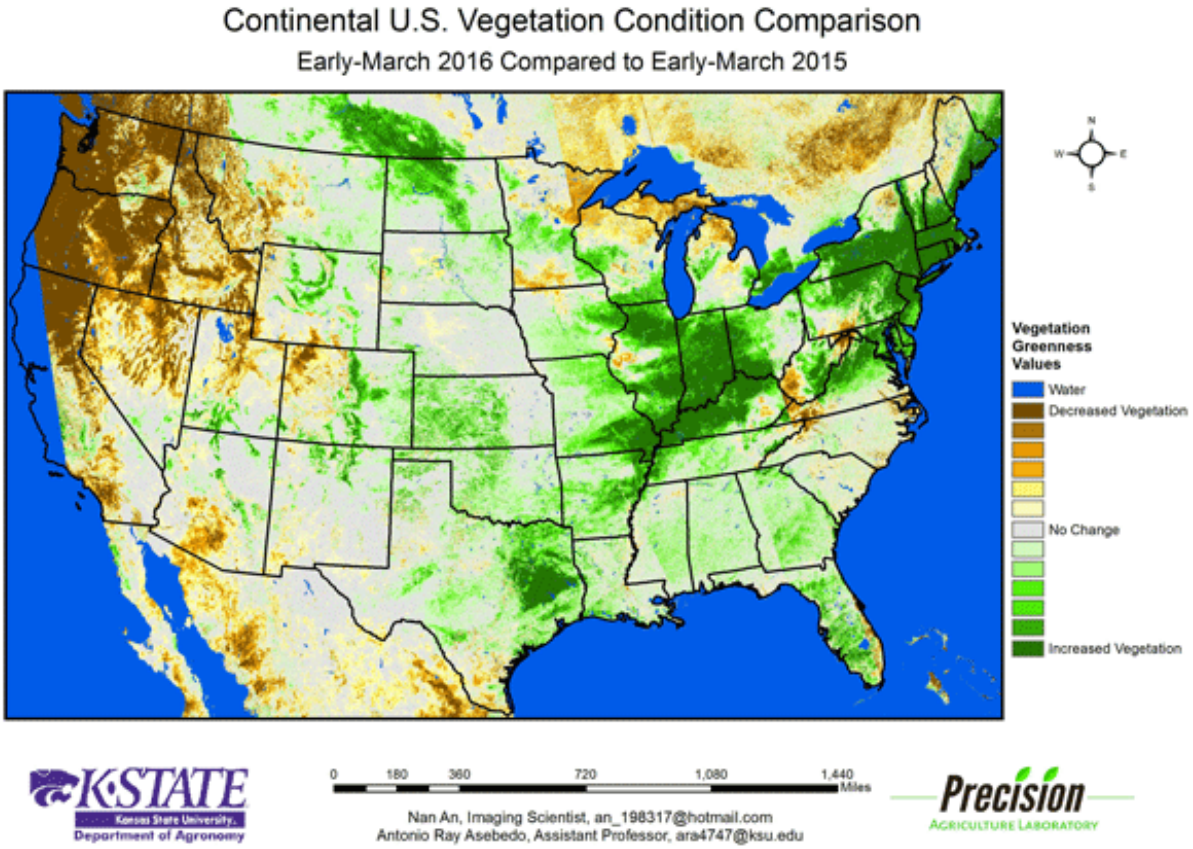


Figure 5. The U.S. comparison to last year at this time for the period March 1 – 7 from K-State's Precision Agriculture Laboratory shows that lower NDVI values are most evident along the Pacific Northwest while much higher NDVI values are visible from the Great Lakes to New England. Snow continues to be the major influence in both cases. The Ohio River area continues to see a low-snow season, while the Pacific Northwest has a higher snow pack than last year.

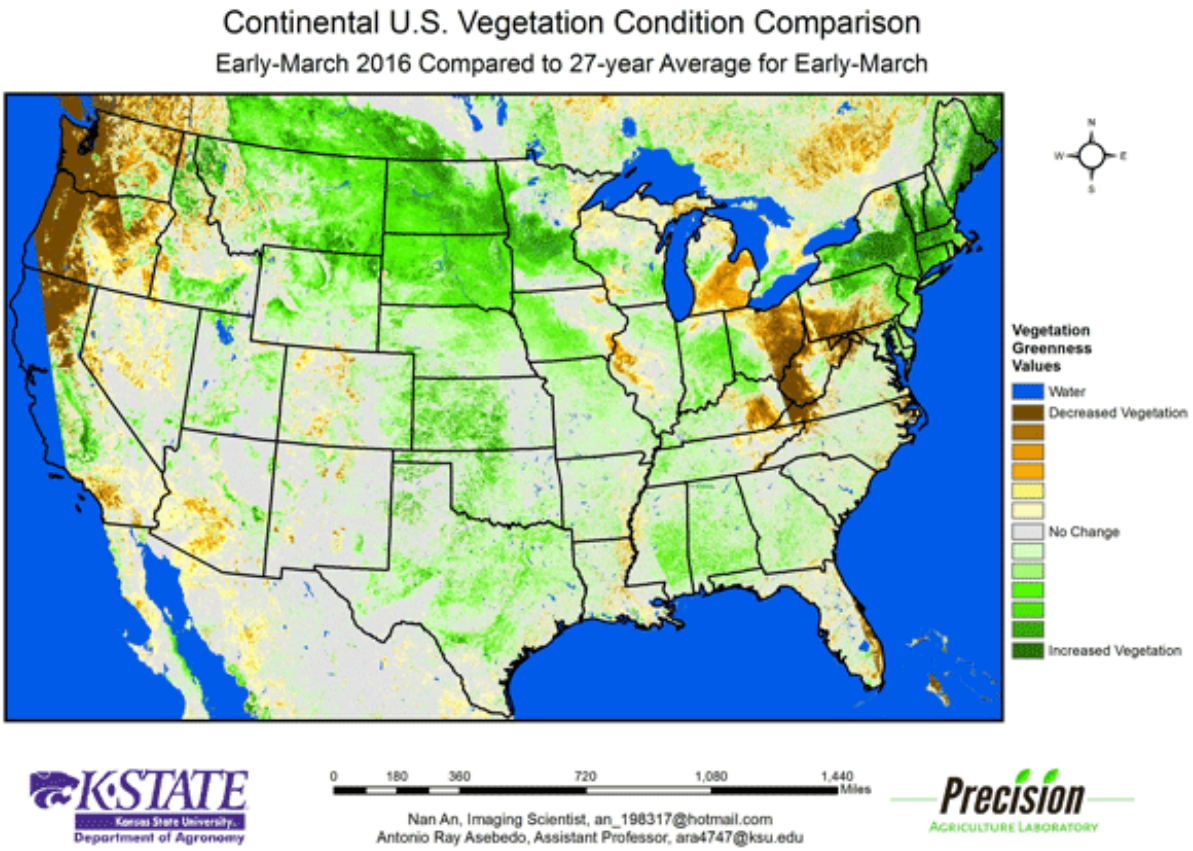


Figure 6. The U.S. comparison to the 27-year average for the period March 1 – 7 from K-State's Precision Agriculture Laboratory shows much above average photosynthetic activity across much of the continental U.S. The increased vegetative activity in eastern Montana and North Dakota is of particular concern. Snow pack in these areas is below average and abnormally dry conditions continue to expand in the region. Warmer-than-average winter temperatures across the Northern Plains is also spurring plant development.

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