



K-STATE
Research and Extension

Extension Agronomy

eUpdate

04/08/2016

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, 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 cthomпсо@ksu.edu.

| | |
|--|-----------|
| 1. Status of Roundup Ready 2 Xtend soybeans and herbicide options..... | 3 |
| 2. Drought conditions across most of Kansas starts to affect the wheat crop..... | 5 |
| 3. Stripe rust continues to spread in central Kansas..... | 13 |
| 4. Weed control strategies in grain sorghum | 15 |
| 5. Agricultural Mobile Apps: A review and update of non-agricultural apps..... | 18 |
| 6. Restrictions on buckwheat use in cover crop mixtures near commodity wheat..... | 24 |
| 7. Wheat In-Depth Diagnostic School in Colby, May 17-18 | 26 |
| 8. How dry and windy has it been in Kansas so far this year..... | 27 |
| 9. Kansas weather summary for March 2016: Another roller coaster | 33 |
| 10. Comparative Vegetation Condition Report: March 29 - April 4..... | 40 |

1. Status of Roundup Ready 2 Xtend soybeans and herbicide options

Roundup Ready 2 Xtend (RR2X) soybeans, with resistance to both dicamba and glyphosate herbicides, have been in development for a number of years. RR2X soybeans were deregulated by USDA over a year ago, but the soybeans were not introduced into the market last year because they still had not been approved for export to China or received herbicide approvals.

Early this year, China granted import approval of dicamba-tolerant oilseeds, which cleared the way for Monsanto to sell RR2X soybean seeds for planting in the 2016 crop season. However, the U.S. EPA has **NOT** yet approved the use of any dicamba products on RR2X soybeans and it is very unlikely that they will be registered in time for use during the 2016 cropping season.

Consequently, dicamba can only be used in accordance with currently existing dicamba product labels, which do **NOT** allow for any in-crop applications to soybeans and require minimum waiting intervals before planting soybeans depending on use rate, precipitation, geography, and specific dicamba product. Applying any dicamba product other than those specifically approved for use on Roundup Ready 2 Xtend soybeans could lead to substantial fines and possible embargo of the treated crop.

EPA is currently considering the registration of dicamba for use on RR2X soybeans. The approval process includes a public comment period during which anyone can submit their comments in support or opposition of the pesticide registration. This is your opportunity to provide input on the proposed registration of dicamba use on RR2X soybeans. Below is the announcement of the public comment period from EPA and the anticipated timelines.

“EPA is making available for a 30-day public comment period a proposed regulatory decision to register dicamba for use in controlling weeds on genetically-engineered (GE) dicamba-tolerant cotton and soybeans. This registration would be a new use for the previously approved herbicide dicamba. These GE cotton and soybean plants are the first developed to be resistant to dicamba and are intended to allow farmers to use dicamba to control weeds that have developed resistance to glyphosate and other herbicides.

“Public comments on the EPA’s proposed regulatory decision must be submitted no later than **April 30, 2016**. Comments may be submitted to the EPA docket [EPA-HQ-OPP-2016-0187](http://www.regulations.gov) at www.regulations.gov. After the comment period closes, EPA will review all of the comments and reach a final decision, which the **Agency expects to issue in late summer or early fall.**”

Monsanto and BASF have developed new formulations of dicamba with reduced drift potential, which, if approved, will be the primary products registered and marketed specifically for use on RR2X soybeans. The proposed name for the new dicamba product from Monsanto is XtendiMax, and the new dicamba product from BASF is Engenia. Monsanto also plans to have a new glyphosate-plus-dicamba premix named Roundup Xtend.

It is imperative that all products be used according to label guidelines to avoid legal issues and maintain a positive image for the agricultural industry.

Dallas Peterson, Weed Management Specialist
dpeterso@ksu.edu

Phil Stahlman, Weed Scientist, KSU Ag Research Center-Hays
stahlman@ksu.edu

Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist
cthompso@ksu.edu

2. Drought conditions across most of Kansas starts to affect the wheat crop

Drought is a concern this spring to many wheat producers across much of Kansas. Symptoms of drought stress during stem elongation start as lower leaf senescence, as the crop begins to eliminate leaves that will contribute less to the final grain yield in order to decrease the crop water needs. Meanwhile, upper canopy leaves may start to roll and give the crop a blue appearance, which can also be a symptom of drought stress (Figure 1). Many Kansas wheat fields are currently showing these symptoms.

While some yield reduction may already have occurred in Kansas wheat fields, the conditions during the next couple of months will actually determine final path of the wheat crop. If dry conditions persist, senescence can expand to more important leaves in the upper canopy, which contribute more to grain yield, increasing the potential for yield loss. Additionally, extremely dry conditions during the final stages of stem elongation through flowering (anthesis) can ultimately reduce wheat yield potential due to a decreased number of florets fertilized, which directly decreases the number of grains per head. While this is not the current situation of most of Kansas wheat, the established dry conditions across the entire state are a reason for concern if this scenario is not converted in the near future.



Figure 1. Wheat showing symptoms of drought stress at flag leaf emergence. Note the rolled leaves, bluish color of upper leaves. Photo by Erick DeWolf, K-State Research and Extension.

Total precipitation during the current growing season (from October 1, a rough estimate of planting date, until April 7) ranges from 4.3 inches in most of western Kansas to about 30 inches in the far southeast (Figure 2). Most of the wheat-producing region, though, has received no more than about 12 inches of precipitation thus far this growing season.

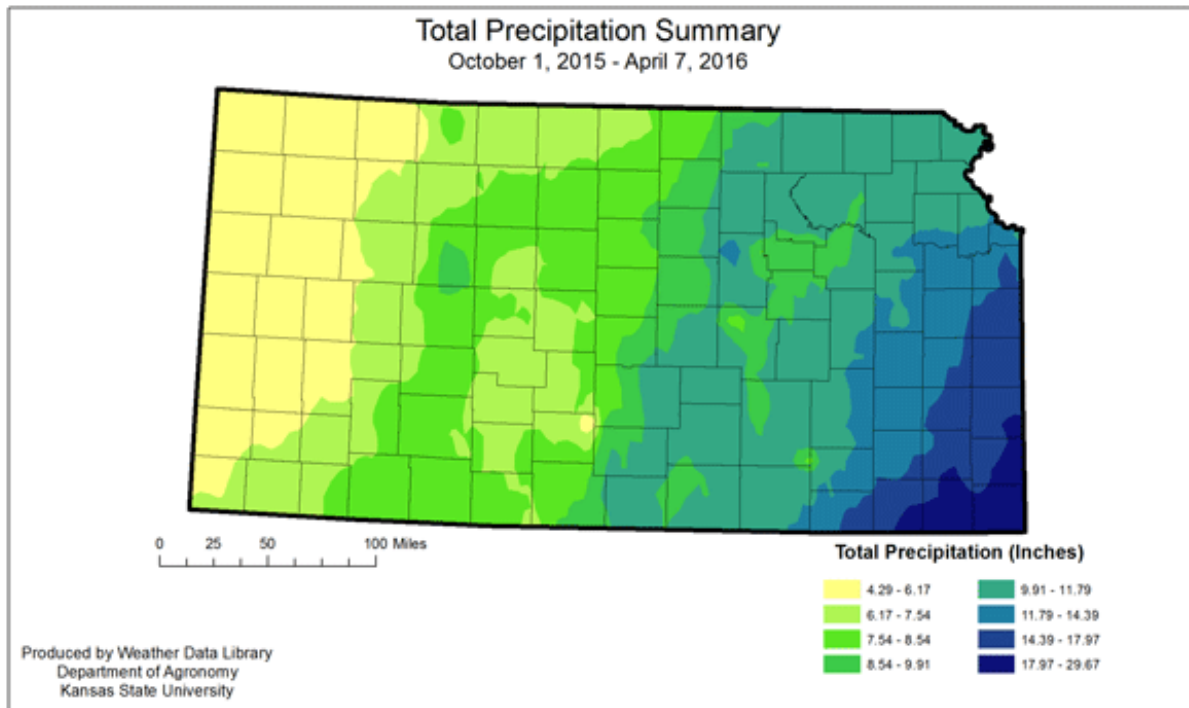


Figure 2. Total precipitation across Kansas during the 2015-16 wheat growing season (from 1 October 2015 until 7 April 2016).

These precipitation totals represent an average water deficit of as much as 2 inches for the growing season across most of central and eastern Kansas when compared to the long-term normal (Figure 3). While the western third of the state shows a positive departure from the normal, this departure does not mean that the crop necessarily has access to this surplus water from fall rains, mainly due to poor precipitation distribution as discussed below.

Figure 4 shows the departure from normal during the last 90 days while Figure 5 subtracts that 90 days departure from the departure from normal for the whole growing season. In other words, regions characterized by a relatively moist fall and dry spring, such as southwest and southeast Kansas, and most of the central region of the state, will show a greater change in precipitation departure from normal. On the other hand, regions that received precipitation within the last 90 days will show less negative departure from normal. Figure 4 shows that almost the entire state has a negative departure from normal in the last 90 days, as a consequence of the dry spring thus far.

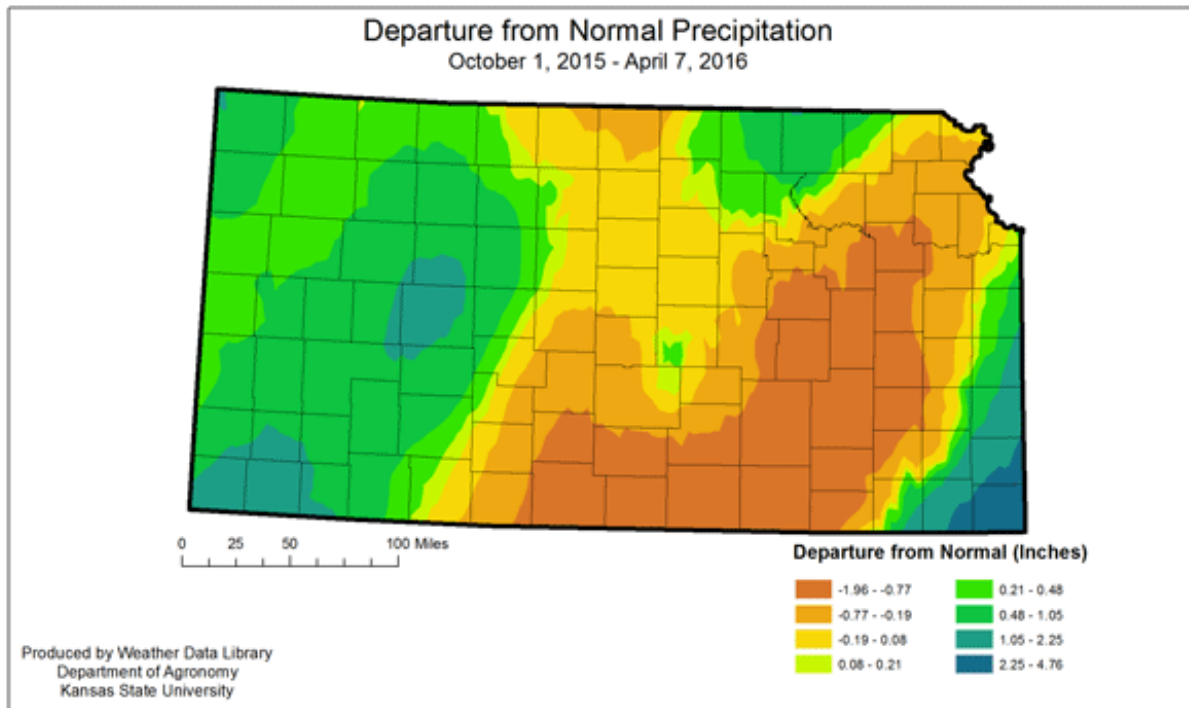


Figure 3. Departure of current growing season's precipitation totals from normal precipitation.

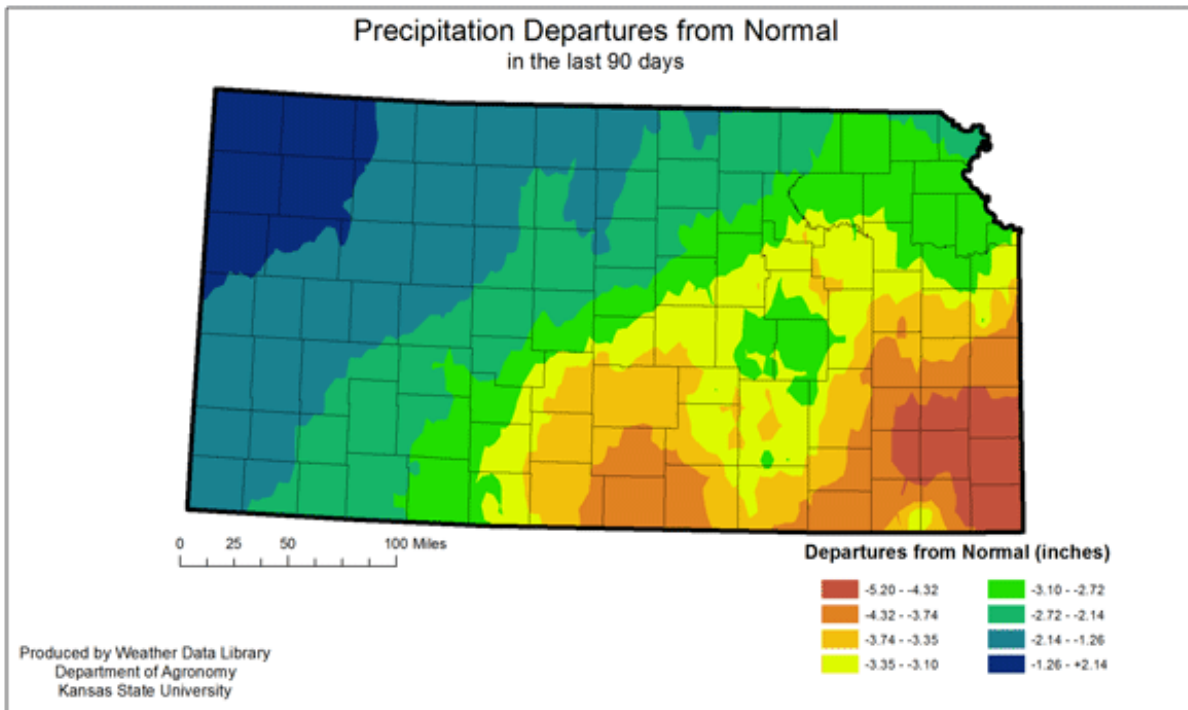


Figure 4. Departure of last 90 days' precipitation totals from normal precipitation.

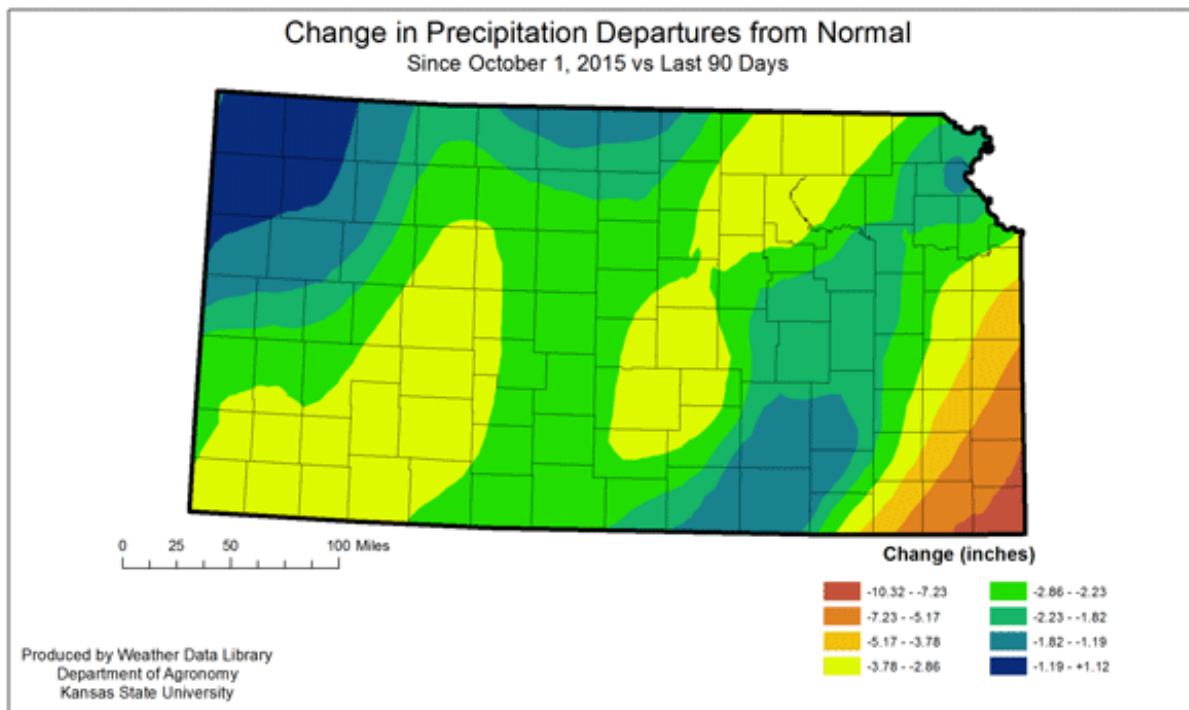


Figure 5. Departure from the normal precipitation for the last 90 days subtracted from the departure from normal precipitation for the entire growing season.

While precipitation totals are important to characterize the growing season conditions up to this point in time, precipitation distribution plays an even more important role in determining wheat grain yield. Situations like the one illustrated in Figure 6 are not uncommon in Kansas during the current growing season, where the crop had enough moisture supply during the fall and is starting to go into drought stress now due to water shortage in the spring. Most of the precipitation in southwest Kansas was concentrated during the fall 2015 and may have been either used by now due to the long, open fall that led to lush canopies; or may be stored in the subsoil. Many fields in southwest Kansas have good subsoil moisture but extremely dry topsoils. Under these circumstances, wheat roots may not have access to the moisture and it may not be translated into grain yield.

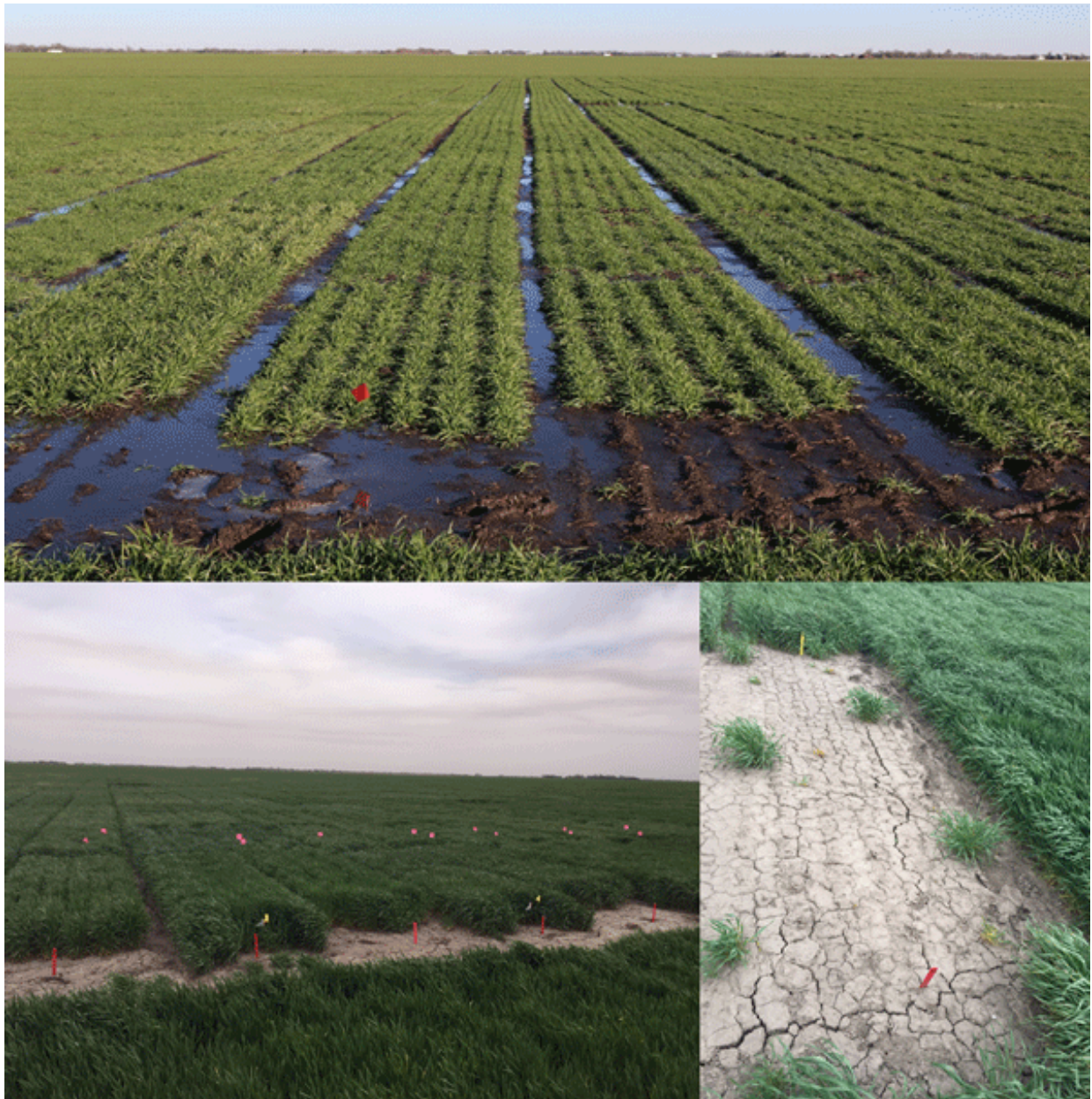


Figure 6. Water-logged soil during the fall (upper image) versus cracked, dry soil during the spring (lower images) in the K-State wheat variety performance test near McPherson. Fall photo taken December 3, 2015 and spring photo taken April 7, 2016 by Romulo Lollato, K-State Research and Extension.

While fall moisture is important to ensure proper wheat tillering, the amount of water needed by the wheat crop increases linearly with the increase in biomass in the spring as the wheat is released from winter dormancy and moves into the stem elongation phase. Wheat daily evapotranspiration increases from about 0.05 inches per day following vernalization to about 0.2 inches per day or more at the peak of water needs around flowering (Figure 7). Data in Figure 7 was collected near Chickasha, in central Oklahoma, during the 2013-14 growing season. The total in-season precipitation amount during this growing season was approximately 8 inches, mostly concentrated

during the fall, similar to a great portion of Kansas during the current growing season. Daily wheat evapotranspiration can be greater in cases in which the crop is not limited by soil moisture stress, such as under irrigation or sufficient precipitation regimes.

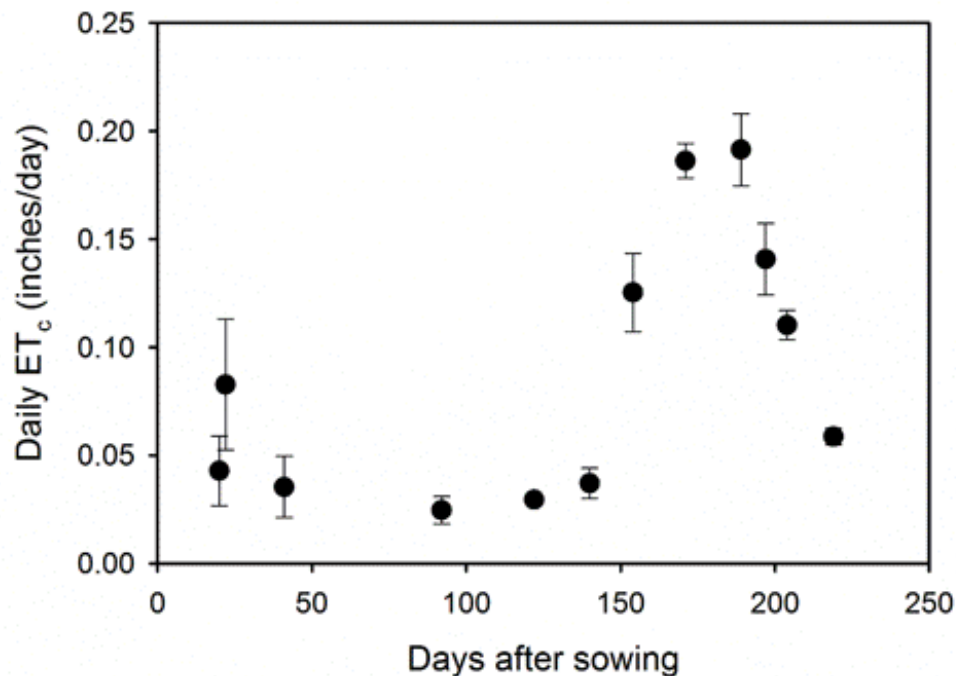


Figure 7. Daily wheat evapotranspiration in inches per day measured near Chickasha, central Oklahoma, during the 2013-14 growing season. Data by Romulo Lollato, K-State Research and Extension.

Romulo Lollato, Wheat and Forages Specialist
lolato@ksu.edu

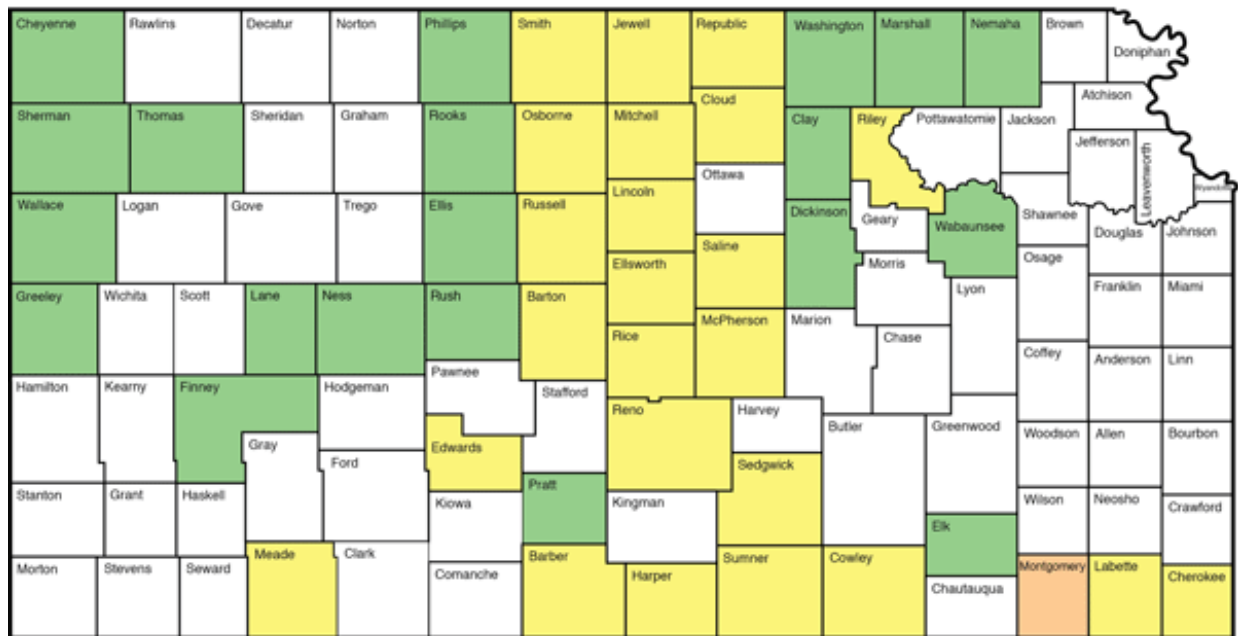
Erick DeWolf, Extension Plant Pathologist
dewolf1@ksu.edu

Mary Knapp, Weather Data Center
mknapp@ksu.edu

3. Stripe rust continues to spread in central Kansas

The wheat crop in Kansas is now at the flag leaf emergence stage of growth in much of southern and central Kansas. The crop is at mid- to late-joining in the west central and northwest regions of the state. Stripe rust continues to be our primary focus this week with new reports from additional counties and further disease development in central Kansas. The disease is still limited to the lower leaves for the most part with occasional mid canopy leaves with trace levels. The incidence of stripe rust on the lower leaves of susceptible varieties ranges from 1-30%.

Distribution of Wheat Stripe Rust April 8, 2016



Disease Risk

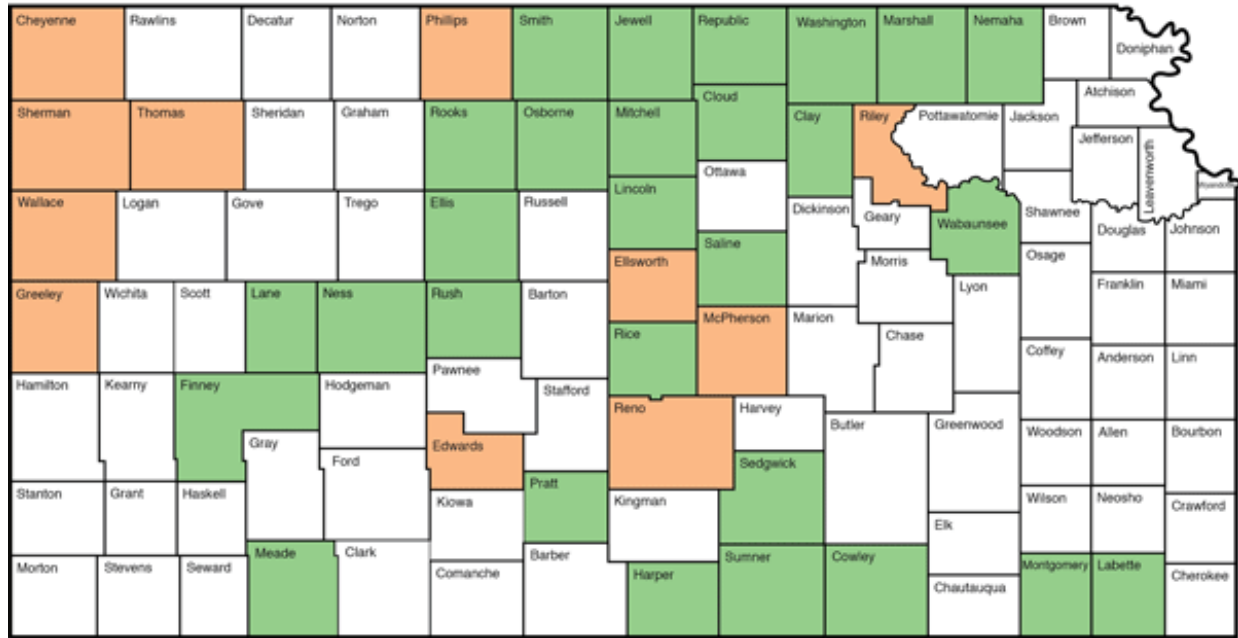
- Stripe rust not observed
- Stripe rust observed on lower leaves
- Stripe rust observed on upper leaves

Disease observation map based on reports from: E. DeWalt, R. Lollato, D. Shoup, L. Haag, S. Duncan, E. Adee, M. Buchanan, G. Cramer, A.J. Foster, S. Campbell, J. Carr, J. Coltrain, J. Falk-Jones, J. Green, M. Gleason, D. Hallauer, R. Hein, J. James, A. Johnson, K. Larson, C. Long, T. Maxwell, C. Miller, M. Ploger, Z. Simon, S. Wick

Leaf rust was observed at multiple locations in central Kansas this week also. As with stripe rust, leaf rust is also on the lower leaves. Only trace levels have been found so far in most plots. We did observe a few fields and plots in Reno and McPherson counties with incidence of leaf rust approaching 90% on the lower leaves. The severity of the infection was still low (<10%) in most cases.

Distribution of Wheat Leaf Rust

April 8, 2016



Disease Risk

- Leaf rust not observed
- Leaf rust observed on lower leaves

Disease observation map based on reports from: E. De Wolf, R. Lollato, D. Shoup, L. Haag, S. Duncan, E. Adee, M. Buchanan, G. Cramer, A.I. Foster, S. Campbell, J. Carr, J. Coltraine, J. Falk-Jones, J. Green, M. Gleason, D. Hallauer, R. Hein, J. James, A. Johnson, K. Larson, C. Long, T. Maxwell, C. Miller, M. Ploger, Z. Simon, S. Wick

The dry conditions may be slowing the spread of leaf diseases temporarily, but growers should be watching this situation carefully. Be prepared to apply a fungicide if disease continues to progress.

Erick De Wolf, Extension Plant Pathology
dewolf1@ksu.edu

Romulo Lollato, Wheat and Forages Specialist
lolato@ksu.edu

4. Weed control strategies in grain sorghum

Severe grass and broadleaf weed pressure will reduce grain sorghum yields and can make harvest very difficult. Good crop rotation and herbicide selection are essential components of managing weeds in grain sorghum.

In a wheat-sorghum-fallow rotation, it is essential that broadleaf and grassy weeds do not produce seed during the fallow period ahead of grain sorghum planting. Always control those summer annual weeds after wheat harvest soon enough to prevent seed production. It is equally important that winter annual grasses are not allowed to head in spring, before the sorghum is planted. Thus, an effective burndown should be applied before winter annuals go into the flowering/heading stages. Most winter annuals produce seed in April and early May.

If you are anticipating problems with glyphosate-resistant pigweeds, it may be very important to include in the April burndown treatment a residual product. This can help minimize pigweed (Palmer amaranth and waterhemp) emergence in late April and May, prior to planting sorghum. A pound of atrazine may provide the needed protection unless the pigweed population is atrazine resistant. Atrazine + chloracetamide herbicides can be used effectively, however.

The Valor label allows the use of 2 oz/acre applied 30 days or more prior to sorghum planting. It is essential that 1 inch of precipitation fall during the window between Valor application and sorghum planting. Valor will control glyphosate-resistant and triazine-resistant pigweeds as it has a different mode of action than glyphosate and atrazine.

An effective burndown prior to planting is essential if any weeds have emerged. Sorghum should always be planted into a weed-free seedbed. The addition of a dicamba product or 2,4-D with glyphosate generally will control broadleaf and grass weeds effectively provided an earlier burndown treatment has been applied in March or April. There is a waiting period of 15 days between application and sorghum planting when using 8 fl oz of Clarity. Current 2,4-D labels do not address a waiting period ahead of planting sorghum; however, for corn or soybeans a 7-day waiting period is required for 1 pint or less of 2,4-D ester when used in the burndown.

In sorghum, the best choice of herbicides will depend on the weed species present. Broadleaf weeds generally can be controlled with a combination of preemergence and postemergence applied herbicides. With the development of herbicide-resistant weeds, however, this is becoming increasingly difficult.

Control of pigweeds in sorghum is an increasing concern across the state. Using a soil-applied chloracetamide herbicide with atrazine (such as Bicep II Magnum, Bicep Lite II Magnum, Outlook, Degree Xtra, FulTime NXT, or generic equivalents of these products) will greatly enhance controlling pigweeds. Some of the broadleaf escapes producers can expect when using the chloracetamide/atrazine mixtures are devilsclaw, puncturevine, velvetleaf, morningglory, atrazine-resistant kochia.

Using a product such as Lumax EZ or Lexar EZ preemergence, which contains mesotrione (Callisto), will help control the triazine-resistant pigweeds and kochia. The addition of 10 oz of Verdict, which is a mix of 2 oz of Sharpen and 8.3 oz of Outlook, can help control triazine-resistant pigweeds as well as the large-seeded broadleaf weeds. The chloracetamide/atrazine herbicides will do a very good job of controlling most annual grassy weeds.

A weakness of all soil-applied programs is that rainfall is required for activation. Without activation, poor broadleaf and grass control can be expected. Once rain is received, the herbicides are activated and weed control measures are in place. Weed escapes prior to this activation will need to be controlled with postemergence applied herbicides.

Grass control in sorghum can be a difficult task in some cases. If a field has severe shattercane or longspine sandbur pressure, planting grain sorghum is not recommended. For other annual grassy weeds, it will be important to apply one of the chloracetamide herbicides. Grasses that emerge before the soil-applied herbicides are activated will not be controlled. There are no herbicides currently labeled for postemergence grass control in conventional grain sorghum. Although atrazine and Facet L have grass activity and can control tiny grass seedlings, it's generally not a good practice to depend on these herbicides for grass control. Facet L is the new liquid formulation of quinclorac (previously Paramount 75 DF) and has excellent activity on field bindweed.

A new technology for grass management is Inzen sorghum, a non-GMO type of sorghum. Growing Inzen sorghum will allow the use of nicosulfuron (an ALS grass herbicide) applied postemergence for control of labeled annual grasses when they are small. DuPont has developed a liquid formulation of nicosulfuron that has an anticipated registration in the next few months. Currently a 75% a.i. nicosulfuron dry formulation product has received a registration for Inzen sorghum. Hybrid availability is extremely limited in 2016. Advanta and Pioneer will be marketing Inzen hybrids. Hopefully availability will improve over time.

Postemergence broadleaf weed control herbicides are available for grain sorghum. These products will be most effective when applied in a timely manner. Weeds that are 2-4 inches tall will be much easier to control than weeds that are 6-8 inches tall, or larger. Controlling weeds in a timely manner will result in less weed competition with the crop compared to waiting too long to control the weeds. Atrazine combinations with Huskie, Banvel, 2,4-D, Buctril, or Aim (or generic versions of these herbicides) can provide excellent broad-spectrum weed control.

Huskie, the newest herbicide registered in sorghum should be applied at 12.8 to 16 fl oz/acre with 0.25 to 1.0 lbs of atrazine, NIS 0.25% v/v or 0.5% v/v HSO (high surfactant oil concentrate), and spray grade ammonium sulfate at the rate of 1 lb/acre to sorghum from 3-leaf to 12 inches tall. Huskie alone, without atrazine, can now be applied to sorghum up to 30 inches tall prior to flag leaf emergence, however it will be less effective. Huskie is effective on kochia, pigweeds, and many other broadleaf weed species. Huskie is most effective on small weeds. The larger pigweed and kochia get, the more difficult they are to control. Temporary injury to sorghum is often observed with Huskie.

The presence of certain weed species will affect which postemergence herbicide programs will be most effective. See the grain sorghum section in the *K-State 2016 Chemical Weed Control Guide* (SRP 1126) to help make the selection:

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

The crop stage at the time of postemergence herbicide applications can be critical to minimize crop injury. Delayed applications to large sorghum increase the risk of injury to the reproductive phase of grain sorghum, thus increasing crop injury and yield loss from the herbicide application. Timely applications not only benefit weed control, but can increase crop safety. Always read and follow label guidelines.

Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist
cthompso@ksu.edu

5. Agricultural Mobile Apps: A review and update of non-agricultural apps

This article provides a review and update of some of the current “non-agricultural apps.” These apps can assist everyone and are for general use, such as e-readers, calculators, email, calendars, checking the speed of your internet connection, picture editing, and more.

This is the last article of the Ag-Apps series of annual reviews and updates from our KSUCROPS Crop Production team (led by Dr. Ciampitti) and the K-State Department of Agronomy. Check all the previous categories in the previous nine editions of our Agronomy eUpdate newsletter.

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.

10. Non-Agricultural Apps

Apps for general use.

MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

Non-Agricultural Apps

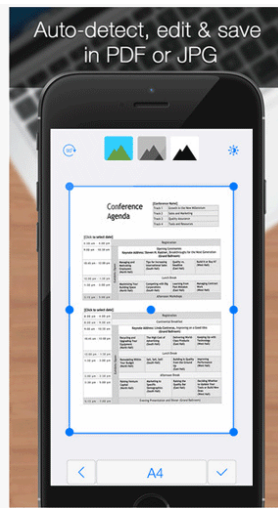
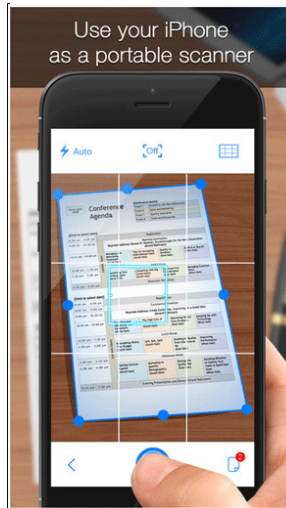
| Name of App and Source | Picture | Brief description and cost |
|------------------------|---------|----------------------------|
|------------------------|---------|----------------------------|

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

iScanner

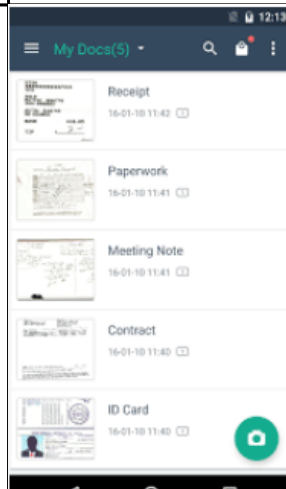


The iScanner app provides a way to scan any kind of book, receipt, document, paper note, schedule, timetable.

\$0.99

Ascella Apps

CamScanner

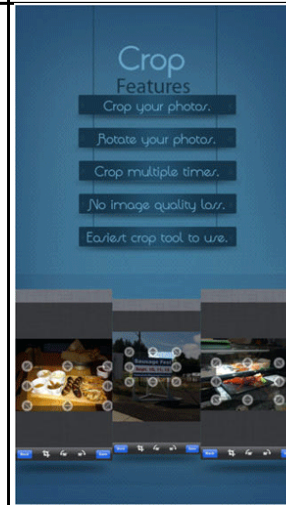


This app allows you to scan any document, transfer text from scanned images to documents, and more.

FREE

INTSIG Information Co., Ltd

Crop



This app allows cropping and sizing any image. Select a photo and drag the dots to crop your image. Rotate images too with a single touch.

FREE

Green Mango Systems, Inc.

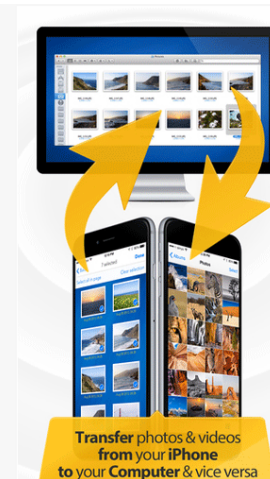
MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

Non-Agricultural Apps

| Name of App and Source | Picture | Brief description and cost |
|------------------------|---------|----------------------------------|
| Photo Transfer App | | Photo Transfer App allows you to |



ERCLab, LLC



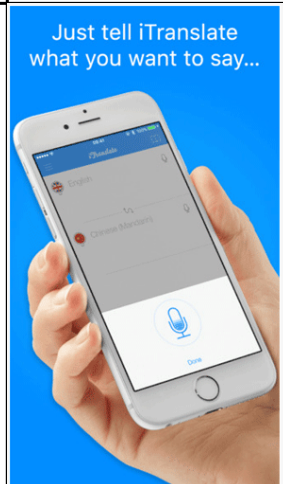
quickly copy photos and videos between your iPhone, iPad, Mac, or PC using your local Wi-Fi network.

\$2.99

iTranslate



Sonico GmbH



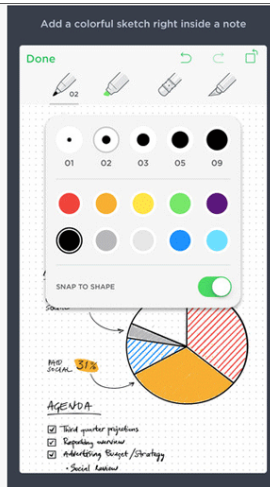
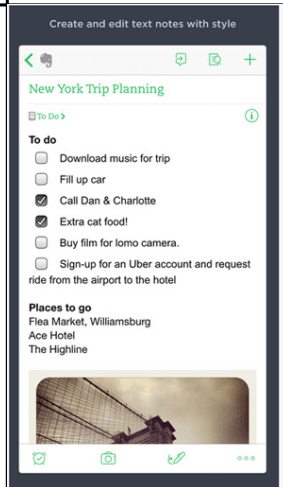
Words and phrases often lead to different meanings based on dialects, regions, and more. iTranslate draws from many dictionaries to find the exact phrase you need.

FREE

Evernote



Evernote



With this app write notes, checklists, and research; clip from anywhere on the web. Check PDF documents and edit, highlight the text.

FREE

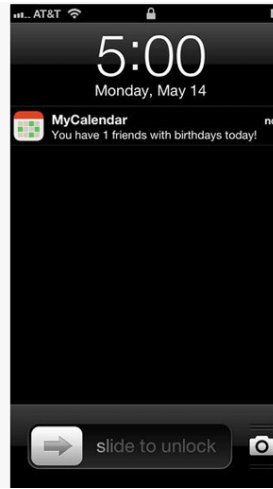
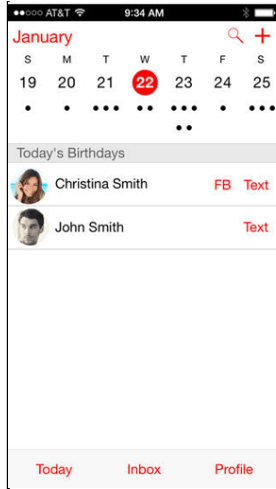
MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

Non-Agricultural Apps

| Name of App and Source | Picture | Brief description and cost |
|------------------------|---------|--|
| MyCalendar | | Add birthdays of all contacts from you |



K-Factor Media, LLC



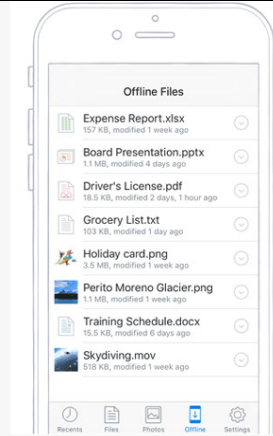
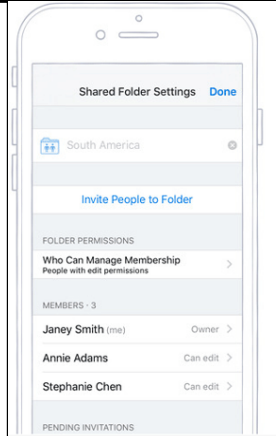
phone, customize reminder settings, and easily message your friends via text or Facebook.

FREE

Dropbox



Dropbox



Dropbox is the place for your photos, docs, videos, and other files. Files you keep in Dropbox are safely backed up and you can get to them from all your devices.

FREE

Calculator Plus



DigitAlchemy, LLC



Calculator remembers everything you calculate, and lets you review it anytime, making it perfect for shopping, doing homework, balancing checkbooks, and calculating taxes.

FREE

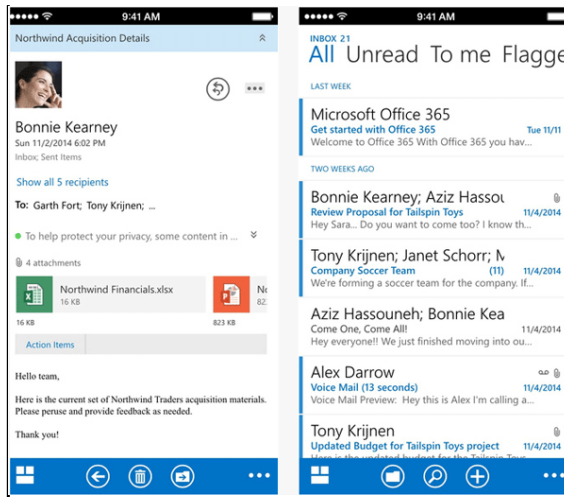
MOBILE AGRICULTURAL APPS – REVIEW from KSUCROPS ©Kansas State University

Non-Agricultural Apps

| Name of App and Source | Picture | Brief description and cost |
|------------------------|---------|--|
| OWA | | This app is the Office Windows email for Apple products. All the familiar features of Office Email, with the |



Microsoft Corporation



convenience of your iPhone.

FREE

Speedtest.net



Ookla



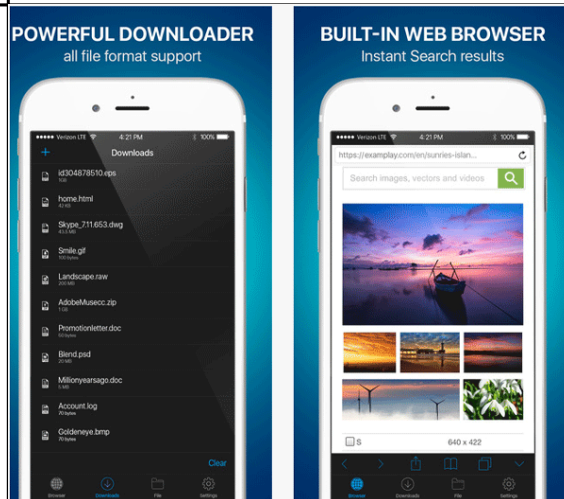
This app provides information related to the download and upload speed of internet connections

FREE

Downloader Pro



Contreras Graham



This app is designed to help download files to your iPhone, iPod, and iPad to work offline with lightning-fast speed

FREE

This is the last in the series of eUpdate articles for this year featuring Ag Apps from our KSUCROPS Crop Production team and the K-State Department of Agronomy.

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

Jeffrey Albers, Agronomy undergraduate student in crop production, KSUCROPS Team
jjalbers@ksu.edu

Aaron Brinkman, Agronomy undergraduate student in crop production, KSUCROPS Team
aaron49@ksu.edu

6. Restrictions on buckwheat use in cover crop mixtures near commodity wheat

On March 16, the USDA-NRCS released an eBulletin stating that NRCS will not recommend buckwheat in cover crop plantings in areas in rotation with or adjacent to commodity wheat production that will be planted to wheat within the next 2 calendar years after planting buckwheat. This is because of the potential for buckwheat seed to contaminate the wheat crop and the health risks that it potentially poses. This decision has been taken as a result of a request by some U.S. wheat grower associations and their concerns about Japanese markets.

The NRCS bulletin, NB 190-16-8 ECS, is as follows:

Exclusion of Buckwheat in Conservation Plantings in or Near Commodity Wheat Fields in Selected West and Central States

Purpose. To explain potential health risks of buckwheat allergies in some Asian countries and provide guidance for excluding buckwheat in conservation plantings in Colorado, Idaho, Kansas, Minnesota, Montana, Nebraska, North Dakota, Oregon, South Dakota, Washington, and Wyoming and reducing contamination in wheat exports to Japan and other Asian countries.

Expiration Date. September 30, 2017

Background. Farmers in the United States grow buckwheat (*Fagopyrum esculentum*) as a grain crop but also as a cover crop to improve soil health and, in pollinator habitat seed mixes, to support bees and other pollinators. The Pacific Northwest exports much of its wheat crop to Asia, including Japan. In recent years, Japanese buyers have found low levels of buckwheat in their wheat shipments from the United States. Japan is concerned with buckwheat contamination in wheat shipments. They require listing of the presence of buckwheat as an allergen on food products. Japanese have a higher level of sensitivity to buckwheat allergies, causing issues analogous to peanut allergies in the United States.

U.S. wheat grower associations are working to eliminate buckwheat contamination in wheat shipments to Japan. Their efforts are critical due to the potential health risk the buckwheat presents to those with an allergy, and buckwheat contamination in wheat shipments to Japan could have significant economic impacts. Grain and wheat associations are working diligently to educate producers who grow buckwheat as a grain crop. They have asked NRCS to assist with buckwheat used in conservation programs.

The wheat export stream through Pacific Northwest terminals to Japan comes from many wheat-producing States, including Colorado, Idaho, Kansas, Minnesota, Montana, Nebraska, North Dakota, Oregon, South Dakota, Washington, and Wyoming. Some of these export to Japan only when

economic conditions are conducive.

NRCS recommends buckwheat as a cover crop throughout much of the United States. Buckwheat is a warm-season annual that can mature in less than 60 days, and is useful in rotations with cool-season crops. Buckwheat is highly attractive to a number of pollinator species including honey bees and native bees. Both traditional and organic producers use buckwheat.

Explanation. NRCS State offices in Colorado, Idaho, Kansas, Minnesota, Montana, Nebraska, North Dakota, Oregon, South Dakota, Washington, and Wyoming must update their seeding recommendations to exclude buckwheat in conservation plantings around wheat crops as follows:

- NRCS will not recommend buckwheat in conservation plantings in areas in rotation with or adjacent to commodity wheat production that will be planted to wheat within the next 2 calendar years after planting buckwheat because of the potential for buckwheat seed to contaminate the wheat crop, and the health risks that potentially poses. “Adjacent” is designated as within 30 feet of a wheat field. Although the general recommendation is to not plant wheat for 1 year after growing buckwheat, NRCS will be more conservative and require 2 calendar years.
- Each State must update their conservation practice specifications (i.e., seeding recommendations and implementation guides) to permanently reflect this exclusion of using buckwheat around commodity wheat fields. This update includes, but is not limited to, the following conservation activities:
 - Use of buckwheat must be excluded from cover crops plantings in rotation or adjacent to fields with wheat production or abstain from growing wheat as a commodity for 2 calendar years after planting buckwheat.
 - Use of buckwheat must be excluded from pollinator plantings in rotation with or adjacent to fields currently planted or that will be planted to commodity wheat within the next 2 calendar years.
 - The use of buckwheat in conservation plantings in these States is still permitted in fields or areas that are not used for commodity wheat production.
- Each State must ensure that conservation planners are aware of this issue and the guidance and criteria for buckwheat exclusion.

Actions must be completed prior to 2016 planting season for buckwheat.

Contact. Questions regarding this bulletin should be directed to John Englert, National Program Leader-Plant Materials, Ecological Sciences Division, at John.Englert@wdc.usda.gov.

7. Wheat In-Depth Diagnostic School in Colby, May 17-18

The Northwest Research and Extension Center (NREC) will hold its 2016 Wheat In-Depth Diagnostic School on May 17 and 18 at the NREC, 105 Experiment Farm Road, Colby. On May 17, the hours are from 9 a.m. until 6 p.m. On May 18, the school begins at 8 a.m. and ends at 1 p.m.

Topics presented by K-State agronomists will include:

- Wheat Growth and Development
- General Wheat Production Problems
- Wheat Diseases and Treatment Options
- Water Use of Wheat As Part of Rotations
- Weed Identification
- Weed Control in Wheat
- Soil Fertility Needs of Wheat
- Sprayer Calibration
- Wheat Insects and Their Interaction with Diseases
- New Technology in Wheat Breeding

This field day is tailored to be a hands-on learning opportunity for agronomy professionals, farmers and anyone interested in wheat production. It has approval for Certified Crop Advisor and Commercial Pesticide Applicator credits. The cost is \$140 for both days for those who RSVP by May 9. After that date, the cost is \$180 for both days.

To register for the school, register online at www.northwest.ksu.edu/WheatSchool

For more information, contact the Northwest Research and Extension Center at 785-462-6281 or jfalkjones@ksu.edu or lhaag@ksu.edu.

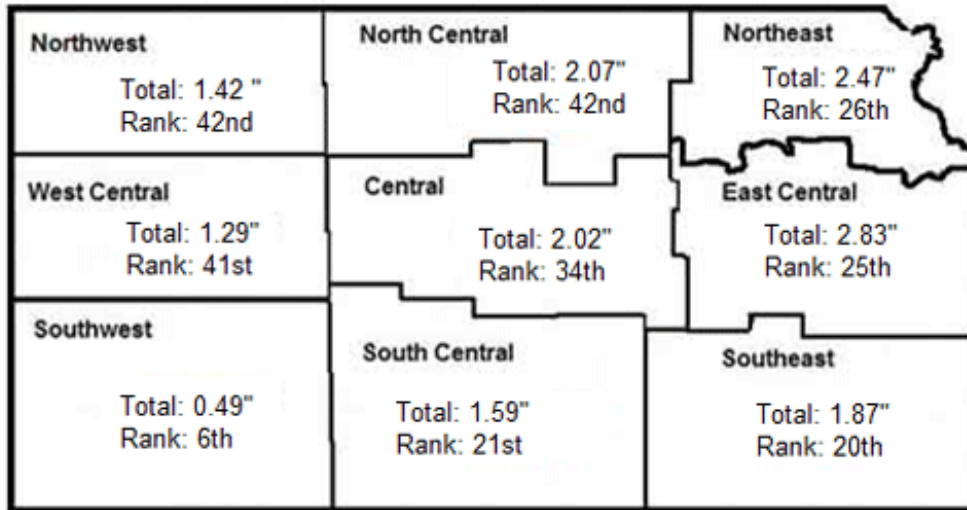
Jeanne Falk Jones, Sunflower District Agronomist
jfalkjones@ksu.edu

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

8. How dry and windy has it been in Kansas so far this year

The dry weather that has persisted into April has raised concerns. In western Kansas, this has been the 6th driest start to the year since 1895. Below is a map showing the total rainfall for 2016 by division and the historical rank:

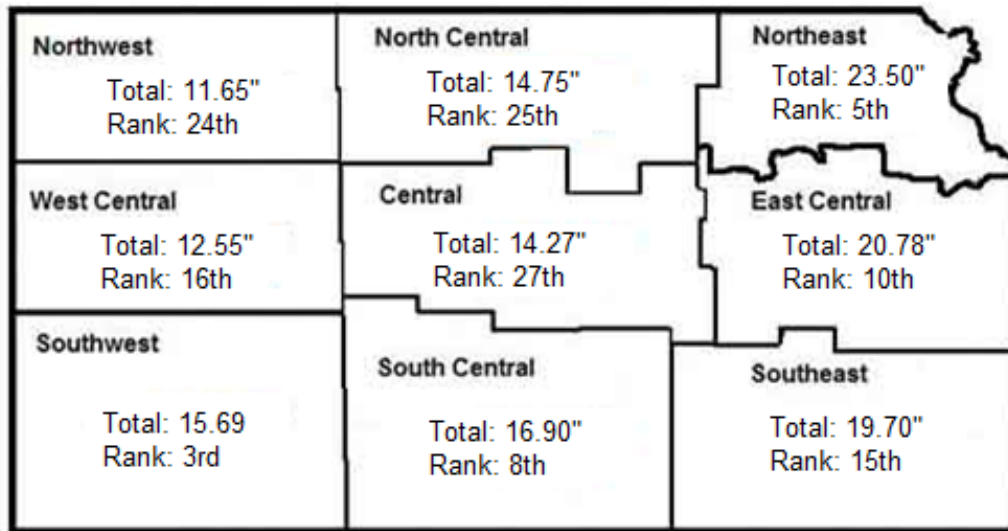
January - March 2016 Precipitation Ranks



With a very dry start to the year, drought has increased across the state. Impacts of these drought conditions have been felt in several ways, with one of the biggest issues being prolonged periods of critical fire weather. Contributing to these fire weather concerns is the wetter-than-normal condition that prevailed during the previous year's primary production season for grass – May to July. Those wet conditions favored high amounts of fine fuels. The lack of snow cover to pack the grass down has left grasses standing upright and able to carry fire very well. Below is a map showing the May-July precipitation ranks for 2015:

May-July 2015 Precipitation Ranks

Wet vs Dry



In addition to the dry conditions, strong winds have created increasing problems with blowing dust and extreme fire behavior. Below is a table comparing this year's average winds at the National Weather Service 1st Order stations to data at the same location from 1930-1996:

| Kansas Winds | | Jan | Feb | Mar |
|---------------------|-----------------------------------|------------|------------|------------|
| Concordia | Historical Wind Speed (1930-1996) | 12 | 12 | 14 |
| | Wind Speed 2016 | 9.7 | 11.8 | 12.3 |
| | 2016 Days avg >= 20 mph | 0 | 1 | 2 |
| | Peak Gust (1930-1996) | 60 | 52 | 54 |
| | Peak Gust 2016 | 28 | 37 | 38 |
| Dodge City | Historical Wind Speed (1930-1996) | 11 | 11 | 12 |
| | Wind Speed 2016 | 11.4 | 13.2 | 13.9 |
| | 2016 Days avg >= 20 mph | 1 | 1 | 3 |

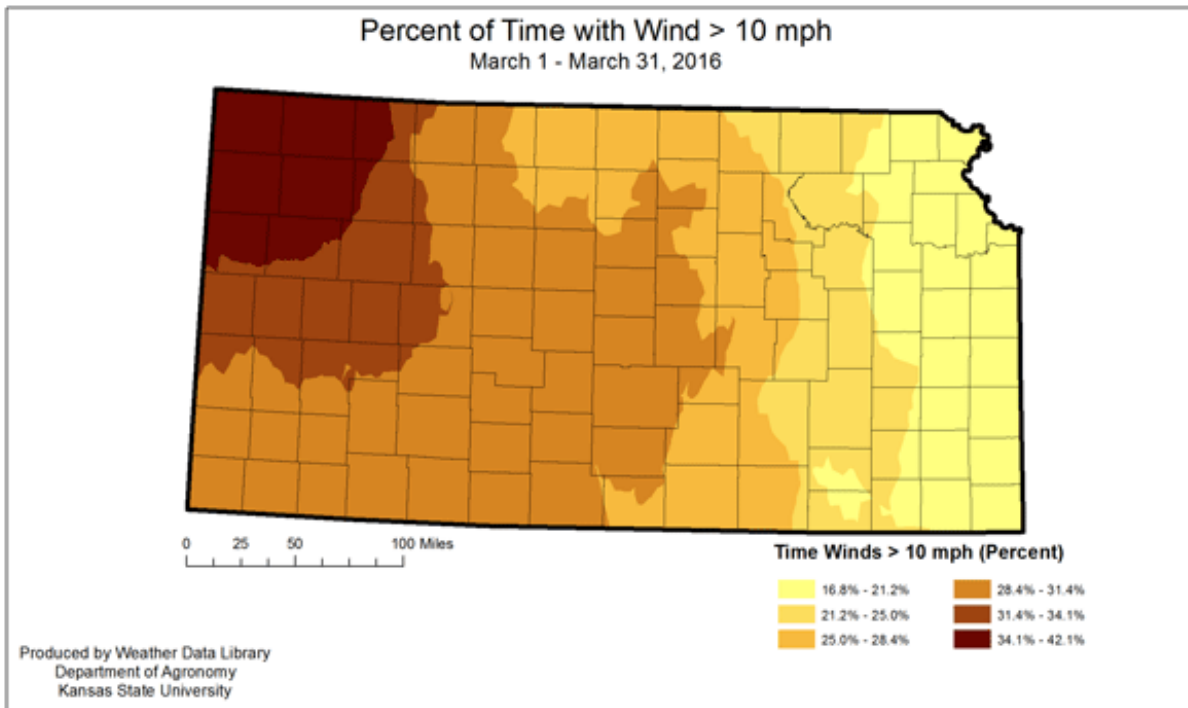
Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

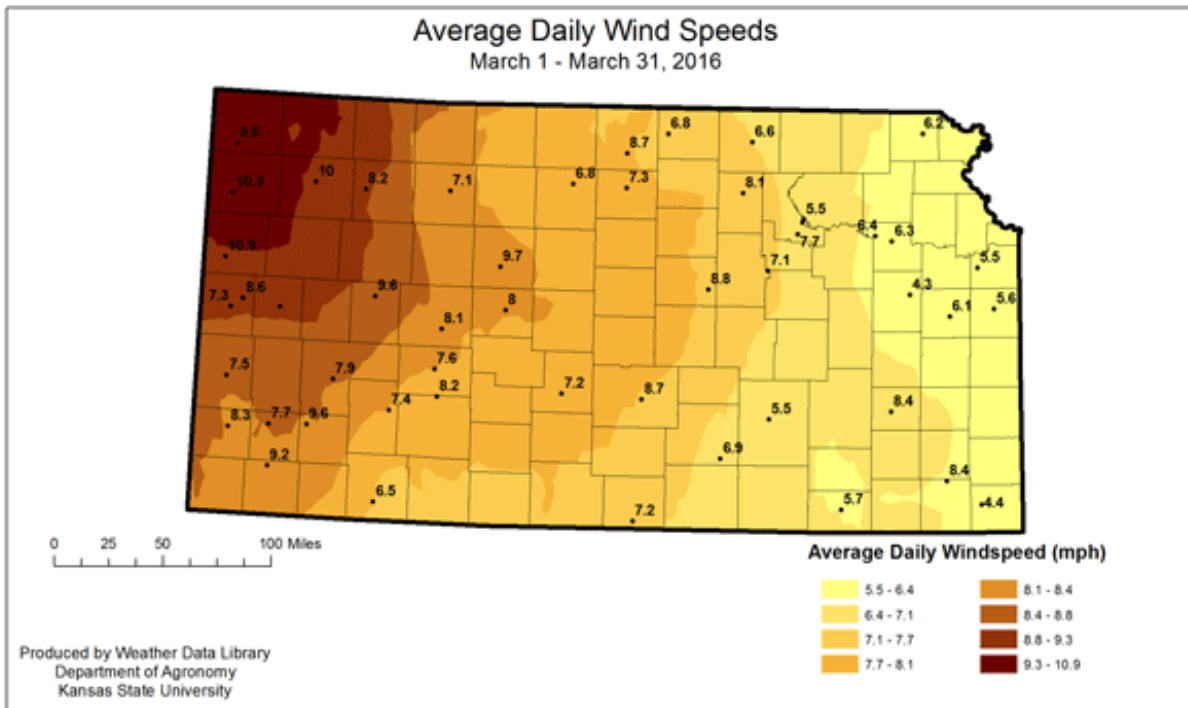
www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

| | | | | |
|----------|-----------------------------------|------|------|------|
| Goodland | Peak Gust (1930-1996) | 66 | 57 | 48 |
| | Peak Gust 2016 | 32 | 38 | 40 |
| | Historical Wind Speed (1930-1996) | 13 | 13 | 14 |
| | Wind Speed 2016 | 11.1 | 13.6 | 14.3 |
| | 2016 Days avg \geq 20 mph | 0 | 0 | 3 |
| | Peak Gust (1930-1996) | 64 | 51 | 53 |
| Topeka | Peak Gust 2016 | 44 | 44 | 49 |
| | Historical Wind Speed (1930-1996) | 10 | 10 | 12 |
| | Wind Speed 2016 | 7.4 | 9.7 | 9.6 |
| | 2016 Days avg \geq 20 mph | 0 | 0 | 0 |
| | Peak Gust (1930-1996) | 49 | 47 | 43 |
| | Peak Gust 2016 | 24 | 40 | 33 |
| Wichita | Historical Wind Speed (1930-1996) | 10 | 10 | 11 |
| | Wind Speed 2016 | 10 | 12.3 | 13.9 |
| | 2016 Days avg \geq 20 mph | 0 | 1 | 4 |
| | Peak Gust (1930-1996) | 59 | 49 | 49 |
| | Peak Gust 2016 | 28 | 31 | 43 |

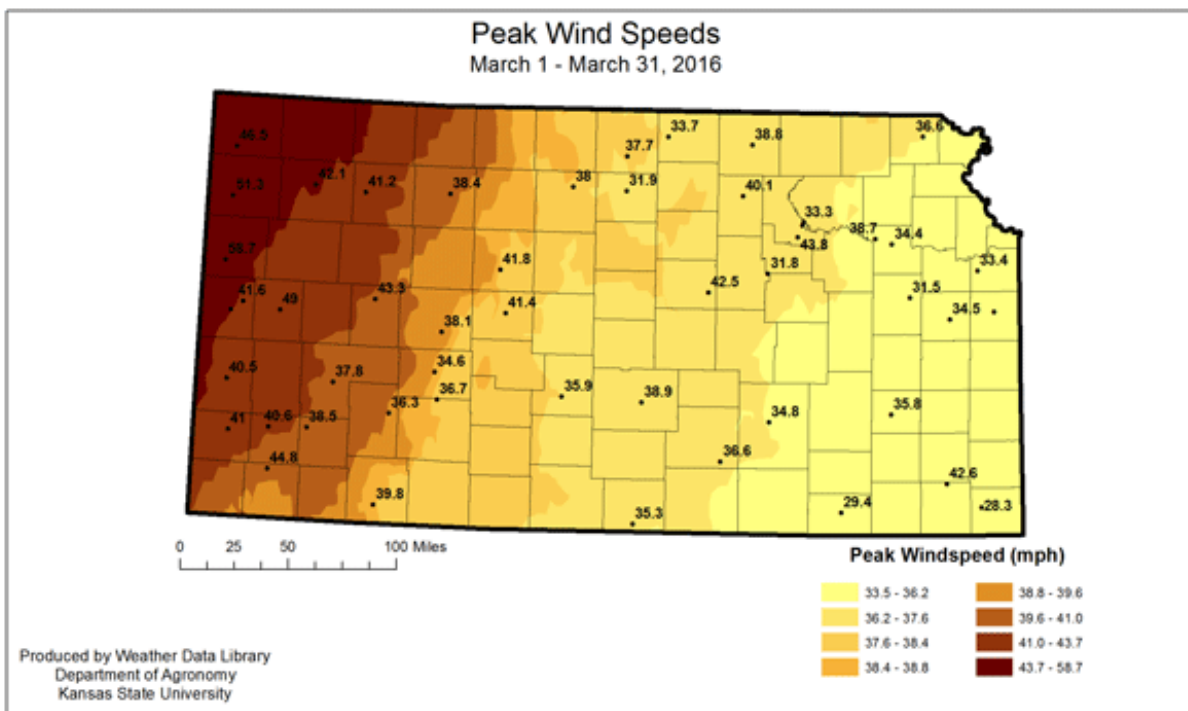
While wind speeds have been only several miles per hour higher than average so far in 2016, that is a significant increase considering the overnight periods, which are typically calm.



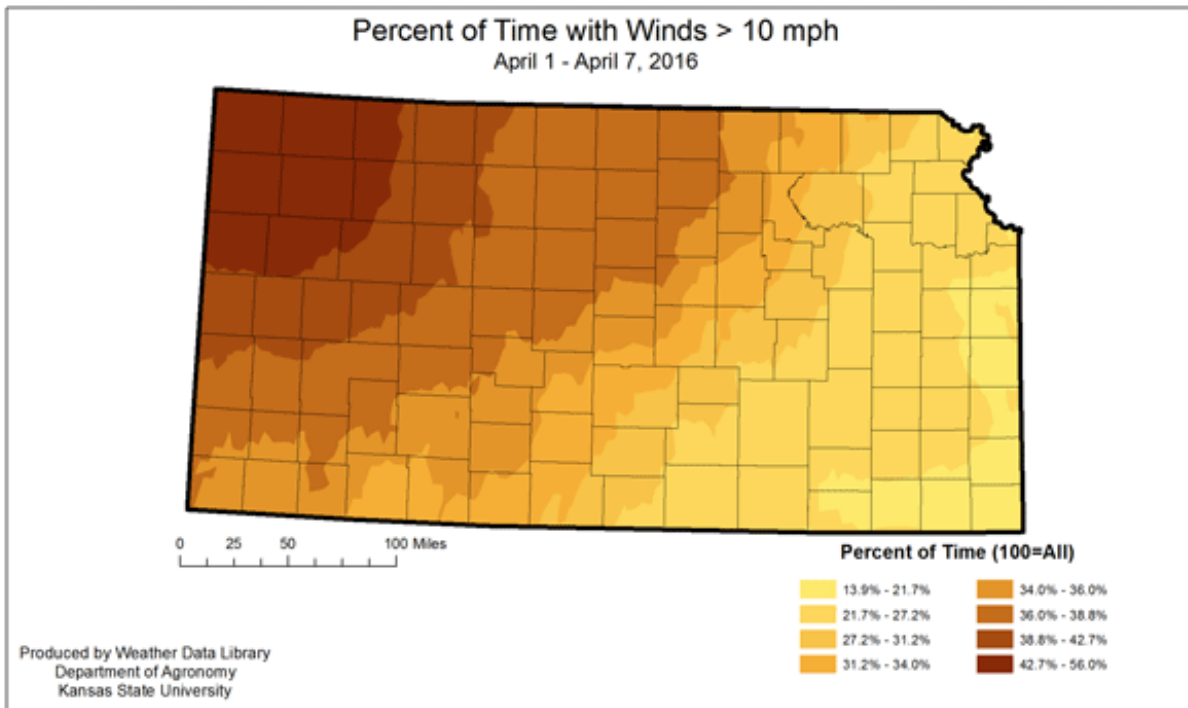
Many overnight periods are not experiencing winds die down, with continued mixing into the mid-levels. This not only brings increased winds, but also prevents relative humidity recovery at night -- critical to impending fire weather the next day. This is creating some "ideal" prescribed burning conditions overnight, but also allowing previous fires to rekindle much easier because moisture doesn't return to the fine fuels at night. With winds continuing overnight, some fires have been able to make significant runs at night whereas typically fires would lay down. Below is a map of the March average daily wind speeds statewide showing persistent winds:



Strong wind gusts were also observed statewide:



April hasn't had any slacking in the wind. Below is the percent of time with winds greater than 10 miles per hour for the first week:



Christopher Redmond, Weather Data Library/Kansas Mesonet
christopherredmond@ksu.edu

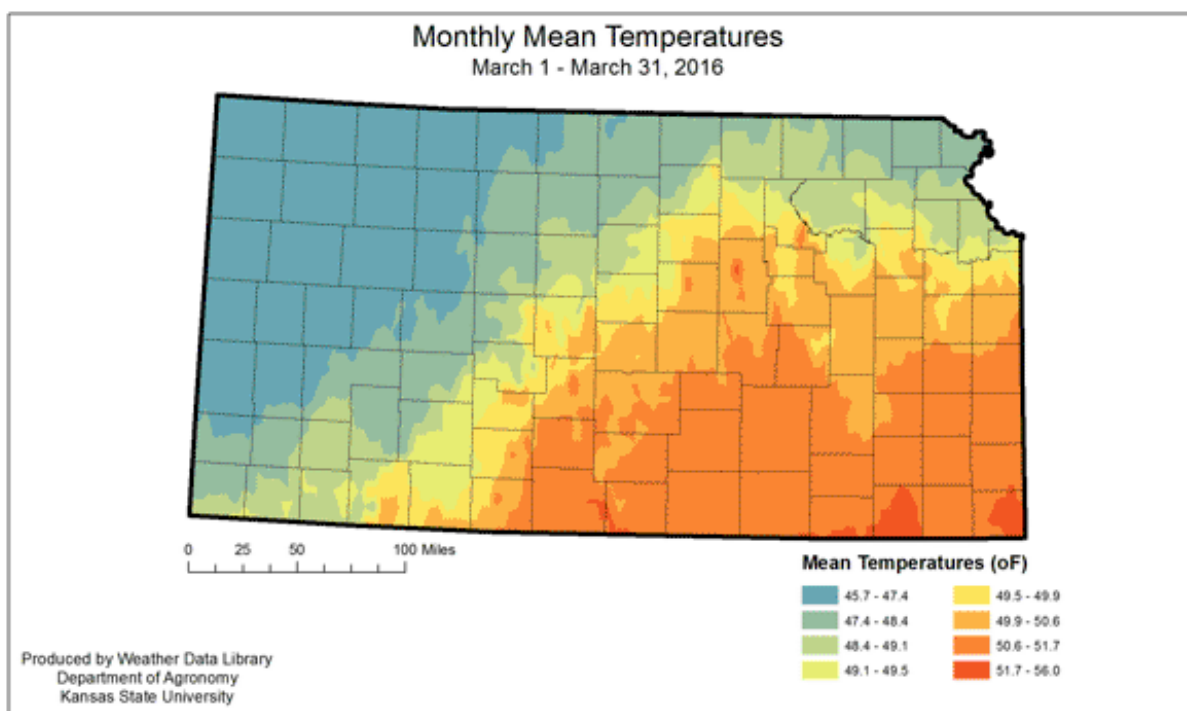
Mary Knapp, Weather Data Library ☒
mknapp@ksu.edu

9. Kansas weather summary for March 2016: Another roller coaster

March started with much warmer-than-normal temperatures, continuing the trend from February.

The statewide average temperature was 48.7 degrees F, which was 5.2 degrees warmer than normal.

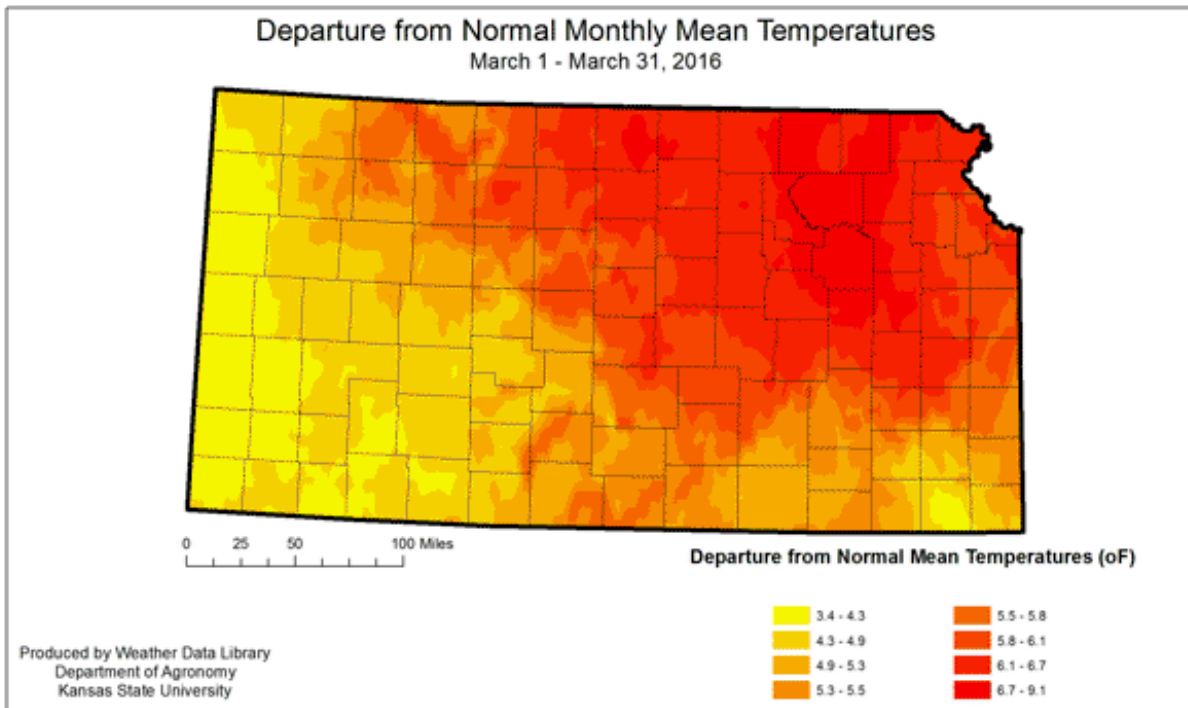
That places this March as the 10th warmest on record. The warmest March occurred in 2012, when the average temperature was 55.5 degrees F. The coldest March recorded was in 1916, when the average temperature was just 30.3 degrees F. The Northeastern Division had the largest departure with a mean temperature of 48.7 degrees F, or 6.0 degrees warmer than average. There were fewer daily record highs than in February, but still 35 new daily records established. In addition to the new record high temperatures, there were 57 new record warm minimum temperatures set. The warmest high temperature was 90 degrees F recorded at Ashland (Clark County) on the 23rd. There was one new record cold high temperature: 39 degrees F set at WaKeeney (Trego County) on the 23rd. The coldest reading for the month was 2 degrees F observed at WaKeeney (Trego County) on the 27th. This illustrates the rapid temperature swings that were prevalent throughout the month. Daily temperature swings of more than 50 degrees were experienced on several occasions. All parts of the state had temperatures below 32 degrees F, prolonging the winter season. These low temperatures after the warm conditions in February and early March brought concerns of damage to vegetation that moved out of dormancy early. This was especially true for winter wheat.



Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

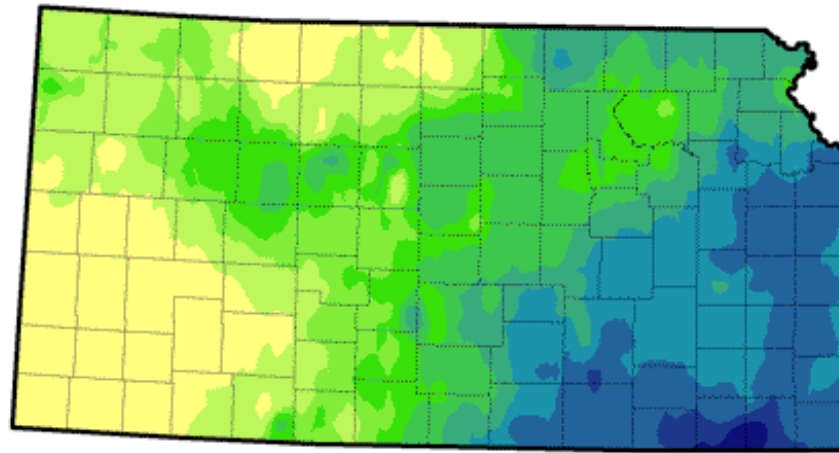
www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron



The overall precipitation pattern for March was drier than normal. The Southeast Division came closest to normal with an average of 1.89 inches or 61 percent of normal. In contrast, the Southwest Division averaged just 0.05 inches, or 3 percent of normal. The Garden City airport reported only a trace of precipitation in the entire month. The statewide average precipitation was 0.77 inches, or 31 percent of normal. This ranks as the 14th driest March on record. Despite the overall dry pattern, a few locations saw significant rain and a small portion of southeast Kansas actually had above-normal precipitation for the month. The greatest monthly total was 4.83 inches at Mound Valley 3WSW, Labette County (NWS). The greatest total for CoCoRaHS stations was 2.87 inches at Wichita 4.5 ENE, Sedgwick County. Twelve locations set new daily precipitation records for March. Not surprisingly, Mound Valley was one of those locations with 2.66 inches of the monthly total reported on the 31st.

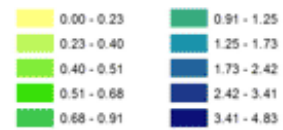
Monthly Precipitation Summary

March 1 - March 31, 2016



0 25 50 100 Miles

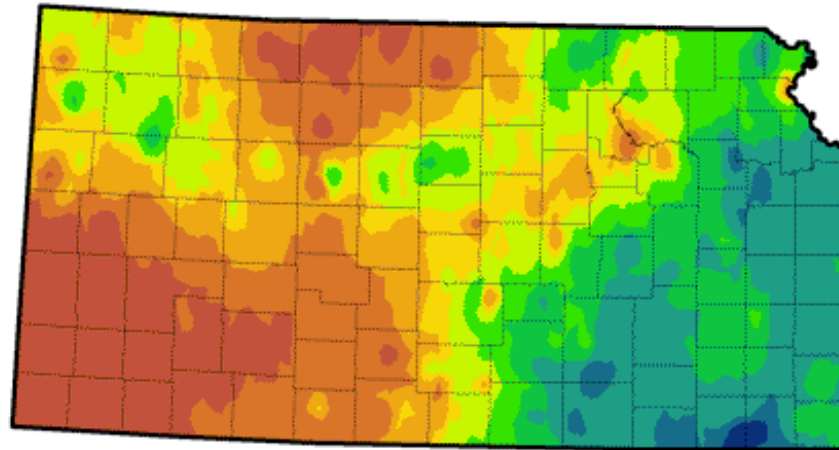
Total Precipitation (Inches)



Produced by Weather Data Library
Department of Agronomy
Kansas State University

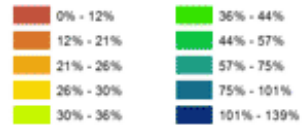
Percent of Normal Monthly Precipitation

March 1 - March 31, 2016



0 25 50 100 Miles

Percent of Normal Precipitation (100=Normal)

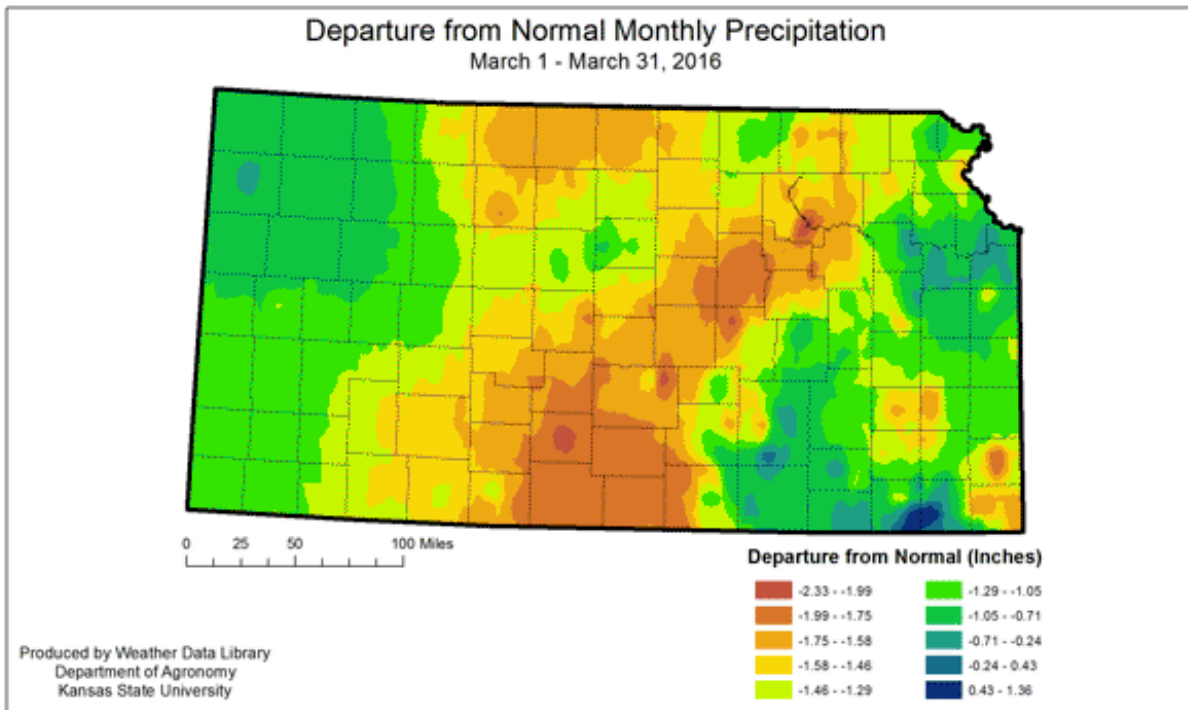


Produced by Weather Data Library
Department of Agronomy
Kansas State University

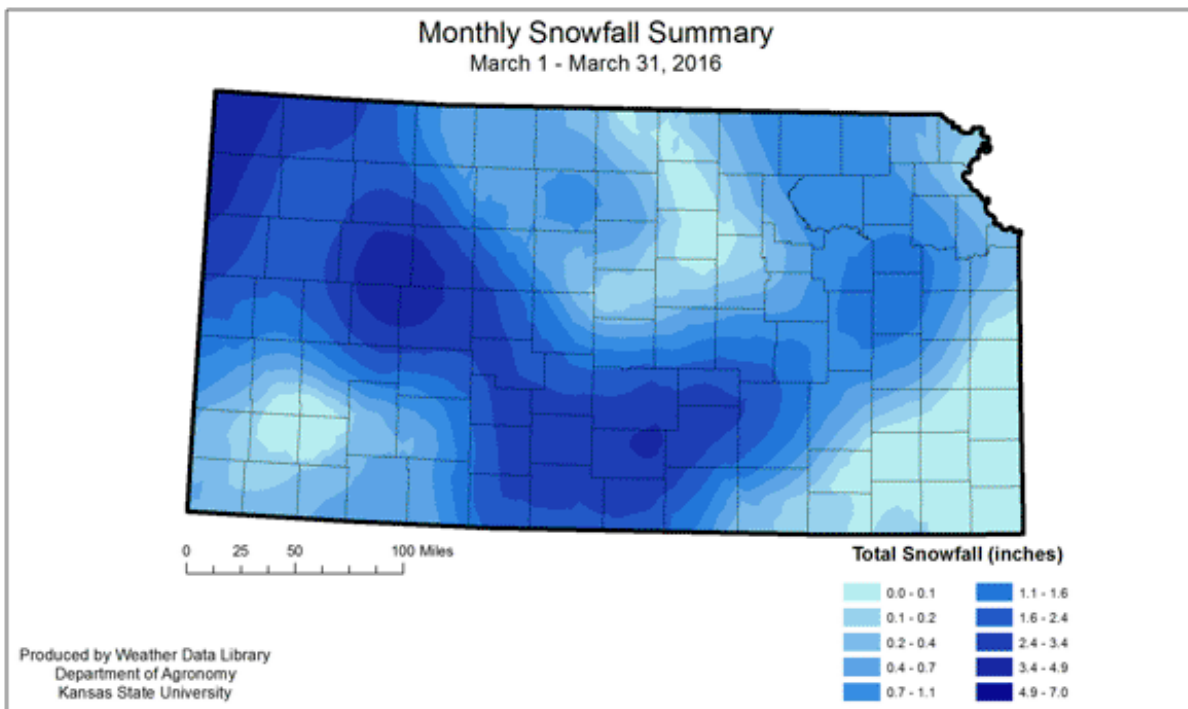
Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron



Despite the warmer-than-normal temperatures, snow was again a feature during the month. The greatest 24-hour total was 6 inches at Kingman on the 27th. Hutchinson 10SW was the station with the greatest monthly total for the state at 7.9 inches.



Severe weather season moved slowly in March. There was 1 tornado reported in Cowley County, as well as 12 hail reports and one severe wind report. The major event was the Anderson Creek fire in south central Kansas. One of the largest wildfire in Kansas history, it started in Oklahoma. Extreme fire weather conditions with winds in excess of 50 mph and humidity levels as low as 15 percent drove the fire into Kansas in Barber and Comanche counties. Almost 400,000 acres were burned before the fire was contained. This was the largest of many wildfires across the state as extreme fire weather conditions were prevalent this month and fuel loads were high due to ample moisture in the fall.

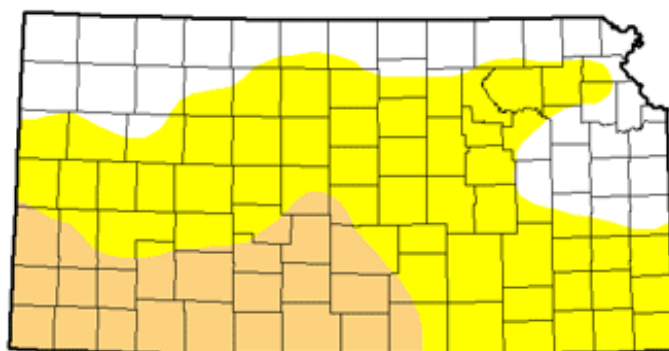
As might be expected with the warmer and drier conditions, there was broad expansion of drier-than-normal conditions, and moderate drought. The moderate drought was mostly seen in the southwest, where active vegetation coupled with warm temperatures, high winds, and low humidity are beginning to have impacts. The disappointing moisture totals, despite the snowy end to the month, are likely to fuel further expansion in drought conditions. Currently, about a quarter of the state is drought-free. Last week that was at more than 40 percent. The precipitation outlook for April is neutral, with equal chances for above- or below-normal precipitation. However, the short-term outlooks are for drier-than-average conditions for the first half of the month. The forecast confidence is low at this time of the year.

U.S. Drought Monitor Kansas

March 29, 2016

(Released Thursday, Mar. 31, 2016)

Valid 8 a.m. EDT



Drought Conditions (Percent Area)

| | None | D0 | D1 | D2 | D3 | D4 |
|---|-------|-------|-------|-------|------|------|
| Current | 25.99 | 51.81 | 22.20 | 0.00 | 0.00 | 0.00 |
| Last Week 3/22/2016 | 43.24 | 49.51 | 7.25 | 0.00 | 0.00 | 0.00 |
| 3 Months Ago 12/29/2015 | 97.84 | 2.16 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start of Calendar Year 1/2/2016 | 97.84 | 2.16 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start of Water Year 9/29/2015 | 80.79 | 14.72 | 4.48 | 0.00 | 0.00 | 0.00 |
| One Year Ago 3/01/2015 | 6.52 | 24.78 | 45.25 | 20.57 | 1.88 | 0.00 |

Intensity:

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Brad Rippey
U.S. Department of Agriculture

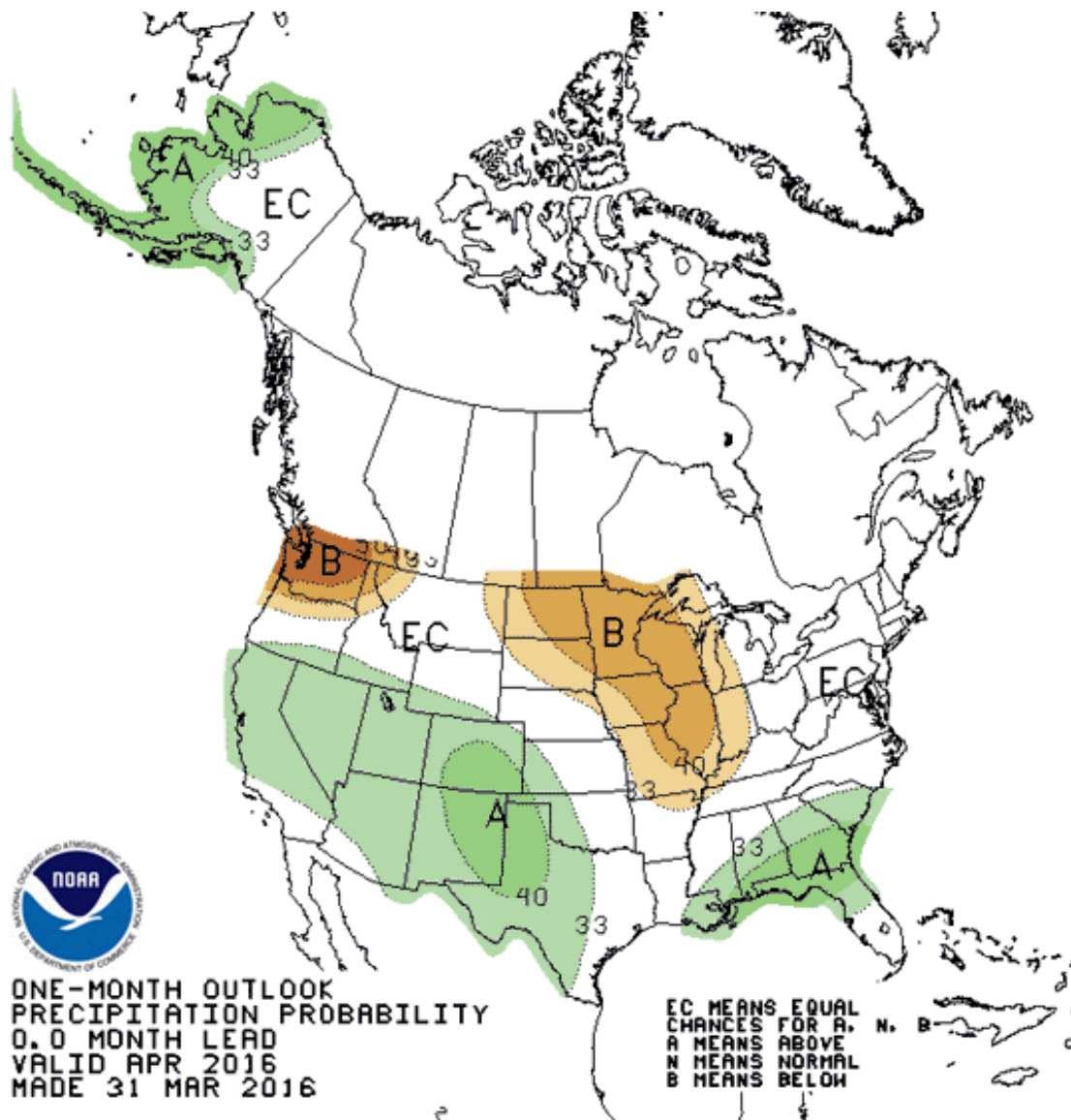


<http://droughtmonitor.unl.edu/>

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron



March 2016

Kansas Climate Division Summary

| | Precipitation (inches) | | | Temperature (°F) | | | | | | |
|---------------------|------------------------|-------------------|----------|------------------------|-------------------|----------|------------------|-------------------|-----|-----|
| | March 2016 | | | 2016 Jan through March | | | Monthly Extremes | | | |
| | Division Total | Dep. ¹ | % Normal | Total | Dep. ¹ | % Normal | Ave | Dep. ¹ | Max | Min |
| Northwest | 0.29 | -1.05 | 23 | 1.38 | -0.97 | 60 | 45.5 | 5.0 | 86 | 6 |
| West Central | 0.42 | -1.01 | 28 | 1.32 | -1.23 | 49 | 46.3 | 4.4 | 87 | 2 |
| Southwest | 0.05 | -1.34 | 3 | 0.36 | -2.07 | 14 | 48.8 | 4.4 | 90 | 8 |

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

| | | | | | | | | | | |
|----------------------|------|-------|----|------|-------|----|------|-----|----|----|
| North Central | 0.44 | -1.62 | 20 | 1.81 | -1.74 | 50 | 48.2 | 5.7 | 82 | 18 |
| Central | 0.63 | -1.66 | 27 | 1.97 | -2.07 | 49 | 49.7 | 5.6 | 87 | 17 |
| South Central | 0.97 | -1.68 | 35 | 1.67 | -3.04 | 34 | 51.4 | 5.6 | 88 | 15 |
| Northeast | 0.99 | -1.34 | 42 | 2.26 | -2.04 | 52 | 48.7 | 6.0 | 82 | 16 |
| East Central | 1.26 | -1.43 | 46 | 2.42 | -2.61 | 47 | 49.6 | 5.5 | 82 | 19 |
| Southeast | 1.89 | -1.17 | 61 | 2.95 | -3.16 | 48 | 50.5 | 4.4 | 81 | 20 |
| STATE | 0.77 | -1.38 | 31 | 1.76 | -2.17 | 42 | 48.7 | 5.2 | 90 | 2 |

1. Departure from 1981-2010 normal value
2. State Highest temperature: 90 oF at Ashland (Clark County) on the 23rd.
3. State Lowest temperature: 2 oF at WaKeeney (Trego County) on the 27th.
4. Greatest 24hr rainfall: 4.83 inches at Mound Valley 3WSW, Labette County (NWS); 2.10 inches at Arkansas City 6.9 E, Cowley County, on the 10th (CoCoRaHS).

Source: KSU Weather Data Library

Mary Knapp, Weather Data Library
mknapp@ksu.edu

10. Comparative Vegetation Condition Report: March 29 - April 4

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.

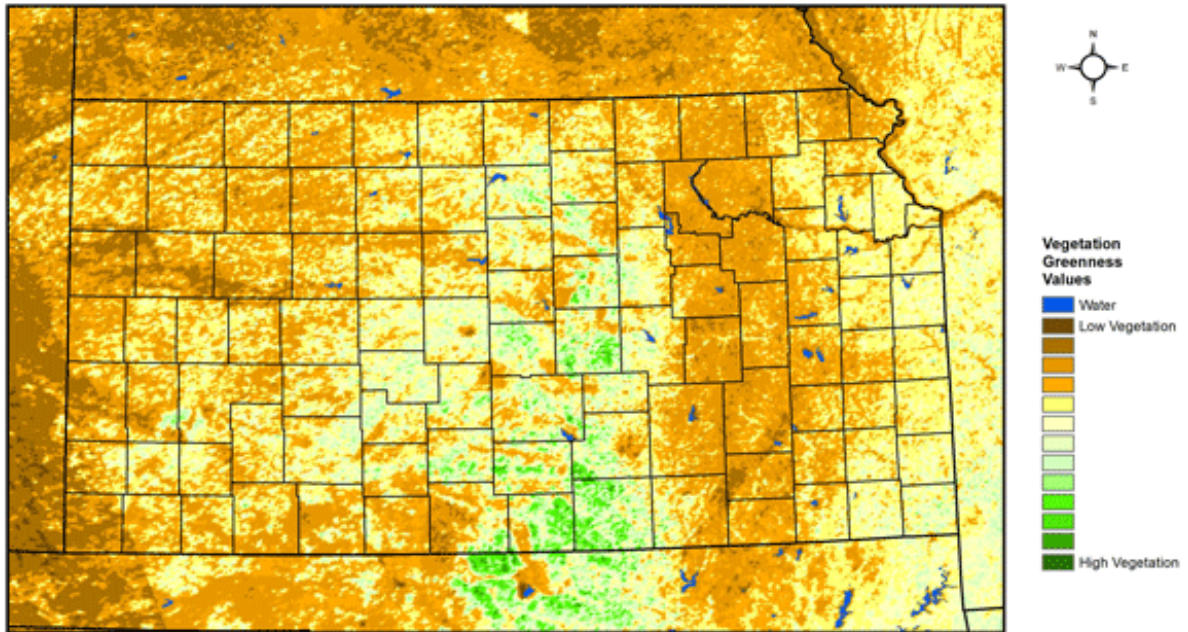
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new 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 14: 03/29/2016 - 04/04/2016



0 25 50 100 150 200 Miles

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



Figure 1. The Vegetation Condition Report for Kansas for March 29 – April 4 from K-State’s Precision Agriculture Laboratory shows slightly more expansion of the area of highest plant production. The highest NDVI values are still in Sumner and Harper counties. There is still little sign of green up in the Flint Hills.

Kansas Vegetation Condition Comparison
Late-Mar/Early-Apr 2016 compared to the Late-Mar/Early-Apr 2015

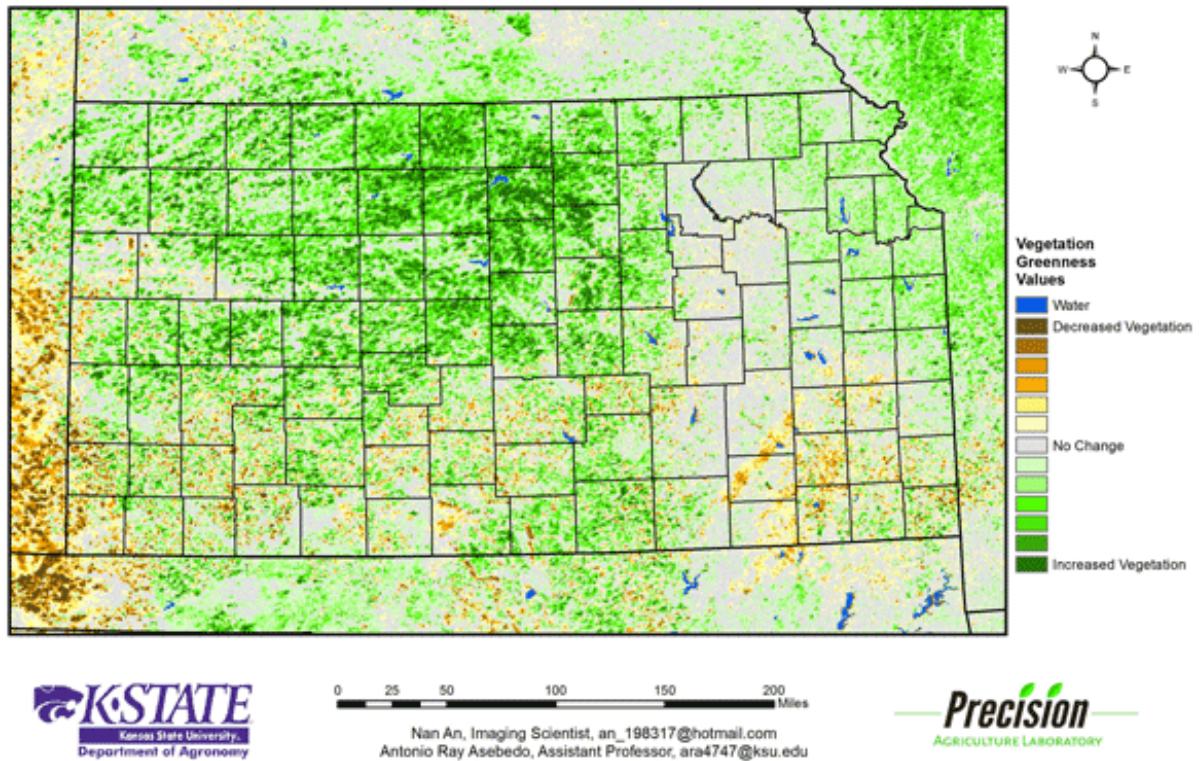


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for March 29 - April 4 from K-State's Precision Agriculture Laboratory shows much higher photosynthetic activity continues in the western two-thirds of the state. More areas of decreased vegetative activity are becoming visible in the southern parts of the state. Lack of moisture as vegetation emerges from dormancy is creating stress.

Kansas Vegetation Condition Comparison

Late-Mar/Early-Apr 2016 compared to the 27-Year Average for Late-Mar/Early-Apr

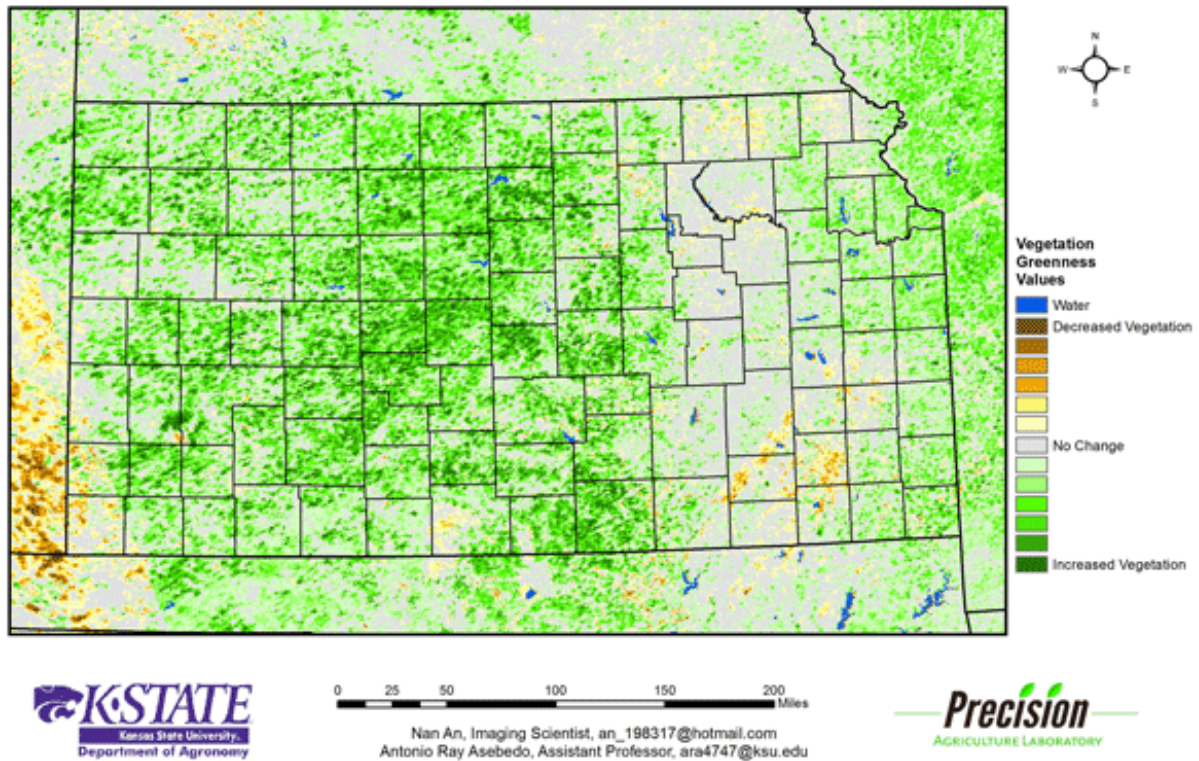


Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for March 29 – April 4 from K-State's Precision Agriculture Laboratory shows that the area of above-average photosynthetic activity covers much of the state. The largest areas with the greatest increase are in central and south central Kansas. Even with the recent cool weather, temperatures continue above normal across the state. An exception to the generally above-average photosynthetic activity can be seen in western Barber County. Lack of precipitation has slowed the plant recovery from the fire in that area.

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

Continental U.S. Vegetation Condition

Period 14: 03/29/2016 - 04/04/2016

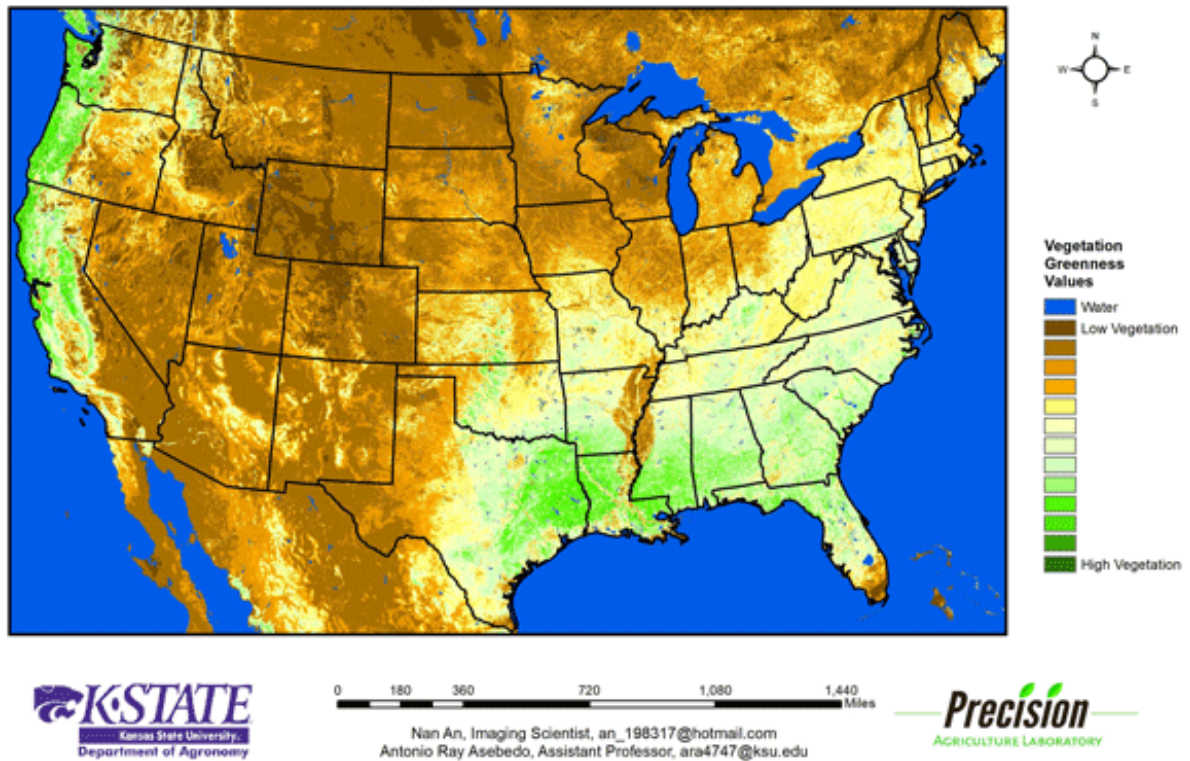


Figure 4. The Vegetation Condition Report for the U.S for March 29 – April 4 from K-State’s Precision Agriculture Laboratory shows high NDVI values in much of the West Coast and along the Gulf Coast. Favorable moisture has resulted in active photosynthesis. A pocket of lower photosynthetic activity can be seen in the middle Mississippi Valley region, where the impact from winter floods is still being felt.

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

Continental U.S. Vegetation Condition Comparison
Late-Mar/Early-Apr 2016 Compared to Late-Mar/Early-Apr 2015

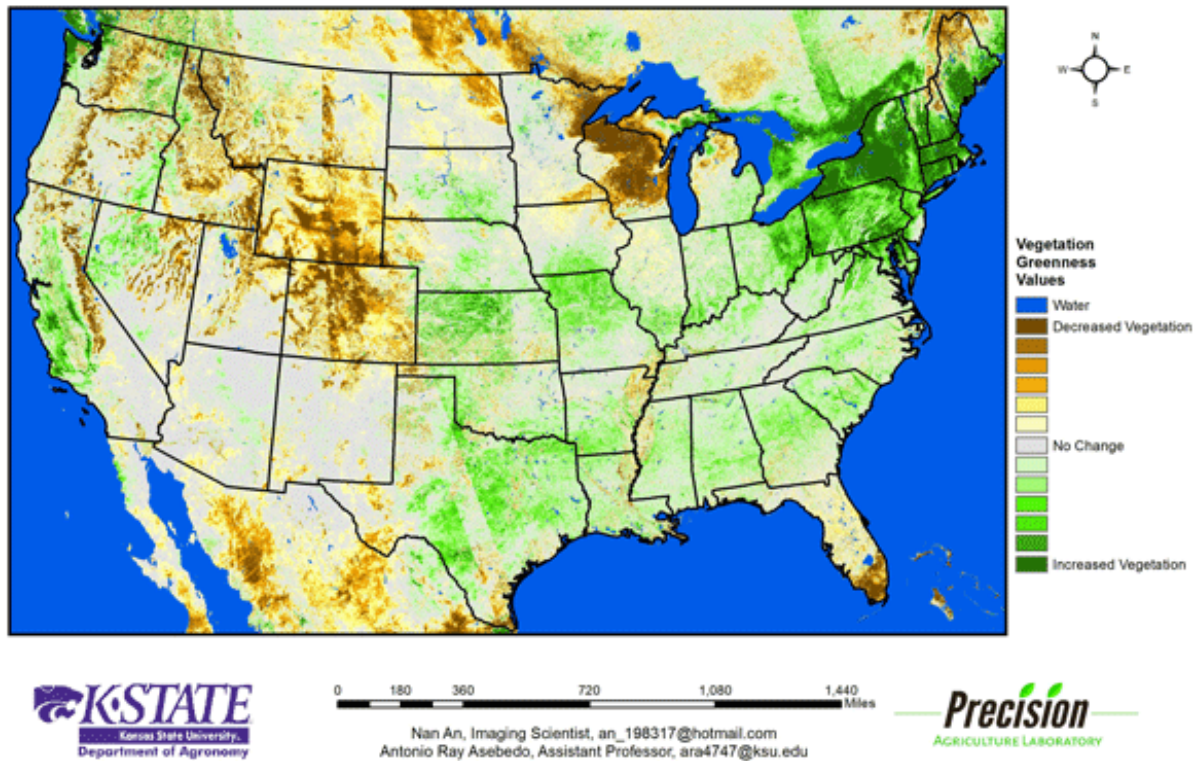


Figure 5. The U.S. comparison to last year at this time for the period March 29 – April 4 from K-State’s Precision Agriculture Laboratory shows that lower NDVI values are most evident in Wyoming and Colorado due to late-season snowfall this year. In contrast, much higher NDVI values are visible from the Great Lakes to New England. Despite the recent snows in that area, the overall snow depth is less than last year, and more vegetation is active.

Continental U.S. Vegetation Condition Comparison
Late-Mar/Early-Apr 2016 Compared to 27-year Average for Late-Mar/Early-Apr

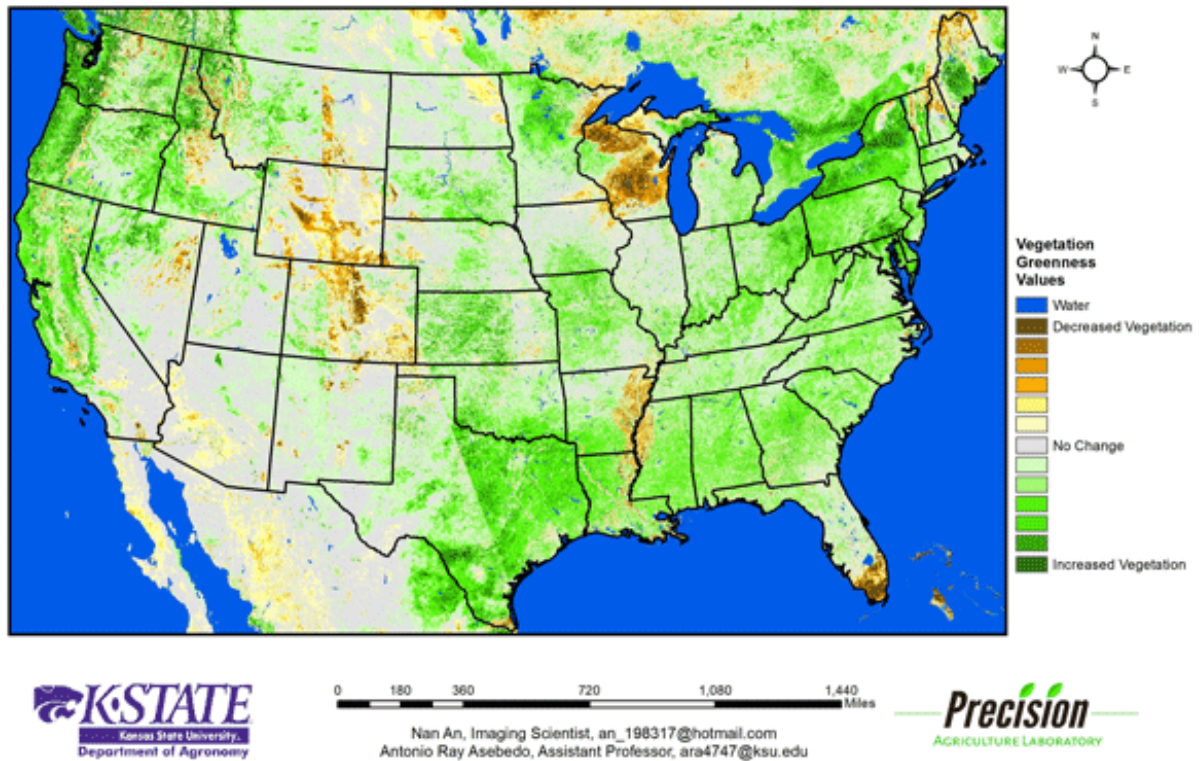


Figure 6. The U.S. comparison to the 27-year average for the period March 29 – April 4 from K-State’s Precision Agriculture Laboratory shows continued above-average photosynthetic across the Plains. Snow pack from the late season storms in Colorado and Wyoming have resulted in below-average activity in these areas, which isn’t much concern at this time.

Mary Knapp, Weather Data Library
mknapp@ksu.edu

Ray Asebedo, Precision Agriculture
ara4747@ksu.edu

Nan An, Imaging Scientist
an_198317@hotmail.com