Issue 608

K-STATE Research and Extension

Extension Agronomy

eUpdate

01/20/2017

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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eUpdate Table of Contents | 01/20/2017 | Issue 608

1. Effect of the recent winter storm on the Kansas wheat and alfalfa crops

The week of January 10 – 16 brought to the Kansas wheat crop some much needed moisture, which was accompanied by a considerable amount of ice -- especially in the southwest portion of the state. Precipitation totals ranged from about 0.25 inch in far northwest Kansas, to just over 3 inches throughout the southern two tiers of counties (Fig. 1). The majority of the state received more than 0.5 inches of precipitation.

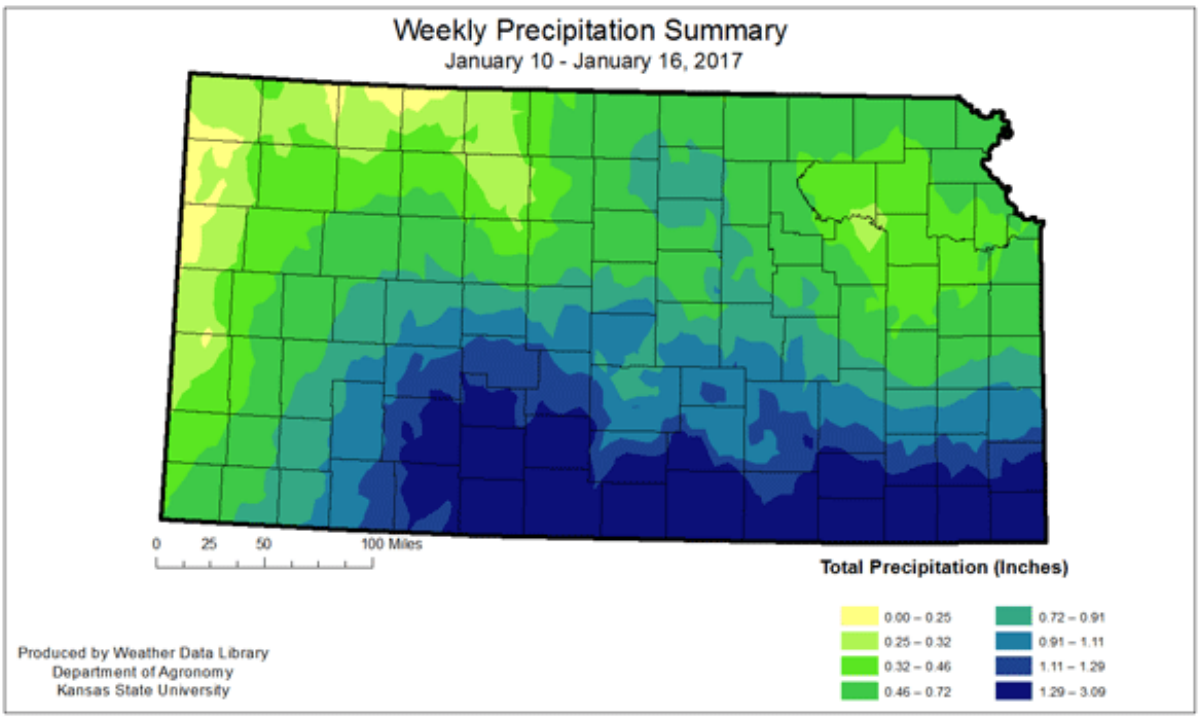

Figure 1. Cumulative precipitation for the period encompassing Jan. 10 – 16, 2017.

In addition to this precipitation, the western fifth of the state also got as much as 2.3 inches of snow (Fig. 2). This protects the crop from extreme cold temperatures, although it may not bring much moisture to the wheat crop. Usually, one foot of snowfall brings about 1 inch of moisture; thus, 2 inches might bring approximately 0.15" moisture if the snow persists in the field.

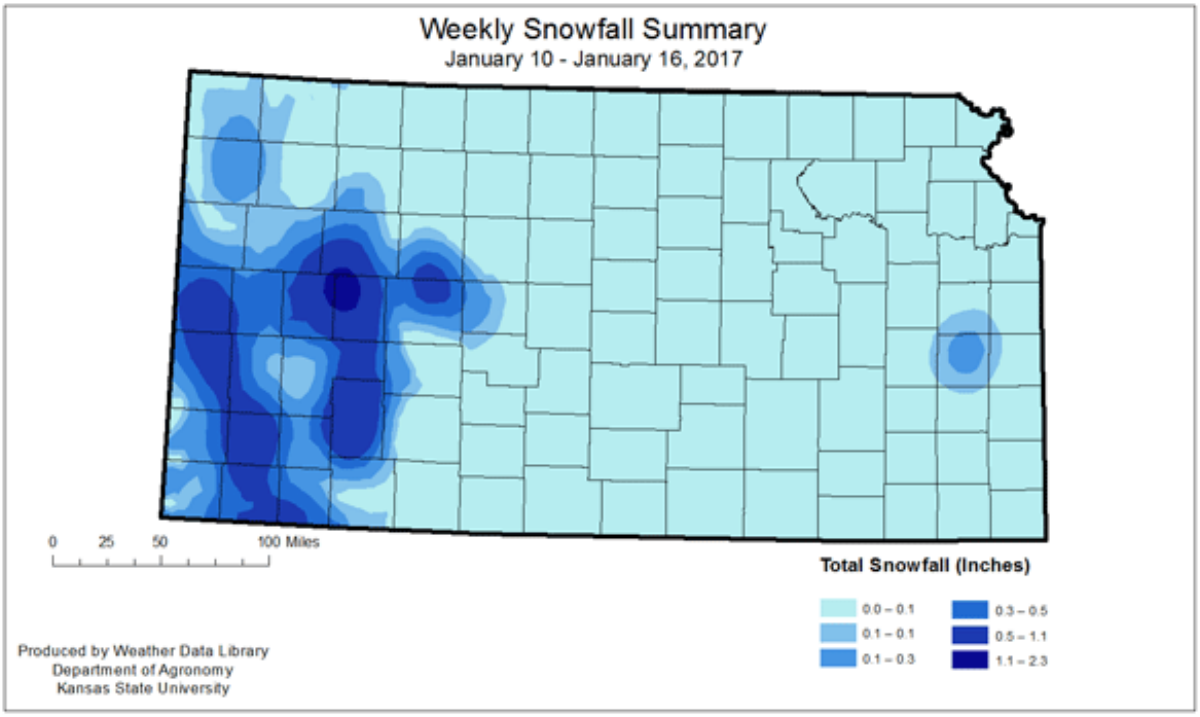

Figure 2. Cumulative snowfall for the period between Jan. 10 – 16, 2017.

These storms were accompanied by relatively mild temperatures throughout the state. In fact, the southern half of Kansas had mean temperatures above 32 degrees F for the Jan. 10 - 16 period, which is about 2 to 7 degrees F or more higher than the historical mean temperatures for the period (Fig. 3). The exception to this rule was in the north, and specifically the northwest section of the state, where temperatures ranged from 27.8 to 30.3 degrees F and were below average by about 2 degrees F.

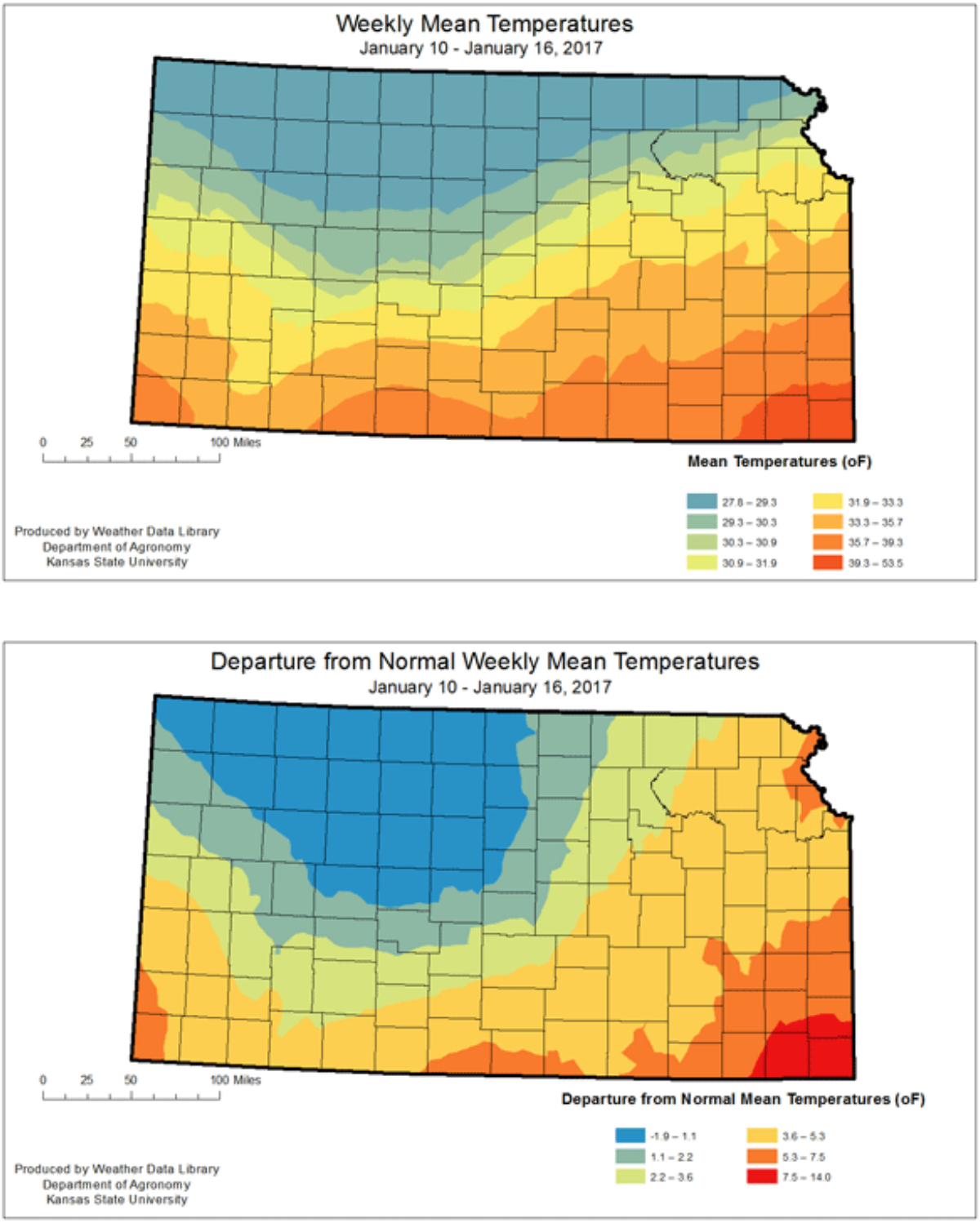

Figure 3. Mean temperature observed between January 10 – 16, 2017 (upper panel) and the departure from the long-term mean for the same period (lower panel).

Ice formation

Ice storms occur when freezing rain falls for a long period of time, accumulating on roads, trees, and over the winter wheat crop. Most of the ice formation from the recent winter storm seems to have taken place in the southwest portion of Kansas. Central and eastern Kansas received precipitation mostly as rainfall.

Possible consequences to the wheat and alfalfa crops

With exception of the north central portion of Kansas, the majority of the wheat growing region of the state was under some level of drought conditions as of January 10, ranging from abnormally dry in the central and south central portions of the state to severe drought in the far southwest counties (Fig. 4).

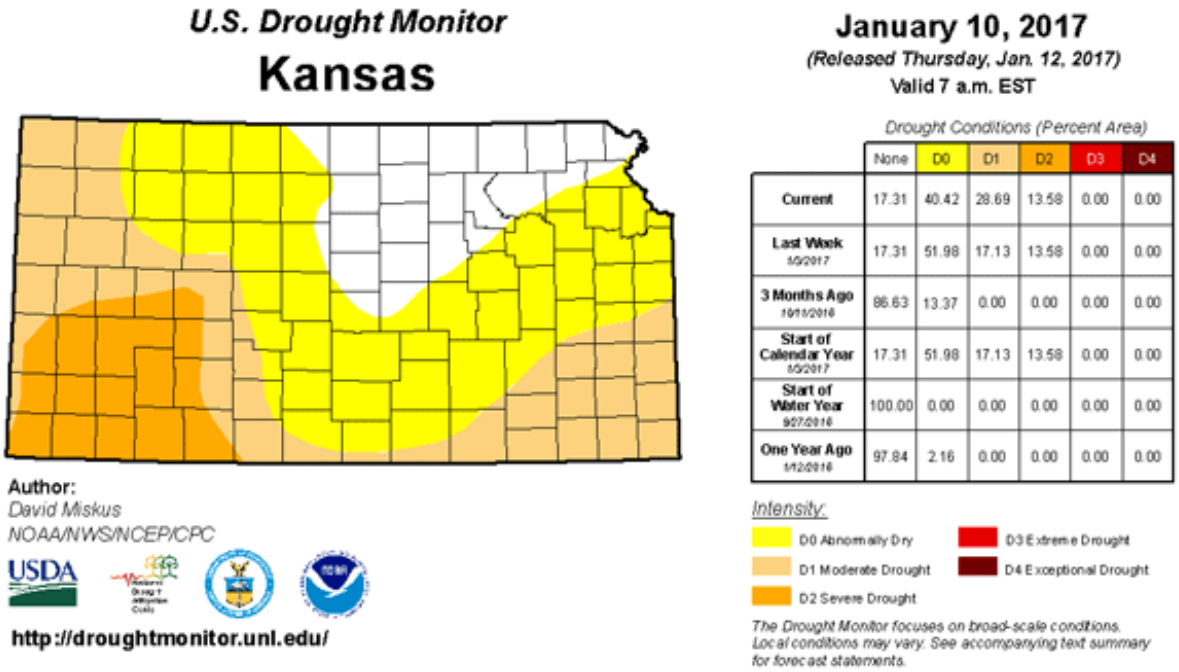

Figure 4. Drought indices for the state of Kansas for January 10, retrieved from droughtmonitor.unl.edu.

The possible consequences of the recent winter storm to the wheat and alfalfa crops will depend on drought and crop conditions experienced prior to the storm, total precipitation received, and whether this precipitation resulted in ice formation. Significant improvement in soil moisture occurred in the eastern parts of the state, but only moderate improvements occurred in the west, where precipitation was generally lighter and the drought more severe (Fig. 5).

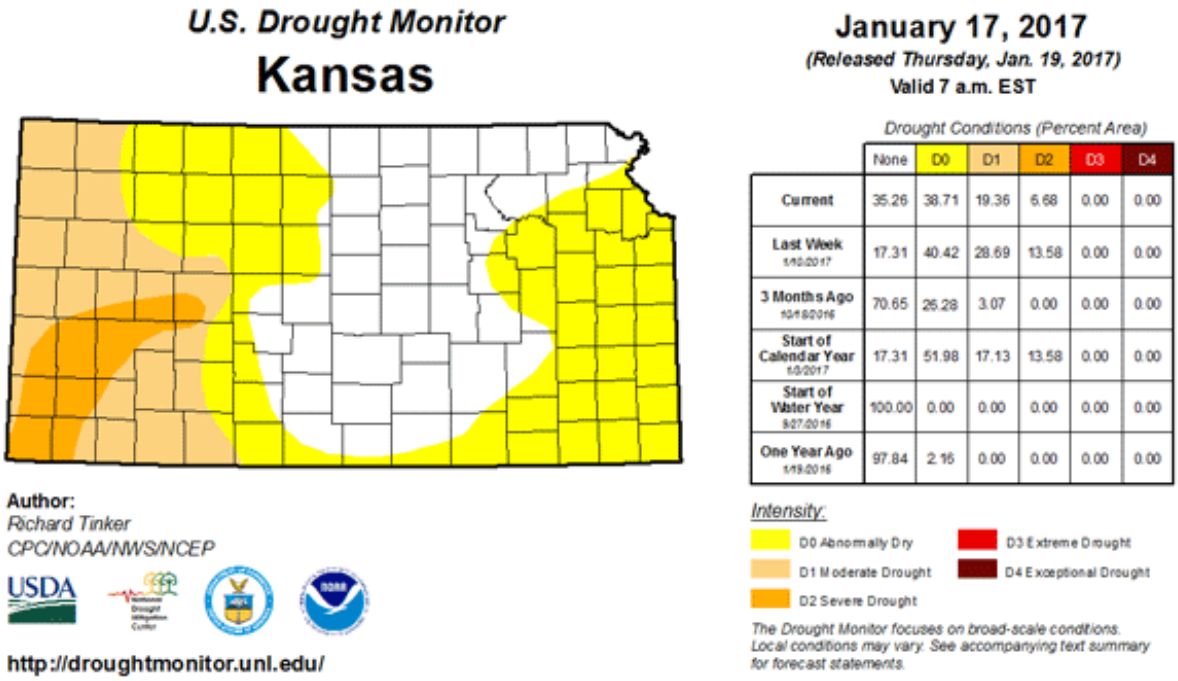

Figure 5. Drought indices for the state of Kansas for January 16, retrieved from droughtmonitor.unl.edu.

For most of central and southern Kansas, the storm brought some much-needed moisture to both alfalfa and wheat crops. The combination of little to no ice formation and as much as three inches of precipitation means this storm should overall be a benefit to wheat in the state, and more than meet the water needs of winter wheat through the winter. In fact, winter wheat consumes very little water during the winter, with average consumption of less than 0.1 inch per week (Fig. 6). Thus, the range in precipitation received in most of Kansas, which varied from 0.5 to 3 inches, should be very beneficial for the crop, most of which was under some degree of drought stress. Wheat in regions of the state that received about 3 inches or more of precipitation should even have enough soil water now to meet the needs of wheat for a portion of the spring, perhaps up to stem elongation, when winter wheat water needs increase.

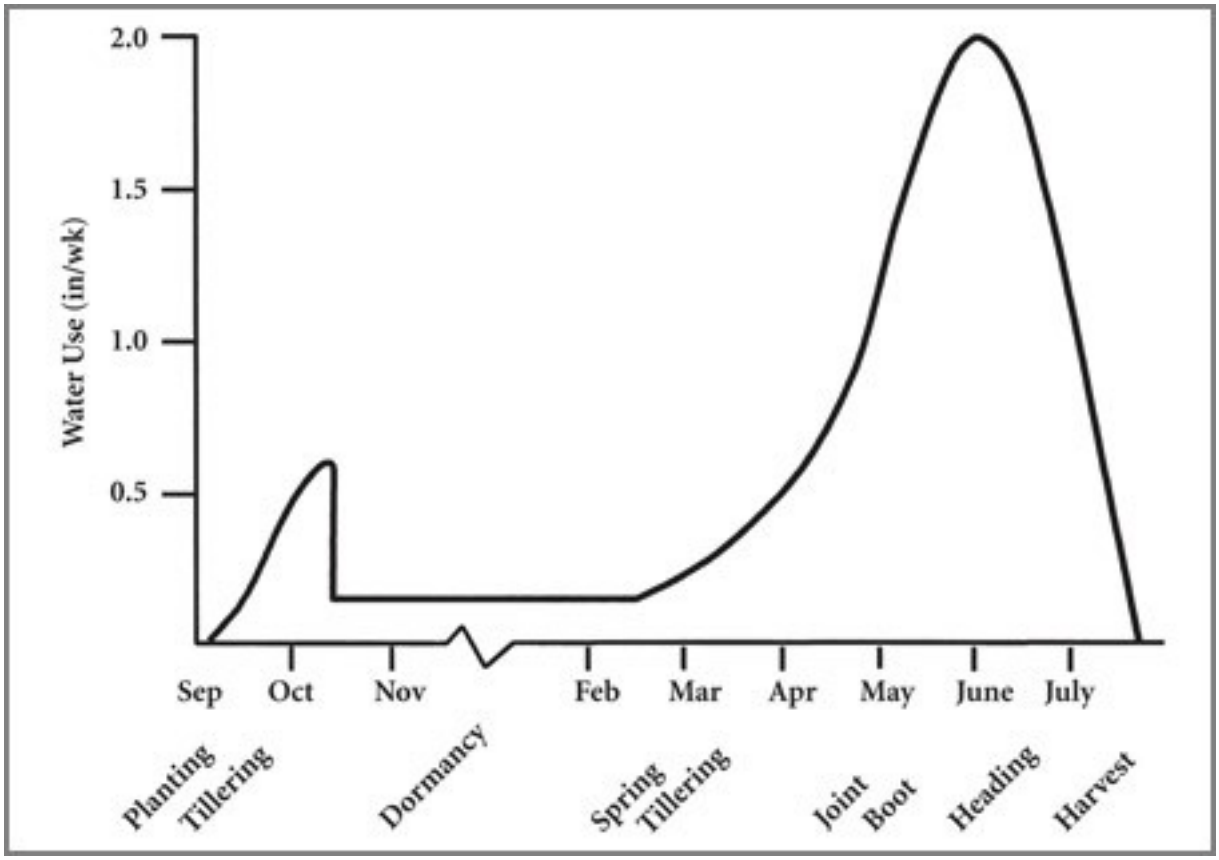

Figure 6. Winter wheat weekly water use. Source: Univ. of Nebraska EC731.

In far southwest Kansas, a few different scenarios may take place. In this portion of the state, many wheat fields have not yet emerged or have very scattered emergence at this point, due to the drought conditions experienced throughout the fall. Under these circumstances, precipitation -- either as rainfall or ice -- could possibly benefit the crop, and be sufficient for enabling the crop to emerge.

Previous studies have shown that for a wheat crop sown about one inch deep or less, approximately 0.4 inch of precipitation should suffice for even emergence and a good stand to be established. Thus, the precipitation received in southwest Kansas should be enough to help wheat that has not yet emerged to make it out of the ground as a spring-emerged crop, provided the seed is still viable. Ungerminated seed might not be viable where it started to germinate and then stopped for lack of moisture, or where there has been insect or disease damage, or wildlife feeding. It is important to keep in mind that spring-emerged winter wheat has considerably less yield potential than a fall-emerged crop, and producers will have to decide whether maintaining the crop is a viable option.

Possible ice damage to the wheat and alfalfa crops?

Most likely, there will not be any damage to the wheat or alfalfa crops from ice. For an established wheat crop or alfalfa stand to suffer damage from ice, previous research has shown that a minimum 10 to 40 days of ice surrounding the leaves is necessary. Ice generally damages plants by sealing leaves, stems, and buds, from the surrounding air, creating an anaerobic environment. When ice

surrounds the crown of wheat or alfalfa for long periods of time, it allows toxic metabolites resulting from this anaerobic environment (ethanol and carbon dioxide) to build up, preventing the natural gas exchange that occurs during respiration. In other words, it "suffocates" the plants. Still, for suffocation to occur, a long period of ice-covered leaf surface is needed; thus, the crops around Kansas should not suffer from ice damage from last week's storm.

What to look for

We should not expect widespread cold damage from the recent winter storm, but a few extreme drops in temperature with very little snow cover happened during that fall, which might result in some localized cold damage. It will not be possible to fully know whether winter cold has caused damage to the wheat or alfalfa crops approximately until spring greenup, when the crops are breaking winter dormancy. At that point, it is extremely important to go out and check the fields, preferably sampling some whole plants, before investing any more money in the crop.

For wheat, producers should pull plants out of the ground, pull the leaves back to expose the crown and stems, and check for color. Brown color with shriveled, mushy stems indicate damage and possibly winterkill (Fig. 6). If wheat plants have white stems and a healthy-looking crown area, even a slight amount of injury should not be of major concern. Producers should check to determine plant survival, and set a target of anywhere from 20 to 30 healthy plants per square foot, depending on location within the state (20 plants for the western portion of the state, 30 plants for central and eastern portions). If the final healthy wheat stand is less than 20 to 30 plants per square foot (with approximately 50% of the target stand being a threshold for maintaining or terminating the crop), producers can try to compensate with additional N to enhance spring tillering. If stands are less than about 10 plants per square foot in western Kansas, and 15 plants per square foot in central and eastern Kansas, producers could consider terminating the crop and planting a spring crop as an alternative.

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Figure 6. Comparison between a winter wheat plant that suffered winter injury, characterized by brown crown and shriveled stems (left panel) and a plant that shows only minor symptoms of cold damage (brown leaves) but overall has white and healthy stems (right panel). Photos by Sandra Wick, K-State Research and Extension.

For alfalfa, the procedure should be similar. Producers should use a spade to cut into the taproot and crown, and check whether the color is a healthy whitish-beige, or a darker brown, which would be an indicative of a cold-damaged crown. Additionally, producers should look for newly appeared green crown buds at ground level. A good goal to shoot for is approximately 30 vigorous stems per square foot. If poorer stands are found, producers can consider a soil test to determine whether added nutrients are needed. Another option is to delay the first harvest to beyond the late bud stage, which would decrease the quality of the first cut but result in more reserves for regrowth, most likely improving persistence of the stand.

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2. Summary of diseases on 2016 corn, grain sorghum, and soybeans in Kansas

Corn diseases

Significant rainfall amounts across most of the state alleviated drought conditions in 2016, but at the same time, the precipitation provided ideal conditions for many foliar diseases. Gray leaf spot, while not present at the record levels seen in 2015, was still higher than the long term average.

Unfortunately, because of low commodity prices, many producers chose not to apply a fungicide and this was a significant mistake where more susceptible hybrids were being grown. Yield losses could easily be more than 15 percent.

Figure 1. Gray leaf spot on V7 corn in Harvey County, mid-June 2016. Photo by Doug Jardine, K-State Research and Extension.

For the second consecutive year, southern corn rust made its first appearance in mid-June rather than the historical time period of late July to early August. The disease quickly spread across the entire state and certainly resulted in yield losses of 10 percent or more where corn was planted later

and fungicides were not applied.

Goss's bacterial blight was present at near normal levels, with most of the reports coming from the western half of the state. A new bacterial disease, commonly referred to as corn bacterial leaf streak, was identified for the first time in Kansas. This disease has been present in Nebraska since at least 2014, and may have been in Kansas since at least last year, but 2016 was the first year that the causal bacterium, *Xanthomonas vasicola* pv *vasculorum* (Xvv) was positively identified as the cause. By year end, Xvv was officially diagnosed in 16 Kansas counties, most of which are in the western third of the state. The disease is most common and severe in fields that are in a continuous corn, no-till production system with overhead irrigation. At this time, it is not clear if this disease is associated with any yield loss.

Rainy weather at silking time also resulted in a record epidemic of Diplodia ear rot. This disease can cause entire ears to become moldy, shrinking and discoloring kernels. The disease can also penetrate the cob, causing "cob rot," which ultimately leads to large amounts of foreign material in the grain from infected fields and results in significant dockages at the point of sale.

Aspergillus ear rot, the cause of aflatoxin problems was present on a very localized basis. The most severe problem area was in southern Harper and Barber counties and into Oklahoma. While a few samples tested more than 1,000 ppm, most samples were well below the 20 ppm safe level established by the Food and Drug Administration.

Lastly, Fusarium, anthracnose and Diplodia stalk rots were present to varying degrees across a large part of the state. Stalk rots led to premature death of infected plants with the result being reduced yields from smaller ears and the additional threat of losses from lodging.

Grain sorghum diseases

Disease levels in grain sorghum varied with the location in the state. The highest levels of disease were reported from south central Kansas, where frequent rainfall events throughout the summer caused significant levels of the foliar disease sooty stripe. Sooty stripe is a splash-dispersed disease. Levels on susceptible hybrids were the highest seen since the late 1990's from the Wichita area southward. This disease is capable of producing yield losses up to 35 percent on susceptible hybrids. The other significant problem in sorghum in 2016 was the development of sooty mold in fields where high sugarcane aphid populations were present. Sooty mold, while not a true pathogen, forms on the upper surface of leaves that have large amounts of aphid honeydew on them. The black mold does not penetrate the leaf, but effectively blocks sunlight from reaching the leaf and thereby reduces yields due to reduced photosynthesis.

Sorghum rust, an occasional problem in Kansas, was present at higher-than-normal levels in 2016, again due to frequent rains. Most fields were mature enough for it not to be an issue, but some later-planted fields may have suffered some yield loss.

Fusarium stalk rot was also present, but appeared to be at normal levels compared to 2015, when levels were much above normal in some parts of the state.

Lastly, for the first time in several years, sorghum ergot was reported in the state in both Jewell and Republic counties. In both instances, late-planted forage sorghum was the host. While the disease causes some yield reduction on its own, the biggest threat is harvest delays associated with having to

clean off the sticky sap produced by the fungus from harvesting and other crop handling equipment. This disease does not overwinter in Kansas, and hopefully its presence will continue to be just isolated incidences.

Soybean diseases

Heavy rains early in early July resulted in numerous cases of Rhizoctonia root rot and Phytophthora root rot, especially in east central and south central Kansas. Even with all the rain, there were numerous cases of charcoal rot reported later in the season. Sudden death syndrome was common in late August and September in parts of east central and southeast Kansas. Levels of frogeye leafspot were well above normal across large portions of northeast and north central Kansas. Numerous fields reached levels where a fungicide application would have been practical.

Good growing conditions hid damage from soybean cyst nematode. Numerous samples with nematode counts in the moderate to high range were received in the Plant Disease Diagnostic Clinic. Research indicates that many of the current "SCN resistant" varieties are losing their effectiveness and yield loss is much greater than what growers realize.

Late in the season, many mature fields had plants that were still green. Samples of these plants usually tested positive for tobacco streak virus, a reemerging problem in the western soybean belt. Fortunately, there are usually only a handful of affected plants in any given field and yield loss is negligible.

Doug Jardine, Extension Plant Pathology
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3. K-State Soybean Schools scheduled for late January 2017

A series of three K-State Soybean Production Schools will be offered in late January 2017 to provide in-depth training targeted for soybean producers and key stakeholders. The schools will be held at three locations around the state.

The one-day schools will cover a number of issues facing soybean growers: weed control strategies; production practices; nutrient fertility; and insect and disease management.

The dates and locations of the K-State Soybean Production Schools are:

Jan. 24th – Parsons, 25092 Ness Road
Contact information:
Josh Coltrain, Wildcat Extension District, jcoltrain@ksu.edu, 620-724-8233
Jeri Geren, Wildcat Extension District, jlsigle@ksu.edu, 620-331-2690

Jan. 26th – Hesston, Dyck's Arboretum of the Plains, 177 W Hickory St.
Contact information:
Ryan Flaming, Harvey County Extension, flaming@ksu.edu, 316-284-6930

Jan. 27th – Highland, Highland Community Building, 501 West Av
Contact information:
David Hallauer, Meadowlark Extension District, dhallaue@ksu.edu, 785-863-2212
Matthew Young, Brown County Extension, mayoung@ksu.edu, 785-742-7871

More information on the final program for each Soybean School will be provided in future issues of the Agronomy eUpdate.

Lunch will be provided courtesy of Kansas Soybean Commission. There is no cost to attend, but participants are asked to pre-register by Jan. 19.

Online registration is available at: K-State Soybean Schools

You can also preregister by emailing or calling the nearest local Research and Extension office for the

location you plan to attend.

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

Doug Shoup, Southeast Area Crops and Soils Specialist
dshoup@ksu.edu

Stu Duncan, Northeast Area Crops and Soils Specialist
duncan@ksu.edu

4. Prescribed Burning Workshops scheduled for 2017

Six Prescribed Burning Workshops are scheduled for the remainder of the winter in Kansas, with the possibility of more upon request.

The agencies involved include K-State Research and Extension, USDA-NRCS, USDA-FSA, Kansas Department of Wildlife, Parks & Tourism, and the National Weather Service. Each workshop lasts about 4 hours. Topics include, reasons for burning, regulations, weather considerations, liability, burn contractors, equipment and crew, hazards, fuels, firebreaks, fire types and behavior, ignition techniques, and burn plans. Attendees have the opportunity to talk through specific burn scenarios with the presenters.

Contact Walt Fick at 785-532-7223 or whfick@ksu.edu if you would like to host a prescribed burning workshop.

Workshop	Date (2017)	Location	Host	Agency	Phone	email
Greenwood	Jan. 25	Eureka	Ryan Schaub	K-State	620-583-7455	reschaub@ksu.edu
Kingman	Feb. 3	Kingman	Jake Renner	K-State	620-532-5131	jwrenner@ksu.edu
Jeffrey Energy Center	Feb. 16	Jeffrey Energy Center	J.R. Glenn	Westar	785-575-6518	jr.glenn@westarenergy.com
Edwards	Feb. 21	Kinsley	Jess Crockford	KPFC	620-664-4882	jbcrock@sbcglobal.net
Frontier District	Feb. 22	Ottawa	Rod Schaub	K-State	785-828-4438	rschaub@ksu.edu
Southwind District	March 1	Uniontown	Chris Petty	K-State	620-223-3720	cgp@ksu.edu

Figure 1. Dusty Schwandt, USDA-NRCS, presenting information on equipment and crew considerations at the Marysville Prescribed Burning Workshop. Photo by Walt Fick, K-State Research and Extension.

Walt Fick, Range Management Specialist
whfick@ksu.edu

5. North Central Kansas Field Winter Update in Scandia, January 27

K-State Research and Extension will host the North Central Kansas Experiment Field Winter Update Jan. 27 from 9:30 a.m. until noon.

The update, to be held at the Scandia Community Center, 406 4th St. in Scandia, will be followed by a complimentary lunch.

The program includes:

- Variety Selection and Management for High-Yielding Wheat in Kansas – Romulo Lollato, Wheat and Forages Specialist
- Weed Suppression Using Cover Crops – Anita Dille, Weed Ecology Professor
- New Soybean Technology Weed Control Update – Dallas Peterson, Weed Management Specialist

Preregistration is appreciated. To register, contact the North Central Kansas Experiment Field office 785-335-2836 or email Andrew Esser at aresser@ksu.edu

6. K-State Sorghum Schools scheduled for late January and early February 2017

A series of four K-State Sorghum Production Schools will be offered in late January and early February 2017 to provide in-depth training targeted for sorghum producers and key stakeholders. The schools will be held at four locations around the state. The one-day schools will cover a number of issues facing sorghum growers: weed control strategies; production practices; nutrient fertility; and insect and disease management.

The dates and locations of the K-State Sorghum Production Schools are:

Jan. 31st – Colby: City Limits Convention Center, 2227 S Range Ave
Kurt Sexton, Thomas Co. Extension, kurtsexton@ksu.edu, 785-460-4582

Feb. 1st – Wichita: Sedgwick Co. Extension Center, 7001 W 21st St N
Zach Simon, Sedgwick Co. Extension, zsimon@ksu.edu, 316-660-0100

Feb. 2nd – Concordia: Cloud County Community College, 2221 Campus Drive
Kim Kohls, River Valley Extension District, kclarson@ksu.edu, 785-243-8185

Feb. 3rd – Iola Riverside Park New Community Building, 600 S. State St
Carla Nemecek, Southwind Extension District, cnemecek@ksu.edu, 620-365-2242

More information on the final program for each Sorghum School will be provided in future issues of the Agronomy eUpdate.

Lunch will be provided courtesy of Kansas Grain Sorghum Commission. There is no cost to attend, but participants are asked to pre-register by Jan. 27. Online registration is available at: K-State Sorghum Schools

You can also preregister by emailing or calling the nearest local Research and Extension office for the location you plan to attend.

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Pat Damman, Kansas Grain Sorghum Commission
pat@ksgrainsorghum.org

Pat Damman, Kansas Grain Sorghum Commission
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7. K-State Agriculture Technology Days, Feb. 9-10, Great Bend and Beloit

Keep your farming operation up-to-date and efficient by attending K-State Research and Extension's "Agriculture Technology Days," hosted by Barton County Extension and the Post Rock Extension District.

The first meeting will be Thursday, Feb. 9 in Great Bend at the Recreation Center. The second date will be Friday, Feb. 10 in Beloit at the NCK Technical College. The meetings will begin at 9:20 a.m. and will conclude at 2:00 p.m. The program is the same both days.

9:20 a.m. Welcome and Sign-in

9:30 a.m. Big Data Implications for Farmers – Terry Griffin, Agricultural Economics

10:10 a.m. N Management Using Green Seeker – Romulo Lollato, Wheat and Forages Specialist

10:50 a.m. Planting Technologies: High Speed Planter in Corn – Ajay Sharda, Biological and Agricultural Engineering

11:30 a.m. Lunch

12:00 p.m. Brian McCornack Data Integration Using myFields.info – Brian McCornack, Entomology

12:40 p.m. Use of Satellite Imagery for Forecasting Corn Yield Monitor Data – Ignacio Ciampitti, Crop Production and Cropping Systems Specialist

1:20 p.m. Collecting and Using Yield Monitor Data – Lucas Haag, Northwest Area Crops and Soils Specialist

2:00 p.m. Adjourn

A free lunch meal will be served at each of the sites, courtesy of sponsors CropQuest, Kansas Corn, First Kansas Bank, Plains State Bank, Simpson Farm Enterprises, Inc., and The Guaranty State Bank & Trust.

There is no cost for either meeting. However, RSVP is requested by Monday, February 6, for both meetings. Please RSVP to:
Barton County Extension -- Alicia Boor aboor@ksu.edu 620-793-1910
Post Rock Extension District Offices in Beloit, Lincoln, Mankato, Osborne or Smith Center, or Sandra L. Wick swick@ksu.edu 785-282-6823

Online registration is also available at Barton County Extension (www.barton.ksu.edu) and Post Rock Extension District (www.postrock.ksu.edu) websites. Twenty registered participants will be needed at each site to host the meetings.

8. Western Kansas Forage Conference planned Feb. 20 in Larned

Jeff Rasawehr, of Celina, Ohio, and co-founder of Cover Crop Ranch, will present "Making a Cover Crop Your Most Valued Crop" at the Western Kansas Forage Conference on Feb. 20.

Sponsored by K-State Research and Extension and the Kansas Forage and Grassland Council, the conference will be at the J.A. Haas Building, 400 E. 18th St. in Larned, Kansas. Registration begins at 8:30 a.m., with the program from 9 a.m. - 3 p.m.

Cover Crop Ranch is a network of farms in Michigan and Ohio using sustainable farming practices of no-till, cover crops and a system called mob grazing to produce meat. Mob grazing involves moving cattle at least daily between small enclosures and split by electric fences. The plants in the enclosure are eaten, walked on and trampled, then allowed to rest for 60-120 days or more.

Rasawehr will share his knowledge and experience in using cover crops and making them valuable in a crop production system.

Other conference speakers and topics include:

- Soil Management with Cover Crops – DeAnn Presley, K-State soil management specialist
- What Are We Learning from Integrating a Cover Crop into our Production Practice? – Dale Younker, U.S. Department of Agriculture soil health specialist
- Pasture Weed Management – Walt Fick, K-State range scientist
- Kansas Forage and Grassland Council Update – Mark Jensen, KSFGC board member
- Animal Health Concerns When Grazing Cover Crops – Jaymelynn Farney, K-State animal scientist
- Pasture Risk Insurance – Monte Vandeveer, K-State agricultural economist
- Producer Panel

Registration is requested by Feb. 10. Lunch is included in the registration fee, which is $25 for KSFGC members and $55 for non-members. Online registration and more information are available at www.southwest.ksu.edu. More information is available by contacting Foster at 620-276-8286 or anserdj@ksu.edu.

A.J Foster, Southwest Area Crops and Soils Specialist
anserdj@ksu.edu

9. Comparative Vegetation Condition Report: January 10 -16

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 27-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

The Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography, and his pioneering work in this area is gratefully acknowledged.

The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

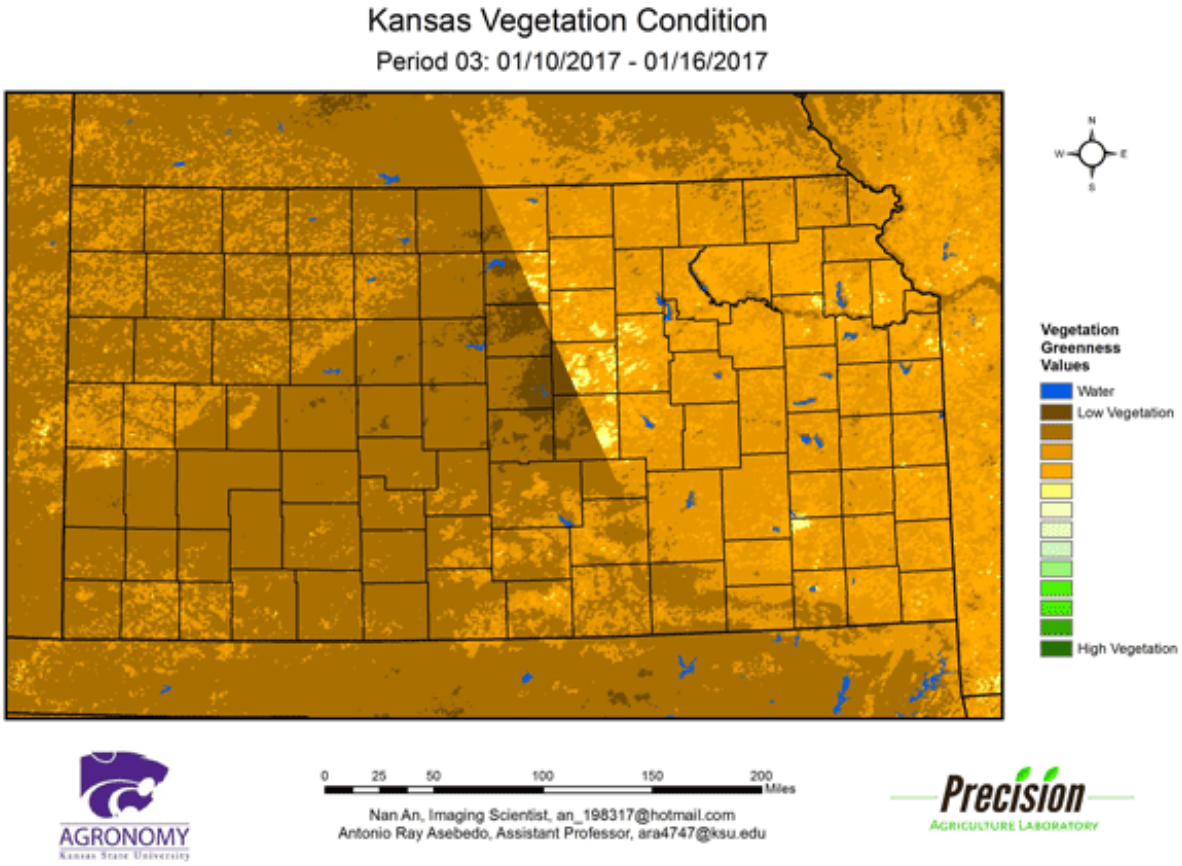

Figure 1. The Vegetation Condition Report for Kansas for January 10 – January 16, 2017 from K-State's Precision Agriculture Laboratory shows almost no photosynthetic activity. The little production there is shows up mainly in central Kansas. This is not unexpected given the season. The sharp line in the central part of the state is a splice line due to cloud issues.

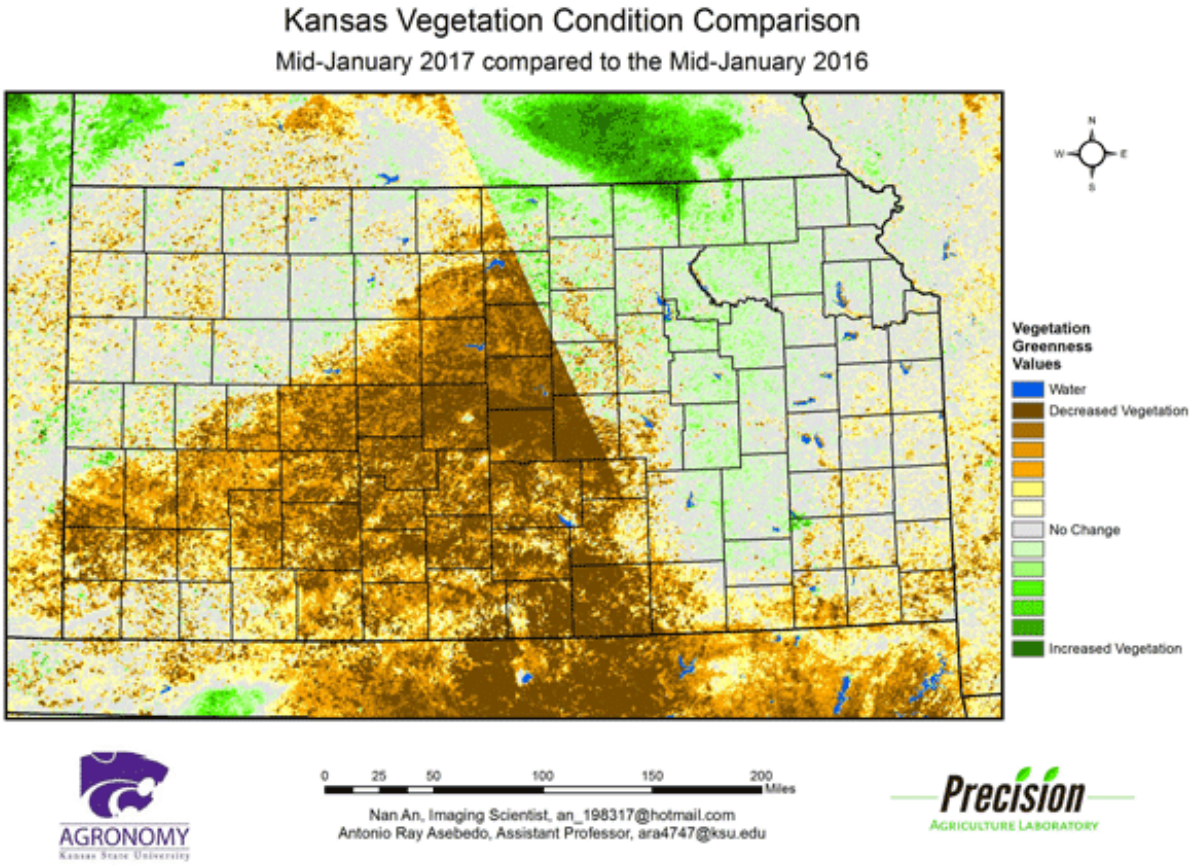

Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for January 10 – January 16, 2017 from K-State's Precision Agriculture Laboratory shows much lower NDVI values in much of the state. Clouds and snow/ice cover have enhanced this pattern. The sharp line in the central part of the state is a splice line due to cloud issues.

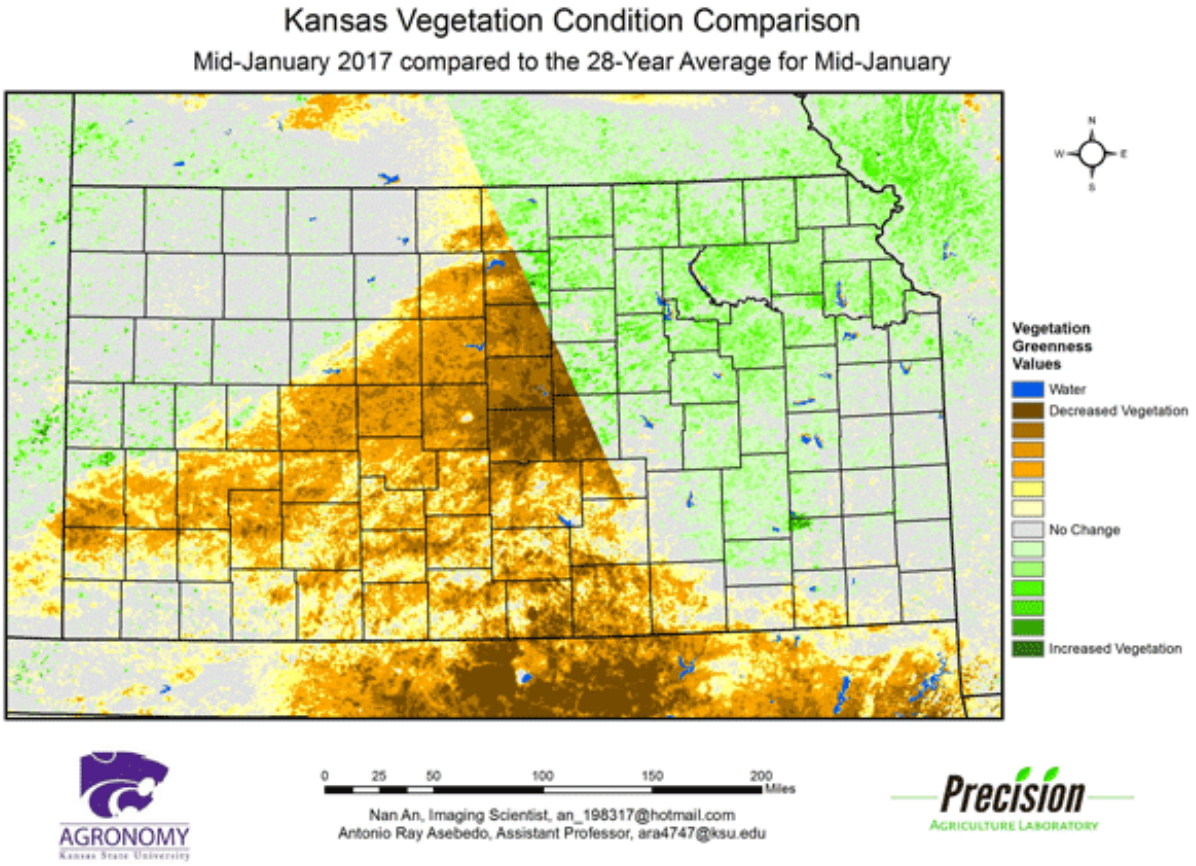

Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for January 10 – January 16, 2017 from K-State's Precision Agriculture Laboratory has a pronounced line across the center of the state due to cloud issues. The below-average NDVI values in central and southwest Kansas are largely due to snow/ice coverage.

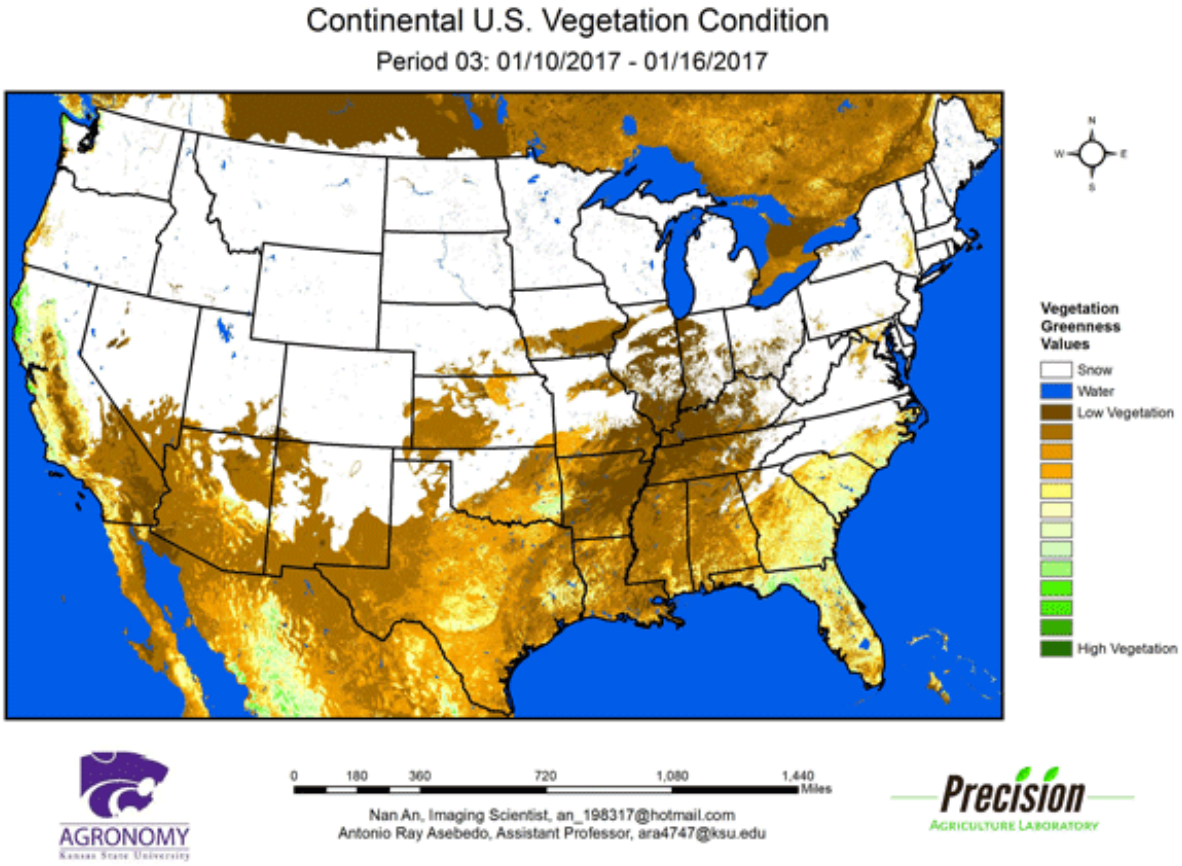

Figure 4. The Vegetation Condition Report for the U.S for January 10 – January 16, 2017 from K-State's Precision Agriculture Laboratory shows the area of highest NDVI is confined to the South, particularly in the Florida Panhandle. Snowfall moved south to include areas of the Texas Panhandle and Oklahoma, as well as parts of the Mid-Atlantic.

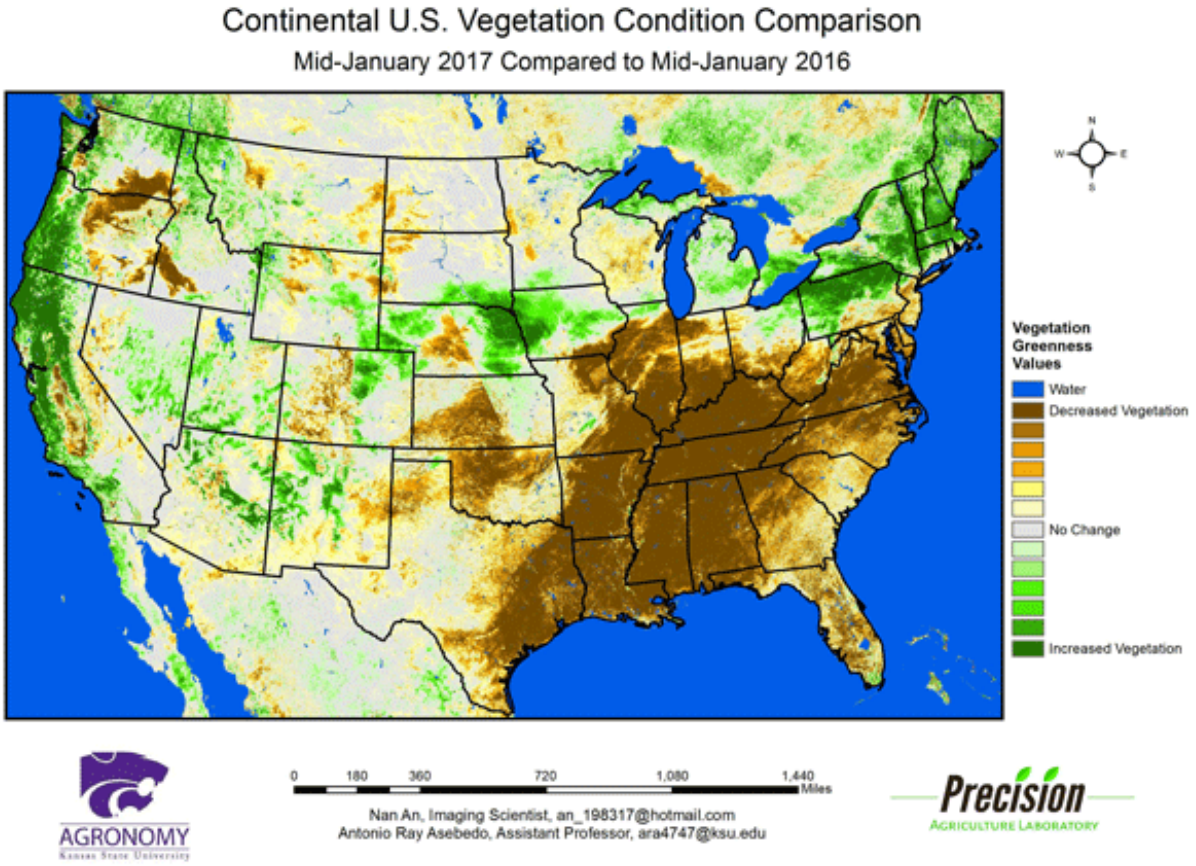

Figure 5. The U.S. comparison to last year at this time for January 10 – January 16, 2017 from K-State's Precision Agriculture Laboratory shows higher NDVI values on the East and West Coasts, particularly in New England and the Pacific Northwest. Rainfall has been much more plentiful this year.

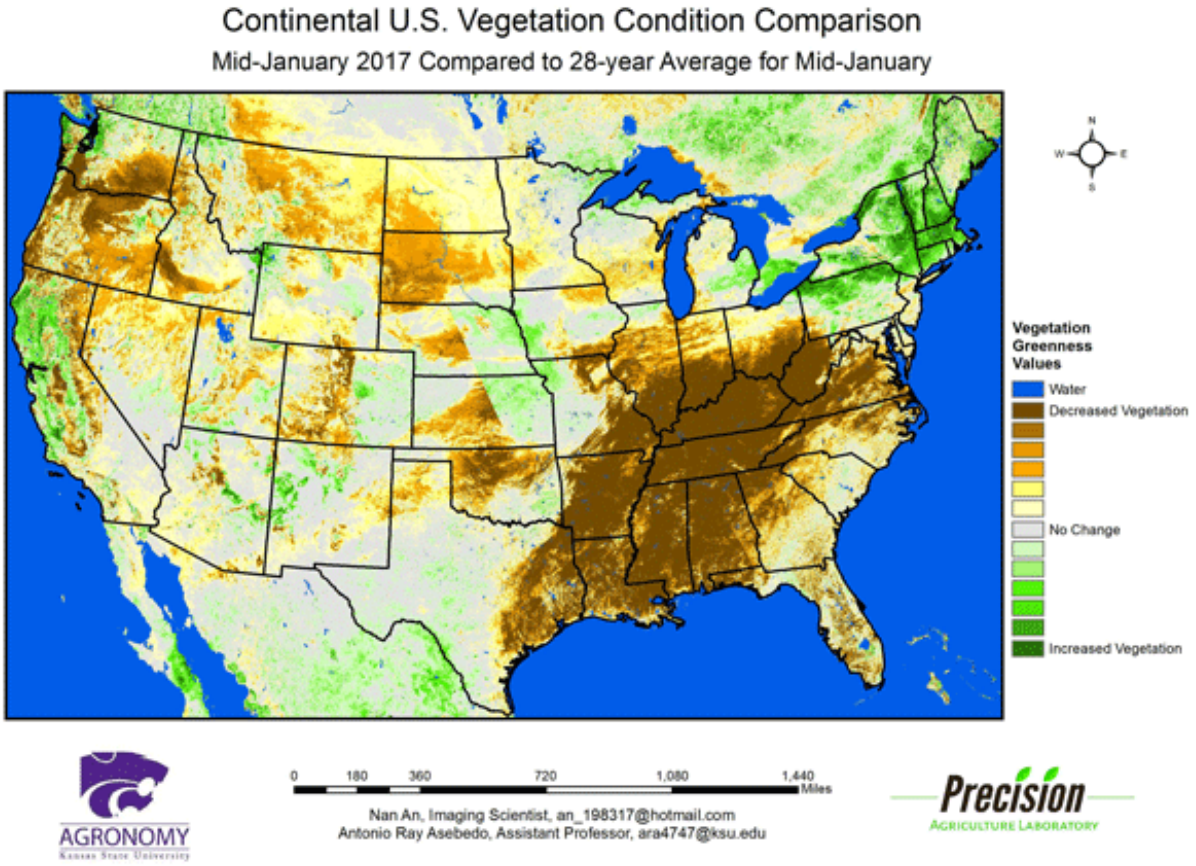

Figure 6. The U.S. comparison to the 27-year average for the period of January 10 – January 16, 2017 from K-State's Precision Agriculture Laboratory shows an area of below-average NDVI values in the South, where recent cloud cover has masked vegetative activity. NDVI values have dropped in the Pacific Northwest and Intermountain West as snow cover continues to increase.

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