



K-STATE
Research and Extension

Extension Agronomy

eUpdate

11/21/2024

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy eUpdate 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 Kathy Gehl, 785-532-3354 kgehl@ksu.edu, or Dalas Peterson, Extension Agronomy State Leader and Weed Management Specialist 785-532-0405 dpeterso@ksu.edu.

Subscribe to the eUpdate mailing list: <https://listserv.ksu.edu/cgi-bin?SUBED1=EUPDATE&A=1>

eUpdate Table of Contents | 11/21/2024 | Issue 1030

1. Pesticide container misuse - Be aware of the regulations.....	3
2. Updated publication on nitrates and groundwater now available.....	4
3. Kansas Drought Update and Climate Report for Nov. 13-19, 2024.....	7
4. Don't miss the K-State/KARA Crop Production Update on Dec. 4-5.....	16
5. Sorghum Connection Series Extends Support to Kansas Growers with Winter Series.....	18

1. Pesticide container misuse - Be aware of the regulations

This is a reminder that pesticide containers are not to be repurposed after the pesticide has been used. Labels on non-refillable containers state, "Do not reuse or refill this container." Some containers are refillable, and those labels typically say, "Refill this container with pesticide only. Do not reuse this container for any other purpose." In some cases, the label may say, "Refill this container with [common chemical name]" or "This is a sealed, refillable container to be used only for [common chemical name]," which indicates that it can be refilled with the same pesticide by a retailer. These labeling statements make every pesticide container, from a 2.5-gallon jug up to a 30-gallon tote, illegal to reuse. Reusing containers for any other purpose is considered pesticide misuse and a violation of the Federal Insecticide, Fungicide, and Rodenticide Act. A pesticide container, even if it is empty or the label is removed (defaced), remains part of the pesticide product.

After use, pesticide containers should be disposed of properly. Disposal options may be limited by local regulations and ordinances. Containers that have been triple rinsed and crushed and/or punctured may be accepted by sanitary landfills or landfills that accept industrial waste. Check with your landfill operator prior to taking empty containers for disposal. Triple-rinsed containers can also be returned to the supplier. In addition, some counties in Kansas have a plastic pesticide container recycling program. Check with your county's Household Hazardous Waste program for more information.

Sarah Lancaster, Extension Weed Science Specialist
slancaster@ksu.edu

Frannie Miller, Pesticide Safety and IPM Coordinator
fmiller@ksu.edu

2. Updated publication on nitrates and groundwater now available

Nitrate is a common contaminant in groundwater. Groundwater with excessive nitrate contamination can have immediate and long-term health effects. Groundwater supplies about 50% of the drinking water in the United States. Almost all private water supplies are from wells or springs. This recently updated publication, [Nitrates and Groundwater MF857](#), addresses the drinking water nitrate standard, water testing, nitrate sources, the reduction of nitrate contamination risk, and groundwater treatment methods.

Human Health Concerns for Nitrate

The immediate health concern is the conversion of nitrate to nitrite in the digestive tract by nitrate-reducing bacteria. Nitrite is readily absorbed into the blood where it combines with the hemoglobin that carries oxygen and forms methemoglobin, which cannot carry oxygen. The resulting reduced oxygen supply to the body tissues produces physical stress. In infants, this condition is called methemoglobinemia, or blue baby syndrome, because of the blue color around the eyes and mouth.

Infants, both human and animal, are the most susceptible to nitrate poisoning because bacteria that convert nitrate to nitrite are abundant in their digestive systems. By the time a child is 6 months old, the digestive system produces acid that prevents nitrate-reducing bacteria from thriving, and the risk is greatly reduced.

Animal Health and Nitrates

Animals respond similarly, but the digestive tract may mature more quickly. Older ruminant animals, such as sheep, cattle, and goats, have a different digestive system that allows nitrate-reducing bacteria to thrive. Horses have a large cecum where nitrate-reducing bacteria also thrive. High-nitrate effects on livestock include reduced conception rates, spontaneous abortions, reduced rate of gain, and poor performance in dairy cows, including reduced milk production.

Maximum Contaminant Level

The maximum contaminant level (MCL) for nitrate in drinking water is 10 ppm or 10 mg/L nitrate-nitrogen (NO₃-N). Long-term exposure at two to three times the MCL can produce an increase of methemoglobin, which may not show outwardly but causes stress that may be blamed on other causes. Pregnant women and people with health infirmities should be protected from high-nitrate sources. The long-term effect occurs when nitrate is more than twice the MCL.

Nitrogen is lost from the soil by leaching, denitrification, volatilization, and immobilization (Figure 1). From the standpoint of groundwater quality, leaching is the only concern. The potential for nitrate leaching varies with soil type and rainfall or irrigation. Sandy soils under high rainfall or irrigation have high leaching potential. Fertilizer application beyond crop requirements and poor management of any nitrogen source can increase the potential for nitrate leaching.

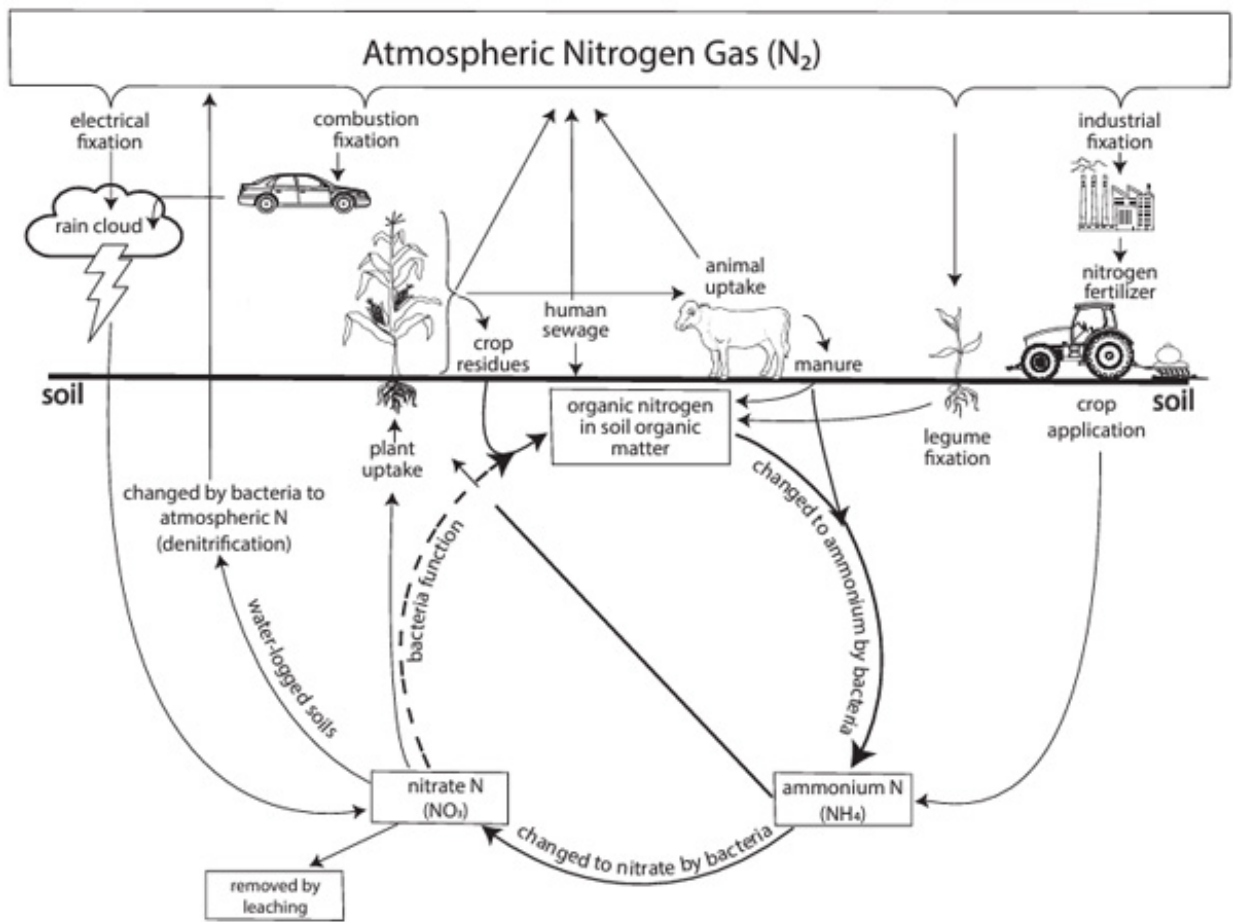


Figure 1. The nitrogen cycle. The graphic was taken from KSRE publication MF857. It originated from Fertilizers and Soil Amendments, 1981. Prentice-Hall, Inc. and adapted with permission.

Summary

High nitrate levels in water are a health concern. Excess nitrogen can be converted to nitrate, moves with water, and may reach groundwater. Nonagricultural and agricultural sources of nitrogen contribute to the total nitrate levels. All nitrate sources require careful management to minimize the risk for contamination of groundwater and private wells. Careful management of livestock lots and use of the proper rate of nitrogen are the most important factors, but other management practices also are important. Recommended practices that minimize the risk of contamination should be given careful and immediate attention.

The full publication containing more information on management options and drinking water treatment is available at https://bookstore.ksre.ksu.edu/pubs/nitrate-and-groundwater_MF857.pdf.

Stacie Minson, Extension Watershed Specialist, KCARE
sedgett@ksu.edu

Other contributors:

Pat Murphy, Extension Engineer, retired

Joe Harner, Extension Engineer, retired

Herschel George, Watershed Specialist, retired

Dan Wells, Environmental Administrator, KDHE

Melissa Harvey, KCARE

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

3. Kansas Drought Update and Climate Report for Nov. 13-19, 2024

Temperature summary

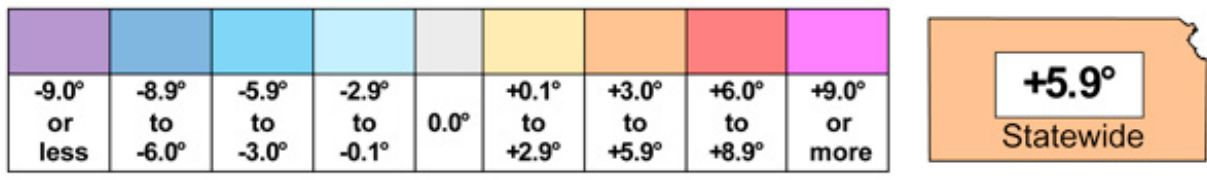
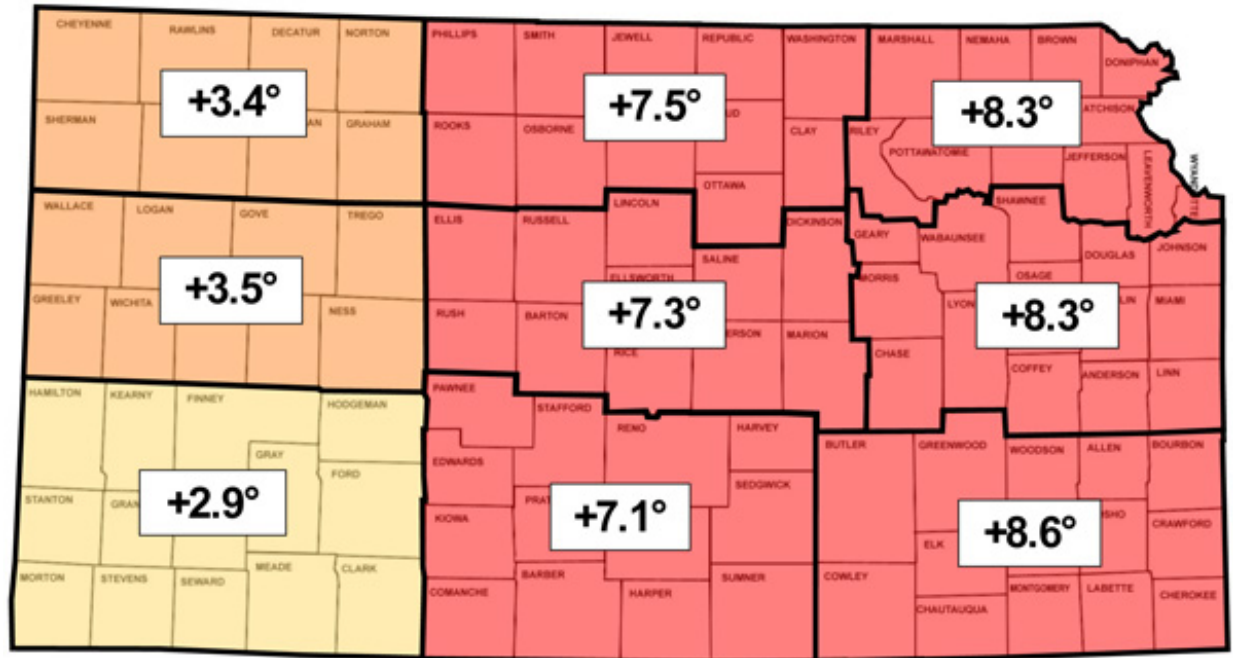
Above-normal temperatures were the rule across the state during the period. The average statewide temperature across the Kansas Mesonet was above normal all seven days, extending the string of above-normal days to 11 as of the 19th. Highs averaged in the 60s from the 14th through the 16th, with cooler 50s on the other four days. Only one morning, the 14th, had a sub-freezing average low (30°). Statewide daily average lows are now below freezing. Sub-freezing lows should be common this time of year, but this fall, fewer than normal have been recorded across the state. Goodland averages 23 days with lows at or below 32° by November 19th each fall but has had just 12 so far. Other locations well below normal in their freezing counts include Hill City (9; normal is 23), Dodge City (3; 14), Wichita (2; 14), and Topeka (1; 12). The 7-day average temperature was 48.8°, or 5.9° above normal (Figure 1). All nine divisions were above normal for the week; departures ranged from +2.9° in southwest to +8.6° in southeast Kansas. For November, Kansas is averaging 4.5° above normal. If the month finishes at the same departure, it would rank it as the 6th warmest of the past 130 Novembers.

Precipitation summary

The main precipitation event during the period began on the evening of the 17th. It continued into the 18th, the result of a strong low-pressure system that pulled moisture into the state as well as very mild air for mid-November. Many areas picked up over an inch of rain from this event, and at least 20 counties had one or more reports of rainfall of two inches or greater. The highest storm total was 3.00" in Kismet in Seward County. Dodge City measured 2.17" on the 18th, boosting their monthly total to 6.24", which set a new record for the wettest November in 151 years of record-keeping. Wichita has also set their record wettest November with 6.99" of rainfall so far, including 1.58" that fell during the 7-day period. The only area that missed out on the event was far northwestern Kansas. Goodland recorded just a trace of precipitation, and all three CoCoRaHS observers in Cheyenne County measured zero for the 7-day period. Even in places where no rain fell, strong winds were observed in conjunction with the pressure gradient created by the deep low that moved through the state. The Little River Mesonet site in Rice County recorded a minimum sea-level pressure of 980.2 millibars or 28.95 inches. Pressures under 29 inches are very unusual in Kansas. Wind gusts of over 40 mph were recorded by at least three dozen Mesonet sites, with the highest gust of 64 mph at the Rock Springs tower in eastern Dickinson County. Not to be outdone, the Russell Airport clocked the highest reported gust at 66 mph.

The statewide average precipitation for the 7-day period was 1.48", over four times the normal weekly amount of 0.31" (475%). All nine divisions in the state were above normal again this week (Figure 1). The three southern divisions were the wettest in the state, led by southeast (2.02") Kansas. Southwest Kansas' total of 1.63" was the highest percent of normal at a whopping 1458%. All divisions had at least triple their normal amount, even the driest division, northwest Kansas (0.57"). The recent precipitation further boosted the surpluses for the water year. Since October 1st, the average precipitation across Kansas is 5.94", or 2.50" above normal. Divisional percents of normal range from 146% (northeast) to 231% (southwest). Since January 1st, the average statewide precipitation is 27.62". This amount is 94% of normal or a departure of -1.65". Three divisions are above normal for the year: southwest (114%), west central (107%), and east central (102%) Kansas. North central Kansas has the lowest percent of normal (88%) as well as the largest departure from normal (-3.31"). The preliminary estimate of the average November precipitation across Kansas is

5.18", which is half an inch above the current record for wettest November (4.68") set in 1909. All nine divisions currently rank in the top ten, with five divisions where the estimate exceeds the current record, most notably in southwest Kansas where the estimate of 5.06" is well over an inch ahead of the current record of 3.31". The CoCoRaHS observer 4 miles north of Havana in Montgomery County has the highest total so far this month of 10.55". The cooperative observers in Sedan (10.45") and Fredonia (10.41") are also above 10 inches for the month. The last time 10 inches or more was observed in Kansas in November was in 1998.



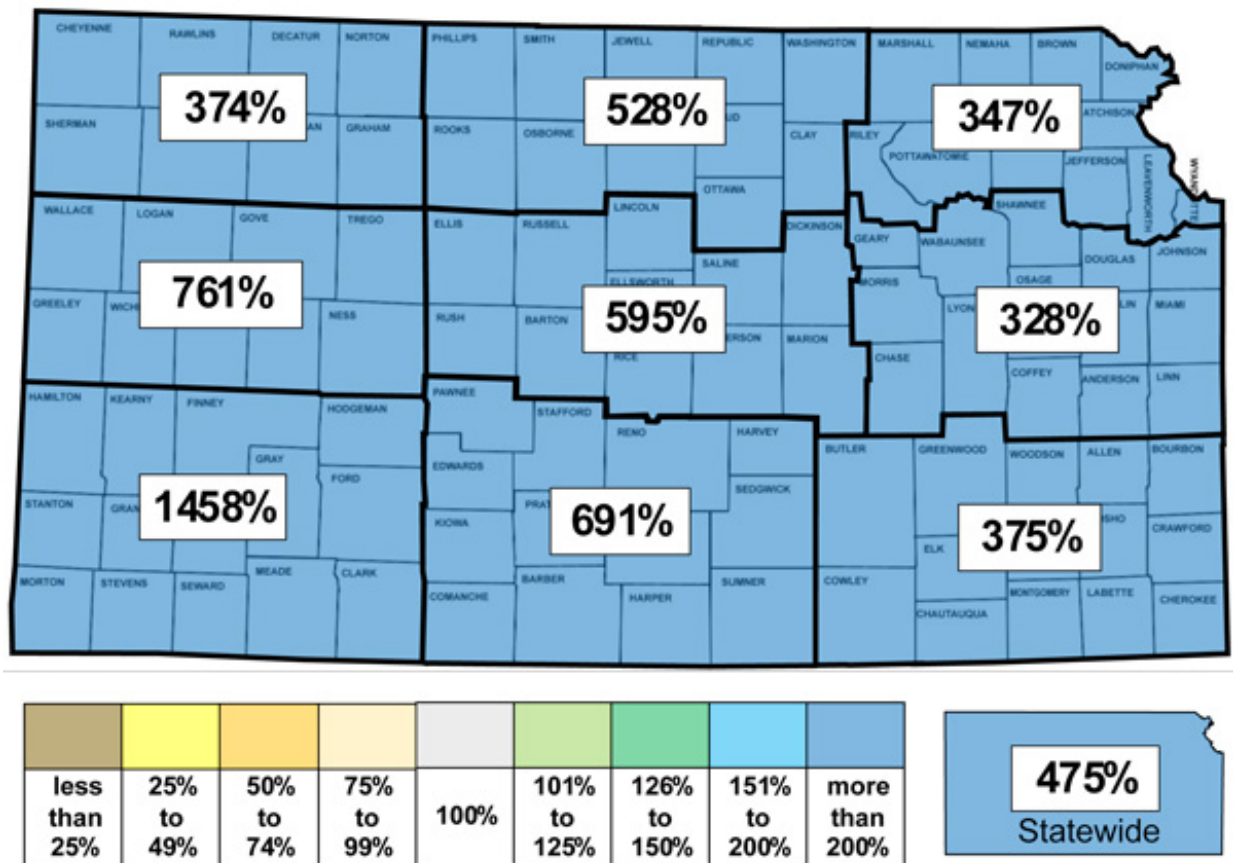


Figure 1. This week's departure from normal temperature (°F, top) and percent of normal precipitation (bottom) by Kansas climate division. Source: MRCC.

Evapotranspiration and soil temperatures

The average evapotranspiration for grass across the state for the week was 0.47". This is slightly below the normal of 0.50" for the 7-day period. Divisional averages ranged from 0.43" in east central to 0.53" in south central Kansas. The statewide average 2" soil temperature across the Kansas Mesonet fell 1.2° this week to 50.4°. This average is 4.9° above the normal of 45.5° for the 7-day period. Divisional averages ranged from 45° in northwest to 55° in southeast Kansas.

Drought update

In this week's US Drought Monitor update, there were a few areas of one-category improvement, including parts of 29 counties (Figure 2). The largest areas were in north central as well as southeast Kansas. All remaining areas of D2 in the state were removed due to these changes. The last time all of Kansas was no worse than D1 was over three years ago, on July 27, 2021. The improvements boosted the percentage of drought-free area in the state to 30.4%, an increase of 3.6% from last week. The statewide Drought Severity and Coverage Index (DSCI) fell 9 points and now stands at 101.

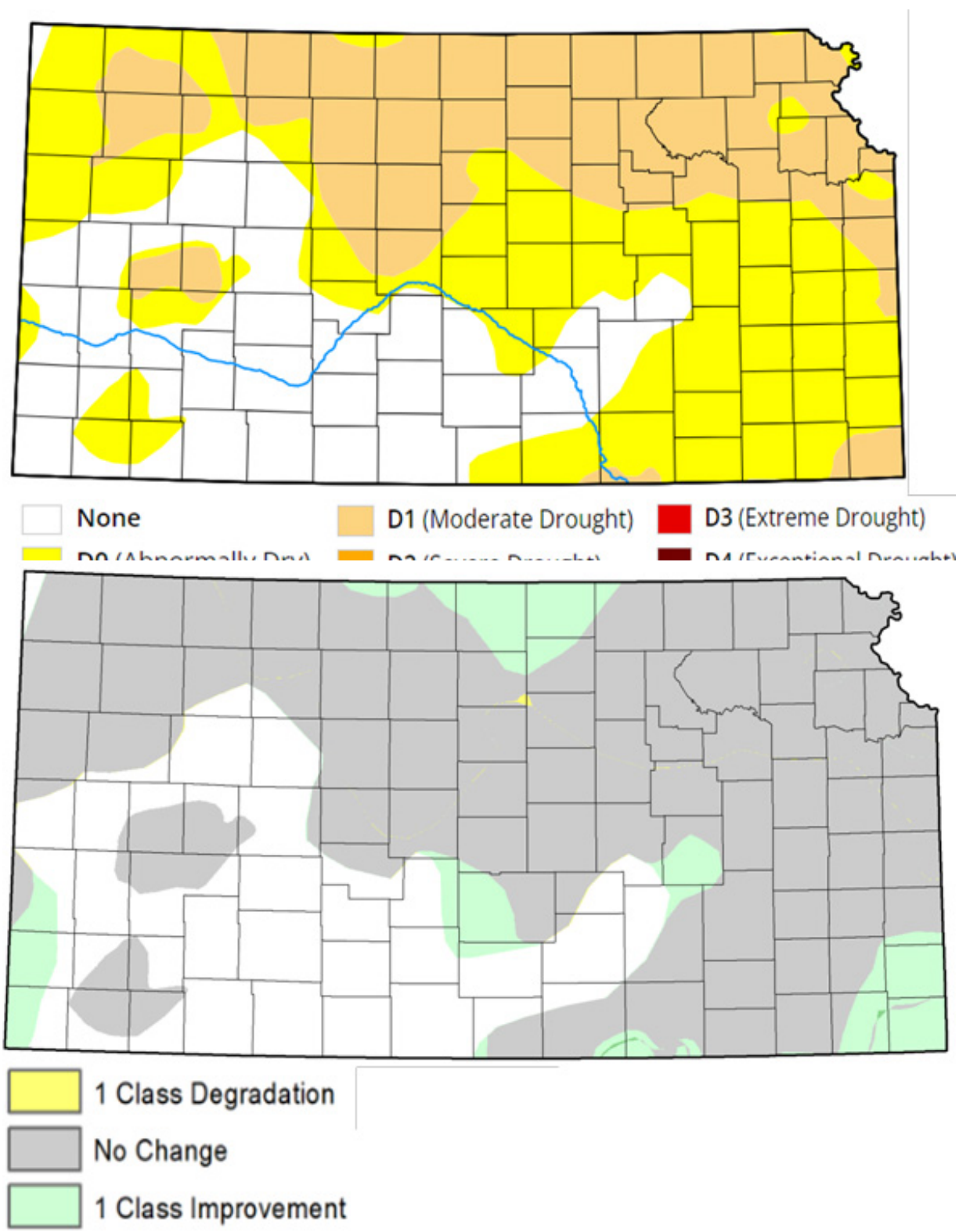


Figure 2. Current weekly drought status (top) and change in drought category over the past week (bottom). Source: UNL Drought Monitor.

Weather outlooks

The Weather Prediction Center's 7-day precipitation forecast, valid for the period November 20th through the 26th, calls for a dry week for most areas (Figure 3). A few light amounts under one-tenth of an inch are possible in south central Kansas. Mild temperatures are expected to continue, with weekly temperatures expected to average from 2 to 6 degrees above normal, with the warmest temperatures expected this weekend. The average daily high and low across Kansas for this period are 52° and 28°. Average 7-day precipitation is 0.12" in western, 0.26" in central, and 0.44" in eastern Kansas.

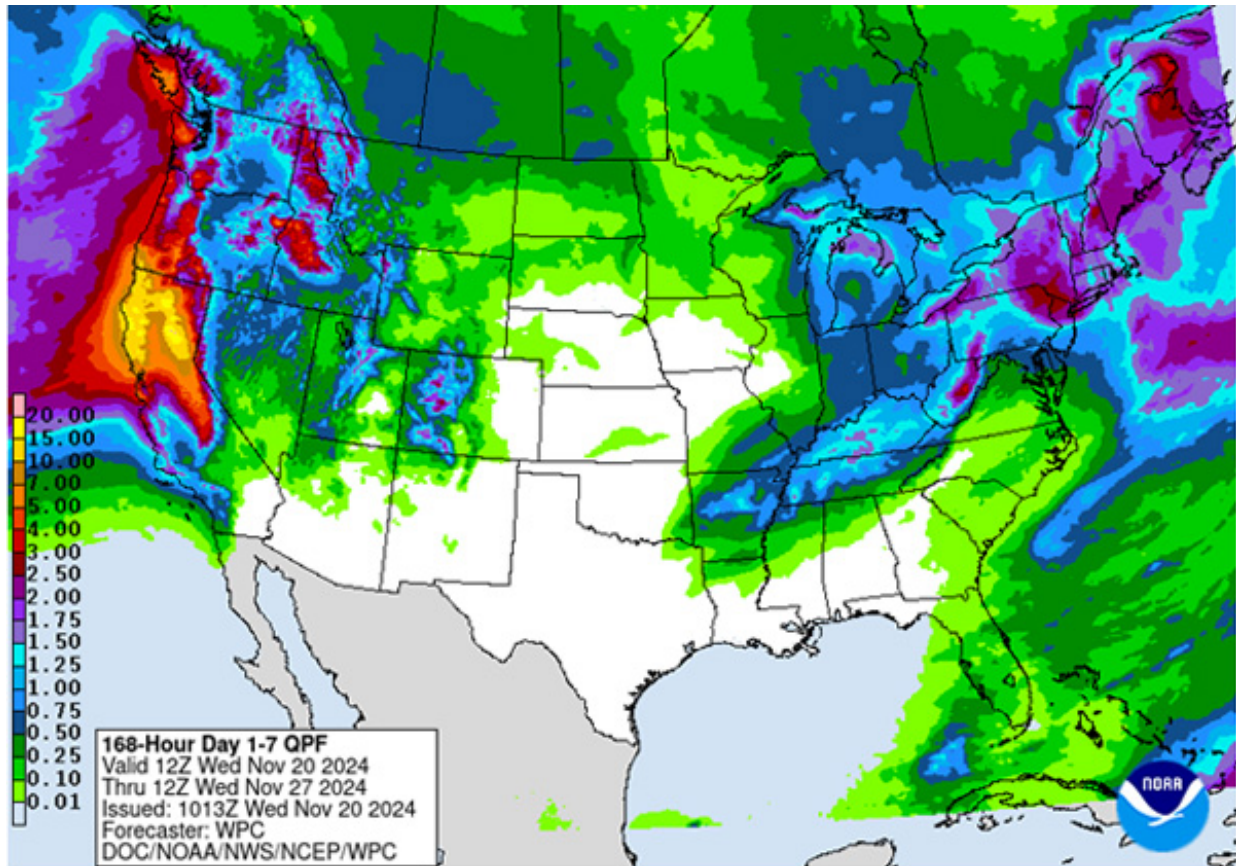


Figure 3. The National Weather Service Weather Prediction Center's (NWS-WPC) 7-day precipitation forecast (Nov. 20 – 26, 2024).

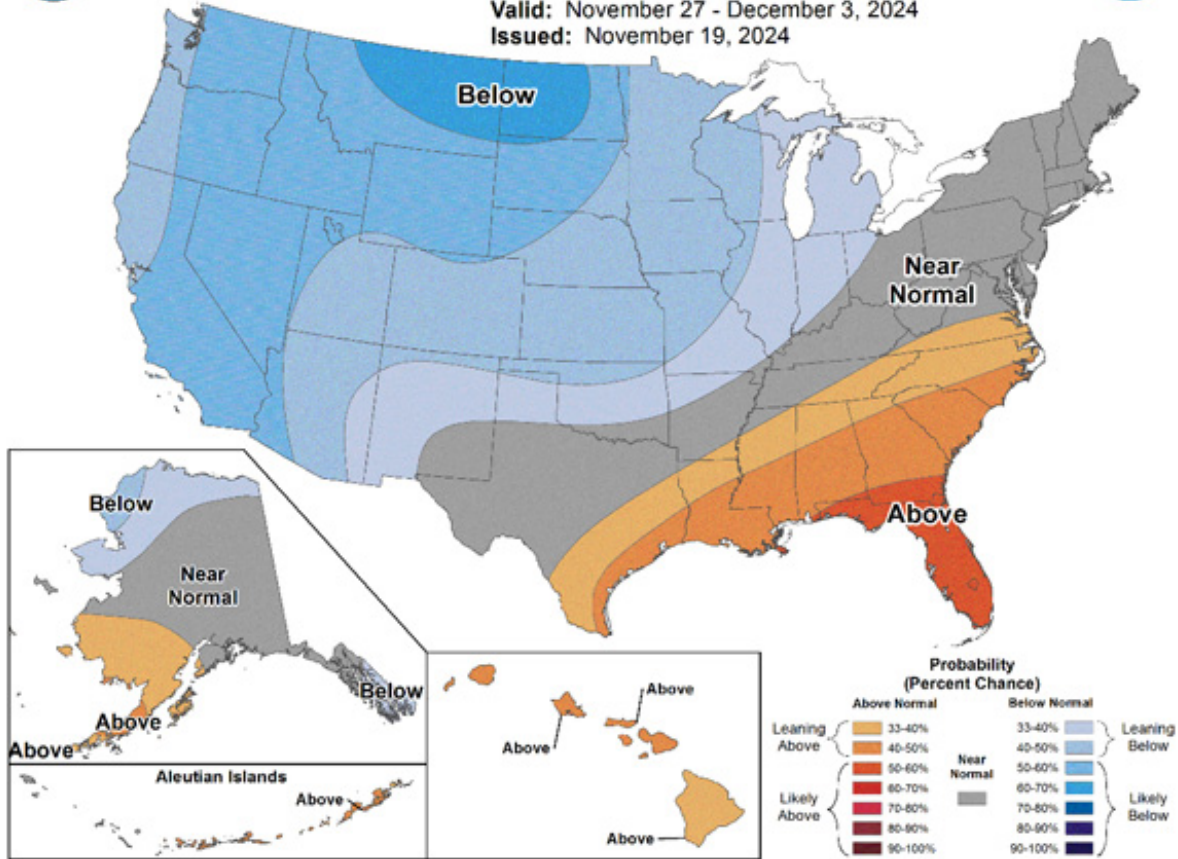
The 8 to 14-day outlook (Figure 4), valid for November 27 through December 3, favors below-normal temperatures statewide, with probabilities increasing from southeast to northwest, ranging from 40% to 47%. Near normal precipitation is favored in eastern Kansas, with slightly elevated probabilities of above normal precipitation in the west, with the highest probability 36% in the far southwest.



8-14 Day Temperature Outlook



Valid: November 27 - December 3, 2024
Issued: November 19, 2024



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



8-14 Day Precipitation Outlook



Valid: November 27 - December 3, 2024
Issued: November 19, 2024

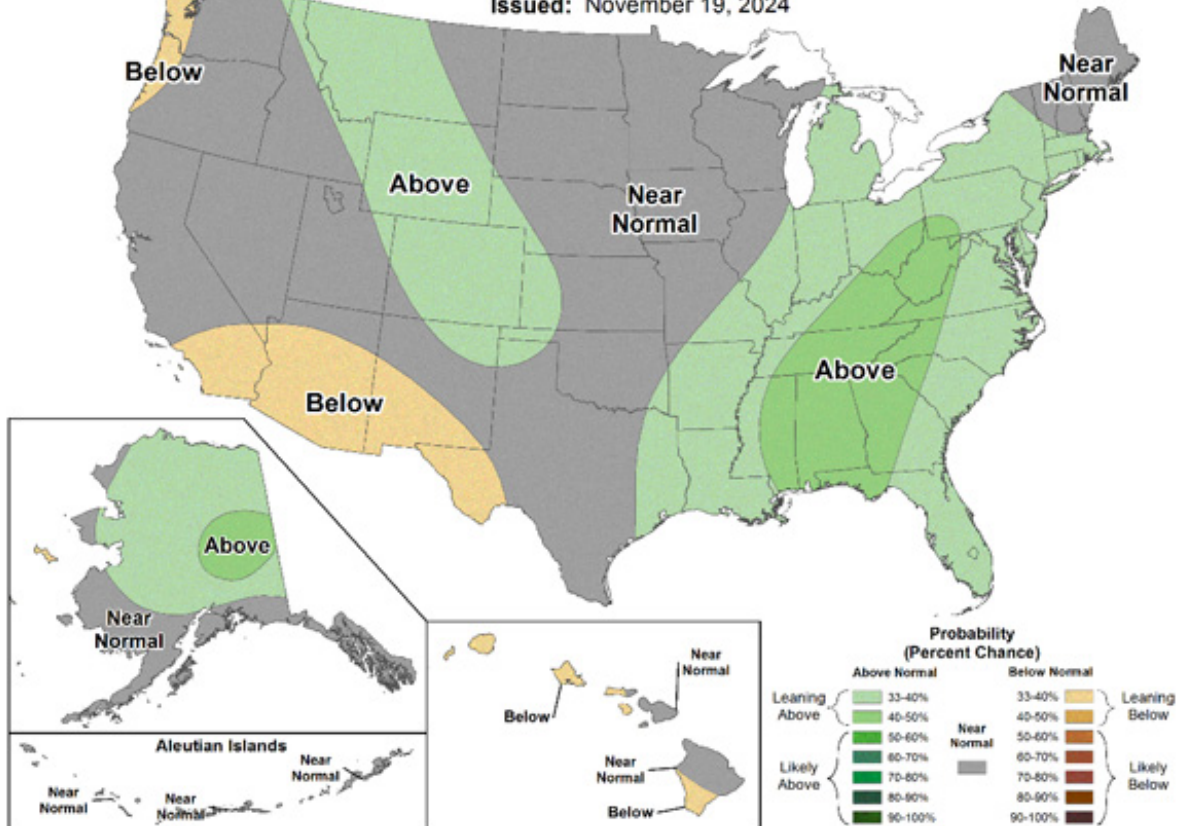


Figure 4. The National Weather Service Climate Prediction Center’s (NWS-CPC) 8 to 14-day temperature (top) and precipitation (bottom) outlooks.

Looking even further ahead, the Climate Prediction Center’s weeks 3 and 4 outlook (Figure 5), valid for the 14-day period from November 30th through December 13th, calls for equal chances of above and below normal temperatures for nearly the entire state; only far southeast Kansas has an above even chance for warmer than normal temperatures. Above-normal precipitation is favored (50-55% probability) in far eastern Kansas, with equal chances of above and below-normal precipitation across the remainder of the state.

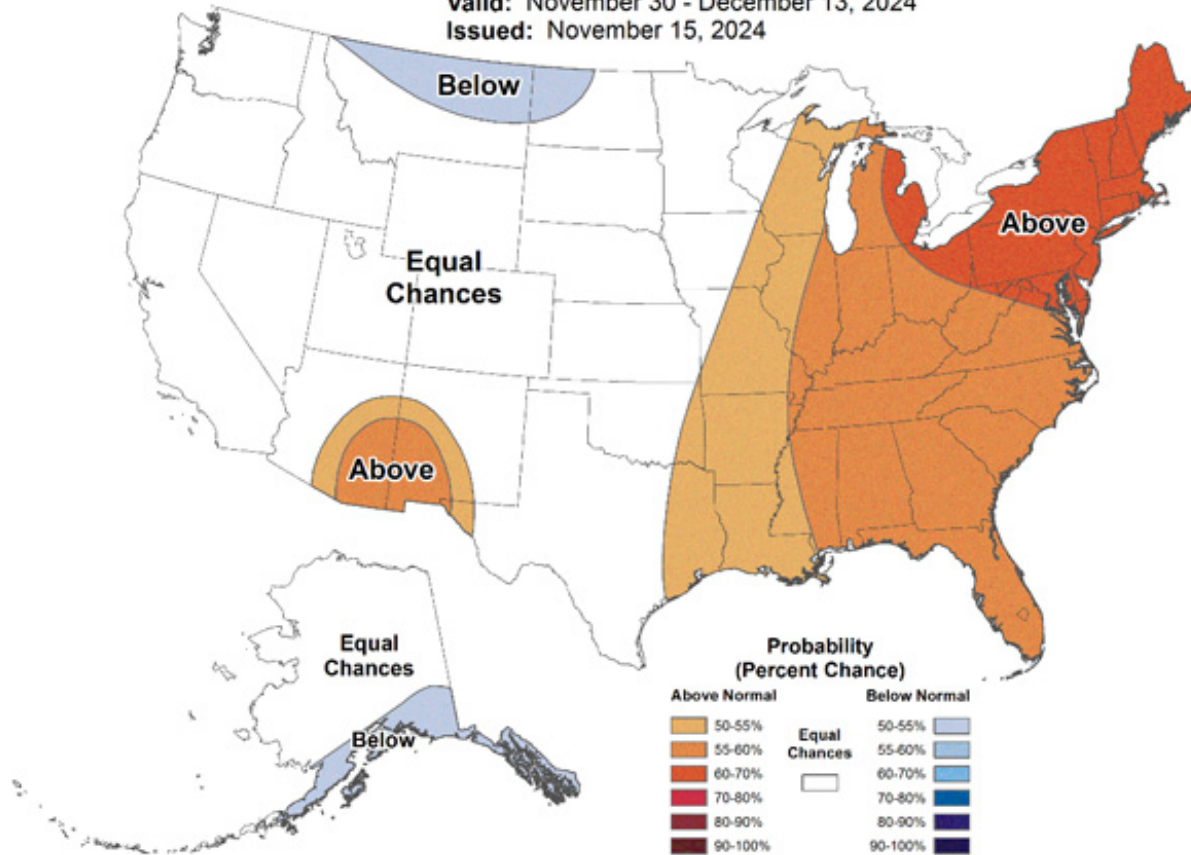


Weeks 3-4 Temperature Outlook



Valid: November 30 - December 13, 2024

Issued: November 15, 2024



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



Weeks 3-4 Precipitation Outlook



Valid: November 30 - December 13, 2024

Issued: November 15, 2024

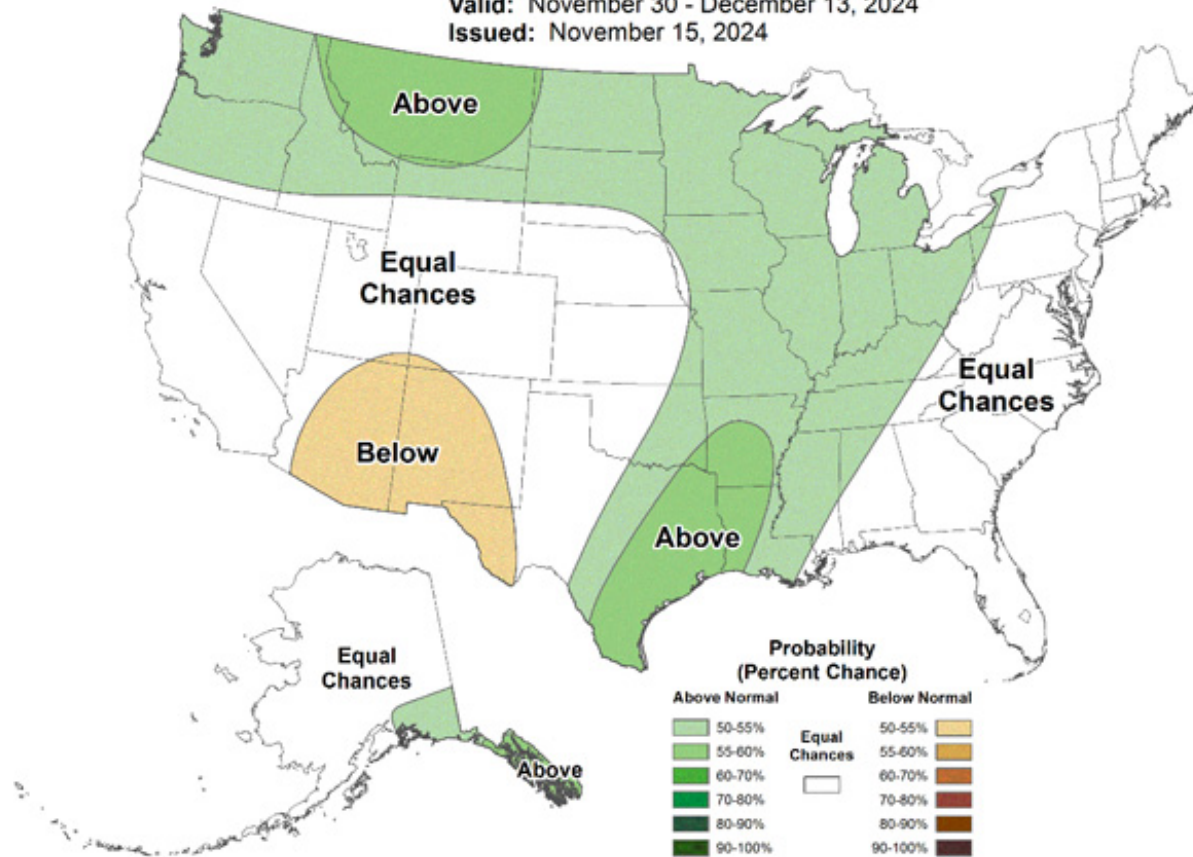


Figure 5.The Climate Prediction Center’s weeks 3 and 4 outlooks for temperature (left) and precipitation (right).

This article is a shortened version of the weekly Kansas Drought Update and Climate Report. If you would like to receive the full report delivered to your email each week, please send a request to Matt at msittel@ksu.edu. He will add you to his distribution list.

Matthew Sittel, Assistant State Climatologist
msittel@ksu.edu

4. Don't miss the K-State/KARA Crop Production Update on Dec. 4-5

Have you registered for the 2024 Crop Production Update, hosted by the Kansas Agribusiness Retailers Association (KARA) and in cooperation with K-State Research and Extension? The two-day event will be held on December 4 and 5 at the Bluemont Hotel in Manhattan, KS. It will offer 13 CCA CEUs and 3 Commercial Applicator credits.

This training provides the latest research and technological advances in weed and insect control, fertilizer and chemical recommendations, crop production, water management, soil fertility, and more.

Speakers and Topics

December 4 – Wednesday

- Soil conservation and carbon intensity scores – Peter Tomlinson and Kathy Gehl
- Sustainable wheat value chain – Romulo Lollato
- Farm data layers and management zones – Gaurva Jha
- Crop diseases as biosecurity threats – Giovana Cruppe
- Recent advances in AI – Pascal Hitzler
- Wind erosion – DeAnn Presley
- Research update on disease management in wheat – Kelsey A. Onofre

December 5 – Thursday

- Biological products in crop production – Brian Arnall
- Cotton production in the High Plains – Logan Simon
- Irrigation management for main crops – Tina Sullivan
- Fertility management of row crops – Dorivar Ruiz Diaz
- Weed control in summer crops – Sarah Lancaster
- Variable rate technology in precision ag – Deepak Joshi

You can register for the conference by visiting <https://www.ksagretailers.org/events-training/crop-production-update/>. The cost breakdown is available by clicking on the registration button.

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

Clay Fagan, Kansas Agribusiness Retailers Association – Director of Member Investment and Training
clay@kansasag.org



2024 KARA Crop Production Update

Kansas Agribusiness Retailers Association
K-State Research and Extension

9:20 a.m. – 4:40 p.m. December 4 and

8:30 a.m. – 2:50 p.m. December 5

Bluemont Hotel, 1212 Bluemont Ave., Manhattan, KS

Topics

- Conservation and carbon intensity scores
- Sustainable wheat value chains
- Farm data layers and management zones
- Crop diseases as biosecurity threats
- Recent advances in AI in Agriculture
- Wind erosion
- Research update on wheat diseases
- Biological products in crop production
- Cotton production in the High Plains
- Irrigation management for main crops
- Fertility management of row crops
- Weed control in summer crops
- Variable rate technology in precision ag

Speakers

- Peter Tomlinson and Kathy Gehl
- Romulo Lollato
- Gaurav Jha
- Giovana Cruppe
- Pascal Hitzler
- DeAnn Presley
- Kelsey A. Onofre
- Brian Arnall
- Logan Simon
- Tina Sullivan
- Dorivar Ruiz Diaz
- Sarah Lancaster
- Deepak Joshi

This event will offer 13 CCA CEUs and three Commercial Applicator credits.

Register online at <https://www.ksagretailers.org/events-training/crop-production-update/>
For registration questions, please contact Clay Fagan at clay@kansasag.org or 785-234-0461.
Prices differ depending on membership status and program selected.

Coffee breaks and lunch are included with registration and will be provided both days.

KANSAS STATE
UNIVERSITY



Kansas State University is committed to making its services, activities and programs accessible to all participants. If you have special requirements due to a physical, vision, or hearing disability, contact Clay Fagan, 785-234-0461. Kansas State University Agricultural Experiment Station and Cooperative Extension Service
K-State Research and Extension is an equal opportunity provider and employer.

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

5. Sorghum Connection Series Extends Support to Kansas Growers with Winter Series

The Sorghum Connection Series, launched in September by the Kansas Grain Sorghum Commission (KGSC) in collaboration with K-State Research and Extension and the Department of Plant Pathology, announces a comprehensive winter educational program.

Building on the success of its inaugural field day series focused on stalk rot prevention and producer profitability, the Sorghum Connection team is offering an additional series of one-day events across central and western Kansas. The events will be held in Salina on Dec. 4, Hays on Dec. 5, and Garden City on Dec. 6.

Attendees will gain valuable insights from leaders at K-State on critical topics such as:

- Managing chinch bug populations by Anthony Zukoff
- Effective weed management strategies by Sarah Lancaster
- Unleashing the potential of sorghum in the pet food industry by Julia Pezzali
- Navigating the sorghum market outlook by Dan O'Brien

Each event will begin with registration at 8:00 AM and will conclude at approximately 3:00 PM. To register or learn more about these events, please visit www.ksgrainsorghum.org.

The Sorghum Connection Series offers a unique opportunity for Kansas sorghum growers to connect, learn, and stay ahead of the curve. Don't miss this chance to cultivate success in the years ahead.



SORGHUM CONNECTION **WINTER SERIES**

Mark your calendars for local winter summits aimed to bring multi-disciplinary, data-driven information to Kansas grain sorghum producers to help improve on-farm productivity and profitability.

DECEMBER 4, 2024 | SALINA

DECEMBER 5, 2024 | HAYS

DECEMBER 6, 2024 | GARDEN CITY