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Research and Extension

Extension Agronomy

eUpdate

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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.

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1. Calculating the value of poultry litter and proper storage considerations

The use of poultry litter can contribute to reducing the cost of fertilizer inputs for many operations, depending on the price and transportation cost of the litter. For many farmers, the use of poultry litter may represent significant savings, particularly in times of high fertilizer prices. However, for many producers, there is a “hassle factor” with using poultry litter. Reliable delivery, storage site location, uniform application, access to application equipment, and odor can all be additional challenges to producers unfamiliar with its use and should be a consideration.

Calculating poultry litter value

How valuable is poultry manure? This may not be a straightforward answer and depends on several factors, including the nutrient(s) required for a specific field. Here is one example using the average nutrient analysis values from southeast Kansas of 56-53-46 (N-P₂O₅-K₂O lb per ton):

Year 1

- 35% of N is inorganic (all available) = 19.6 lb N/ton litter
 - 65% of N is organic (25% is available in year 1) = 9.1 lb N/ton litter
 - Total N available in year 1 = 28.7 lb N/ton litter
 - Total value of N available in year 1 (@ \$0.62/lb N) = \$17.80/ton litter
 - Phosphorus (P) is 50% available in year 1 = 26.5 lb P₂O₅/ton litter
 - Total value of P in year 1 (@ \$0.37/lb P₂O₅) = \$9.80/ton litter
 - Potassium (K) is 100% available in year 1 = 47.0 lb K₂O/ton litter
 - Total value of K in year 1 (@ \$0.28/lb K₂O) = \$13.16/ton litter
- **Total in year 1 = \$40.76/ton litter**
• **Residual N and P = \$26.73/ton litter**

More information on nutrient availability in poultry manure is available online in eUpdate Issue 982 at <https://bit.ly/49r2ak5>. In addition to the N, P, and K, poultry litter also contains sulfur, micronutrients, and organic matter, which adds additional value to the poultry litter.

Storage considerations

Proper storage of manure is important to prevent runoff contamination of water and odor problems. The following practices should be utilized:

- Avoid stockpiling litter near homes, public roadways, and drainage ditches.
- Stockpile litter at least 200 feet from “Waters of the State.”
- Use tarps on litter piles to keep litter dry, reduce odor, and reduce N losses from volatilization.
- Create an earthen berm around piles to allow time for water and nutrients running off the pile to infiltrate.

Additional considerations when selecting a suitable storage site

- Locate stockpiles in areas with minimal slope.
- Avoid sites that slope toward waterways and receive extraneous drainage.
- Locate sites in areas surrounded by grass that can serve as a buffer.
- Avoid sensitive groundwater areas and sites in close proximity to wells.



Figure 1. Poultry litter stockpiles. Photo by Dan Donnert, K-State Research and Extension.

If poultry litter is a regular part of your operation's fertility program, consider constructing improved poultry litter storage sites that include a storage pad built out of lime screenings, all-weather truck access, and a grass or cropland buffer to trap nutrients leaving the storage site. K-State Research and Extension Watershed Specialists may be able to help in identifying suitable storage locations and/or designing improved temporary storage sites that pose the least possible environmental risk from runoff for the area.

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2. K-State 2023 Fertilizer Research Report is now available online

[The Kansas Agricultural Experiment Station fertilizer reports include preliminary results of research conducted on fertilizer use and management practices for crops in Kansas. These studies are conducted across the state, varying from year to year. In this report, research was conducted in Barton, Brown, Clay, Dickinson, Ellis, Franklin, Gove, Jefferson, Jewell, Logan, McPherson, Mitchell, Reno, Republic, Riley, Saline, and Shawnee counties. The research reports included in the 2023 issue are listed below.](#)

- Nitrogen and Phosphorus Rates' Impact on Different Varieties of Alfalfa in Central Kansas
- Assessing the Impact of the 4R Nutrient Management on Nitrogen Use Efficiency in Corn
- Evaluating the Impact of Long-Term Phosphorus Placement on Corn and Soybean Rotation under Minimum Tillage System
- Could the Use of Nitrification Inhibitor Optimize the Nitrogen Use Efficiency of Corn Production?
- Corn and Soybean Yield as Affected by Cover Crop and Phosphorus Fertilizer Management
- Evaluation of Plant Tissue Analysis to Assess Phosphorus Nutritional Status for Corn and Soybean
- Chloride Fertilization's Impacts on Kansas Winter Wheat Grain Yield During 2021-2022
- Field Evaluations of Nitrogen-Fixing Products in Grain Sorghum
- Assessing Corn Response to Cover Crops and Nitrogen Fertilization in a No-Till, Three-Year Rotation in Northeast Kansas
- 2022 Fertilizer Station Weather Report

To access the Fertilizer Research Report for 2023, you can scan the QR code below with a cell phone or tablet or by using this link: <https://newprairiepress.org/kaesrr/vol9/iss8/>



Interested in the historical reports? You can access past years here: <https://www.agronomy.k-state.edu/outreach-and-services/kaes-research-reports/fertilizer.html>

3. Significant precipitation fell over southwest Kansas in mid-December

A storm system brought significant precipitation to much of southwest Kansas last week. Most of the precipitation fell as rain, but with temperatures in the 30s during much of the event, some freezing rain was noted, especially early in the event on Dec. 13. A tenth of an inch of ice was reported in Gove County, with a thin glaze of ice noted in a few locations, including at Colby, Goodland, Hoxie, Leoti and Tribune. Snow fell in some areas, particularly on the northern fringes of the precipitation shield. The highest measured snow total was 4 inches in northern Wallace County, 3.3 inches in Tribune, and 1 to 3 inches in Sherman County, including the Goodland area. Later, snow mixed in at times further south as heavier precipitation increased the layer of cold air aloft, allowing precipitation to remain frozen all the way to the surface. Both Garden City and Dodge City reported periods of snow before precipitation changed back to rain.

Precipitation lasted into early on the 15th. Storm totals exceeded 3 inches in some areas (Figure 1, Table 1). The highest total was 3.59 inches, reported by a CoCoRaHS observer in southern Meade County. Reports of over 3 inches also came from Seward, Clark, Ford, and Edwards Counties. In most areas, the bulk of the precipitation fell on the 14th and was reflected in the 24-hour totals from the morning of the 15th (Table 2). The highest 24-hour total was in Clark County, where the cooperative observer in Ashland picked up 2.30 inches. Not far behind was a 2.24 inches report near Bucklin, in Ford County. The Bucklin total was historic, as it was the largest 24-hour amount ever recorded in the month of December at that location, where records date back 130 years. At least ten locations recorded a top 5 wettest December day during this event, including Dodge City, Greensburg, Hays, and Russell.

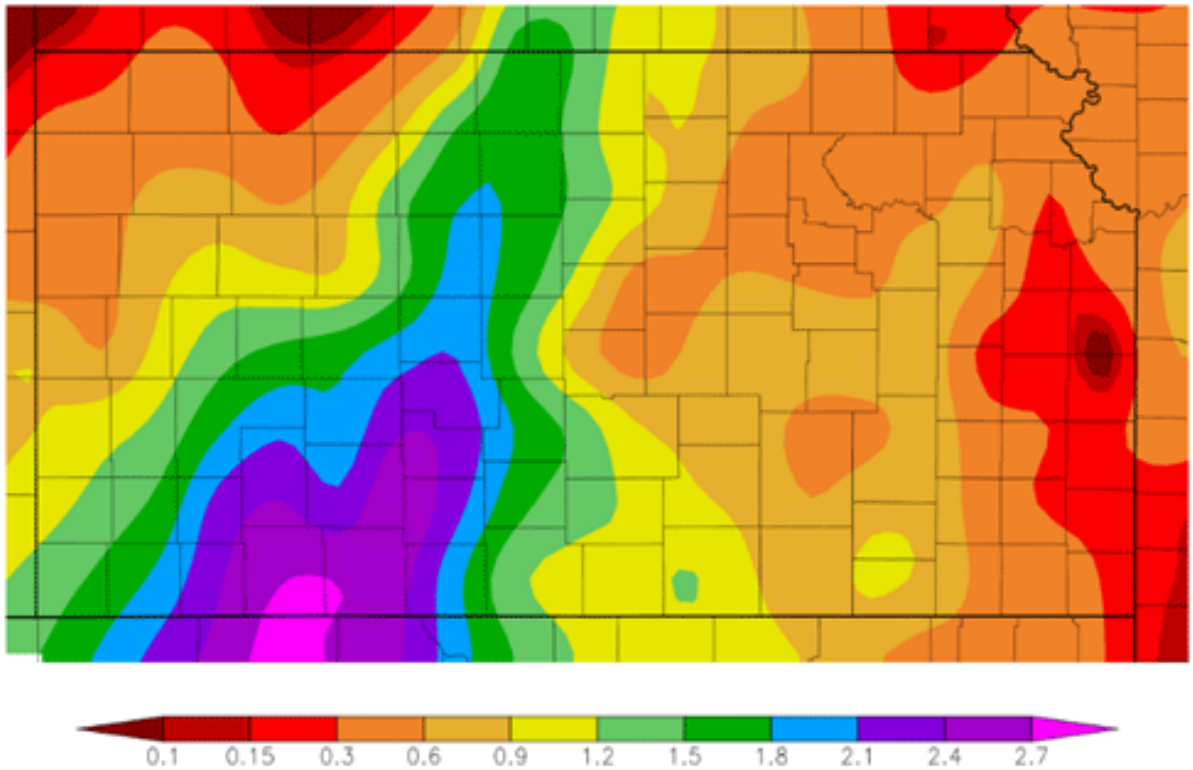


Figure 1. 7-day precipitation totals for the period Dec. 11-17, 2023. Source: HPRCC.

Table 1. The highest storm total precipitation amounts from selected counties across Kansas. Totals are in decreasing order and are based on totals for the period December 13-16, 2023.

Location	Network	County	Total (inches)
Meade 15.5 SSE	CoCoRaHS	Meade	3.59
Minneola 4.1 SSE	CoCoRaHS	Clark	3.49
Satanta	Mesonet	Seward	3.12
Bucklin 0.1 SE	CoCoRaHS	Ford	3.02
Lewis 3.8 W	CoCoRaHS	Edwards	3.00
Ingalls 6.9 SW	CoCoRaHS	Gray	2.67
Mullinville 5.7 NNW	CoCoRaHS	Kiowa	2.66
Kalvesta 12.1 NNW	CoCoRaHS	Finney	2.43
Sublette 0.6 WSW	CoCoRaHS	Haskell	2.43
Coldwater 6.7 NW	CoCoRaHS	Comanche	2.41
Jetmore 11.5 WNW	CoCoRaHS	Hodgeman	2.38
Timken 7.8 SSW	CoCoRaHS	Rush	2.27
Hugoton 0.6 NNW	CoCoRaHS	Stevens	2.26
Burdett 3S	COOP	Pawnee	2.20
Russell 0.1 E	CoCoRaHS	Russell	2.17
Sublette 1E	Mesonet	Haskell	2.12
Victoria 0.1 ESE	CoCoRaHS	Ellis	2.01

Galatia 4.6 E	CoCoRaHS	Barton	1.93
Utica 0.0 E	CoCoRaHS	Ness	1.90
Hays	COOP	Ellis	1.80
Natoma 6.7 NNE	CoCoRaHS	Osborne	1.76
Sylvan Grove 5 NNW	COOP	Lincoln	1.76
Smith Center	COOP	Smith	1.70
Ulysses 13.0 ENE	CoCoRaHS	Grant	1.68
La Crosse	Mesonet	Rush	1.68
Syracuse 14.4 SSW	CoCoRaHS	Hamilton	1.65
Plainville 4 WNW	COOP	Rooks	1.62
Ionia	COOP	Jewell	1.53
Holyrood 4.8 N	CoCoRaHS	Ellsworth	1.50

Table 2. Records for the 24-hour period ending midnight or 7 AM on December 15, 2023. The 24-hour period at WBAN sites ends at midnight, while the 24-hour period at COOP sites ends at 7 AM. WBAN stands for Weather Bureau, Air Force, and Navy, which refers today to any observation provided and measured by a government agency. COOP refers to a cooperative citizen observer. T in the rankings refers to a tie.

Location	Network	County	12/15 Precip. (in.)	12/15 Rank Most 1-day Dec. Precip.	Year Records Began	Record Highest 1-day Precip. in Dec.	
						Amt.	Date
Ashland	COOP	Clark	2.30	3rd	1900	2.98	12/30/2006
Bucklin 1SE	COOP	Ford	2.24	1st	1893	2.24	12/15/2023
Offerle 5S	COOP	Edwards	1.85	2nd	1973	1.85	12/30/2006
Dodge City	WBAN	Ford	1.76	3rd	1874	2.43	12/29/2006
Greensburg	COOP	Kiowa	1.76	2nd	1893	1.87	12/27/2018
Hays	COOP	Ellis	1.71	2nd	1952	1.83	12/28/2019
Coldwater	COOP	Comanche	1.60	7th	1893	2.52	12/11/2007
Burdett 3S	COOP	Pawnee	1.60	3rd	1941	1.67	12/30/2006
Caldwell	COOP	Sumner	1.34	T 7th	1940	2.64	12/20/2011
Cimarron	COOP	Gray	1.28	8th	1911	2.60	12/30/2006
Russell	WBAN	Russell	1.26	3rd	1949	1.78	12/13/2015
Smith Center	COOP	Smith	1.18	9th	1910	1.78	12/18/1918
Kingman	COOP	Kingman	1.12	15th	1907	2.58	12/27/2018
Plainville 4WNW	COOP	Rooks	1.03	9th	1893	2.70	12/14/2015
Utica	COOP	Ness	1.02	10th	1916	2.78	12/30/2006
Bluff City	COOP	Harper	0.95	9th	1973	1.45	12/27/2018
Ionia	COOP	Jewell	0.93	9th	1894	1.77	12/14/2015
Cedar Bluff Dam	COOP	Trego	0.89	5th	1949	2.37	12/30/2006
Hill City	WBAN	Graham	0.78	13th	1907	2.17	12/29/2006
Garden City	WBAN	Finney	0.70	18th	1893	2.27	12/29/2006

In at least fifteen locations, the totals from this event, when added to the first twelve days of the month, are enough to ensure a top 20 wettest December (Table 3), even if no additional precipitation falls for the rest of the month. At about half those locations, a top 10 wettest December is guaranteed. One of those locations is Smith Center, which had comparatively less precipitation than further south and west, but their 1.70 inches total is still good enough to secure at least a 9th wettest December. With two weeks left in this month, the final monthly totals may increase further, and more locations could finish in the top 10. The 7-day precipitation outlook calls for at least half an inch of precipitation for most of the state by Christmas morning, with totals over an inch possible in southeastern Kansas (Figure 2).

Table 3. December 2023 precipitation data at selected long-term climate sites in Kansas. POR refers to the period of record, the total number of available years of climate data at a given recording site. All precipitation amounts are reported as inches.

Location	County	Dec. 13-16 Storm Total	Dec. 1-12 Precip	Dec. '23 Precip. to Date (1 st -16 th)	Dec. '23 Precip. to Date Rank/POR	Most Precip. in Dec.		Normal Dec. Precip.
						Amt.	Year	
Ashland	Clark	2.92	0.11	3.03	5 / 124	4.59	2006	1.00
Bucklin 1SE	Ford	2.84	0.16	3.00	4 / 103	4.16	2006	1.04
Cedar Bluff Dam	Trego	1.17	0.00	1.17	12 / 72	4.60	2006	0.80
Cimarron	Gray	2.22	0.00	2.22	6 / 113	5.35	2006	0.90
Coldwater	Comanche	2.01	0.30	2.31	T11 / 120	4.19	2007	1.12
Concordia	Cloud	0.77	0.05	0.82	51 / 139	3.91	2013	1.04
Dodge City	Ford	2.00	Trace	2.00	10 / 150	4.36	1877	0.96
El Dorado	Butler	0.74	0.65	1.39	45 / 124	5.04	1984	1.30
Emporia	Lyon	0.86	0.08	0.94	26 / 56	3.10	2011	1.30
Garden City	Finney	1.52	0.00	1.52	10 / 123	4.97	2006	0.56
Goodland	Sherman	0.48	0.00	0.48	37 / 117	2.90	1924	0.47
Greensburg	Kiowa	2.30	0.49	2.79	4 / 115	4.21	1918	0.96
Hays	Ellis	1.80	0.00	1.80	13 / 130	3.11	1913	0.76
Hill City	Graham	0.83	Trace	0.83	20 / 99	4.80	1913	0.66
Kingman	Kingman	1.29	0.36	1.65	T20 / 95	3.62	1943	1.29
Manhattan	Riley	0.62	0.19	0.81	62 / 131	3.84	1913	1.19
Medicine Lodge	Barber	1.12	0.01	1.13	34 / 126	3.98	1984	1.09
Plainville 4WNW	Rooks	1.62	Trace	1.62	T15 / 112	3.91	2006	0.95
Russell	Russell	1.75	0.01	1.76	8 / 72	3.20	1984	0.74
Sedan	Chautauqua	0.87	0.74	1.61	53 / 131	5.41	1895	1.86
Smith Center	Smith	1.70	0.00	1.70	9 / 114	4.69	1913	0.79
Topeka	Shawnee	0.86	0.16	1.02	72 / 137	5.08	1944	1.49
Tribune	Greeley	1.07	0.00	1.07	13 / 117	3.82	2006	0.56
Wichita	Sedgwick	0.94	Trace	0.94	64 / 136	4.71	1984	1.22

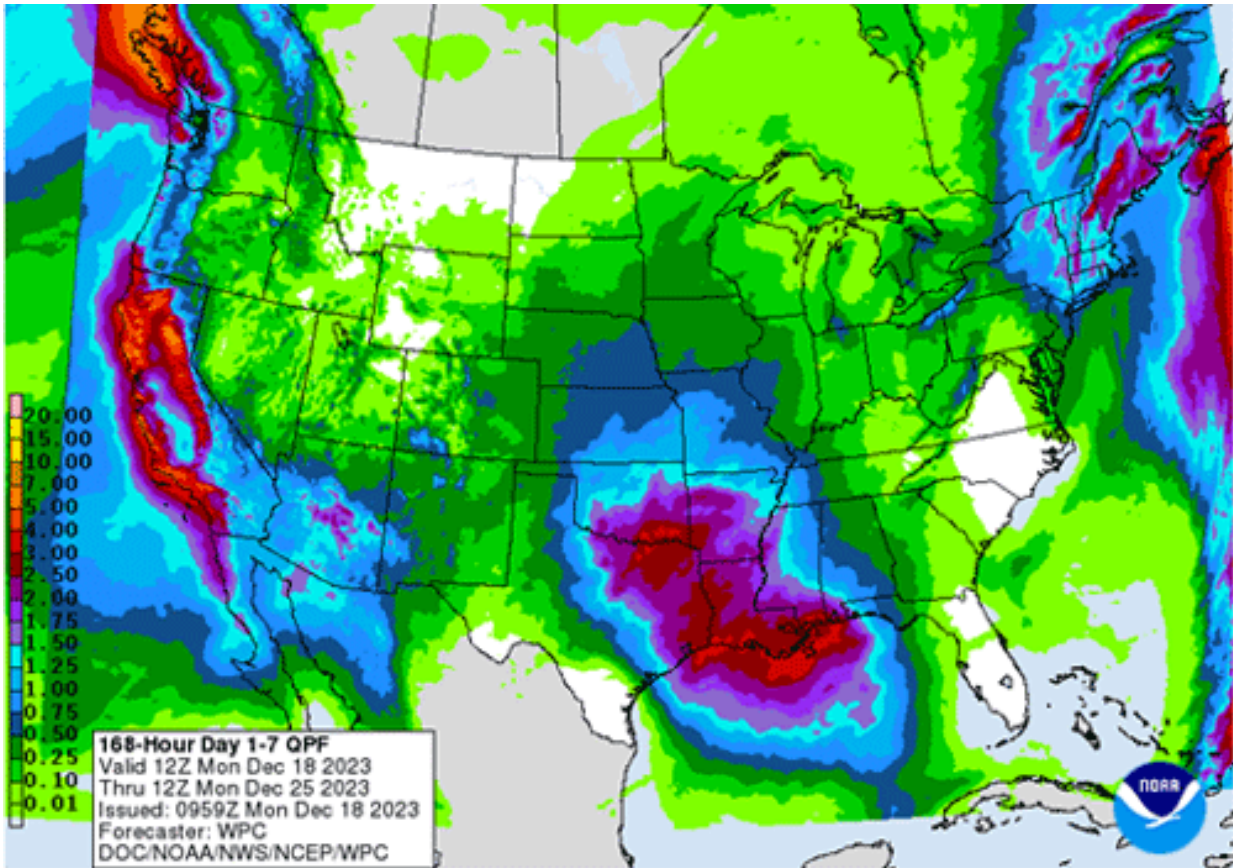


Figure 2. The Weather Prediction Center’s 7-day precipitation outlook is valid for December 18 to 25, 2023.

As of December 17, the Midwest Regional Climate Center reported the average statewide precipitation for the month so far is 1.34 inches. This total is ahead of the 30-year average amount of 1.07 inches for the entire month of December, and ties for the 25th wettest December on record, dating back to 1895 (Table 4). Kansas needs just 0.16 inches more this month to crack the top 20. A top 10 wettest December will occur if that final total reaches 2.12 inches or greater. The wettest December in Kansas was 1913 when an average of 3.15 inches fell. While that record amount appears to be out of reach, it will be interesting to see how high 2023 finishes on the list of wettest December, especially if the current precipitation forecast verifies. Stay tuned!

Table 4. The top 25 wettest Decembers on record in Kansas for the period 1895-2022, based on average statewide monthly precipitation. Source: NCEI.

Rank	Year	Precip.	Rank	Year	Precip.	Rank	Year	Precip.	Rank	Year	Precip.
1	1913	3.15	8	2018	2.19	15	1991	1.81	22	1924	1.46

2	2006	2.67	T9	1911	2.12	16	1942	1.77	23	1907	1.45
3	1984	2.63	T9	1973	2.12	17	1992	1.70	24	1980	1.38
4	1918	2.61	11	1997	2.09	18	1965	1.68	25	2014	1.34
5	2007	2.48	12	1947	1.98	19	1898	1.61	Normal Precipitation for December: 1.07" (based on 1991-2020)		
6	2015	2.36	13	1944	1.93	20	1943	1.50			
7	2011	2.26	14	1982	1.89	21	1895	1.49			

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4. Unseasonably mild weather for December in Kansas

Christmas is only a few days away, and astronomical winter begins on the 21st, but the weather certainly doesn't look or feel winter-like right now. Heavy rain drenched southwest Kansas last week, with precipitation totals more typical of late spring than late fall, and mild temperatures have been the rule for most of this month. For those traveling for the holidays, a lack of snow in Kansas and much of the United States is good news, as travel delays due to the weather are less likely. But for those dreaming of a white Christmas in Kansas, it appears that holiday activities such as dashing through the snow and building a snowman in the meadow may happen only in your dreams. All hope is not lost, though, as the forecast models call for a precipitation event on Christmas Eve. However, as it appears now, temperatures will be too warm for anything but rain in the eastern half of the state. In the west, temperatures may be cold enough for snow, but the bulk of the moisture may end up too far east to give those areas anything more than a light snow event. The meteorological definition of a white Christmas is at least 1 inch of snow on the ground at 7 AM on Christmas morning, and the chances of that happening are low in the west and near zero in the east. The models are not in complete agreement yet though, so monitor forecasts if you have travel plans between now and Christmas.

December has been unseasonably mild in Kansas so far. Through the first 20 days of December, the average daily temperature across the Kansas Mesonet has been above normal for 17 days. Only December 1, 2, and 10 averaged below normal. The warmest conditions were on the 7th when highs were in the 60s and 70s statewide, leading to an average temperature of nearly 17 degrees above normal that day. With more days of mild weather in the forecast in the days leading up to Christmas, December 2023 could go down in history as one of the warmest on record. The average temperature across the Kansas Mesonet for the first 20 days of December is 39.3°F, or 5.3° above normal. If Kansas' statewide average temperature were to finish at that number, 2023 would be the second warmest of the last 129 Decembers on record, behind only 2021 (Table 1), which averaged 41.1°F.

Table 1. The 15 warmest Decembers in Kansas, as ranked by average statewide temperature (in °F) for the month, dating back to 1895. Source: NCEI.

Rank	Year	Average	Rank	Year	Average	Rank	Year	Average
1	2021	41.1°	6	1965	37.4°	T8	2001	36.9°
2	1957	38.5°	7	1939	37.3°	12	1999	36.8°
3	1896	38.2°	T8	1931	36.9°	13	2019	36.7°
4	1933	37.9°	T8	1946	36.9°	T14	1988	36.3°
5	2015	37.6°	T8	1959	36.9°	T14	1991	36.3°

Could 2023 be the warmest December on record? We will probably fall short of 2021's mark, but we could get closer to the record than we are now. Mild temperatures are forecast in the days leading up to Christmas, with highs potentially reaching 60 degrees in the eastern half of the state. The Climate Prediction Center's outlook for the last 7 days of December favors above-normal temperatures across the state as well, with the highest chances in northeast Kansas (Figure 1). Still, it's worth noting that the same forecast models that disagree on precipitation around Christmas Eve also have a difference of opinion regarding what happens after Christmas. The American model, the GFS, favors mild temperatures after Christmas, while the European model, the ECMWF, thinks temperatures will cool

to near normal.

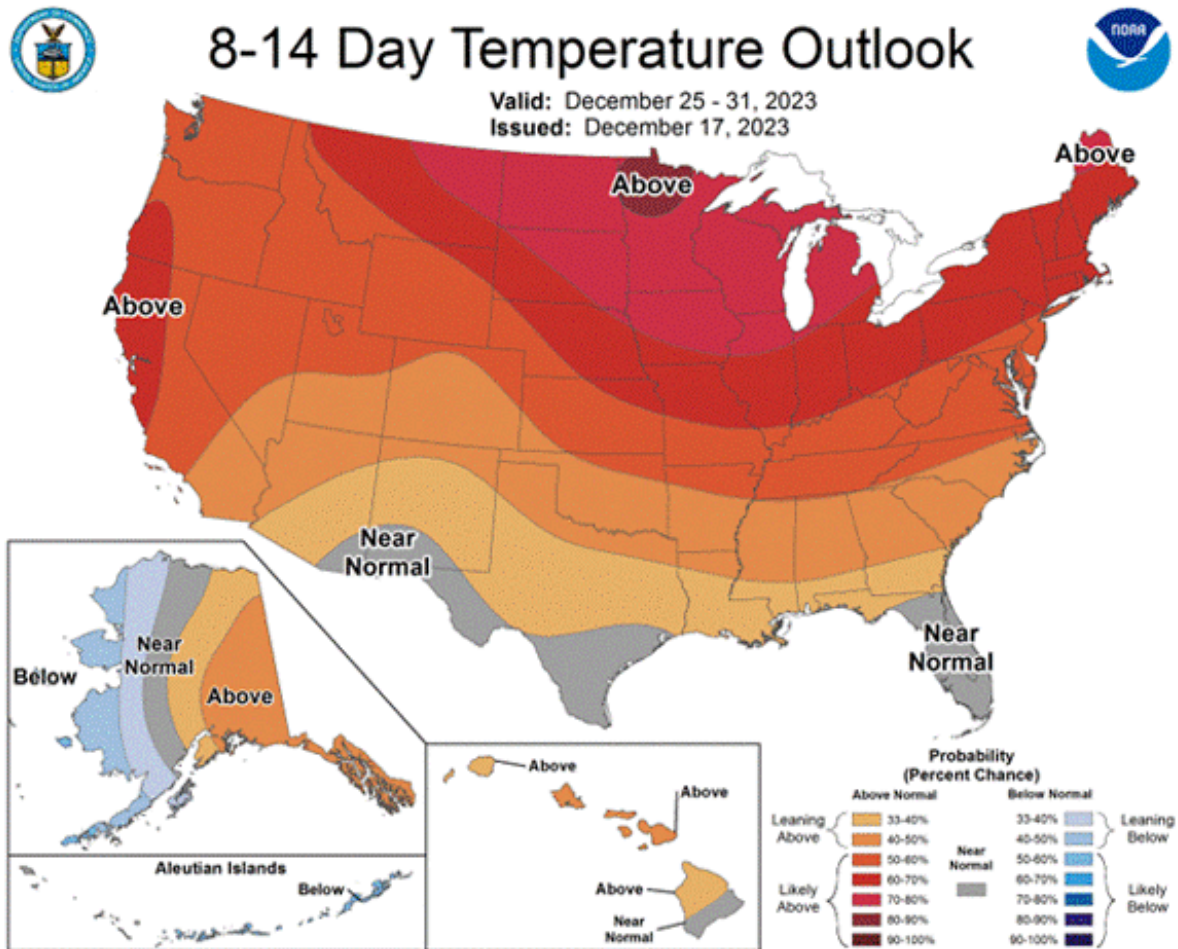


Figure 1. The Climate Prediction Center's 8 to 14-day outlook for the period December 25-31, 2023.

Even if we don't set a new record this month, it appears likely that 2023 will be a top-10 warmest December for the state. The final ranking for the month, based on the official monthly average temperature for Kansas, will be released by the National Centers for Environmental Information (NCEI) on January 9. The average precipitation data will also be released then, at which time we will see how high Kansas ranks on the list of wettest Decembers on record. Topping both lists is unlikely, but a top-10 finish on both lists is a definite possibility. Individual climate divisions are even more likely to finish in the top 10 on their respective lists. Southwest Kansas, the wettest division so far this month with an average of 2.27 inches (Source: Midwest Regional Climate Center), could finish in the top three wettest Decembers. North Central Kansas is running the most above normal of any division in the state; their departure from normal through the first 20 days of the month is +7.0°F. Should their departure from normal still be that high at month's end, it would be their 2nd warmest December on record. New records are also possible at individual observation sites. Dodge City is already guaranteed a top 10 finish on their list of wettest Decembers thanks to 2.00" of precipitation this month. Hill City and Medicine Lodge's average monthly temperatures through the 20th are above

their current record for warmest December, set back in 1957. Most of the official observing sites in Kansas will likely have a top 10 warmest December should their current average temperatures stay where they are now (Table 2). An updated report detailing December's final rankings will be issued soon after the official NCEI numbers are released.

Table 2. Records for warmest monthly minimum temperature in December at selected locations across Kansas. Rankings are limited to months with no missing records. Source: SC-ACIS. Years with a (*) indicate the most recent of multiple occurrences. ^ Data for 2023 are as of December 20th. T in the ranking columns refers to a tie with at least one other year.

Location [Number of Years]	Coldest			Average			
	December Temperature (°F)			December Temperature (°F)			
	2023 [^]	2023 Rank - Highest	Record Highest (Year)	2023 [^]	2023 Rank – Warmest	Record Highest (Year)	Normal (2023 Dep.)
Ashland [104 years]	16°	T 2nd	20° (1936)	40.3°	8th	42.3° (1933)	34.3° (+6.0°)
Chanute [103 years]	23°	1st	22° (2021)	43.6°	3rd	48.2° (2021)	37.0° (+6.6°)
Concordia [136 years]	18°	T 2nd	21° (1931)	40.1°	3rd	42.3° (1933)	31.5° (+8.6°)
Dodge City [150 years]	17°	T 3rd	18° (2019)	40.4°	T 6th	44.6° (1889)	34.0° (+6.4°)
Emporia [95 years]	23°	1st	19° (1959*)	40.9°	4th	44.7° (2021)	34.2° (+6.7°)
Garden City [102 years]	11°	T 6th	15° (1991*)	37.7°	T 6th	40.1° (1933)	32.3° (+5.4°)
Goodland [110 years]	11°	T 4th	13° (1896)	37.5°	4th	39.6° (1933)	30.8° (+6.7°)
Hays [115 years]	17°	1st	16° (2019*)	37.5°	3rd	38.7° (1933)	31.4° (+6.1°)
Hill City [86 years]	16°	1st	15° (2019)	38.6°	1st	38.0° (1957)	31.5° (+7.1°)
Horton [107 years]	17°	1st	16° (1957)	36.8°	T 5th	39.5° (1965)	30.5° (+6.3°)

Manhattan [96 years]	20°	1st	16° (2015*)	38.5°	4th	40.9° (2021)	32.7° (+5.8°)
Medicine Lodge [98 years]	20°	2nd	21° (1957)	44.4°	1st	44.3° (1957)	35.5° (+8.9°)
Olathe [97 years]	23°	1st	20° (1931)	40.9°	3rd	45.0° (2021)	33.8° (+7.1°)
Salina [115 years]	20°	1st	18° (2015*)	39.8°	6th	40.6° (1939)	32.9° (+6.9°)
Sedan [103 years]	23°	1st	20° (1986*)	43.0°	5th	46.5° (2021)	36.6° (+6.4°)
Topeka [136 years]	21°	2nd	22° (1931)	40.6°	5th	45.3° (1889)	33.9° (+6.7°)
Tribune [105 years]	9°	T 5th	11° (1994*)	35.3°	T 13th	38.9° (1933)	31.0° (+4.3°)
Wichita [136 years]	22°	2nd	23° (1931)	41.3°	5th	46.4° (1889)	35.6° (+5.7°)

One reason for the high ranking on the list of warmest Decembers is a lack of Arctic air this month. So far this month, the coldest reading in the state is 5°, recorded on the 10th at the Hamilton County Mesonet site. A December with no sub-zero readings anywhere in the state is not unprecedented; it happened in some of our warmest years on record such as 1896 (coldest 4°), 1957 (0°) and 2015 (1°). Speaking of a lack of cold, a few places in Kansas may set a more obscure record this year: the December in which the coldest temperature recorded during the month was the highest of any December. For example, in Manhattan, the coldest so far this month (as of the 20th) is 20° back on the 2nd and 3rd of December. In every other December on record, the temperature fell to 16° or colder at least once. As of the 20th, at least nine locations in Kansas are still in the running for their warmest monthly minimum in December.

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5. Kansas Ag-Climate Update for November 2023

The Kansas Ag-Climate Update is a joint effort between our climate and extension specialists. Every month, the update includes a summary of that month, agronomic impacts, relevant maps and graphs, 1-month temperature and precipitation outlooks, monthly extremes, and notable highlights.

November 2023: Drought conditions remain in central Kansas

The average statewide temperature for November was 45.3°F, or 2.0°F above normal. This ranked as the 23rd warmest November out of 129 years of records, dating back to 1895. All nine climate divisions were above normal. Anomalies ranged from +1.2°F (northeast) to +3.1°F (northwest). Northwest (13th), North Central (18th), and West Central (18th) all had the top 20 warmest Novembers.

The average statewide precipitation for November was 0.99", or 76% of normal. This amount was 0.31" below normal and ranked as the 63rd driest November on record. Central and East Central Kansas had above-normal precipitation, while all other divisions were below normal. South Central (1.58") and Northeast (1.47") were the two wettest divisions, while West Central (0.21") and Northwest (0.25") were the two driest divisions.

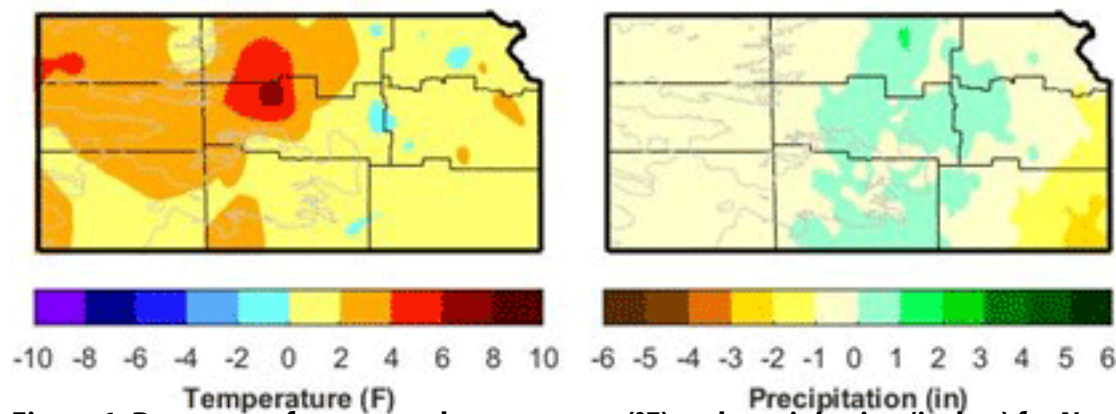


Figure 1. Departures from normal temperature (°F) and precipitation (inches) for November 2023.

View the entire November 2023 Ag-Climate Update, including the accompanying maps and graphics (not shown in this eUpdate article), at <http://climate.k-state.edu/ag/updates/>

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6. Cover Your Acres Winter Conference, January 16-17 in Oberlin

K-State Research and Extension will host the 21st annual [Cover Your Acres Winter Conference](#) for crop producers and consultants on January 16 and 17. The conference will take place in the traditional in-person format at the Gateway Civic Center in Oberlin, KS.

Cover Your Acres is a producer-driven meeting focused on new ideas and research-based updates in crop production in northwest Kansas and the Central High Plains region.

The conference, which typically draws more than 400 attendees from Kansas and other states, highlights the latest technology, methods, and conservation practices to improve crop production in the region. This year's conference will feature university specialists and industry representatives discussing what's driving profitability in northwest Kansas farms. **Confirmed session topics** will include economic drivers on northwest Kansas farms, weed resistance management, cropping systems, and soil fertility management. Additional session topics and speakers are still being finalized and will be announced in an upcoming eUpdate article and on the conference website (link included below).

The same programs will be offered on both days of the conference. Participants attending both days will find it easier to catch most or all of the programs. The sessions are followed by a social on Tuesday evening where attendees can visit with industry representatives and conference speakers while enjoying hor d'oeuvres.

Online registration is open. The fee is \$55 for Tuesday, January 16, \$60 for Wednesday, January 17, or \$80 for both days. After January 10th, and for walk-ins, the cost is \$80 per day. The conference fee includes lunch, morning and afternoon refreshments, and educational materials. The program will offer continuing education unit (CEU) credits for Certified Crop Advisors and 1A for Commercial Applicators credit.

To view the preliminary conference details, lodging accommodations, and online registration, visit www.northwest.ksu.edu/coveryouracres. For questions, call 785-462-6281.

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7. K-State Corn and Soybean Schools to be held Jan. 16-19, 2024

In January 2024, look for a new format for the traditional K-State Corn and Soybean Winter Crop Schools. K-State Research and Extension, in collaboration with Kansas Corn and Kansas Soybean, has combined the schools for a whole-day program covering both crops.

Online registration is open! Please visit <https://kscom.com/schools/> and get signed up today!

2024 K-State Corn and Soybean Crop Schools

- **January 16 (Tuesday) – Parsons**
K-State Southeast Research and Extension Center
- **January 17 (Wednesday) – Hesston**
Agco Corporation
- **January 18 (Thursday) – Garden City**
Corteva Agriscience Research Center
- **January 19 (Friday) – Olathe**
John Deere Ag Marketing Center

Participant check-in will begin at 8:30 a.m. at each location with the program starting at 9:00 a.m. The school will wrap up around 3:00 p.m. Morning refreshments and a hot lunch will be provided. CCA and Commercial Pesticide Applicator credits have been applied for. Save the date for one of the locations near you!

Each school will feature a range of region-specific topics covering corn and soybean production. The final agendas for each location will be shared in an upcoming eUpdate. Some of the topics include:

- Agronomics for corn and soybean production
- Corn and soybean disease update
- Carbon credits
- Updates from the Kansas Mesonet
- Market update
- Insect pressure update
- Planter technology
- Weed control
- Soil fertility
- Irrigation for corn and soybean crops

The poster features a central white text area flanked by two vertical images. The left image shows a close-up of a soybean pod on a stem, and the right image shows a field of young corn plants. The central text is set against a dark green background.

**2024 KANSAS
CORN & SOYBEAN
SCHOOLS**

CORN K-STATE

REGISTER AT [KSCORN.COM/SCHOOLS](https://kscorn.com/schools)

SIGN-IN BEGINS AT 8:30 A.M.
SPEAKERS BEGIN AT 9 A.M.
SCHOOLS WRAP UP AT 3 P.M.

Jan. 16 – Parsons

Jan. 17 – Hesston

Jan. 18 – Garden City

Jan. 19 – Olathe

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