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eUpdate

10/10/2024

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.

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eUpdate Table of Contents | 10/10/2024 | Issue 1024

1. Fall fertilization of smooth brome and tall fescue

Cool-season forages require annual fertilization for optimum production. Fall is a good time to plan on fertilizing cool-season improved pasture perennial grasses such as smooth brome and tall fescue (Figure 1). Particular attention must be paid to nitrogen, phosphorus, potassium, and pH. More information on fall soil testing of hayfields and pastures was published in this recent eUpdate article: https://eupdate.agronomy.ksu.edu/article/fall-soil-testing-of-hayfields-and-pastures-611-3.

Balanced fertility is essential. For example, adding nitrogen will not produce optimum yields if phosphorus is low. Soils low in phosphate limit plant and root growth. Fertilizer should be applied by broadcasting in the fall or before spring growth begins.

Figure 1. Fall growth of established smooth brome field prior to fertilizer application. Photos by John Holman, K-State Research and Extension.

Nitrogen Source. Nitrogen management is critical for optimum smooth brome production. Several nitrogen sources are available—liquid nitrogen solutions, urea, ammonium nitrate, and anhydrous ammonia. Anhydrous ammonia is not extensively used on permanent pastures because application is difficult. Nitrogen source research generally has shown little difference among sources under most conditions. When urea fertilizers—including liquid nitrogen—are applied to moist soils covered with grass residue, an enzyme called urease can break down the urea to ammonia, which is lost to the air. This can occur fairly rapidly when moist conditions are followed by warm temperatures, and rapid drying occurs without rain to move the urea into the soil. If urea is applied from November through February, volatilization loss should be minimal.

Application Timing. When brome is grazed in the fall, the yearly nitrogen application should be split. If adequate soil moisture is available for good growth in late August and early September, apply all phosphorus and potassium indicated by a soil test plus 30-40 pounds of nitrogen per acre. Before the soil freezes in November or December, apply the remainder of the nitrogen recommended for haying or grazing. Split or late fall applications generally initiate earlier green-up in the spring.

If soil moisture is limited, apply all nitrogen, phosphorus, and potassium before the soil freezes in November or December. **To minimize loss, do not apply fertilizer to frozen soil.**

Spring applications should be made as soon as the soil thaws are acceptable for spring-only grazing.

Timely application is often delayed because of wet soils. An application needs to be applied in the fall or early spring to allow sufficient time for fertilizer incorporation to benefit forage production (Figure 2).

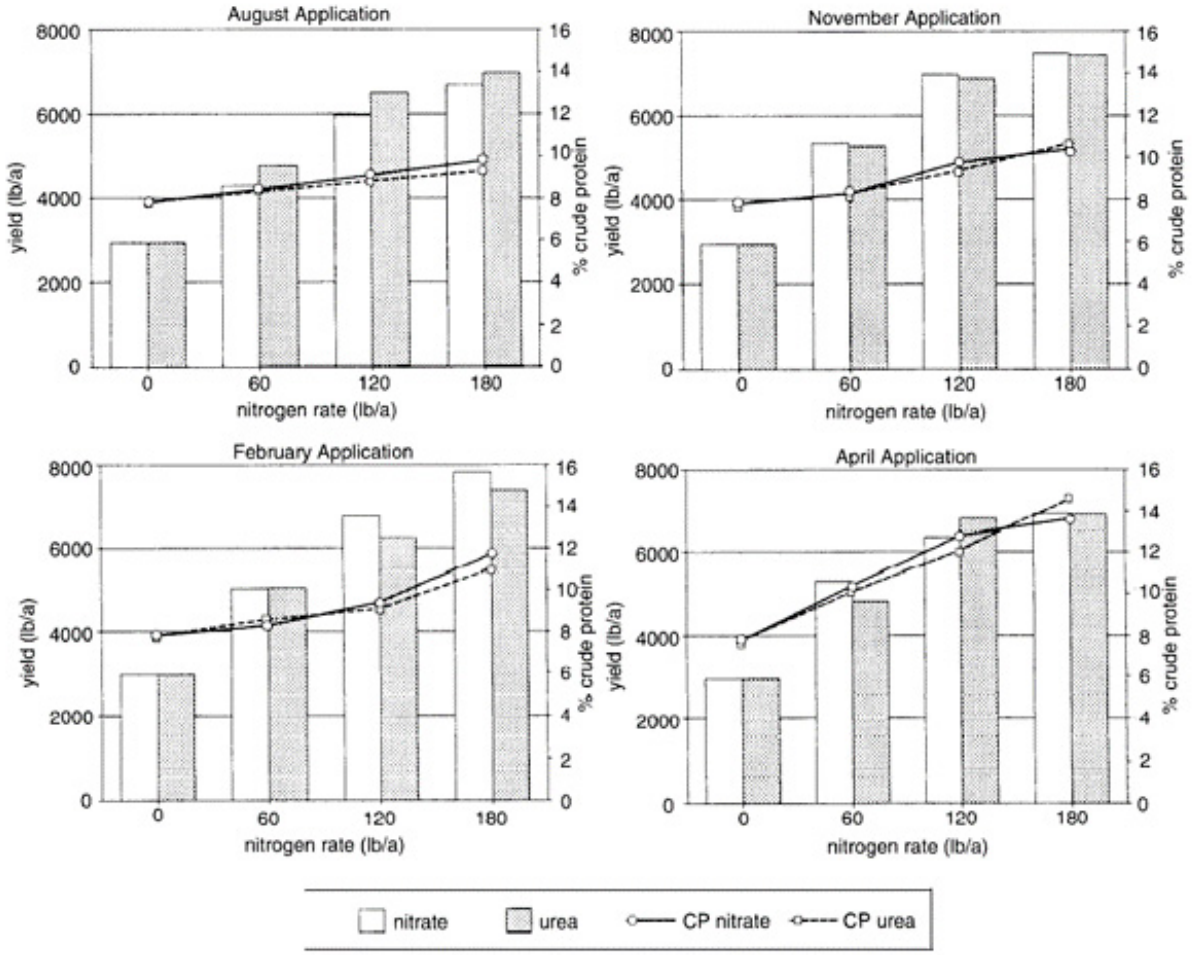

Figure 2. Timing of N application on smooth brome yield. Source: KSRE publication C402 Smooth Brome Production and Utilization.

Fertilizer Rates (N, P, and K). Fertilizer rate recommendations for N, P, and K for established stands of smooth bromegrass are shown in Tables 1, 2, and 3, respectively. When brome is to be utilized for hay production, excessive N may cause lodging and reduce the amount of harvestable hay. Nutrient rates in all tables are based on soil test values and yield goals. Nitrogen rate should be selected based on factors such as fertilizer cost, hay price, and/or grazing pressure.

Table 1. Nitrogen recommendations[1] for smooth bromegrass and fescue.

Expected Yield (tons/acre)	Production (lbs/ac)	New Seedling lb/a N
2	80	20
4	160	20
6	240	20
8	320	20

10	400	20

[1]Nitrogen rates required at various expected yields. The total N requirements presented only include expected yield adjustments and the total N requirements should be modified for other appropriate adjustments

The P recommendations are for the total amount of broadcast and banded nutrients to be applied. If Mehlich-3 P is greater than 20 ppm, then the basic P recommendation is zero. If Mehlich-3 P is less than 20 ppm, then the minimum P recommendation is 15

Table 2a. Phosphorus recommendations for smooth bromegrass and fescue established stands.

	Soil Test Level (ppm P)				
Established Stands	Very Low	Low	Medium	High	Very High
Expected Yield (tons/acre)	(0-8)	(9-15)	(16 - 20)	(21 - 30)	(31 or more)
	lb/a P_2O_5				
2	45	25	15	0	0
3	50	25	15	0	0
4	55	30	15	0	0
5	60	30	15	0	0
6	65	35	15	0	0

Table 2b. Phosphorus recommendations for smooth bromegrass and fescue new stands.

	Soil Test Level (ppm P)				
New Stands	Very Low	Low	Medium	High	Very High
Expected Yield (tons/acre)	(0-8)	(9-15)	(16 - 20)	(21 - 30)	(31 or more)
	lb/a P_2O_5				
2	70	35	15	0	0
2.5	75	40	15	0	0
3	80	40	15	0	0
3.5	85	45	15	0	0
4	90	45	15	0	0

The K recommendations are for the total amount of broadcast and banded nutrients to be applied. If extractable K is greater than 130 ppm, then basic K recommendations is 0. If less than 130 ppm, then a minimum recommendation is 15 lbs.

Table 3a. Potassium recommendations smooth bromegrass and fescue existing stands

	Soil Test Level (ppm K)				

Established stands	Very Low	Low	Medium	High	Very High
Expected Yield (tons/acre)	(0-40)	(40-80)	(81-130)	(131 - 160)	(161+)
	lb/a K_2O				
2	45	30	15	0	0
3	50	30	15	0	0
4	55	35	15	0	0
5	60	40	15	0	0
6	65	40	15	0	0

Table 3b. Potassium recommendations for new smooth bromegrass and fescue stands.

	Soil Test Level (ppm K)				
New Stands	Very Low	Low	Medium	High	Very High
Expected Yield (tons/acre)	(0-40)	(40-80)	(81-130)	(131 - 160)	(161+)
	lb/a K_2O				
2	100	65	25	0	0
2.5	110	70	25	0	0
3	115	75	25	0	0
3.5	120	75	25	0	0
4	130	80	30	0	0

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2. Be mindful of fire safety during harvest season

As fall harvest continues across Kansas, many areas of the state are challenged by abnormally dry to severe drought conditions and elevated fire risk. With above-average temperatures and limited to no precipitation expected in the near future (Figure 1.), conditions are perfect for combine fires and quick-moving field fires. Dry crop residues, as well as leaking fuel or oil, can provide ample fuel, and overheated bearings, belts, and chains on harvest equipment can provide ignition during operation.

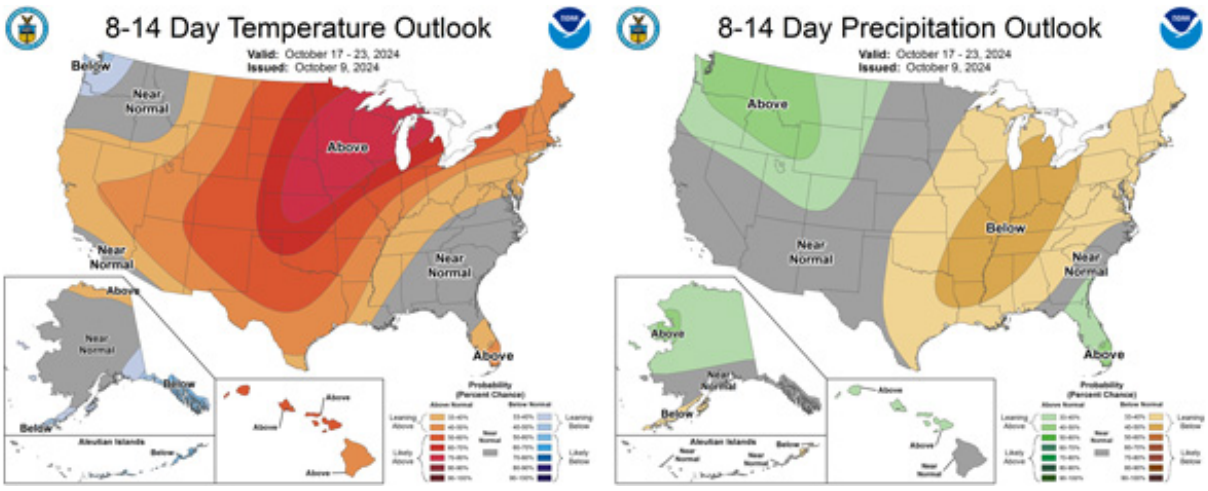

Figure 1. The temperature and precipitation outlook was issued on October 9, 2024, for the next 8-14 days (October 17-23). Source: Climate Prediction Center.

Awareness and preparation are critical when harvest coincides with excessively dry periods. Before starting your day, always check the weather forecast and make sure others know where you'll be working that day.

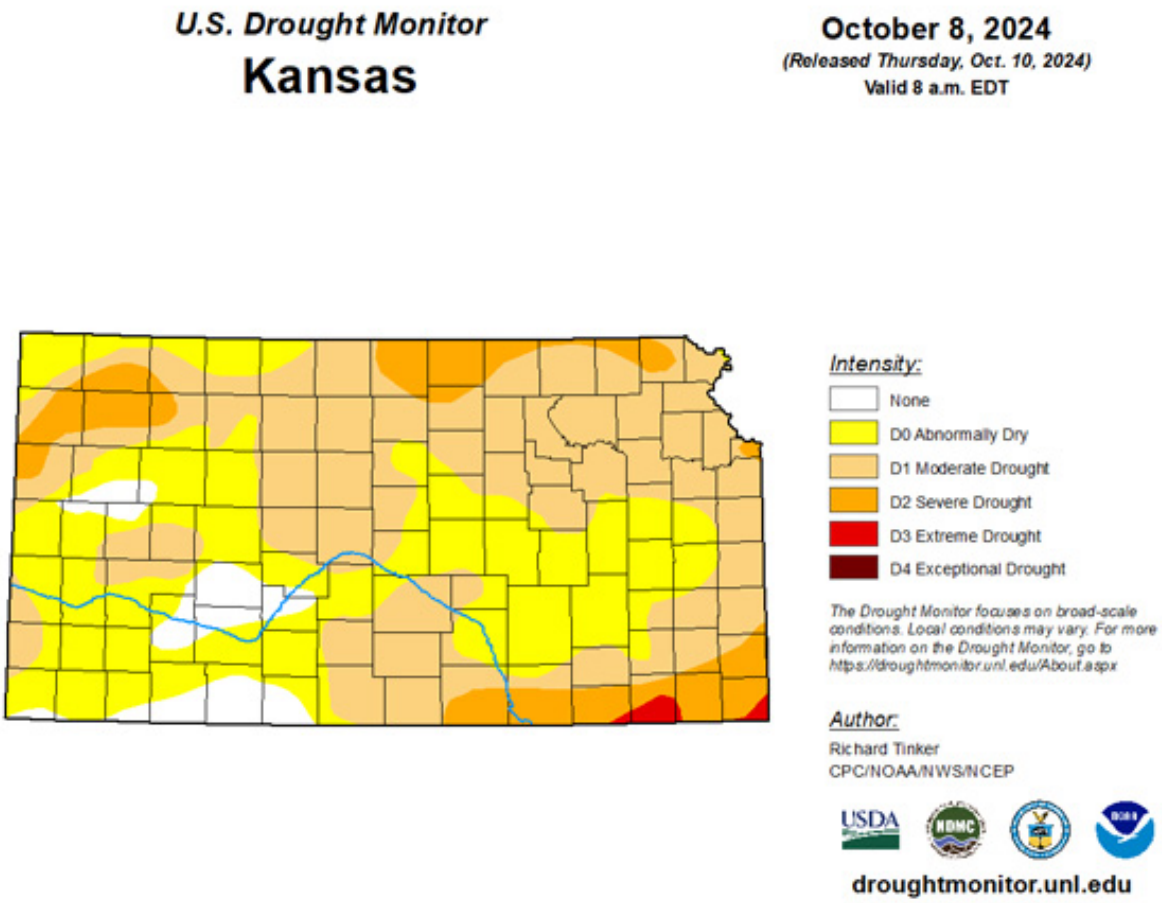

Figure 2. Drought conditions across Kansas as of October 8, 2024. Source: U.S. Drought Monitor.

Know your local fire risk

Several platforms are available to monitor your local fire risk:

- US Drought Monitor. Areas under drought conditions will have very dry vegetation and plant residues on croplands and adjacent natural areas (Figure 2).
- National Weather Service. Know your weather forecast and avoid fieldwork on excessively hot and windy days.
- Kansas Mesonet. Check relative humidity, wind speed, and soil moisture in the area as dry air and dry soil also favor rapid fire spread. Kansas Mesonet's 7-day fire danger forecast is a great tool for checking out each day during harvest season (Figure 3).

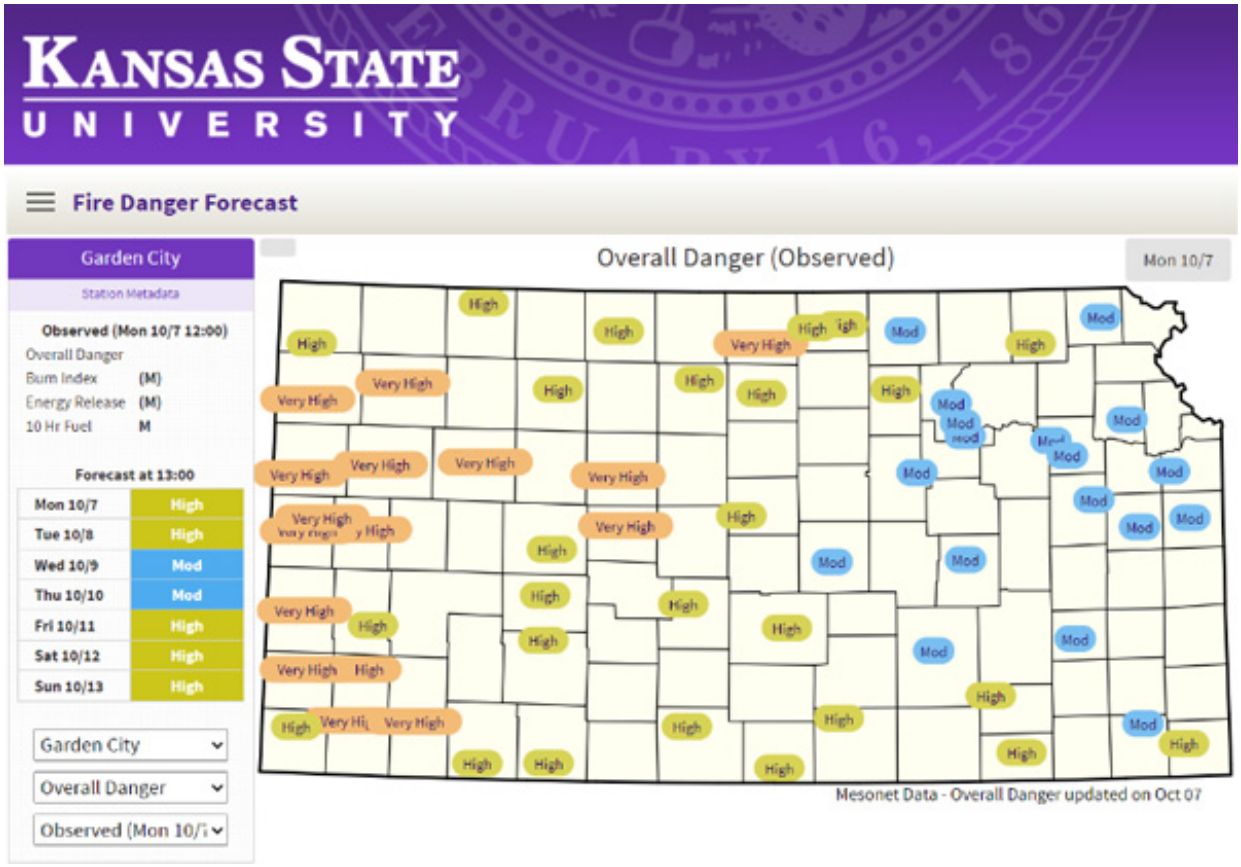

Figure 3. The Kansas Mesonet's 7-day fire danger forecast (October 7-13). Source: Kansas Mesonet.

Ways to prevent fires at harvest

- Clean harvesters (combines, cotton strippers) regularly, especially around the engine or exhaust. A leaf blower or air compressor is helpful for removing crop residue or debris but power washing may be needed to remove oil or grease that might accelerate a fire.
- Check the machine daily for any overheated bearings or damage in the exhaust system: greasing moving parts, maintaining proper coolant and oil levels, and repairing fuel or oil lines if they appear to leak.
- Use a ground chain attached to the machine's frame to prevent static charge from igniting dry chaff and residue. The chain should drag in contact with the ground while in the field.
- Check bearings, monitor engine load, and maintain the electrical system. Overheating bearings, excessive engine stress, and overloading circuits can all cause fires.
- Allow engines to cool before refueling whenever possible, and never refuel a harvester while the engine is running.
- Park a hot machine outside and away from buildings. Always allow harvesters to cool down before parking them in sheds.

What to do and have on hand in case of fire

- Have a plan for if a fire occurs, and be sure all employees (hired hands, helpers) know the plan. Your and your people's safety always comes before saving equipment.
- Always keep a cell phone on hand for any and all emergencies. Regularly charge your phone

fully (100%) or at least once daily.

- Have two fully charged ABC fire extinguishers (regularly checked and maintained) on the machine. Keep a 10-pound unit in the cab and a 20-pound unit mounted outside and at ground level.
- Have one fully charged ABC fire extinguisher (regularly checked and maintained) in the tractor, grain cart, and pickup truck. These extinguishers are for the first sign of smoke or a small flame.
- Have a shovel on standby. Though small, they can be used to throw dirt over burning residue.

How to respond if you have a fire

- If safe, move the machine to a harvested area with less standing crop residue that could serve as fuel and spread the fire (Figure 4).
- Turn the engine off to stop the air intake from feeding oxygen to the fire and move a safe distance from the machine.
- **Call 911 as soon as possible** before trying to extinguish the fire yourself and provide clear directions to your location for emergency services.
- Use the fire extinguisher from a safe distance away. Be careful when opening compartments on the machine, as small fires can flare up with additional oxygen.
- Remember the PASS technique: **Pull** the pin, **Aim** the nozzle, **Squeeze** the trigger, and **Sweep** across the base of the fire.
- If the fire cannot be extinguished, work to contain the fire to prevent spread through the field.

Figure 4. Machine fires happen fast. If safe, move the machine to a harvested area and call 911 as soon as possible. Photos courtesy of Jay Wisbey, K-State Research & Extension.

Take-home points

- Check the Kansas Mesonet's 7-day fire danger forecast each day during the harvest season.
- Regularly clean harvesters and monitor bearings, engine load, and the electrical system.
- Have a plan for if a fire occurs, and be sure all employees (hired hands, helpers) know the plan.
- Call 911 as soon as possible before trying to extinguish the fire yourself.

- Remember the PASS technique: Pull the pin, Aim the nozzle, Squeeze the trigger, and Sweep across the base of the fire.
- If the fire cannot be extinguished, work to contain the fire to prevent spread through the field

By taking precautions and preparing for emergencies, we can protect ourselves, our employees (hired hands, helpers), our farms, and our communities. Always prioritize your and your people's safety over equipment—no piece of machinery is worth risking a life!

Stay aware of the risk and stay safe this harvest season!

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3. Cover crop response to herbicides

As we head into fall, some producers are thinking about seeding winter cover crops in fields currently planted to corn. The successful establishment of winter cover crops is influenced by several factors discussed in last week's eUpdate article "Planting cereal rye after corn harvest." This article will provide some additional details about cover crop responses to various herbicides.

A number of factors, including biological and biochemical characteristics of the plant, chemical characteristics of the herbicide, and weather conditions since herbicide application will influence cover crop response to herbicides. Table 1 summarizes the response of selected cover crops to selected herbicides. For simplicity, no herbicide premixes are included in the list. The responses are cautious/conservative estimates based on published field research, herbicide labels, and a recent publication from the Take Action campaign. A field bioassay is the most reliable method to determine crop response to potential herbicide residues. A bioassay is an easy at-home test to see how your seeds will grow in the field soil.

Table 1. Likelihood of injury to selected cover crops when planted in the fall after a spring application of selected corn herbicides. Green = injury unlikely; Yellow = injury possible; Red = injury likely.

Herbicide	Cereal rye	Wheat	Red clover	Hairy vetch	Radish
Atrazine					
Balance Flexx, (isoxafluotle)					
Callisto (mesotrione)					
Dual II Magnum (S-metolachlor)					
Harness (acetochlor)					
Outlook (dimethenamid-P)					
Prowl H20 (pendimethalin)					
Sharpen (saflufenacil)					
Valor (flumioxazin)					
Zidua (pyrasulfoxone)					

An often overlooked fact is that potential crop response is not the only factor determining planting intervals. Sometimes, the potential for herbicide residues in the harvested product is the limiting factor. As such, cover crop planting consideration after certain herbicides may be different if grazed. For example, herbicides containing acetocholor, dimethenamid, and pyroxasulfone have very little potential for cover crop injury but may contain herbicide residues if grazed.

The use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current and updated use requirements.

References

Brooker, et al., 2020; Cornelius and Bradley, 2017; Palhano, et al., 2018; Price, et al., 2020; Rector, et al., 2020; Wallace, et al., 2017

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4. Watch for sorghum midge damage this season

Historically, sorghum midge has not been a significant pest in Kansas and has been primarily observed in the southeast portion of the state. However, in recent years, sorghum midge activity has been detected well outside of its typical range in Kansas with occurrences of significant losses in some locations. As sorghum harvest progresses this season, be on the lookout for sorghum midge damage. If you suspect damage, please reach out to your local extension professionals, as we are trying to better understand the distribution and impact of this pest across the state.

Sorghum midge is a very small reddish-orange fly (Figure 1) active when sorghum fields are blooming. While it is too late in the season to scout for sorghum midge adults, as sorghum reaches maturity, it is easy to find evidence of midge activity even if you did not see adults when the fields were blooming. Simply look for flattened, blank zones on the heads (Figure 2). These seeds never developed because the sorghum midge maggots consumed them from the inside. Be aware that it is easy to overlook or confuse sorghum midge damage with other sources of damage, with bird damage being a common confounding factor (Figure 3). Photographs can be very useful for differentiating sorghum midge from other sources of damage (Figure 4).

Figure 1. Close-up of a sorghum midge. Photo by K-State Extension Entomology.

Figure 2. Sorghum midge damage. The damage appears as blank zones on the flowering heads. Photo by Anthony Zukoff, K-State Research and Extension.

Figure 3. Bird damage on a sorghum head. This damage can be mistaken for midge damage. Bird damage will give the sorghum head a "blasted" appearance. Photo by Anthony Zukoff, K-State Research and Extension.

Figure 4. Various types of damage to sorghum heads. Left to right: undamaged head, severe sorghum midge damaged head, a head with heavy bird damage, and on the right, a head exhibiting headworm damage. Photo by Anthony Zukoff, K-State Research and Extension.

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5. Meet the new K-State Precision Agriculture Extension Specialist

Deepak Joshi joined Kansas State University in August 2024 as a Precision Agriculture Extension Specialist based in Manhattan. Originally from Nepal, he was raised on a small farm where his parents grow rice, wheat, lentils, cowpeas, vegetables, and fruits and keep a few cattle, practicing mostly subsistence farming; whatever is needed in the kitchen is grown on their own farm. Having grown up in a conventional farming system, Deepak developed a strong interest in modern agricultural technologies and continues to learn about their applications for more efficient and sustainable farming practices.

Figure 1. Dr. Deepak Joshi, Precision Agriculture Extension Specialist

Deepak earned his bachelor's degree in Agricultural Science from Tribhuvan University in Nepal and later moved to the United States for higher education. He completed two master's degrees, one in Plant Science and another in Data Science, followed by a Ph.D. in Plant Science from South Dakota State University under the mentorship of Dr. David Clay. In addition to his academic career, Joshi worked as a Research Associate at South Dakota State University, where he had the opportunity to engage in diverse, multidisciplinary research areas such as precision agriculture, remote sensing (drone and satellite), on-farm research, soil health, greenhouse gas emissions, and cutting-edge technologies like Artificial Intelligence and Machine Learning.

He is excited to be part of the Wildcat community at Kansas State. His responsibilities in this role include extension, outreach, and applied research related to precision agriculture and modern technologies in Kansas. His research focuses on the multidisciplinary integration of drones, satellite imagery, soil science, and artificial intelligence in agriculture. Outside of his professional work, he enjoys biking in his leisure time. He can be reached via email at drjoshi@ksu.edu.

6. World of Weeds: Shattercane

This World of Weeds feature is all about shattercane. Shattercane (*Sorghum bicolor*), sometimes called wild cane or black amber, is the same species as our domesticated sorghums (Figure 1). Some authorities give it the subspecies name *drummondii* to distinguish it from our cultivated varieties (subsp. *bicolor*), though the taxonomy of this genus is often debated[1]. What is certain, though, is that shattercane easily cross-pollinates with cultivated sorghums via insects and wind-dispersed pollen and also cross-pollinates with its weedy relative johnsongrass (*Sorghum halapense*).

Figure 1. Shattercane growing in a sorghum field. Photo by Sarah Lancaster, K-State Research and Extension.

Ecology

A native of Africa, this species is now widespread in areas of the world where domesticated grain or

forage sorghums are grown. It is possible that sorghum arrived in the U. S. as early as the 1600s, but reliable records indicate that several documented introductions occurred in the early 1800s. Shattercane can be utilized by livestock as a forage, but it can accumulate toxic nitrates and prussic acid under certain conditions. Undigested seeds can be spread in manure applied to fields. Shattercane seeds can also be buoyant, allowing for dispersal in moving water. Birds and small mammals utilize its seeds. Shattercane is a host species for disease and insect pests of sorghum and corn. Yield losses from shattercane interference can be as high as 70% in corn and greater than 95% in soybeans.

Identification

Shattercane is a warm-season plant growing up to 12 feet tall. The plant is quite variable in growth habits and tolerant of both heat and drought. The stems are unbranched, but the plant tillers at the base to form clumps. The leaves are generally smooth and display a prominent midrib. They can be up to 20 inches long and 2 inches wide. It has a short membranous ligule with a fringe of hairs at the top (Figure 2). The inflorescence is typically a loose panicle with several pendulous (drooping) racemes (branches). Seeds are dark brown and typically covered with deep purple to black chaff (Figure 3). The panicles, which can number from one to six per plant, produce between 500 and 1500 seeds each. A special layer of abscission cells at the base of the seeds allows them to easily dislodge (shatter) at maturity, giving the plant its common name.

Figure 2. Left: ligule of shattercane - note the prominent midrib (white stripe) seen in the leaf. Right: mature shattercane panicle. Photos by Patrick Geier, K-State Research and Extension.

Figure 3. A close-up of the seed shows the dark-colored chaff. Photos courtesy University of Missouri.

Management

Shattercane control in **soybean, sunflower, or cotton** begins with a foundation treatment of a Group 3 herbicide such as pendimethalin (Prowl, others). Products containing sulfentrazone (Authority, Spartan, others), a Group 14 herbicide, may also be used in soybeans for partial shattercane control. Group 1 postemergence herbicides such as quizalofop (Assure II, others) or clethodim (Select, others) are very effective for controlling shattercane in broadleaf crops. Where applicable, the Group 10 herbicide glyphosate (Roundup, others) provides excellent shattercane control in glyphosate-resistant crops. Glufosinate (Liberty, others) can also provide good shattercane control in resistant cultivars. Some of the ALS herbicides (Group 2), such as imazethapyr (Pursuit, others), may also control shattercane; however, confirmed resistance to the Group 2 herbicides is well documented in Kansas.

In corn, preemergence options for shattercane generally consist of premixes containing Group 5 (atrazine, others), Group 14 (saflufenacil, others), Group 15 (metolachlor, others), and/or Group 27 (mesotrione, others) herbicides. These products provide fair to good control. Glyphosate-based postemergence herbicides provide excellent control in Roundup-Ready corn, as does quizalofop in Enlist corn. Group 2 herbicides (nicosulfuron, others) can also be effective, provided the shattercane is not a resistant biotype.

Grain and forage sorghum crops provide a unique challenge when managing shattercane. Although some of the premixes listed above for corn are used in sorghum, none is very effective against shattercane. New herbicide-resistant grain or forage sorghum hybrids may come to mind as an option for postemergence control of shattercane. However, shattercane is NOT listed as a weed controlled by the herbicides quizalofop (sold as FirstAct for Double Team hybrids) and imazamox (sold as Imiflex for igrowth hybrids). Farmers who use these technologies must follow the herbicide stewardship guidelines regarding shattercane and johnsongrass on the herbicide labels to slow the development of herbicide resistance. Challenges associated with chemical control of shattercane in grain and forage sorghum mean other management tactics are required. These include starting with a weed-free seedbed (using a burndown herbicide or light tillage to destroy weeds) or planting after

the first flush of shattercane has emerged and can be controlled. Narrow row spacing and dense crop canopies will inhibit weed emergence.

Finally, prevent the spread of shattercane seeds by harvesting infested fields last (where possible), thoroughly cleaning harvest equipment before moving to a new field, and controlling shattercane in ditches and roadways. These cultural control methods are good integrated weed management practices regardless of which crop is being grown.

References:

[1] DeFelice, M. S. 2006. Shattercane, *Sorghum bicolor* (L.) Moench ssp. *drummondii* (Nees ex Steud.) de Wet ex Davidse – black sheep of the family. Weed Technol. 20:1076-1083.

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7. Kansas Mesonet fall freeze and winter cold tool available

Only a few locations, mostly in far northwest Kansas, have reached the freezing mark thus far in fall 2024. Despite very warm temperatures through the weekend, cooler weather will briefly return early next week. It is likely that more locations, again confined mostly to the northern portion of the state, will approach the 32°F mark. This is a great time to visit the Kansas Mesonet's Freeze Monitor (https://mesonet.k-state.edu/airtemp/min/hoursbelow/) to compare fall frost/freeze climatology and look at real-time data. The Freeze Monitor is a handy tool to check conditions in your area. Have freezing conditions been recorded? How does it compare to the average? How many hours below freezing was your area?

The average freeze date (32°F) in northwest Kansas is as early as the last week in September (Figure 1). However, southeast Kansas does not usually see freezing temperatures until the end of October. You can find the average first freeze dates by location here: https://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6. The "Table" tab lists the average dates on the right side (Figure 2). Average dates for the first occurrence of 28°F temperatures are even later (Figure 3).

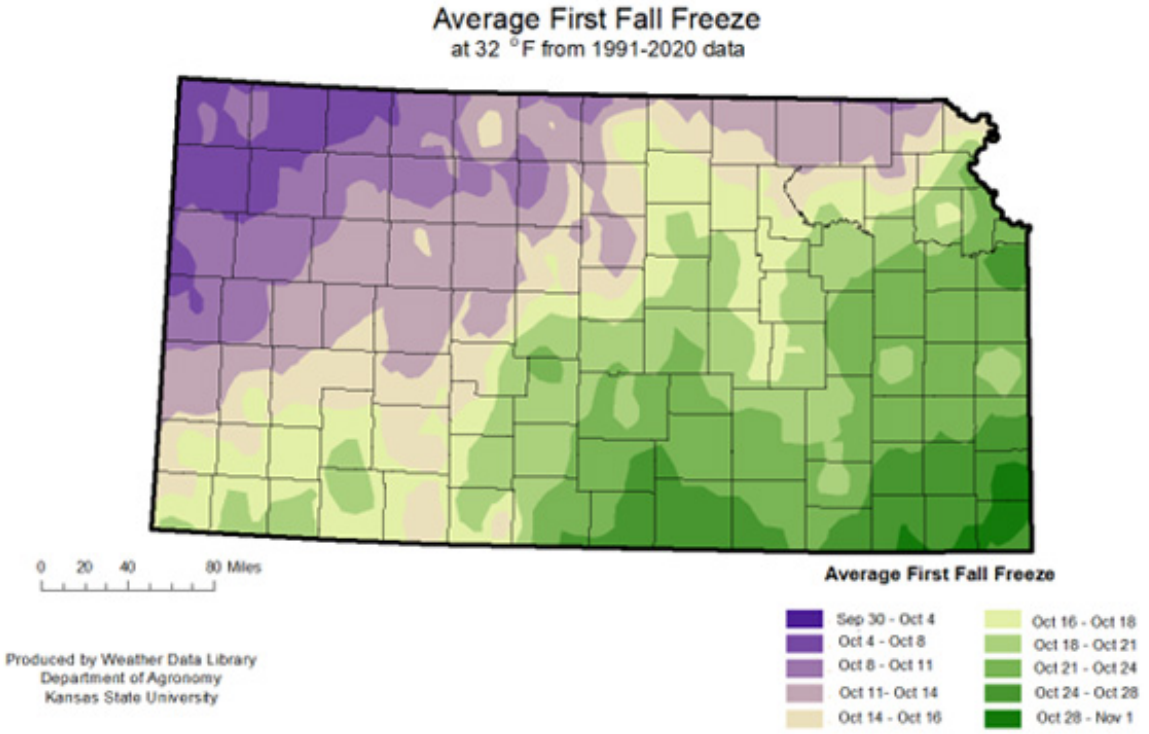

Figure 1. Average fall freeze dates for Kansas. Source: Kansas Weather Data Library.

Table | Chart | Calculate | Download | Resources

Data from Thu Oct 05 2023 08:00 -- Click column headers to sort data

Station	Days Since 24°F: Days	Days Since 24°F: Date	This Fall: First 32°F	Fall Freeze Climatology: Average Date	Fall Freeze Climatology: Record Earliest	Fall Freeze Climatology: Record Latest
Ashland 8S	180	2023-04-08		10-15	1995-09-22	1937-11-14
Ashland Bottoms	181	2023-04-07		10-16	2003-10-01	1998-11-10
Belleville 2W	164	2023-04-24		10-20	2004-10-02	2016-11-12
Bunker Hill 3NE	>365	M		10-17	1995-09-22	1998-11-04
Butler	191	2023-03-28		10-20	1995-09-22	2016-11-12
Cherokee	199	2023-03-20		10-25	1942-09-27	2004-11-25
Cheyenne	164	2023-04-24		10-08	1983-09-22	1963-10-28
Clay	181	2023-04-07		10-16	1995-09-22	1998-11-11
Colby	164	2023-04-24		10-07	1983-09-22	1963-10-28
Corning 2NW	191	2023-03-28		10-13	1995-09-22	1998-11-11
Elmdale 1SE	191	2023-03-28		10-17	1995-09-22	1902-12-03
Flickner Tech Farm	164	2023-04-24		10-20	1995-09-22	2016-11-12
Garden City	181	2023-04-07		10-14	1995-09-22	1973-11-01

Figure 2. First freeze date averages for all Mesonet stations as found on the "Table" tab. Source: Kansas Mesonet.

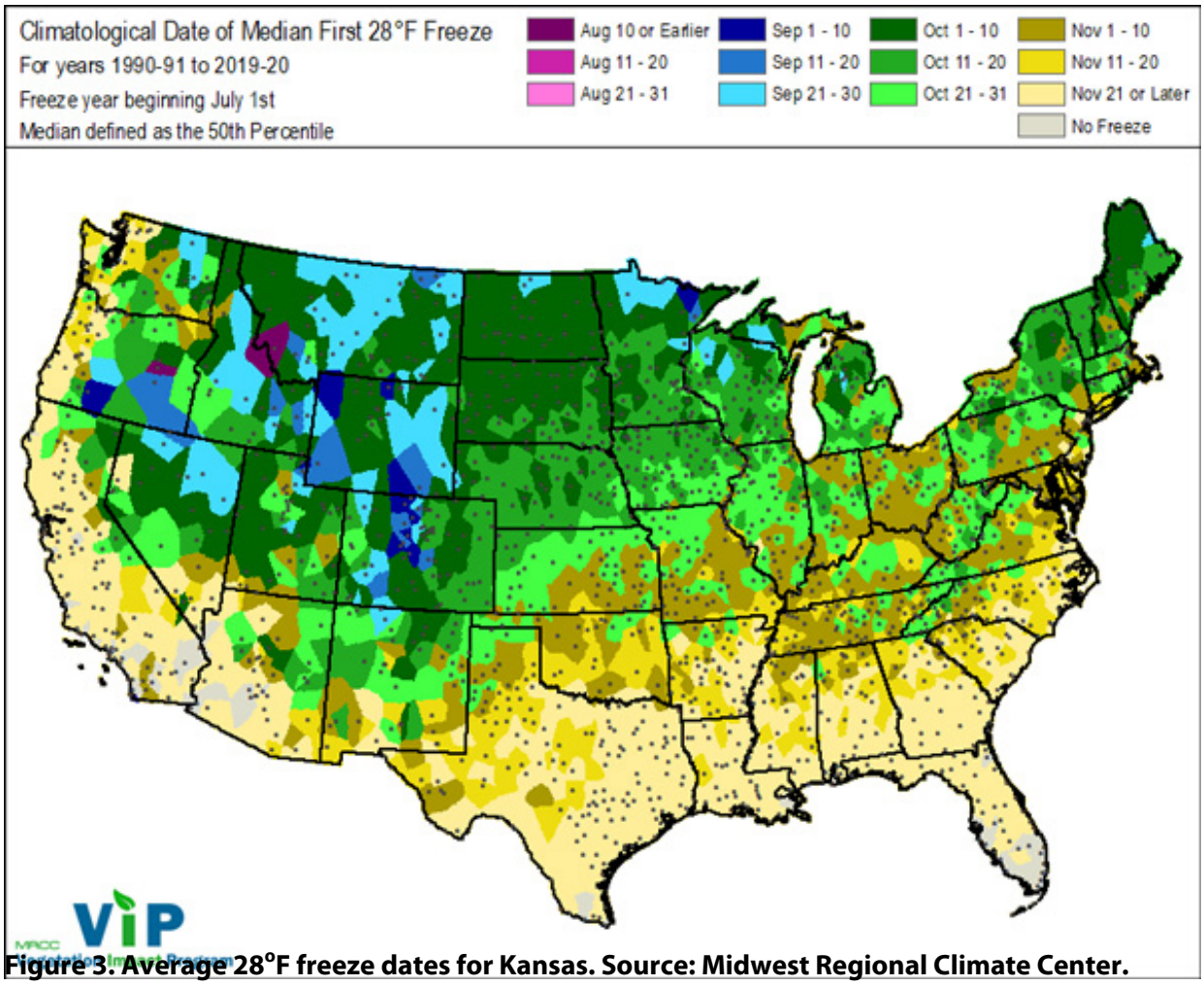

Figure 3. Average 28°F freeze dates for Kansas. Source: Midwest Regional Climate Center.

Historically, almost all parts of the state have recorded freezing temperatures as early as September. The earliest first freeze on record in Kansas was September 3, 1974, when many stations dropped below freezing. This year, with the forecasted near-freezing temperatures on the 7-8th of October,

this would be almost exactly average for portions of the northwest and north-central.

Common question: "How cold did it get?"

The Freeze Monitor tool displays the coldest temperatures observed across Kansas during the previous two weeks (the most recent freeze event during the previous two weeks is displayed; Figure 4). It also tracks the first fall freeze date for each station for comparison to local climatology in a table (https://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6) as seen in Figure 2. Data updates every twenty minutes on both the map and the table.

Common question: "Was it cold long enough to damage crops?"

Another tool important for producers and gardeners is the duration below freezing, as some crops and commodities have lower thresholds for damage. This feature allows users to select options to view maps/data of the "hours below 32°F", "hours below 24°F," and the "hours below 12°F"). While all three are of interest, the lower two thresholds are of great importance to wheat growers later into the fall/winter season.

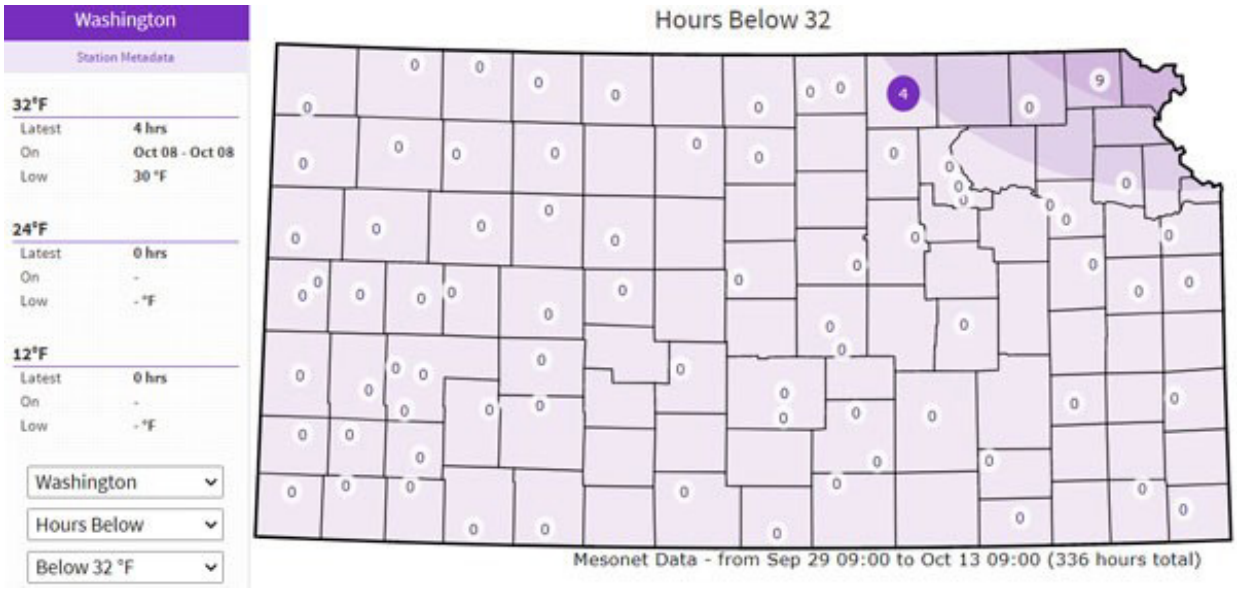

Figure 4. View of the Freeze Monitor webpage on October 13, 2022. Washington (selected station) shows a freeze event on October 8, 2022. The map represents the latest freeze events at these locations since September 29, 2022. Source: https://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=0

Common question: "How long has it been above freezing?"

The freeze monitor can also track the duration of days since the last freeze or below the 24°F and 12°F threshold. This is great for the first freeze and determining the length of the growing season. You can find "days since" using this link: https://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6. Much of the state hasn't seen a freeze since late April in the state of Kansas – a growing season between 150-160 days for 2023 (Figure 5).

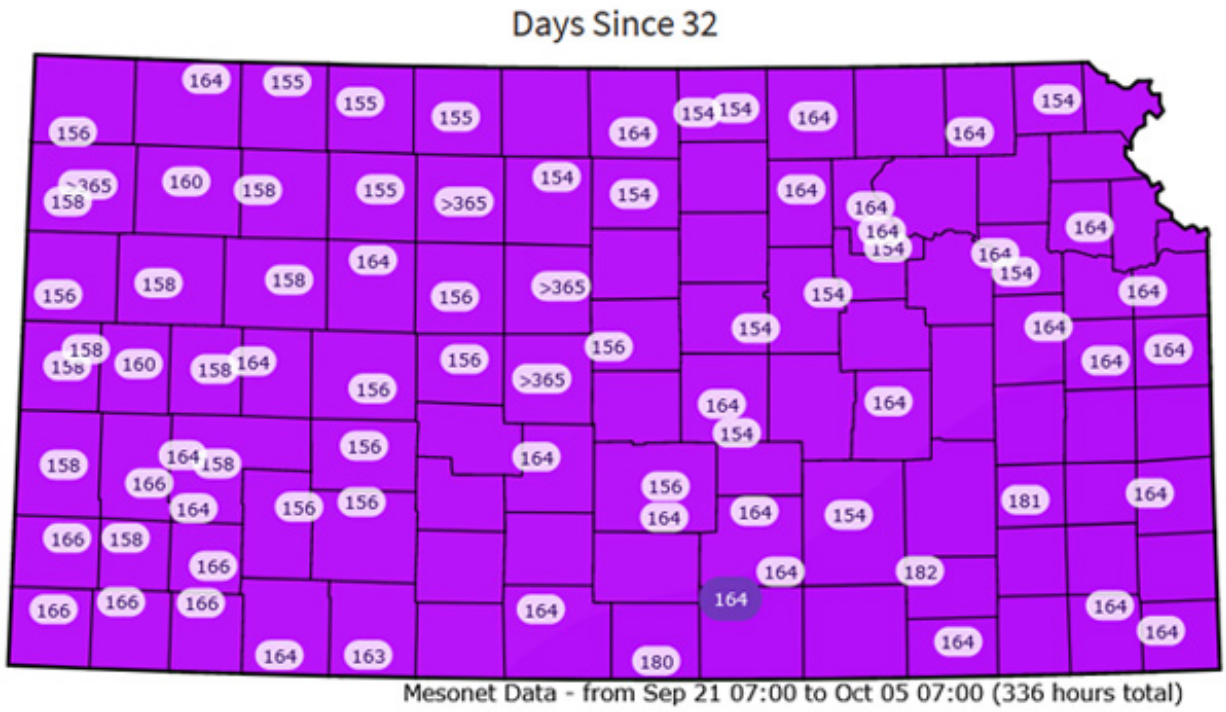

Figure 5. Number of days since the last freeze as of October 5, 2023. Find this information here: https://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6.

The data displayed in the tables below the maps can be sorted. Clicking on the header of a particular column will sort the table by that column. This makes it much easier to see what area was the coldest in the state, as well as the earliest freeze and earliest climatological freeze data. There are several download options, including table and chart data and images of the maps.

The Freeze Monitor is operational through the winter and available for the 24°F and 12°F thresholds in addition to 32°F. As we near spring, the Freeze Monitor will be updated to present the spring freeze climatology.

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