Issue 953

K-STATE Research and Extension

Extension Agronomy

eUpdate

04/27/2023

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. Cold soils can lead to chilling injury for newly planted corn and soybean

Warm soil temperatures for the last couple of weeks in Kansas means that corn planting is well underway. As of April 24, approximately 24% of corn acres have been planted in Kansas, ahead of the five-year average of 19% (USDA NASS), with approximately 3% emerged. The planted area for soybeans is still below 5% but ahead of the historical average of 1% with no emerged soybean plants registered yet. However, temperatures for the week of April 23 plummeted below freezing with durations of several hours in many locations across Kansas, particularly the last weekend (Figure 1). What does this drop in temperature mean for newly planted corn?

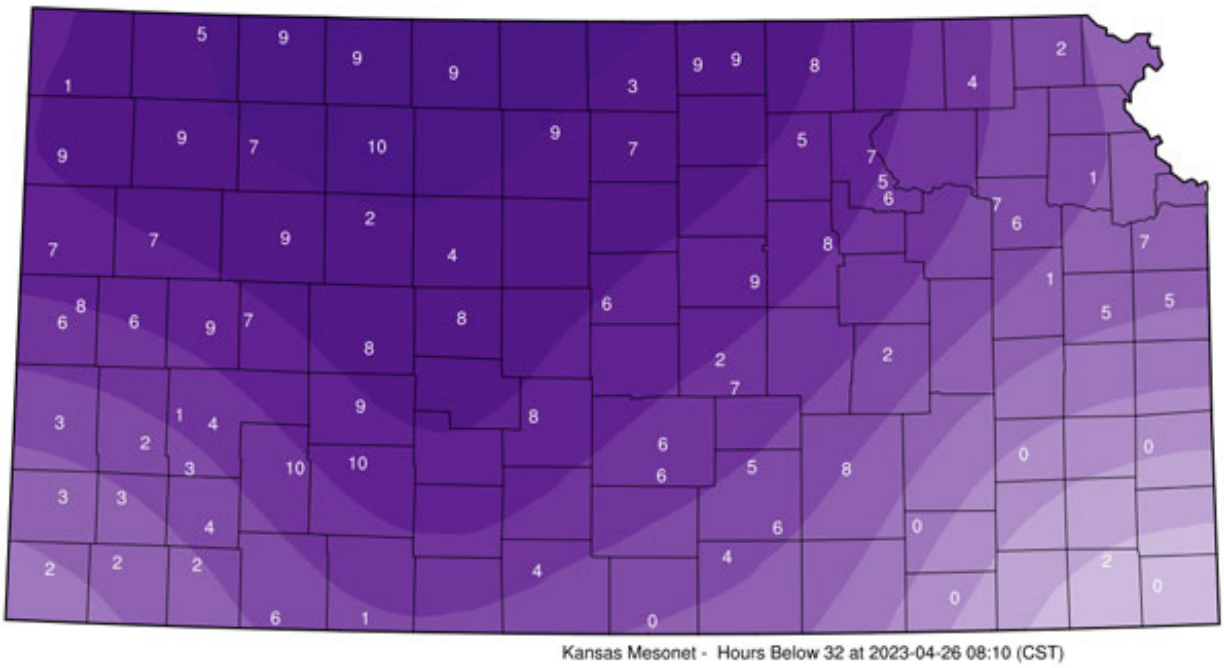

Figure 1. Accumulated hours of air temperature below 32°F from April 22 to April 23, 2023. Map from Kansas Mesonet.

For this week (April 16-22), the average soil temperature at both 2 inches and 4 inches ranged from 48°F in northwest Kansas to 64°F in the south central region (Figure 2).

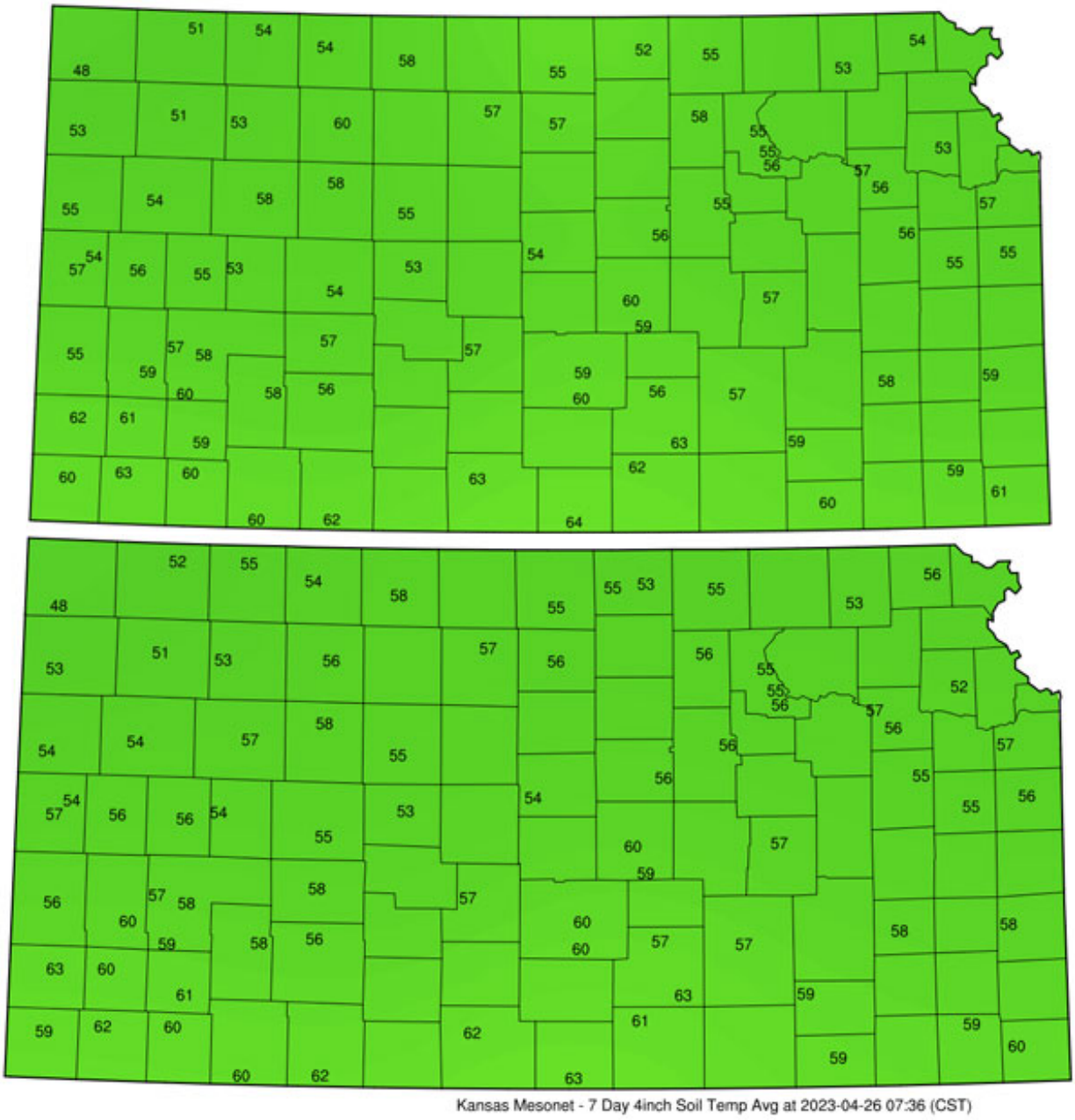

Figure 2. Average soil temperatures at 2-inch (upper panel) and 4-inch (lower panel) soil depth for the week of April 20 - 26, 2023. Maps from Kansas Mesonet.

Daily soil temperature variation within the last week (7-day report) was recorded across Kansas for several locations (Figure 3), presenting variations around 20°F. Overall, cooling conditions have been observed statewide after the very warm start to the month. Where precipitation has occurred, temperatures have become much steadier. Some marginal increases in the last week have been observed in the northeast as moisture has missed that region with drying conditions (Figure 3).

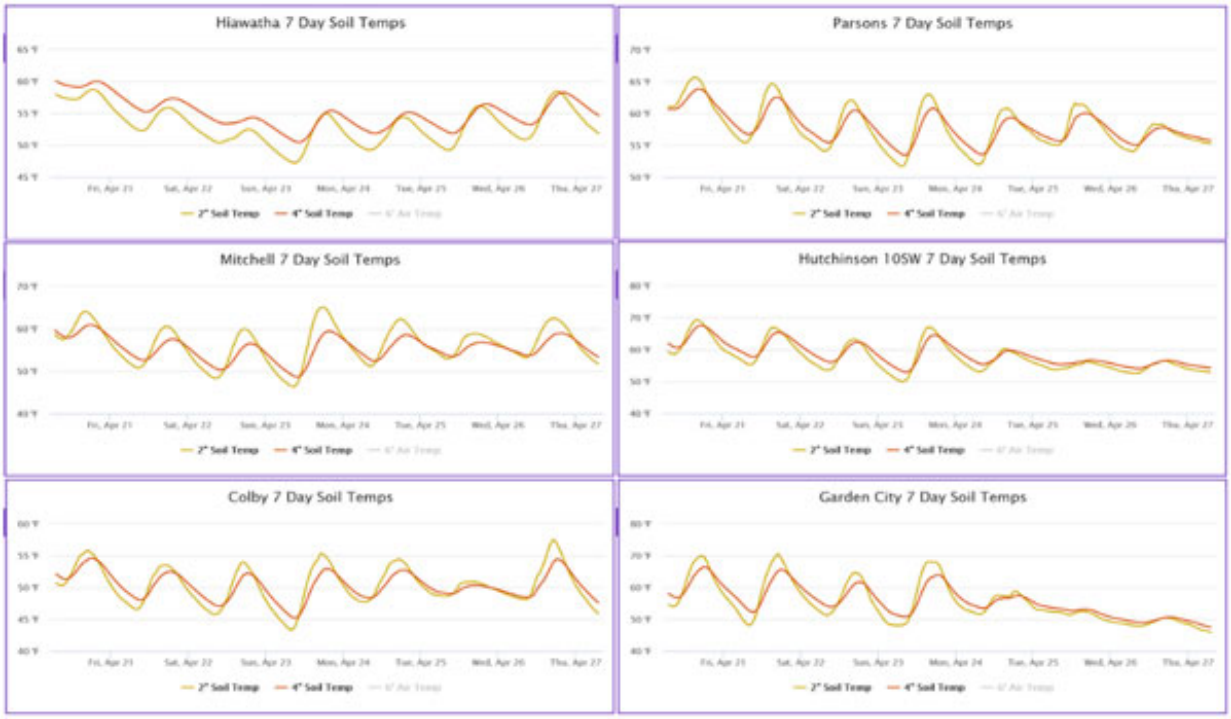

Figure 3. 7-day soil temperatures (2- and 4-inch soil depth) for Hiawatha, Parsons, Mitchell, Hutchinson, Colby and Garden City (top left to bottom right). 2-inch depth represented by yellow line; 4-inch depth represented by orange line. Graphs produced by the Kansas Mesonet.

Chilling injury in corn

Cold temperatures can result in injury to the germinating seed as it is absorbing moisture – a problem called imbibitional chilling injury. Germinating seeds can be damaged when soil temperatures remain at or below 50 degrees F after planting.

Soil temperatures at the 4-inch depth during the first 24-72 hours after planting are critical. It is during this window that the kernels imbibe water and begin the germination process. Kernels naturally swell when hydrating – taking in water. If the cell tissues of the kernel are too cold, they become less elastic and may rupture during the swelling process, resulting in "leaky" cells. Injury symptoms may include swollen kernels that fail to germinate or aborted growth of the radicle and/or coleoptile after germination has begun.

Chilling injury can also occur following germination as the seedlings enter the emergence process. Chilling injury to seedlings can result in:

- Reduced plant metabolism and vigor, potentially causing stunting or death of the seminal roots
- Deformed elongation ("corkscrewing") of the mesocotyl
- Leaf burn (Figure 4)
- Delayed or complete failure of emergence, often leafing out underground

Chilled seedlings may also be more sensitive to herbicides and seedling blights.

Figure 4. Leaf burn from freeze damage early after corn emergence. Photo by Ignacio Ciampitti, K-State Research and Extension.

Impact of cold on soybeans

For this crop, a similar impact could be expected but depending on the planting time and overall plant growth. The most susceptible stage is as the plants are emerging (recently planted). The most typical sign of the impact of freezing temperatures on soybeans can be visualized in the stem and mainly with the yellowing of the cotyledons. If soybeans were advanced in growth, with unifoliate, then the overall impact of a freeze on the cotyledons will be very minor, with most likely no yield loss. If there is a large impact on cotyledons (without having unifoliate leaves unfolded), then there is a lower chance for those soybeans plants to survive.

For some of the fields scouted in the last days, most of the damage is cosmetic and even when some yellowing was present in cotyledons, this effect is minor and most likely will not produce any impact on yields.

Producers should consider all these factors when deciding on the planting time. Before making any decisions, fields should be scouted 4-7 days after the cold occurred as the extent of the damage and potential for new growth will be evident during this time. More information about the planting status of summer row crops will be provided in upcoming issues of the Agronomy eUpdate. Stay tuned!

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2. Is there any value to starter fertilizer on soybeans?

Soybean is a crop that can remove significant amounts of nutrients per bushel of grain harvested.

Because of this, soybeans can respond to starter fertilizer applications on low-testing soils,

particularly phosphorus.

Typically, corn shows a greater response to starter fertilizer than soybean. Part of the reason for that is that soils are generally warmer when soybeans are planted than when corn is planted. The typical response in early growth observed in corn is usually not observed in soybeans. However, yield response to direct soybean fertilization with phosphorus and other nutrients can be expected in low-testing soils.

K-State guidelines for soybeans include taking a soil test for phosphorus (P), potassium (K), sulfur (S), zinc (Zn), and boron (B). If fertilizer is recommended by soil test results, then fertilizer should either be applied directly to the soybeans or indirectly by increasing fertilizer rates to another crop in the rotation by the amount needed for the soybeans.

The most consistent response to starter fertilizer with soybeans would be on soils very deficient in one of the nutrients listed above, or in very high-yield-potential situations where soils have low or medium fertility levels. Furthermore, starter fertilizer in soybeans can be a good way to complement nutrients that may have been removed by high-yielding crops in the rotation, such as corn, and help maintain optimum soil test levels.

Banding fertilizer to the side and below the seed at planting is an efficient application method for soybeans. This method is especially useful in reduced-till or no-till soybeans because P and K have only limited mobility into the soil from surface broadcast applications.

However, with narrow-row soybeans, it may not be possible to install fertilizer units for deep banding. In that situation, producers can surface-apply the fertilizer. Fertilizer should not be placed in-furrow in direct seed contact with soybeans because the seed is very sensitive to salt injury.

Soybean seldom responds to nitrogen (N) in the starter fertilizer. However, some research under irrigated, high-yield environments with sandy soils suggests a potential benefit of small amounts of N in starter fertilizer.

Figure 1. Visual differences with starter P fertilizer on low testing soils. Photo by Nathan Mueller, former K-State Agronomy graduate student and current Associate Extension Educator at the University of Nebraska West Central Research & Extension Center.

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3. Soil temperature, forecast, and seed quality are critical for cotton stand establishment

Cotton can overcome many stresses and produce profitable lint yields when the crop gets off to a good, uniform start. So, when is the "best" time to plant cotton to meet those criteria? In a thermally-limited environment for cotton, such as Kansas, we know we need to plant as early as possible in order to maximize yield potential. However, those extra heat units from early planting are only useful if you have a stand of plants to benefit from.

First, much as with corn, the goal is to achieve an acceptably uniform and optimal stand. The recommended window for cotton planting is relatively narrow compared to that for other summer crops grown in Kansas – roughly May 1 through June 5. However, it is best to monitor soil conditions rather than the calendar. You can monitor soil temperature information on the Kansas Mesonet (http://mesonet.k-state.edu/agriculture/soiltemp/). The Mesonet data can provide a good general idea of soil temperatures and trends. However, a farmer should also monitor actual field conditions at seeding depth, as differences in residue, moisture content, and other factors can result in temperatures that differ from those observed at the local Mesonet station. For a variety of reasons, including seedling chilling, potential herbicide injury, thrips, and seedling diseases, it pays to plant when growers can not only get an adequate stand but also when the crop will grow vigorously.

Soil temperature and the 10-day forecast are two major factors to that fast start. Cotton seed germination and early growth/emergence are favored by soil temperatures above 64°F and adequate, but not excessive, soil moisture. Based on USDA-ARS research work at Lubbock, TX, seedling cotton requires more than 100 hours above 64°F at the seed level to emerge.

Soil Temperatures – Current, Departure from Normal, and Forecast

We often use 60°F at planting depth in Kansas as our baseline temperature. As of April 25, the statewide average 7-day 2-inch soil temperature is 57.3°F or 0.3°F below normal. Soil temperatures have fallen 2.5°F since April 15, thanks to cooler weather (Figure 2). Air temperatures in the last 10 days have averaged 4.5°F below normal statewide. The southern third of Kansas currently has the warmest soil temperature readings, averaging between 59°F and 61°F. Parts of Kansas are finally receiving significant rainfall, but the clouds and rain mean air and soil temperatures are likely to remain below normal. The 6 to 10-day outlook calls for cooler-than-average temperatures to continue into the beginning of May (Figure 3). The average date on which the statewide 7-day average soil temperature first reaches and remains over 60°F is May 6, but reaching and maintaining that threshold will likely be delayed this year.

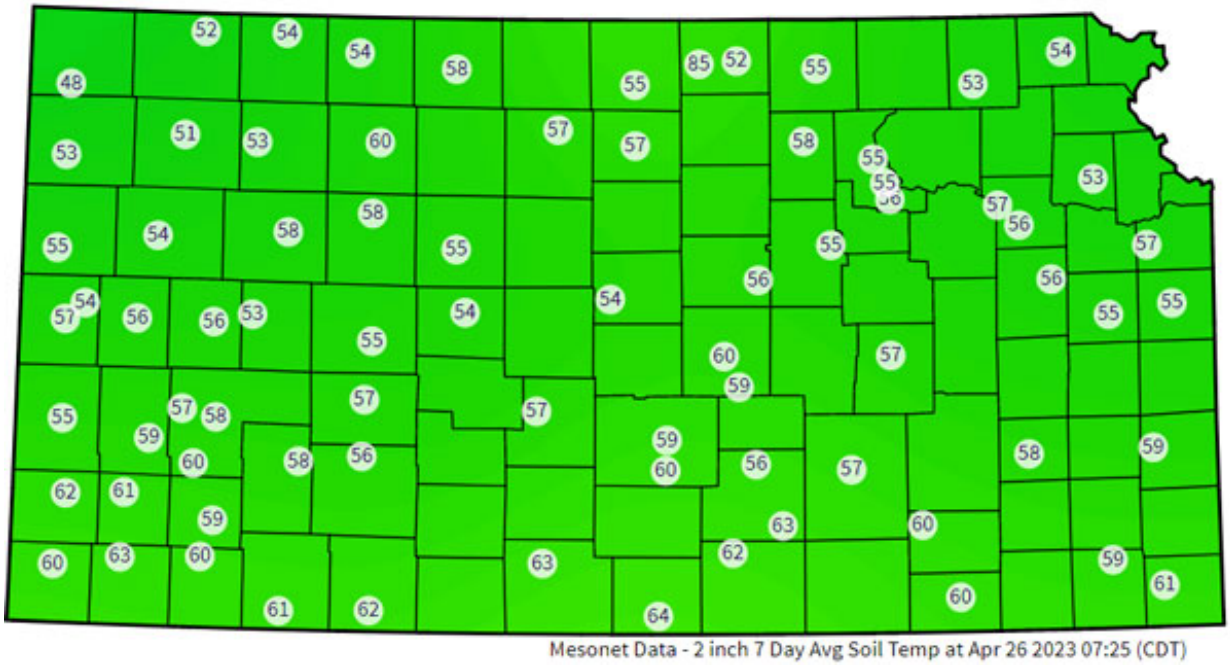

Figure 1. Average 7-day 2-inch soil temperatures as of April 26, 2023. Data and image courtesy of Kansas Mesonet (mesonet.k-state.edu).

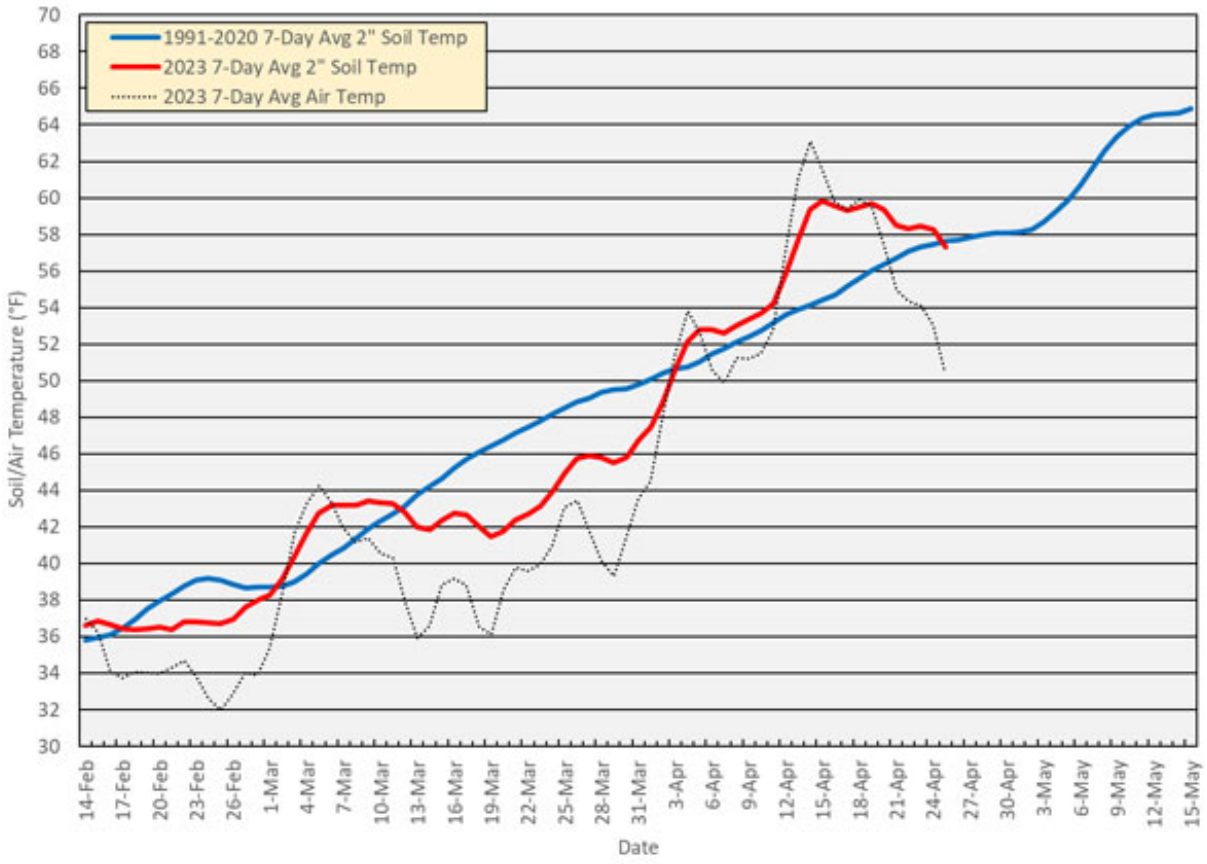

Figure 2. 30-Year average 2-inch soil temperature, 2023 average 2-inch soil temperature, and 2023 average air temperature. Average data plotted are 7-day values. Dates plotted represent the last day of the 7-day average period (e.g., plotted data for April 25 are the 7-day averages for the period April 19th-25th. Graph created by Matthew SIttel, K-State Research and Extension.

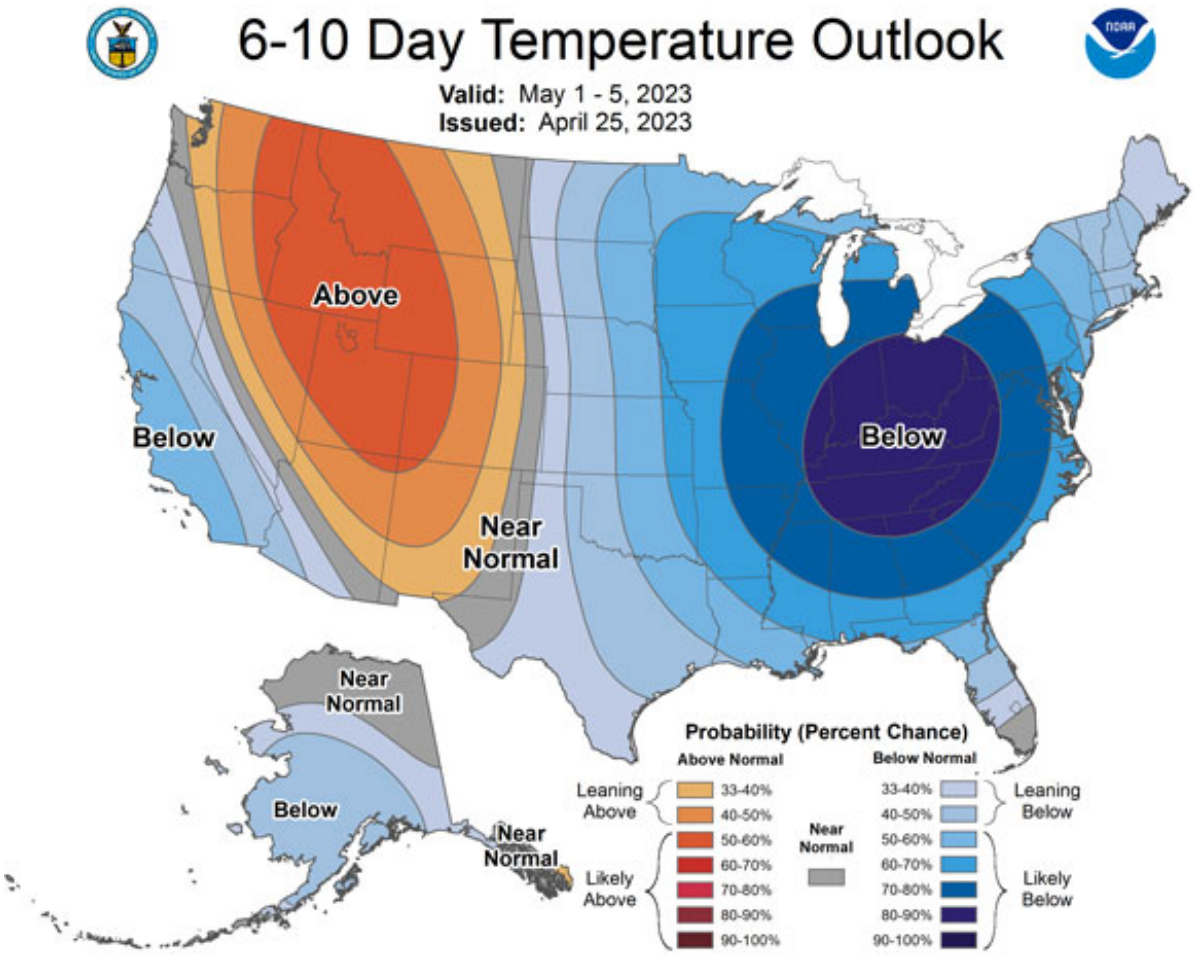

Figure 3. The Climate Prediction Center's 6 to 10-day temperature outlook for the period May 1-5, 2023. Source: cpc.ncep.noaa.gov.

In addition to considering soil temperature, growers should be planting high-quality varieties (e.g. high cold germination and large seed size, with good cold tolerance and early season vigor ratings).

Information from North Carolina State University's cotton web page illustrating the importance of heat unit accumulation immediately following planting is shown in Table 1.

Table 1. Relationship between predicted DD-60s and Planting Conditions (Source: North Carolina State University, https://cotton.ces.ncsu.edu/)

Predicted DD-60 accumulation for five days following planting	Planting conditions
10 or less	Very Poor
11 – 15	Marginal
16 – 25	Adequate
26 – 35	Good
36 – 49	Very Good
50	Excellent

Avoid planting cotton if the low temperature is predicted to be below 50°F for either of the two nights following planting or predicted daily DD-60s is near zero for the day of planting.

Effects of cold soil on cotton seeds

Cotton seed subjected to cold the first 2-3 days after planting, OR when the seed is imbibing moisture from the soil, is susceptible to imbibitional chilling injury. The greatest sensitivity is during the first day after planting as water is being imbibed (Hake et al.) as shown in Figure 4.

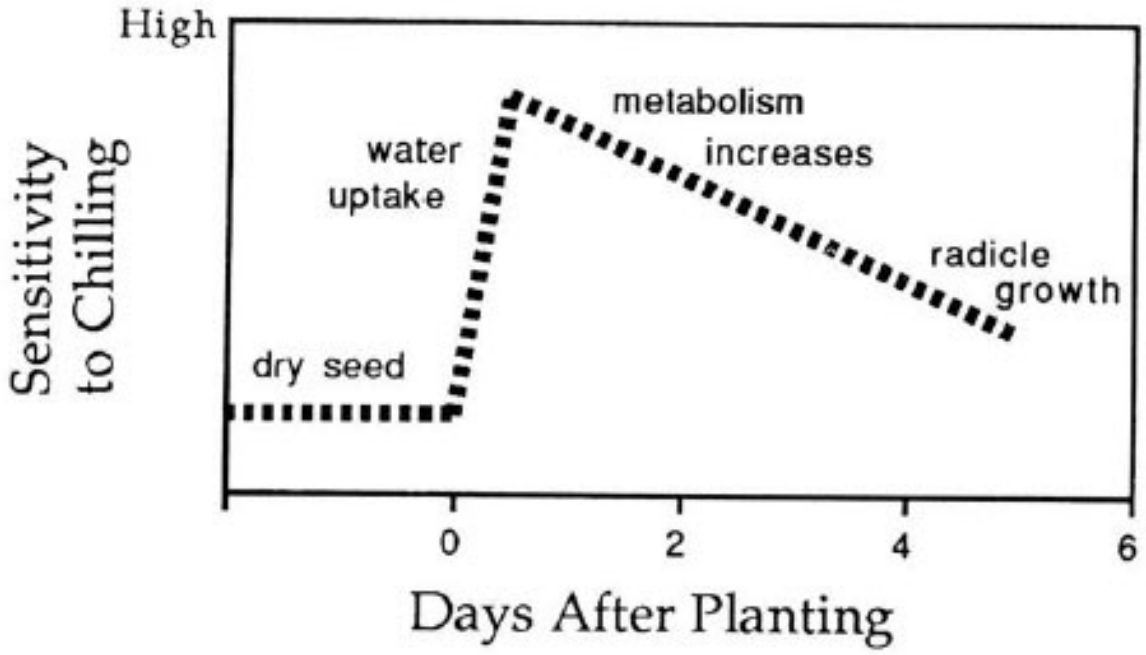

Figure 4. Relative sensitivity of cotton to chilling in the first several days after planting. K. Hake, W. McCarty, N. Hopper, and G. Jividen.

Cotton seeds contain lipids which must be converted to energy, and cell membranes must develop properly. Seedlings may suffer damage if soil temperatures drop below 50°F during this critical germination period. The first 30 minutes after planting, the seed will absorb up to 60% of the water necessary for germination. Cold soil temperatures (<45°F to 50°F) will most likely lead to injury or seedling death. Damage may result in malformed seedlings, loss of or damage to the taproot, and a greater likelihood of seedling disease problems. Injury usually kills the root tip meristematic tissue which stops normal taproot growth and leads to lateral root development (Figure 5). If the plants survive, the root system will not develop normally. Additionally, reductions in yield have been documented when there are less than 25 heat units received in the first 5 days after planting. For these reasons, it's critical that cotton be planted into a warming soil temperature trend.

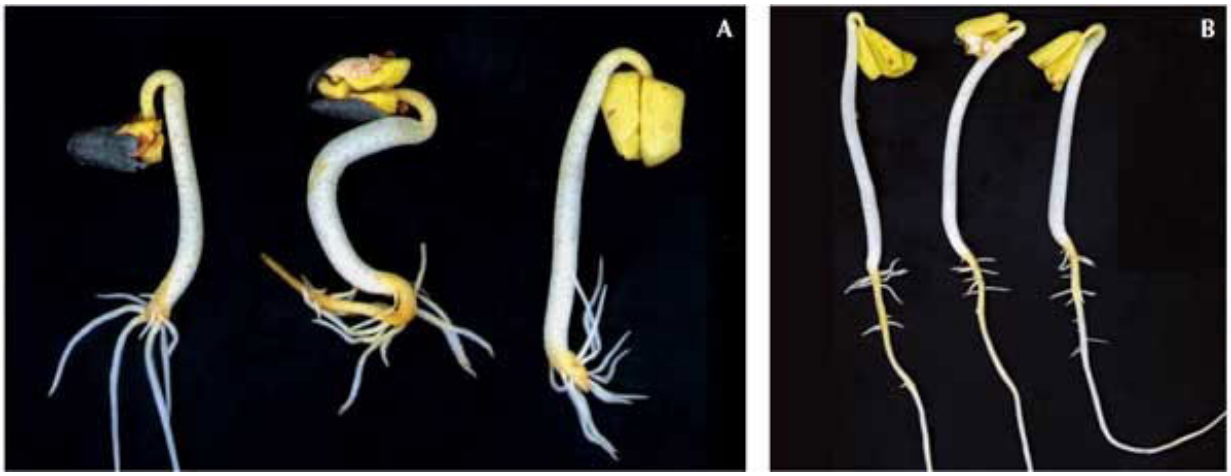

Figure 5. Cotton seedlings subjected to chilling temperatures (A) compared to seedlings not chilled (B) during imbibition from a study conducted by Hopper and Burke. Note the absence of normal taproot growth of the seedlings in A. Seedlings in A and B were exposed to the same temperature (86°F) with the exception of the first six hours of imbibition in which seedlings in A were exposed to chilling temperatures of 40°F. Photos by N. Hopper, Texas Tech University, and J. Burke, USDA-ARS, Lubbock, TX.

Seed Quality

Cotton production in Kansas is typically thermally limited, with slower warming in soil temperatures and higher levels of surface residue present compared to other cotton-growing areas. It is especially important that producers plant cotton seeds with exceptional seed quality and understand both their warm and gold germination scores on their seed lots. Warm germination scores are standardized across the industry and are required by law on seed tags. Cold germination tests are not required by law but are available from reputable seed companies. Be cautioned, that cold germination test procedures are not necessarily uniform across companies. Be sure to ask and understand what methodology was used before comparing cold germination scores across companies. In general, producers should plan to plant cotton seeds with the lowest cold germination scores first. In general, cold scores greater than 85% are preferred for early planting. Some companies may be able to provide the Cool-Warm Vigor Index (CWVI) score for their seed. This test, developed in Texas, gives a score that is the combined percentage of the 4-day warm germination test and the cool germination test. Scores of 160 or greater are excellent, Good = 140-159, Fair = 120-139, and Poor is anything less than 120. Farmers would want to plant seeds with the highest scores first and move to lower-scoring seed lots as soil temperatures increase.

References

R. Boman and R. Lemon. 2005. Soil Temperatures for Cotton Planting. *Agri*LIFE Extension. Texas A&M System. http://cotton.tamu.edu/General%20Production/scs-2005-17%20Soil%20Temp.pdf

K. Edmisten & G. Collins: https://cotton.ces.ncsu.edu/2019/04/cotton-planting-conditions-

april-25-2019/

K. Hake, W. McCarty, N. Hopper, and G. Jividen. 1990. Seed Quality and Germination. Cotton Physiology Today. https://www.cotton.org/tech/physiology/cpt/variety/upload/CPT-Mar90-REPOP.pdf

B. Robertson, S. Stewart, & R. Boman. 2007. Planting and Replanting Decisions. Cotton Physiology Today. https://agrilifecdn.tamu.edu/lubbock/files/2011/10/cptvol13no12007.pdf

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4. 2023 Wheat Plot Tours

The Department of Agronomy and K-State Research and Extension will host several winter wheat variety plot tours in different regions of the state, starting 10 May 2023. Make plans to attend a plot tour near you to see and learn about the newest available and upcoming wheat varieties, their agronomics, and their disease reactions. A preliminary list of plot tour dates, time, and directions is provided below. Plots highlighted in red are still tentative. This list will be continuously updated in the coming weeks.

Date	Time	County	Location	Directions	Agent/Contact
5/10	8:00 AM	Comanche		CANCELLED (crop termination)	Levi Miller
5/10	11:00 AM	Barber	Isabel	K42 and Main St	Justin Goodno
5/10	5:30 PM	Barber	Kiowa	Plots grazed out, tour at 126 S. 7th St., Kiowa	Justin Goodno
5/11	7:30 AM	Harper	Danville	3/4 mile south of Danville (East side)	Jenni Carr
5/11	12:00 PM	Reno	Hutchinson	KWA Field Day: South Central Kansas Exp. Field	Bryson Haverkemp
5/11	5:00 PM	Pawnee	Rozel	Go on Highway 1-56 go past Rozel to the last turn by Blattner Manufacturing turn right head north for a mile, the Pawnee County Wheat Plot is located on the west side of the road across from the Rozel Cemetery Legal NE Quarter of 28-21-19 in Grant Township. A meeting and meal will follow the Wheat Tour at Rozel Community Center which is located at 105 N Main Street, Rozel, KS 67574.	Kyle Grant
5/12	8:00 AM	Edwards	Belpre	Junction of Hwy 50 and Hwy 19, 1/4 mile south on 270th Ave.	Marty Gleason/Jean Huntley
5/12	12:00 PM	Kingman	Kingman	7681 SW 80 Ave, Kingman, KS 67068	Melissa Thimesch
5/15				Wheat Quality Tour	
5/16				Wheat Quality Tour	
5/17				Wheat Quality Tour	
5/18	8:30 AM	Barton	Hoisington	525 NW 190 Rd	Stacy Campbell
5/18	5:00 PM	Sumner	Conway Springs	Plot directions: 1/4 mile east of Tom Pauly Seeds (922 140th Ave N) on SE corner of intersection. Meal to follow the plot at the headquarters.	Randy Hein
5/19	9:00 AM	McPherson	Marquette	Patrick Plot- north side of Highway #4 in Marquette Rd at 10:00am	Shad Marston
5/19	12:00 PM	McPherson	Moundridge	Lunch sponsored by MKC held at noon at the Black Kettle Park in Moundridge. Galle Plot at 1:00pm just west of the	Shad Marston

				corner of 23rd and Cheyenne.	
5/19	3:30 PM	McPherson	Inman	Schroeder Farm test plot between 5th and 4th Ave on Cheyenne Road.	Shad Marston
5/23	8:00 AM	Labette	Parsons	Southeast Extension-Research Center - Parsons	James Coover
5/23	8:15 AM	Sedgwick	Andale	1/2 mile south of intersection 247th St W & 21st St N	Jeff Seiler
5/23	10:30 AM	Sedgwick	Clearwater	South of Clearwater 1 mile west of 151st St W on 119th St S.	Jeff Seiler
5/23	5:00 PM	Sumner	Belle Plaine	Program to follow meal. Meal location—1459 E. 60th Avenue North Southeast of Belle Plaine. Plot location—1/2 mile east from meal.	Randy Hein
5/23	9:00 AM	Walnut Creek	Rush Co (LaCrosse)		Lacey Noterman
5/23	11:00 AM	Walnut Creek	Ness (Ness City)		Lacey Noterman
5/23	5:00 PM	Walnut Creek	Lane (Dighton)		Lacey Noterman
5/24	12:00 PM	Harvey	Newton	Lunch at Camp Hawk. From camp hawk the plot is 1.5 miles west on SW 36th St. It is at the corner of s west rd. and SW 36th street.	Ryan Flaming
5/24	5:00 PM	Sumner	Caldwell	Program to follow meal. Meal Location—South side of highway from plot. Plot Location — From Caldwell, 1 1/2 miles East of Railroad Tracks, on Highway 81, North side of the road	Randy Hein
5/24	6:30 PM	Riley	Manhattan	SAVE Farm (9680 N. 52nd Street, Manhattan, KS 66503)	Greg McClure
5/25	9:30 AM	Ellis	Hays	Wheat Rx Field day at the K-State's Agricultural Research Center (1232 240th Ave, Hays, KS 67601). RSVP Required.	Romulo Lollato
5/25	11:00 AM	Ellsworth	Lorraine	2 ½ miles W on Ave V on the south of the road between 8th & 7th Rd	Craig Dinkel
5/25	5:00 PM	Russell	Russell	2 ½ miles W on old HWY 40 south of the HWY between 182nd & 181 rd.	Craig Dinkel
5/26	8:30 AM	Saline	Solomon	Ryan family farm: 3 miles west of Solomon on Old Hwy 40 and 2.5 miles S on Gypsum Valley Road	Jay Wisbey
5/26	11:00 AM	Saline	Mentor	Isaacson Family Farm, West of Mentor on Old 81 Highway	Jay Wisbey
5/26	3:00 PM	Cloud	Minneapolis	Tim and Ryan Myers, 1.5 Miles West of K-106 Highway on Justice Road	Jay Wisbey
5/31	12:30 AM	Post Rock District	Lebanon	Highway 281, 1 mile S of Lebanon, East side of highway	Sandra Wick
5/31	12:00 PM	Post Rock District	Jewell	Off of Hwy 14 north of Jewell, then west on K Road for 2 1/2 miles on the south side of the road.	Sandra Wick

5/31	4:30 PM	Post Rock District	Beloit	From Beloit: Go 11 miles south on K-14, then 11 miles west on S Road, plot is on south side of road. From Hunter: 8 miles east on Hunter blacktop (X Road) to 230 Road, then 5 miles north on 230 Road to S Road, then ¾ mile east. Plot is on the south side of road.	Sandra Wick
6/1	8:00 AM	Republic	Belleville	2 miles west of Belleville on Hwy 36 at K-State North Central Experiment Field	Luke Byers
6/1	10:00 AM	Republic	Belleville	Polansky Seed East Location (1.5 mi. E of Belleville on Hwy. 36)	Luke Byers
6/1	6:00 PM	Ellis	Hays	Golf Course Rd. & 180th Ave. at intersection go 1.5 miles S. on 180th Rd	Stacy Campbell
6/1	6:00 PM	Phillips	Phillipsburg	North of Phillipsburg in the corner of Hwy 183 ad E Osage Road.	Cody Miller
6/2	8:00 AM	Republic	Belleville	2023 In-Depth Wheat Diagnostic School (CEU/CCA credits, full day program). Registration required. 2 miles west of Belleville on Hwy 36 at K-State North Central Experiment Field.	Romulo Lollato
6/8	5:00 PM	Washington	Palmer	Ohlde Seed Farms (3 mi. E of Palmer on 4th Rd)	Luke Byers

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5. Review of restricted use pesticides and applicator licenses

As the 2023 field season gets into full swing, now is a good time for a refresher on restricted use pesticides (RUPs) and pesticide applicator licenses.

There are lots of ways to categorize pesticides, one of which is general use versus restricted use. In short, a general-use pesticide is one that can be used without any special training. A RUP, on the other hand, should only be used by an individual who is a certified pesticide applicator or is under the direct supervision of a certified pesticide applicator. RUPs are classified as such due to their potential to cause 'unreasonable adverse effects' on the environment, the applicator, or bystanders if appropriate precautions are not taken when using the product. Some RUPs you may be familiar with are listed in Table 1.

Table 1. Various restricted use pesticides (RUPs) listed by active ingredient and product name if applicable.

Active ingredient	Example product
Herbicides	
atrazine	Aatrex 4L
isoxaflutole	Balance Flexx
metsulfuron	Ally XP
paraquat dichloride	Gramoxone, Firestorm
picloram	Tordon 22K, Grazon P + D
Insecticides	
lambda-cyhalothrin	Warrior II, Karate, Silencer
chlorpyrifos	Lorsban, Duraguard
bifenthrin	Sniper, Brigade, Capture
permethrin	Reality, Pounce, Ambush
methomyl	Lannate
zeta-cypermethrin	Mustang, Stallion
Fungicides	
triphenyltin hydroxide	Agri Tin Flowable

Private applicator versus commercial applicator licenses

There are two types of certifications that will allow you to use a RUP. A private applicator license allows you to use or supervise the use of a restricted use pesticide to produce an agricultural commodity on property owned or rented by you or your employer. However, a commercial license is needed if you are going to apply pesticides on someone else's property and charge a fee for the service. You can contact your local Extension office if you need to obtain or renew an applicator's license.

Also remember, there are some extra record-keeping requirements for individuals who apply RUPs. There is no standard form, but within two weeks of the application, you should document what was sprayed, including:

- the date and location of the application,
- product name and EPA registration number,
- total amount applied and area treated,
- the site to which the application was made, and
- the name and certification number of the applicator.

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 use requirements.

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6. World of Weeds - Corn gromwell

It has been a while since the last World of Weeds feature, but we have a timely article for the month of April. Corn gromwell (*Buglossoides arvensis*) is currently flowering in no-till field areas around northeast Kansas (Figure 1). It is a member of the Boraginaceae family, which includes the popular bedding plants forget-me-not and comfrey, but no other weeds of agronomic importance in Kansas.

Figure 1. Corn gromwell growing in corn residue at the Kansas River Valley Experiment Field.

Photo by Eric Adee, K-State Research and Extension.

Ecology

Corn gromwell is a winter annual or biennial that is native to Asia and Europe. The roots were historically used to make red dye for clothing. It can be found in fallow fields, pastures, gardens, fencerows, and roadsides throughout Kansas. It can be especially troublesome in winter wheat due to the similarities of their lifecycles. In addition, corn gromwell is well-adapted to dry summers and cold winters.

Identification

Seedlings of corn gromwell typically emerge in the fall. They have large cotyledons. Mature plants grow about 7 to 28 inches tall but are typically 1 to 2 feet in height. Stems often branch at the base, with the central stem usually being the largest. The stems are green to reddish-brown and have rough hairs. Leaves are 1/3 to 1.25 inches long. They attach directly to the stems (sessile) in an alternating pattern. They are lanceolate or linear in shape with one prominent midvein. Leaves are covered with short, stiff hairs on both sides.

White flowers about ¼ of an inch wide form at the ends of the stems (Figure 2). Flowers have five petals arranged in a funnel. The "neck" of the funnel is sometimes blue. Small seeds form in brown to grayish-tan, cone-shaped nutlets that are about 1/10 of an inch long.

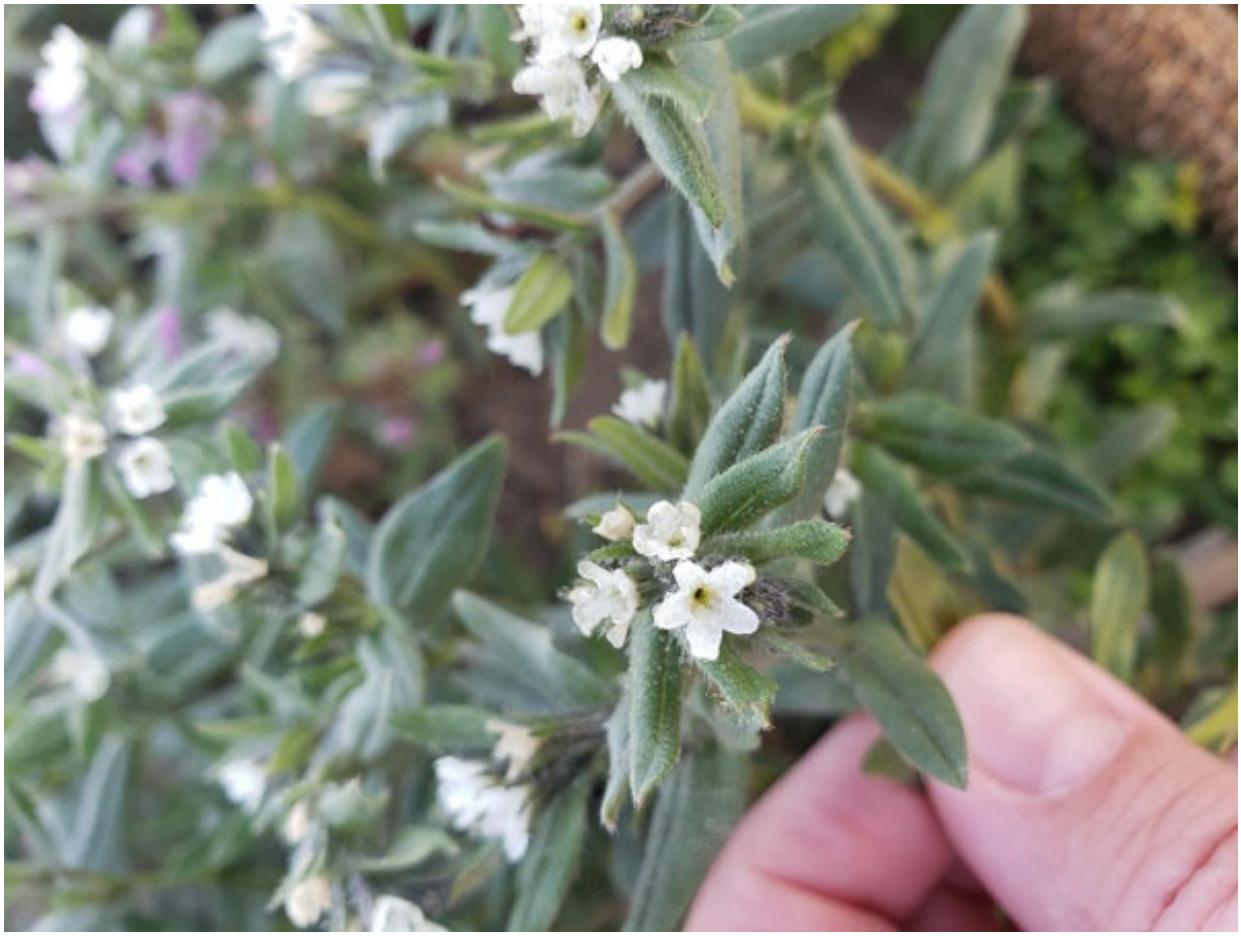

Figure 2. Corn gromwell flowers and leaves. Take note of the five petals and the hairy leaves. Photo by Sarah Lancaster, K-State Research and Extension.

Management

There is little research on the control of corn gromwell. It is not easily controlled by "typical" herbicides applied in the early spring, including glyphosate. Additionally, there are reports that Group 4 herbicides 2,4-D and dicamba are not very effective. There are some reports that chlorsulfuron (Glean, others), metsulfuron (Ally, others) and prosulfuron (Peak) have limited activity. Some products that seem to be more effective include bromoxynil, and triasulfuron (Amber, others). Other herbicides labeled for control include glufosinate (Liberty, others), metribuzin (Dimetric, others), and tribenuron (Express, others).

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 use requirements.

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7. 2022 National Winter Canola Variety Trial results

The results of the 2022 National Winter Canola Variety Trial (NWCVT) are now available online at https://bookstore.ksre.ksu.edu/pubs/SRP1178.pdf

The objectives of the NWCVT are to evaluate the performance of released and experimental varieties,

determine where these varieties are best adapted, and increase the visibility of winter canola across the United States. Breeders, marketers, and producers use data collected from the trials to make informed variety selections. The NWCVT is planted at locations in the Great Plains, Northern Plains, Midwest, and Southeast.

Seed for the NWCVT was distributed to 30 test sites in 15 states for the 2021–2022 growing season. The locations receiving seed are illustrated on the map on the front cover. See the back cover for a listing of participating cooperators. Of the 43 entries, 13 are commercial and 30 are experimental. These entries were provided by seven seed suppliers. All entries in the trial were treated with insecticide and fungicide seed treatments to control insects and seedling diseases through the late fall and early winter months.

In general, the 2021–2022 growing season was marked by dry conditions in the Great Plains, resulting in lower-than-normal yields. Temperatures fluctuated throughout the winter but only minimal winterkill was observed. However, the dry winter conditions resulted in reduced biomass production, limiting yield formation. Spring rains arrived during grain filling but were too late and caused only modest recovery. Some locations in the Southeast received too much rainfall in the spring.

Nineteen harvested test sites in eleven states are included in this report: Dallas Center, IA; Vincennes, IN; Belleville, Hutchinson, Manhattan, and Norwich, KS; St. Joseph, LA; Newton and Stoneville, MS (2 sites); Bozeman, Creston, and Moccasin, MT; Clovis, NM; Perkins, OK; Ashland City and Springfield, TN; Orange, VA; and Alburgh, VT. Eleven locations were not harvested or had poor data quality because of inadequate stand establishment, winterkill, or heavy rainfall. A new cooperator in 2021–2022 is St. Joseph, LA.

Acknowledgments

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8. Save the date - 2023 In-Depth Wheat Diagnostic School

The Department of Agronomy and K-State Research and Extension will host an In-Depth Wheat Diagnostic School on June 2 from 8:00 am to 3:50 pm at the K-State North Central Experiment Field (2 miles west of Belleville on Hwy 36).

This event will offer six CEU CCA and two 1A PM credits by providing hands-on training on diagnosing wheat production problems in a number of different areas listed below.

- Wheat Growth and Development (Romulo Lollato)
- Wheat Diseases ID and Management (Kelsey Andersen Onofre)
- Diagnosing Wheat Fertility Problems (Dorivar Ruiz Diaz and Nathan Mueller)
- Weed Control and Application Problems (Sarah Lancaster)
- Forage and Cover Crop Options (John Holman)
- Wheat breeding technologies (Allan Fritz)

The cost to attend this training is $90 before May 19 and $120 after, including walk-ins. A light breakfast and lunch are included with registration.

Register online: https://commerce.cashnet.com/AGRONKSU

For program or registration questions, please contact Romulo Lollato at lollato@ksu.edu or 785-477-4644.

Dr. Romulo Lollato talks about different wheat research plots near Hutchinson, KS. Photo by Daryl Strouts, former CEO of Kansas Wheat Alliance.

9. Meetings set in May for canola producers to learn about crush facility

A decision by a Nebraska-based agribusiness to recommission an oilseed crush facility near Goodland has opened an opportunity for farmers in Kansas and Oklahoma, said a Kansas State University agronomist.

Canola breeder Mike Stamm noted that Scoular – which lists more than 100 offices in North America and Asia and sales of more than $9 billion – announced in mid-March that it would retrofit the facility to crush both soybeans and canola. The facility is expected to begin operations in fall 2024.

"We wanted to support them by getting growers together to learn more," Stamm said. "For alternative oilseeds like canola to be successfully grown in Kansas, it is crucial to have a readily available end market within the region, which Scoular will provide."

Stamm said K-State Research and the Great Plains Canola Association will host several canola informational meetings for new and experienced growers. The meetings are scheduled for May 11 in Enid, Oklahoma, and May 18 in Montezuma, Kansas and Harper, Kansas. The meetings will include an update from Scoular on their marketing and pricing strategies and the company's vision for the rapidly changing renewable fuels market. Brief updates on canola research and extension activities and an update from the Great Plains Canola Association will be given.

The meetings are free to attend, but reservations are required because a meal will be provided. Location and contacts for each meeting include:

Thursday, May 11: Hoover Building, 300 E Oxford Ave, Enid, Okla.

- 9:30 a.m., Coffee and networking
- 10 a.m., presentation and meeting

RSVP to Ron Sholar, jrsholar@aol.com

Thursday, May 18: Montezuma Community Building, 508 West Sunnyside Ave., Montezuma, Kansas.

- 12 p.m., presentation and meal

RSVP to the Gray County Extension Office, 620-855-3821, or Kurt Werth, kwerth@ksu.edu

Thursday, May 18, 2023 – Fencepost, 700 E. 14th St., Harper, Kansas

- 6 p.m., presentation and meal

RSVP to the Harper County Extension Office, 620-842-5445, or Jenni Carr, jlcarr@ksu.edu