Issue 798

K-STATE Research and Extension

Extension Agronomy

eUpdate

05/08/2020

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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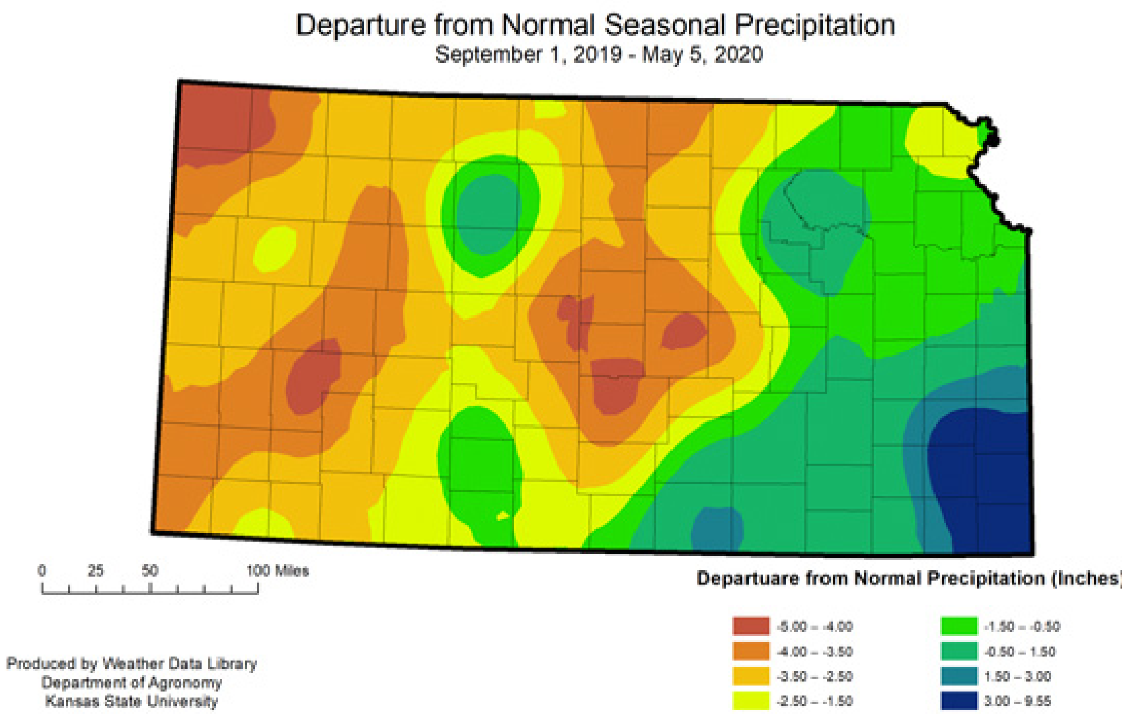
1. Drought stress taking its toll on Kansas wheat production in 2020

Total precipitation received across the state during the 2020 wheat growing season (September 1, 2019 through May 5, 2020) is anywhere from five inches below normal to close to normal in central and western Kansas (Fig. 1). These numbers indicate that severe, long-term drought stress has been established in parts of the state. Meanwhile, a more short-term analysis (January 1, 2020 to present) suggests that the region mostly affected by winter and spring drought is north central Kansas, which is up to four inches behind in precipitation accumulation for the period (Fig. 1).



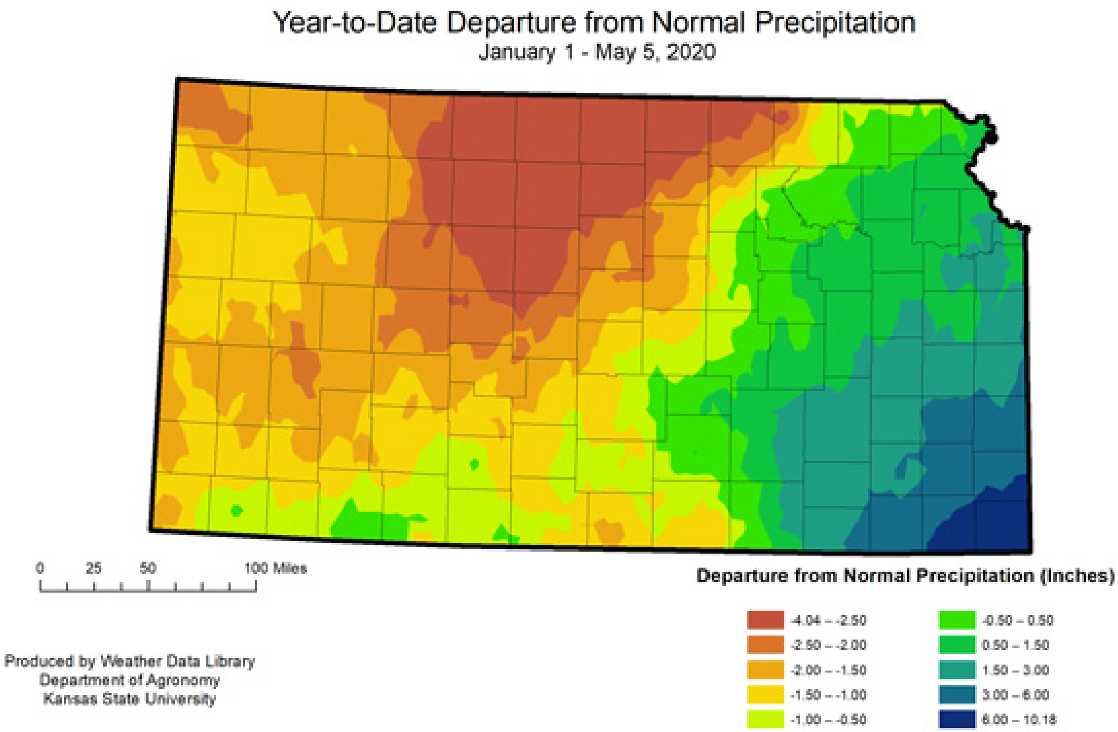


Figure 1. Departures from normal precipitation for Kansas during wheat growing season (upper panel, September 1, 2019 to date), and year-to-date period of January 1, 2020 to May 5, 2020 via Cooperative Observer (COOP), Community Collaborative Rain Hail Snow (CoCoRaHS), and Kansas Mesonet.

Several wheat fields in north central Kansas and western third of the state (eastern edge) are showing symptoms of short-term drought stress, including leaf rolling and loss of older (lower) leaves and a blue canopy coloration (Fig. 2). These symptoms are sometimes coupled with damage from the recent freeze events which causes abortion of older leaves and yellowing of lower canopy to be more pronounced (Fig. 3).

In western Kansas (i.e., Scott and Finney counties and west), many fields are showing long-term symptoms of drought stress, including extremely reduced plant height and biomass (crop stunting), and maturity acceleration (Fig. 4 and 5). Many of the fields are achieving later stages of development (such as flag leaf emergence and boot) at only 9-15 inches tall due to the prolonged stress. The lack of growth will not only reduce the crop's yield potential, but also create difficulty during harvest. A rain within the next few days is essential to improve crop conditions and ensure some level of harvestable grain yield. If no rain occurs in the next few days, producers will have to face the decision of whether to harvest a crop with extremely limited yield potential or to terminate the crop and switch to a summer crop – a decision that in some cases has already been made. The combination of a severe fall drought in southwest Kansas (Fig. 1), followed by a freeze damage in April 13 plus spring drought, has led many southwest Kansas growers to abandon their wheat fields and terminate them likely to plant a summer crop (Fig. 6).

Figure 2. Drought stressed wheat in Reno Co, Kansas. Early symptoms of drought stress include rolling of new leaves and blue discoloration of the canopy. Photos by Romulo Lollato, K-State Research and Extension.

Figure 3. Wheat field in Ness Co, Kansas, showing severe loss of leaves in the lower canopy due to the freeze damage from April 13. Photos by Romulo Lollato, K-State Research and Extension.

Figure 4. Wheat field in Scott Co, Kansas, showing severe symptoms of drought stress, including loss of leaves in the lower canopy and rolled up leaves, crop stunting and decreased biomass production, and a very thin stand. Photos by Romulo Lollato, K-State Research and Extension.

Figure 5. Wheat field in Finney Co, Kansas, showing severe symptoms of drought stress, including loss of leaves in the lower canopy and rolled up leaves, crop stunting and decreased biomass production, and a very thin stand. Photos by Romulo Lollato, K-State Research and Extension.

Figure 6. Wheat field terminated in Finney county, KS. This is a very common scenario in southwest Kansas during the 2019-2020 growing season due to prolonged drought conditions and potentially damaging freezing temperatures. Photos by Romulo Lollato, K-State Research and Extension.

For more information on management options for damaged wheat, see the following eUpdate articles from recent issues.

"Options and Management strategies for freeze-damaged wheat" – April 24, 2020 (Issue 796)

"Herbicide carryover considerations when re-cropping damaged wheat" – April 24, 2020 (Issue 796)

"Forage options for freeze-damaged wheat" – Current eUpdate: May 8, 2020 (Issue 798)

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2. Forage options for freeze-damaged wheat

Freezing conditions during April over some parts of Kansas potentially caused some damage in winter wheat, and with the passage of time, the level of damage is becoming more clear. As a result, producers facing reduced grain yields must soon decide whether to keep the wheat crop for grain or make a forage such as wheat hay or silage.

Comparing net returns to grain versus forage at this stage, however, requires market prices for wheat hay and silage, which aren't always readily available. So how do you put a value on these forage products? This article updates a 2018 eUpdate article to provide some current estimates of wheat forage values as producers consider their options moving forward. The earlier article has more details on harvest concerns and relative feedstuff values.

It must also be mentioned that insured wheat growers should check first with their crop insurance agent before harvesting a forage crop to determine insurance requirements and document potential grain yield losses. Sometimes producers may be required to leave small areas of uncut wheat to provide a way to estimate grain yields. Insurance agents can also inform producers of any other restrictions which may apply. Some additional information about insurance-related decisions appears in another KSU article which discusses options for a potentially failed crop.

Pricing wheat silage and wheat hay

The approach for pricing these wheat forage products will be to derive a silage or hay price using feed value comparisons to a feedstuff for which more reliable price information exists. A good candidate for a proxy feedstuff in Kansas is alfalfa hay, with prices reported weekly across the entire state and for a range of quality levels.

Alfalfa hay rated as "good" quality will have 58-60 percent total digestible nutrients (TDN) and 18-20 percent crude protein. According to USDA Ag Marketing Service reports, "fair/good" grinding alfalfa in southwest Kansas is currently selling for around $150-170 / ton, as a reference point. Wheat silage made from wheat at "early-head stage" maturity contains just over 15% Crude Protein and 73% TDN, on a dry matter basis (see Belyea, et al.).

Using an alfalfa hay price of $160/ton and the value of energy in alfalfa hay, a comparable wheat silage price based solely on energy would figure out to about $70 per ton as fed ($199/ton dry matter basis), assuming the silage is 35 percent dry matter. A similar calculation based solely on protein content would suggest a wheat silage price of about $50/ton as fed (about $143/ton dry matter basis). These results, based on rather simplistic calculations, might be viewed as upper and lower bounds on wheat silage prices, from a feed value perspective.

For wheat hay, Watson, et al. (1993) indicated that wheat hay harvested at the dough stage would have 56-62 percent TDN and 8-10 percent crude protein, on a dry matter basis. So, wheat hay has almost as high an energy content as alfalfa hay, but significantly lower protein. Wheat hay priced solely on energy, relative to alfalfa, would figure out to about $155 per ton as fed. However, a similar calculation based solely on protein content would suggest a wheat hay price of only about $69/ton as fed. This is a rather wide range and could be considered as upper and lower bounds on the wheat hay value.

Given this wide range, this same approach based on relative feeding values is also estimated with a comparison to forage sorghum hay, which is closer in nutrient content to wheat hay and may provide a more meaningful range of price estimates. Using a TDN value of 57% and a crude protein value of 8% for forage sorghum hay, along with an edge-of-the-field price of $110 ton, we get suggested wheat hay prices in the range of $110 to $124 per ton.

Ultimately, of course, market prices are determined by buyers and sellers. However, the discussion above provides a couple of perspectives on how interested parties might approach the problem.

References

Belyea, R.L., R.E. Ricketts, F.A. Martz, R.R. Ruehlow, and R.C. Bennett. October 1993. "Wheat Silage for Dairy Cattle," University of Missouri Extension Service, Columbia, Missouri.

Watson, S.J., D.L. Fjell, J.P. Shroyer, K. Bolsen, and S. Duncan. "Small Grain Cereals for Forage." Kansas State University Agricultural Experiment Station and Cooperative Extension Service, MF-1072. Manhattan, KS. August 1993.

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3. Reports of stripe rust are increasing across Kansas, although incidence remains low

Scouting efforts from across Kansas have reported several new occurrences of stripe rust this week. So far, incidence has generally been low (> 1%), and reports have been limited to the lower-to-mid canopy. There is evidence that disease incidence is increasing at some locations and producers should continue scouting efforts. Lower canopy infections are less likely to result in yield reductions. When environmental conditions are favorable (extended periods of dew, for example), infections in the lower leaves may spread to the upper canopy and neighboring plants, resulting in reduced yield. Spread within a field and symptoms that have moved to the upper canopy may warrant a fungicide application. To preserve yield, it is critical to protect the flag leaf.

Additional information for fungicide decision making can be found in the publication *Evaluating the Need for Wheat Foliar Fungicides* (https://bookstore.ksre.ksu.edu/pubs/MF3057.pdf) and information on product efficacy can be found in the *Foliar Fungicide Efficacy for Wheat Disease Management* publication (https://bookstore.ksre.ksu.edu/pubs/EP130.pdf).

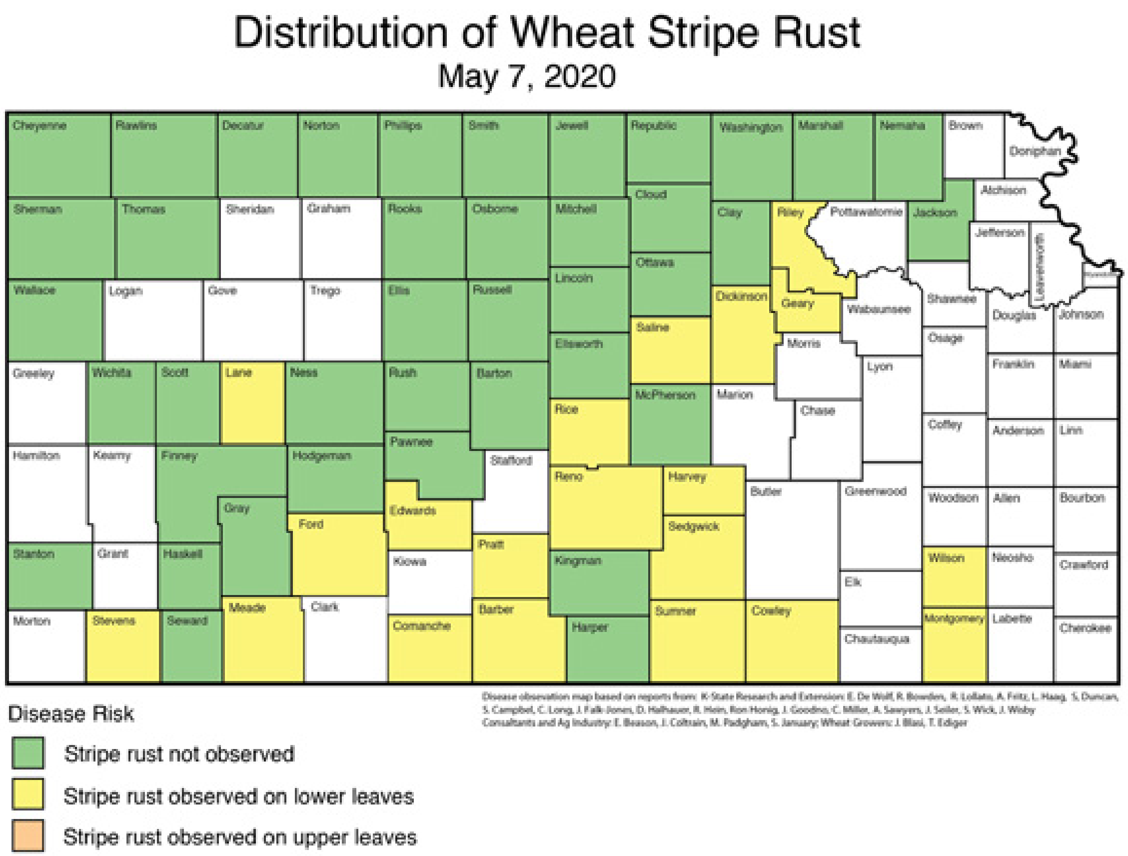

Figure 1. Distribution of stripe rust in Kansas as of May 7, 2020. Map is based on observations by K-State Research and Extension, crop consultants, and wheat producers in the state. Map created by Kelsey Andersen Onofre and Erick DeWolf, K-State Research and Extension.

Scouting for stripe rust

Stripe rust presents with characteristic yellow lesions that form in narrow bands across the leaf. When conditions are right, spores may spread to and infect the upper canopy. It is important to walk into the field during scouting campaigns and to move the canopy aside to get a good view of lower leaves. Walking several parts of the field is a good idea, as stripe rust can tend to form foci of high disease severity, which can be easy to miss from the edge of the field.

Figure 2. Photo of stripe rust with characteristic yellow lesions, present on a single leaf in the lower canopy. Image taken in Riley county on May 6, 2020. Photo by Kelsey Andersen Onofre, K-State Research and Extension.

If you find stripe rust in your county, please send a report to your local extension agent or directly to Kelsey Andersen Onofre (andersenkf@ksu.edu) and Erick DeWolf (dewolf1@ksu.edu) with photos of symptoms, if possible.

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4. Dry conditions in early May leads to expansion of drought in Kansas

For the week ending on May 5, 2020, precipitation was variable across Kansas. Over the seven-day period, Kansas received 58 % of normal moisture. The Southwest Division saw zero precipitation for the week and the West Central and Northwest Divisions had between 3 and 63 percent of their weekly normal. Meanwhile the East Central Division had 116 % of normal (Figure 1). Greatest measured daily precipitation in the state occurred in Osage County with 3.61 inches recorded (Melvern 0.9 E, on May 5). The highest precipitation amounts were seen in the east, with greatest in the East Central Division (Figure 2).

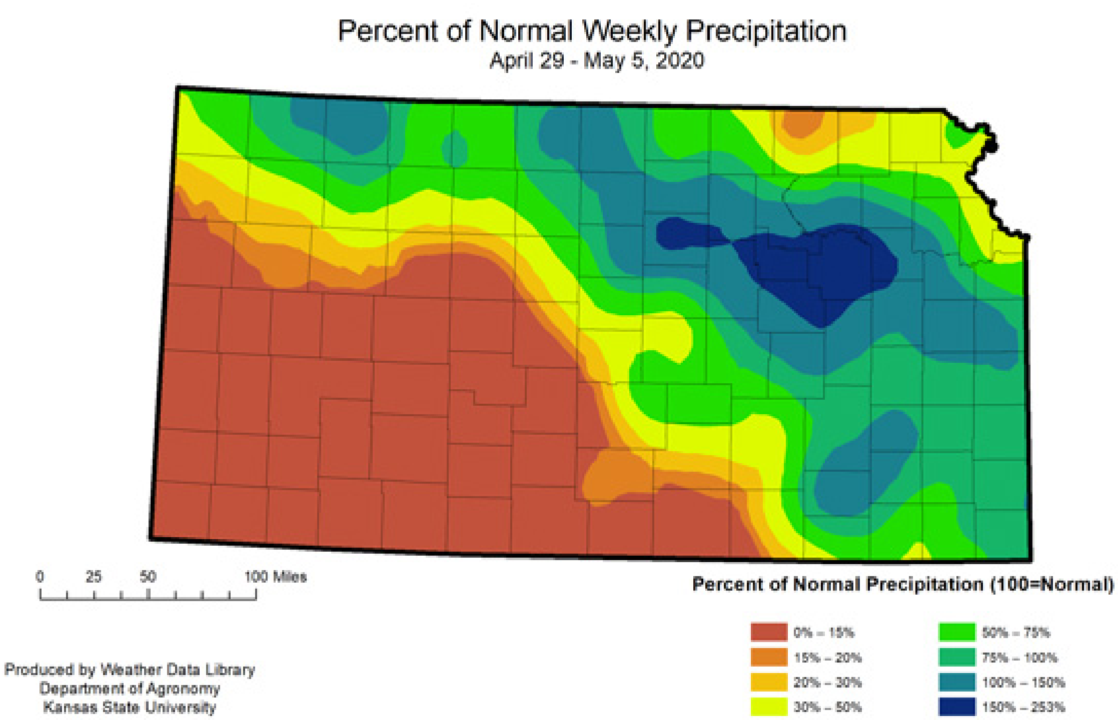

Figure 1. Percent of normal precipitation for the week of April 29-May 5, 2020. Values less than 100 indicate below-normal amounts. Map by the Kansas Weather Data Library.

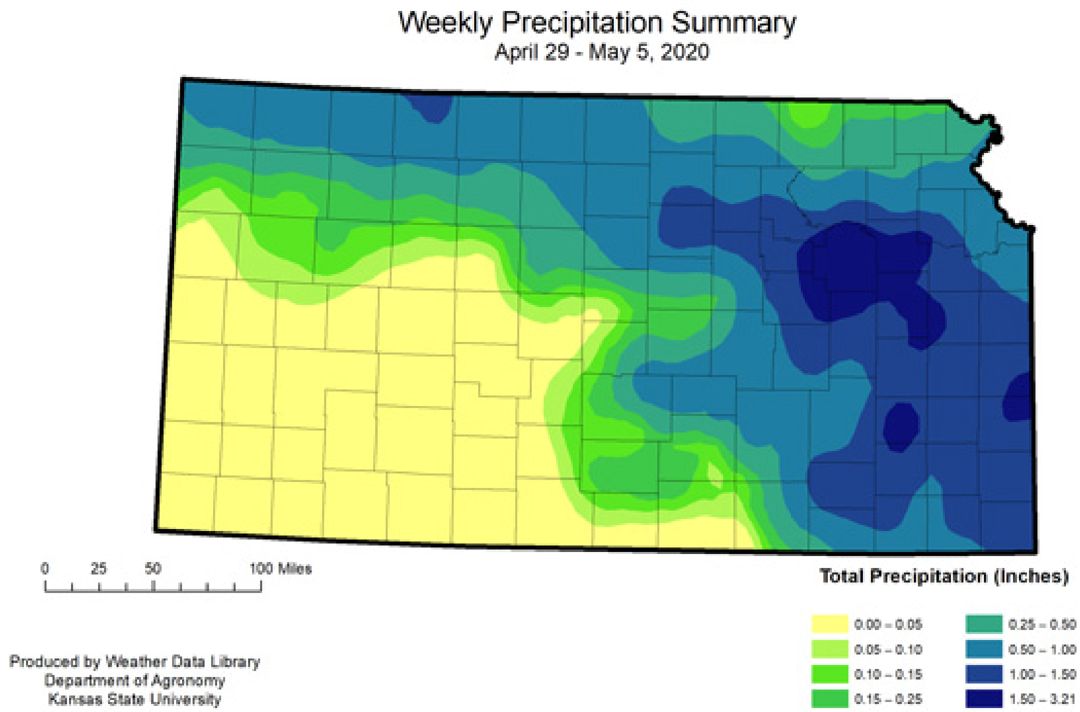

Figure 2. Total precipitation (inches) recorded for the week of April 29-May 5, 2020. Map by the Kansas Weather Data Library.

Temperatures showed considerable variability with the warmest reading 95 °F (Garden City Exp. Station, Finney County, on May 2) and coldest being 31 °F (St. Francis, Cheyenne County, on May 1). The state averaged 3.3 °F warmer than normal for the seven-day period, with the warmest departures in the Southwest, which averaged 6.2 °F warmer than normal. The northeast was closest to normal with an average departure of 1.2 degrees warmer than normal. (Figure 3).

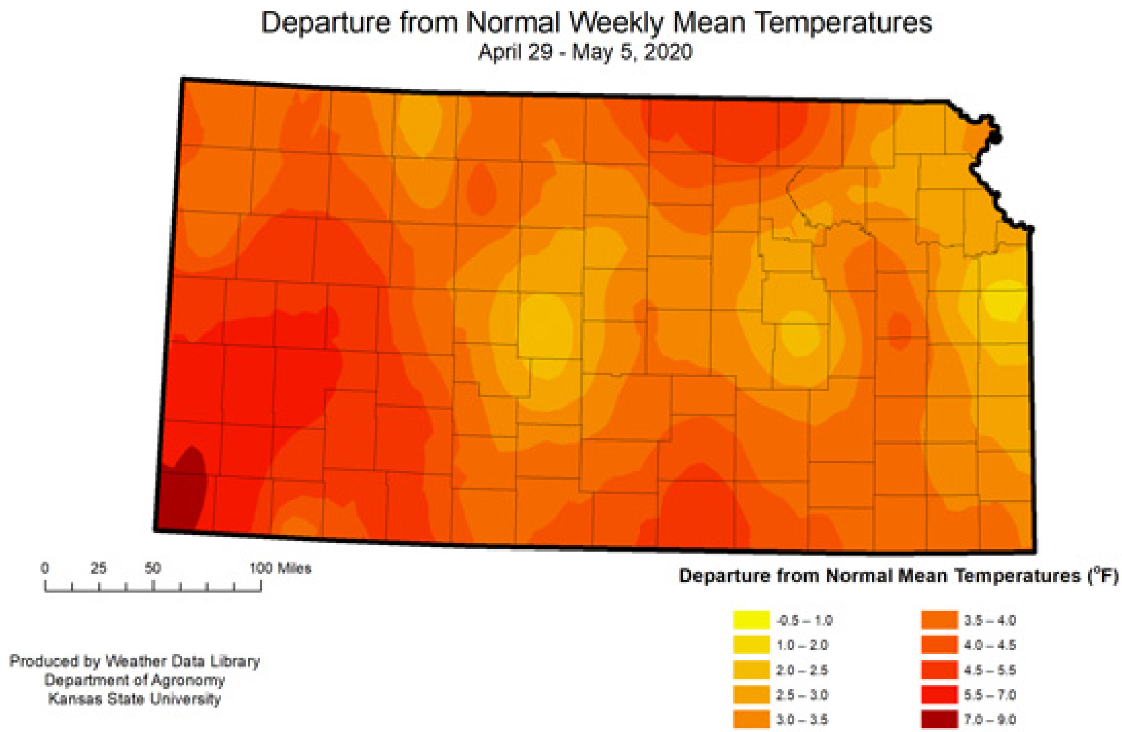

Figure 3. Departure from normal weekly mean temperatures.

Drought status for Kansas

The dry start to May has resulted in worsening drought conditions in the western third of the state. Extreme drought (D3) appears on the map for the first time this year (Figure 4). In many areas, the soil surface is dry while the subsoil is moist (Figure 5). Perennials are beginning to actively grow and decreases in sub-surface moisture are being observed with increased evapotranspiration demands. Drought stress is showing in many fields and will continue to worsen until above normal moisture is received.

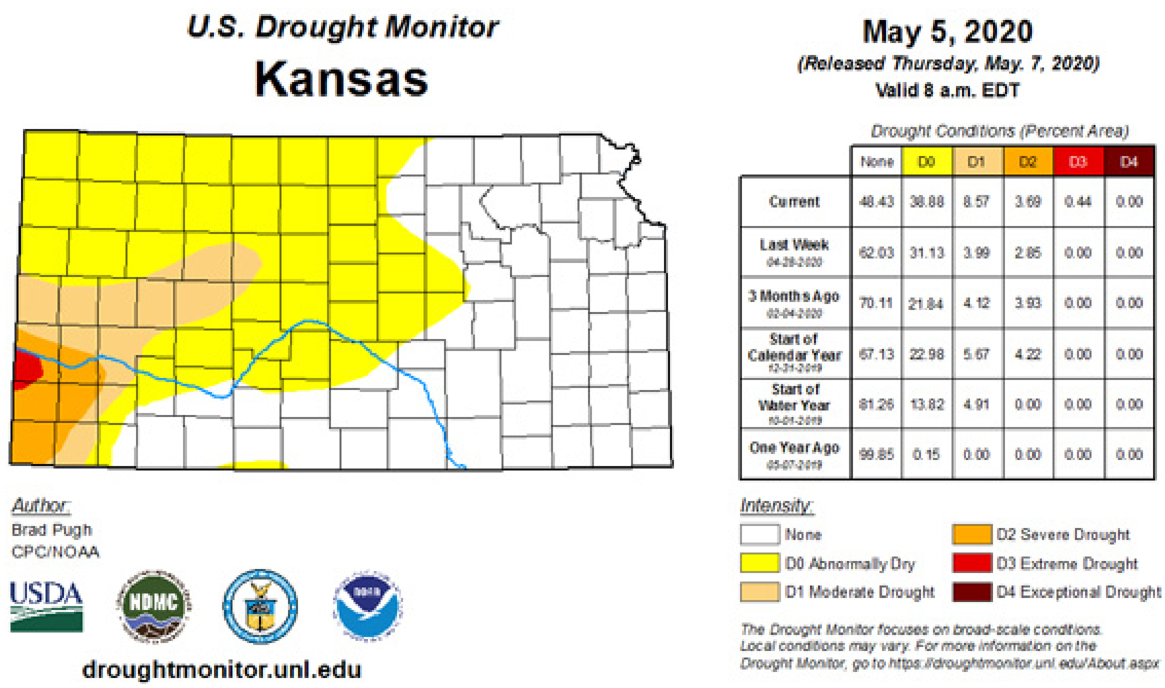

Figure 4. Current weekly drought status (U.S. Drought Monitor).

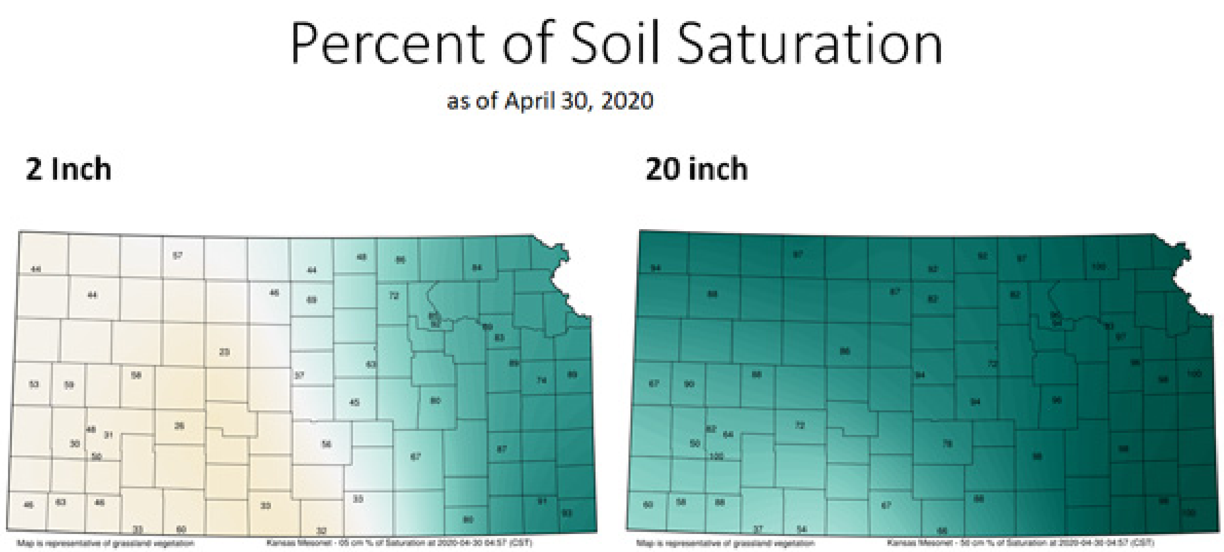

Figure 5. 2-inch (surface soil) versus 20-inch (sub-surface soil) moisture (% of soil saturation) as of April 30, 2020. Data from Kansas Mesonet.

In the upcoming week, there is a slight chance of above-normal precipitation, particularly in the eastern parts of the state (weekly average precipitation for mid-May is 1-1.5 inches). As we move into summer, average precipitation across the state is increasing daily. As a result, more moisture is required to reach normal thresholds. The eastern border counties are expected to receive up to two inches (Figure 6). The outlooks suggest equal chances for above- or below-normal temperatures for the next 8-14 days.

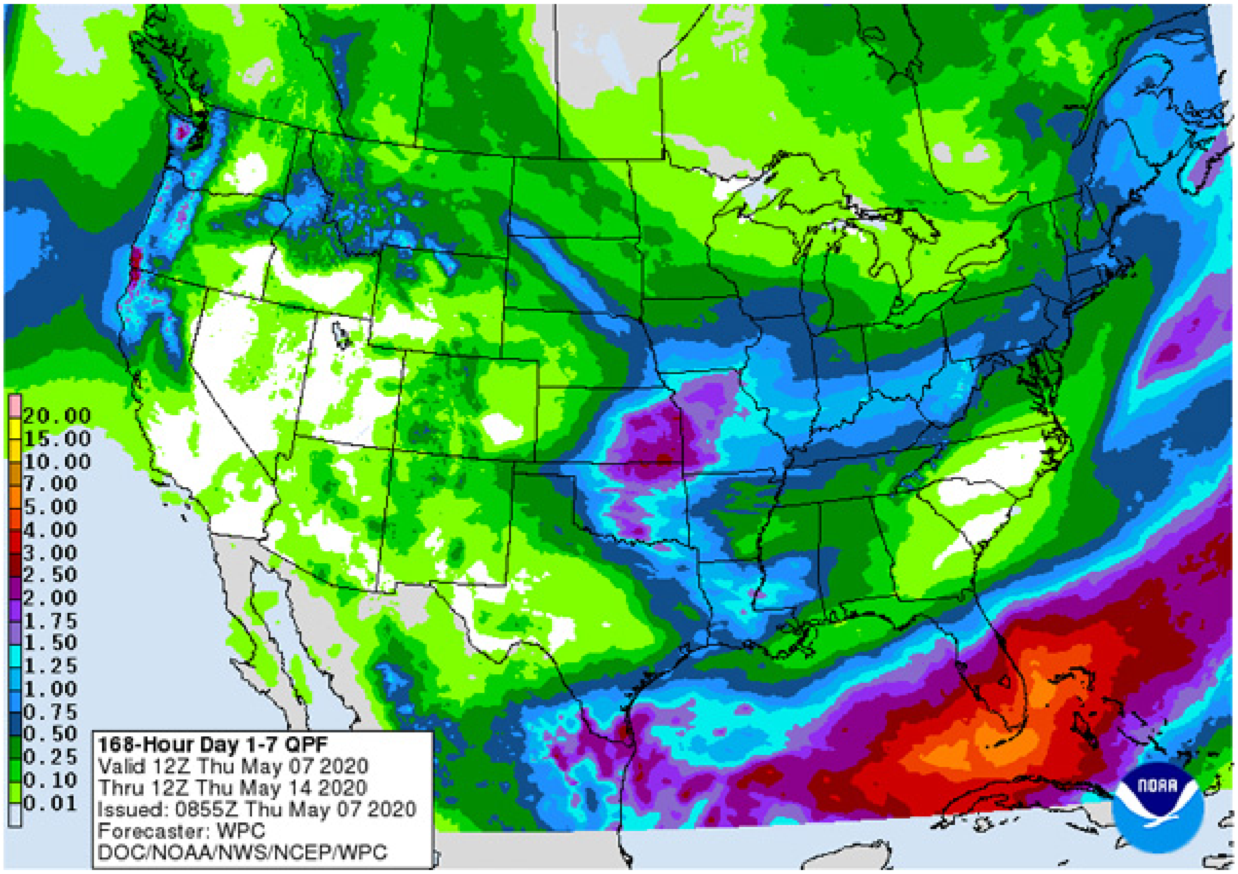

Figure 6. Quantitative Precipitation Forecast for the week ending on May 14, 2020 (Weather Prediction Center).

Summary of key points

- Temperatures averaged warmer than normal.
- Continued split precipitation pattern – wet to the east; dry to the west.
- Extreme drought added to southwest Kansas; abnormal dry conditions were added in Northwest/North-Central.
- Forecast for the upcoming week is for near-normal temperatures and above-normal precipitation with highest confidence in the east.

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5. Updated wheat fungicide publication for 2020

With wheat in the boot stage and approaching heading (Feekes 10) in many parts of Kansas, producers are considering the use of fungicides to manage foliar diseases and protect the yield potential of their crop. Susceptible varieties are at highest risk for yield loss when environmental conditions are favorable for disease development. K-State research has found that a single application can result in a 4-13% yield increase in susceptible varieties relative to wheat that remained untreated.

The publication *Foliar Fungicide Efficacy for Wheat Disease Management* has been updated and can be found at: http://www.bookstore.ksre.ksu.edu/pubs/EP130.pdf. The recommendations in this publication reflect several years of head-to-head comparisons of products in Kansas and many other wheat producing states.

Considerations for managing foliar diseases

Timely disease scouting is the first step in assessing the need for foliar fungicide applications. Important foliar diseases for Kansas wheat producers this year include stripe rust, leaf rust, tan spot, and leaf blotch. Producers should scout for symptoms of foliar diseases in the upper canopy, and particularly near the flag leaves of primary tillers. Damage to the flag leaf is most associated with reduced yield. If symptoms are present when scouting, a foliar fungicide application may be considered. There are many fungicides available in Kansas that provide very good to excellent control of foliar diseases and producers should consult the updated *Foliar Fungicide Efficacy for Wheat Disease Management* publication for details.

Managing Fusairum head blight (wheat scab)

It is important to remember that strobilurin fungicides (picoxystrobin, pyraclostrobin, azoxystrobin, etc.) should not be applied after heading (Feekes 10) if there is risk for Fusarium head blight. Strobilurins can cause increased mycotoxin levels in infected plants. Luckily, there are several products that are very good for Fusarium head blight control, including Caramba, Miravis Ace, and Prosaro. For maximum control, a single application may be applied at flowering (Feekes 10.51). The window for fungicide applications closes within a few days of the flowering period and very early stages of grain development. Most products labeled for head scab have a 30-day pre-harvest interval.

It is important to carefully consult fungicide label recommendations prior to product application.

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6. UPDATE - Soil temperature and cold injury for corn

For the week of May 1 to May 6, the average soil temperature at 2 inches ranged from 58 °F in north central Kansas to 75 °F in the southwest. Temperatures at the 4-inch depth are not much different. Weekly average soil temperatures at the 4-inch depth ranged from 59 °F in the northeast to 71 °F in south central Kansas (Figure 1).

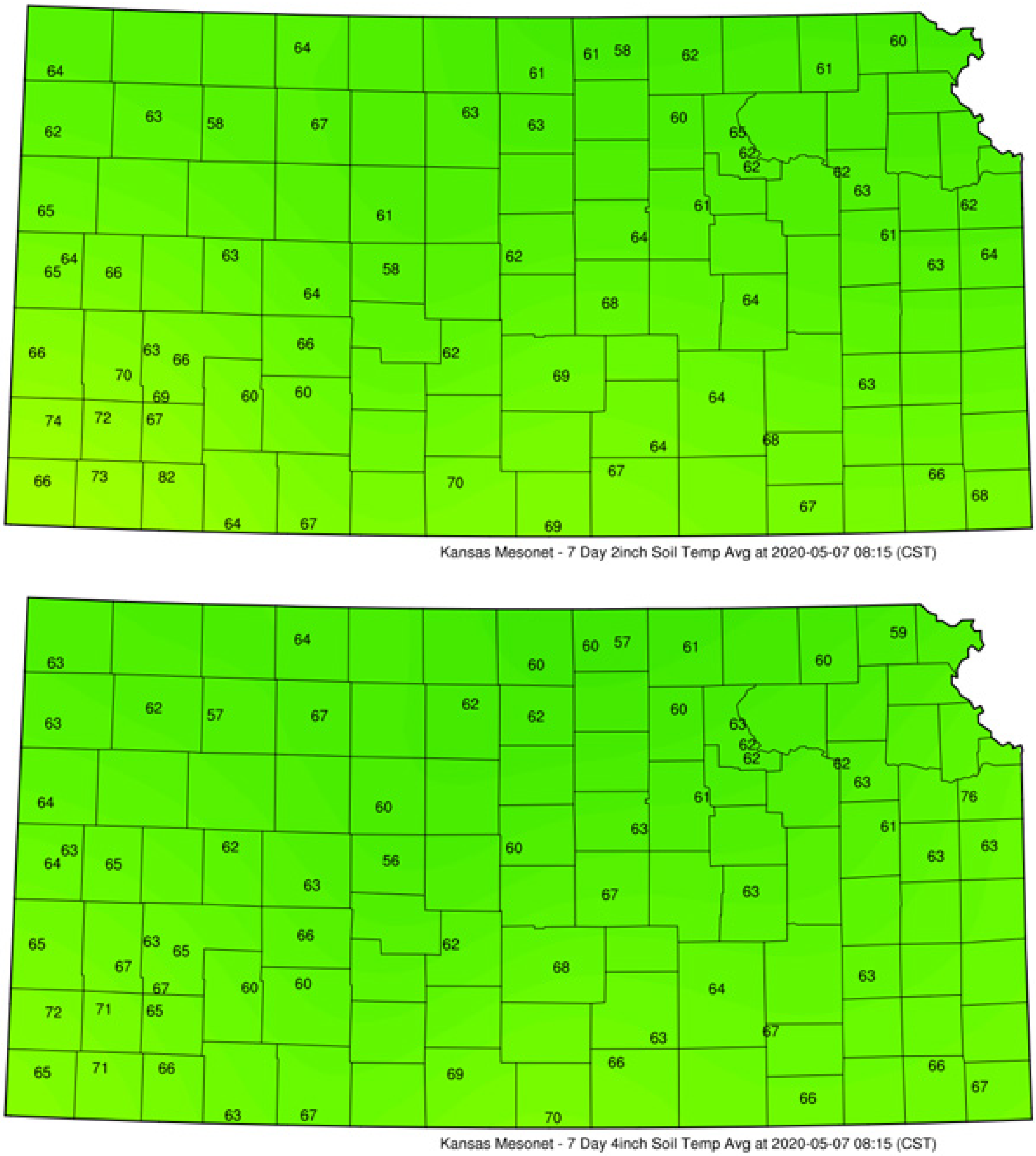


Figure 1. Average soil temperatures at 2-inch (upper panel) and 4-inch (lower panel) soil depth for the week of May 1 - 7, 2020. Map data from Kansas Mesonet.

Air temperatures are projected to go below 40°F for May 8-10 (Fig. 2). Minimum temperatures across the state will drop to 32°F on Sunday morning (May 10) for the northwest region and less than 35°F for north central area of the state (Fig. 2). This will produce a problem for the recently planted corn and soybean crops with soil temperatures declining in the next coming days following air temperature changes.

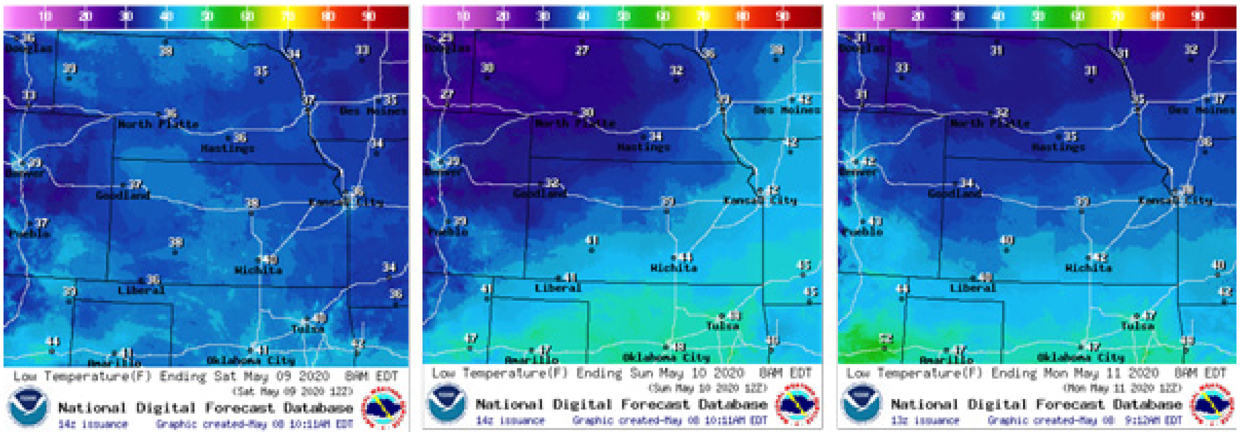
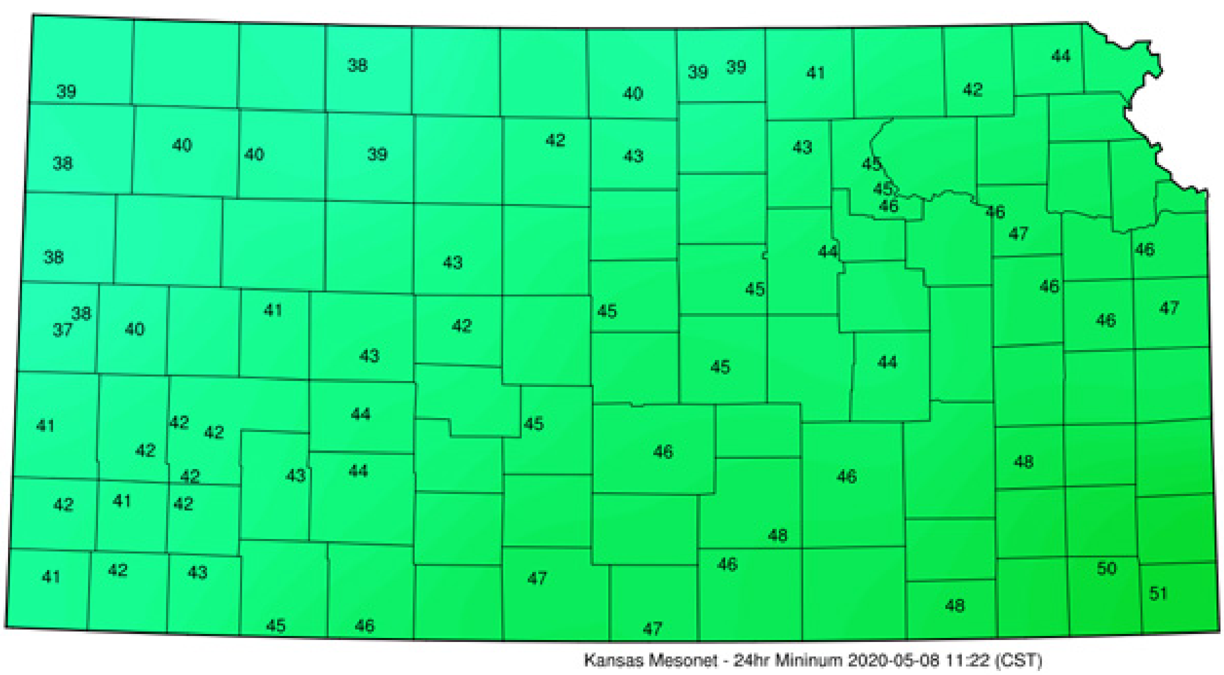


Figure 2. Minimum air temperatures for the next days, Saturday, Sunday, and Monday (May 9-11, 2020). Source: NOAA

With morning lows on May 8 in the 30s in the northwest and in the mid-40s across the rest of the state, minimum 2-inch soil temperatures also dropped (Figure 3). Dry, bare soils will cool more rapidly than moist soils, and the temperatures will warm more rapidly as well.



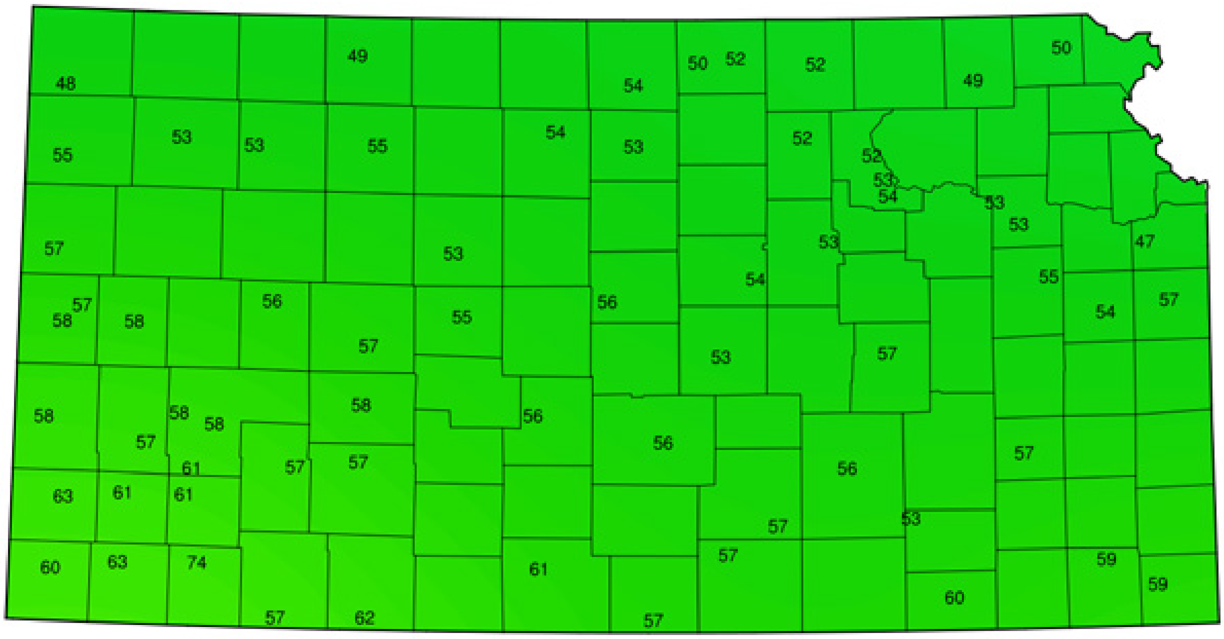


Figure 3. Minimum air temperature (upper panel) and minimum 2-inch soil temperature (lower panel) for May 8, 2020. Map data from Kansas Mesonet.

Chilling injury to seeds

Cold temperatures can result in injury to the germinating seed as it is absorbing moisture – a problem called imbibitional chilling injury. Damage to germinating seeds can occur when soil temperatures remain at or below 50 °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 3)
- Delayed or complete failure of emergence, often leafing out underground

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

Before making any decisions, fields should be scouted 4-7 days after the cold occurred since the extent of the damage and potential for new growth will be evident during this time.

The biggest risks are likely to be in the northwest, where temperatures are expected to be the coldest and soils are dry. More information about the potential impacts on low temperatures will be in upcoming issues of the Agronomy eUpdate. Stay tuned!

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

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7. Soil temperature and forecast are critical for successful cotton stand establishment

Cotton has a great ability to 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?

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 on the Kansas Mesonet (http://mesonet.k-state.edu/agriculture/soiltemp/). 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 is favored by soil temperatures above 64 degrees F and adequate, but not excessive, soil moisture. Based on USDA-ARS research work at Lubbock, TX, the seedling cotton requires more than 100 hours above 64 degrees F at the seed level to emerge. In Kansas, we often use 60 degrees F as our baseline temperature at seed level. Current 2-inch soil temperatures indicate that threshold is approaching, particularly in the southwest (Figure 1). The 6-10 weather outlook favors cooler-than-normal temperatures for the period, which will slow soil warming.

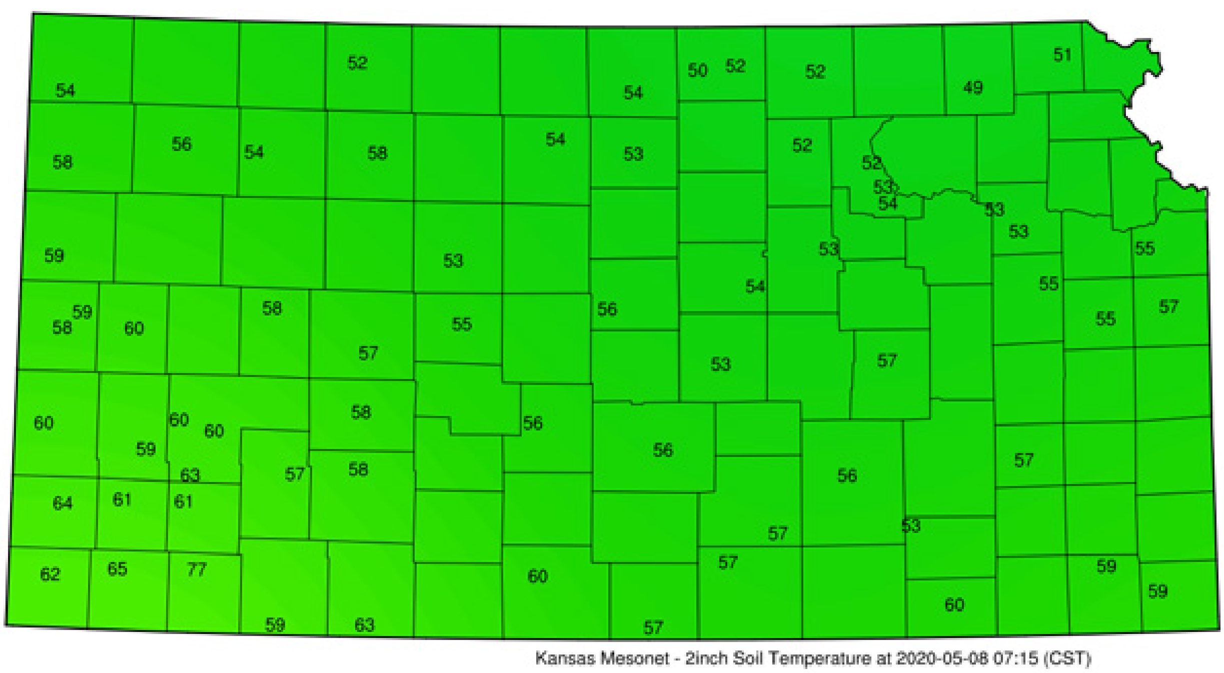

Figure 1. Two-inch soil temperatures on May 8, 2020 from Kansas Mesonet.

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.	

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. Cotton seed contains lipids which must be converted to energy, and cell membranes must develop properly. If soil temperatures drop below 50 degrees F during this critical germination period, seedlings may suffer damage. 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 (Figure1). If the plants survive, the root system will not develop normally.

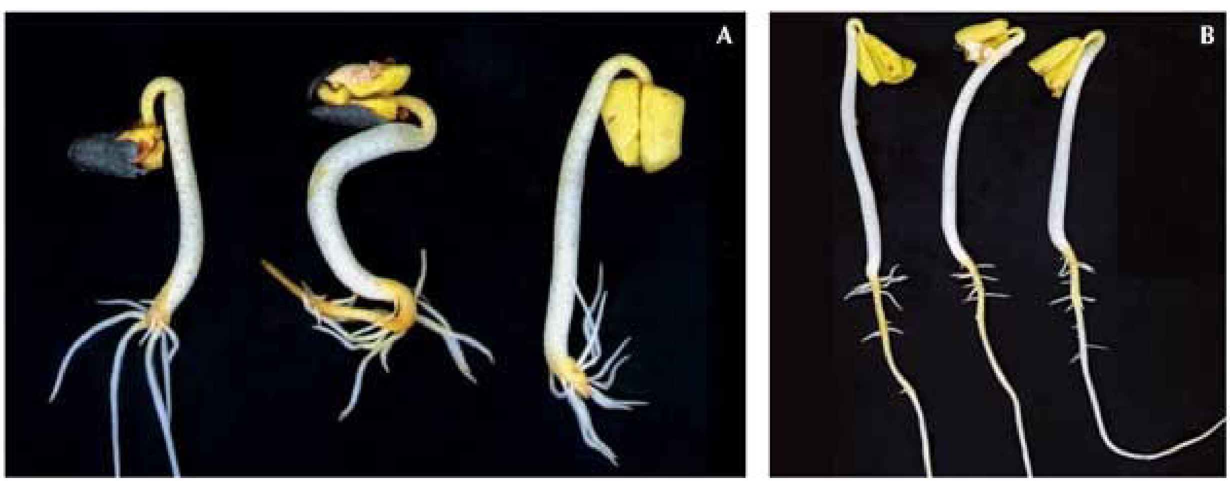

Figure 2. Cotton seedlings subjected to chilling temperatures (A) compared to seedlings not chilled (B) during imbibition from a study conducted by Hopper and Burke. Note the absence

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.

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/

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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8. Control options for buckbrush, roughleaf dogwood, and smooth sumac

Three common brush species native to Kansas are buckbrush (*Symphoricarpos orbiculatus*), roughleaf dogwood (*Cornus drummondii*), and smooth sumac (*Rhus glabra*).

Buckbrush is generally 2-3 feet tall and occurs on prairies and woodlands. Patches of buckbrush provide cover for birds and mammals. Above-ground runners help buckbrush spread around forming clumps.

Roughleaf dogwood is a shrub that can reach 15 feet in height. Flat-topped clusters of white flowers usually appear in late May to early June. Roughleaf dogwood can be found in fence rows, edge of woods, along streams, and open prairies. It provides cover for wildlife and nesting birds.

Smooth sumac will grow to a height of 5-7 feet and produces an open milo-like head in early June. It grows on rocky soils in pastures and along fence rows. Some birds will eat the seed and the plants provide cover for birds and mammals.

All three shrubs can produce clumps that will shade out and reduce forage production. Cattle generally do not browse on these species, but sheep and goats are more likely to utilize these woody plants.

Top removal of buckbrush after the plants have leafed out and the nonstructural carbohydrates stored in the roots are at a low level can be an effective control. One way to accomplish top removal is with prescribed burning. Fire can be an effective control technique if burning is done in the late spring. It may take 2 or 3 years of consecutive burning to reduce buckbrush stands. If you missed the opportunity to burn this year or are located in areas where burning wasn't possible, mowing becomes an option. Again, it may take 2 or 3 years of consecutive mowing at the proper time (generally early to mid-May) to reduce stands.

Herbicides can also be used to control buckbrush. The best time to spray occurs just as the leaves are starting to change from a light to dark green color (Figure 1). This timing corresponds with the low point in the nonstructural carbohydrate cycle. A number of herbicides can be used to spray buckbrush, but 2,4-D low-volatile ester formulations at 1.5 to 2 lbs/acre are usually quite effective. Other herbicides used for buckbrush control include Grazon P+D (picloram + 2,4-D) at 2-3 pint/acre and Chaparral (aminopyralid + metsulfuron). Chaparral can be used alone at 2 to 3 oz/acre for buckbrush control, but I prefer adding 2 pint/acre 2,4-D to 2 oz/acre Chaparral. Caution should be used if treating cool-season grasses with Chaparral. Grazon P+D is a restricted use pesticide. Always read the label when considering the use of herbicides.

Figure 1. Leaf color change on buckbrush. Photo by Walt Fick, K-State Research & Extension.

Roughleaf dogwood is rarely grazed and invades grassland in the absence of prescribed burning. Pastures that are frequently burned usually do not have a roughleaf dogwood problem. Once established, roughleaf dogwood is difficult to remove with fire alone as the plant usually leafs out after the burning season. Long-term late spring burning may gradually reduce stands of roughleaf dogwood.

The optimum time to spray roughleaf dogwood is between the flower bud state and early seed production (Figure 2). A number of foliar-applied herbicides including triclopyr (Remedy Ultra), dicamba (Banvel), and picloram (Tordon 22K) used alone or in combination with 2,4-D will defoliate roughleaf dogwood, but actual mortality is usually less than 25%. Roughleaf dogwood can be difficult to control. High-volume treatments providing greater than 50% mortality include 0.5-1% PastureGard HL (triclopyr + fluroxypyr), 1% Surmount (picloram + fluroxypyr), and 1% Grazon P+D + 0.5% Remedy Ultra (picloram + 2,4-D + triclopyr). All these herbicides are applied with water. Adding a 0.25 to 0.5% v/v non-ionic surfactant may enhance control. Aerial applications should be applied in a minimum 3 gallons per acre total spray solution to insure adequate coverage.

A single application of any herbicide does not completely eliminate roughleaf dogwood, but may open up the stand enough to carry a fire. In subsequent years, a combination of prescribed burning in the late spring followed by a herbicide application 4-6 weeks post burning should provide good control.

Figure 2. Roughleaf dogwood in full bloom. Photo by Walt Fick, K-State Research & Extension

Late-spring burning will keep smooth sumac shorter in stature, but generally increases stem density. The optimum time to spray smooth sumac is between the flower bud stage and early seed production (Figure 3). Smooth sumac is among the easiest woody plants to control with herbicides if applied at the proper time. Smooth sumac is controlled with 2-3 pint/acre 2,4-D with ground or aerial application.

Figure 3. Smooth sumac in early seed production stage. Photo by Walt Fick, K-State Research & Extension

Soil-applied materials such as Spike 20P (tebuthiuron) and Pronone Power Pellets (hexazinone) can provide control of roughleaf dogwood and smooth sumac. Spike 20P should be applied during the dormant season at 0.75 ounces product per 100 square feet. This is equivalent to 20 pounds of product per acre. Pronone Power Pellets should be applied when the soil is moist and rainfall is expected within 2 weeks of application. For plants 3-6 feet tall apply 2-4 pellets at the base of the plant. Expect to see grass damage following use of Pronone Power Pellets. Spike 20P can also be used to control buckbrush.

These dry soil-applied products may be useful in areas where spray drift may cause considerable non-target damage.

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9. Ag-Climate Update for April 2020

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

April 2020: Dry and cool, but a difficulty month due to COVID-19

April was cool and dry (Figure 1). It ranked as the 18th driest April and the 36th coolest. Statewide, 34 new daily record highs were recorded. There were also 38 record daily low minimum temperatures. Statewide precipitation averaged much below normal, with only the eastern divisions above 70 percent of normal. The Northeast averaged 2.62 inches; 80% of normal.

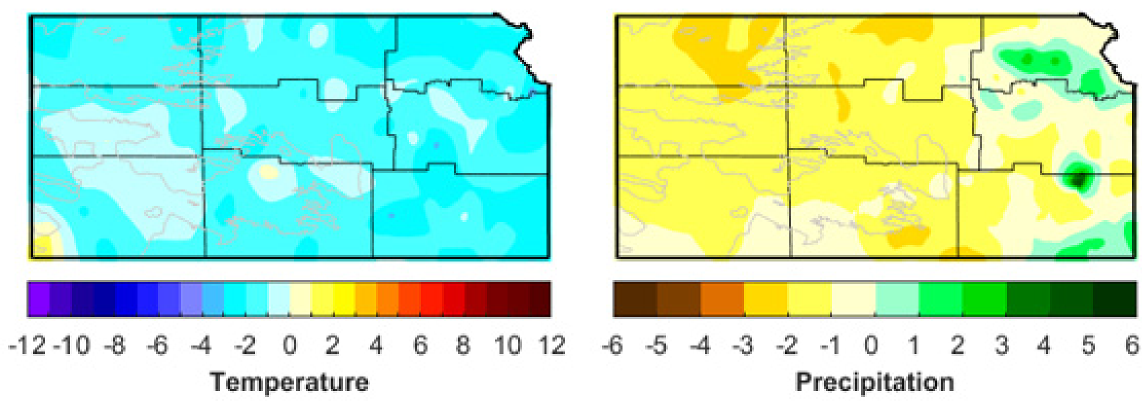

Figure 1. Departures from normal temperature (°F) and precipitation (inches).

Severe weather was limited. There were no reports of tornadoes, and 29 reports of hail and 12 reports of damaging wind. There were several swaths of hail in western, central, and northeast KS. One storm event in NE KS wiped out fences and caused flooding. Despite the cold temperatures, snowfall was limited. Greatest snowfall totals included: 2.2 inches at Frankfort 6NE, Marshall County (NWS); 2.0 inches at Baileyville 1.0 S, Nemaha County (CoCoRaHS).

The CoVID-19 quarantines also had an impact. Stay-at-home rules reduced travel and $C0_2$ emissions, but made field scouting and other agricultural activities difficult. The lack of trade caused a steep drop in commodity prices along with difficulty moving product to market.

View the entire March Ag-Climate Summary, including the accompanying maps and graphics (not shown in this summary), at http://climate.k-state.edu/ag/updates/.