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These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy e-Update 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 Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Forage options for drought-stressed wheat

The dry conditions that have prevailed over much of Kansas since the fall of 2017 have left some wheat growers with relatively dim prospects for grain production for the summer 2018 harvest. An alternative use for that wheat is as a forage crop – silage or hay – which may still have considerable value at a time when pasture grazing prospects and hay supplies may be uncertain. This article briefly looks at some issues producers should consider as they contemplate their options for their drought-stressed wheat.

Wheat silage and hay can both be valuable feedstuffs for cattle producers. Wheat harvested at the dough stage should contain approximately 56-62 percent total digestible nutrients (TDN) and 8-11 percent crude protein, on a dry matter (DM) basis. Wheat silage and hay may be used in the diets of feeder cattle, calves, replacement heifers, and beef cows. However, if the wheat is harvested post-heading, producers should grind the wheat hay if the variety has awns, since awns can cause health problems if fed unground.

Producers looking at these alternative uses for their wheat crops should also consider their options for marketing each type of feedstuff. For those who do not have their own cattle to feed, prospective demand for either silage or hay from nearby livestock producers could play an important role in their decision. Hay is more flexible in that it can be hauled farther and may be of use to a wider potential clientele.

Finally, insured wheat growers should check first with their crop insurance agent regarding insurance requirements to document potential grain yield losses before harvesting a forage crop. If producers believe they would have low grain yields and otherwise be entitled to an insurance indemnity, they may be required to leave small areas of uncut wheat to provide a way to estimate grain yields for the insurance loss calculation. Insurance agents can also inform producers of any other restrictions which may apply.

Making wheat silage

Timing is a key factor for making small grain silage. Small grain forage yields and feeding values depend heavily on the stage of maturity at the time of harvest (noted here). The optimal moisture level for ensiling small grains is 62 to 68 percent. Moisture levels above 70 to 75 percent can cause excessive seepage and undesirable fermentation (noted here). At lower moisture levels, the silage may contain more hollow stems and result in excessive air entrapment. This possibility means that small grain silage should be chopped finer than corn or sorghum silage. Timing is crucial in obtaining these target moisture levels. It is often more of a challenge to put up small-grain silage with adequate moisture if harvesting at soft-dough, which requires little drying time between swathing and chopping, while putting up silage in the boot stage may require some drying time between swathing and chopping. Carefully monitor moisture content when swathing and chopping. Wheat maturity can advance quickly, so producers with significant acreage to harvest may consider whether to begin while the grain is still in the milk stage, when moisture content is typically 65 to 70 percent.

Information from New Mexico State University Extension indicates there are actually two schools of

thought on the timing of small grain silage harvest. The more conventional perspective aims for ensiling during the late-boot/early heading period because energy and protein are optimized. The quality may be high enough to use for lactating dairy cows. The second perspective argues for waiting until the soft-dough stage; while this later harvest results in lower energy and protein per ton, the increase in yield is usually enough to offset the decline in quality. That is, more protein and energy will be harvested on a per acre basis.

Under typical growing conditions, wheat silage yields will be in the range of 5 to 7 tons per acre of 35 percent DM forage when harvested in the late boot stage, and 8 to 10 tons per acre in the late-dough stage. Of course, drought-stressed wheat will likely produce less tonnage per acre; depending on the severity of drought, a 25-50% reduction in biomass can be expected.

Regarding feed values, Table 1 shows nutrient content of wheat silage at different stages of growth, according to research at the University of Missouri:

Table 1. Nutrient content of wheat silage at different stages of growth

Growth stage	Crude protein (% of dry matter)	TDN (% of dry matter)
Boot	20.87	73
Early-head	15.31	66
Mid-head	11.26	59
Late-head	10.27	46
Milk	8.99	49
Dough	8.49	55
Ripe seed	6.78	54

Source: Adapted from Belyea, et al. (1993), University of Missouri.

Pricing wheat silage

One challenge for buyers and sellers of wheat silage is how to determine a sale price for a commodity that isn't commonly traded and for which no widely accepted market price exists. Two approaches will be considered here: the first method will be to derive a silage 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. A second pricing perspective considered here is to estimate how high the wheat forage must be priced in order to provide a higher payoff than harvesting the wheat as grain.

Alfalfa hay rated as "good" quality will have 58-60 percent 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 $140-150 / ton, as a reference point. Using the silage feed values for the "early-head" stage of maturity from Table 1, we see that on a dry matter basis, energy content (TDN) of wheat silage will be equivalent to or even better than alfalfa hay. The crude protein content in wheat silage, however, is slightly lower than good alfalfa.

Using the value of energy in alfalfa hay, a wheat silage price based solely on energy would figure out to about $63 per ton as fed ($180/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 $45/ton as fed (about $120/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.

A second pricing approach is to estimate a price per ton of silage which would offer a comparable or better return to the wheat grower than harvesting the wheat as grain. Net returns to grain harvest are equal to the expected yield multiplied by market price, minus the cost of grain harvest. As an example, assume a yield of 25 bu/acre with a market price of $4.80/bu, and harvest costs (based on custom rates) of $29 per acre. These values indicate a net return to harvesting grain of about $91 per acre.

Returns to harvesting wheat as silage are calculated as a silage yield of 3.86 tons per acre (35% dry matter; this is equivalent to a 1.5 ton hay yield, assuming 90% dry matter), multiplied by the $45/ton lower bound price from above, less harvesting costs of $34.74 per acre (calculated at $9/ton for chopping and hauling). This gives a net return of about $139 per acre, a more attractive option than the return to grain harvest calculated above.

Making wheat hay

A forage alternative that will appeal to many Kansas wheat growers is wheat hay. As mentioned earlier, wheat hay makes a very good feedstuff for a variety of cattle enterprises, and in some cases hay can be hauled farther and more easily than silage. Again, precautions are needed if the wheat variety has awns.

Past research from K-State indicates that wheat hay harvested at the boot stage would have the highest quality and less concern about awns, but that haying at the early milk stage offers the best compromise between high dry matter yield and forage quality. An earlier harvest favors higher protein content, but dry matter yields are typically 20 to 40 percent higher per acre at the later maturity. The other concern often mentioned with wheat hay is the presence of rough awns in more mature forage, which can prove irritating to cattle's eyes and mouth. Ensiling or grinding the hay can alleviate the concern about awns.

Wheat cut for hay in the late-boot stage will benefit from the use of a crimper to speed the drying, but use of a crimper at a later stage could increase shattering losses, and the more mature crop is already at a lower level of moisture anyway. Past studies from K-State have shown 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.

In the case of drought-stressed wheat, drought should not have such an important impact on nutritional quality. Maturity stage at harvest will still have the greatest effect on forage quality. Wheat is a nitrate accumulator and thus testing is recommended for wheat harvested for forage. Ensiling can greatly reduce nitrate levels (30-70% reduction), thus if wheat contains nitrate levels in excess of 4500 parts per million (ppm) nitrate ensiling should be considered. Producers should consider testing wheat hay for nitrate prior to feeding if nitrate was not evaluated prior to harvest.

Pricing wheat hay

Coming up with a price for wheat hay can face the same challenge as that seen for wheat silage: we don't have a widely operating market with commonly known prices. This section will use the same methods used for silage above: (i) estimate a wheat hay price calculated by comparing feed values with other forages; and (ii) estimate a wheat hay price which will offer a comparable return to harvesting wheat for grain. Note that hay prices are usually quoted for harvested forage ready at the edge of the field, so harvesting costs are included in this price. Hauling costs would typically be considered the responsibility of the buyer.

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 $140/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. While these values could be viewed as upper and lower bounds, they present a rather wide range and are not very satisfying guides for pricing decisions.

Given this wide range, this same approach based on relative feeding values is also estimated with a comparison to forage sorghum hay. Market prices aren't quoted for this forage for many regions in the state as alfalfa hay, at least in the USDA-Ag Marketing Service weekly reports. However, forage sorghum hay is closer in nutrient content to wheat hay, which 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 $90/ton, we get suggested wheat hay prices in the range of $90 to $100 per ton.

The second approach, "what hay price does it take to beat grain harvest", also provides a helpful reference point in this case. On the grain side, net returns to grain harvest use the same values mentioned earlier, resulting in a return of about $91 per acre.

Returns to wheat hay are calculated as a hay yield of 1.5 tons per acre (90% dry matter), times (initially) the lower bound price of $69/ton, less swathing and baling costs of $45.50 per acre (uses $12/bale for 1200-lb. bales). These values suggest a net return to hay of only about $57 per acre, much less than the return to grain. However, using a wheat hay price of $95 per ton provides a net return of about $97 per acre for harvesting hay, a slight advantage over grain harvest.

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.

For more information you can access the following publications:

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.

Blasi, D., and D. Fjell. October 1998. "Small Grain Cereals for Silage and Hay," Kansas Forage Task Force, Forage Facts Notebook, Kansas State University Agricultural Experiment Station and Cooperative Extension Service, Manhattan, KS.

Marsalis, M.A. October 2012. "Small Grain Silages for New Mexico" New Mexico State University Cooperative Extension Service, Circular 630. Clovis, NM.

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

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2. Sorghum management considerations: Planting practices

Some of the main planting practices affecting yields in sorghum are: row spacing, row arrangement, seeding rate/plant population, planting date, and hybrid maturity.

Sorghum plants can compensate and adjust to diverse environmental conditions through modifications in the number of tillers, head size, and final seed weight. For sorghum, the final number of seeds per head is the plant component that varies the most; and thus has more room for adjustment than the other plant components (seed weight and number of tillers).

Seeding rate / plant populations

Sorghum population recommendations range from a desired stand of 23,000 to more than 100,000 plants per acre depending on annual rainfall Table 1:

Table 1. Grain sorghum recommended seeding rate, plant population and row spacing at different average annual rainfall.
Source: https://www.bookstore.ksre.ksu.edu/pubs/MF3046.pdf

Avg. Annual Rainfall (inches)	Seeding rate (x 1,000 seeds/acre)*	Recommended Plant Population (x 1,000 plants/acre)	Within-row Seed Spacing (65% emergence)		
			10-inch rows	20-inch rows	30-inch rows
< 20	30-35	23-27	21-18	10-9	7-6
20 to 26	35-64	25-45	18-10	9-5	6-3
26 to 32	50-80	35-55	13-8	6-4	4-3
> 32	70-125	50-90	9-5	4-2	3-2
Irrigated	110-150	80-110	5-4	3-2	2-1

* Assuming 65% field emergence.

Because of sorghum's ability to respond to the environment, final stands can vary at least 25 percent from the values listed above, depending on expected growing conditions, without significantly affecting yields. Lower seeding rates minimize risk of crop failure in dry environments. Sorghum can compensate for good growing conditions by adding tillers and adjusting head size, but yields can be reduced in a dry year if populations are too high. For a high-yielding environment (>150 bu/acre), under narrow rows, high plant populations can be a critical factor for improving sorghum yields.

Higher seeding rates also should be used when planting late. Increase rates by 15-20 percent if planting in late-June or later. Late planting will restrict the time that sorghum plants will have in the season for producing productive tillers, thus decreasing the plants' ability to compensate for inadequate stands.

Recent research in Kansas has confirmed these long-term recommendations. In these studies, sorghum yields were maximized at 25,000 plants per acre (optimum between 20,000 to 30,000 plants per acre) in western Kansas at 17 inches annual precipitation; 40,000 in central Kansas at 30 inches

annual precipitation; and 50,000 in eastern Kansas at 32 inches annual precipitation. Studies in Missouri, with substantially more than 32 inches of annual precipitation, maximized yield with about 60,000 plants per acre. For western Kansas, final stands of about 20,000 to 30,000 plants per acre can attain yields of 60 to 80 bushels per acre or more. For central and eastern Kansas, final stands of 50,000 to 70,000 plants per acre can maximize yields, with the final objective of having 1 to 1.5 heads per plant.

Having more than the recommended number of plants per acre results in fewer fertile and productive tillers and thinner stems, which will reduce yield in the drier environments and increase susceptibility to drought. On the other extreme, thin stands can compensate for better-than-expected growing conditions somewhat by producing more and/or larger heads. However, under high-yielding environments, a higher final plant population will be needed to increase yields as much as possible (Table 1).

Planting date

A summary of research data performed in the last several years has confirmed that the optimum planting date for maximizing yields will be around early June (Figure 1). Still, the decision related to the optimum planting date should be timed so plants have the best possible chance of avoiding hot, dry weather at the flowering stage, but can still have sufficient time to mature before the first frost.

Planting date has some effect on seeding rates. Sorghum will tiller more readily in cool temperatures and less readily under warm conditions. As a result, later plantings in warmer weather should be on the high side of the recommended range of seeding rates for each environment since there will be less tillering. The potential for greater tillering with earlier planting dates makes sorghum yields generally more stable when planted in May and early June compared to late June or July plantings.

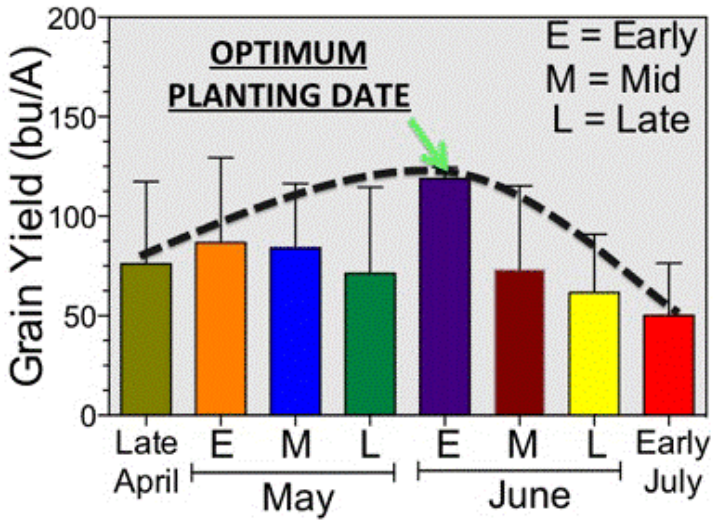

Figure 1. Planting date effect on final sorghum yields (Tribune/ Hutchinson/ Manhattan, Vanderlip; Scandia 1994-96, Gordon; St. John 1993-95, Martin and Vanderlip; Columbus 2000/03, Kelley). From Sorghum: State of the Art and Future Perspectives**, Agronomy Monographs 58, 2016, chapter "**Genotype × Environment × Management Interactions: US Sorghum Cropping Systems**" doi:10.2134/agronmonogr58.2014.0067, Ignacio A. Ciampitti and P.V.V. Prasad (Eds).**

Planting depth

Seed placement is also a critical factor when planting sorghum. Optimum seed placement for sorghum is about 1-2 inches deep. Shallower or deeper planting depths can affect the time between planting and emergence, affecting early-season plant uniformity. We recently conducted a planting depth study, using late planting (about mid-June) under uniform soil temperatures and three seed placements – shallow, 0.5 inch; optimum, 1.5 inches; and deep, 3 inches. Optimum and deep placement resulted in similar shoot growth while shallower placement resulted in delayed development with fewer number of leaves and less total shoot mass (Figure 2).

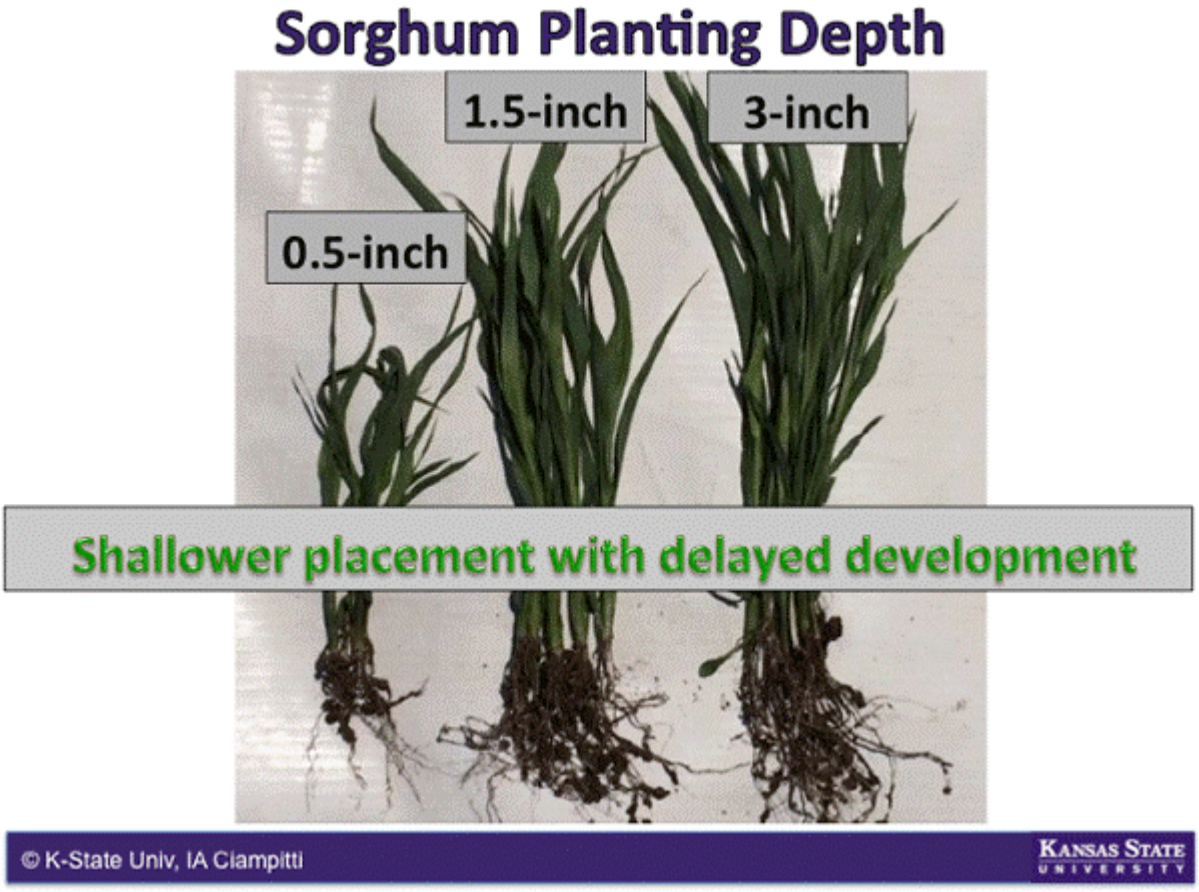

Figure 2. Seed placement effect on early sorghum growth and development, Manhattan, 2014 (Ciampitti et al., 2014).

Row spacing

The other factor that can influence yield is row spacing. The last three columns in Table 1 show that plant spacing within the row becomes greater as row spacing decreases. This greater intra-row plant spacing reduces plant-plant competition early in the growing season when head number and head size are being determined.

A response to narrow row spacing is expected under superior growing environments, when water is a non-limiting factor. Narrow rows increase early light interception, provide faster canopy closure, reduce evaporation losses, can improve suppression of late-emerging weeds (a major issue in sorghum), and maximize yields.

The influence of row spacing on sorghum yield has not been entirely consistent in K-State tests. In a summary of experiments conducted in Kansas, the comparison between wide (30-inch) vs. narrow (15-inch) row spacing shows a close relationship, with an overall yield benefit of 4 bushels per acre with narrow rows. In addition, narrow rows out yielded wide rows in 71 percent of all observations evaluated (Figure 3).

A more consistent response to narrow rows was documented when yields were above 70 bushels per acre, with a greater chance of having higher yields when using narrow rows. In summary, the potential for a positive yield response to narrow rows is greatest in high-yielding environments, but the response is not always consistent. Under low-yielding environments, conventional (30-inch) wide row spacing is the best alternative.

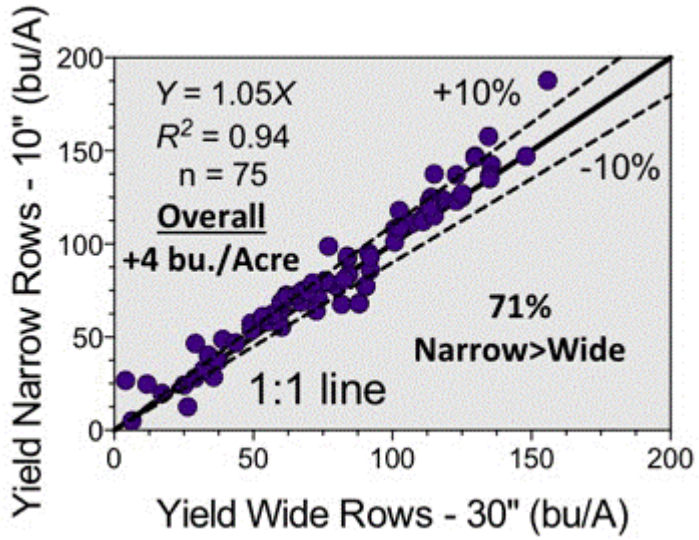

Figure 3. Yield in narrow rows versus yield in wide rows. From a total number of 75 observations, 71% had a greater yield in narrow as compared to wide row spacing.

Should populations be adjusted with narrow rows? Research results indicate that the population producing the greatest yield doesn't change with different row spacing, but the magnitude of response to population potentially can be greater with narrower row spacing in high-yielding environments.

Planting date seems to have an interaction with row spacing. Over three years at the North Central Experiment Field, there was essentially no difference in yield between 15- and 30-inch rows for late-May plantings, but there was a 10-bushel yield advantage for 15-inch rows for late June plantings. A similar response was observed at Manhattan in 2009 when no difference in row spacing was observed for the May planting, but 10-inch rows had an 11-bushel/acre yield advantage over 30-inch

rows with the June planting. The opposite response was seen at Hutchinson in 2009 where narrow rows had a 6 bushel/acre yield advantage with a May planting date, but wide rows had a 6 bushel/acre yield advantage with a June planting date. In all cases, yields were less with the June planting, but the June plantings at Belleville and Manhattan averaged more than 115 bushels/acre, while yields at Hutchinson were less than 92 bushels/acre.

Hybrid selection

The selection of sorghum hybrids should be based not only on maturity, but also on other traits such as resistance to pests, stalk strength, head exsertion, seeding vigor, and overall performance. The selection of a sorghum hybrid based on its maturity should be strictly related to the planting date, expected duration of the growing season, and the probability the hybrid will mature before the first freeze event. Shorter-season hybrids might be a better fit for late planting dates (mid-June to July depending on the regions); while a longer-season hybrid is recommended when planting time is early and the duration of the growing season is maximized.

For the summary of planting date information in Figure 1, hybrid maturity showed a very complex pattern across the diverse locations. Overall, longer-season hybrids showed a better yield at the mid-May planting time, but yields were less than 100 bushels per acre. For medium- and short-season hybrids, the early June planting date produced yields of more than 100 bushels per acre. The goal is to plant a hybrid maturity at each particular site/environment (weather and soil type) so the plants can bloom in favorable conditions, and have adequate grain fill duration before the first fall freeze occurs.

On-farm research experience: 2014-2016 seasons

During the last three growing seasons, on-farm research studies were established in collaboration with farmers and Sandra Wick, Post Rock District Extension Agent.

A summary of sorghum plant population response to all years of on-farm research revealed an optimal response to plant population at around 30 to 45 thousand seeds per acre (Figure 4). This shows how essential it is to continue the on-farm research efforts for properly identifying optimal plant population and providing a better guidance to key stakeholders in Kansas.

The recommendations provided in Table 1 can serve as a guideline for sorghum seeding rates, but more on-farm studies with a local and regional focus are needed in order to fine-tune and better understand sorghum yield responses to seeding rates.

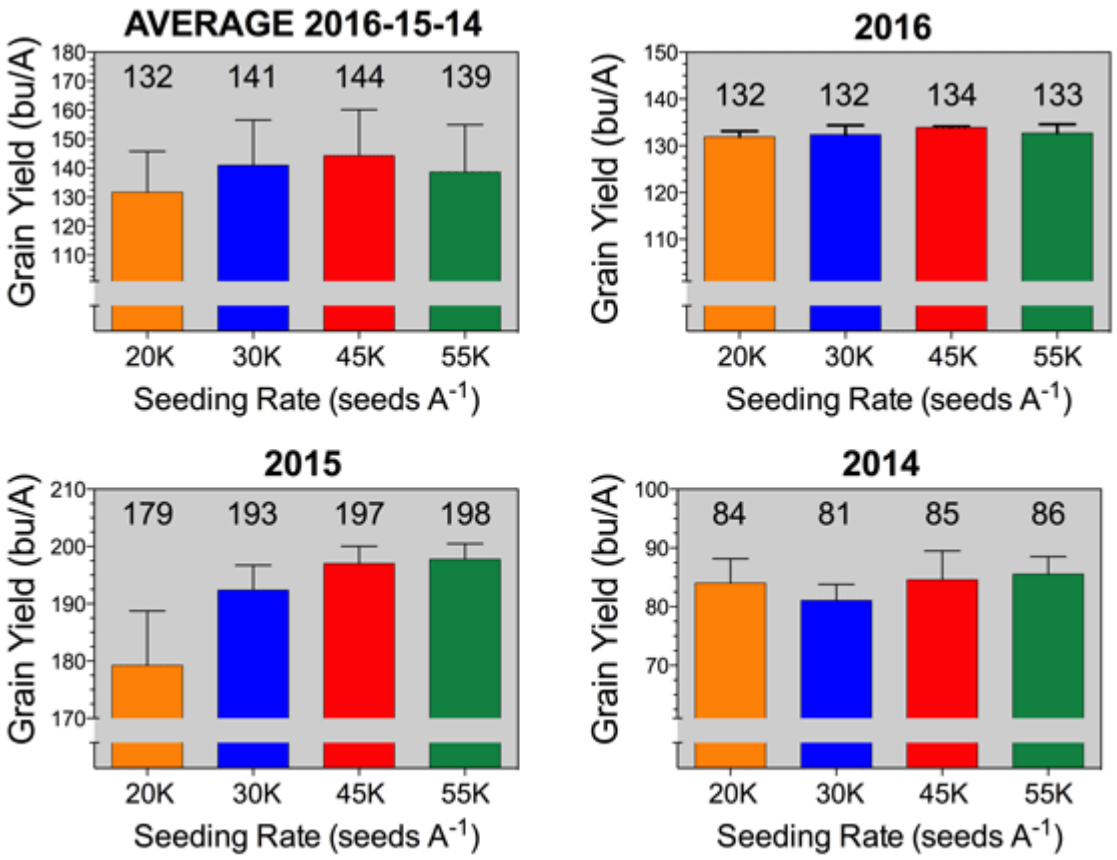

Figure 4. On-farm sorghum seeding rate studies performed in collaboration with Sandra Wick, Post Rock Extension District, sorghum farmers, and KSUCROPS Lab - Dr. Ciampitti.

Summary

- Determine your desired population based on average rainfall and expected growing conditions. There is no need to go overboard.
- Make sure you plant enough seed for your desired plant population. About 65-70 percent field germination is a good general rule to use.
- Think about using narrower row spacing to close the canopy sooner and potentially capture greater yields in yield environments of 70 bushels per acre or more.
- Planting data and hybrid selection are tied together and are related to the conditions experienced by sorghum plants during the late summer. Think about this before deciding your planting time and selecting a hybrid.

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3. Soil sampling for pH and liming in continuous no-till fields

One question that commonly comes up with continuous no-till operations is: "How deep should I sample soils for pH?" Another common question is: "How should the lime be applied if the soil is acidic and the field needs lime?".

Sampling depth in continuous no-till

Our standard recommendation for pH is to take one set of samples to a 0-6 inch depth. On continuous no-till fields where most or all of the nitrogen (N) is surface applied, we recommend taking a second sample to a 0-3-inch depth. We make the same recommendation for long-term pasture or grass hayfields, such as a bromegrass field that has been fertilized with urea annually for several years.

Nitrogen fertilizer is the primary driving force in lowering soil pH levels, so N application rates and methods must be considered when determining how deep to sample for pH. In no-till, the effects of N fertilizer on lowering pH are most pronounced in the area where the fertilizer is actually applied. In a tilled system, the applied N or acid produced through nitrification is mixed in through the action of tillage and distributed throughout the tilled area.

Where N sources such as urea or liquid UAN solutions are broadcast on the surface in no-till system, the pH effects of the acid formed by nitrification of the ammonium will be confined to the surface few inches of soil. Initially this may be just the top 1 to 2 inches but over time, and as N rates increase, the effect of acidity become more pronounced, and the pH drops at deeper depths (Figure 1). How deep and how quickly the acidity develops over time is primarily a function of N rate and soil CEC (cation exchange capacity), or buffering capacity.

Where anhydrous ammonia is applied, or liquid UAN banded with the strip-till below the surface, an acid zone will develop deeper in the soil. As with long-term surface applications, these bands will expand over time as more and more N fertilizer is placed in the same general area. The graphic below (Figure 1) illustrates the effect of repeated nitrogen and phosphorus application with strip-till in the same area in the row middle on a high CEC soil for more than 12 years.

Stratification of soil pH after 25 years of NT	Soil pH after banded fertilizer with strip-till

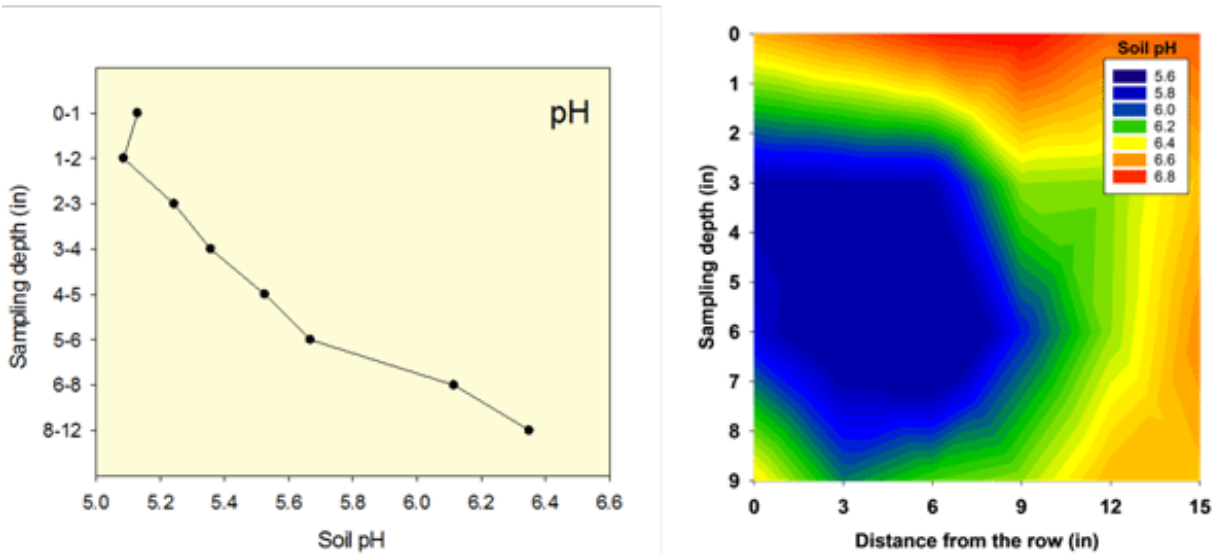

Figure 1. Soil pH stratification after 25 years of no-till and surface nitrogen fertilizer application, and the effect of repeated fertilizer application with strip-till in the same area after 12 years.

Liming application methods in continuous no-till

Where do you place the lime in continuous no-till?

If you surface apply N, then surface apply the lime. That's a simple but effective rule. But remember that surface-applied lime will likely only neutralize the acidity in the top 2-3 inches of soil. So if a producer hasn't limed for 20 years of continuous no-till and has applied 100 to 150 pounds of N per year, there will probably be a 4-5 inch thick acid zone, and the bottom half of that zone may not be neutralized from surface-applied lime. So, if a producer is only able to neutralize the top 3 inches of a 5-inch deep surface zone of acid soil, would that suggest he needs to incorporate lime? Not really. Research has shown that as long as the surface is in an appropriate range and the remainder of the acid soil is above pH 5, crops will do fine.

Liming benefits crop production in large part by reducing toxic aluminum, supplying calcium and magnesium, and enhancing the activity of some herbicides. Aluminum toxicity doesn't occur until the soil pH is normally below about 5.2 to 5.5 and KCl-extractable (free aluminum) levels are greater than 25 parts per million (ppm). At that pH the Al in soil solution begins to increase dramatically as pH declines further. Aluminum is toxic to plant roots, and at worse the roots would not grow well in the remaining acid zone.

This implies that the acid zones from ammonia or banded UAN are probably not a major problem. We have monitored ammonia bands in the row middles of long-term no-till for many years and while the pH dropped very low, we never saw any adverse impacts on the crop that would justify liming and using tillage to incorporate the lime. In fact, some nutrients such as zinc, manganese, and iron can become more available at low pH, which can be an advantage at times.

Yield enhancement is not the only concern with low-pH soils, however. Herbicide effectiveness must also be considered. The most commonly used soil-applied herbicide impacted by pH is atrazine. As pH goes down, activity and performance goes down. So in acidic soils, weed control may be impacted. We do see that happen in corn and sorghum production.

Liming products for no-till

When choosing a liming product, is there any value to using dolomitic lime (which contains a large percentage of magnesium in addition to calcium) over a purely calcium-based lime product?

Most Kansas soils have high magnesium content. So as long as we maintain a reasonable soil pH, there normally is enough magnesium present to supply the needs of a crop. Calcium content is normally significantly higher than magnesium, so calcium deficiency is very, very rare in Kansas. The soil pH would need to be below 4.5 before calcium deficiency would become an issue. Before calcium deficiency would occur, aluminum toxicity or manganese toxicity would be severely impacting crop growth. So producers really don't have to worry about a deficiency of calcium or magnesium on most Kansas soils.

What about the use of pelletized lime as a pH management tool on no-till fields?

The idea has been around for a while to use pel-lime in low doses to neutralize the acidity created from nitrogen and prevent acid zones from developing. . Pel-lime is a very high-quality product, normally having 1800 to 2000 pounds of effective calcium carbonate (ECC) per ton, and can be blended with fertilizers such as MAP or DAP or potash easily. Therefore, if you apply enough product this can be an excellent source of lime. Lime can be from various sources and with different qualities. Consecutively, to ensure a standardized unit of soil-acidity neutralizing potential, we use units of ECC.

Summary

Applying N fertilizer to soil will cause the soil to become acidic over time. Placement of the applied N and the level of soil mixing done through tillage determine where the acid zones will develop. Make sure your soil testing program is focused on the area in the soil becoming acidic, and apply the lime accordingly.

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4. Impact of the recent warm weather on growing degree days

After a very cold April, May has been warmer-than-normal (Figure 1). This has meant that despite the slow start, corn planting is near average for this time of year (Figure 2). Producers may be interested in how that might influence corn development. Growing degree days (GDD) are the common method for tracking development. The new Degree Days page on the Kansas Mesonet is designed to provide flexibility for our users, including options to select the time period and more built-in calculations. Because of the flexibility, it is somewhat more complicated than the older version. An explanation of the features can be found in a previous eUpdate story from Issue 619.

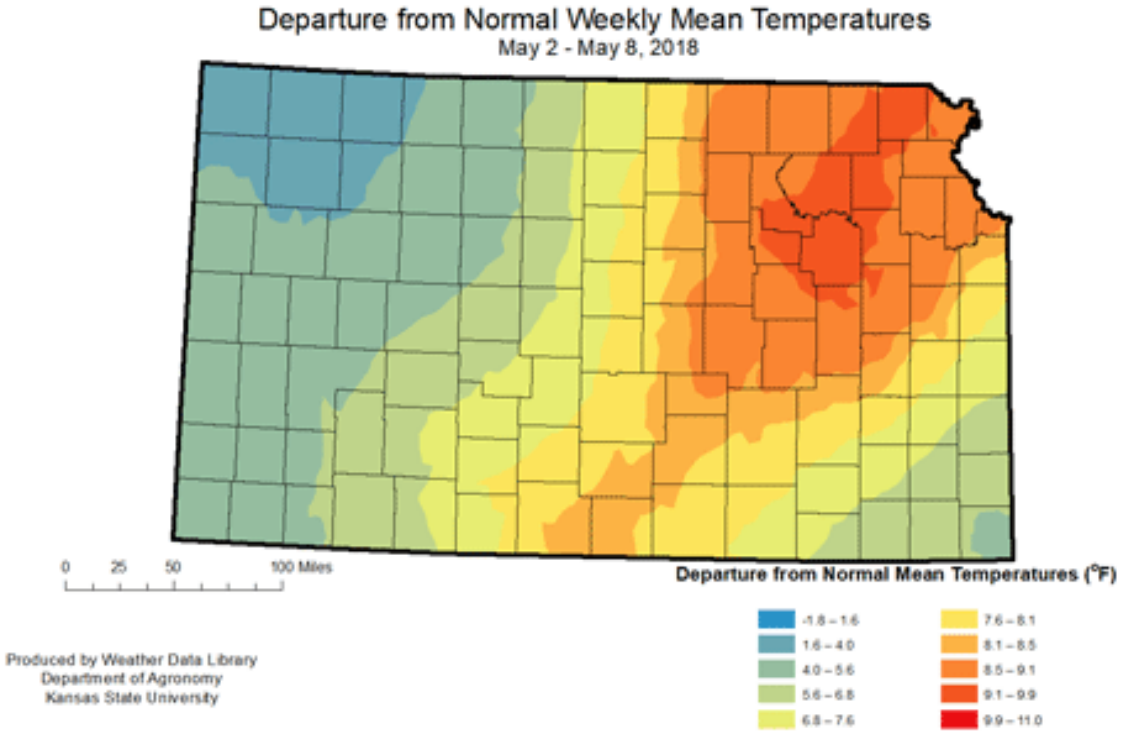


Figure 1. Departure from Normal Temperatures for May 2 - May 8, 2018.

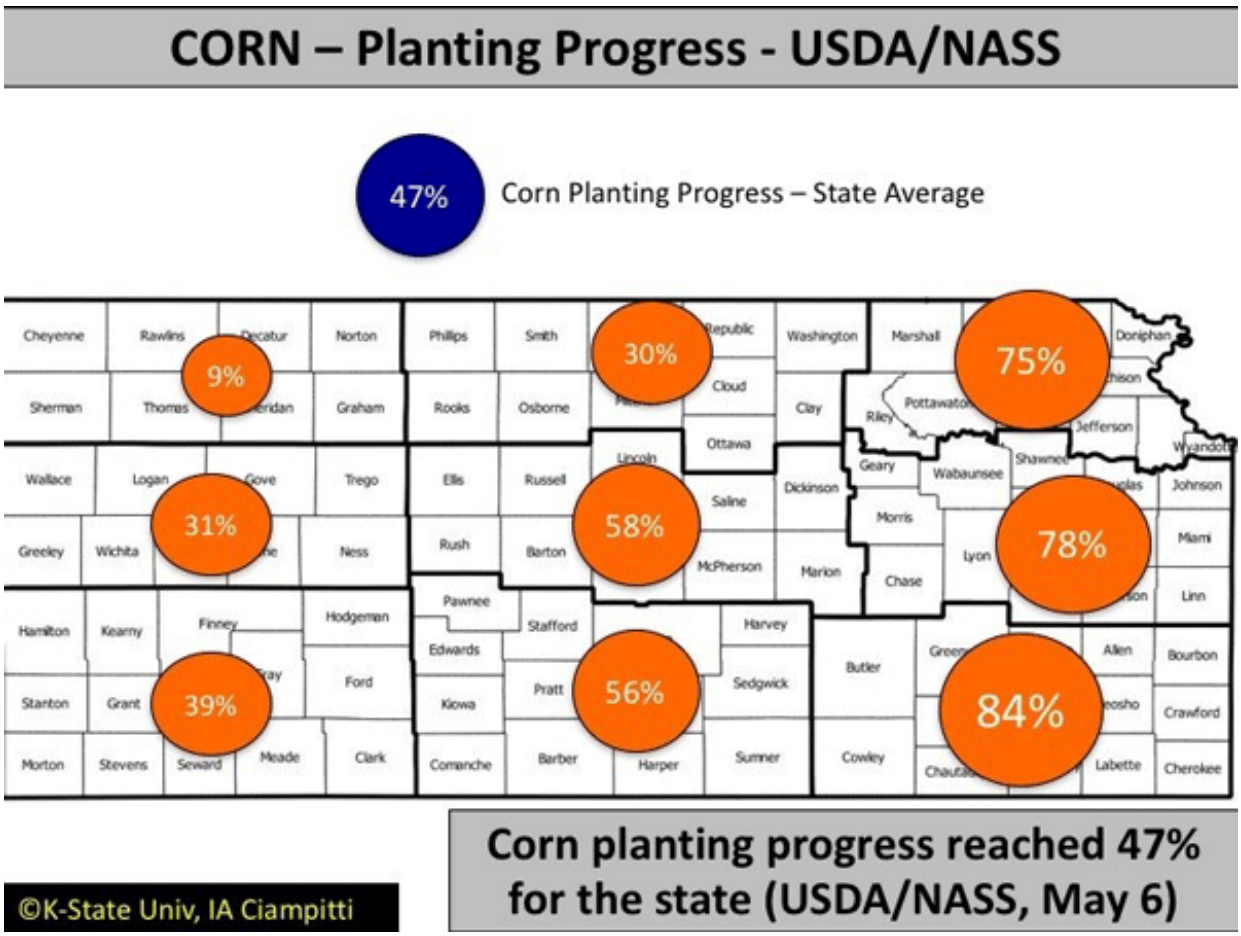
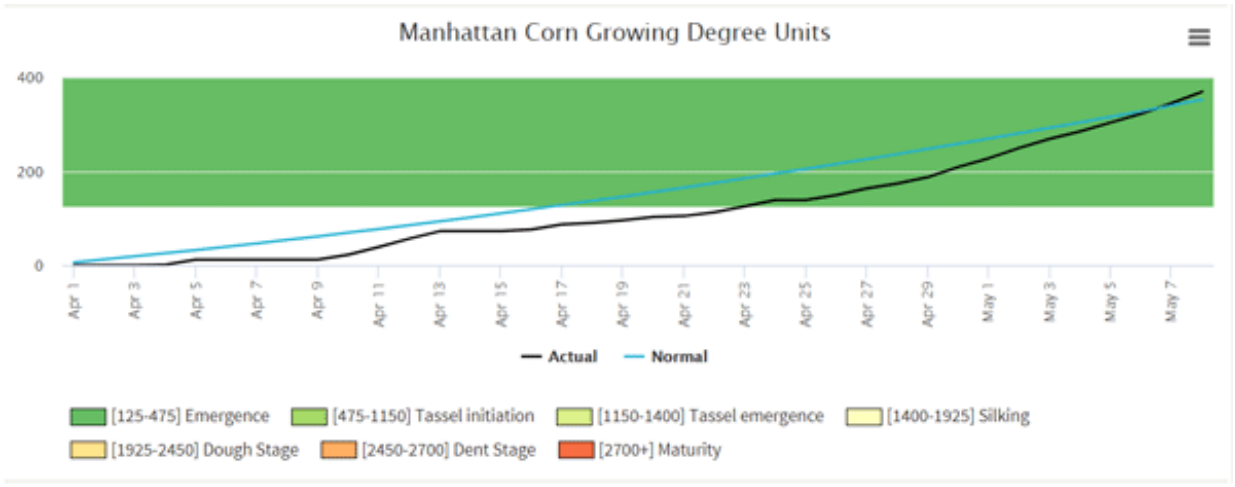


Figure 2. Corn planting progress. Graphic by Ignacio Ciampitti, K-State Research and Extension.

For producers who planted early, the amount of GDD accumulation was limited. The graphs below show the GDD accumulation at Manhattan from April 1 – May 8 and from May 1 – May 8 (Figure 3).



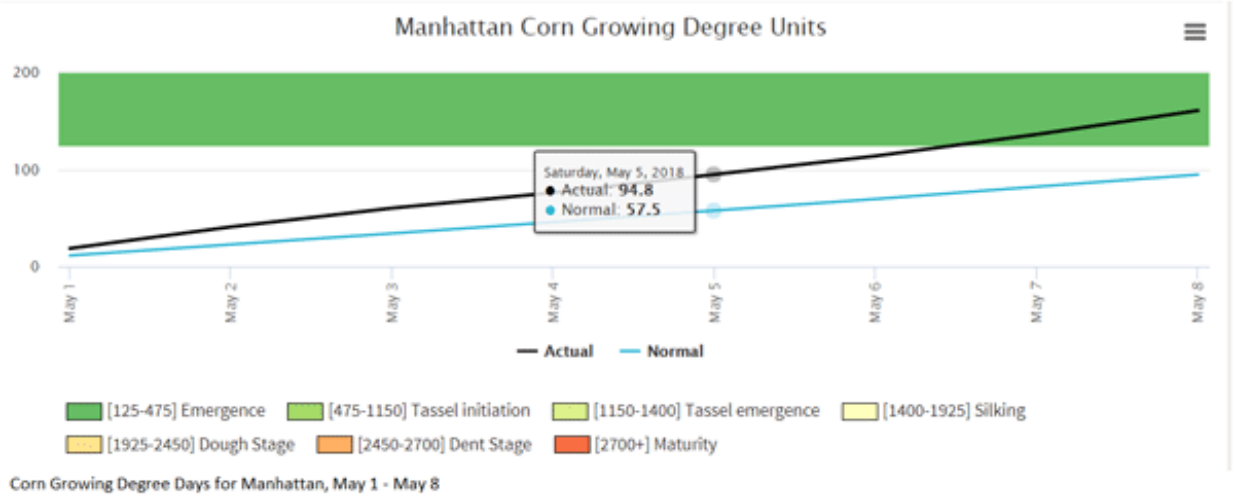


Figure 3. Accumulated corn growing degree days at Manhattan (Kansas Mesonet)

The difference is even greater in northwest Kansas, where temperatures have been cooler. In Cheyenne County, temperatures averaged almost 2 degrees below normal. The growing degree accumulation is only 9 degree days above normal (Figure 4).

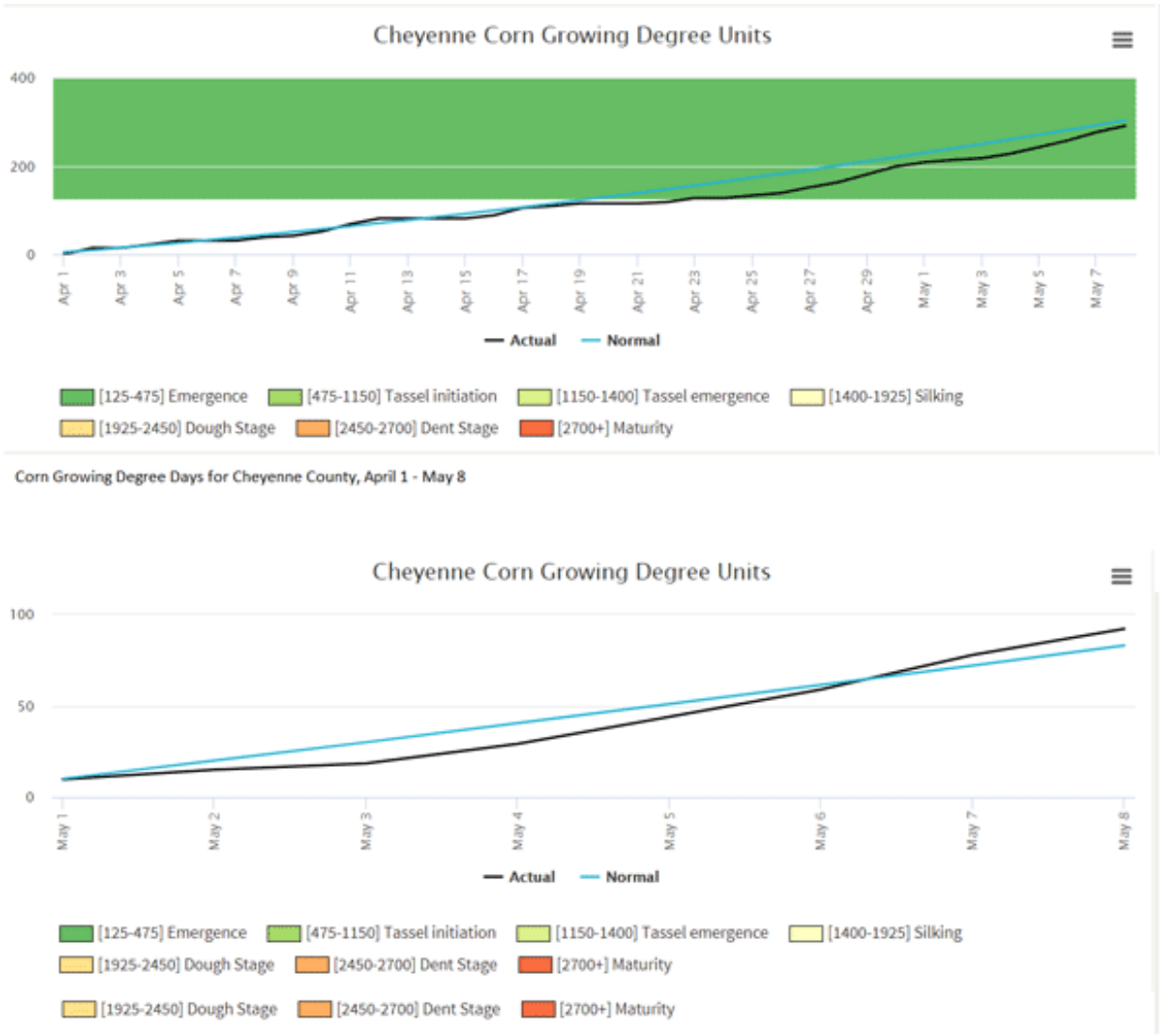


Figure 4. Accumulated corn growing degree days in Cheyenne County (Kansas Mesonet)

Warmer temperatures are expected in the next week, but when the high temperatures exceed the upper threshold of 86 degrees F (Figure 5), accumulation won't be as rapid as with more moderate temperatures

$$GDU = \frac{\text{Daily Max Air Temp} + \text{Daily Min Air Temp}}{2} - \text{Base Temp}$$

Base Temp: 50

Temperatures above ATmax will be set to ATmax — ATmax: 86

Temperatures below ATmin will be set to ATmin — ATmin: 50

Figure 5. Formula for Corn Degree Days. Graphic taken from KSRE publication Corn Production Handbook**.**

If you have questions, please don't hesitate to contact us.

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Chip Redmond, Kansas Mesonet
christopherredmond@ksu.edu

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist
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5. Update on drought conditions in Kansas - May 11, 2018

Current status

After a record cold April, May has started with much warmer-than-normal temperatures. The statewide average temperature for the week ending on May 8th was 65.7 degrees F (6 degrees warmer-than-normal). The East Central Division had the largest departure from normal with an average of 68.9 degrees F which was 8.3 degrees warmer-than-normal. The Northwest Division was closest to normal with an average of 57.0 degrees F, which was just 0.9 degrees warmer-than-normal. As might be expected with the transition, there was a wide range in temperatures. In the northwest, the temperatures ranged from a high of 90 degrees F at Atwood on the 8th to a low of 20 degrees F at Brewster 4W on the 2nd. The warmest temperature reported in Kansas was 93 degrees F reported at Dodge City WFO, Ford County, on May 7. The coldest temperature was 20 degrees F recorded at Brewster 4W on the 2nd.

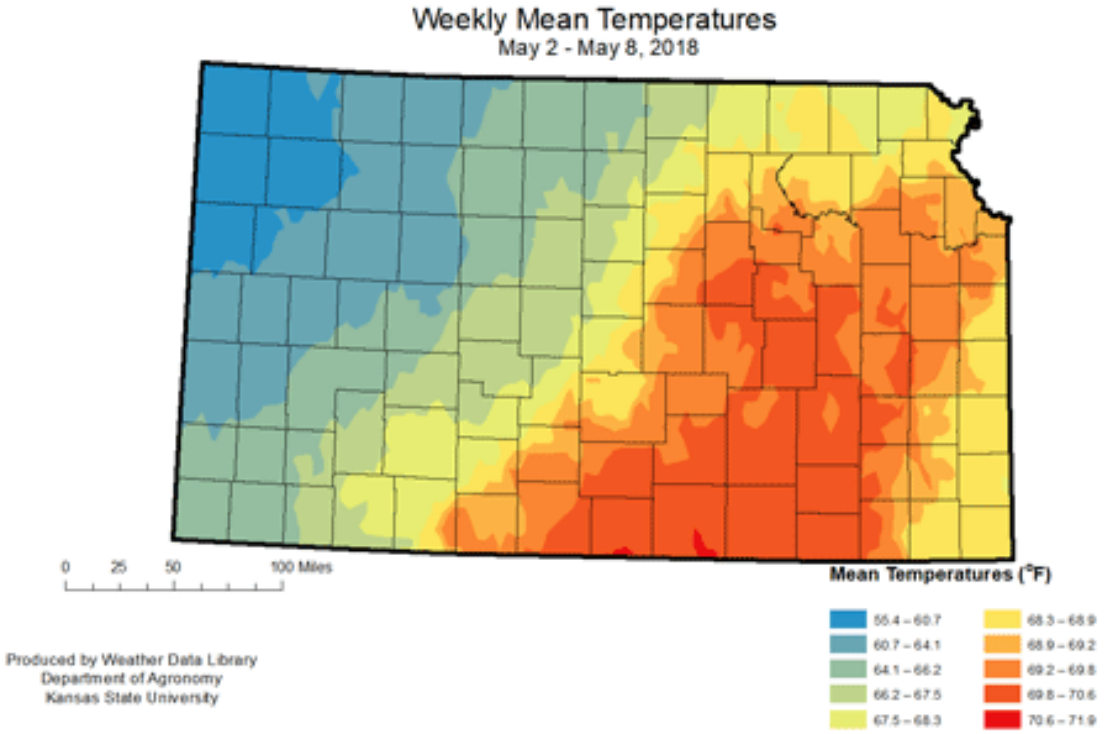

Figure 1. Weekly mean temperatures for Kansas during the week of May 2 – 8, 2018 via Cooperative Observer (COOP) and Kansas Mesonet.

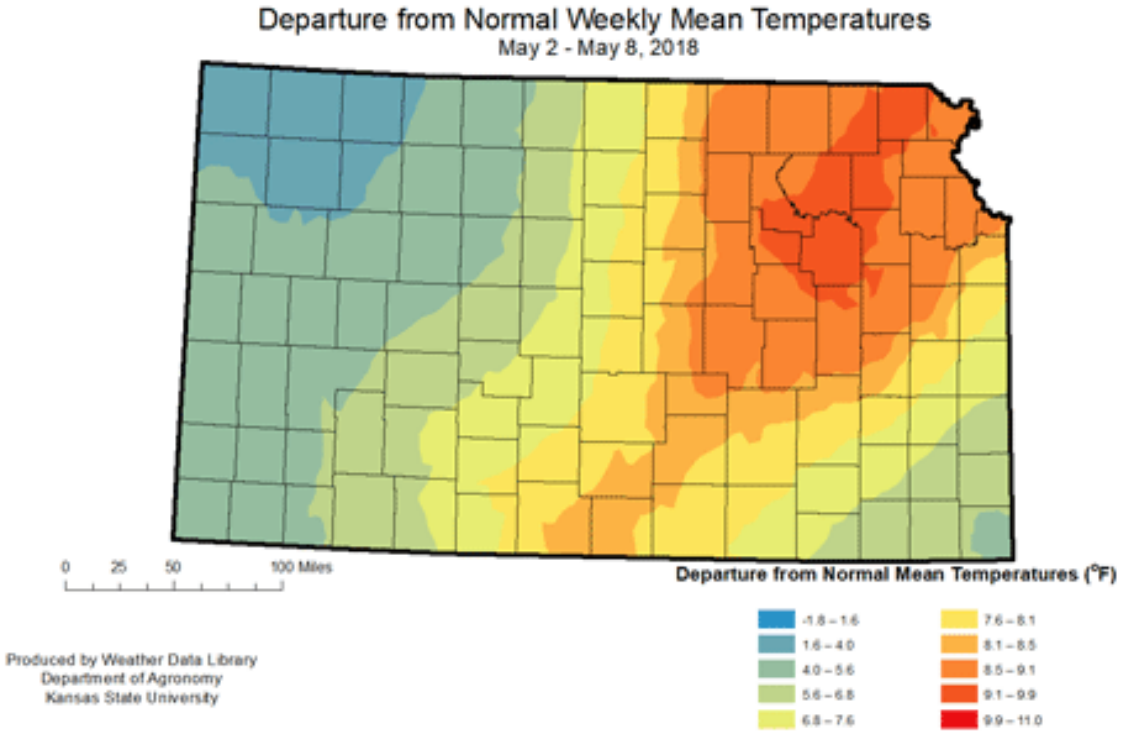

Figure 2. Departures of weekly mean temperatures from normal for Kansas during the week of May 2 – 8, 2018 via Cooperative Observer (COOP) and Kansas Mesonet.

The statewide average precipitation was just 0.70 inches or 75 percent of normal. Unfortunately, the western divisions saw very little rain, with amounts averaging just 0.02 inches in the Northwest Division to 0.18 inches in the West Central Division. The Northeast Division had the largest average precipitation at 1.84 inches or 180 percent of normal. The North Central Division followed closely in second with an average of 1.51 inches or 170 percent of normal. The greatest total for the week at a National Weather Service Cooperative station was 3.69 inches at Clay Center, Clay County. For the Community Collaborative Rain Hail and Snow network, the greatest weekly total was 4.90 inches at Hunter 2.1 NNW, Mitchell County. Among the Kansas Mesonet stations the greatest weekly amount reported was 3.26 inches at the Clay County site, north of Clay Center.

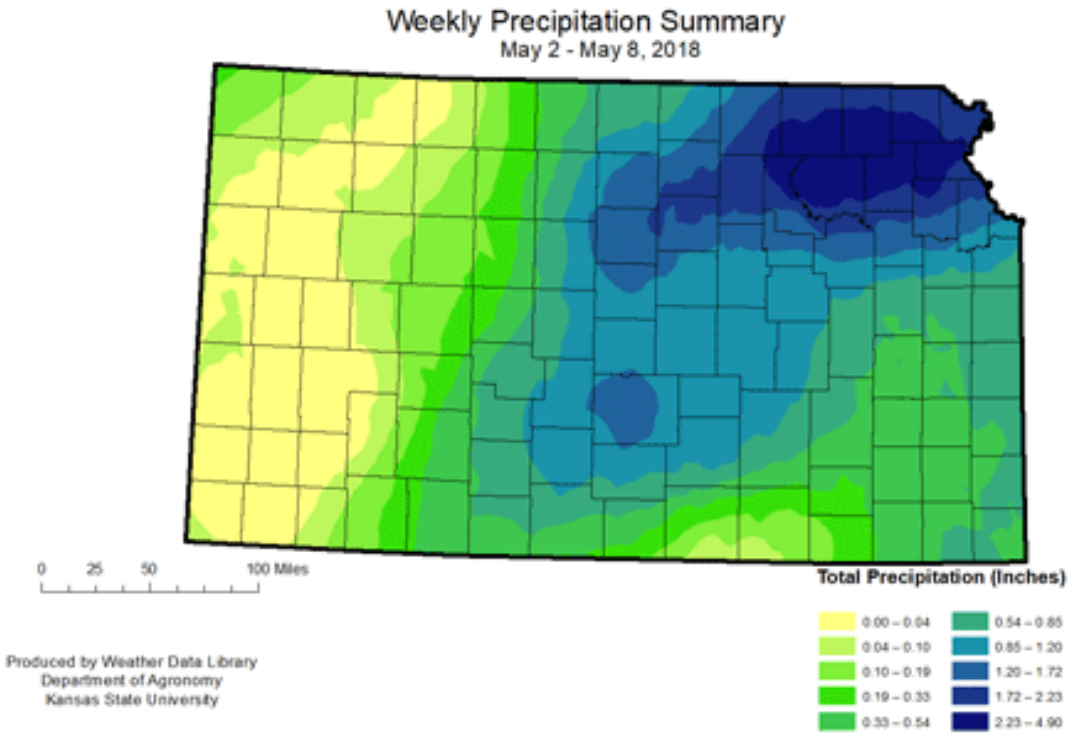

Figure 3. Weekly precipitation summary for Kansas during the week of May 2 – 8, 2018 via Cooperative Observer (COOP), Community Collaborative Rain Hail Snow (CoCoRaHS) and Kansas Mesonet.

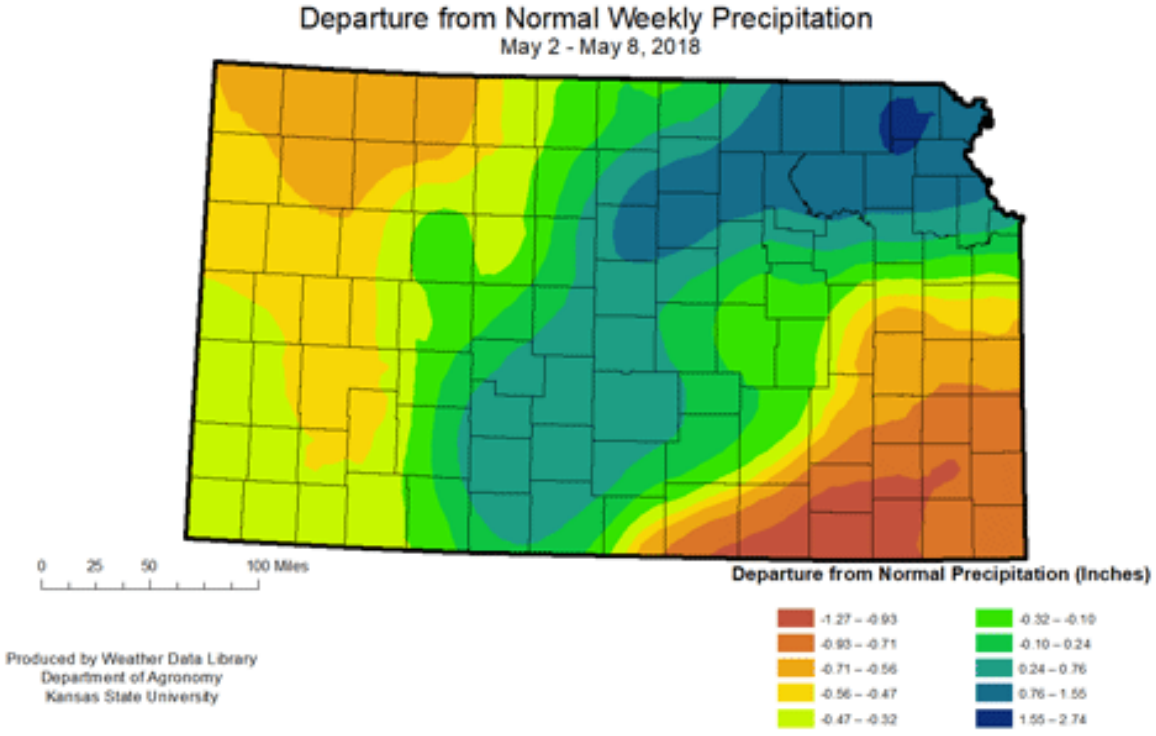

Figure 4. Departures from normal of weekly precipitation for Kansas during the week of May 2

– 8, 2018 via Cooperative Observer (COOP), Community Collaborative Rain Hail Snow (CoCoRaHS) and Kansas Mesonet.

Despite the moisture, drought persists across most of Kansas. (Figure 5). The change in drought categories (Figure 6) shows how little the moisture received changed the overall deficit. There was a slight improvement on the western edge of northeast Kansas where precipitation was heaviest.

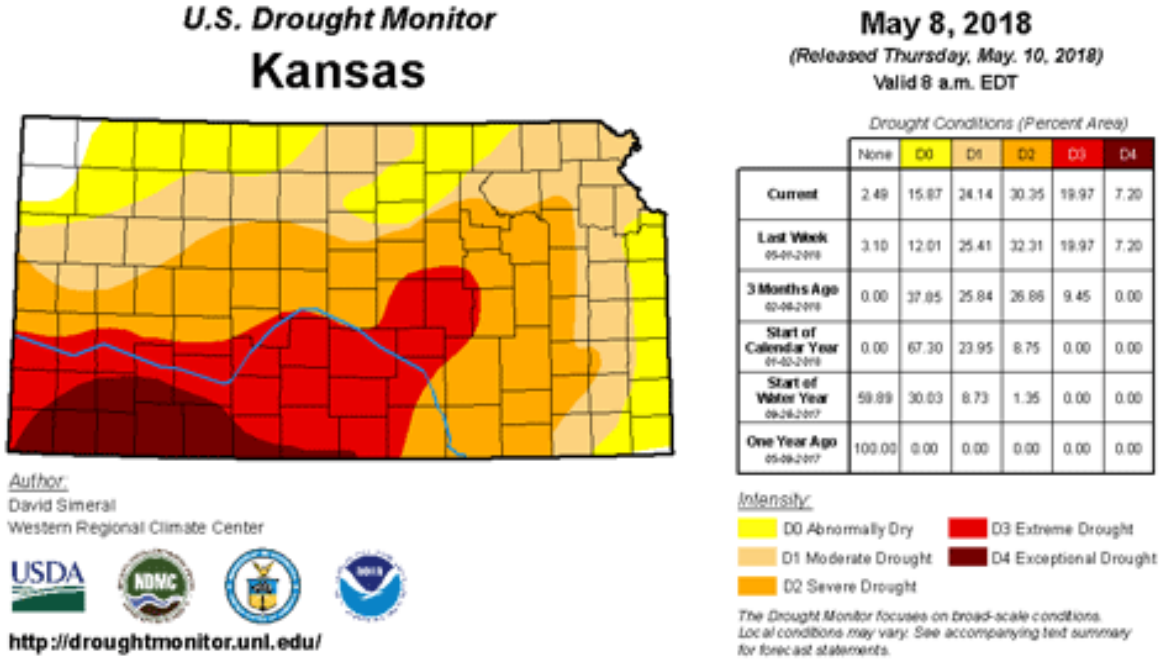

Figure 5. U.S. Drought Monitor for Kansas (US Drought Monitor).

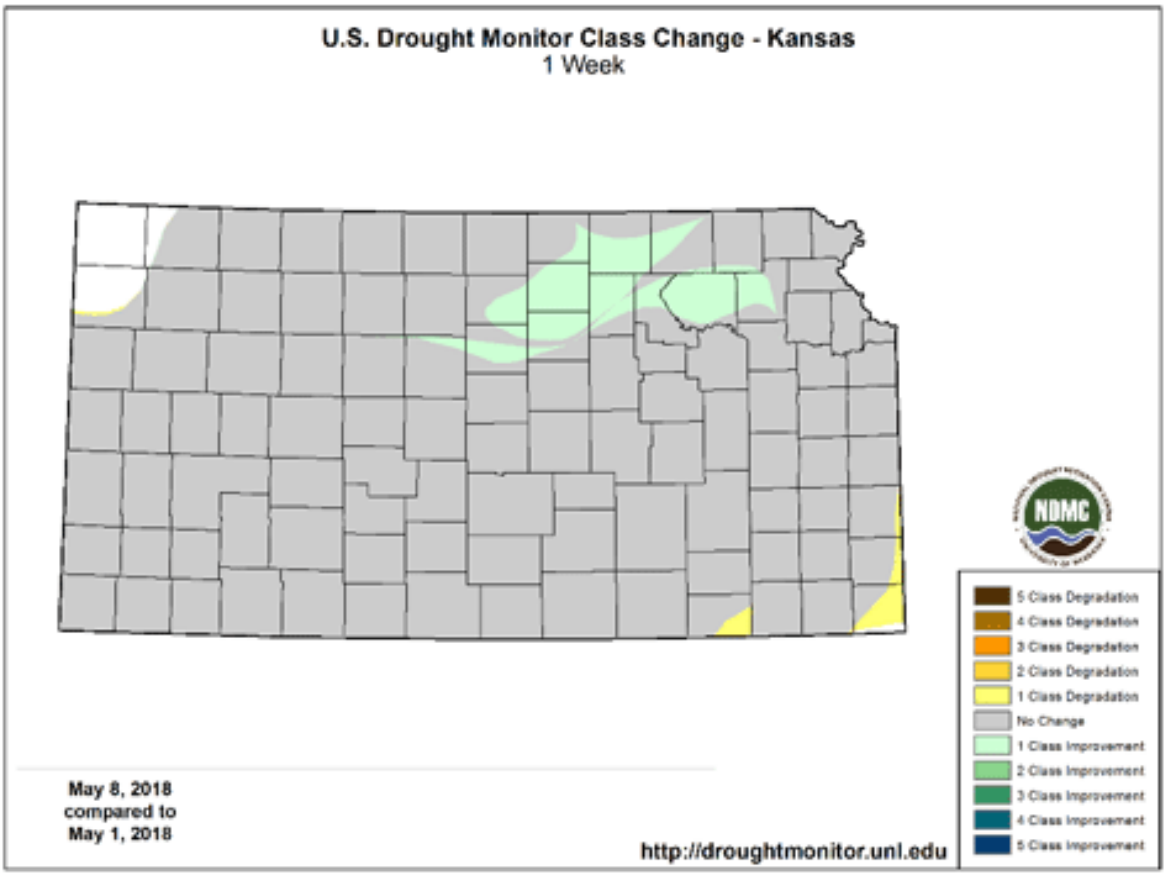

Figure 6. Difference in drought categories (US Drought Monitor).

Short-term Weather Outlook for Kansas

The quantitative precipitation forecast for the 7-day period, ending on May 17, favors moisture across the state. The areas with highest expected amounts are in the eastern third of the state (Figure 7). The areas with heaviest amounts may see up to two inches of rain. However, amounts drop sharply across the rest of the state, with less than a quarter of an inch expected in extreme southwest Kansas. The 8 to 14-day precipitation outlook (Figure 8) indicates a slightly increased chance of above-normal precipitation across the state. The temperature outlook is for warmer-than-normal conditions across the state, which will result in increased evapotranspiration rates.

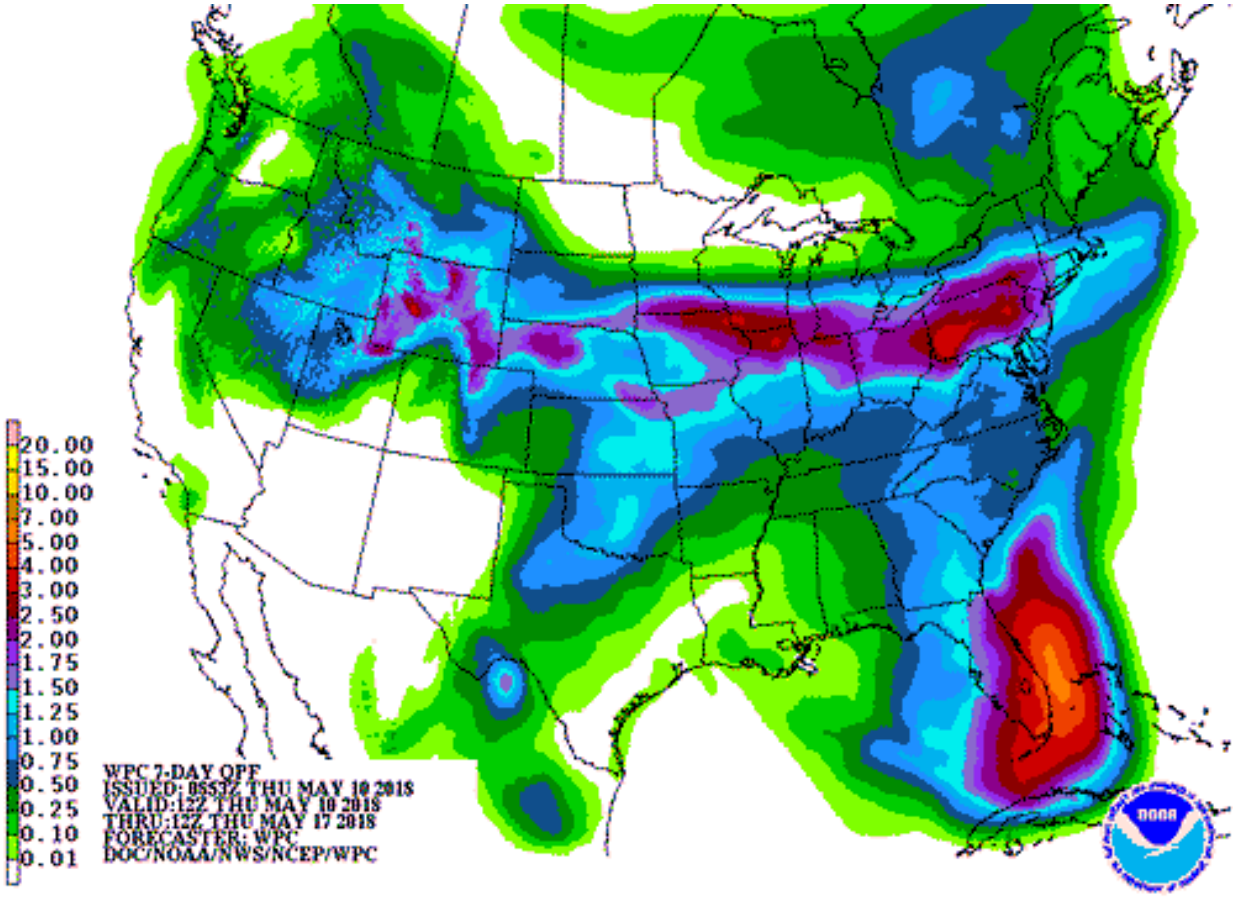

Figure 7. Quantitative Precipitation Forecast the 7-day period ending on May 17, 2018 (NOAA)

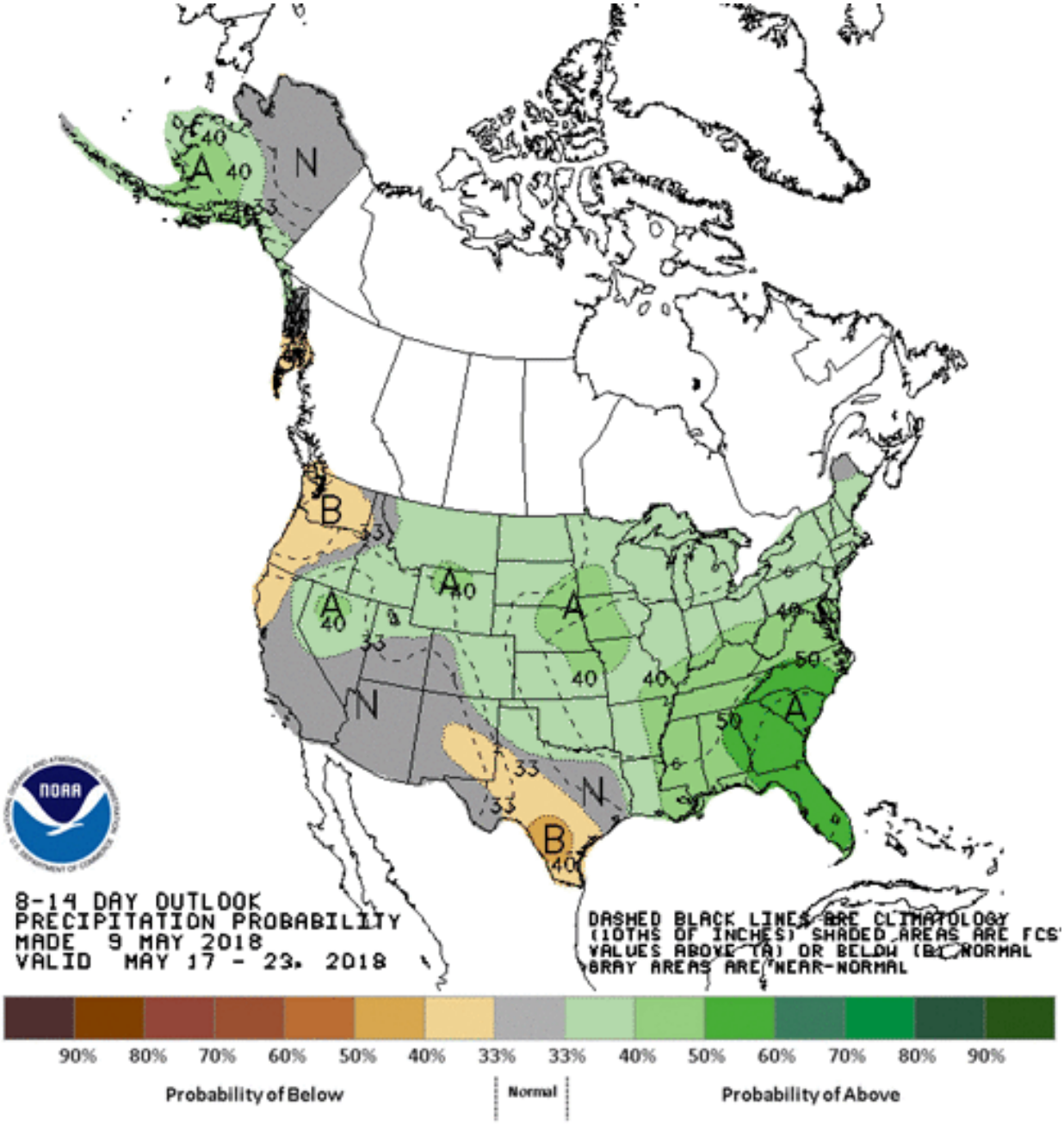

Figure 8. 8-10 day Precipitation Outlook for period ending on May 23, 2018 (CPC)

Additional information can be found in the latest Agronomy eUpdate at https://webapp.agron.ksu.edu/agr_social/eu.throck and on the Kansas Climate website under weekly maps or drought reports http://climate.k-state.edu/maps/weekly and http://climate.k-state.edu/reports/weekly/2018/.

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Chip Redmond, Kansas Mesonet
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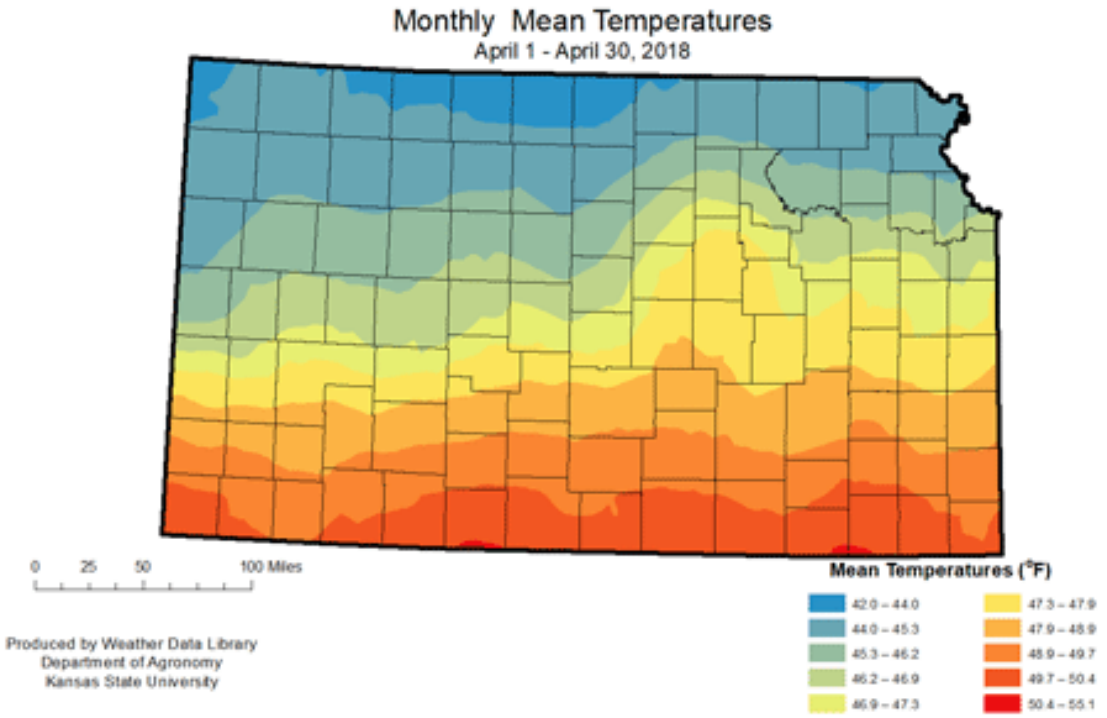
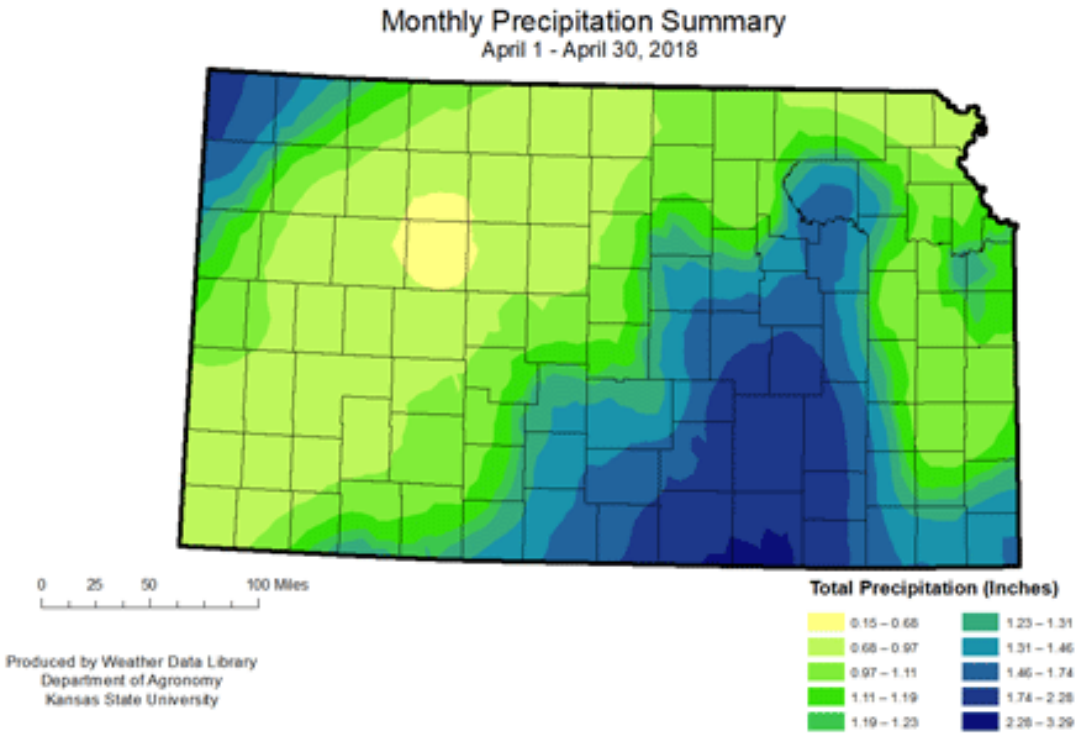
6. April weather summary for Kansas - Cold and dry

Record-setting cool temperatures

April set a new record as the coldest since 1895. The state-wide average temperature for the month was 46.7 degrees F. This was 6.5 degrees cooler-than-normal. The Northeast Division had the greatest departure with an average of 44.5 degrees F which was 9 degrees cooler-than-normal for Kansas. The West Central Division came closest to normal with an average of 46.0 degrees F (4.7 degrees cooler-than-normal). There were 189 new record daily cold maximum temperatures, of which 18 set new record low maximums for the month. In addition, there were 291 new daily record low minimum temperatures, of which 3 set new records for the month. The records weren't all on the cold side, however. There were 26 new record high maximum temperatures and 10 new record high minimum temperatures record during April. The warmest temperature reported during the month was 99 degrees F at Ashland, Clark County, and Wilmore 16SE, Comanche County, on the 13th. The coldest temperature reported during April was 4 degrees F. This was reported at multiple locations and dates with the latest at Atwood, Rawlins County, on the 8th.



While precipitation began to fall towards the end of the month, April continued the pattern of below-normal precipitation. The state-wide average precipitation was 1.19 inches which was just 45 percent of normal. April is one of the months with higher normal precipitation, so the deficit of -1.48 inches has had a negative impact on vegetation. The division that came closest to normal precipitation was the Southcentral Division with an average of 1.57 inches or 58 percent of normal. The Northeast Division had the greatest departure, with an average of 1.01 inches or just 31 percent of normal. The greatest monthly total for a National Weather Service Cooperative station was Augusta, Butler County with 3.29 inches. The Community Collaborative Rain, Hail and Snow network station with the greatest monthly precipitation was Winfield 5.9SW, Cowley County, with 3.06 inches. Among the Kansas Mesonet stations, the Butler County station near El Dorado had the greatest total at 2.38 inches.



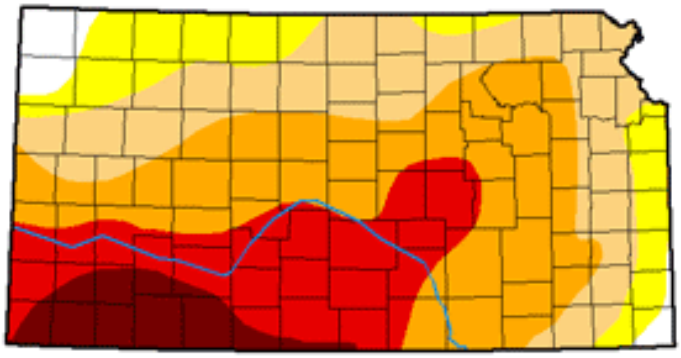
Given the dry conditions, severe weather reports during the month were limited. There were 11 hail reports and 4 damaging wind reports. The lack of tornadoes in April made for the latest start to the tornado season since 2000.

As of the Drought Monitor published on May 1*, the northwest and southeast corners of the state remain drought-free. The rest of the state saw deterioration in drought conditions. Exceptional drought now cover just over 7 percent of the state, while extreme drought covers an additional 20 percent of the state. Severe drought has expanded to a quarter of the state while moderate drought covers an additional 32 percent of the state.

**An updated discussion on the drought conditions in Kansas can be viewed in this issue of the eUpdate: "Update on drought conditions in Kansas – M ay 11, 2018".*

The May outlook has a slight chance for wetter-than-normal conditions across the state. The temperature outlook is for cooler-than-normal temperatures statewide. Unless May moisture is significant, that combination is unlikely to result in significant improvement of the drought conditions. With the wet summer last year, current dryness, and the cool start to the year, increased fire danger continues in southwest Kansas.

U.S. Drought Monitor
Kansas



Author:
David Simeral
Western Regional Climate Center

http://droughtmonitor.unl.edu/

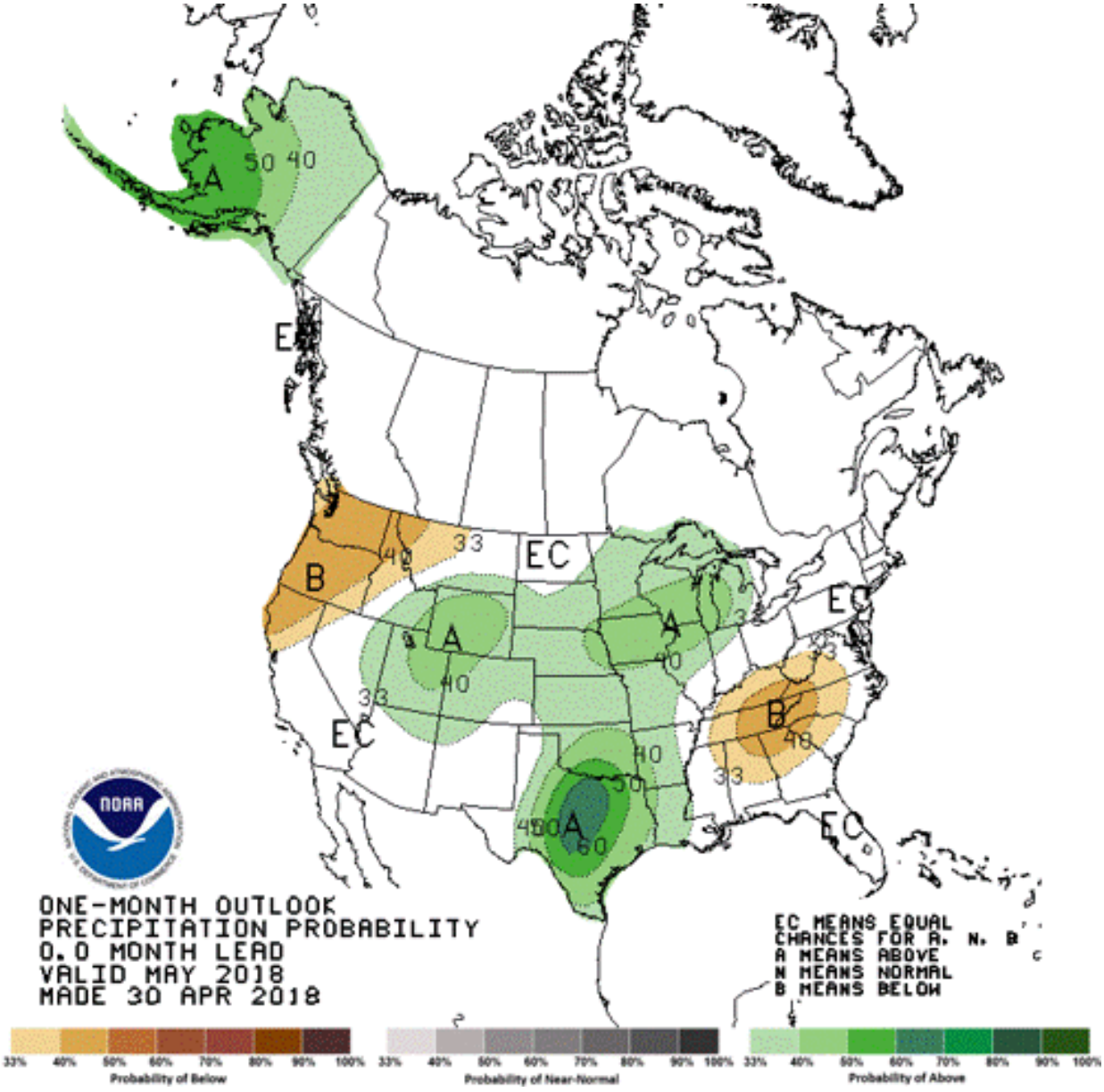
May 1, 2018
(Released Thursday, May. 3, 2018)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	3.10	12.01	25.41	32.31	19.97	7.20
Last Week 04-24-2018	3.10	12.05	25.38	32.31	19.97	7.20
3 Months Ago 01-30-2018	0.00	34.71	36.22	24.77	4.30	0.00
Start of Calendar Year 01-02-2018	0.00	67.30	23.95	8.75	0.00	0.00
Start of Water Year 09-26-2017	59.89	30.03	8.73	1.35	0.00	0.00
One Year Ago 05-02-2017	100.00	0.00	0.00	0.00	0.00	0.00

Intensity:
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



Kansas State University Department of Agronomy
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www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

April 2018										
Kansas Climate Division Summary										
	Precipitation (inches)						Temperature (°F)			
	April 2018			2018 through April					Monthly Extremes	
Division	Total	Dep. [1]	% Normal	Total	Dep. [1]	% Normal	Ave	Dep. [1]	Max	Min
Northwest	0.67	-1.40	32	1.69	-2.68	39	44.7	-4.9	88	4
West Central	0.81	-1.10	42	1.84	-2.57	42	46.0	-4.8	92	10
Southwest	0.89	-0.75	54	1.44	-2.58	36	48.6	-4.9	99	4
North Central	0.99	-1.53	39	2.56	-3.45	43	45.0	-7.8	91	8
Central	1.21	-1.45	45	2.82	-3.79	43	47.1	-6.7	95	8
South Central	1.57	-1.13	58	3.57	-3.75	49	48.8	-6.4	99	14
Northeast	1.01	-2.24	31	3.16	-4.30	42	44.5	-9.0	88	12
East Central	1.63	-1.93	46	4.50	-3.98	53	46.5	-7.6	87	15
Southeast	1.66	-2.21	43	5.80	-4.07	59	48.9	-6.8	87	17
STATE	1.19	-1.48	45	3.07	-3.45	47	46.7	-6.5	99	4
1. Departure from 1981-2010 normal value										
2. State Highest temperature: 99 °F at Ashland, Clark County, and Wilmore 16SE, Comanche County, on the 13th.										
3. State Lowest temperature: 4 °F multiple locations and dates; latest at Atwood, Rawlins County, on the 8th.										
4. Greatest 24hr: 1.74 inches at Winfield, on the 21st (NWS); 2.40 inches at Latham 0.2 W, Butler County on the 22nd (CoCoRaHS).										
Source: KSU Weather Data Library										

Mary Knapp, Weather Data Library
mknapp@ksu.edu

7. K-State winter canola field days: May 18 and May 30

The latest research and production information on winter canola will be featured at K-State Research and Extension (KSRE) field days on May 18 and May 30, 2018.

The field days are opportunities to see winter canola variety trials and producer fields, said Mike Stamm, K-State canola breeder. New and experimental varieties will be on display and a discussion will be held on the challenges of the current growing season.

"The production year has not been without its struggles, starting with dry conditions for establishment last fall and expanding drought" said Stamm. "We want to reassure producers that there are benefits to growing canola in rotation even in the years when we know production is going to be down."

With harvest season approaching, harvest management options will also be discussed.

The dates, location, and schedule for the field days are:

- May 18 - **Kingman County**
  - The program begins at 9:00 a.m. at the variety trial and demonstration plots, three miles south of Norwich and one-half mile east on SE 160th St., just off of KS-2 highway. New cultivars and production practices will be discussed. Refreshments will be provided. Please RSVP to Jake Renner, jwrenner@ksu.edu, or by calling 620-532-5131 by Wednesday, May 16.

- May 30 - **Harper County**
  - The program begins at 11:00 a.m. at the variety demonstration plot located 1.5 miles east of Danville on US-160 highway. Lunch is sponsored by Progressive Ag Coop. Please RSVP to Monte Hampton at 620-561-1088.

For more information, contact Mike Stamm at 785-532-3871 or mjstamm@ksu.edu.

8. K-State wheat plot tours for May 14-18 and May 21-25

The weeks of May 14-18 and May 21-25 features 26 wheat plot tours in Kansas. Producers wanting to learn about the different varieties can choose to attend one (or several) plot tours in their county or agricultural district.

The plot tours generally include a discussion of wheat conditions across the state, as well as tips on what to look for when selecting wheat varieties. New and upcoming varieties are discussed, as well as older and more established ones, and a discussion of how all these varieties are responding to this growing season's conditions.

For the week of May 14-18, the plot tour locations include:

Monday, 5/14/2018, 10:30 a.m.
Location: Clark Co., Minneola
Contact: Brice Gibson, 620-635-2811, begibson@ksu.edu
Directions: 2 mi north of Minneola, on Hwy 283, turn east, drive 1 mi on CR A to CR 7 and turn south, drive 1/4 mi.

Monday, 5/14/2018, 6:00 p.m.
Location: Pawnee Co., Larned
Contact: Kyle Grant, 620-285-6901, kkgrant@ksu.edu
Directions: Plot - Between mile marker 210 and 220 on I Road in Pawnee County;
A meeting and meal will follow the Wheat Tour Johnny Converse Shed.

Tuesday, 5/15/2017, 7:30 a.m.
Location: Edwards Co., Kinsley
Contact: Marty Gleason, 620-659-2149, mgleason@ksu.edu
Directions: Breakfast will be served at the St. Peter and Paul Hunting Lodge, plot will follow on North of K road on 70th Ave.

Tuesday, 5/15/2017, 12:00 p.m.
Location: Barber Co., Isabel
Contact: Justin Goodno, 620-886-3971, jgoodno@ksu.edu
Directions: K-42 and Main Street junction at Isabel, KS

Tuesday, 5/15/2017, 5:30 p.m.
Location: Kingman Co., Zenda
Contact: Jake Renner, 620-532-5131, jwrenner@ksu.edu
Directions: From Wichita, head west on HWY 54/400 to Kingman. After passing Kingman, drive approximately 4.5 miles until you reach SW 90th Avenue. Head South toward Calista & Zenda. Turn East on SW 80th Street. Drive 1 Mile to SW 80th Avenue: Turn South. Conrardy Seeds will be on the West side of SW 80th Avenue

Tuesday, 5/15/2018, 7:00 p.m.
Location: Ford Co., Wright
Contact: Andrea Burns, 620-227-4542, aburns@ksu.edu
Directions: U.S. Highway 50 Bypass & 116 Road (across from Koch Nitrogen Plant)

Wednesday, 5/16/2017, 7:30 a.m.
Location: Stafford Co., St. John
Contact: Glenn Newdigger, 620-549-3502, gnewdigg@ksu.edu
Directions: Breakfast at the Stafford Co Extension office (210 E. 3rd Ave, St. John) followed by plot tour

Wednesday, 5/16/2017, 5:30 p.m.
Location: Pratt Co., Pratt
Contact: Jodi Drake, 620-672-6121, jdrake@ksu.edu
Directions: Pratt Community College (southeast corner of the PCC Campus, south of the baseball field on Fincham Street). PCC is on the east side of Highway 61. Meal to follow at the PCC – Ag Building.

Thursday, 5/17/2017, 7:00 a.m.
Location: Marion Co., Hillsboro
Contact: Rickey Roberts, 620-382-4215, rroberts@ksu.edu
Directions: The breakfast and beginning remarks will be held at the Coop Grain and Supply Crop Production Center, 121 Santa Fe, Hillsboro, KS. It is located just off 56 Hwy about 1 mile E. of Hillsboro. Next door to Country Side Feed Mill which is right on the Hwy. Plot tour will follow on Hwy 56 just east of the Crop Center.

Thursday, 5/17/2017, 11:00 a.m.
Location: Reno Co., Hutchinson
Contact: Daryl Strouts, 785-320-4080, dstrouts@ksu.edu
Directions: Kansas Wheat Alliance seed producer field day. K-State South Central Experiment Field, 10620 S. Dean Road.

Friday, 5/18/2018, 9:00 a.m.
Location: McPherson Co., Marquette
Contact: Shad Marston, 620-241-1523, smarston@ksu.edu
Directions: Just north of Marquette

Friday, 5/18/2018, 12:00 p.m.
Location: McPherson Co., Moundridge
Contact: Shad Marston, 620-241-1523, smarston@ksu.edu
Directions: Memorial Park (809 Koehn Ave) in Moundridge for the Mid Kansas Coop sponsored meal at noon. At 1:00 on to Galle Plot (Cheyenne road and 22nd Ave.)

Friday, 5/18/2018, 4:00 p.m.
Location: McPherson Co., Inman
Contact: Shad Marston, 620-241-1523, smarston@ksu.edu
Directions: Schroeder Plot (4th and Comanche)

For the week of May 21-25, the plot tour locations include:

Monday, 5/21/2018, 9:00 a.m.
Location: Reno Co., Nickerson
Contact: Darren Busick, 620-662-2371, darrenbusick@ksu.edu
Directions: 1/2 mile west of Sego Road on 56th street near Nickerson.

Monday, 5/21/2018, 12:00 p.m.
Location: Reno Co., Haven
Contact: Darren Busick, 620-662-2371, darrenbusick@ksu.edu
Directions: 2.5 miles south of 50 highway on Mayfield Road near Haven.

Monday, 5/21/2018, 6:00 p.m.
Location: Sumner Co., Belle Plaine
Contact: Randy Hein, 620-326-7477, rvhein@ksu.edu
Directions: Meal – 1459 E. 60th Avenue North, Southeast of Belle Plaine
Plot – 1 ½ mile east, ¾ mile south of address, west side of road

Tuesday, 5/22/2018, 8:30 a.m.
Location: Ellis Co., Hays
Contact: Guorong Zhang, 785-625-3425, gzhang@ksu.edu
Directions: K- State Agricultural Research Center-Hays. 1232 240th Ave, Hays, KS 67601

Tuesday, 5/22/2018, 5:00 p.m.
Location: Reno Co., Hutchinson
Contact: Jane Lingenfelser, 785-317-3391, jling@ksu.edu
Directions: K-State South Central Experiment Field, 10620 S. Dean Road

Tuesday, 5/22/2018, 6:00 p.m.
Location: Sumner Co., Caldwell
Contact: Randy Hein, 620-326-7477, rvhein@ksu.edu
Directions: From Caldwell, west on Bluff City Rd, ¼ mile north of town, west side of road, south of cemetery.

Wednesday, 5/23/2018, 10:00 a.m.
Location: Comanche Co., Coldwater
Contact: Aaron Sawyers, 620-582-2411, asawyers@ksu.edu
Directions: 8 miles north of Coldwater HWY 183, east of Clark and Alice Smith's house. Meal to follow tour.

Wednesday, 5/23/2018, 4:00 p.m.
Location: Finney Co., Garden City
Contact: A.J. Foster, 620-276-8286, anserdj@ksu.edu
Directions: Spring Field Day. K-State Southwest Research-Extension Center. 4500 E. Mary Street, Garden City, KS 67846

Wednesday, 5/23/2018, 6:00 p.m.
Location: Sumner Co., Conway Springs
Contact: Randy Hein, 620-326-7477, rvhein@ksu.edu
Directions: From Conway Springs, go north to 140 Ave N, east ¾ mile, plots south side of road

Thursday, 5/24/2018, 8:30 a.m.
Location: Dickenson Co., Solomon
Contact: Tom Maxwell, 785-309-5850, tmaxwell@ksu.edu
Directions: Located 3 miles west of Solomon on Old Hwy 40, then 2 1/2 miles south on Gypsum Valley Road

Thursday, 5/24/2018, 11:00 a.m.
Location: Saline Co., Mentor
Contact: Tom Maxwell, 785-309-5850, tmaxwell@ksu.edu
Directions: Located ½ mile west of Mentor at intersection of Old Hwy 81/Mentor Rd

Thursday, 5/24/2018, 2:00 p.m.
Location: Ottawa Co., Minneapolis
Contact: Tom Maxwell, 785-309-5850, tmaxwell@ksu.edu
Directions: Located 1 ½ miles west of K-106 Highway on Justice Rd

Thursday, 5/24/2018, 6:00 p.m.
Location: Barton Co., Susank (RSVP by 5/22)
Contact: Stacy Campbell, 620-793-1910, scampbel@ksu.edu
Directions: from Hoisington go N. on blacktop--Susank Rd. at Susank go 4 miles E. on the blacktop, turn N. onto NE40 Ave. go 1 mile N. to NE 200 Rd., turn E on 200 and go about 3/8 mile. Meal will follow plot tour at the Beaver Volunteer Fire Dept. Station

The eUpdate will highlight upcoming tours each week in its regular Friday edition.

Romulo Lollato, Extension Wheat Specialist
lollato@ksu.edu

Erick DeWolf, Extension Wheat Pathologist
dewolf1@ksu.edu

9. Spring Field Day: South Central Experiment Field, May 22

The Spring Field Day at the South Central Experiment Field will be held May 22, starting at 5:00 p.m.

The event will be held at 10620 South Dean Road, Hutchinson, Kansas.

The main topics will include:

- Wheat Varieties – Allan Fritz, K-State Wheat Breeder
- Cover Crops for Weed Suppression – Anita Dille, K-State Weed Ecologist
- Water Quality Concerns in South Central Kansas – Nathan Nelson, K-State Soil Fertility and Nutrient Management
- Economic Status of Farms in South Central Kansas in 2017 – Bryan Manny, Kansas Farm Management Association

More information about the field day is available by calling Jane Lingenfelser at 785-532-7251, or jling@ksu.edu. A meal will follow the field day program.

SPRING FIELD DAY

South Central Kansas Experiment Field
Hutchinson, Kansas

May 22, 2018
5:00 p.m.
Location: 10620 South Dean Road, Hutchinson
Dinner will follow program.

K-STATE Research and Extension

Field Day Topics

- Wheat varieties..... Allan Fritz, KSU Agronomy
- Cover crops for weed suppression..... Anita Dille, KSU Agronomy
- Water quality concerns in south central Kansas..... Nathan Nelson, KSU Agronomy
- Economic status of farms in south central Kansas in 2017..... Bryan Manny, Kansas Farm Mgmt Assoc.

Kansas State University is committed to making its services, activities, and programs accessible to all participants. If you have special requirements due to a physical, vision, or hearing disability, or a dietary restriction, please contact Jane Lingenfelser (785) 532-7251.

10. Spring Crops Field Day: Southeast Research and Extension Center, May 22

The Southeast Research and Extension Center in Parsons will host a Spring Crops Field Day on Tuesday, May 22 to update producers in the region on the latest information on wheat varieties, crop production, and disease management.

The field day starts with registration and a complimentary breakfast courtesy of several sponsors from 7:30 to 8:30 a.m. at the Southeast Research and Extension Center, 25092 Ness Road, (immediately south of U.S. Highway 400), Parsons, Kansas.

The program includes:

Wheat Variety Plot Tour – Allan Fritz, K-State wheat breeder, Lonnie Mengarelli, K-State research assistant, and seed company representatives

2018 Grain Markets: Outlooks and Strategies – Dan O'Brien, Extension Agricultural Agronomist, K-State Research and Extension

Managing Root Diseases of Soybean in Kansas – Chris Little, Plant Pathologist, K-State

Timing of Side-dress Applications of Nitrogen for Corn Grown in Different Tillage Systems – Dan Sweeney, Soil and Water Management, K-State Southeast Agricultural Research Center

There is no cost to attend. In the event of rain, the program will be conducted indoors. Please contact Marla Sexton at 620-820-6133 for more information.

11. Spring Field Day: Southwest Research and Extension Center, May 23

The Southwest Research-Extension Center will host its Spring Field Day on Wednesday, May 23. Registration and introductions will begin at 4:00 p.m. The event will conclude at 7:00 p.m. with supper. The Center is located at 4500 E. Mary Street, Garden City, Kansas.

The Spring Field Day is an annual event hosted at the Southwest Research and Extension Center for more than a decade. It provides an opportunity for K-State researchers to engage with local producers, provide updates, and receive feedback on the status of current research programs.

Producers attending the field day will learn about wheat and canola varieties and agronomy management practices to maximize productivity.

This field day provides a platform to keep producers up-to-date on new research and technology and serves as a medium for dialogue between researchers and producers. Producers should consider this conference as an opportunity to refresh basic principles and to learn new principles they can apply to their own situation.

The event is free and supper will be provided courtesy of industry supporters. Continuing education credits have been applied for and should be available at this meeting.

Advance registration is important to ensure supper will be available for all attendees. Please contact Ashlee Wood at 620-276-8286 or email awood22@ksu.edu by **5 p.m. on May 18** to register.

For more information on the program, contact A.J. Foster at 620-276-9164, or email anserdj@ksu.edu.

SOUTHWEST RESEARCH-EXTENSION
SPRING FIELD DAY
MAY 23, 2018
4:00 – 7:00 PM (CST)

K-State Southwest Research-Extension Center
4500 E. Mary Street, Garden City, KS 67846

Topics & Tours to be covered include:

Wheat Variety Tour
Canola Variety Tour
Agronomy Management Discussion
(fertility, wheat protein, fungicide, weeds, insects, irrigation, PGR etc.)

Cost: None – Sponsored Supper Provided

Advance registration is required by May 18, 2018
RSVP online at http://www.southwest.k-state.edu or contact Ashlee Wood by email awood22@ksu.edu or call (620)276-8286

(CEUs applied for and should be available at this meeting)

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