



## Extension Agronomy

# eUpdate

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*10/11/2019*

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](mailto:kgehl@ksu.edu), or Dalas Peterson, Extension Agronomy State Leader and Weed Management Specialist 785-532-0405 [dpeterso@ksu.edu](mailto:dpeterso@ksu.edu).

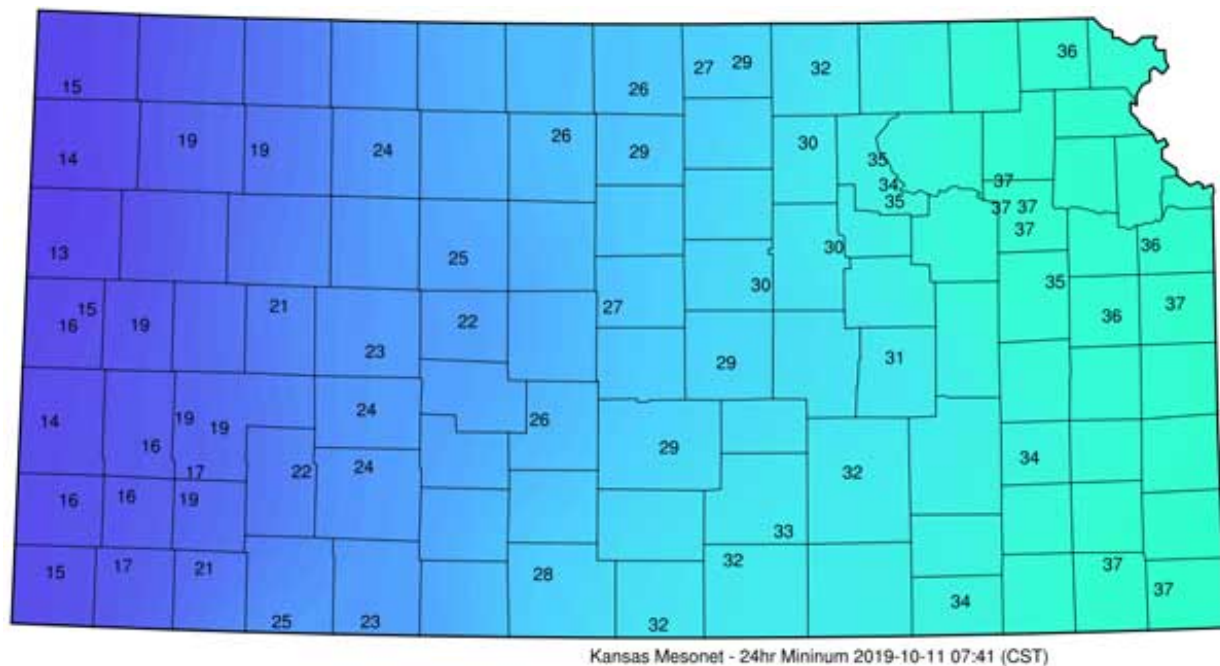
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<b>1. Effect of low temperatures on summer row crops.....</b>	<b>3</b>
<b>2. Late-season rainfall: Moldy corn ears and premature kernel sprouting.....</b>	<b>6</b>
<b>3. Wheat response to cold temperatures.....</b>	<b>10</b>
<b>4. Wheat planting conditions in Kansas: October 11, 2019.....</b>	<b>11</b>
<b>5. Considerations when planting wheat into dry soils.....</b>	<b>15</b>
<b>6. Musk thistle control in the fall.....</b>	<b>18</b>
<b>7. Cooler weather brings the return of the Mesonet Freeze Monitor.....</b>	<b>22</b>
<b>8. Management of feral rye with CoAXium® wheat production system in Kansas.....</b>	<b>26</b>
<b>9. Ag-Climate Update for September 2019.....</b>	<b>31</b>
<b>10. Retirement reception for longtime Extension Weed Science Specialist Dallas Peterson</b>	
<b>.....</b>	<b>32</b>

## 1. Effect of low temperatures on summer row crops

Extreme low temperatures were recorded in western Kansas overnight (Figure 1). For all summer crops, these killing temperatures will end development. At this point, corn is near maturity and the potential impacts of lower temperatures will have little (depending on the absolute value, the duration of the stress, and phenology of the crop) or no impact on expected corn yields. The main challenges of low temperatures will occur for soybeans in the coming weeks during the final reproductive stage, with the potential of impacting final seed weight (either affecting the rate of accumulation of dry matter on the seeds or by interrupting this process) where temperatures dropped below 32 degrees F.



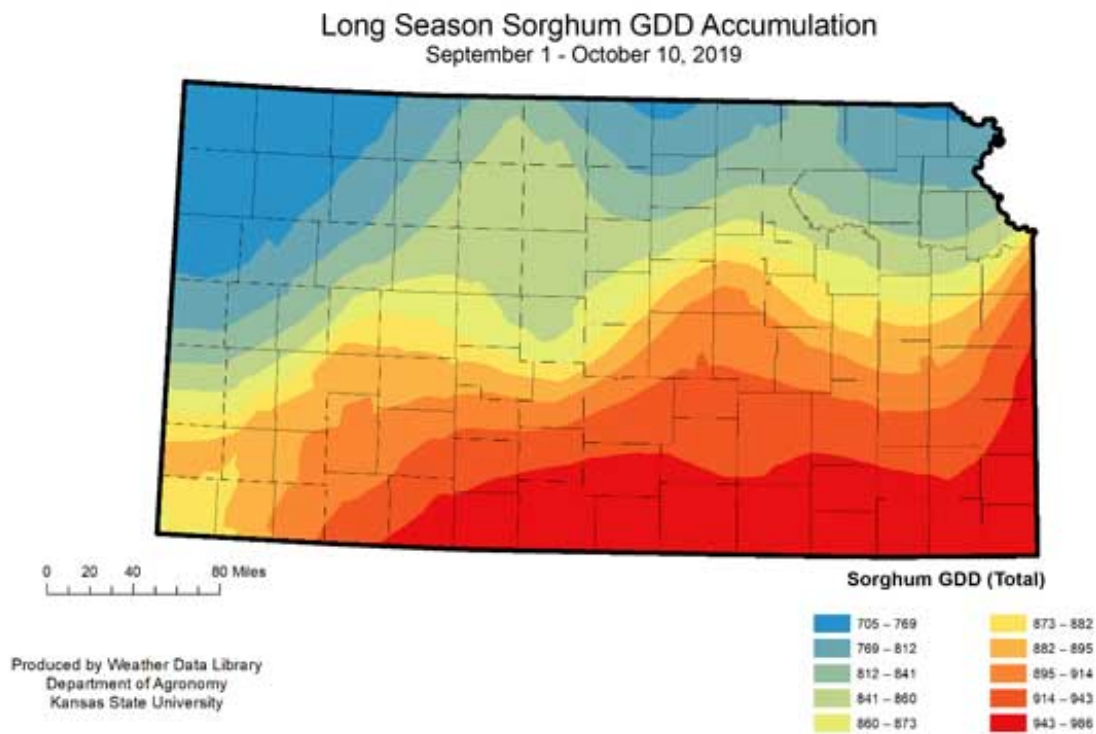
**Figure 1. 24-hour Minimum Temperatures as of October 11, 2019 at 7:41 am (Kansas Mesonet).**

## Low temperature effects on sorghum, corn, and soybeans

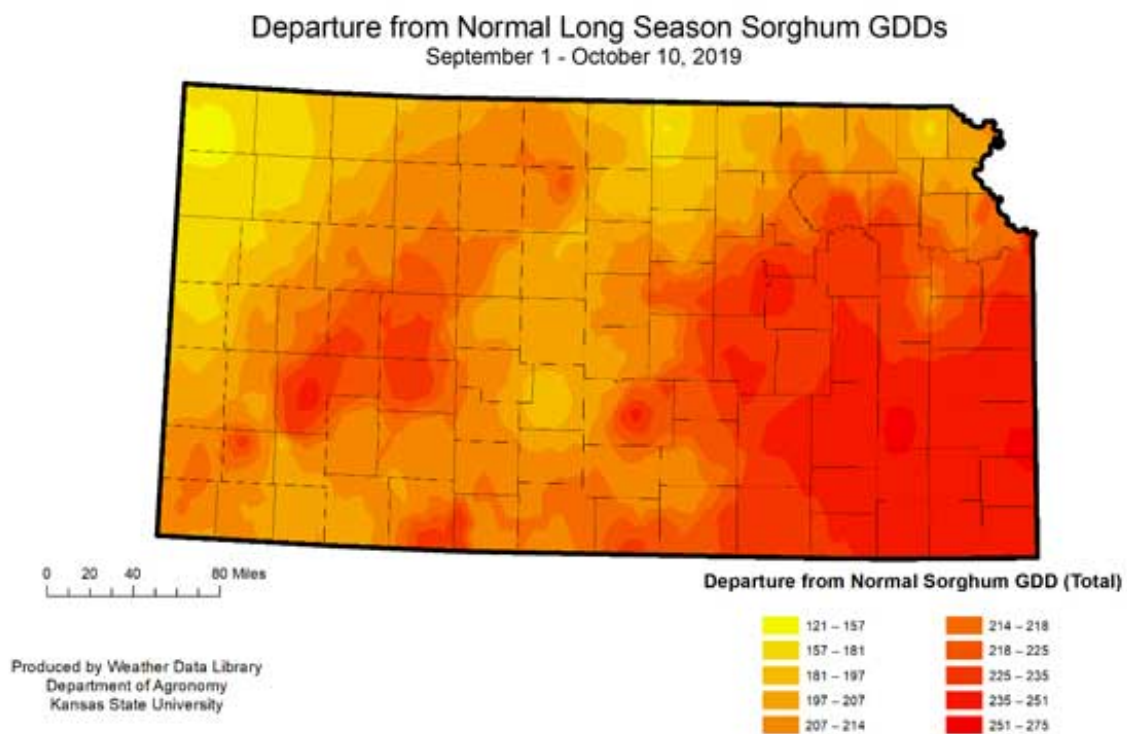
Sorghum:

Wet conditions delayed sorghum planting in some areas of the state thus delaying heading. During August, cooler-than-normal temperatures dominated the state, followed by a warmer-than-normal September. A delay in flowering time could jeopardize yields if the crop is exposed to heat around blooming or if low temperatures occur during grain fill. The long-season growing-degree-day (GDD) accumulation from September 1 – October 10 portrays a lower GDD accumulation for the north

central and eastern parts of the state (Figure 2). The largest departure of GDD accumulation was recorded in the south central, southeastern, and northeast-north central portions of the state (Figure 3).



**Figure 2. Accumulated long season sorghum Growing Degree Days.**



### **Figure 3. Departure from normal accumulation of long season Sorghum GDDs.**

Low temperatures will reduce seed growth and affect final test weight and seed quality. Temperatures below 40 degrees F will inhibit growth. A freeze will kill sorghum if the stalks are frozen, impairing the flow of assimilates and nutrients to the grain. A freeze at the hard-dough stage (before grain matures) will produce lower weight and chaffy seeds.

The likelihood of sorghum maturing before a freeze is related to the following factors (as affected by weather and hybrid):

- planting date
- plant growth rate during the season
- date of half-bloom.

When the crop flowers in late August or early September, it may not reach maturity before the first fall freeze in some parts of the state. For the northwest, western, and north central areas, any sorghum that has not reached maturity will not.

Corn:

Temperatures below 32 degrees F can produce equivalent or greater damage even when the exposure time is relatively short. Clear skies, low humidity, and calm wind conditions increase freeze damage even with temperatures above 32 degrees F. Any freeze damage at this point in the season will hardly produce any visible symptoms, but can affect the final test weight and potentially seed quality - depending on the growth stage. Corn is not affected by freeze once it reaches the black layer stage.

Soybeans:

Temperatures below 32 degrees can interrupt grain filling and impact yield, meaning lower test weight and seed quality. Necrosis of the leaf canopy is a visible symptom of freeze damage. Absolute temperature is more important than the duration of the cold stress – especially if temperatures drop below 28 degrees F. As the crop approaches maturity, the impact of a freeze event on yields declines.

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## 2. Late-season rainfall: Moldy corn ears and premature kernel sprouting

The corn growing season is reaching an end, but late-season rains could impact corn grain quality and test weight. Late-season precipitation can increase fungal colonization of corn ears, increase pre-harvesting sprouting, and reduce final test weight and grain quality.

Moldy ears can occur on corn that died prematurely from stress. Corn in this situation usually has high grain moisture content, which favors fungal colonization (Figure 1). In addition, the wet pattern experienced this past week favors the occurrence of moldy ears. Also, corn ears affected by abiotic or biotic (e.g., insect and bird damage) stress are more susceptible to ear molds.







**Figure 1. Moldy corn ears. Photos by Eric Adee and Ignacio A. Ciampitti, K-State Research and Extension.**

“Exposed ears” are also more susceptible. Exposed ears occur when the ear keeps elongating beyond the end of the husks. The upper part of the ear becomes partially or completely exposed. The combination of heat and drought early this season, followed by an unusually cool and wet pattern, increased the presence of exposed ears (Figure 2).



**Figure 2. “Exposed” corn ears. Photo by Ignacio A. Ciampitti, K-State Research and Extension.**

When ears are exposed out of the husks, diverse disease problems are evident. Some of the most common diseases are: *diplodia* ear rot, *aspergillus* ear and kernel rot, *fusarium* ear and kernel rot, *gibberella* ear rot, and blue eye mold, among several other diseases.

### **Low test weight**

The occurrence of moldy ears can affect test weight in corn, resulting in light-weight and chaffy grain. Other causes of low test weight are: 1) higher grain moisture, 2) abiotic stress conditions (e.g., drought and heat), 3) late-season leaf diseases, and 4) below-normal temperatures during the end of the grain filling, which was not the case this year.

Moldy ears can also impact final grain quality through the production of mycotoxins, potentially affecting quality of the grain as an animal feeding source. It can also cause issues for storage and end-use processing (e.g., starch quality and ethanol).

### **Sprouting**

Pre-harvest sprouting is likely to occur when dry grain (less than 20% moisture content) is re-wetted. This situation is particularly associated with late-season rains, warm temperatures, and upright ears. The main result is a sprouted kernel in the lower section of the corn ear (Figure 3). If this is a large-scale problem throughout the field, grain quality can be compromised and cause problems for storage purposes.





**Figure 3. Premature corn kernel sprouting in the lower section of the ear. Photo by Eric Adee, K-State Research and Extension.**

In summary, these production issues are occurring now in the field in some cases. One the most effective management practices is to scout fields for these issues and estimate the portion of your field affected by moldy ears or pre-harvest sprouting problems. Timely harvest and pre-screening of corn ears can help mitigate these issues and diminish the economic impact.

For more information on corn ear abnormalities, please refer to K-State Research and Extension publication **EP169 “Abnormal Corn Ears”** at <https://www.bookstore.ksre.ksu.edu/pubs/EP169.pdf>.

For a new web version of the publication **EP169 “Abnormal Corn Ears”**, please check this out at:

<https://spark.adobe.com/page/Z0xaA/>

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### 3. Wheat response to cold temperatures

Whether the sudden sharp drop in air temperatures across Kansas this week affect the wheat crop that has already emerged to any degree depends on several factors.

First, it might only mean risk of cold injury for fields that were sown relatively early and already had a good above-ground development. These plants would not have had the chance to properly acclimate to the cold temperatures and are more susceptible to winterkill.

Second, the moisture level in the topsoil will be important, as dry soils will get colder more easily than wet soils. Soil moisture was generally good in most of the state except for southwest Kansas (see accompanying article). The cold temperatures will be more likely to cause injury to wheat in fields that were planted early, had some significant growth during September and early October, and were now showing drought-stress symptoms.

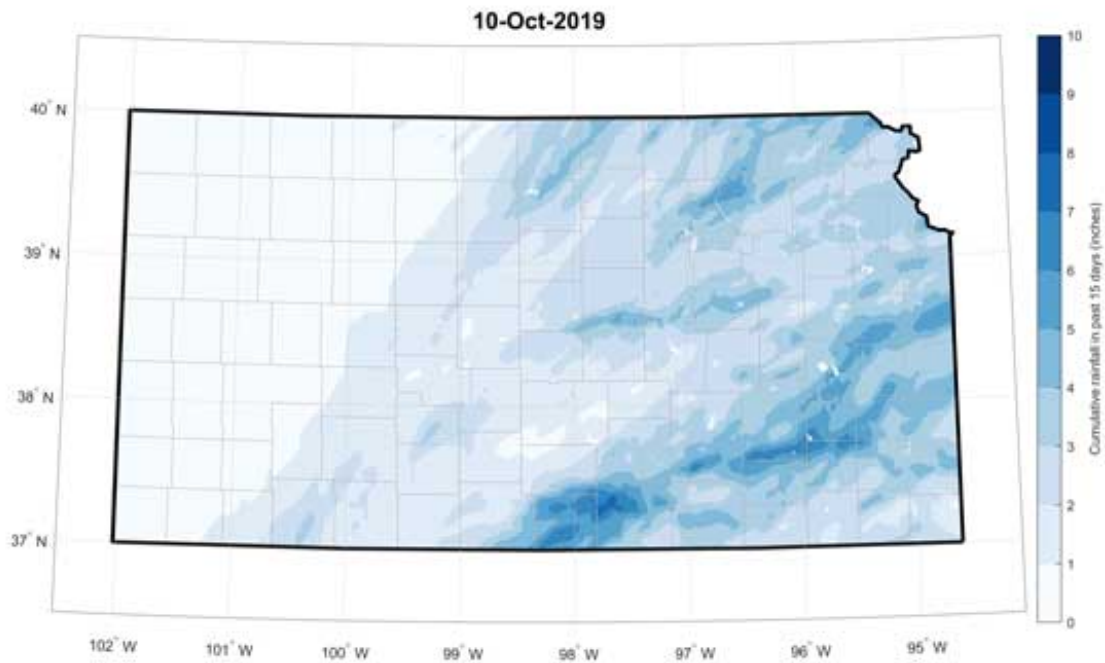
There was a severe cold snap in mid-November 2014 that contributed to winter injury on some wheat, and in many cases resulted in winterkill. In 2014, the crop was sown relatively early and had good development in the fall due to warm temperatures in October. These warm October temperatures caused drying of the topsoil and enhanced the potential for cold damage. The weather during the fall of 2014 was also warm which likely provided too few cold enough nights to have allowed the wheat to develop cold hardiness.

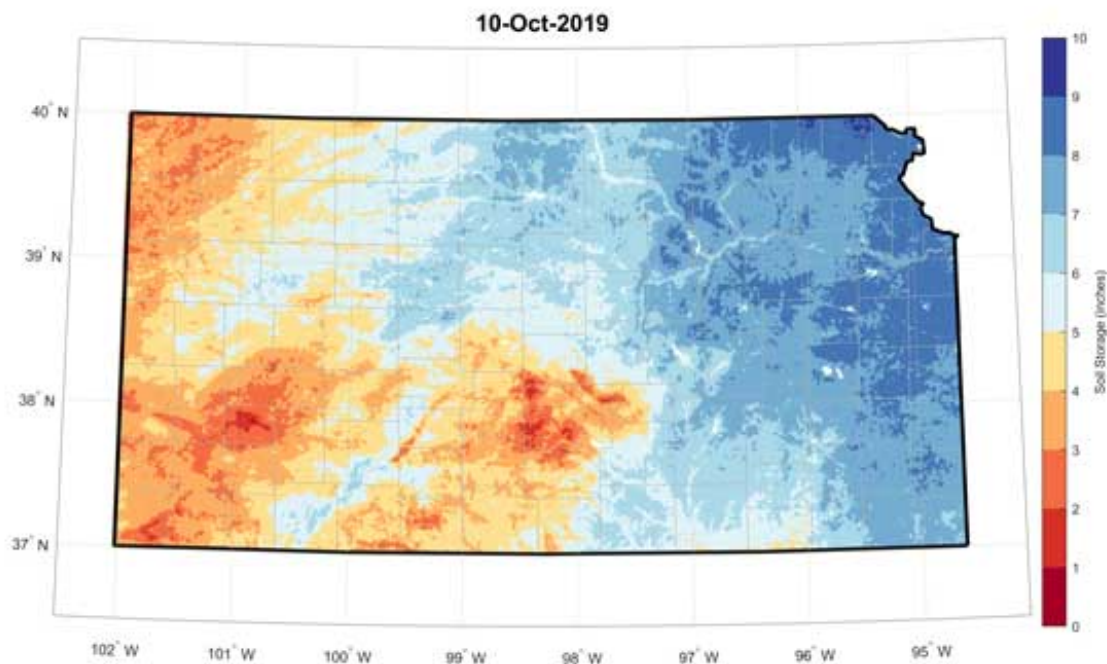
The extent of the unusually large and rapid drop in temperatures from well above normal to well below normal is a concern in those early-planted fields which would be more susceptible to injury from the recent cold snap. The first thing we'll see is burndown of the wheat from these cold temperatures, but if the crown below the soil surface remains alive, the wheat should be fine. We likely won't know with certainty the extent of the damage until at least a couple weeks of warmer temperatures occur.

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#### 4. Wheat planting conditions in Kansas: October 11, 2019

A drier pattern dominated September in the western parts of Kansas; however, central and Kansas received considerable amount of precipitation in the last 15 days (Figure 1, upper map). Thus, estimated root-zone soil moisture is relatively low in the west as compared to central and north central Kansas (Figure 1, lower map).



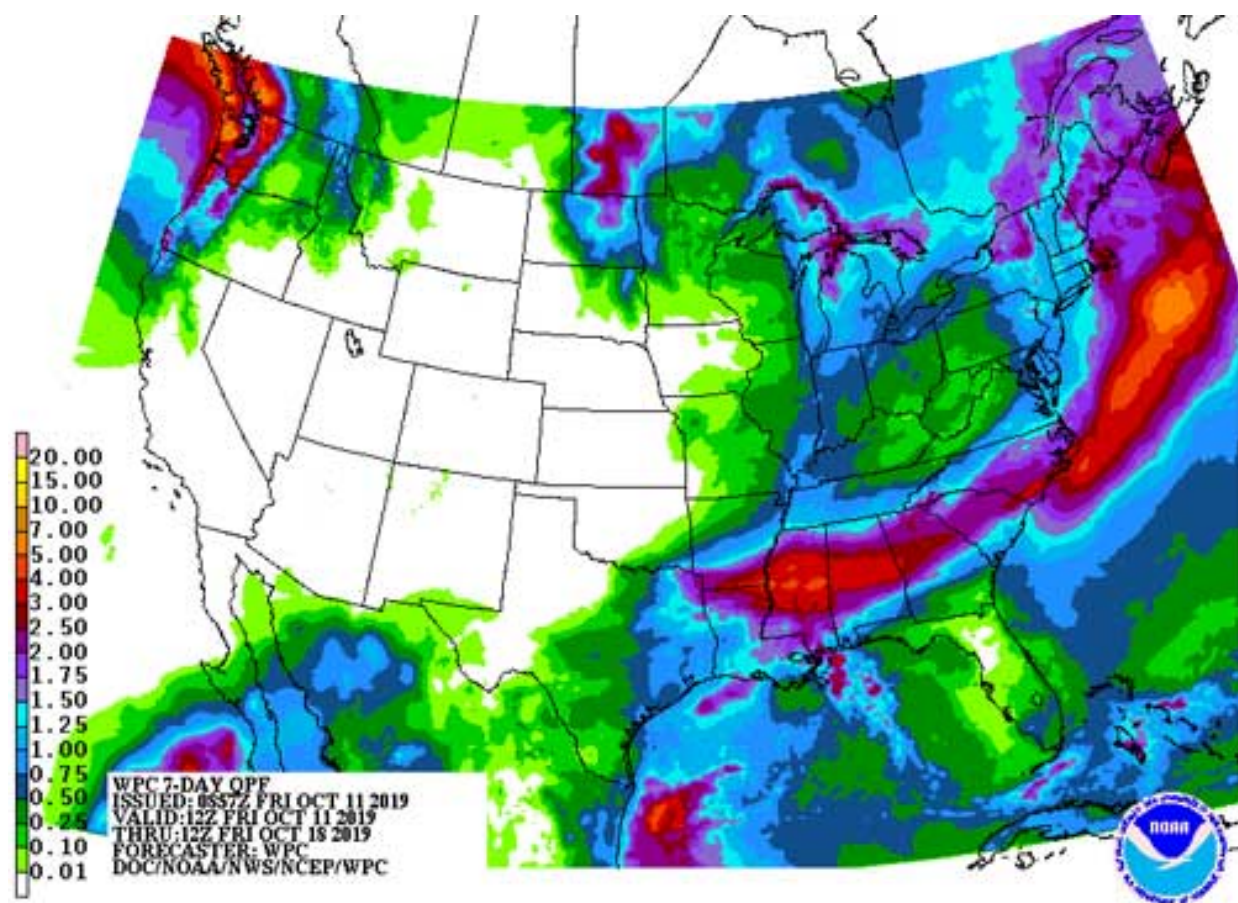


**Figure 1. Total cumulative precipitation for the period between September 26 and October 10, 2019 (upper panel), and soil water storage in the upper 50 cm (lower panel). Maps by the Soil Water Processes lab, K-State Research and Extension.**

## Weather Forecast

The weekly quantitative precipitation forecast for Kansas indicates that the probability of precipitation for the next seven is very low (Figure 2), which might favor sowing development in central Kansas but will not help alleviate the water deficit stress in western Kansas.





**Figure 2. Weekly precipitation forecast as of October 11, 2019 by the National Weather Service Weather Prediction Center (NOAA). Precipitation probabilities in Kansas for the next 7 days are nonexistent.**

### **Possible challenges for wheat planting and crop establishment**

As of October 6, 2019, the wheat-planted acreage in Kansas was 45% according to the USDA-NASS crop progress report. This is close to the 5-year average of 47%. The majority of the development in planted area was likely in the western portion of the state, as the central portion had significant amount of precipitation in the last 15-days and likely many fields did not get planted (Figure 1).

With about 55% of the winter wheat area still to be planted and a dry forecast, the crop sowing progress is likely to increase considerably in the next days. Perhaps the biggest challenges will include sowing into dry soils. Planting wheat into a dry topsoil can also be challenging. While a good seed distribution is generally achieved when sowing wheat into dry soils, if the forecast rain does not materialize, the lack of moisture for germination can result in uneven stands and high within-field stand variability (Figure 3), which can ultimately impact grain yield. Otherwise, the forecast rain will help ensure a good stand establishment. For more consideration when planting in dry soils, please see the accompanying article in this eUpdate issue.





**Figure 3. Uneven wheat stands resultant from sowing into dry soils. Photo by Romulo Lollato, K-State Research and Extension.**

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## 5. Considerations when planting wheat into dry soils

The full soil profile observed early this summer due to abundant rainfall has become steadily drier through the late summer and early fall. Topsoil conditions are now very dry in portions of southwest Kansas, which leaves producers with basically three main options for wheat yet to be planted:

### **Option 1 - “Dust in” the wheat**

Producers can choose to “dust in” the wheat at the normal seeding depth and normal planting date, and hope for rain. Some farmers may consider planting it shallower than normal, but this could increase the potential for winterkill or freeze damage as the crown will likely be formed closer to the soil surface. Planting the wheat crop at the normal depth and hoping for rain is probably the best option where soils are very dry. The seed will remain viable in the soil until it gets enough moisture.



**Figure 1. Wheat dusted in near Belleville in October 2015. Photo by Romulo Lollato, K-State Research and Extension.**

Before planting, producers should look at the long-term forecast and try to estimate how long the dry conditions will persist. If it looks like there’s a good chance the dry weather will continue until at least the back end of the optimum range of planting dates, producers should treat the fields as if they were planting later than the optimum time. Rather than cutting back on seeding rates and fertilizer to save money on a lost cause, producers should increase seeding rates, consider using a fungicide seed treatment, and consider using a starter phosphorus fertilizer to improve early season development. However, producers should be cautious with in-furrow nitrogen or potassium

fertilizers as these can make it more difficult for the seed/seedling to absorb water needed for germination. The idea is to make sure the wheat gets off to a good start and will have enough heads to have good yield potential, assuming it will eventually rain and the crop will emerge late. Wheat that emerges in October may still hold full yield potential, but wheat that emerges in November almost always has fewer fall tillers and therefore can have decreased yield potential.

There are some risks to this option. First, a hard rain could crust over the soil or wash soil off planting ridges and into the seed furrows, potentially causing emergence problems. Another risk is the potential for wind erosion if the field lies unprotected with no ridges. Also, the wheat may not come up until spring, in which case it may have been better not to plant the wheat at all and plant a spring crop instead. In fact, not planting wheat and allowing soil moisture to build for a summer crop planted next spring is an option for the dry portions of southwest Kansas.

Probably the worst-case scenario for wheat planted into dry soils would be if a light rain occurs and the seed gets just enough moisture to germinate but not enough for the seedlings to emerge through the soil or to survive very long if dry conditions return. Once the coleoptile extends to the soil surface, the plant must have enough moisture to continue growth otherwise it will perish. This situation may be worsened if producers are planting wheat following a summer crop such as corn, soybean, or sorghum, which depleted subsoil moisture through late summer. Without subsoil moisture to sustain growth, there can be a complete loss of the wheat stand. If late October continues to bring cooler temperatures, dusting wheat in becomes a more interesting option as soil moisture from a possible rainfall event could be stretched further.

### **Option 2 - Plant deeper than usual into moisture with hoe drill**

Planting deeper than usual with a hoe drill can work if the variety to be planted has a long coleoptile, the producer is using a hoe drill, and there is good soil moisture within reach. The advantage of this option is that the crop should come up and make a stand during the optimum time in the fall. This would keep the soil from blowing. Also, the ridges created by hoe drills also help keep the soil from blowing.

The main risk of this option is poor emergence. Deep-planted wheat normally has below-normal emergence, so a higher seeding rate should be used. Any rain that occurs before the seedlings have emerged could add additional soil into the seed furrow, making it even harder for the coleoptile to reach the soil surface. Any time you increase the seeding depth, the seedling will have to stay within the soil just that much longer before emerging through the soil surface.

Delayed emergence leads to more potential for disease and pest problems. Additionally, deep-planted wheat generally results in reduced tillering and consequently a reduced number of heads, which directly reduces the yield potential of the crop. It's even possible that the wheat would get planted so deep that it would germinate but never emerge at all, especially if the coleoptile length is too short for the depth of planting. Generally speaking, it's best to plant no deeper than 3 inches with most varieties. It is also important to keep in mind that ridges formed by narrow press wheels can make the effective planting depth much deeper if the seed furrows fill in during a heavy rainfall event.

### **Option 3 - Wait for rain before planting**

To overcome the risk of crusting or stand failure, producers may decide to wait until it has rained and

soil moisture conditions are adequate before planting. Under the right conditions, this would result in good stands, assuming that planting is not extremely delayed, that the producer uses a higher seeding rate and a starter fertilizer, if appropriate. If it remains dry well past the optimum range of planting dates, the producer would then have the option of just keeping the wheat seed in the shed until next fall and planting spring crop next year instead.

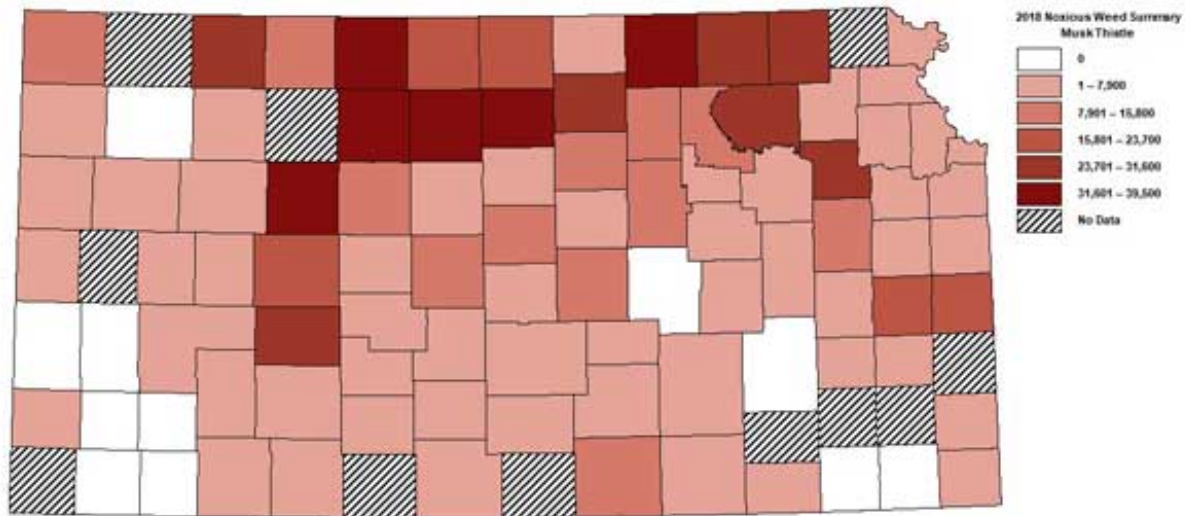
The risk of this option is that the weather may turn rainy and stay wet later this fall, preventing the producer from planting the wheat at all (similar to what happened in the fall of 2018), while those who dusted their wheat in have a good stand. There is also the risk of leaving the soil unprotected from the wind through the winter until the spring crop is planted.

Crop insurance considerations and deadlines will play a role in these decisions. Another consideration is to delay the bulk of nitrogen application until topdress time in the spring, as wheat does not require much nitrogen in the fall. This would defer expenses until an acceptable wheat stand is assured.

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## 6. Musk thistle control in the fall

Musk thistle (*Carduus nutans*) is one of 12 state-wide noxious weeds in Kansas. Musk thistle has been reported in nearly every county in Kansas (Figure 1) and is found primarily in pastures, rangeland, hay meadows, alfalfa, fallow, roadsides, and waste areas.



**Figure 1. Distribution of musk thistle in Kansas. Map courtesy of the Kansas Department of Agriculture.**

Musk thistle is primarily a biennial or winter annual species. Biennials take two growing seasons to complete their life cycle. Thistles that germinate in the spring will spend the entire summer as a rosette, live through the winter, and bolt the next year in May and June. Winter annual plants will germinate with moisture and warm temperatures in the fall, live through the winter, and bolt the following year.

Most people recognize musk thistle during the early summer when the plants are actively blooming (Figure 2, top photo). However, musk thistle control is easiest as a rosette (Figure 2, bottom photo).





**Figure 2. Musk thistle in flowering and rosette stages of growth. Photo courtesy of Walt Fick, K-State Research and Extension.**

Fall is an excellent time to spray musk thistle as all are in the rosette stage of growth. Another advantage for treatment in the fall is reduced risk of off-target drift. Waiting until most deciduous trees have lost their leaves and most crops are harvested will greatly reduce the likelihood of damage from herbicide drift. A wider window of opportunity for treating musk thistle also exists in the fall. The spraying window in the fall probably extends until the ground is frozen and the musk thistle plants have shut down activity until warmer temperatures in the spring. Freezing temperatures will start to damage musk thistle plants, with some yellowing and curling of leaves. However, the plants are susceptible to herbicides as long as green tissue exists.

Studies in Kansas indicated that a fall application of 2,4-D LVE at 2 lbs per acre was more effective (80% control) than a similar rate of 2,4-D amine (49% control). Dicamba + 2,4-D amine at 0.25 + 0.75 lbs per acre and picloram at 0.125 lbs per acre were also effective (>90% control) on musk thistle treated in the fall.

Data presented in Table 1 were collected in July 2013 following treatment on December 6, 2012. Conditions at the time of treatment were 50 degrees F air temperature, 66% relative humidity, and 6-8 mph wind speed. Skies were overcast and cloudy. All treatments provided excellent control of rosettes present at the time of spraying (data not shown).

The data in this table reflect residual control of rosettes that germinated during spring 2013. The number of rosettes on untreated plots increased 92% between December 2012 and July 2013, indicating spring germination. The only treatment not providing nearly 100% residual control was 2,4-D LVE applied at 64 fl oz per acre. The active ingredient in Milestone is aminopyralid. Tordon 22K contains 2 lbs per gallon picloram. Chaparral contains aminopyralid and metsulfuron. These products are all labelled for use on range and pasture. Milestone, 2,4-D, and Tordon 22K are also labeled for use on non-cropland sites including roadsides, right-of-ways, and industrial sites. Opensight was not included in this test, but is a product similar to Chaparral that can be used on non-cropland sites.

**Table 1. Musk thistle control with herbicides applied on December 6, 2012.**

<b>Herbicide</b>	<b>Rate</b>	<b>% control, July 5, 2013</b>
Milestone	3 fl oz	99
Milestone	4 fl oz	100
Milestone	5 fl oz	100
Tordon 22K	10 fl oz	100
2,4-D LVE	64 fl oz	43
Chaparral	1.5 oz	100
Untreated	---	0

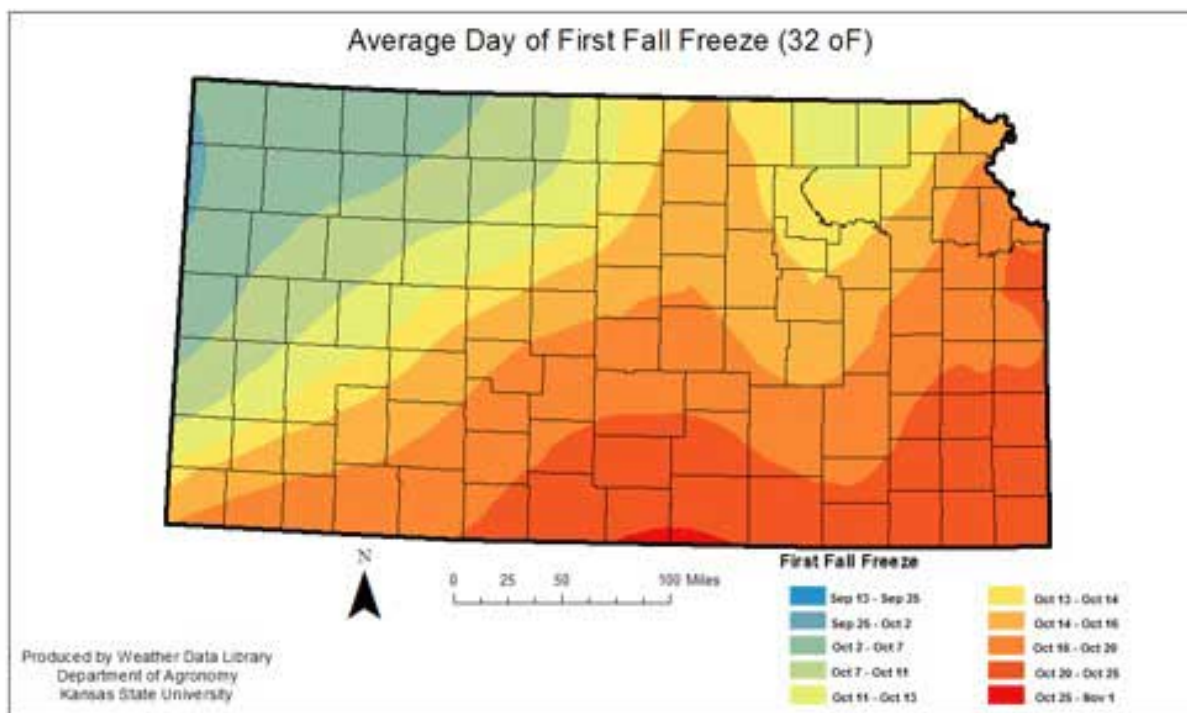
If you need to treat musk thistle this fall, herbicides exist that will not only control the rosettes at the time of application, but will carryover and control new emerging rosettes next spring. If possible, select a warm, sunny day when spraying musk thistle this fall.

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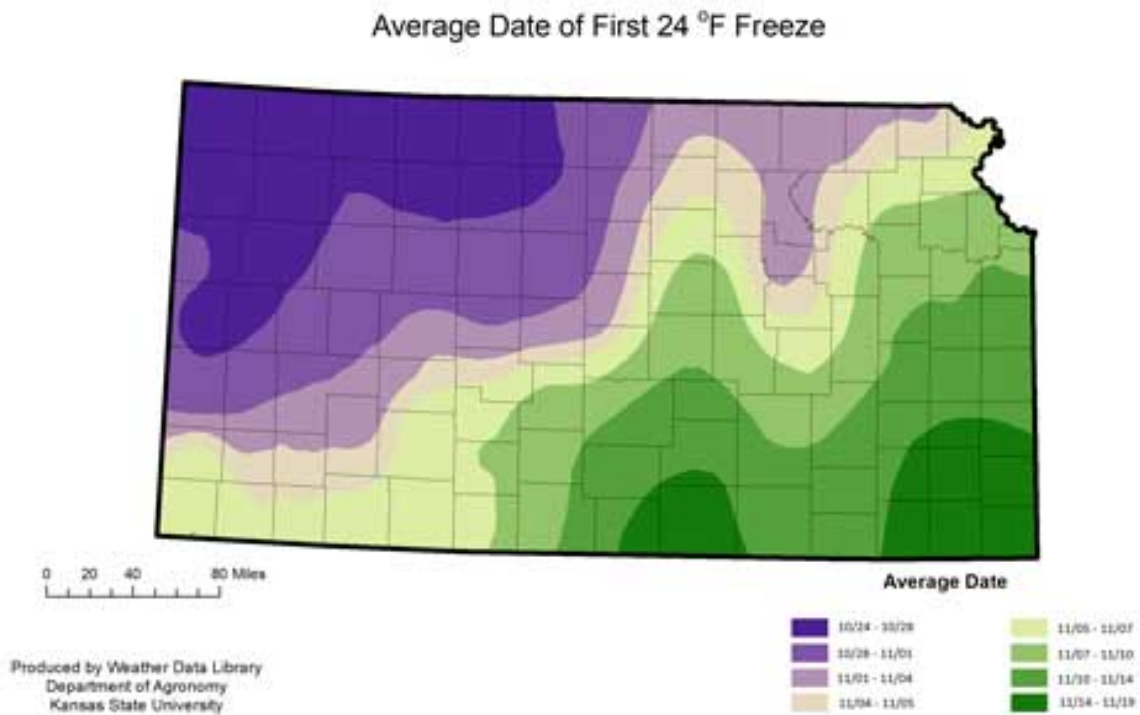


## 7. Cooler weather brings the return of the Mesonet Freeze Monitor

Cold weather is making its appearance with frost advisories issued this last weekend and freeze warnings this week. The average freeze date in northwest Kansas is as early as the last week in September. However, southeast Kansas does not usually see freezing temperatures until the end of October (Figure 1). Average dates for the first occurrence of 24-degree F temperatures are even later (Figure 2).



**Figure 1. Average fall freeze dates (Weather Data Library).**



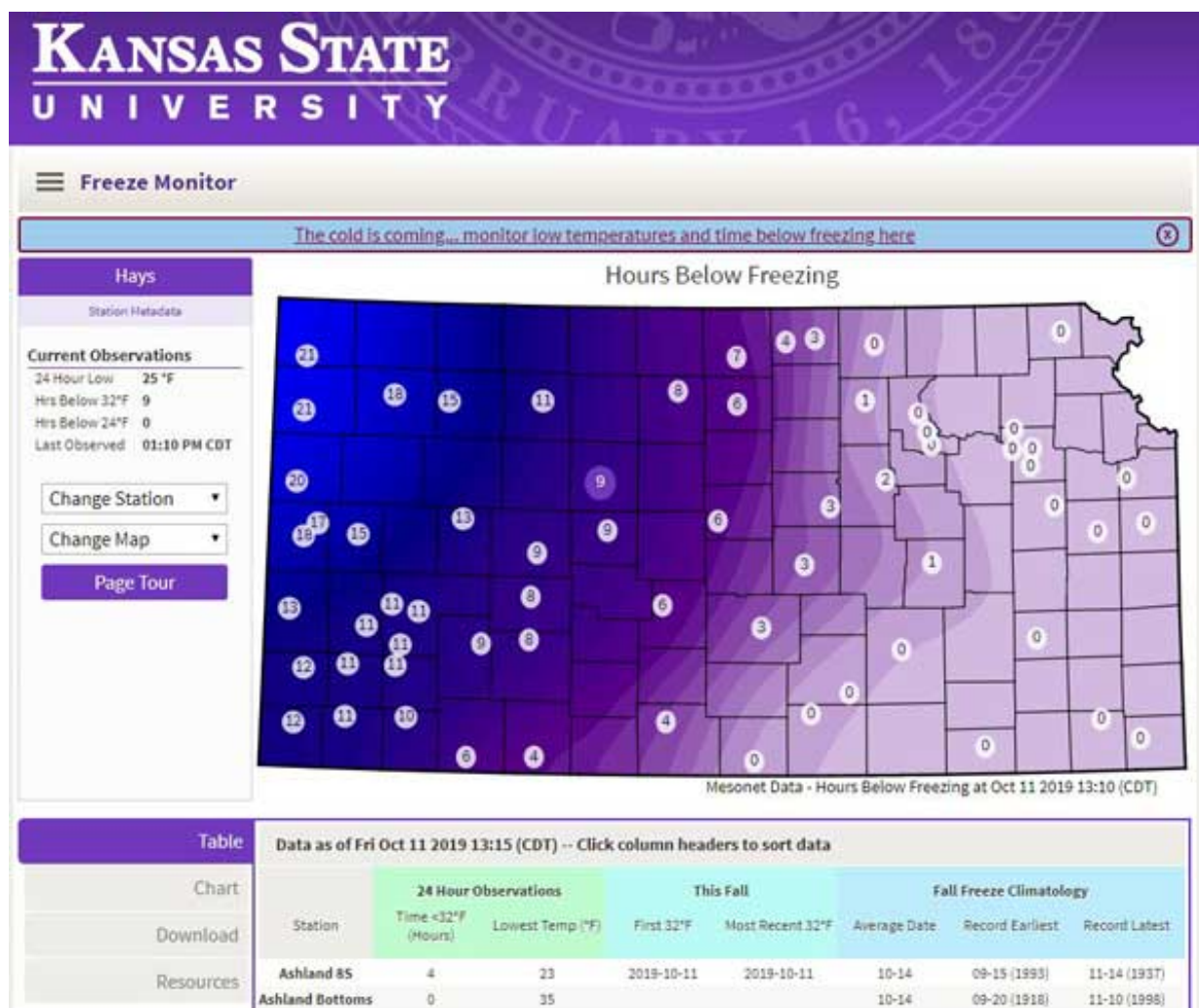
**Figure 2. Average 24 °F freeze dates (Weather Data Library).**

Historically, almost all parts of the state have recorded freezing temperatures as early as September. Earliest first freeze on record in Kansas is September 3, 1974, when many stations dropped below freezing.

The Kansas Mesonet's Freeze Monitor (<http://mesonet.k-state.edu/weather/freeze/>) is now available for the 2019 fall frost/freeze season. This tool displays the coldest temperatures observed across Kansas during the previous 24 hours. It answers the frequent question: How cold did it get last night? It also tracks the first fall freeze date for each station for comparison to local climatology (<http://mesonet.k-state.edu/weather/freeze/#tab=chart-tab&mtIndex=1>). Data updates every twenty minutes on both the map and the table (Figure 3).

Another tool important for producers and gardeners is the duration below freezing, as some crops and commodities have lower thresholds for damage. This feature allows users to select options to view maps/data of the duration below freezing (32 degrees F <http://mesonet.k-state.edu/weather/freeze/#tab=chart-tab&mtIndex=1>) and the number of hours below 24 degrees F (<http://mesonet.k-state.edu/weather/freeze/#tab=table-tab&mtIndex=2>). While both are of interest, the lower threshold is of great importance to wheat growers later into the fall season.





**Figure 3. View of the Freeze Monitor webpage for October 11, 2019, with the Hays station selected as an example. Source: [mesonet.ksu.edu/weather/freeze](https://mesonet.ksu.edu/weather/freeze)**

The data displayed in the tables below the maps can be sorted. Clicking on the header of a particular column will sort the table by that column. This makes it much easier to see what area was the coldest in the state, as well as earliest freeze and earliest climatological freeze data. There are a number of download options, including table and chart data, and images of the maps (Figure 4).



**Figure 4. Download options on the Freeze Monitor website.**

The Freeze Monitor is updated in the spring, as a new growing season arrives, to show the spring freeze climatology.

The Freeze Monitor is available at: <http://mesonet.k-state.edu/weather/freeze/>

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## 8. Management of feral rye with CoAXium® wheat production system in Kansas

Feral rye (*Secale cereale* L.), also commonly known as cereal or volunteer rye, is a troublesome winter annual grassy weed in wheat producing regions of the United States, including Kansas. Feral rye seeds can germinate in fall or early spring with optimum soil temperatures ranging from 55 to 60 °F. Feral rye generally matures early and shatters seeds before wheat harvest. A single feral rye plant can produce up to 800 seeds and those seeds can remain dormant and viable in soil for several years. The contamination of feral rye seeds can cause wheat dockage, losses in wheat quality, and grade reduction. The presence of feral rye seeds in wheat grains can also reduce the milling and baking characteristics of wheat flour. A survey conducted in 1995 estimated that the feral rye infestation in winter wheat was up to 600,466 acres in Kansas. The management of this winter annual has always been challenging in wheat, as current herbicides do not have the selectivity that allows for effective control without causing injury to wheat.

### CoAXium® wheat production system

CoAXium® wheat production system is a new non-GMO herbicide-resistant wheat technology that combines the use of Aggressor® (quizalofop-p-ethyl, Group 1) herbicide with wheat varieties containing genes that confer tolerance to this herbicide – AXigen® trait. Three CoAXium® hard red winter wheat varieties (LCS Fusion AX, Crescent AX, and Incline AX) that contain the AXigen® trait (resistance to the ACCase class of herbicides) are now commercially available for use. Aggressor® herbicide has good foliar activity on grassy weeds, so the CoAXium® wheat production system can provide an opportunity for post-emergence control of feral rye in wheat.

### On-farm field study

An on-farm field study near Great Bend, KS evaluated different rates and timings of Aggressor® herbicide for feral rye control in winter wheat during 2018/2019 growing season. The study utilized a CoAXium® winter wheat variety “LCS Fusion AX” planted on Nov. 19, 2018. The field site had a natural infestation of feral rye population. Treatments included post-emergence applications of Aggressor® herbicide in fall (3- to 4-leaf stage of wheat) and spring (3- to 4-tillers stage of wheat) at different rates: 8 + 8, 10, and 12 fl oz/a.

Results indicated that all Aggressor® treatments provided excellent late-season control of feral rye compared to non-treated plots irrespective of application timing and rates used (Table 1; Figure 1).

**Table 1. Feral rye control with fall/spring-applied Aggressor® herbicide in LCS Fusion AX winter wheat at a grower field near Great Bend, KS in 2019.**

Herbicide	Rate (oz/a)	Timing <sup>c</sup>	Feral rye <sup>d</sup>		
			4/18/19	5/2/19	6/6/19
			-----(% control)-----		
Aggressor + NIS <sup>a</sup>	10	FP	89 ab	94 ab	96 a
Aggressor + MSO <sup>b</sup>	10	FP	89 ab	94 ab	96 a
Aggressor + MSO <sup>b</sup>	10	SP	75 c	94 ab	96 a
Aggressor + MSO <sup>b</sup>	12	SP	80 bc	93 ab	94 a
Aggressor + NIS <sup>a</sup> / Aggressor + MSO <sup>b</sup>	8 (Fall) + 8 (Spring)	FP/SP	93 a	96 a	98 a

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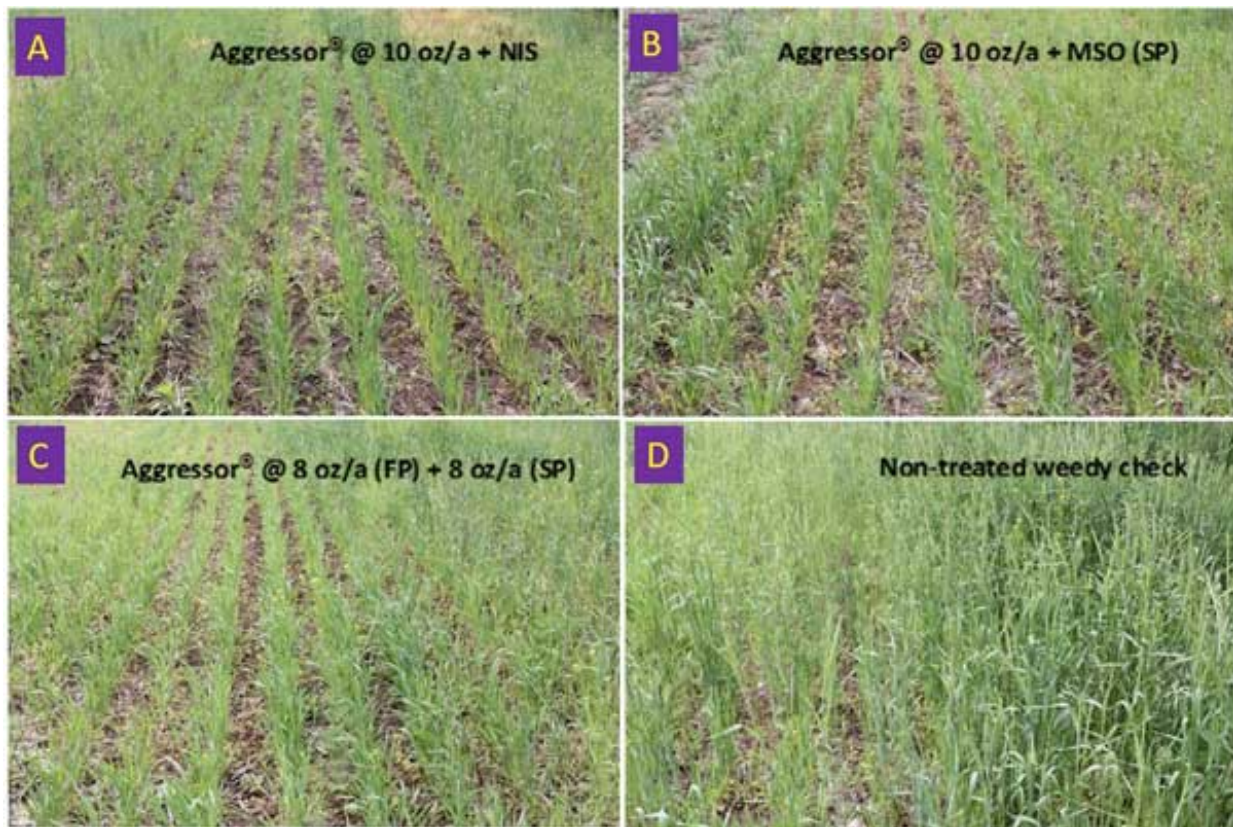
[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

<sup>a</sup> Nonionic surfactant (NIS) at 0.25% v/v was included.

<sup>b</sup> Methylated seed oil (MSO) at 1% v/v was included.

<sup>c</sup> Fall Post (FP) was applied on Dec 19, 2018, Spring Post (SP) was applied on April 4, 2019.

<sup>d</sup> Means within each column followed by same alphabet letters are not different based on Fisher's protected LSD test at  $P < 0.05$ .

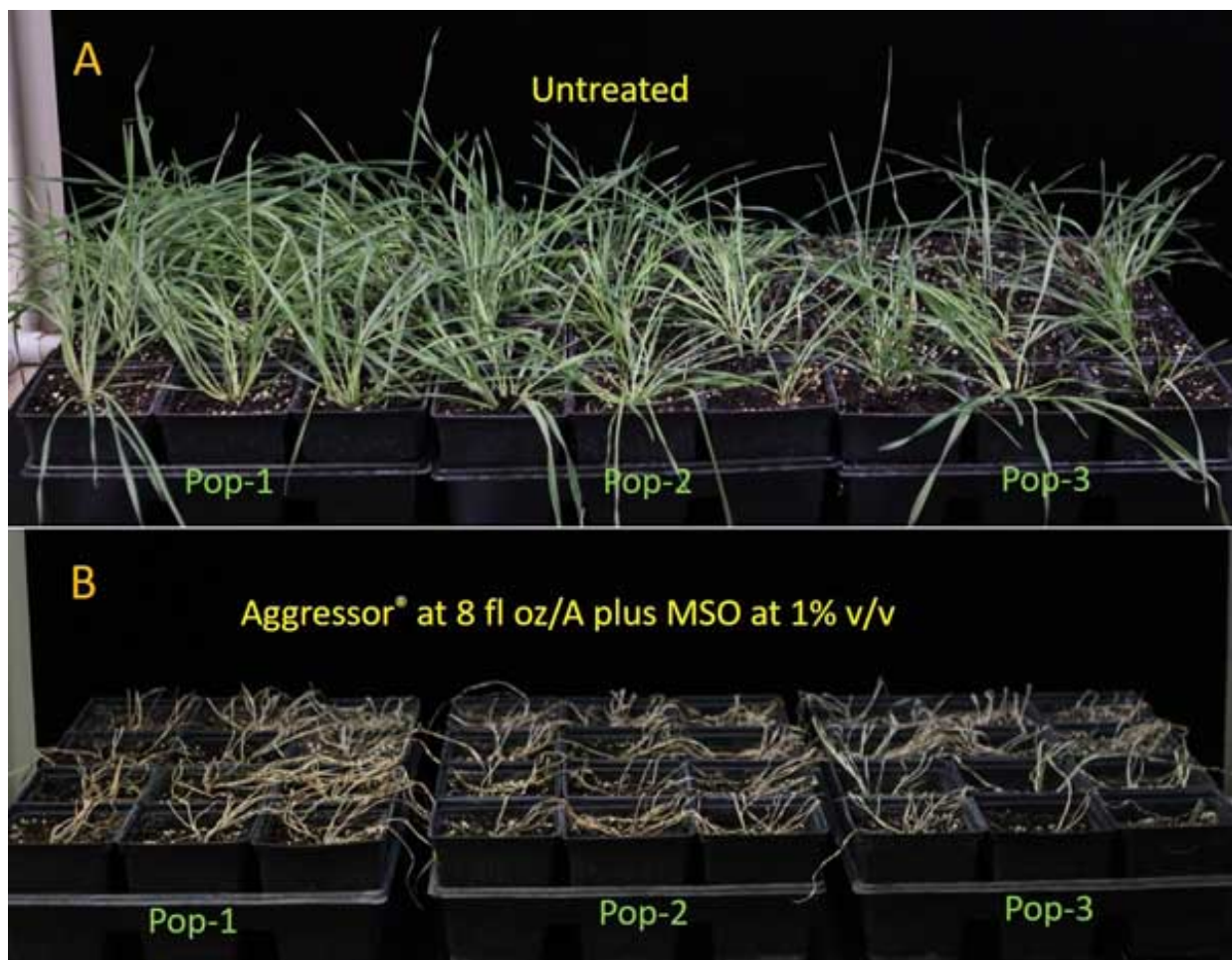


**Figure 1. Visual response on May 2, 2019 of feral rye in CoAXium® wheat plots treated with Aggressor® herbicide in fall (A), spring (B), fall followed by spring (C), and non-treated weedy check (D). Photos by Rui Liu, K-State Research and Extension.**

### **Greenhouse study**

In a separate greenhouse study conducted at K-State Agricultural Research Center near Hays, KS, approximately 9 feral rye populations collected from wheat fields in central Kansas were completely killed with a field-use rate (8 fl oz/a) of Aggressor® herbicide plus MSO (1% v/v) at 21 days after treatment (Figure 2). Further studies are in progress to understand the effects of plant growth stage, environmental factors, and adjuvant systems on the efficacy of Aggressor® herbicide on Kansas feral rye populations.





**Figure 2. Visual response of 3 Kansas feral rye populations treated with 8 fl oz/a rate of Aggressor herbicide at 21 DAT in a greenhouse at K-State Agricultural Research Center-Hays. Photo by Rui Liu, K-State Research and Extension.**

### Summary

These preliminary results indicate that Kansas feral rye populations are generally sensitive to Aggressor® herbicide and CoAXium® wheat production system can help Kansas wheat producers in managing this hard to control winter annual grassy weed. In addition to feral rye, Aggressor® herbicide can also provide good control of most other winter annual grasses (including ALS-resistant weed biotypes) such as downy brome, jointed goatgrass, Italian ryegrass, and volunteer cereals, but provides no broadleaf weed control. Aggressor® herbicide should be applied to actively growing wheat and grasses during periods when the high daily temperatures are expected to be 40 °F or higher the following week.

**Important note:** Do not apply Aggressor® to non-AX wheat varieties (including Clearfield® wheat) or wheat will be severely injured or killed.

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## 9. Ag-Climate Update for September 2019

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.

### **September 2019 – Warm and mostly dry to end the summer**

Temperatures were the big story for September. State-wide average temperature for the month was roughly 75 °F, 6.8 °F warmer than normal. This ranks as the 2<sup>nd</sup> warmest September on record. Temperature swings were great, ranging from 40 °F at Marysville on the 14th to 103 °F at Atwood, Rawlins County; Colby 1S, Lakin, Richfield, and Tribune 1W, on the 3rd and 4th. State-wide average precipitation for the month was 2.2 inches (57 mm), a slightly dry month at 79 % of normal rainfall. Eastern Kansas was slightly wetter than normal.

Despite the warmer temperatures, corn, soybeans and sorghum remain behind normal progress. Growing degree days (GDD) accumulation in September is typically low. As of October 6, 84% of corn was mature and only 34% had been harvested.

Colder temperatures to start October will not provide many additional GDDs.

Root zone soil moisture conditions remain wet, especially in the eastern parts of the state. In the southwest parts of the state additional moisture is needed for good winter wheat establishment.

View the entire September 2019 Ag-Climate Summary, including the accompanying maps and graphics, at <http://climate.k-state.edu/ag/updates/>.

## 10. Retirement reception for longtime Extension Weed Science Specialist Dallas Peterson

The Department of Agronomy at K-State is hosting a retirement reception for Dr. Dallas Peterson, Extension Weed Science Specialist. The reception is scheduled for Wednesday, October 30, from 4:30 p.m. to 6:00 p.m. It will be held at the new Agronomy Education Center located on the grounds of the Agronomy North Farm (across from Bill Snyder Family Stadium) in Manhattan.

All are invited to attend this casual gathering to celebrate the exceptional career of Dr. Peterson. Light refreshments will be served. Interim Agronomy Department Head, Dr. Mickey Ransom, will offer remarks at 5:00 p.m., with plenty of time afterwards to visit with Dallas.

A full retirement announcement detailing Dr. Peterson's background and career will be featured in an upcoming eUpdate article.

Join us in celebrating Dallas's many contributions to Kansas agriculture throughout his 30 years of professional service at Kansas State University.



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