



**K-STATE**  
Research and Extension

## Extension Agronomy

# eUpdate

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*11/22/2019*

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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## 1. Meet the new Extension Weed Science Specialist, Dr. Sarah Lancaster

Sarah Lancaster is the new Weed Science Extension Specialist, starting November 4, 2019. Lancaster's start comes on the heels of the retirement of Dallas Peterson, professor of Weed Science and Extension Specialist. She was most recently an Assistant Professor in the Department of Environmental Plant Science and Natural Resources at Missouri State University.



### **Dr. Sarah Lancaster, Extension Weed Specialist**

A native of Missouri, Sarah was raised on a row crop and cow-calf farm near Jonesburg in east central Missouri. She was the first of five children and her father and one brother continue on the family farm. She earned a B.S. degree from the University of Missouri, Columbia, in 2002, majoring in plant science with a minor in agricultural economics. Lancaster continued her educational career at North Carolina State University, receiving her M.S. in crop science in 2008. Lancaster received her Ph.D. in agronomy from Texas A&M University in 2008.

As a doctoral student at Texas A&M, Lancaster studied soil microbial response to glyphosate-based cotton pest management systems. Upon receiving her doctorate, she accepted an Assistant Professor position in the Department of Plant and Soil Sciences at Oklahoma State University. This position had both teaching and extension responsibilities. Over the last 10+ years, Lancaster has taught a wide range of agronomic courses at the undergraduate and graduate level. Her research experience and expertise spans more than weed science and represents a well-rounded background in agronomy.

Outside of the halls of Throckmorton, Lancaster enjoys spending time with her husband, Phillip, and their two active boys, Levi (7) and Caleb (4). Some of her favorite things include a good book, a long jog, Cardinals baseball, and home improvement/garden projects.

Her goal in this position is to develop research-based extension programs that benefit Kansas farmers. She is humbled by the challenge of stepping into Dallas' program and feels blessed to

benefit from his insights.

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## 2. Kansas weeds: Know your mustard species

Several mustard species are found in Kansas fields, including tansy mustard, flixweed, bushy wallflower, field pennycress, and blue mustard. These plants all form rosettes in the fall of the year and produce seed capsules (i.e. pods) in the spring. Some of their identifying features are described below, broken down by species. A summary of identifying features is shown in Table 1 at the end of this article.

### Tansy mustard and flixweed

Tansy mustard and flixweed are two similar mustard species common in central and western Kansas. These weeds emerge in the fall and grow as a rosette with finely lobed compound leaves. Tansy mustard and flixweed bolt in the spring. Small, orange seeds are produced in long, narrow seed capsules. Seed capsules of tansy mustard are usually about 1/2-inch-long and thicker than flixweed seed capsules, which are generally 1 to 1 1/2 inches long.

Tansy mustard (*Descurania pinnata*) is a native winter annual. The plant is covered with fine hairs. The stem is erect, branched and 4 - 30" high. The flowers are small, pale yellow, and occur in small clusters. Tansy mustard spreads by seed from early to late summer.



**Figure 1. Tansy mustard. All photos by Dallas Peterson, K-State Research and Extension.**

Flixweed (*Descurainia sophia*) is very similar to tansy mustard, and often confused with it. It is an introduced annual or winter annual species from Eurasia which reproduces by seed. Stems are erect, branched, and 4 - 40" high. Flixweed often grows taller than wheat, while tansy mustard generally does not. Leaves have a lacy appearance. The stem and leaves are covered with fine hairs. Flowers are small, pale yellow, and grow in small clusters. Although tansy mustard is native to the area and flixweed is introduced, flixweed is probably the more common weed problem in wheat fields.



**Figure 2. Mature flixweed (left photo); rosette stage (right photo).**

Bushy wallflower (treacle mustard)

Bushy wallflower, or treacle mustard, (*Erysimum repandum*) is a common weed in central and eastern Kansas. It is native to Eurasia. It usually emerges in the fall and forms rosettes with long narrow leaves and irregular leaf margins. Most vegetative growth occurs during the spring. Bushy wallflower rosettes bolt in the spring and bear bright yellow flowers at the top of the plant, which only grows to about 12 – 18" tall. Seeds are produced in long, narrow seed capsules.



**Figure 3. Bushy wallflower or treacle mustard (top photo); rosette stage (bottom photo).**

## Field pennycress

Field pennycress (*Thlaspi arvense*) is native to Eurasia. The seedling develops as a compact, vegetative rosette. If it emerges in the fall, it overwinters either as seedlings or vegetative rosettes. It can also emerge from seed in the spring. It bolts in the spring and bears white flowers at the top of the plant, which may grow from 1 to 2 feet tall. Field pennycress has a flat, broadly winged seed capsule that looks something like a penny. Field pennycress reproduces solely by seed. It is often found in grain fields, roadsides, and other disturbed areas. Once this weed is established in a field, the soil will soon become contaminated with its seeds. It is an aggressive competitor with crops and can cause significant yield reductions. Field pennycress may produce from 1,600 to 15,000 seeds per plant. The seed shatters readily. Seed dispersal is primarily by wind. Seeds can remain viable for as long as 6 to 10+ years in the soil. This persistent viability of field pennycress seeds in the soil, their capacity to germinate when brought to the surface by cultivation, and the very large reservoir of dormant seeds present in the soil of a heavily infested area are all factors that contribute significantly to the persistence of this troublesome weed. Field pennycress has a strong, foul odor, even causing cows to produce bitter flavored milk after eating it. It is sometimes called stinkweed.



**Figure 4. Field pennycress (top photo); rosette stage (lower photo).**

Blue mustard

Blue mustard (*Chorispora tenella*) is a winter annual that germinates in the late summer and fall, and produces a rosette similar in appearance to a dandelion. The plant overwinters as the rosette. Blue mustard bolts in the spring. With mild February weather, the flower stalk may elongate in early March. Cold weather in February results in late March elongation. It bears purple or blue flowers at the top of the plant, which may grow from 12 to 18" tall. Seeds are produced in long, narrow seed capsules 1 to 2 inches long. Viable seed can be produced approximately 10 days after bloom. Blue mustard is a problem in winter annual crops, such as winter wheat, throughout Kansas. Blue mustard was introduced into the U.S. from Siberia. Uncontrolled blue mustard can be extremely competitive with wheat, causing as much as 85% yield loss from season-long competition. Research at K-State in 2014 found more than 65% yield loss where blue mustard was not controlled until spring.



**Figure 5. Blue mustard (top photo); rosette stage (bottom photo).**

**Table 1. Identifying features of mustards found in Kansas. Table created by Sarah Lancaster, K-State Research and Extension.**

<b>Species</b>	<b>Emergence</b>	<b>Basal leaves</b>	<b>Height</b>	<b>Flowers</b>	<b>Fruit and seeds</b>
Tansy mustard	Fall	Compound, finely lobed, hairy	4-30"	Pale yellow	Narrow capsules, ½" long
Flixweed	Fall	Compound, finely lobed, fine hairs	4-40"	Pale yellow	Narrow capsules, 1 to 1½ " long
Bushy wallflower	Fall	Narrow, irregular margins	12-18"	Bright yellow	Narrow capsules
Field pennycress	Fall , spring	Oval, wavy margins	12-24"	White	Broad capsule
Blue mustard	Late summer, fall	Oval, sticky hairs	12-18"	Blue/purple	Narrow capsules, 1-2" long

For detailed information on controlling the different mustard weeds in Kansas wheat fields, see the companion article in this eUpdate issue, "Control of mustards in wheat".

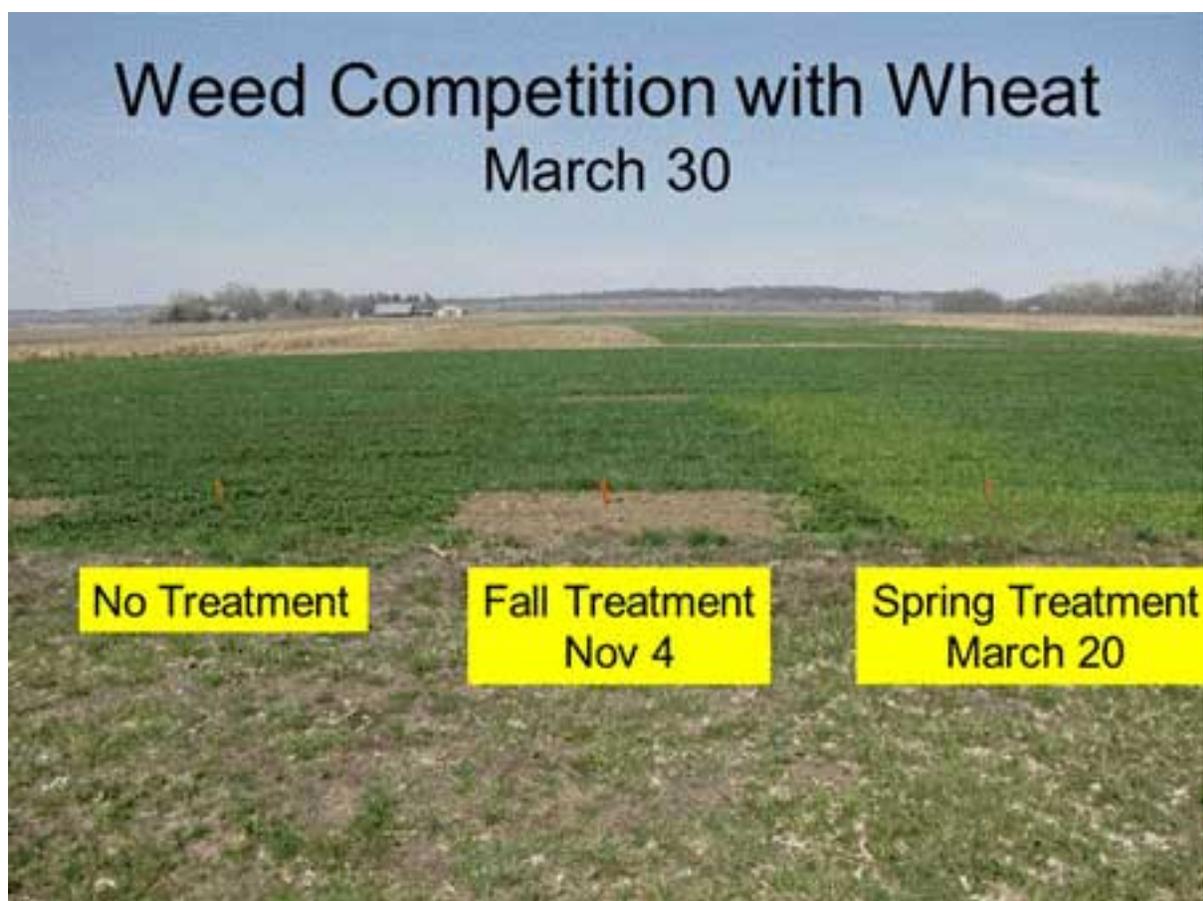
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### 3. Control of mustards in wheat - Timely treatment is important

Too often producers do not notice mustard weeds in their wheat fields until the mustards start to bloom in the spring. As a result, producers often do not think about control until that time. Although it is still possible to get some control at that time with herbicides, mustards are much more difficult to control at that stage and often have already reduced wheat yields by then.

To minimize yield losses, mustards should be controlled by late winter or very early spring, before the stems begin to elongate (bolt). If mustards are present in the fall, they can be controlled with ALS-inhibiting herbicides such as Ally, Amber, Finesse, Affinity, Rave, Olympus, or PowerFlex. Huskie, Talinor, Quelex, 2,4-D, and MCPA can also provide good control of most mustards if the weeds are at the right stage of growth and actively growing, and if the wheat is at the correct growth stage. Dicamba and Starane are not very effective for mustard control.

In the late winter or early spring, blue mustard is perhaps the most difficult of the winter annual broadleaf weeds to control because it bolts very early. To be effective on blue mustard, herbicides typically need to be applied in late February or early March. Blue mustard is more difficult to control than tansy mustard with 2,4-D because blue mustard has often already bolted by the time 2,4-D can be safely applied to wheat. Thus, 2,4-D often is applied too late to be effective on blue mustard.



# Weed Competition with Wheat

## April 22



**Figures 1a and 1b. Effect of timing of blue mustard control in wheat: K-State research, 2014. Photos by Dallas Peterson, K-State Research and Extension.**

Flixweed and tansy mustard should be treated when they are no larger than two to three inches across and two to three inches tall. As these plants become larger, the control decreases dramatically. Ester formulations of 2,4-D and MCPA are more effective on tansy mustard and flixweed than amine formulations. Field pennycress is easier to control than tansy mustard or flixweed. Herbicide applications made before the pennycress bolts are usually effective. Wheat should be fully tillered before applying 2,4-D or tillering will be inhibited and wheat yields may be decreased.

Most ALS-inhibiting herbicides control winter annual mustards very well, although there are populations of bushy wall flower (treacle mustard) and flixweed in Kansas that are ALS-resistant and cannot be controlled by these products. Alternative measures will be needed to control these populations. The best approach to control ALS resistant broadleaf weeds is to use other herbicides or tank-mixes with 2,4-D, MCPA, Huskie, or Talinor. MCPA can be applied after the wheat is in the 3-leaf stage; but as mentioned above, 2,4-D should not be applied until after wheat is fully tillered -- which often does not occur until spring. Huskie and Talinor can be applied from the 2-leaf to the flag leaf stage of growth. None of these herbicides have much residual control, so the majority of weeds need to be emerged and actively growing at the time of treatment.

Quelex is a premix of a short-lived ALS herbicide and an auxin-type herbicide called halauxifen. It

generally can provide good control of most mustard species. Quelex can be applied from the 2-leaf up to flag leaf emergence growth stages of wheat and should be applied in combination with nonionic surfactant or oil concentrate for control of small, actively growing weeds. If ALS-resistant weeds are present, Quelex alone may not be effective.

Some producers commonly apply ALS herbicides with fertilizer in January or February. Unfortunately, MCPA, 2,4-D, and Huskie are most effective when applied to actively growing weeds, so application when weeds are dormant may not provide good control. As a result, if an ALS-inhibitor tank-mix with one of these herbicides is applied to dormant ALS-resistant mustards in the winter, poor control could occur.

ALS-resistant bushy wallflower seems to be present in a number of fields in central Kansas. ALS-resistant flixweed has only been confirmed in the Saline county area, but may also be present elsewhere. Producers should watch for cases of poor control, and consider alternative herbicides or herbicide tank-mixes to help prevent or manage ALS-resistant weeds.

Crop rotation with corn, grain sorghum, soybeans, cotton, or sunflowers is a good way of managing mustards as long as they are controlled in the spring prior to producing seed. Crop rotation will usually result in a gradual reduction of mustard populations in the future as the seedbank in the soil gradually decreases.

For detailed information concerning the different mustard species in Kansas, see the companion article in this eUpdate issue, "Kansas weeds: Know your mustard species".

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#### 4. The latest winter weather outlook for Kansas is here

As snow is falling across portions of Kansas today, read the latest winter weather outlook for Kansas. What are the chances of seeing more precipitation this winter? Will it be warmer than normal?



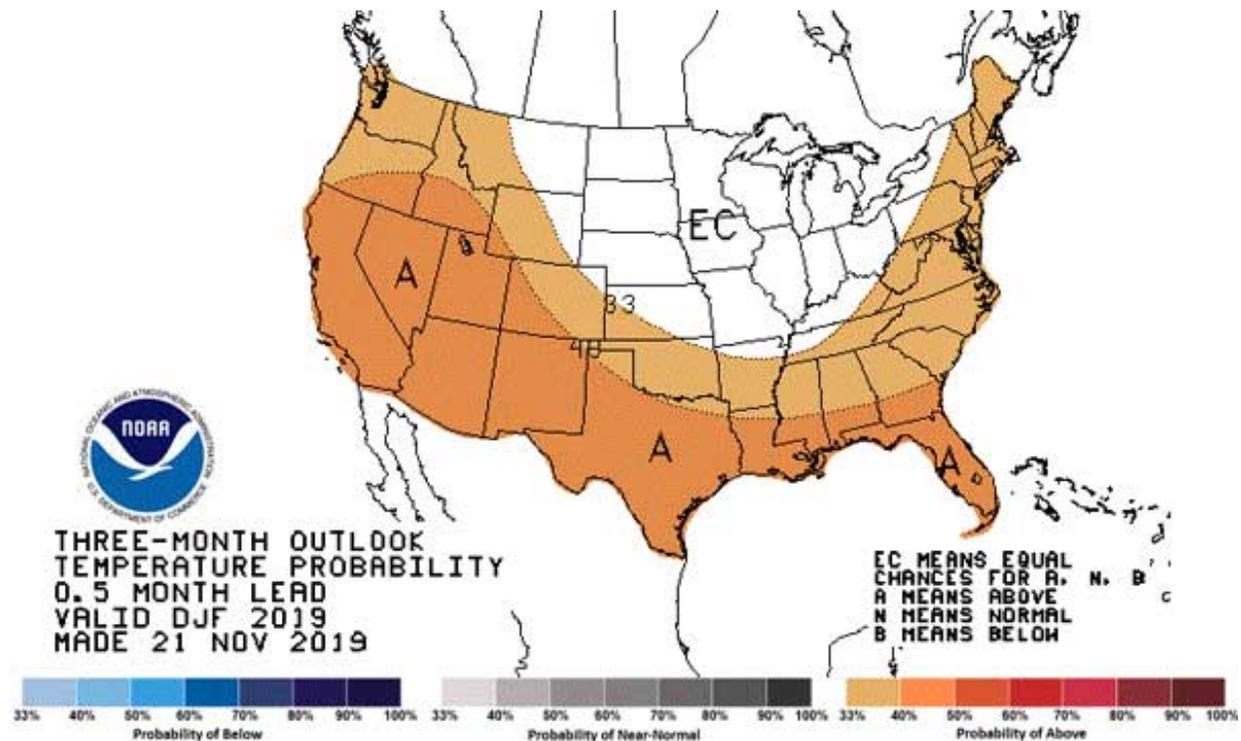
**Snowy scene outside Throckmorton Plant Sciences Center in Manhattan on November 22, 2019. Photo by Kathy Gehl, K-State Research and Extension.**

#### Understanding Climate Outlook Probabilities

The Climate Prediction Center (CPC) takes a scientific, quantitative approach to the outlooks through the use of probabilities: either *Above Normal*, *Equal Chances*, or *Below Normal*. Uncertain outlooks are classified as “Equal Chances”, meaning there is statistically little confidence in either above/below with possible normal conditions as a third outcome.

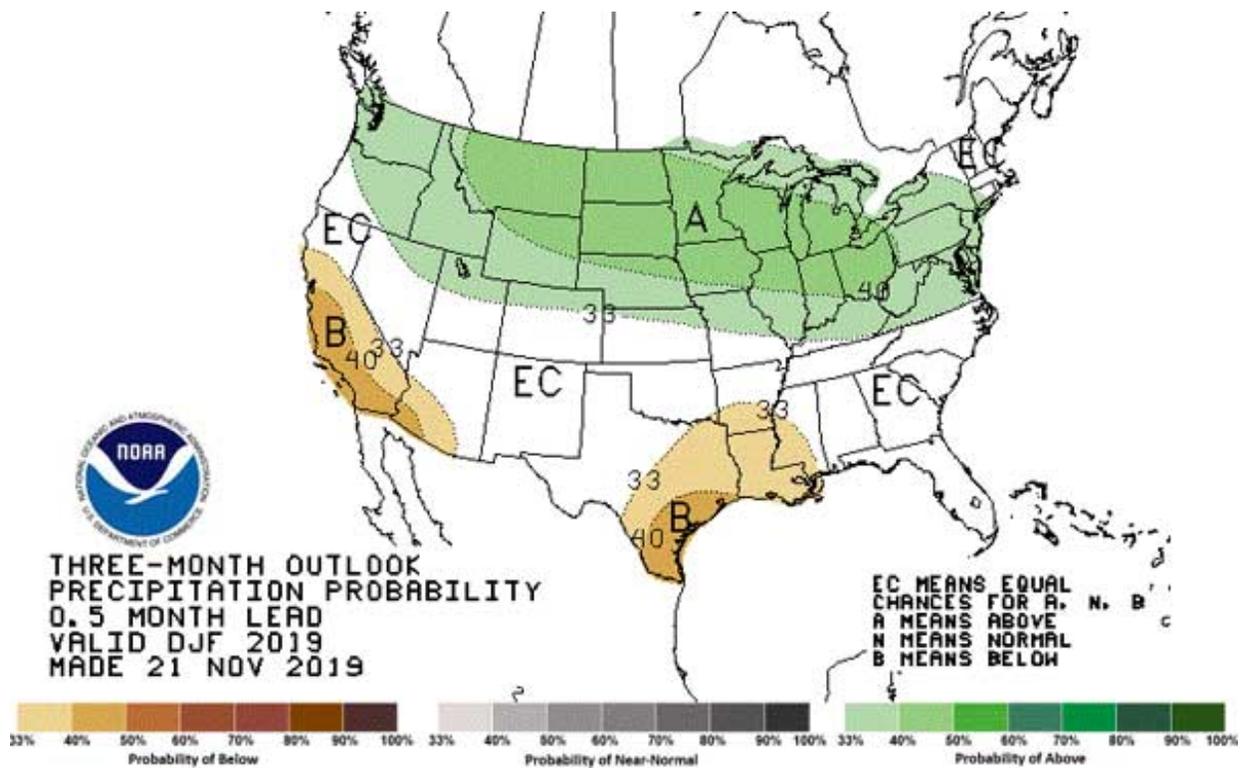
#### Kansas Winter Outlook for 2019-2020

For the winter season, the CPC looks at the average outlook for December, January, and February. The latest winter climate outlook (and last before winter begins) was issued on November 21<sup>st</sup>. This winter outlook calls for a slight chance of warmer-than-normal conditions in southwest Kansas, with equal chances of above- or below-normal temperatures across the rest of the Northern Plains (Figure 1).



**Figure 1. Winter Temperature Outlook for December, January, and February. Southwest Kansas has a slight chance of above-normal temperature, with the rest of Kansas falling into the “Equal Chances” category for either normal, above-normal, or below-normal temperatures. [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)**

The moisture outlook is for equal chances of precipitation for all but the northern most parts of Kansas, where there is a slight chance of above-normal precipitation (Figure 2). This represents little change from previous outlooks released this fall. The outlook for wetter-than-normal conditions in the northern Plains is likely to continue to cause flooding issues, particularly in the northeastern parts of Kansas.

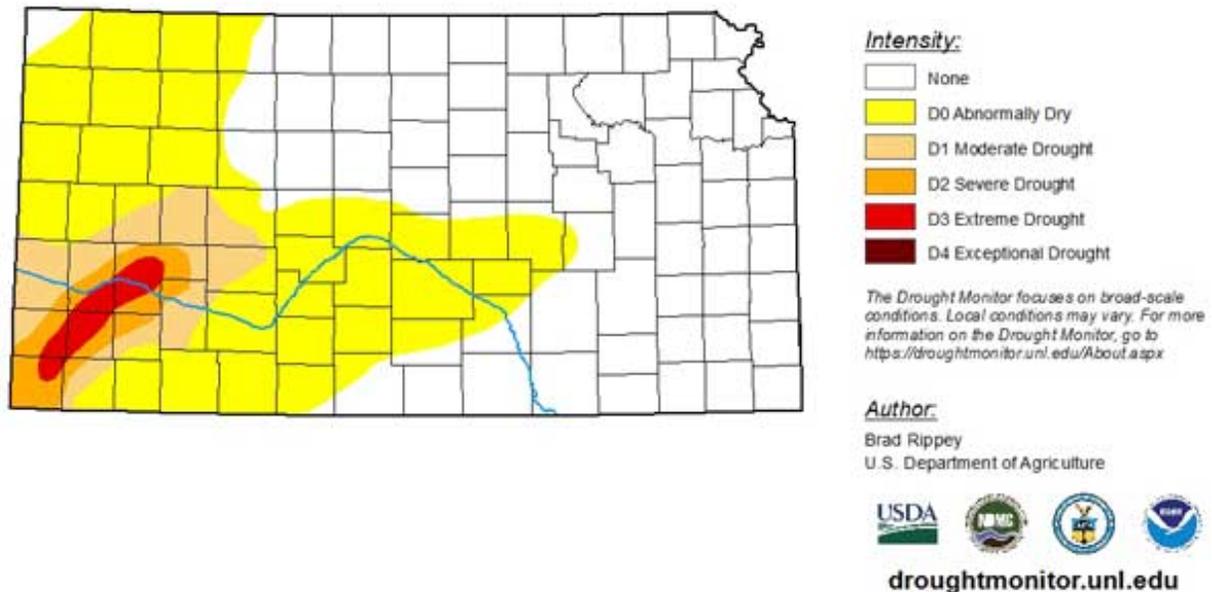


**Figure 2. Winter Precipitation Outlook for December, January, and February. Most of Kansas falls into the “Equal Chances” category for either normal, above-normal, or below-normal precipitation. Only extreme northern areas of Kansas are classified with a slight chance of above-normal precipitation. [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)**

This pattern is likely to be the result of a continuation of weather seen this fall. That includes periods of mild temperatures quickly supplanted by much colder Arctic air. It is also important to note that given the dry nature of winter in Kansas, a single active storm could change the scale to wetter than normal. Even much wetter-than-normal conditions in southwest Kansas would need to continue into the spring to erase the existing moderate to extreme drought (Figure 3).

U.S. Drought Monitor  
Kansas

November 19, 2019  
(Released Thursday, Nov. 21, 2019)  
Valid 7 a.m. EST



**Figure 3. Drought Monitor for Kansas released on November 21, 2019. A small section of Extreme Drought (D3) was added in southwestern Kansas. Several locations in this region have reported less than one-half inch of precipitation since September 1.**

There has also been some talk of a Modaki El Niño. Modaki comes from a Japanese term meaning “similar but different”. The difference is a Modaki El Niño refers to warmer-than-normal surface water temperatures in the central Pacific, rather than the more typical El Niño which is based on the eastern Pacific. The influences of a Modaki El Niño on ocean-atmosphere teleconnections tend to be more concentrated in the Central Pacific and Australia, rather than basin-wide. Research is still trying to answer the question of what, if any, impact might be seen in the United States.

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## 5. Save the date for the K-State Winter Crop Schools - Corn, Soybean, and Sorghum

Looking ahead to 2020, please mark your calendars to attend the K-State Winter Crop Schools.

Detailed information on agendas, speakers, locations, and registrations will be featured in upcoming eUpdate articles.

### 2020 Soybean Schools

- Smith Center, KS  
**January 13**, Monday – 9:00 am to 1:30 pm
- Salina, KS  
**January 13**, Monday – 3:00 pm to 7:30 pm
- Mulvane, KS  
**January 14**, Tuesday – 9:00 am to 1:30 pm
- Emporia, KS  
**January 21**, Tuesday - 3:00 pm to 7:30 pm
- Atchison, KS  
**January 22**, Wednesday – 9:00 am to 1:30 pm
- Marysville, KS  
**January 22**, Wednesday - 3:00 pm to 7:30 pm

Each Soybean School will be free to attend and attendees will be treated to either lunch or dinner. There will a targeted program on location-specific issues related to soybean production. Stay tuned for more information!

### 2020 Corn Schools

K-State Research and Extension and Kansas Corn have teamed up once to again to host six regional corn schools in 2020. While each school's agenda varies, the schools will connect to the overall theme of "maximizing advancement in your operation." These schools are free to attend and open to farmers and industry partners. Each school will run from 9:00 am to 2:00 pm with lunch provided. All attendees registered at least one week in advance will receive a free pair of gloves.

The dates and locations are:

- **January 6** - Montezuma (Corn-Fed Beef Seminar to follow), Hy-Plains Feedyard
- **January 8** – Parsons, Southeast Area Extension Office
- **January 10** – Wichita, Sedgwick Co. Extension Office
- **February 3** - Oakley, Buffalo Bill Cultural Center
- **February 5** - Salina, Hilton Garden Inn
- **February 7** - Olathe, John Deere Ag Marketing Center

More information on the agenda and registration can be at <https://kscorn.com/schools/>.

## 2020 Sorghum Schools

A series of three K-State Sorghum Production Schools will be offered in late January to provide in-depth training targeted for sorghum producers and key-stakeholders. The schools are sponsored by Kansas Grain Sorghum Commission. Each school will cover a number of issues facing sorghum growers: risk management, marketing opportunities, weed control, crop production practices, nutrient and soil fertility, and insect management. Topics will vary depending on the location.

The final dates and specific locations have been set focusing with Schools across the state. More details on speakers, topics, and specific locations will be in an upcoming eUpdate. Stay tuned!

- Scott City, KS  
**January 29**, Wednesday – 2:30 pm to 7:00 pm
- Great Bend, KS  
**January 30**, Thursday – 8:30 am to 1:00 pm
- Hutchinson, KS  
**January 30**, Thursday – 2:30 pm to 7:00 pm

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