Issue 842

K-STATE Research and Extension

Extension Agronomy

eUpdate

03/04/2021

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy eUpdate Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Kathy Gehl, 785-532-3354 kgehl@ksu.edu, or Dalas Peterson, Extension Agronomy State Leader and Weed Management Specialist 785-532-0405 dpeterso@ksu.edu.

Subscribe to the eUpdate mailing list: https://listserv.ksu.edu/cgi-bin?SUBED1=EUPDATE&A=1

eUpdate Table of Contents | 03/04/2021 | Issue 842

1. Optimal time to remove cattle from wheat pastures: First hollow stem

The unique climate characteristics of the Southern Great Plains allow producers to use wheat as a forage and grain crop (dual-purpose), potentially increasing overall profitability compared to grain-only or forage-only systems. Date of grazing termination is an important factor in determining wheat's recovery potential and ability to produce grain. First hollow stem (FHS) is the optimal time to remove cattle from wheat pastures to protect grain yield potential.

What is the first hollow stem (FHS) stage of wheat development?

Before the wheat leaf sheaths become erect after spring green-up, the developing growing point, which is below the soil surface, will soon begin to form a tiny head. Although the head is quite small at this point, it has already established some important yield components. At this stage, the maximum potential number of spikelets is determined. Sufficient nitrogen (N) should already be available in the root zone at this growth stage to maximize the potential number of seeds per head.

Once the embryo head has developed, the first internode will begin to elongate, pushing the head up through the leaf sheaths. This first internode will be hollow. This will be visible before you can actually feel the first node (joint, located just above the first internode).

FHS is the point at which a 1.5 cm (about half-inch) length of hollow stem can first be identified below the developing head (Figure 1). This length is roughly equivalent to the diameter of a dime, which makes its identification in the field easier. FHS occurs when the developing head is still below the soil surface. This means that producers have to dig plants out of the ground to measure it.

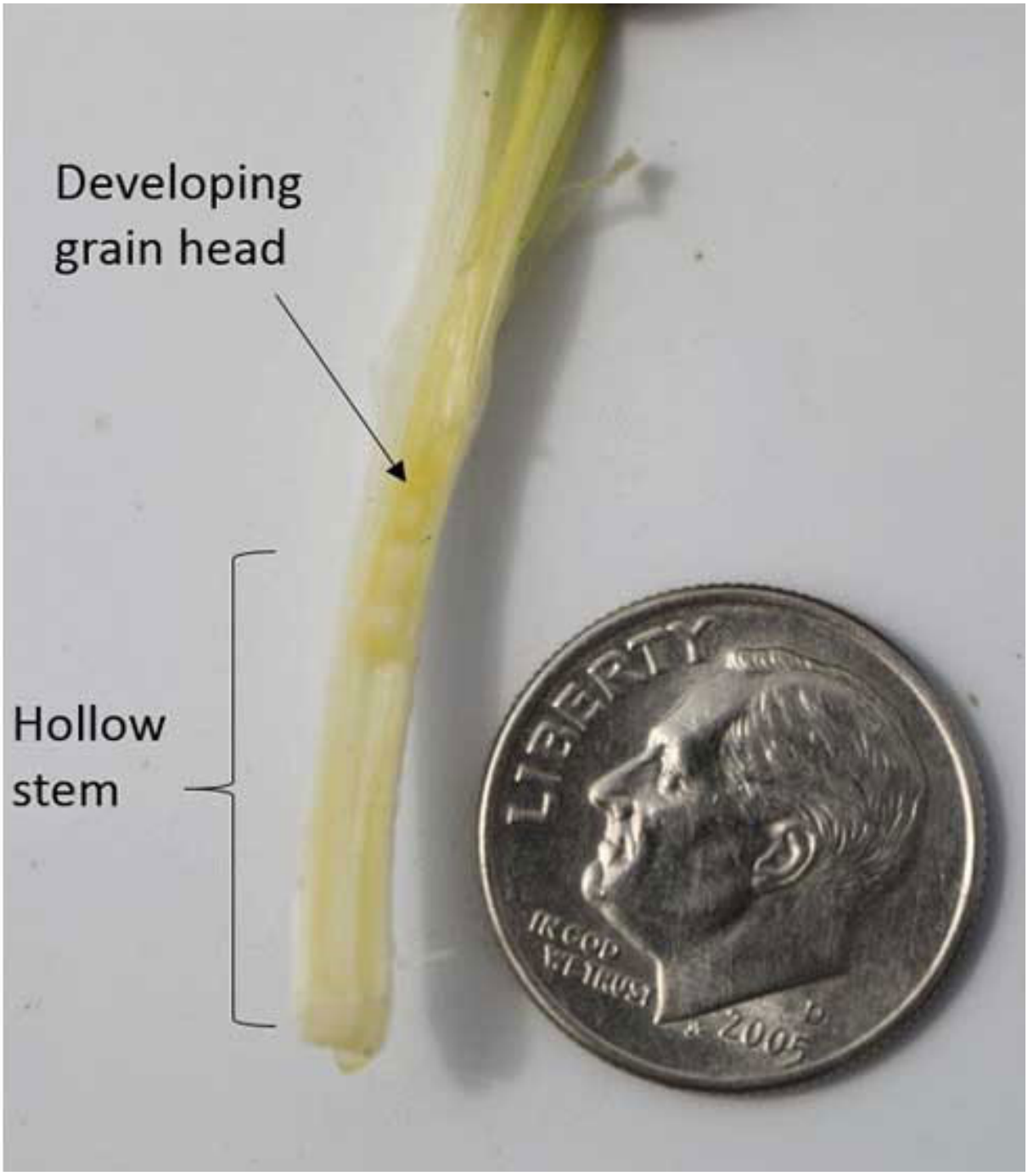


Figure 1. Wheat plant reaching the first hollow stem stage of growth, characterized by approximately 1.5 cm (or roughly the diameter of a dime) of hollow stem underneath the developing grain head. Photo by Romulo Lollato, K-State Research and Extension.

Assessing for first hollow stem

To look for FHS, start by digging up some plants from fields or areas that have not been grazed, such as field corners or just outside the fence. Date of FHS is variety- and field-specific, so it is important to sample each individual field. Select the largest tillers to examine, and slice the stem open from the crown area up. Look for the developing head, which will be very small. Next, see if you can find any

hollow stem between the developing head and the crown area. If there is any separation between the growing point and crown, the hollow stem is elongating. If that separation is 1.5 cm, the wheat plant is at FHS. FHS occurs between a few days to a week or more prior to jointing, depending on temperatures.

Yield losses from grazing past first hollow stem

If the wheat has reached FHS, cattle should be removed to prevent grain yield loss. Yield losses from grazing after FHS can range from 1 to 5% per day, depending on grazing intensity and the weather following cattle removal (Figure 2). If cattle removal is followed by cool, moist weather, yield losses will often average about 1% per day grazed after FHS; if weather is hot, dry, and harsh, yield losses of 5% per day or more can be expected. It is easy for producers to be late by a few days in removing livestock as they wait for obvious nodes and hollow stems to appear, and even the first few days can be significant.

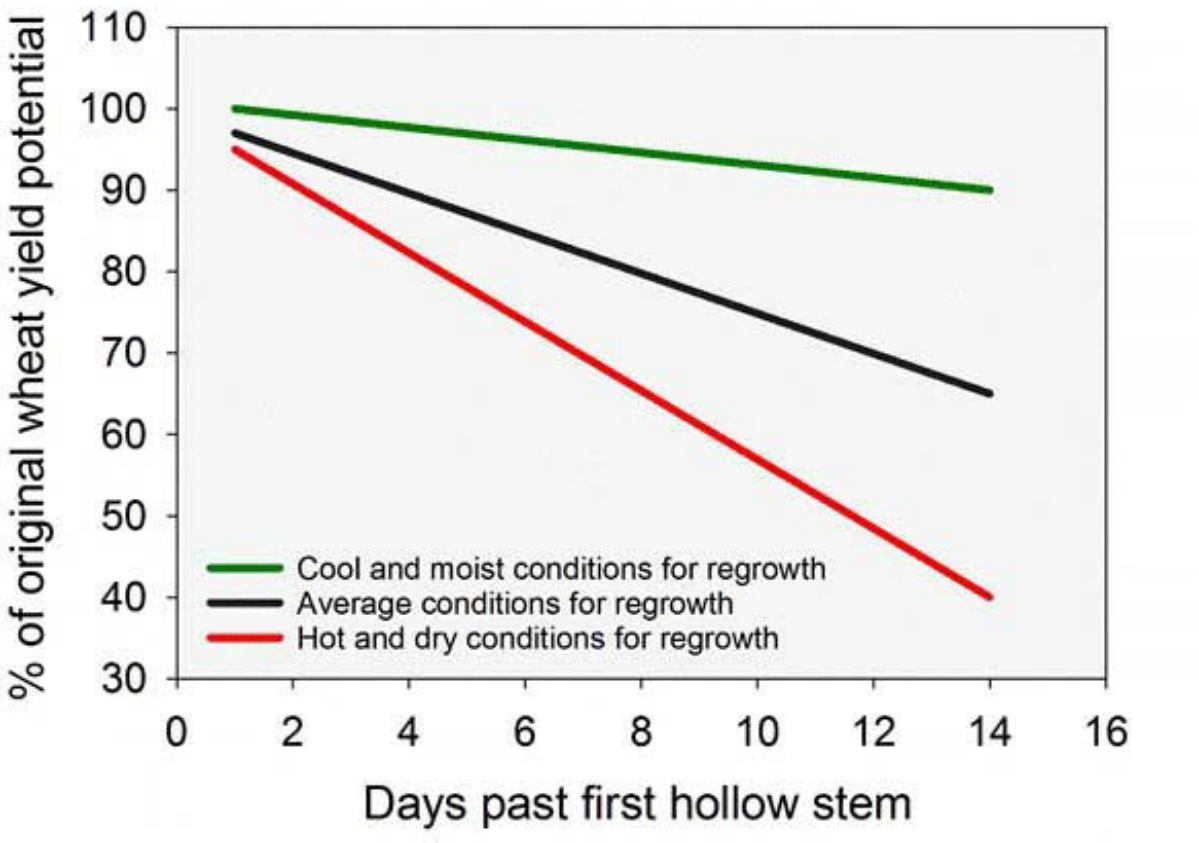


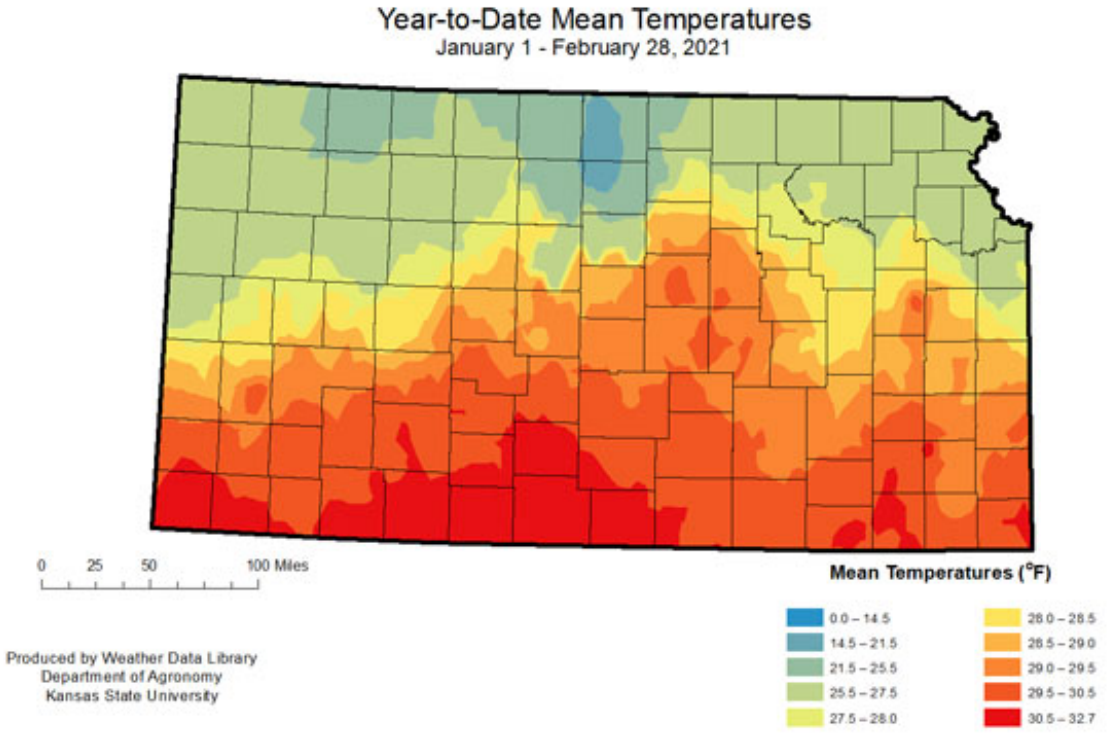
Figure 2. Percent of original wheat yield potential as affected by days of grazing past first hollow stem and weather conditions following grazing termination. Average yield losses by grazing for 14 days past first hollow stem ranged from 10% under favorable conditions to 60% under non-favorable conditions. Research conducted by Oklahoma State University (OSU) and published as K-State publication MF3375 and OSU publication PSS-2178.

Two things can occur when wheat is grazed too long: 1) fewer heads per acre because the primary tiller has been removed, and 2) smaller and lighter heads than expected because leaf area has been removed. As cattle continue grazing, the wheat plant is stressed and begins to lose some of the tillers

that would produce grain. A little later, if there are not enough photosynthates, the plant begins aborting the lower spikelets in the head or some of the florets on each head. Finally, if there is not enough photosynthate during grain filling, the seed size will be reduced and if the stress is severe enough, some seed will abort.

Air and soil temperatures during 2021

Crop development is mostly a function of available water, nutrients, and temperature. Nutrient availability is field specific and thus we will not discuss it here. Water has been limiting since the fall for the majority of the wheat growing region of the state, which will likely slow down crop development. Likewise, average temperatures across most of Kansas were cooler-than-normal for the period between January 1 and February 28 (Figure 3), which has likely slowed down the progression toward first hollow stem compared to most years. As temperatures increase and wheat begins growing more rapidly in the spring, producers should start thinking about when to pull cattle off pasture to protect grain yields.



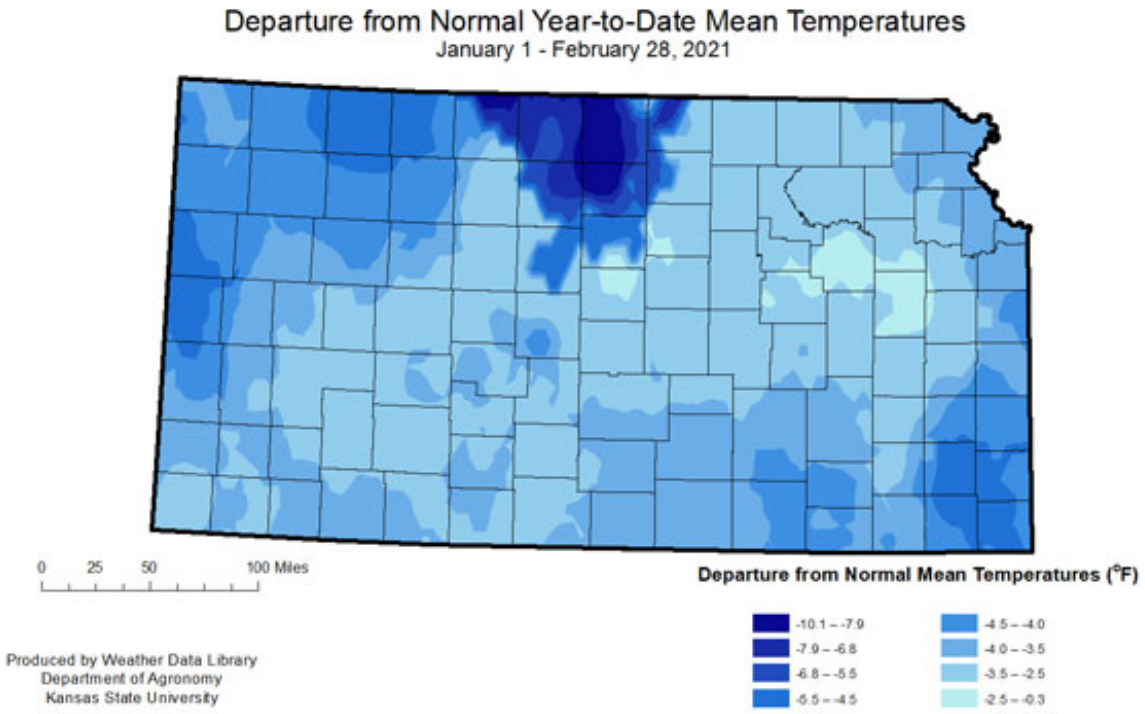


Figure 3. Mean temperatures during the January 1 to February 28 period (upper map) and departure from long-term average temperatures during the same period (lower map). For the lower map, darker blue colors indicate temperatures were much below average. Graph generated by the K-State Weather Library.

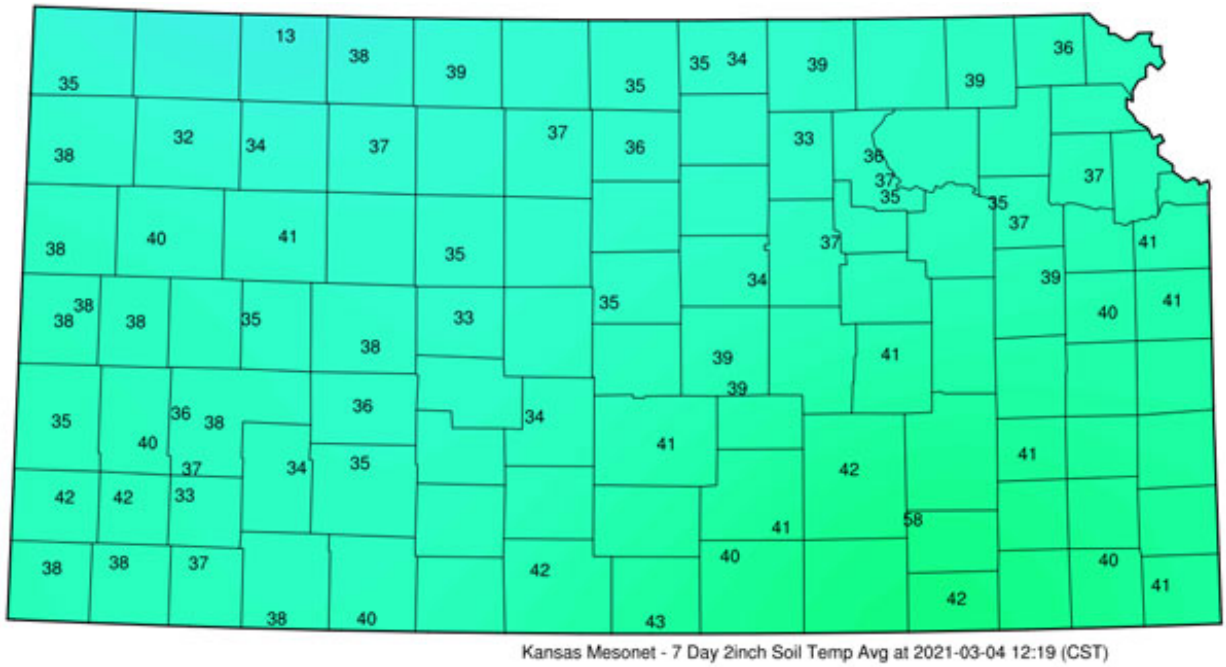


Figure 4. Weekly average soil temperatures at the 2-inch depth during the February 26- March 4, 2021, period. Graph generated by the K-State Weather Library.

Soil temperatures may be quick to warm as much of the state has dry soils. As the soils thaw, muddy conditions may also influence the decision to remove cattle in some areas.

For more information on managing wheat in dual-purpose systems, check the K-State Research and Extension publication MF3375 [PSS-2178 from Oklahoma State Extension], "Dual-purpose wheat: Management for forage and grain production" at https://www.bookstore.ksre.k-state.edu/pubs/MF3375.pdf.

Romulo Lollato, Wheat and Forages Specialist
lollato@ksu.edu

Mary Knapp, Weather Data Library
mknapp@ksu.edu

2. Foxtail infestations in smooth bromegrass hay meadows

Managing foxtail infestations in smooth bromegrass, especially in old or thin stands, is a frequent question from farmers and extension agents. Experiments were conducted in 2020 to evaluate some options for pre-emergence control of foxtail species in smooth bromegrass hay meadows in Dickinson (DK) and Pottawatomie (PT) counties. Applications of pendimethalin (Prowl H2O), *S*-metolachlor (Dual II Magnum) and metsulfuron (Escort XP) occurred at two times: late March and after hay harvest (mid-June) in smooth bromegrass hay meadows (Table 1). Foxtail control and brome injury measurements were recorded bi-weekly and brome dry matter yields were measured in early June.

Table 1. Herbicides and application rates applied in early spring and after brome hay harvest in Pottawatomie and Dickinson Counties in Kansas.

Herbicide	Product	Rate (product/a)
Metsulfuron†	Escort XP	1 oz/a
Pendimethalin	Prowl H2O	4 pt/a
S-metolachlor	Dual II Magnum	1 pt/a

† Metsulfuron was applied with 0.25% v/v crop oil concentrate.

Averaged over both sites, Prowl H2O, applied early, controlled 97% of emerging foxtail compared to only 47% and 34% control provided by Dual II Magnum and Escort XP, respectively (Figure 1). Escort XP applied in early spring resulted in 28% visual injury to the brome (Figure 2) and 62% less dry matter production compared to the untreated check (Figure 3). Post-harvest herbicide applications provided minimal, non-significantly different levels of foxtail control (Figure 1). When data collection stopped in early September, foxtail suppression was unacceptable in all plots.

Figure 1. Brome injury 4 weeds after herbicide application. Plot at top just right of center is same treatment.

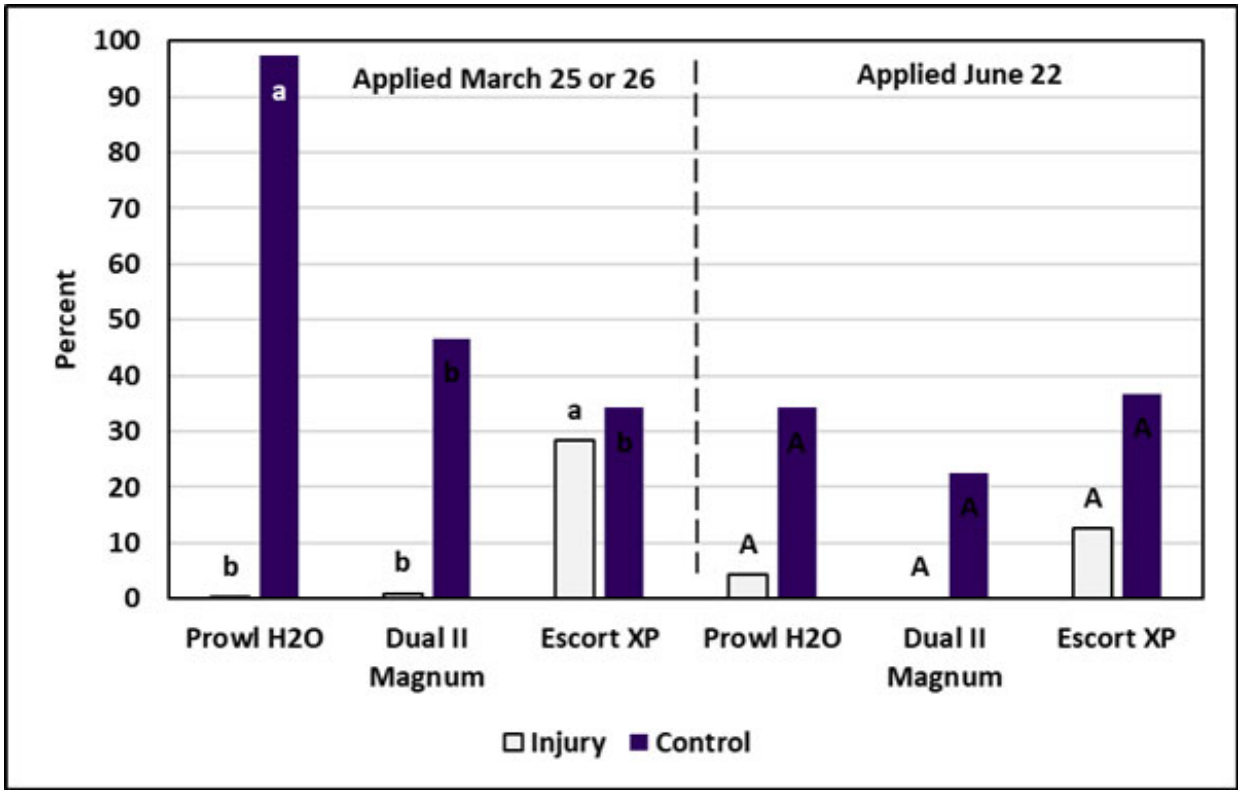


Figure 2. Foxtail control and brome injury 8 weeks after herbicide application. Means within an application date with similar letters are similar.

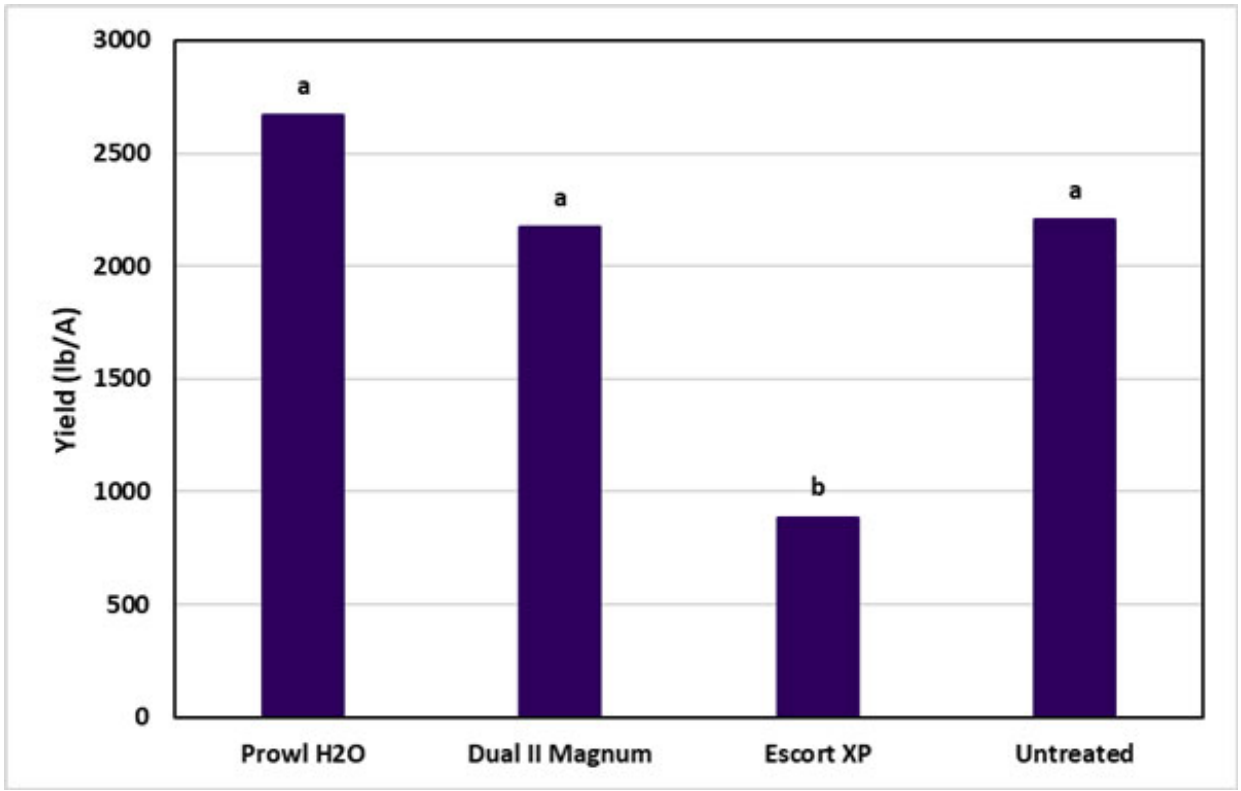


Figure 3. Smooth bromegrass hay yield eight weeks after spring herbicide application. Yields with similar letters are similar.

With the exception of early spring applied pendimethalin, herbicides did **not** adequately control foxtail in the short term and caused visible, but not always statistically significant, smooth brome injury. Smooth brome injury was likely worsened by below-average temperatures, including six hard freeze events that occurred the week after spring application. Herbicides did not reduce the late-summer foxtail infestation, despite apparent suppression eight weeks after the early spring application.

This work will be repeated in 2021 with refinement of treatments. Split applications of Prowl H2O may hold some promise and will be added. Because of the unacceptable brome injury from Escort XP, and the lack of significant foxtail control by either Escort XP or Dual II Magnum treatments, these two treatments will be dropped from this study.

Acknowledgements

The authors express appreciation to Mr. Tony Whitehair, Chisholm Trail District Agriculture & Natural Resources agent and Ms. Shannon Blocker, Pottawatomie County Agriculture & Natural Resources agent for their assistance with this project.

Stu Duncan, Southeast Area Agronomist
sduncan@ksu.edu

Sarah Lancaster, Extension Weed Science Specialist
slancaster@ksu.edu

3. Kansas Ag-Climate Update for February 2021

The Kansas 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.

February 2021: 5th Coldest in our Instrumental Climate Records

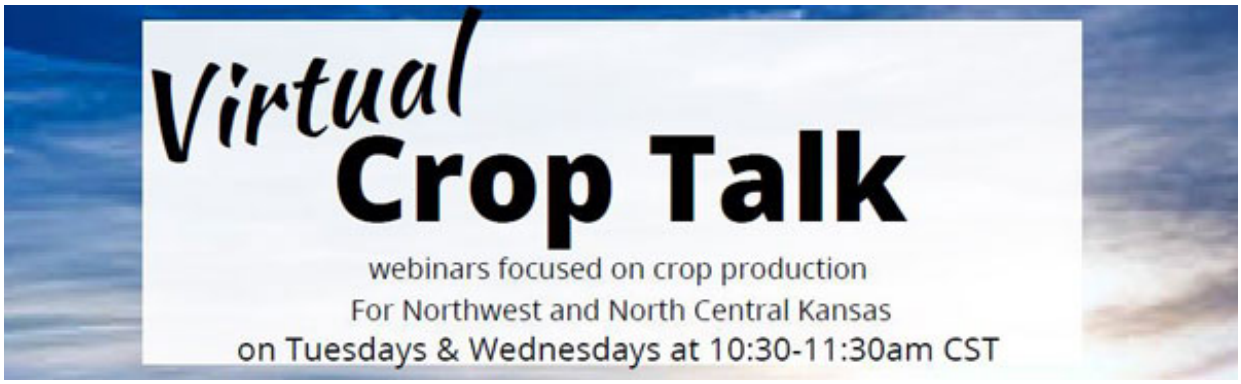
Statewide average temperature for February was 22.9°F, which is 11.0 degrees colder than normal. This ranks as the 5th coldest February on available records. The West Central Division was the closest to the normal with an average of 23.0°F, 10.0 degrees cooler than normal. The Northeast Division was the coldest, with an average of 20.1°F, 12.1 degrees colder than normal. The extreme cold temperatures bring concern of cold damage to the wheat crop (Figure 1).

February was much drier than normal at all divisions, ranking as the 18th driest February since 1895. The Southwest Division was the driest with 13 percent of normal, resulting in continuing drought in the west. The dryness in north-central and western Kansas increased the chance of cold damage to the wheat.

Figure 1. Leaf burn observed on winter wheat plots. Photo by G. Zhang, K-State Research and Extension.

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

4. Virtual Crop Talk webinars to end on March 9



The last of a series of hour-long webinars that began in early February will occur on March 9. This series is focused on agronomic topics targeted for northwest and north central Kansas. Topics range from soil fertility, weed management, insect management, and dryland corn dynamics. Continuing education credits have been applied for and will vary based on the subject area of each webinar. Each webinar will begin at 10:30 am (CST) and last until 11:30 am.

Upon registration, participants will receive an email with instructions to attend via Zoom or YouTube. These webinars are open to all and there is no cost. Visit the K-State Northwest Research and Extension Center's website to register: https://www.northwest.k-state.edu/events/crop-talk-series.

March 9 - **Dryland Corn Dynamics**
Lucas Haag, K-State NW Regional Agronomist

(1 Crop Mgmt CCA Credit)

Previous webinars are available to watch online

Every session of the Virtual Crop Talk webinar series was recorded and is available to view anytime. The videos and speaker handouts can be found on the K-State Northwest Area Extension office events page at: https://www.northwest.k-state.edu/events/crop-talk-series/index.html#Recordings_and_Handouts

The videos are also available on the K-State Agronomy YouTube channel at:
https://www.youtube.com/playlist?list=PLZuS-gs49LuzJrBcIgolPjgzejublw5x2

Please contact any local KSRE extension office in north central or northwest Kansas for any questions.

A complete list of the past webinars, with dates, topics, and speakers is detailed below.

February 2 - **Soil Fertility Questions from Growers for the 2021 Season (focused for Northwest Kansas)**
Dorivar Ruiz Diaz, K-State Soil Fertility Specialist

(1 Soil Fertility CCA Credit)

February 3 - **Soil Fertility Questions from Growers for the 2021 Season (focused for North Central Kansas)**
Dorivar Ruiz Diaz, K-State Soil Fertility Specialist

(1 Soil Fertility CCA Credit)

February 9 - **Weed Management and that Pesky Palmer Amaranth (focused in Northwest Kansas)**
Sarah Lancaster, K-State Weed Scientist
Vipan Kumar, K-State Weed Scientist

(1 Integrated Pest Mgmt CCA Credit)

February 10 - **Weed Management and that Pesky Palmer Amaranth (focused in North Central Kansas)**
Sarah Lancaster, K-State Weed Scientist
Vipan Kumar, K-State Weed Scientist

(1 Integrated Pest Mgmt CCA Credit)

February 16 - **Corn Insect Resistance: Rootworm & Western Bean Cutworm**
Julie Peterson, UNL Entomologist

(1 Integrated Pest Mgmt CCA Credit)

February 23 - **Grain Sorghum Weed Control: Start Clean, Stay Clean**
Sarah Lancaster, K-State Weed Scientist

(1 Integrated Pest Mgmt CCA Credit)

February 24 - **Sorghum Insects: Aphids, Headworms and Chinch Bugs.. Oh My!**
J.P. Michaud, K-State Entomologist

(1 Integrated Pest Mgmt CCA Credit)

March 2 - **Alfalfa Management and Weevil Update**
Romulo Lollato - Wheat & Forage Specialist
Anthony Zukoff, K-State Extension Entomology Associate

(1 Crop Mgmt CCA Credit)