

Extension Agronomy

eUpdate

02/03/2022

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

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1. Should you be concerned about winterkill in winter canola?

We are about half way through winter and some questions have been asked about the status of the winter canola crop. Going from a warmer-than-normal fall to a chilly January has the crop taking on a wintery appearance. We are seeing the typical cold temperature response of white and brown colors as leaves loose chlorophyll. Despite the abnormally dry weather and growing drought concerns, the crop appears to be holding on fairly well with stored subsoil moisture. However, timely and adequate quantity of precipitation will be needed as we approach the rapid period of moisture and nutrient uptake at spring green up.

Last September, establishment conditions were challenging across Kansas. For many, soil moisture in the planting zone was lacking, making emergence inconsistent across many locations. Fortunately, rains in October, coupled with warm temperatures, allowed the crop to establish well and to attain optimum top growth (6 to18 inches) for the winter. In some instances, especially near Manhattan, the crop showed excessive fall growth with potential overuse of water and nutrients (Figure 1) and as a result, fall stem elongation was observed in some varieties. Fall stem elongation produces a growing point elevated above the soil surface that is unprotected from cold temperatures and wind chill. History shows that when fall stem elongation happens it can be a recipe for winterkill.

Cold temperatures also arrived rapidly, later than normal, and were preceded by a short acclimation period. At Manhattan, the first hard freeze (27.8°F) occurred on November 12. Prior to that date, temperatures had only approached freezing on a couple of occasions and the crop was hardening off rather slowly. December was very warm, but colder periods in the middle of the month, in early January, and in mid-January have given the crop its winter colors (Figure 2).



Figure 1. Canola plants in the National Winter Canola Variety Trial near Manhattan, KS showing greater than optimal fall growth on November 17, 2021. Photo by Mike Stamm, K-State Research and Extension.



Figure 2. Canola plants in the National Winter Canola Variety Trial near Manhattan showing typical winter coloring. Hybrid varieties are planted on the left and open-pollinated varieties are on the right. Photo by Mike Stamm, K-State Research and Extension.

Observations on January 31 indicate minimal winterkill present near Manhattan. Most of the winterkilled plants are small, spindly ones that were outcompeted by bigger plants. Other plants that could be lost to further cold temperatures are those that are prone to fall stem elongation. These plants have taken on the characteristic white tops (bleached stems and leaf petioles) but the base of the crown and stem remain green. Only time will tell if these plants will be lost.

Two important defenses against winterkill are a flat, prostrate growth habit, which keeps the crown protected at the soil surface, and the ability to avoid fall stem elongation. The K-State breeding program continues to select for both winter protecting traits among its breeding materials and experimental varieties (Figure 3). In addition, analysis of the National Winter Canola Variety Trials over the past decade suggests that when planting during the recommended window, with a well-established crop, winterkill is becoming less of a concern. Figure 4 shows differences among growth habits in experimental hybrids. The crowns of the semi-dwarf hybrids (bottom photo) are thicker, more compact, lower to the ground, and showing more green leaf tissue. The crowns of the conventional hybrid (top photo) are showing much higher crown elevation, thinner stalks, and less green leaf tissue. This particular hybrid is more prone to fall stem elongation. The breeding program continues to evaluate the semi-dwarfing trait for potential usefulness in future hybrids.



Figure 3. K-State experimental open-pollinated variety in the National Winter Canola Variety Trial near Manhattan showing tight, compacted crowns and no fall stem elongation. Photo by Mike Stamm, K-State Research and Extension.



Figure 4. Conventional hybrid (top) prone to fall stem elongation and a semi-dwarf hybrid (bottom) with tight, compacted crowns near Manhattan. Photo by Mike Stamm, K-State Research and Extension.

Producers who are concerned about winterkill can visit their fields and pull back the dead and dying leaves to observe the crown. If the crown is green and firm when squeezed, then there is certainty that the plant hasn't winterkilled. However, if the crown is soft and squishy when squeezed, then winterkill may be a future concern. Remember that winterkill is best rated as the crop begins to break dormancy and after the threat to further cold temperature loss has passed. Do not give up on a thinned stand too early as canola has a tremendous ability to compensate for stand loss!

The winter canola growing season is long and we could be in for a few more stretches of bitterly cold

temperatures, but the crop is well acclimated to handle these. Canola can withstand temperatures below zero at this stage, but hopefully any such stretch is short lived. It will be fascinating to watch how the crop handles our typical temperature fluctuations and dry conditions heading toward spring.

For more information on canola production, please visit the Great Plains Canola Production Handbook: <u>https://bookstore.ksre.ksu.edu/pubs/MF2734.pdf</u>.

Mike Stamm, Canola Breeder mjstamm@ksu.edu

Ignacio Ciampitti, Farming Systems ciampitti@ksu.edu

Mario Secchi, PhD Graduate Student secchi@ksu.edu

2. Herbicides for damaged brome hayfields

Fall 2021 was a hard year for brome growers. In most of the late-harvested (mid-to-late July) fields, when plants started to regrow, the armyworms were everywhere in eastern Kansas. Some of these fields were sprayed with insecticide two or three times, while the brome was using its reserves to grow new leaves and the worms were voraciously eating. As a result, some of these fields are dead and needing to be replanted. However some of them are significantly damaged and growers will need to decide on the best course of action.

For the dead fields, growers could seed brome in the spring, but weed pressure will be high. Controlling emerged weeds will be critical for successful establishment of a new stand. Light tillage or a non-selective herbicide can be used to control any emerged winter annual weeds. It is also likely that thin stands allowed greater than usual weed seed production during the summer of 2021. It will be important to control these weeds in newly established bromegrass. Herbicide options are limited in seedling bromegrass (Table 1). Mowing is a non-chemical option that could be considered to reduce weed competition and prevent weed seed production during establishment.

On the other hand, in some of the damaged fields, growers could wait to see if the brome will come back. In this case, controlling weeds during the spring and summer will be a need. Herbicides commonly used in established bromegrass are listed in Table 1. Care should be taken to observe plant-back intervals that may interfere with establishment if fall-seeding of bromegrass is needed.

Herbicide	Weeds controlled	Used in	Plant-back	Suppression
		establishment	interval	expected
2,4-D	Broadleaf	After 6 leaf stage	30 days	
Chaparral	Broadleaf	No	1 year	Yes
Cimarron Max	Broadleaf	No	2 months	
Cimarron Plus	Broadleaf	No	2 months	
Clarity	Broadleaf	No	45 days per 16 fl	May be injured
			oz/A	with > 16 fl oz/A
Crossbow	Broadleaf	No	3 weeks	
DuraCor	Broadleaf	No	45 days	Yes
Facet	Annual	No	10 months	
	grass/broadleaf			
Grazon P+D	Broadleaf	No	60 days	Yes
GrazonNext HL	Broadleaf	No	Grasses may be	Yes
			reseeded in the fall	
			following an	
			application in	
			spring or early	
			summer	
Milestone	Broadleaf	No	1 year	Yes

Table 1. Herbicides labeled for use in smooth bromegrass. Consult label for appropriate rate and adjuvant selection.

PastureGard HL	Broadleaf	After tillering	3 weeks	
Plateau	Grass and broadleaf	No	26-36 months	Yes
Range Star	Broadleaf	> 6 leaves	3 weeks per quart	
Rave	Broadleaf	60 days after	4 months	
		emergence		
Remedy Ultra	Broadleaf	No	3 weeks	
Tordon 22K	Broadleaf	After tillering	Grasses may be	Yes
			reseeded in the fall	
			following an	
			application in	
			spring or early	
			summer	
Yukon	Broadleaf	No	2 months	

The use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current use requirements.

Sarah Lancaster, Weed Management Specialist slancaster@ksu.edu

Walt Fick, Range Management Specialist whfick@ksu.edu

Bruno Pedreira, Agronomist, Southeast Research and Extension Center pedreira@ksu.edu

3. 2021 Kansas Performance Tests with Corn Hybrids report now available

The 2021 Kansas Performance Tests with Corn Hybrids report is now online and in print form. In this report, you will find a review of the 2021 corn crop, with a detailed discussion summarizing the statewide growing conditions and impacts from diseases and insects. More importantly, the results of the 2021 corn hybrid performance tests are also shown. Corn performance tests are conducted each year by the Kansas Agricultural Experiment Station. The results from these tests provide producers, extension agents, and industry professionals with unbiased agronomic information on many of the corn hybrids marketed in Kansas.

Producers and crop consultants can use this resource to help select corn hybrids for their operation by checking for varieties that show a consistently good performance in their region.

The online version of the corn hybrid performance test results can be found at: <u>https://bookstore.ksre.ksu.edu/pubs/SRP1166.pdf</u>.

Paper copies can be ordered from the K-State Research and Extension Bookstore at: <u>https://bookstore.ksre.ksu.edu/Item.aspx?catId=221&pubId=24579</u>

Jane Lingenfelser, Crop Performance Testing Coordinator jling@ksu.edu

2021 Kansas Performance Tests with



Report of Progress 1166



Kansas State University Agricultural Experiment Station and Cooperative Extension Service

4. An impressive snow storm impacted western Kansas in late January

An impressive and much needed snow storm occurred on January 25, 2022. As much as 27 inches was reported in western Kansas (Mount Sunflower), giving the current state record a run for its money. The corridor of heaviest snow extended into Colorado and remained for over a week (Figure 1). The 21-inch report from Sharon Springs tied for the 7th highest one-day snowfall on record for Kansas. This storm system was well forecasted but over-performed, with many totals as much as quadruple the anticipated snow amount. This article will briefly explain what happened, discuss Kansas snow records, and how you can make history with an accurate snow report.



Figure 1. Lingering snow a week (January 31st) after the event as observed by satellite imagery. Snow highlighted in blue. Source: College of DuPage.

A little science behind the meteorology

Snow is a complicated event to forecast. It can get "buried" in technical concepts including physics, buoyancy, dendritic growth zones, snow-to-liquid ratios, conditional symmetric instability and more. For now, let's discuss one component, *snow-to-liquid ratios* or SLR. On average, snow typically is a 10:1 SLR, meaning one inch of moisture for every ten inches of snow. In a warm, near-freezing (32F) environment, this can be as low as 5:1 and results in extremely heavy, wet snow. Great snowman making but dangerous to shovel. However, in a very cold environment (both at the surface and above), these ratios can exceed 30:1. This snow is very dry, fluffy, and prone to blowing. For the event on January 25, there was a saturated atmosphere completely filled with moisture, ideal for heavy snow. Factor in the very cold temperatures and the atmosphere was primed to dump from 20-30:1

SLR in western Kansas.

Those cold temperatures and very moist air (saturated) are perfect to develop large dendrites, i.e. snow crystals (Figure 2). These dendrites have large amounts of open space around them. However, they accumulate fast and optimize the stacking ability of the snow - adding up quickly and efficiently on the ground. This is critical for large snow accumulations such as what occurred with this event.



Figure 2. Snow crystal type by a function of temperature and supersaturation in the snow development layer (cloud). Source: Libbrecht, 2012.

Snow totals and the current state record(s)

As a result of these atmospheric conditions, snow totals were impressive for this event. Along and south of the Smoky River valley, a band of totals of 15+ inches extended from Burlington to Scott City (Figure 3). The largest totals observed were 27 inches at Mount Sunflower, 22 inches in east Scott County, and Sharon Springs with 21.8 inches. These large totals were all in a 24-hour time frame on January 25 and had many people questioning the current state records.



Figure 3. Public and COOP snow reports to the National Weather Service ending on January 26, 2022. Note, some totals are unofficial. Source: IEM.

As of this writing, the record highest daily total in Kansas occurred on March 28, 2009. Two locations in Pratt County reported 30 inches from that storm, upsetting the previous record of 25 inches set in 1903 (Table 1). Only seven storms have ever resulted in a 20+ inches total amount over a 24-hour period. Some storms do persist longer than just a day. When considering storm totals over a 3-day period, there are forty reports that exceed 20 inches with 13 at/above 25 inches (Table 2). However, many of the same events are included in the 3-day summary as the single day totals. Only 10 years in the last 137 have had a 20+ inches report, a 7% chance for any one year. Quite a rare event!

Table 1. Maximum one day snowfall reports over 20" on record at official observing locations. The Sharon Springs total from January 25, 2022 is highlighted in blue - the only 20"+ valid observation to be stored in the historical record. Source: ACIS.

Maximum 1-Day Snowfall Over 20"				
Station	Туре	Amount	Date	
		(Inches)		
Pratt 3NW	NWS COOP	30	3/28/2009	
Preston 3.2 WNW	CoCoRaHS	30	3/28/2009	
Ulysses 3NE	NWS COOP	25	2/26/1903	
Wamego 4 W	NWS COOP	24	2/27/1900	
Norcatur 3WSW	NWS COOP	24	10/26/1997	
Elkhart	NWS COOP	23	5/1/2017	
Syracuse 1NE	NWS COOP	22	5/1/2017	
Atwood	NWS COOP	22	11/18/2015	
Tribune 13NNE	NWS COOP	22	12/30/2006	
Lenora COOP	NWS COOP	21.5	10/26/1997	

Sharon Springs	NWS COOP	21	1/26/2022
Arlington	NWS COOP	21	3/27/2009

Table 2. Maximum 3-day snowfall reports over 25" on record at official observing locations. Source: ACIS.

Maximum 3-Day Snowfall Over 25"				
Station	Туре	Amount	Date	
		(Inches)		
Elkhart	NWS COOP	33	2/26/1903	
Wallace	NWS COOP	31.5	12/31/2006	
Hugoton	NWS COOP	31.4	12/20/1918	
Sharon Springs	NWS COOP	31	12/31/2006	
Pratt 3NW	NWS COOP	30	3/30/2009	
Preston 3.2 WNW	CoCoRaHS	30	3/30/2009	
Syracuse 7.2 WSW	CoCoRaHS	27	5/1/2017	
Leoti	NWS COOP	26	1/1/2007	
Atchinson	NWS COOP	25.8	4/2/1926	
Johnson	NWS COOP	25.5	5/1/2017	
Traer 2.5 NNW	CoCoRaHS	25.2	12/31/2006	
Ulysses 3NE	NWS COOP	25	2/28/1903	
Syracuse 1NE	NWS COOP	25	5/1/2017	

You can make history!

A photo of a 27-inch snowfall was making its rounds on social media following the snow storm on January 25 (Figure 4). This is very cool photo of an impressive snowfall event! If you are interested in official documentation, there are a few requirements involved when measuring snowfall amounts for historical records.

- To properly measure snow, you must measure on the ground. This ensures accurate and consistent measurements, even if some snow melts on contact. Elevated surfaces like the table/bench pictured freeze before the ground and will hold snow sooner. Therefore, it won't match historical data.
- Snow should be measured on a snow board. This is a white piece of wood or water board that is at least ³/₄" inch thick and painted white.
- Observations should be taken in an open area that is not prone to drifting, nor subject to obstructions. Although wind was light, there are trees in close proximity to the location. This implies unnatural impacts to the measurements made and potential inconsistencies.



27" of snow at Mt Sunflower so far and still falling. Might even be able to ski the mountain today!



1:40 PM - Jan 25, 2022 - Twitter for Android

Figure 4. Tweet from Eric Purvis featuring Ed Harold, property owner. Source: https://twitter.com/EricPurvis8/status/1486093840670887936

Lastly, you have to be a registered weather observer. This ensures you are trained and can properly take consistent observations. This may sound daunting; however, **joining/training is free!** The Community Collaborative Rain Hail and Snow network, or CoCoRaHS for short, is a citizen science driven project that obtains 10,000+ observations a day. Everyone uses the same rain gauge (see Figure 5) and consistently reports. Had the Mount Sunflower observation been an official CoCoRaHS report, it would go down in history. Until we increase the number of reporters in many of these low observation areas, we will never quite know what goes on.

Let's make history! Join CoCoRaHS today: https://www.cocorahs.org/



Figure 5. On the left is a map of the Community Collaborative Rain Hail and Snow (CoCoRaHS) network snow measurements on the morning of January 26, 2022. The blue star represents the approximate location of Mount Sunflower. On the right is a CoCoRaHS standardized rain gauge of which all these reporters use. Source: CoCoRaHS.

Sources:

CoCoRaHS rain gauge: https://weatheryourway.com/collections/cocorahs-gauge-parts/products/official-cocorahs-gauge

Libbrecht, Kenneth. (2012). Toward a Comprehensive Model of Snow Crystal Growth Dynamics: 1. Overarching Features and Physical Origins.

Chip Redmond, Kansas Mesonet christopherredmond@ksu.edu

K-State CropTalk Webinar Series

Join us Mondays from 12:00-1:00 CST



In 2021, a new series of hour-long webinars was launched with great success. For 2022, the K-State CropTalk webinar series is back and will be focused on agronomic topics targeted for northwest and north central Kansas. Topics range from soil fertility, weed management, cover crops, and weather resources. Continuing education credits have been applied for and will vary based on the subject area of each webinar.

Each webinar will begin at 12:00 pm (CST) and last until 1:00 pm. 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: <u>https://www.northwest.k-state.edu/events/</u>.

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

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

February 7 – **Manure and your Soil Fertility Program** Peter Tomlinson, K-State Environmental Quality Specialist

February 14 - **High Fertilizer Prices: The Perfect Time for Precision Ag** Lucas Haag, K-State NW Region Agronomist

February 21 – **Managing Soil Fertility During Record High Fertilizer Prices** Dorivar Ruiz Diaz, K-State Soil Fertility Specialist

February 28 – **Growing Nitrogen with Cover Crops** DeAnn Presley, Soil Management Specialist

March 7 – **Climate Update and Kansas Mesonet** Chip Redmond, K-State Assistant Climatologist and Kansas Mesonet Coordinator

K-State CropTalk Webinar Series

focused on Crop Production for Northwest and North Central Kansas

Join us Mondays from 12:00-1:00 p.m. CST

January 31 Rolling with the Punches: 2022 Weed Control Dr. Sarah Lancaster, K-State Weed Science Specialist

February 7 Manure and Your Soil Fertility Program Dr. Peter Tomlinson, K-State Environmental Quality Specialist

February 14 High Fertilizer Prices: The Perfect Time for Precision Ag Dr. Lucas Haag, K-State NW Region Agronomist

February 21 Managing Soil Fertility During Record High Fertilizer Prices Dr. Dorivar Ruiz, K-State Soil Fertility Specialist

February 28 Growing Nitrogen with Cover Crops Dr. DeAnn Presley, K-State Environmental Soil Science and Management Specialist

March 7 Climate Update and Kansas Mesonet Chip Redmond, K-State Assistant Climatologist and Kansas Mesonet Coordinator

For each session, 1 CCA credit has been applied for



Free to attend. Register online or contact your local office: www.northwest.ksu.edu/events



After registering, you will get a link to join via Zoom or YouTube



For questions or more information please contact Sandra L. Wick, KSU Post Rock Extension District at 785-282-6823 or swick@ksu.edu.

Cansas State University is committed to making its services, activities and organms accessible to all participants. If you have special requirements due to physical, vision, or hearing disability, contact Sandra L. Wick, 705-202-8023.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service State Research and Extension is an equal opportunity provider and employer.

6. Kansas Wheat Rx Schools to be held in Wichita and Hays

Wheat Rx seminars are scheduled for February 8 in Wichita and on February 9 in Hays. Wheat Rx is partnership between Kansas Wheat and K-State Research and Extension to disseminate the latest research recommendations for high-yielding and high-quality wheat to Kansas wheat farmers.

These two Wheat Rx schools will have speakers that will discuss the most up-to-date wheat research information on how to manage your wheat crop not only for yield but also for quality and sustainability. Detailed agendas for each school can viewed in the flyers at the end of this article.

Registration for the event is \$100 for non-members of the Kansas Association of Wheat Growers. However, members (including new members) will receive one free registration. Lunch and meeting materials are included with the registration fee.

Register online at https://kswheat.com/wheat-rx-registration-page



Register at kswheat.com/wheatrx

LUNCH

8:30-9:00 a.m. Registration

Welcome and Introduction to Wheat Rx Aaron Harries, Vice President of Research and Operations,

Kansas Wheat

9:15 a.m. Capturing Value for High-Quality Wheat

- E.G. Herl, Vice President Grain & Logistics, Grain Craft • From an insdustry perspective, what is "wheat grain quality"?
- Why high quality wheat is important, not only at the farm level, but also at regional and international levels.
- How can growers capture value of high-quality grain?

10:05 a.m. BREAK

9:00 a.m.

10:20 a.m. Fertility Management for High Yield and High Quality Wheat Dr. Dorivar Ruiz Diaz, Professor of Agronomy, Kansas State

- University

 Nitrogen management for high yield and high quality winter wheat
- Protein determination and its interaction with nitrogen management.
- · Sulfur management for high yield and quality wheat.

11:10 a.m. Fungicides and Wheat Health

- Dr. Kelsey Andersen Onofre, assistant professor of Plant Pathology, Kansas State University
- Yield benefits of fungicide to wheat in Kansas:
- a summary of long-term experiments.

 Timing of fungicide application on winter wheat grain yield
- and quality.

 Does fungicide product matter? A summary of current
- research.

1.00 p.m. Intensive Wheat Management to Maximize Yield and Quality

- Dr. Romulo Lollato, associate professor of Agronomy, Kansas State University, Extension Wheat and Forages Specialist • Results from a grower survey of management practices on
- wheat yield. • Summary of 6 years of small plot research on intensive wheat
- Summary of 6 years of small piot research on intensive wheat management for yield and milling and baking quality.
 Management for yield and milling and baking quality.
- Managing fertility and fungicide to maximize wheat yield and quality.

1:50 p.m. Variety Selection for High Yield, High Quality Wheat

- Dr. Allan Fritz, wheat breeder and Professor of Agronomy at Kansas State University
- Managing winter wheat variety selection for high yield and high quality.
- Challenges of maintaining high quality and high yield through improved genetics in the field.
- Which are the best winter wheat varieties for your field? Helping growers make an informed decision.

2:40 p.m. QUESTION AND ANSWER PANEL

3:00 p.m. ADJOURN

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron



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

7. Two remaining K-State Soybean Schools scheduled for February

It's not too late to attend a 2022 Kansas Soybean School! There are two remaining schools to be held on February 8 in Oakley and Great Bend. These events will provide in-depth training targeted for soybean producers and key-stakeholders. The schools will be sponsored by the Kansas Soybean Commission.

The schools will cover a number of issues facing soybean growers including weed control, crop production practices, nutrient management and soil fertility, insects, risk management, and disease management.

Oakley, KS - February 8 (Tuesday) – 9:00 am to 12:30 pm (registration will start at 8:30 am) Buffalo Bill Cultural Center, 3083 US-83 Contact: Kelsi Wertz, <u>kjwertz@ksu.edu</u>

Great Bend, KS - February 8 (Tuesday) – 4:00 to 6:30 pm (registration will start at 3:30 pm) Knights of Columbus Hall, 723 Main Street Contact: Stacy Campbell, <u>scampbel@ksu.edu</u>

Lunch/dinner will be provided courtesy of the Kansas Soybean Commission. There is no cost to attend, but participants are asked **to pre-register by** <u>noon on Friday, February 4</u>. Online registration is available at <u>http://bit.ly/KSUSoybean</u>. You can also register by emailing/calling the nearest K-State Research and Extension office for the location you plan to attend (contact emails for each location are listed above).



Ignacio Ciampitti, Farming Systems ciampitti@ksu.edu

Kathy Gehl, Extension Program Coordinator kgehl@ksu.edu