



Extension Agronomy

eUpdate

01/05/2018

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Kathy Gehl, 785-532-3354 kgehl@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Possible impacts of the recent cold weather to the Kansas wheat crop

The extent of possible winter damage to the developing wheat crop due to low temperatures will depend on several variables, including:

- Extent and duration of low temperatures
- Crop development
- Soil temperature
- Soil moisture
- Snow cover
- Soil residue cover
- Wind speed
- Stand density
- Temperature gradients in the field

Minimum air temperatures and their duration are the leading factors in any possible winter injury. However, it is important to remember that the crown is protected by the soil during this stage, so factors other than air temperature also need to be considered. For instance, crown insulation by the soil (influenced by seed-to-soil contact at sowing and sowing depth), crown root development, above-ground crop development, soil temperature, soil moisture, snow cover, crop residue, and how well the crop acclimated during the fall, will all influence the crop's response to below-freezing temperatures at this stage.

What level of cold can the wheat crop withstand at this stage?

Wheat needs at least 4-5 leaves and 1-2 tillers prior to winter dormancy for maximum cold tolerance. In this situation, wheat can withstand air temperatures of -5 to -10 degrees F for a couple hours without significant risk of winterkill (Figure 1) as long as temperatures at the crown level do not reach single digits.

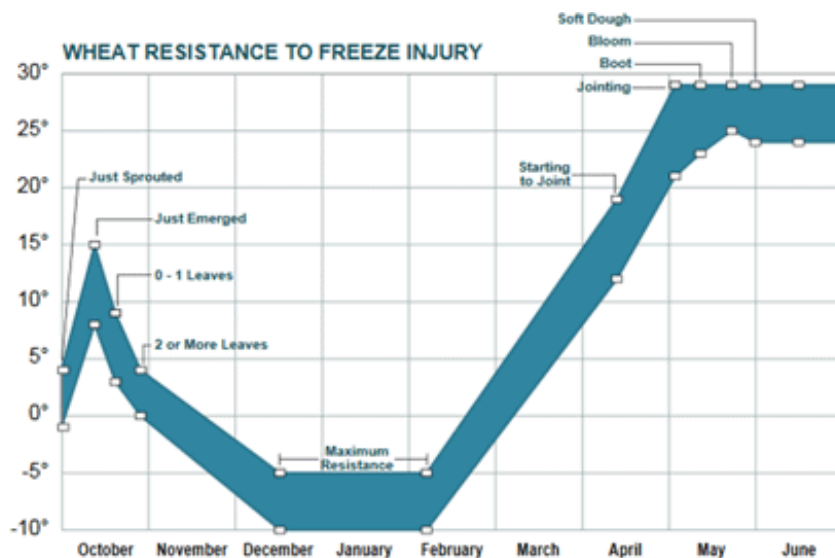


Figure 1. Temperatures that cause freeze injury to winter wheat at different growth stages. Winter wheat rapidly loses hardiness during spring growth and is easily injured by late freezes (graph adapted from A. W. Pauli).

Figure 1. Temperatures that cause freeze injury to winter wheat at different growth stages. Maximum resistance to cold temperatures occur between mid-December and early-February. Adapted from A.W. Pauli.

Wheat that has fewer tillers and leaves will be more susceptible to winter kill, which unfortunately is the situation for the majority of the Kansas wheat crop during the 2017-18 season. During the fall of 2017, wheat sowing was delayed for about 60-80% of the Kansas crop due to early October precipitation. Therefore, the crop is behind in development as compared to the historical average. Many fields in north central Kansas had sowing delayed even further as producers had to finish a summer crop harvest prior to sowing wheat. It was not uncommon for producers in that region to sow wheat in the last week of October or after the first of November. The crop likely did not have enough time to tiller during the fall (Figure 2).



Figure 2. Upper panels reflect early October sown field (left) and plant (right) and lower panels reflect a wheat field (left) and plant (right) sown in the last ten days of October. Photos by Guilherme Bavia, K-State Wheat and Forages Production Group.

How cold did it get?

Minimum air temperatures reached very low levels on New Year's Day across Kansas, with temperatures as low as -16 degrees F recorded in the north central and northeast portions of the state (Figure 3). Parts of southwest Kansas, central, and north central Kansas had minimum temperatures reaching values lower than -5 degrees F which could result in damage to the crop. While most of the state was exposed to minimum temperatures below 0 degrees F for the week ending on January 2, 2018, potential damage should be restricted to areas where minimum temperatures reached values below -5 to -10 degrees F.

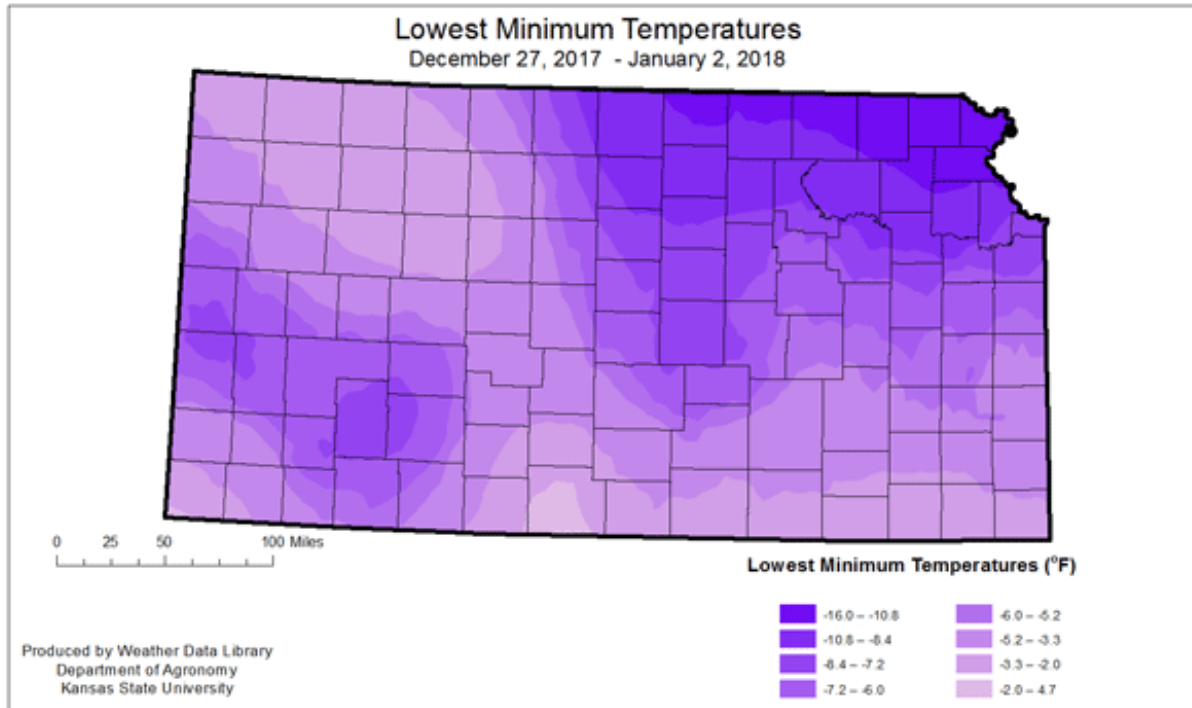


Figure 3. Lowest Minimum Air Temperatures, December 27, 2017 – January 2, 2018.

How long were these cold temperatures sustained?

As mentioned earlier, the risk of freeze damage to wheat is a function of the minimum temperature and duration of time spent at potentially damaging temperatures. During the week ending on January 2, 2018, the number of hours below -5 and -10 degrees F varied according to geographical location within Kansas (Figure 4). The majority of the wheat growing region had anywhere between 4 to 24 hours below -5 degrees F and less than 1 hour below -10 degrees F, with exception of north central Kansas. Counties in the north central and northeast portions of the state were exposed to as many as 30 hours below -5 degrees F and approximately 10 hours below -10 degrees F. The greatest risk of winterkill will be areas where temperatures were sustained below -10 degrees F for long periods of time, but areas with a long period of time below -5 degrees F could also sustain damage.

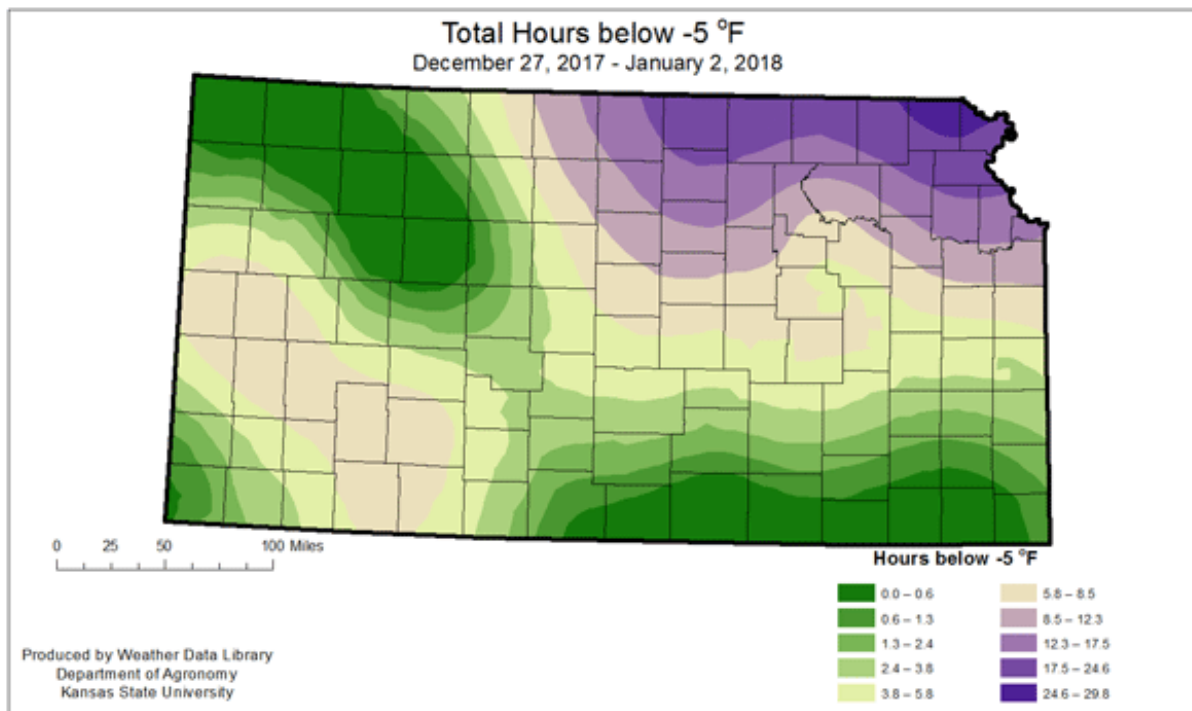


Figure 4. Total number of hours below -5 degrees F (upper panel) and -10 degrees F (lower panel), December 27, 2017 – January 2, 2018.

Soil temperatures

As freeze damage potential is a result of many interacting variables, evaluating only air temperatures may not completely reflect the conditions experienced by the wheat crop. In this situation, soil temperatures can help determine the extent of the cold stress at crown level.

While air temperatures reached critical levels for foliar tissue damage and in parts of the state, winterkill, soil temperatures at 2-inch and 4-inch depth were above 27 degrees F in northwest Kansas, and in most cases between 30-35 degrees F in other regions of the state (Figure 5). The lowest recorded soil temperature was 19 degrees F at the 2-inch depth near Scandia in north central Kansas. During the fall, most of the wheat winterkill occurs when temperatures reach single digits at the crown level. Higher soil temperatures may have helped buffer the cold air temperatures, thus minimizing possible injury to the wheat crop.

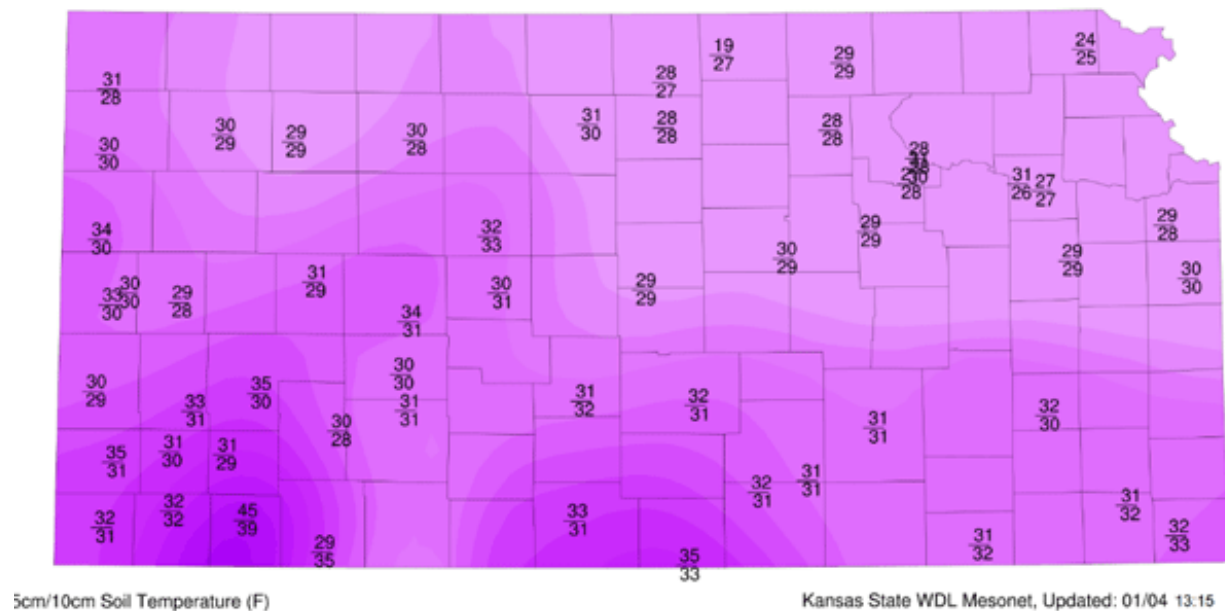


Figure 5. Soil temperatures measured at 1:15 pm on January 4th for the 2-inch/4-inch depth.

Soil moisture

North central Kansas recorded the lowest temperatures for a longer period of time compared to other regions of Kansas during the week ending on January 2. In addition to the low temperatures, this area of Kansas is also experiencing abnormally dry conditions due to no significant precipitation for weeks (Figure 6). The lack of soil moisture decreases the capacity of the soil to buffer temperature changes. As a result, a dry soil will cool down faster than a moist soil, increasing the chances of lower temperatures at the crown level and subsequent winter injury.

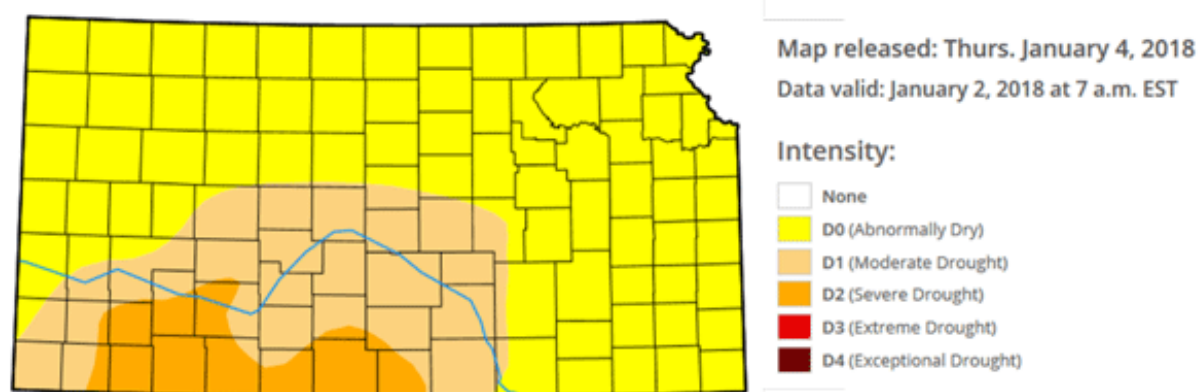


Figure 6. Kansas drought conditions as of January 4, 2018. Map developed by United States Drought Monitor (<http://droughtmonitor.unl.edu>).

Snow cover

Another factor affecting the potential for winterkill to the wheat crop is the amount of snow cover when low temperatures occurred. Snow can act as a buffer to cold air temperatures. If a minimum of 1-2 inches of snow is present on top of the wheat canopy, temperatures at the soil level should be sustained close to ~32 degree F. However, if less snow is present or if windy conditions removed the snow from the wheat canopy, the buffering effect might not occur. Figure 7 shows the total snowfall accumulated in two events prior to the occurrence of the low temperatures on New Year's Day (mostly accumulated between December 24th and 26th). Anywhere from 0 to 5 inches of snow were accumulated in Kansas, with the largest amounts measured in parts of north central and northwest Kansas (Figure 7). The majority of Kansas, where colder temperatures occurred (north central), had some level of snow coverage, ranging from 1 to 5 inches. If the snow was present at the wheat fields at the time low temperatures occurred, it likely helped the crop withstand the low temperatures measured.

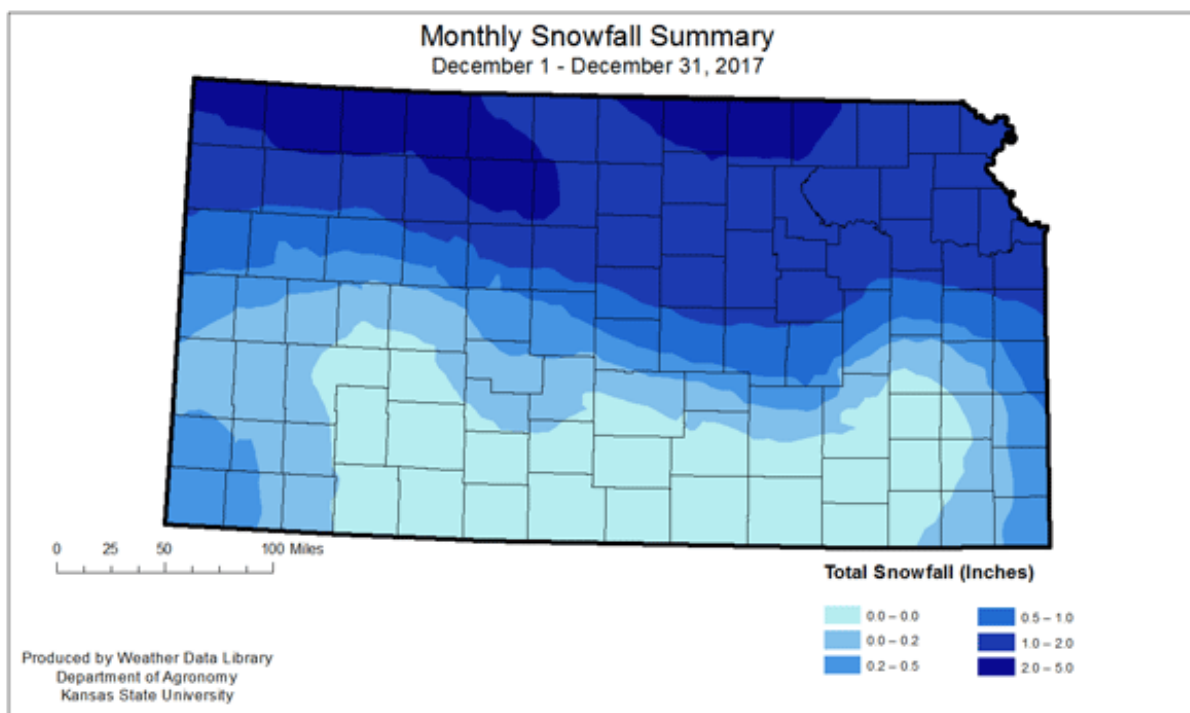


Figure 7. Monthly snowfall summary for December 2017. The majority of the measured snowfall occurred in two events (December 24th and 26th), a few days prior to the onset of the coldest temperatures measured.

Summary

Air temperatures measured during New Year's Day were cold enough to harm the wheat crop in many parts of the state, especially north central Kansas where temperatures were sustained below -10 degrees F for up to 10 hours. The effects of the cold temperatures could be magnified by dry soil conditions and poor fall development due to late sowing across the state.

Potential for winterkill exists, especially in north central Kansas (very cold temperatures for a long period of time), or in other areas of the state where air temperatures were sustained below -5 degrees F for several hours, worsened by a dry topsoil. On the bright side, soil temperatures never reaching single digits at 2 inches across the entire state, and snow cover up to 5 inches in some areas could have helped winter wheat survival.

It is difficult to truly assess the extent of the damage at this point. Thus, producers should not take any immediate action. While foliage damage will be apparent a few days after the cold event, the first apparent sign of freeze injury being leaf dieback and senescence, symptoms of winterkill will only be apparent at spring greenup. This is when the crop starts to take up water and nutrients for spring growth. Damaged leaves will appear burned back and dead, but that is not a problem as long as newly emerging leaves in the spring are green. Provided that the crown is not damaged, the wheat will recover from this foliar damage in the spring with possibly little yield loss. If damage to the crown occurred, the crop will not greenup in the spring or will greenup for a short period of time using existing resources, and perish shortly after. In any case, we will only be able to assess the true extent of the damage at spring greenup.

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2. Frozen pond safety guidelines

With the recent extremely cold weather, ponds across Kansas have begun to freeze over. Invariably, questions arise such as, “How quickly does the ice thicken?” and “How thick does ice need to be to support a person? A car?”. The answers to these questions vary greatly.

Ice accumulation rates can be determined by a number of complex formulas that include temperature, snow cover, wind, and radiational cooling. A simpler method looks at Frost Degree Days (FDDs). This is calculated similar to growing degree days. Take the average temperature and subtract it from the freezing point of water (32 degrees F). Each degree that the average is below freezing is one FDD. After the first ice layer forms, studies have shown that the ice will accumulate at about 1 inch per 15 FDDs. For the questions regarding depth to support various objects, there are tables that indicate 2-4 inches of ice would support a single individual, while 8 to 12 inches of ice would support a car (<http://www.dnr.state.mn.us/safety/ice/thickness.html>). However, all of those guides mention that this is for “clear, solid ice”, and are based on regions with consistent, long-term cold weather, such as Canada, Alaska, the northern United States, and Russia. It should also be noted that these calculations are for still water. Rate of accumulation will be much slower in moving water, and the strength of the ice will be less.

The Michigan Department of Natural Resources (DNR) has this advice, “The DNR does not recommend the standard “inch-thickness” guide used by many anglers and snowmobilers to determine ice safety. A minimum of four inches of clear ice is required to support an average person's weight on the ice, but since ice seldom forms at a uniform rate it is important to check ice thickness with a spud and ruler every few steps.” They also note, “Be especially cautious in areas where air temperatures have fluctuated. A warm spell may take several days to weaken the ice; however, when temperatures vary widely, causing the ice to thaw during the day and refreeze at night, the result is a weak, “spongy” or honeycombed ice that is unsafe.” (http://www.michigan.gov/dnr/0,4570,7-153-10364_52261_63242-160657--,00.html).

So despite the recent cold weather, don’t trust that ice on the ponds here in Kansas.

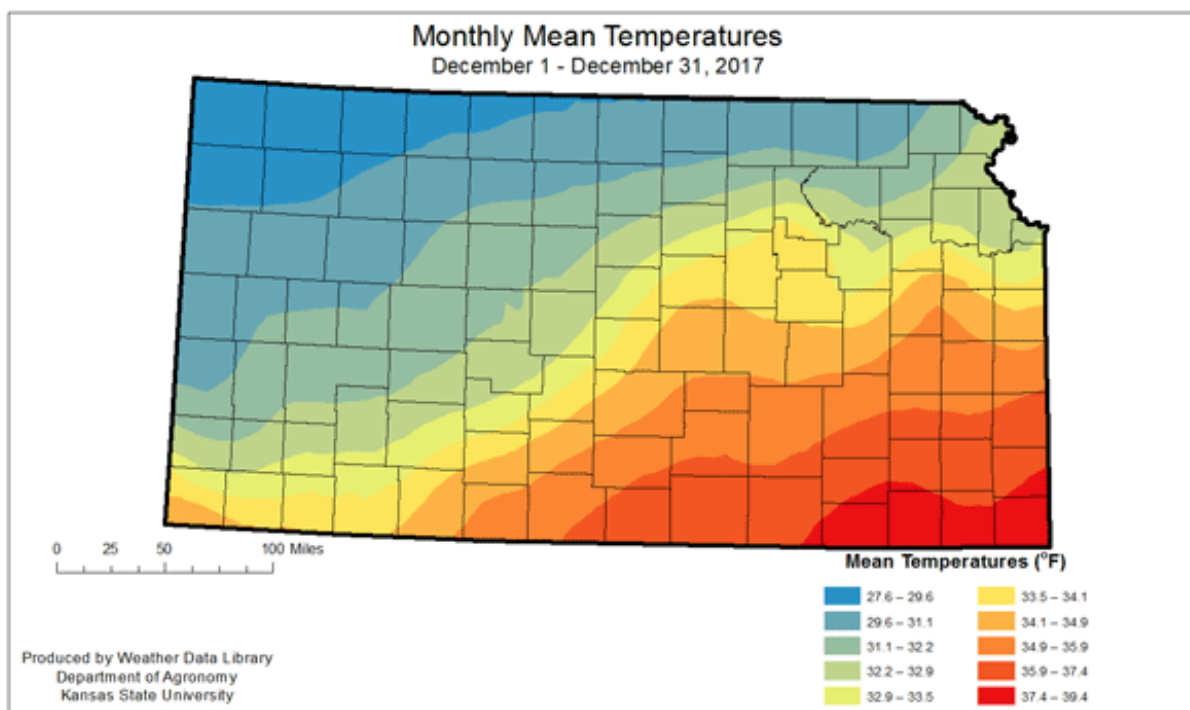


Figure 1. Newly formed ice on pond. Photo is public domain.

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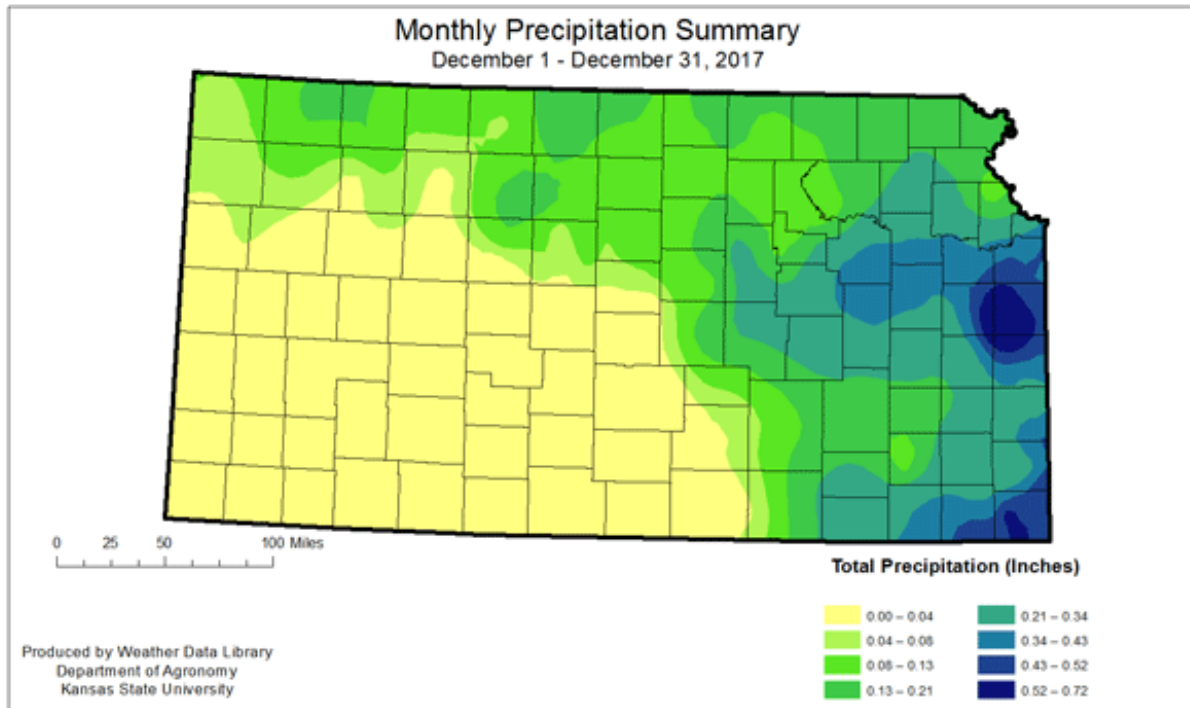
3. December weather summary for Kansas: Roller coaster temperatures

December started on a very warm note, but ended in a deep freeze. The statewide average temperature was 32.9 degrees F, or 1.5 degrees warmer-than-normal. The extremely cold end-of-the-month temperatures weren't enough to offset the very warm start. The first three weeks of December all averaged above-normal, while the week ending on January 2nd averaged 12 degrees cooler-than-normal. The western divisions came closest to normal, with the West Central Division averaging 30.8 degrees F, or 0.1 degrees warmer-than-normal. The eastern divisions had the greatest departures, with the Southeast Division averaging 36.8 degrees F, or 2.7 degrees warmer-than-normal. The warmest temperature reported for December was 80 degrees F at Ashland, Clark County, on the 4th. The coldest reading was -11 degree F at Baileyville, Nemaha County, on the 28th. Records were set on both the cold and warm end of the spectrum. On the cold side, there were 90 new record low maximum temperatures, but no new record low minimum temperatures. On the warm side, there were 33 new record high maximum temperatures and 31 new record high minimums.

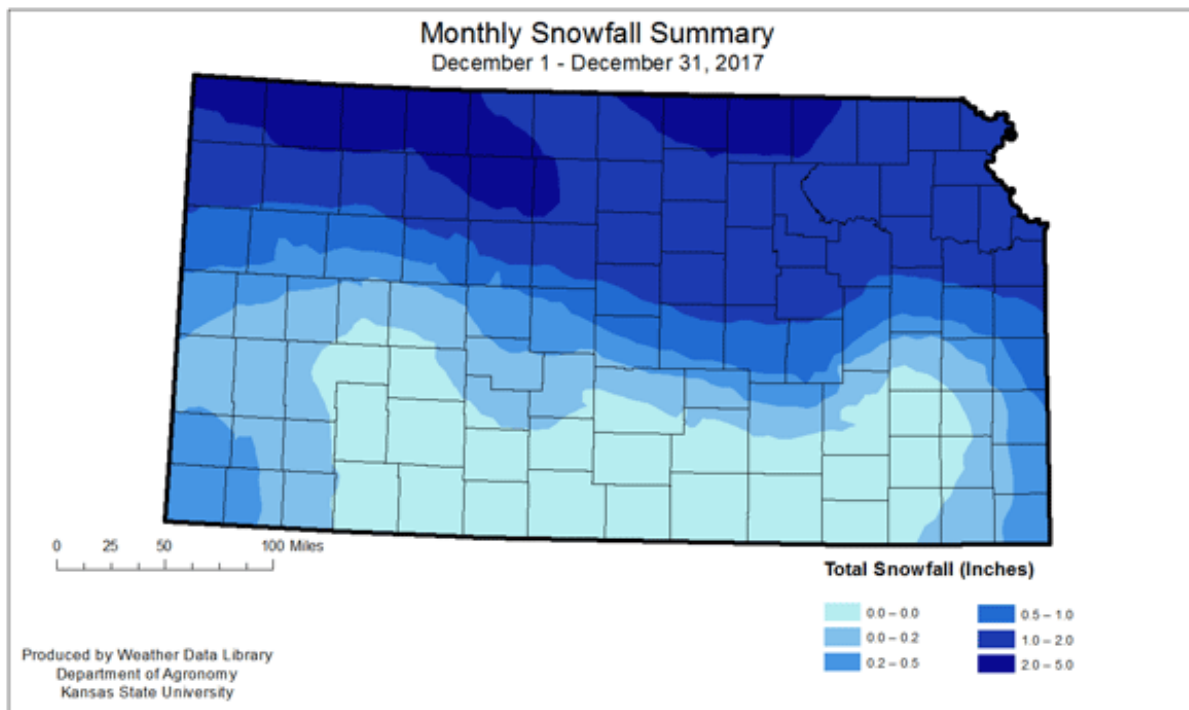


Moisture was limited in December. The statewide average precipitation was just 0.08 inches. That places it as the 4th driest December since 1895. December 1976 was the driest, when statewide average precipitation was just 0.05 inches. The Southwest and West Central Divisions tied for the driest division with average precipitation of zero. The South Central Division wasn't much better with an average of just 0.01 inches. The Southeastern Division was one of the wetter divisions with an average of 0.19 inches, but it had the greatest departure from normal at -1.63 inches. The greatest

precipitation total for the month at a National Weather Service Cooperative (NWS) station was 0.57 inches at Lecompton, Douglas County. For the Community Collaborative Rain Hail and Snow network (CoCoRaHS) the greatest monthly total was 0.49 inches at Garland 2.7 SW, Bourbon County. The greatest 24-hour totals were 0.57 inches at Lecompton, Douglas County (NWS) and 0.49 inches at Garland 2.7 SW, Bourbon County (CoCoRaHS). Despite the dry weather, twelve stations still managed to set daily precipitation records during the month.



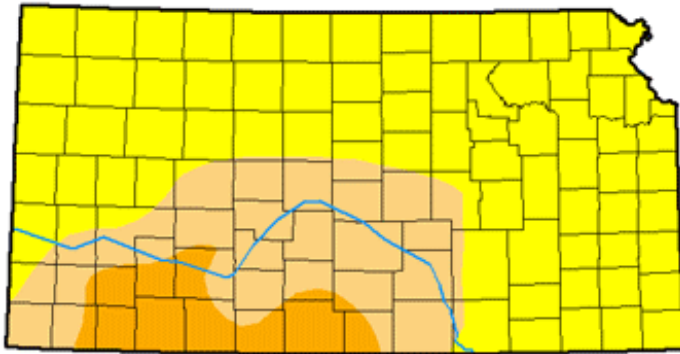
Not all of the precipitation came in the form of rainfall. Many locations in the northern half of the state recorded snowfall on the 24th and 26th of December. Eleven locations set daily records for snowfall. Multiple locations tied for the greatest daily snowfall at 2.5 inches on the 24th. The greatest snowfall report for the month was 4.3 inches at Norton Dam, Norton County.



There were no severe weather reports during the month. There were several days with extreme fire danger, and also several days with wind chill warnings.

With much below-normal precipitation and warmer-than-normal temperatures, there was a steep increase in the drought conditions. Abnormally dry conditions now encompass the entire state, while the moderate drought area has increased to cover 24 percent of Kansas. Severe drought is also present, covering approximately 9 percent of the state. The January outlook has a slight chance for wetter-than-normal conditions in the eastern portion of the state, and equal chances for above- or below-normal precipitation in the rest of the state. Given the low amount of moisture that typically is seen in January, improvement in the current drought status is unlikely. With the wet summer and current dryness, increased fire danger is likely.

U.S. Drought Monitor Kansas



Author:
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NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

December 26, 2017
(Released Thursday, Dec. 28, 2017)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	0.00	67.30	24.08	8.63	0.00	0.00
Last Week 12-19-2017	0.00	79.42	18.73	1.85	0.00	0.00
3 Months Ago 09-26-2017	59.89	30.03	8.73	1.35	0.00	0.00
Start of Calendar Year 01-03-2017	17.31	51.98	17.13	13.58	0.00	0.00
Start of Water Year 09-26-2017	59.89	30.03	8.73	1.35	0.00	0.00
One Year Ago 12-27-2016	17.31	51.99	17.13	13.58	0.00	0.00

Intensity:

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

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

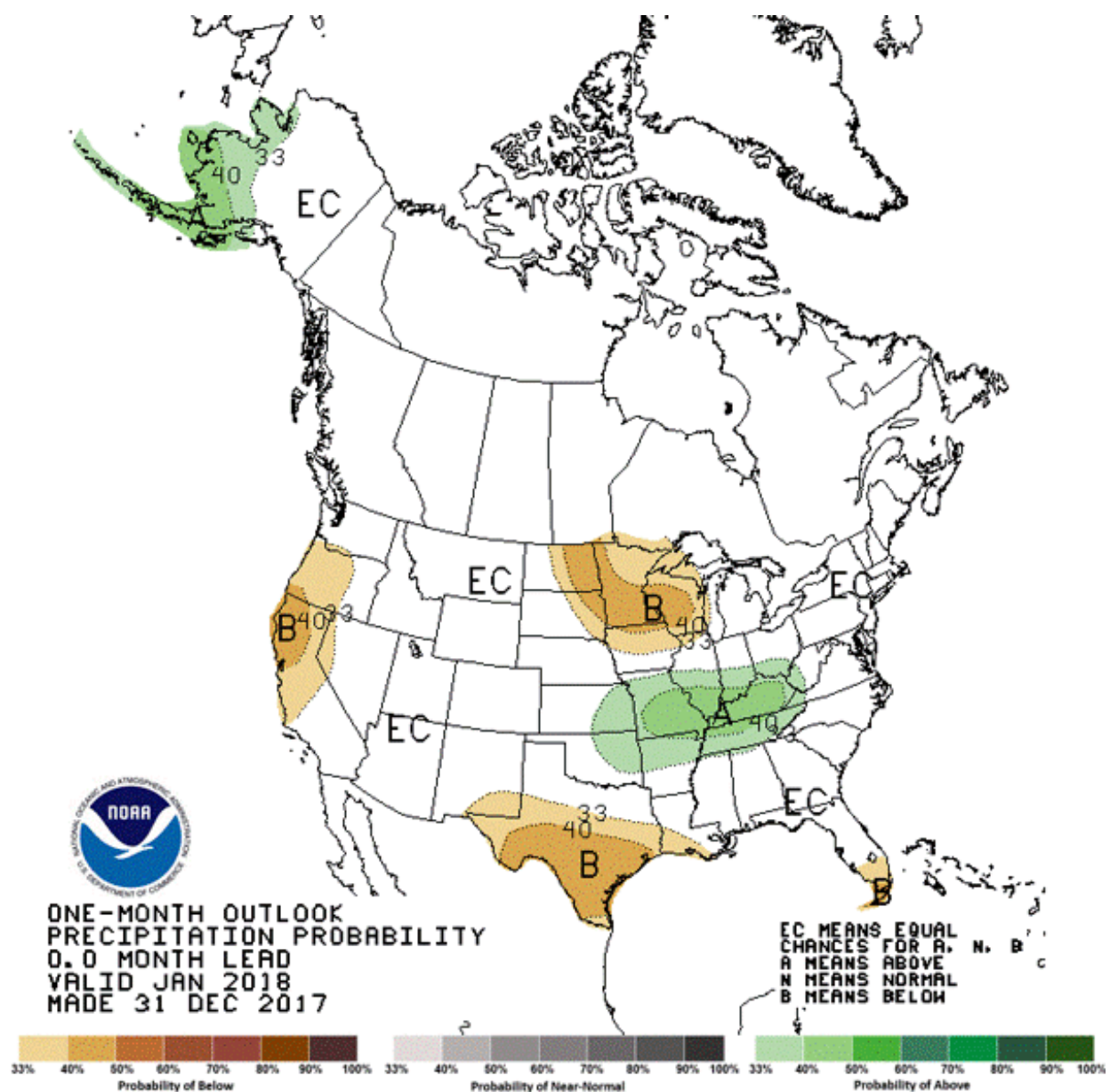


Table 1. Kansas Climate Division Summary December 2017										
	Precipitation (inches)						Temperature (°F)			
	Dec-2017			2017 through December			Ave	Dep. 1	Monthly Extremes	
Division	Total	Dep. 1	% Normal	Total	Dep. 1	% Normal			Max	Min
Northwest	0.02	-0.55	3	20.37	-0.99	94	29.6	0.3	67	-4
West Central	0.00	-0.63	0	23.25	2.48	112	30.8	0.1	69	-5
Southwest	0.00	-0.67	0	24.32	4.42	123	33.4	0.7	80	-5
North Central	0.07	-0.82	7	26.29	-1.75	93	31.3	1.8	71	-10
Central	0.05	-0.88	4	25.99	-3.30	89	33.4	1.9	72	-7
South Central	0.01	-1.11	1	31.18	-0.14	99	35.2	1.9	76	-2
Northeast	0.11	-1.11	8	29.28	-5.72	83	31.6	1.6	70	-6
East Central	0.28	-1.12	18	33.15	-4.77	86	33.8	2.2	74	-8
Southeast	0.19	-1.63	10	41.37	-0.12	99	36.8	2.7	76	-2
STATE	0.08	-0.95	5	28.64	-0.75	98	32.9	1.5	80	-10
1. Departure from 1981-2010 normal value										
2. State Highest temperature: 80 oF at Ashland, Clark County, on the 4th.										
3. State Lowest temperature: -11 oF at Baileyville, Nemaha County, on the 28th.										
4. Greatest 24hr: 0.45 inches at Eskridge, Wabaunsee County, on the 17th (NWS); 0.41 at Baldwin City 4.6 NNE, Douglas County, on the 17th (CoCoRaHS).										
Source: KSU Weather Data Library										

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4. Kansas Agricultural Technologies Conference, January 18-19 in Junction City

The 21th Annual Kansas Agricultural Technologies (KARTA) Conference will be held January 18-19, 2018 in Junction City at the Courtyard by Marriott & adjacent Convention Center, 310 Hammons Dr.

This annual event brings hundreds of agricultural producers and industry leaders together for a two-day interactive workshop on the ever-changing precision agriculture industry. There will be presentations on a wide variety of topics dealing with precision agriculture. The two-day event also includes vendor displays, the KARTA Annual Meeting, research presentations from grant recipients, and an interactive evening discussion that is always an attendee favorite.

Conference topics and invited speakers include:

- *Making precision work, perspectives of a service provider* - Ty Flichenster, Upward Ag Systems
- *Are you harvesting your most important assets?* - Jeremy Wilson, CropIMS
- *The internet of machines* - Jason Ward, NC State University
- *Optimizing every plant with automation* - Erik Ehn, Blue River Technology
- *Approaches to variable rate nitrogen* - Brian Arnall, Oklahoma State Univ.
- *Rapid fire overview of current precision ag research at K-State* - various K-State faculty

In addition to the invited speakers, KARTA members will present research results from various on-farm projects.

The conference is co-sponsored by K-State Research and Extension and the Kansas Agricultural Research and Technology Association, whose members are producers, university researchers, and industry professionals focused on learning about agricultural production and technological and informational changes on today's farms.

There is a fee for this conference, and you must register. More information about the conference, including online registration, is available at www.KARTA-online.org

Information is also available by contacting Lucas Haag, K-State Research and Extension Northwest Area Crops and Soil Specialist, at 785-462-6281 or lhaag@ksu.edu.

5. Canola College 2018 in Enid, Oklahoma, January 19



The latest developments in canola production and marketing will be highlighted at the Canola College 2018. This conference is sponsored by Kansas State University, Oklahoma State University, Great Plains Canola Association, and partners from the canola industry.

Canola College 2018 will be held January 19 at the Chisholm Trail EXPO Center, 111 W. Purdue, Enid, OK.

This will be the premier canola education/training event in the region in 2018. Canola College 2018 is for anyone with an interest in the canola industry including: experienced and first time growers, crop insurance agents, members of agricultural governmental agencies, and canola industry service and product suppliers. Attendees will hear from canola experts on a variety of key topics and will have the opportunity to visit with industry members who provide the goods and services needed to produce, handle, and market the crop.

Canola College 2018 topics will include:

- **Why We Grow Winter Canola** – Heath Sanders, OSU Southwest Area Extension Agronomist and Josh Bushong, OSU Northwest Area Extension Agronomist
- **Advanced Production Practices** – Bob Schrock, Grower, Kiowa, Kan., Jeff Scott, Grower, Pond Creek, Okla., and David Seck, Grower, Hutchinson, Kan.
- **Interactions of Seeding Rate, Row Spacing, and Genetics** – Kraig Roozeboom, KSU Cropping Systems/Crop Production
- **Canola Cropping Systems** – Josh Lofton, OSU Extension Cropping Systems Specialist
- **Managing Harvest to Maximize Yield and Oil Content** – Mike Stamm, KSU Canola Breeder
- **Canola Harvest Management and Combine Adjustment** – Randy Taylor, OSU Agricultural

Engineering

- **Canola Economics** – Trent Milacek, OSU Northwest Area Extension Ag Economist and Rodney Jones, OSU Extension Ag Economist
- **Weed Control** – Misha Manuchehri, OSU Extension Weed Scientist
- **Disease Control** – John Damicone, OSU Extension Plant Pathologist
- **Insect Management** – Tom Royer, OSU Extension Entomologist

The very popular **Canola Learning Laboratory** will be continued in 2018. A meal and coffee breaks are being sponsored by members of the canola industry. The lunch program will consist of updates from Canola College sponsors. Time will be allotted on the program for attendees to meet with sponsors at their booths.

Individuals can register for Canola College 2018 at www.canola.okstate.edu. For more information on Canola College, contact Mike Stamm at 785-532-3871 or mjstamm@ksu.edu

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6. Cover Your Acres Winter Conference, January 16-17 in Oberlin

K-State Research and Extension is partnering with the Northwest Kansas Crop Residue Alliance to host the 15th annual Cover Your Acres Winter Conference for crop producers and consultants on January 16-17 at the Gateway Center in Oberlin, Kansas.

Cover Your Acres January 16 and 17, 2018 
Winter Conference The Gateway in Oberlin, KS
 Register Online at www.northwest.ksu.edu/CoverYourAcres

Room 1	Room 2	Room 3	Room 4
7:45 8:15 Registration			
8:15 8:20 Welcome			
8:30 9:20 Profitability Opportunities and Pitfalls ¹ (M. Wood)	A Historical Look at Climate Variability ¹ (J. Basara)	Moisture Probes: Measurement to Management ¹ (J. Aguilar)	Encira Services: Analytical Services for Growers (DuPont Pioneer)
9:30 10:20 Surviving & Thriving in Tough Times ¹ (C. Griffin)	Weed Management Strategies ^{1,2} (C. Thompson)	NWKS Agronomy Research Updates ¹ (L. Haag)	Technology Update (Monsanto)
10:20 10:50 View Exhibits			
10:50 11:40 Soil Health & Profitability in Dryland Cropping ¹ (M. Schipanski)	Making the Right Crop Insurance Choices ¹ (A. Barnaby)	Maximizing Your Rangeland ^{1,2} (K. Harmony)	Sunflower Update (National Sunflower Assoc.)
11:50 12:40 Smart Spending of Fertility Dollars ¹ (D. Leikam)	Moisture Probes: Measurement to Management ¹ (J. Aguilar)	Lunch	
12:50 1:40 Making the Right Crop Insurance Choices ¹ (A. Barnaby)	NWKS Agronomy Research Updates ¹ (L. Haag)		
1:50 2:40 A Historical Look at Climate Variability ¹ (J. Basara)	Soil Health & Profitability in Dryland Cropping ¹ (M. Schipanski)	Smart Spending of Fertility Dollars ¹ (D. Leikam)	Is Wheat Worth It? (Horton Seed Services)
2:40 3:10 View Exhibits			
3:10 4:00 Producer Panel: Staying Successful with No-Till	Maximizing Your Rangeland ^{1,2} (K. Harmony)	Surviving & Thriving in Tough Times ¹ (C. Griffin)	Lower Inputs, Raise Yields (Suns Fertilizer & Chemical)
4:10 5:00 Weed Management Strategies ^{1,2} (C. Thompson)	Profitability Opportunities and Pitfalls ¹ (M. Wood)	The Importance of Adjuvants (EGE Products)	Finding a More Effective Application for Starter Fertilizer (CapstanAG)

Platinum Sponsors:
 CapstanAG
 DuPont Pioneer
 Horton Seed Services
 Hoxie Implement
 Lang Diesel

Monsanto
 National Sunflower Assoc.
 PacLeader Technology
 Plains Equipment Group
 SureFire Ag

Tuesday: Bull session with hors d'oeuvres begins at 5:00
¹ CCA CEUs applied for.
² Commercial Applicator CEUs applied for.

Like to Attend?

Early-Bird Registrations

Due January 10.

Online Registration:

www.northwest.ksu.edu/CoverYourAcres

or Mail in:

Circle when you would like to attend.

Tuesday, Jan 16 **Wednesday, Jan 17**
 Cost \$40.00 Cost \$40.00

Both days - Jan 16 & 17
 Cost \$60.00

Name: _____

Address: _____

City, State Zip: _____

Phone: _____

Email: _____

Please include information for all attending.

Would you be interested in receiving Agronomy related emails from K-State? Yes ☐ No ☐

After January 10

\$60.00 per day

Mail registrations to:

Cover Your Acres
 KSU NW Research-Extension Center
 PO Box 786
 Colby, KS 67701

For questions, call (785) 462-6281.

Program will be held regardless of weather. No refunds will be given.

Cover Your Acres is a producer-driven meeting focused on new ideas and research-based updates in crop production in northwest Kansas and the central High Plains region.

The conference, which typically draws more than 400 attendees from Kansas and other states, highlights the latest technology, methods, and conservation practices to improve crop production in the region. This year it will feature university specialists and industry representatives discussing the following topics:

- A historical look at climate variability
- Making the right crop insurance choices
- Maximizing your rangeland
- Moisture probes: measurement to management

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

- Northwest Kansas Agronomy Research update
- Profitability opportunities and pitfalls
- Smart spending of your fertilizer dollar
- Soil health and profitability in dryland cropping
- Surviving and thriving in tough times
- Weed management strategies

The same programs will be offered both days of the conference. Registration will begin at 7:45 a.m. with educational sessions ending at 5:00 p.m. The sessions are followed by a “bull session” on Tuesday evening where attendees can visit with industry and university specialists.

Early registration is due by January 10. The fee is \$40 for either January 16 or 17 or \$50 for both days. After January 10, the cost is \$60 per day. The conference fee includes lunch and educational materials. Continuing education unit credits are available for commercial applicators and certified crop advisors. The conference will be held regardless of weather and no refunds will be given.

Mail your registration, with a check payable to KSU, to Cover Your Acres, KSU NW Research-Extension Center, P.O. Box 786, Colby, KS 67701. To view the conference details and for online registration, visit www.northwest.ksu.edu/coveryouracres. For questions, call 785-462-6281.

Major sponsors of the conference include CapstanAG, DuPont Pioneer, Horton Seed Services, Hoxie Implement Co., Lang Diesel, Monsanto, National Sunflower Association, PacLeader Technology, Plains Equipment Group, and SureFire Ag. CCA and Commercial Applicator CEU's have been applied for.

Lucas Haag, Northwest Area Crops and Soils Specialist
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7. Don't miss the Kansas Corn Management Schools in early January!



We are excited to announce the three regional 2018 Corn Management Schools.

Central Kansas: Monday, January 8, Hesston

AGCO building, 420 W. Lincoln Blvd

Western Kansas: Tuesday, January 9, Garden City

Clarion Inn, 1911 E. Kansas Ave.

Eastern Kansas: Thursday, January 11, Leavenworth

The Barn, 17624 Santa Fe Trail

Topics are focused on agronomic practices and research updates. Each school's sessions are designed to fit the farmers in the region. Topics include:

- Weed control
- Production Management
- Nutrient Management
- Insect update
- Disease update
- Planter technology update
- Corn marketing and price update
- Usable Corn Condition Progress Tools

Schools are free to attend thanks to the generous support of DuPont Pioneer and Kansas Corn. Lunch is included, so please pre-register online at: KScorn.com/Cornschoo

You can also register with KSRE local extension offices.

Hesston School:

Ryan Flaming, Harvey County, flaming@ksu.edu 316-284-6930
Zach Simon, Sedgwick County, zsimon@ksu.edu 316-660-0153
Darren Busick, Reno County, darrenbusick@ksu.edu 620-662-2371
Jake Renner, Kingman County, jwrenner@ksu.edu 620-532-5131
David Kehler, Butler County, dkeehler@ksu.edu 316-321-9660
Rickey Roberts, Marion County, rroberts@ksu.edu 620-382-2325
Shad Marston, McPherson County, smarston@ksu.edu 620-241-1523

Garden City School:

AJ Foster, Southwest Area Crops and Soils Specialist; anserdj@ksu.edu
Andrea Burns, Ford County, aburns@ksu.edu, 620-227-4542
Kurt Werth, Grey County, kwert@ksu.edu, 620-855-3821
Lacey Noterman, Haskell County, lnote@ksu.edu, 620-675-2261
Bill Haney, Kearny County, haney@ksu.edu, 620-355-6551
John Beckman, Scott County, jbeckman@ksu.edu, 620-872-2930

Leavenworth School:

Karol Lohman, Leavenworth County, klohman@ksu.edu, 913-364-5700
Jessica Barnett, Johnson County, Jessica.barnett@jocogov.org 913-715-7000
David Hallauer, Meadowlark District, dhallae@ksu.edu, 785-863-2212
Ray Ladd, Atchinson County, clad@ksu.edu 913-833-5450
Roberta Wyckoff, Douglas County, rwycckoff@ksu.edu, 785-843-7058
Leroy Russell, Shawnee County, lrussell@ksu.edu, 785-232-0062
Darren Hibdon, Frontier District, dhibdon@ksu.edu, 785-229-3520
Abbie Powell, Marais des Cygnes District, abbie2@ksu.edu, 913-795-2829

For more information, contact:

Stacy Mayo-Martinez, Kansas Corn Director of Industry Relations
smayo@ksgrains.com

Ignacio A. Ciampitti, Crop Production & Cropping Systems Specialist
Ciampitti@ksu.edu

8. Mark your calendar for the K-State Sorghum Schools in early February



A series of three K-State Sorghum Production Schools will be offered in early February 2018 to provide in-depth training targeted for sorghum producers and key stakeholders. The schools will be held at three locations around the state.

The one-day schools will cover a number of issues facing sorghum growers: weed control strategies; production practices; nutrient fertility; and insect and disease management.

The dates and locations of the K-State Sorghum Production Schools are:

- **February 6** – Dodge City - Boot Hill Casino Conference Ctr., 4100 W Comanche St

Andrea Burns, Ford County, aburns@ksu.edu, 620-227-4542

- **February 7** – Hutchinson – Hutchinson Community College, 1300 N Plum St

Darren Busick, Reno County, darrenbusick@ksu.edu, 620-662-2371

- **February 8** – Washington – FNB Washington 101 C Street, Box 215

Tyler Husa, River Valley District, thusa@ksu.edu, 785-243-8185

Lunch will be provided courtesy of Kansas Grain Sorghum Commission. There is no cost to attend, but participants are asked to pre-register by January 31.

Online registration is available at: <http://bit.ly/KSSORGHUMSchools>

You can also pre-register by emailing or calling the nearest local K-State Research and Extension office for the location you plan to attend.

More information on the final program for each Sorghum School will be provided in upcoming issues of the Agronomy eUpdate.

Ignacio Ciampitti, Cropping Systems Specialist
ciampitti@ksu.edu

Pat Damman, Kansas Grain Sorghum Commission
pat@ksgrainsorghum.org

9. Get registered for the K-State Soybean Schools offered in late January

A series of three K-State Soybean Production Schools will be offered in late January 2018 to provide in-depth training targeted for soybean producers and key stakeholders. The schools will be held at three locations around the state.

The one-day schools will cover a number of issues facing soybean growers including: weed control strategies, production practices, nutrient fertility, and insect and disease management. Attendees will also receive auxin training needed for applications of approved dicamba formulations for Xtend soybean and cotton.

The dates and locations of the K-State Soybean Production Schools are:

January 22 – Phillipsburg, KS *Start time for this location only will be 10:00 a.m.*****

Phillips County Fair Building, 1481 US-183

Cody Miller, Phillips-Rooks District, codym@ksu.edu, 785-543-6845

January 23 – Salina, KS (program begins at 9:00 a.m.)

Webster Conference Center, 2601 North Ohio

Tom Maxwell, Central Kansas District, tmaxwell@ksu.edu, 785-309-5850

January 24 – Rossville, KS (program begins at 9:00 a.m.)

Citizen Potawatomi Nation Center, 806 Nishnabe Trail

Leroy Russell, Shawnee Co., lrussell@ksu.edu, 785-232-0062

Lunch will be provided courtesy of Kansas Soybean Commission (main sponsor of the schools). The schools will also be supported by Channel Seeds. There is no cost to attend, however participants are asked to pre-register by January 17.

Online registration is available at: [K-State Soybean Schools](#)

You can also preregister by emailing or calling the local K-State Research and Extension office for the location you plan to attend.



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Doug Shoup, Southeast Area Crops and Soils Specialist
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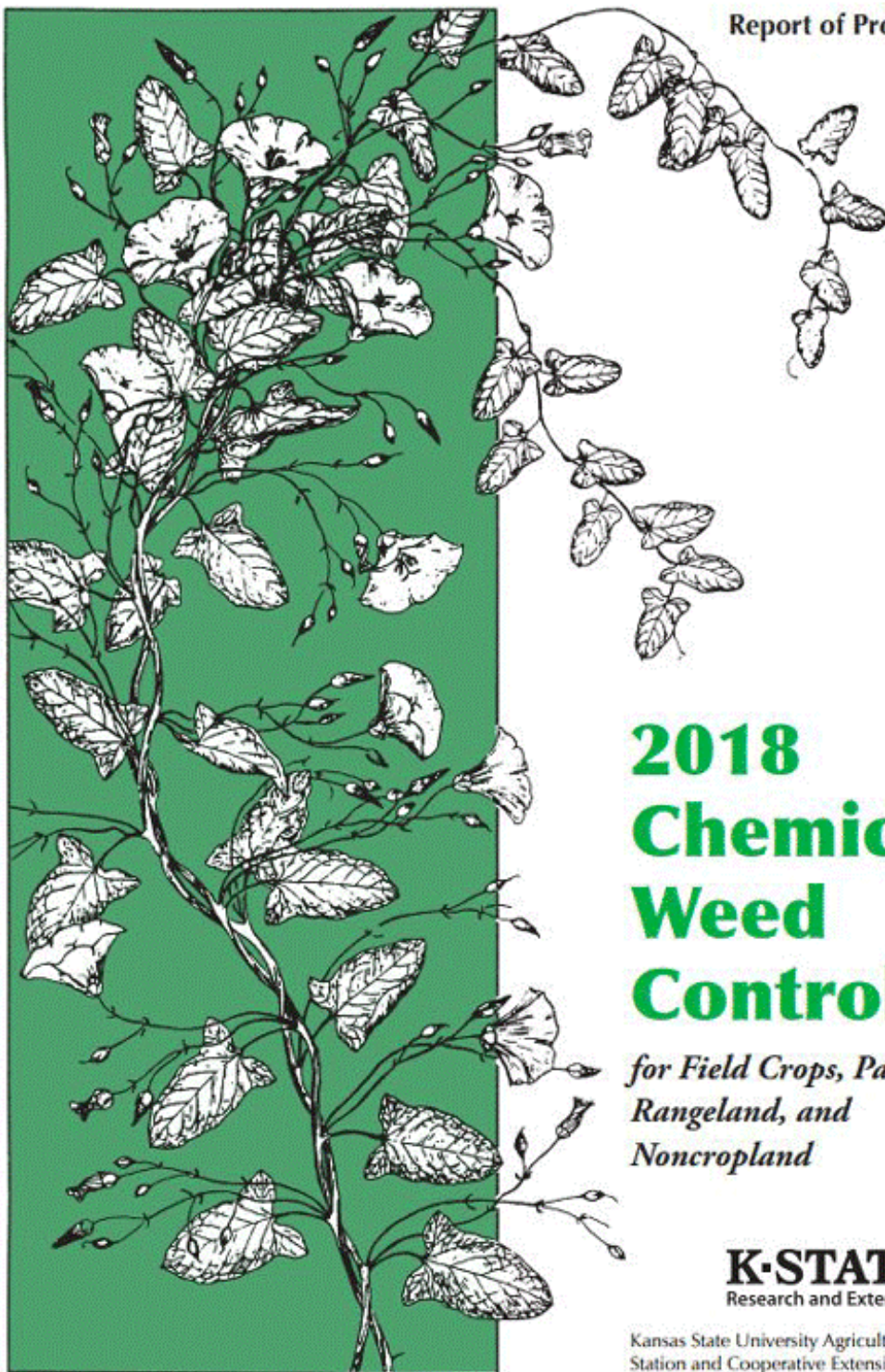
Stu Duncan, Northeast Area Crops and Soils Specialist
sduncan@ksu.edu

10. K-State 2018 Chemical Weed Control Guide now available online

The new K-State 2018 Chemical Weed Control Guide is available online at:

<https://www.bookstore.ksre.ksu.edu/pubs/chemweedguide.pdf>

Hard copies of this publication will be arriving to area KSRE agents in the next 1-2 weeks.



2018 Chemical Weed Control

*for Field Crops, Pastures,
Rangeland, and
Noncropland*

K-STATE
Research and Extension

Kansas State University Agricultural Experiment
Station and Cooperative Extension Service

Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist
cthompso@ksu.edu