



Extension Agronomy

eUpdate

12/15/2017

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. Post-harvest field work: Deep tillage considerations

Now that row crop harvest is over in Kansas, producers might be considering deep tillage for the purpose of alleviating compaction. Here are a few things to consider:

How deep should the tillage operation occur?

That is best answered by taking a spade or soil probe out in your field and digging a few holes. Ideally, you should dig down to about 18 inches. You are looking for dense layers that are restricting plant roots. If you see “platy” soil structure, which looks like many horizontal layers of soil about ¼ to ½ thick in diameter, look to see if the roots have penetrated through this zone in the soil. If the roots have predominantly penetrated this zone, the layer probably isn’t really root-limiting. If you see a lot of roots that are growing horizontally, or if they appear stubby and gnarled, lacking many root hairs, that can also be a sign that the roots are having trouble making it through this layer.

If you see a dense zone that ends, at say, 8 inches, you’d only want to go about 9 inches deep with the tillage operation. As you double the depth of the tillage operation, you quadruple the power requirement, so going too deep is a waste of time and energy. Also, there is no point in going deeper and potentially damaging the soil profile even further (risks are explained below).

Will deep tillage benefit future crop yields?

In research studies, it is commonly concluded that deep tillage is only beneficial if the zone of compaction is truly root limiting. If it isn’t, deep tillage probably won’t be of much benefit. The only way to really know is to leave about 3-5 untilled strips through your field and then compare the yields in those areas to the tilled parts of the field next year — easy enough to do if you have a yield monitor and you mark the locations of those untilled strips.

How long does the effect produced by deep tillage last?

Tillage can temporarily loosen soil, but because it breaks natural soil structure into smaller pieces, eventually tilled soils re-compact and become denser with time. If the field is subsequently conventionally tilled, and particularly if the traffic is not controlled or limited to certain tire track paths, the benefit will probably only last a few years, due to the many trips made across the field with various tillage and other implements. If the field is subsequently no-tilled and traffic is controlled, the effect of a single deep tillage operation might last longer.

Are there any negative side effects of deep tillage?

If tillage is performed when the soil is too wet, the zone of compaction could be moved even deeper. To know if the soil is too wet for tillage, try to make a ribbon out of the soil without wetting it. If you can make a texture ribbon, it is too wet. Alternatively, if you can roll out a “snake” of soil by rubbing it between your palms, it’s too wet. This is called “plasticity” and if the soil is plastic (bendable) it can smear and compact easily. You’ll need your shovel or soil probe to test this to the entire depth that you want to till.

Your goal is to create fracture, so the soil has to be dry enough to shatter, not smear. To see if you’re achieving this, dig between the shanks with a spade and see if the soil is loosened. If you bring up huge clods, the soil isn’t shattering and it would be better to wait until it is drier. Straight shanks are

going to cause the least amount of soil disturbance, as shown in the photos below.





Figure 1. (Top photo) This photo was taken 6 weeks after tillage with a ripper designed for minimum surface disturbance as it has straight shanks. The spade could be easily pushed all the way into the soil. The area between the shanks was easy to dig, except in the end rows where there was a lot of traffic from heavily loaded grain carts. (Bottom photo) This is the implement used in the field described above. Photos by DeAnn Presley, K-State Research and Extension.

Also, keep in mind that certain areas of the field are probably more compacted than others. Compacted areas might not be ready for deep tillage at the same time as the rest of the field because compacted areas tend to stay wetter, longer. A case in point concerns a visit made to an Ellis County producer's farm. Soil shattering was observed from deep tillage across the entire 30 inches between the shanks in the "average" part of the field, but in the end rows where the grain cart was driven, excavated clods were about one cubic foot in size, most likely because those more compacted areas of the field were wetter.

Is deep tillage economical?

Only if a root-limiting layer is really present, and even then it's not an easy decision because this is a costly operation. Deep tillage requires a lot of power. Deep tillage is slow-going and the implements are not very wide. As a result, deep tillage requires a lot of time, diesel fuel, and usually a few sheared bolts! Table 1 below shows the most recent information from the Kansas State University Agricultural Economics Department's Kansas Custom Rates Comparison for 2016.

Table 1. 2016 Custom rates for land tillage

2016 Custom Rates for Land Tillage											
Type of Operation	Average \$/Acre										
	Range	State	Northwest	West Central	Southwest	North Central	Central	South Central	Northeast	East Central	Southeast
Disking	8.00-18.00	12.20	1/	12.00	1/	1/	1/	11.44	1/	14.62	1/
Offset Disk	10.00-15.00	12.60	1/	1/	1/	1/	1/	1/	1/	1/	1/
Chisel (4-12")	10.00-23.00	13.95	1/	12.88	1/	1/	1/	17.00	1/	1/	1/
Undercutter	1.50-15.10	11.13	1/	9.70	12.49	1/	11.63	12.67	1/	1/	1/
Field Cultivator	7.00-17.00	11.78	1/	10.80	13.73	1/	1/	1/	1/	12.73	11.44
Subsoiler/In-line ripper	15.00-20.00	18.24									
Strip Tillage	9.20-20.00	17.07	1/	16.88	17.91	1/	1/	16.06	1/	16.21	1/
Vertical Tillage	9.00-22.00	13.33	1/	13.33	15.27	1/	1/	11.78	1/	15.00	1/

Source: 2016 Kansas Custom Rates survey conducted by the Agricultural Land Use Survey Center in conjunction with the Kansas Department of Agriculture. Publication available at <http://www.agmanager.info/machinery/papers/2016-rates-paid-kansas-farmers-custom-work>

How can you prevent compaction?

Deep compaction is caused by heavy axle loads. Research indicates that axle loads greater than 10 tons can cause compaction as deep as 12 to 18 inches, and many modern implements weigh well over 10 tons per axle. The only way to reduce axle weight is to decrease the load weight or add axles — axle load cannot be reduced by adding more or larger tires, unfortunately. Shifting to continuous no-till can help soils become more resistant to subsequent compaction, and long-term research conducted in the Great Plains shows that no-till is more resistant to compaction at wetter soil moisture levels (Figure 3).

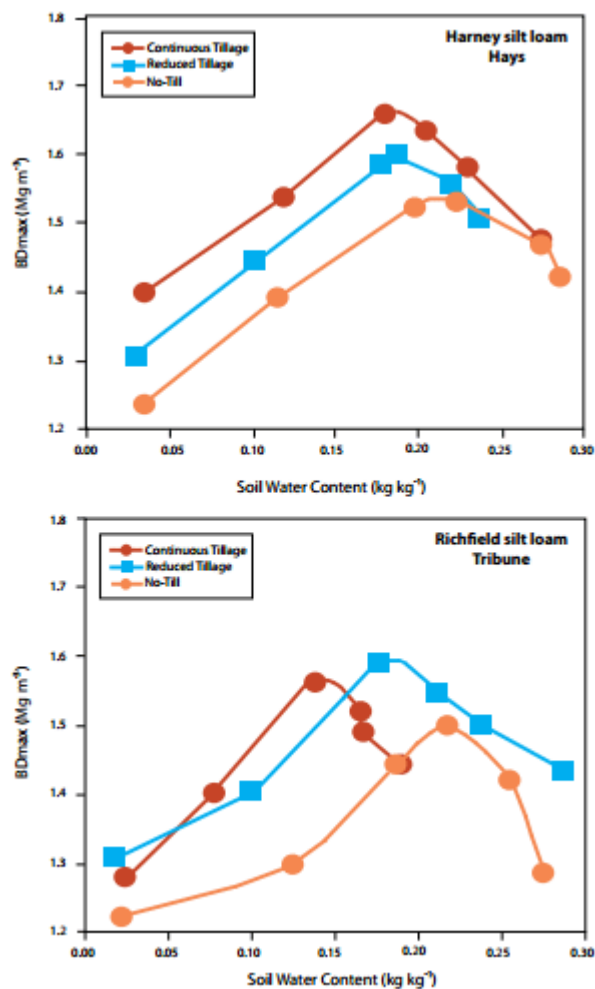


Figure 3. Tilled soils are more easily compacted than those under no-till. Also no-tilled soils can better withstand machinery traffic at higher water contents compared to conventional and reduced tilled soils. From: MF3066 Efficient Crop Water Use in Kansas <https://www.bookstore.ksre.ksu.edu/pubs/MF3066.pdf> (Source of original data: Blanco-Canqui, et al., 2009. No-till induced increase in organic carbon reduces maximum bulk density of soils. Soil Science Society of America Journal 73:1871-1879).

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2. 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.

3. 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

Mike Stamm, Canola Breeder
mjstamm@ksu.edu

4. 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

Presented by Kansas State University and Northwest Kansas Crop Residue Alliance

	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 (M. Wood)	A Historical Look at Climate Variability (J. Basara)	Moisture Probes: Measurement to Management (J. Aguilar)	Endicott Services: Analytical Services for Growers (DuPont Pioneer)
9:30 - 10:20	Surviving & Thriving in Tough Times (C. Griffin)	Weed Management Strategies (C. Thompson)	NWKS Agronomy Research Updates (L. Haag)	(Monsanto)
10:20 - 10:50	View Exhibits			
10:50 - 11:40	Soil Health & Profitability in Dryland Cropping (M. Schipanski)	Making the Right Crop Insurance Choices (A. Barnaby)	Maximizing Your Rangeland (K. Harmony)	Sunflower Update (National Sunflower Assoc.)
11:50 - 12:40	Smart Spending of Fertility Dollars (D. Leikam)	Moisture Probes: Measurement to Management (J. Aguilar)	Lunch	
12:50 - 1:40	Making the Right Crop Insurance Choices (A. Barnaby)	NWKS Agronomy Research Updates (L. Haag)		
1:50 - 2:40	A Historical Look at Climate Variability (J. Basara)	Soil Health & Profitability in Dryland Cropping (M. Schipanski)	Smart Spending of Fertility Dollars (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 (K. Harmony)	Surviving & Thriving in Tough Times (C. Griffin)	Lower Inputs, Raise Yields (Sera Fertilizer & Chemical)
4:10 - 5:00	Weed Management Strategies (C. Thompson)	Profitability Opportunities and Pitfalls (M. Wood)	The Importance of Adjuvants (EGE Products)	(CapstanAG)

Platinum Sponsors:

CapstanAG
DuPont Pioneer
Horton Seed Services
Hoxie Implement

Lang Diesel
Monsanto
National Sunflower Assoc.
PacLeader Technology

Tuesday: Ball session with hors d'oeuvres begins at 5:00
¹ CCA CEUs applied for.
² Commercial Applicator CEUs applied for.
 (!) indicate industry sessions.

www.northwest.ksu.edu/CoverYourAcres

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
Cost \$40.00

Wednesday, Jan 17
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.
Kansas State University is an equal opportunity employer and provider.

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
- 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, and Plains Equipment Group. CCA and Commercial Applicator CEU's have been applied for.

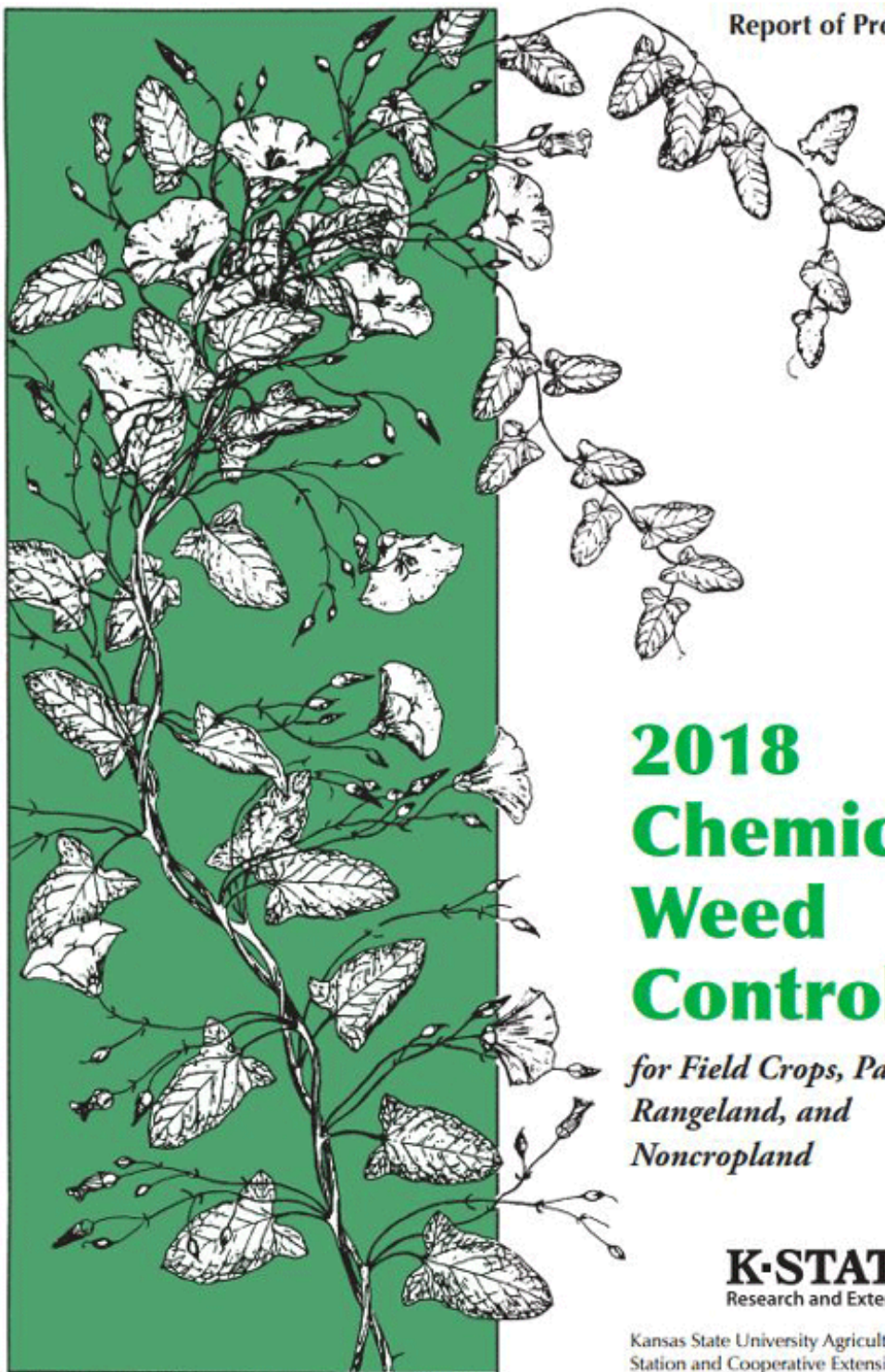
Lucas Haag, Northwest Area Crops and Soils Specialist
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5. New K-State 2018 Chemical Weed Control Guide now available online

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

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

Hard copies of this publication will be available soon.



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
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6. K-State Sorghum Schools scheduled for early February 2018



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.

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Pat Damman, Kansas Grain Sorghum Commission
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7. K-State Soybean Schools offered in late January 2018

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.

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

January 22 – Phillipsburg, KS

Phillips County Fair Building, 1481 US-183
Cody Miller, Phillips-Rooks District, codym@ksu.edu, 785-543-6845

January 23 – Salina, KS

Webster Conference Center, 2601 North Ohio
Tom Maxwell, Central Kansas District, tmaxwell@ksu.edu, 785-309-5850

January 24 – Rossville, KS

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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8. 2018 Kansas Corn Management Schools



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:

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Jessica Barnett, Johnson County, Jessica.barnett@jocogov.org 913-715-7000
David Hallauer, Meadowlark District, dhallaue@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

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