Issue 691

K-STATE Research and Extension

Extension Agronomy

eUpdate

05/04/2018

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. 2018 Kansas Wheat Quality Tour report

The 2018 Wheat Quality Tour took place during April 30 – May 3, 2018. About 100 people actively scouted hundreds of Kansas wheat fields in 25 groups and along six routes (Figure 1). The groups left Manhattan and headed to Colby on day 1, from Colby to Wichita on day 2, and finally from Wichita to Manhattan on day 3.

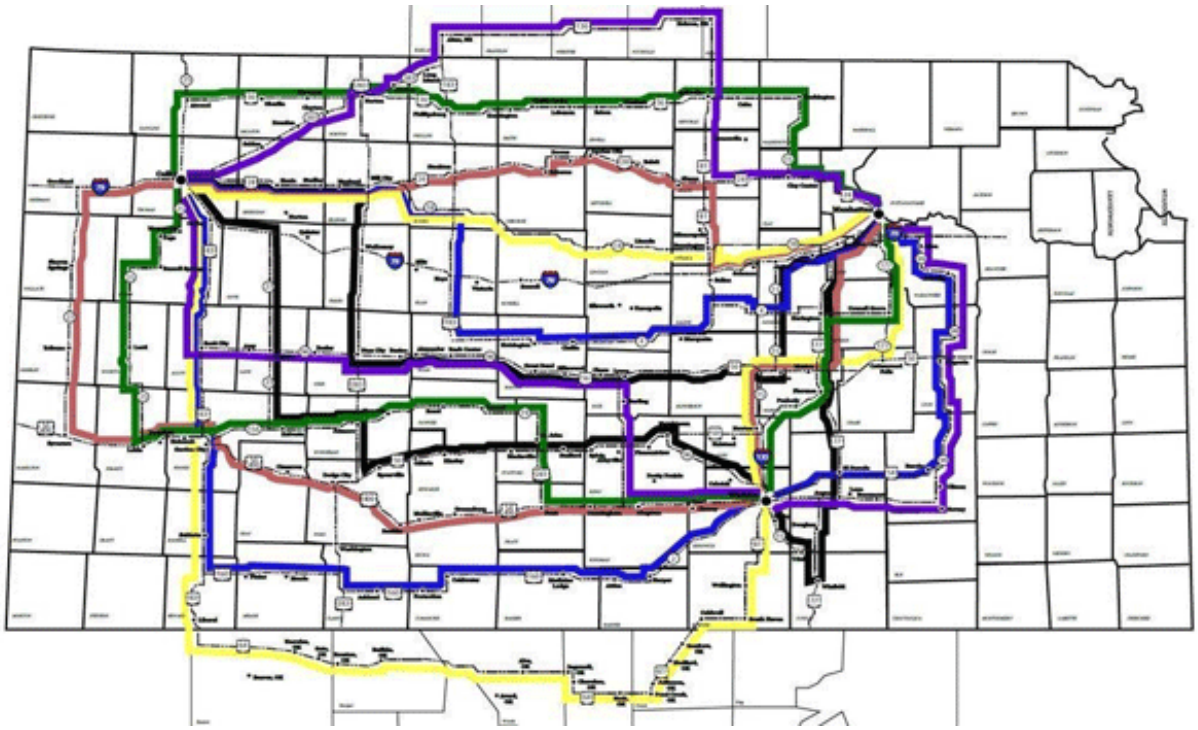


Figure 1. Representation of the six routes (purple, green, pink, yellow, blue, and black) explored during the wheat quality tour. Image courtesy: Wheat Quality Council.

The Kansas wheat crop is currently facing many challenges, as described below. Consequently, the overall 2018 production estimate for Kansas resulting from the tour was 243 million bushels of wheat, compared to 282 million bushels estimated in 2017. Weather conditions during the months of May and early June will be crucial in determining where the final production will actually land.

Drought stress

Several wheat fields sampled in the western portion of the state (from Rush County west) were showing severe symptoms of drought stress, with exception of far northwest Kansas (Figure 2). These symptoms included current drought stress (curling of younger leaves, abortion of older leaves, and yellowing of the lower canopy), and long-term drought stress (extremely reduced plant height and biomass and delayed development). Many of the sampled fields were achieving later stages of development, such as flag leaf emergence and boot, and were only 9-15 inches tall due to the prolonged stress (Figure 2). The lack of growth will not only reduce the yield potential, but also create difficulty during harvest. For fields under these conditions, yield estimates of 25 bushels per acre or less were very common. A rain within the next few days is essential to improve crop

conditions and ensure some level of harvestable grain yield. If no rain occurs in the next few days, producers will have to face the decision of whether to harvest a crop with extremely limited yield potential or to terminate the crop and switch to a summer crop.

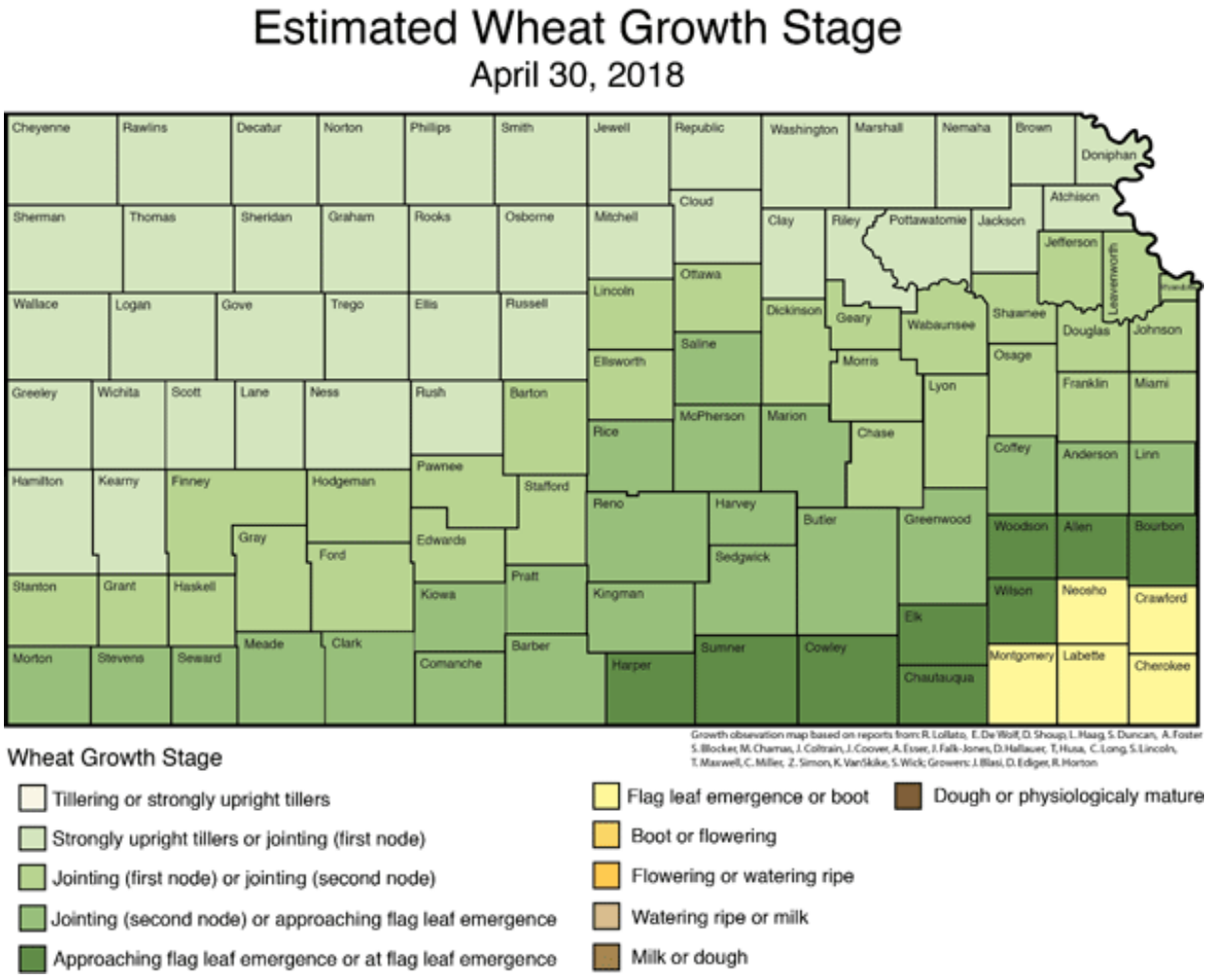
Figure 2. Drought-stressed wheat fields in western Kansas. Symptoms include decreased crop biomass production and height (left, Gove County KS), and curled leaves, abortion of older leaves, and yellowing of lower canopy (right, Ness County, KS). Both fields were between Feekes 7 and 8 (second node to flag leaf emergence) and were about 9 to 13 inches tall. Photos by Romulo Lollato, K-State Research and Extension.

Delayed development

The 2018 Kansas wheat crop is anywhere from two to four weeks behind its normal stage of crop development. For instance, in previous years of the wheat tour, stages of crop development around the state ranged from early grain fill in south central Kansas to boot stage in northwest Kansas (Figure 3). This year, the furthest along fields sampled were in late boot or early heading stages in south central Kansas, and the majority of northwest Kansas is just now jointed (first node, Figure 3). This delayed development is a consequence of drought stress combined with below-average seasonal temperatures, as the departure from normal temperature during the growing season (October 1, 2017 to April 30, 2018) ranged anywhere from zero to minus 13.5 degrees F across the state (Figure 4).

The consequences of this delayed development will depend on the weather conditions during May and June. If conditions are cool and moist, as Kansas experienced in 2015, 2016, and 2017, the crop might still go through favorable grain fill conditions and produce a decent yield. However, if temperatures are normal or above-normal, and precipitation is below-normal, the crop will go through grain fill during warmer conditions (as development will occur later in the year as compared to past years, when there is a greater probability of warmer conditions), which can severely limit grain yield. For fields that are currently at boot stage (south central Kansas), ideal weather conditions would result in as many as 50 days or more until maturity. However, if conditions are warmer and drier-than-normal, the crop might only have about 35 days or less, consequently reducing grain fill

duration. Likewise, where the crop is still at the jointing stages of development, ideal conditions would result in as many as 70 days until maturity. However, warmer conditions might reduce this period to 50 days or less, restricting wheat yield. Drought or heat stress during grain fill limits the photosynthetic production of sugars and decreases the accumulation of starch in the grain, reducing grain test weight and grain yield, consequently increasing the percent protein in the grain.



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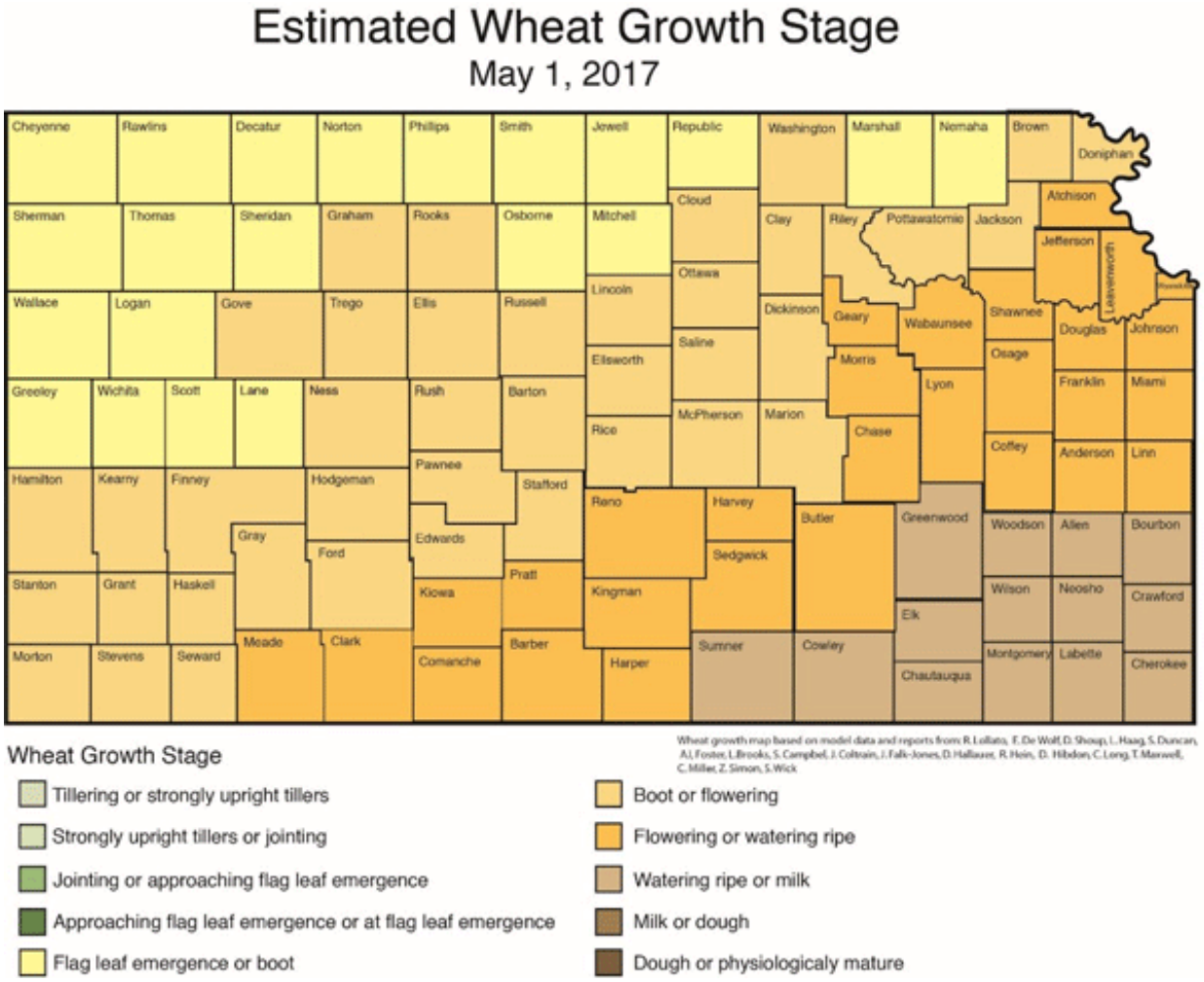

Figure 3. Comparison between estimated wheat growth stage as of April 30, 2018 (upper panel) and May 1, 2017 (lower panel). Note that the most advanced wheat fields in 2018 (boot in southeast Kansas) correspond to the less advanced wheat fields in 2017 (boot in northwest Kansas). Maps courtesy of Erick DeWolf, K-State Research and Extension.

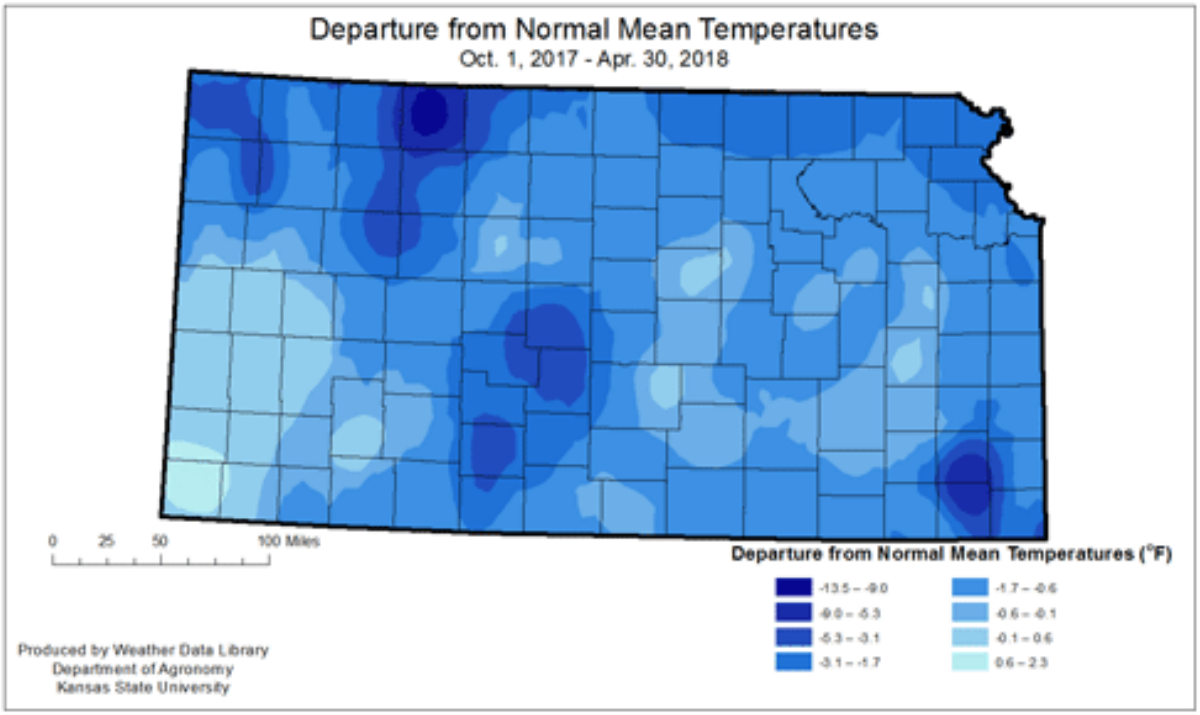

Figure 4. Departure-from-normal mean temperature during the 2018 winter wheat growing season (October 1, 2017 through April 30, 2018). Map courtesy of Mary Knapp, Weather Data Library.

Freeze damage

The majority of the state is showing symptoms of freeze damage in the leaves (Figure 5) but for the most part, the burn back to leaf tissue resulting from freeze should be mostly cosmetic and not result in yield reduction. However, some wheat fields sampled in the central region of Kansas, especially between McPherson and Edwards counties (and surrounding region) were showing signs of freeze damage to the stem and developing heads, including stem and head discoloration and mushy texture (Figure 5). The percent of tillers damaged by the freeze was field-specific and within the fields sampled by our group, ranged from zero to 38%, mostly in the five to 15% range. This freeze damage most likely results from the freeze events observed during April 8 and 16, when temperatures were held below freezing for several hours (for more detail on the freeze events, please check eUpdate issues 685 and 687. If the crop has enough moisture moving forward, it should help compensate for the lost tillers and yield reductions might be minimal. However, we advise producers to scout their fields for freeze damage before further investing in the crop, for example, with foliar fungicides. If the crop has been severely damaged by freeze, yield losses might be severe enough to justify no further investment in the crop.

Figure 5. Left: freeze damage to the stem (brown discoloration) and developing head (white discoloration), photo taken at Edwards County, KS. Upper right: cosmetic damage from freezing temperatures to the leaf tissue, apparent across the entire state. Lower center: white head discoloration due to freeze damage in McPherson County. Lower left: Field showing about 25% tiller abortion due to cold temperatures in Trego County, KS. Photos by Romulo Lollato, Extension Wheat Specialist with Kansas State University.

Stripe rust update

The incidence of stripe rust in the 2018 tour was very low and mostly in the second day of the tour when the group scouted south central Kansas and north central Oklahoma. While at low incidence at this time, stripe rust has been reported in Oklahoma for a few weeks and the recent rainfall events likely brought spores to Kansas fields. It will take approximately two weeks from the time spores are introduced to the fields until the lesions are visible to the naked eye; thus, we advise producers to

scout their fields for the disease in the next few days. The majority of the state is still within the fungicide application window and in case the disease is present, producers still have the option to spray. This decision should take into account the yield potential of the crop, the crop price, disease incidence, weather conditions, variety susceptibility to the disease, and the costs of product and application.

The above factors are a few of the major challenges that the 2018 Kansas wheat crop is currently facing. While all should contribute to restricted wheat yields to a certain extent, the largest uncertainty when estimating wheat production at the state level is the weather during grain filling. Because the crop is severely drought stressed in western Kansas and two to four weeks behind in development for the majority of the state, cool and moist conditions during grain fill are essential to ensure a decent crop. If warm and dry conditions arise, the wheat yield potential can be severely limited.

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2. Inoculation of soybeans: A good insurance policy

When planting soybeans in Kansas, it may be a good insurance policy to inoculate the seed. The *Bradyrhizobium* bacteria forms nodules on soybean roots, and these nodules fix nitrogen from the atmosphere and supply it to the plants. Neither soybeans nor *Bradyrhizobium japonicum* are native to the United States, so there will be no *Bradyrhizobium japonicum* in the soil unless it was introduced at some time in the past by inoculated soybean seed.

Why do we need to inoculate soybean?

1. To enhance good nodulation
2. To improve nitrogen (N) fixation
3. To help ensure a stable yield

Soybeans are big users of nitrogen. For example, a soybean yield of 60 bushels per acre requires 300 lbs N per acre in the plants, removing about 3-4 lbs of N per bushel of seed (Figure 1). Most of the N required by a soybean plant is supplied via biological nitrogen fixation that takes place in nodules on the soybean roots. The nodules, when well established, can provide from 40-80 percent of the soybean plant's N needs for the year. The actual contribution of biological N fixation to the N requirement of soybeans can be influenced dramatically by the amount of residual or mineralized N available in the soil profile or by stress conditions affecting the plant such as drought and heat, inhibiting N fixation due to the cost of maintaining the N fixation process.

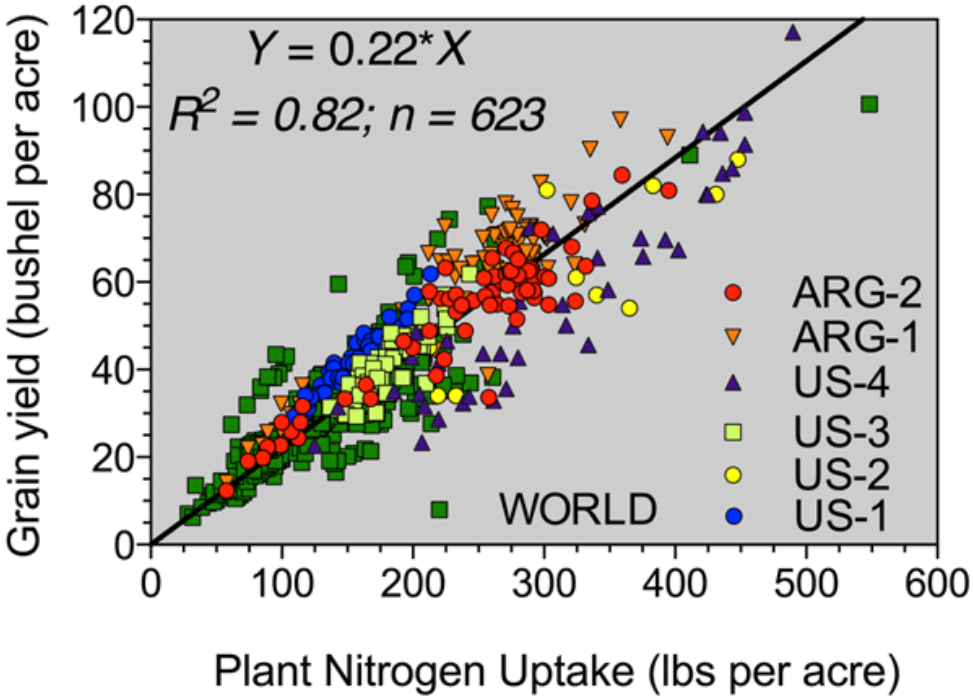

Figure 1. Soybean yield and plant nitrogen uptake relationship from different regions in the US and Argentina. Data reviewed and synthesized by Dr. Ciampitti, K-State Research and Extension.

Yield responses to inoculation have been quite variable in Kansas and other surrounding states. But the cost of buying pre-inoculated seed, or inoculating the seed or soil yourself, is low and the potential yield loss from poor inoculation can be significant unless available soil N levels are high.

Figure 2. The soybeans in the part of the field at left in this photo had good nodulation. The area of the field on the right had poor nodulation and exhibited nitrogen deficiency symptoms. Photo by Tom Maxwell, K-State Research and Extension.

Figure 3. Well-nodulated soybean plants (left) compared to plants without nodulation. Photo by Kraig Roozeboom, K-State Research and Extension.

Soybeans that are poorly nodulated will have to take up most of the N they need from the soil, just like corn, sorghum, wheat, or any non-legume crop. Because N fertilizer is generally not applied for soybeans, a crop that is poorly nodulated will quickly use up the available N in the soil and become chlorotic (yellow) from N deficiency. For poorly nodulated soybeans, N deficiency is usually evident later in the growing season as the nutrient demand increases.

Why is the yield response to inoculation so variable?

There are several reasons for the variability in yield response to inoculation. For one thing, if soybeans have been grown on the field in previous years, there may be enough *Bradyrhizobium* bacteria in the soil to nodulate the soybeans adequately, in which case an inoculant may not benefit the crop. But if there is not enough *Bradyrhizobium* in the soil, the inoculant may increase yields by 2 bushels per acre or more on fields that have had soybeans in the recent past. On fields where soybeans have never been grown, the inoculant can often increase yields by 10 bushels per acre or more (Table 1).

Table 1. Effect of soybean inoculant on land with no prior history of soybeans

	Kansas River Valley Experiment Field, Rossville	**Southwest Research-Extension Center, Garden City**
Treatment	Soybean yield (bu/acre)	
None	56.9	33.9
Seedbox inoculant	57.8	39.6
Seed-applied inoculant	66.4	43.5
LSD (.05)	9.8	3.6

Source: C.W. Rice and L.D. Maddux, Kansas Fertilizer Research 1992, K-State Report of Progress 670; C.W. Rice and M. Witt, Kansas Fertilizer Research 1991, K-State Report of Progress 647.

Even on fields with no history of soybean production, inoculation may increase nodulation but still have no effect on yields – especially if the yield environment is low and soils have enough available N to supply the crop's needs (Figures 4 and 5).

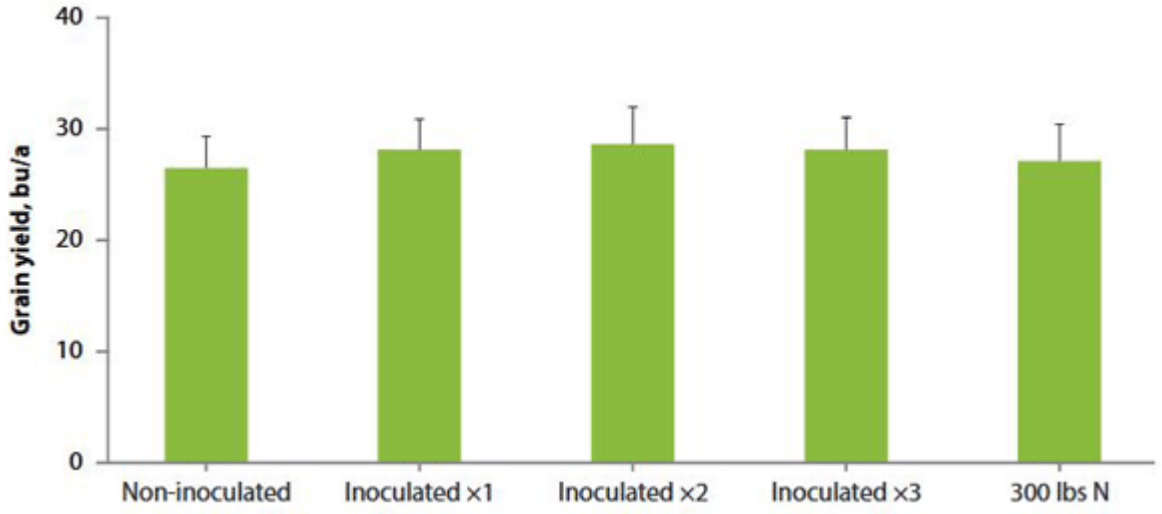

Figure 4. Soybean yield at East Central Experiment Field, 2016. Treatments include inoculation at normal, 2X, and 3X rates; and 300 lbs/acre of N. There were no significant yield differences. Data from K-State agronomists Ignacio Ciampitti, Eric Adee, Jim Kimball, and graduate student G.I. Carmona: http://newprairiepress.org/cgi/viewcontent.cgi?article=1233&context=kaesrr

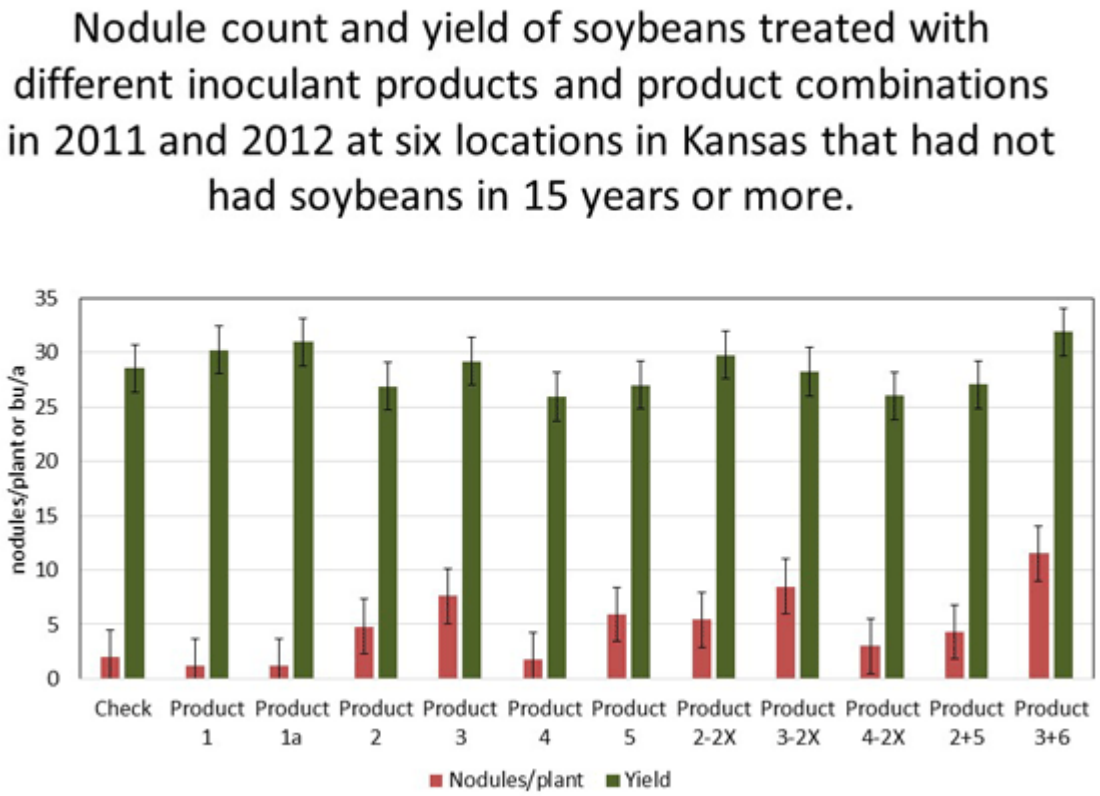

Figure 5. Research by K-State agronomists Kim Larson, Kraig Roozeboom, and Chuck Rice. http://krex.k-state.edu/dspace/handle/2097/16303

Yield response to inoculants can also depend on soil pH, environmental conditions, and other factors.

Soybeans should be inoculated in the following circumstances:

- Where the field has not been planted to soybeans for the past four years or more: *Bradyrhizobium japonicum* do not compete especially well with other soil microbes over time, and their numbers often gradually decline unless a host plant (soybeans) is grown every few years or new populations of the bacteria are introduced regularly from inoculated seed.
- Where the soil pH is less than 5.5 or greater than 8.75: *Bradyrhizobium japonicum* does not survive well in the soil under these pH extremes, and good soybean nodulation is unlikely unless the seed is inoculated. At more normal pH levels, from pH 5.5 to 7.5, the effect of inoculation will vary with the other conditions mentioned above. However, soybean yields will be reduced at pH levels below 6.0 regardless of inoculation (Figure 6).

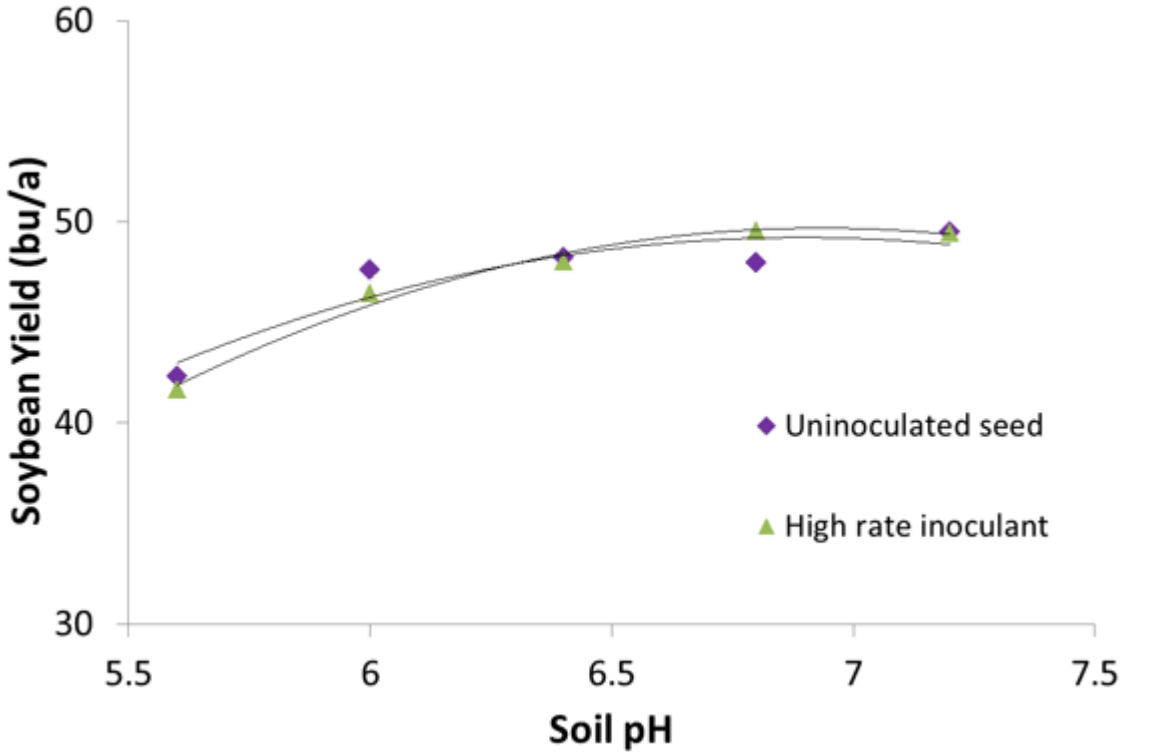

Figure 6. Lower pH levels reduced soybean yields in this research by K-State agronomists Doug Shoup, Dan Sweeney, and Ignacio Ciampitti. In this research, inoculation had no significant effect on yields. This field has beans in the rotation every other year, so a response to inoculation isn't necessarily expected.

- Where soil erosion has occurred since the last time soybeans were grown: If some of the topsoil has been lost, the remaining topsoil will need to be replenished with *Bradyrhizobium*

japonicum from the seed inoculant.

- Where soil organic matter levels are less than 1 percent: Soils with low organic matter levels have less *Bradyrhizobium japonicum* and need to be replenished with new sources from the seed inoculant.
- Where there has been severe drought or flooding: Severe drought and flooding reduce *Bradyrhizobium japonicum* populations in the soil. Just a couple days of saturated soils, however, should not adversely affect *Bradyrhizobium japonicum* populations in the soil.

Based on previous information, inoculation is usually effective when:

1. Soybean was never planted before or in the past 3 to 5 years
2. Soil pH is below 6.0
3. Soil has a high sand content
4. Field has been flooded for more than a week, creating anaerobic conditions, when nodulation was supposed to become established
5. Early-season stress conditions (e.g. heat) affects plant-bacteria establishment

Producers should be aware that inorganic soil N will reduce nodulation and N fixation by *Bradyrhizobium japonicum* bacteria. Where soil N levels are 40-60 lbs per acre or more, soybean plants may look fine, yet have reduced nodulation. At very high N levels, such as where the field was fertilized for corn but the producer decided to plant soybeans instead, there may be little or no nodulation. In most cases, up to 20 lbs N per acre can be applied as a starter fertilizer to help get the soybeans started without having any detrimental effect on nodulation during the growing season (unless the upper layer of soil is already rich in inorganic N at planting time).

Soybean inoculation is basically "cheap insurance" against a potential N deficiency problem. Even if soybeans have been planted in the field recently, it doesn't cost much to inoculate the seed.

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3. Factors affecting successful soybean inoculation and nodulation

If soybean plants are chlorotic (yellow) and nitrogen (N) deficient despite being inoculated, that probably indicates the inoculant has failed.

Assessing nodulation in the field

In the field, nodules from some soybean plants can be crushed to assess their internal color. In general, a pink or reddish internal color indicates the rhizobia is actively fixing N. On the other hand, a dark gray or whitish color indicates the rhizobia is not effectively fixing N. This color will be difficult to see in very young or very old nodules. Nitrogen fixation slows down, and nodules begin to senesce (deteriorate) during seed fill as the plant directs most of its resources to reproduction.

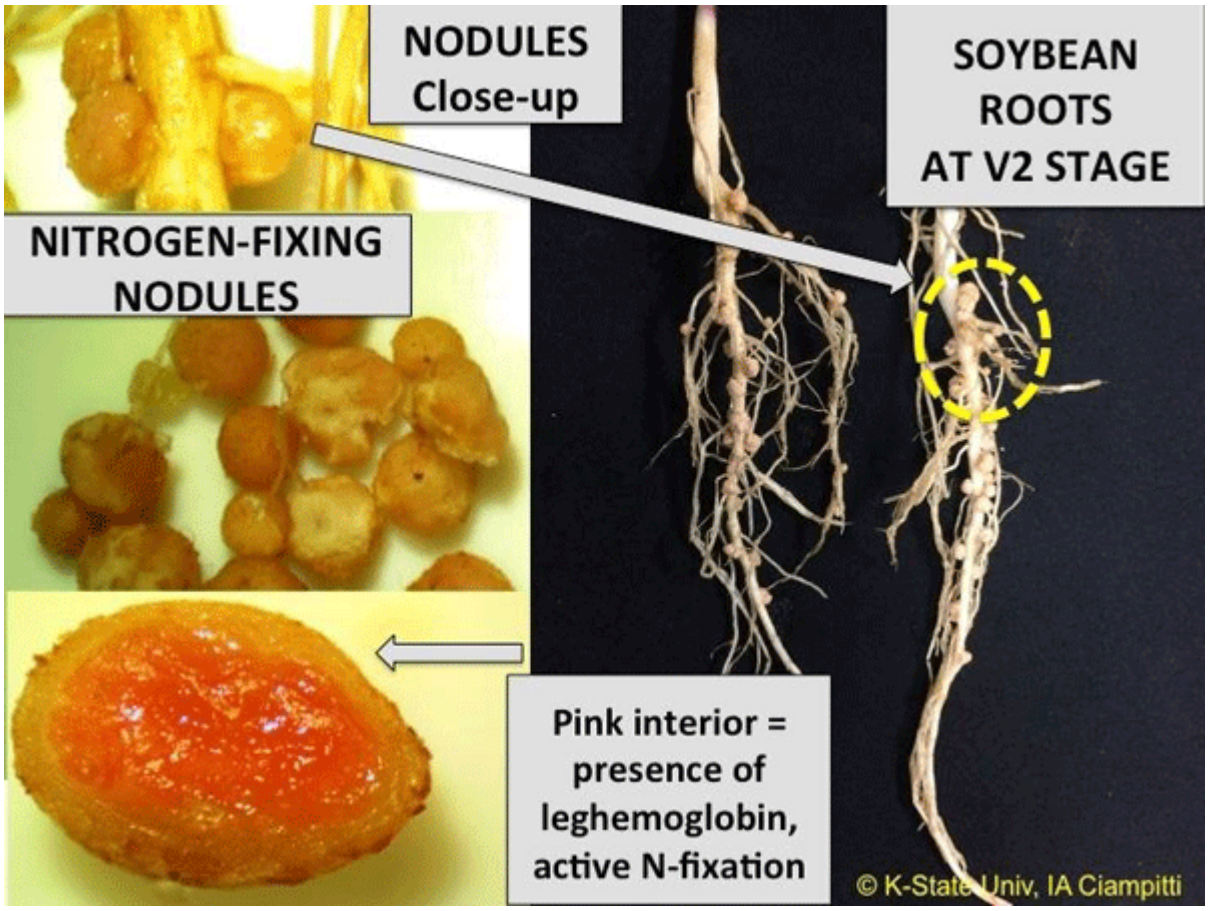

Figure 1. Close-up of soybean nitrogen-fixing nodules. Photos by Ignacio Ciampitti, K-State Research and Extension.

What factors affect inoculation response?

Several factors can result in poor nodulation or failure of inoculation:

1. Poor or inadequate coverage of the seeds by the inoculum during inoculation.
2. Contamination of inoculant with foreign materials.
3. Lack of competitiveness of the introduced *Rhizobia* strain compared to the indigenous *Rhizobia*.
4. Lack of persistence in the soil: The introduced *Rhizobia* should be able to grow and remain viable in the soil and in between crops without undergoing mutation.
5. Low soil phosphorus (P): Legumes need adequate P for proper growth and pod development. Low P can result in poor nodulation and reduced N fixation. Phosphorus deficiency can negatively affect seed development and pod formation leading to low yield.
6. Soil pH: This is an important environmental factor. Most legumes grow and nodulate well at pH 5.6 to 6.7. The best soil pH for *Rhizobium* lies between pH 6 to 7. Low pH soils require liming. In general, legume responds well to liming. Low pH (< 5) causes aluminum (Al) and manganese (Mn) toxicity, and results in P deficiency.
7. Soil nitrate and ammonium levels: High inorganic N (ammonium and nitrate) levels in the soil inhibit nodulation and N fixation. The effectiveness and competitiveness of *Rhizobia* are negatively affected by high inorganic nitrogen.
8. Molybdenum (Mo): Soils deficient in Mo can have reduced nitrogen fixation. Mo, an essential micronutrient, is needed for the formation and function of the nitrogenase enzymes. Legumes also need other micronutrients such as iron, boron, and copper.
9. Stress, either in the form of drought, excessive soil moisture, and high temperatures can reduce nodulation.

If the inoculation has failed, producers may need to apply N to their soybean crop. Depending on the projected yield potential, producers may need to apply as much as 120-180 lbs N/acre.

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4. Update on corn planting progress in Kansas

Combined effects of cool weather during the last week of March and first weeks of April, with the much-needed rain in the last few days, keep delaying corn planting this year. In 2017, close to 50% of the corn had been planted by the first week in May. The latest numbers from the USDA National Agricultural Statistics Service show just 27% planted as the week ending on April 30th (Figure 1). The majority of progress has been in the Southeastern Division, followed by the East Central and Northeastern Divisions.

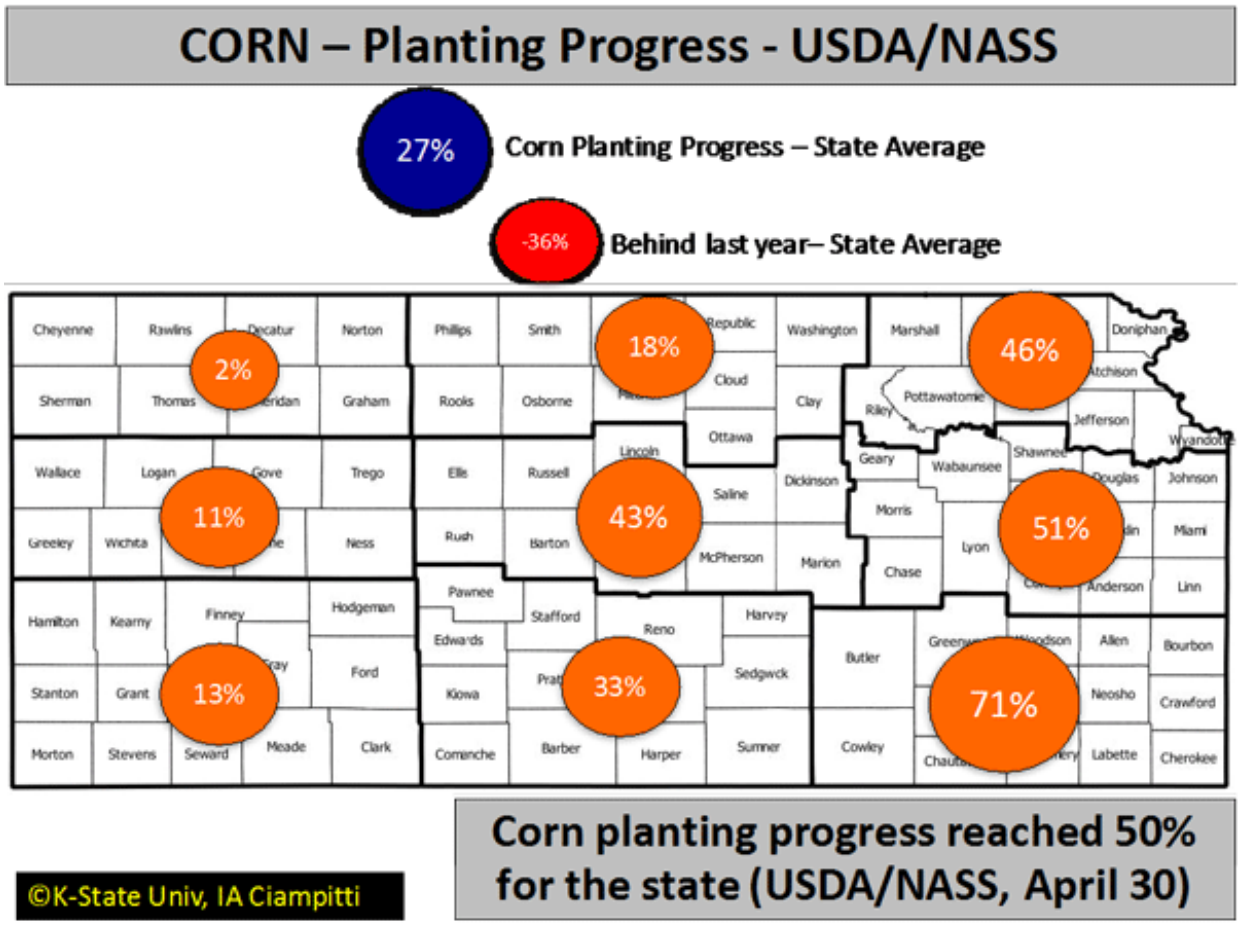

Figure 1. Corn planting progress as of April 30, 2018. Source: USDA/NASS.

Rainy conditions could present challenges for planting corn into ideal soil moisture. It is best to allow time for the soil to dry adequately before tillage or planting operations if at all possible. Wet conditions will make the soil more susceptible to compaction. Compaction can occur in the seed furrow itself, restricting proper root development, diminishing nutrient accessibility and early plant growth.

If wet weather conditions persist for more than a week, corn emergence will be delayed and seedlings will be more vulnerable to the presence of insects and diseases. Uneven corn stands likely

will be greater when planting in cold and wet soils. This situation will directly affect plant-to-plant uniformity, impacting potential yield.

Weather outlook for Kansas

For the next 7-days, ending on May 11 (Figure 2), the outlook for precipitation shows a probability of receiving from an inch (southeast Kansas) to less than a tenth of an inch of rain (western Kansas), adding to the limited precipitation already received this past month (Figure 3). Given the dry conditions in the western and southwest parts of Kansas, this is unlikely to limit field work, but may provide a more favorable moisture environment. Warmer-than-normal temperatures will help warm soil temperatures to more favorable ranges. You can monitor changes in soil temperatures at the Kansas Mesonet: http://mesonet.k-state.edu/agriculture/soiltemp

The precipitation outlook for the medium-term (6-10 and 8-14 days) is calling for near normal conditions across all but the western parts of the state, followed by drier-than-normal conditions to end the period (Figure 4).

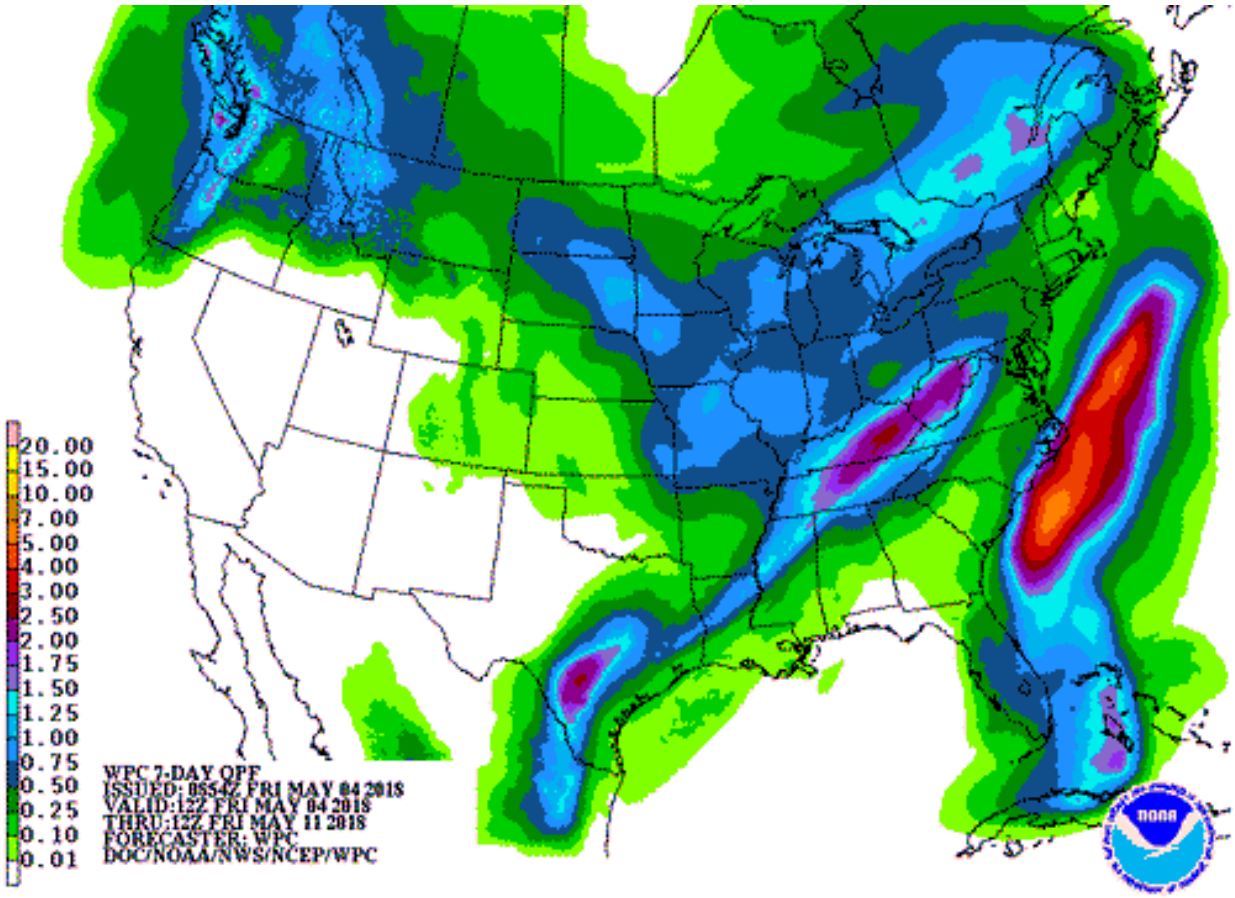

Figure 2. 7-Day Outlook Precipitation Probability from May 4 – May 11 (NOAA).

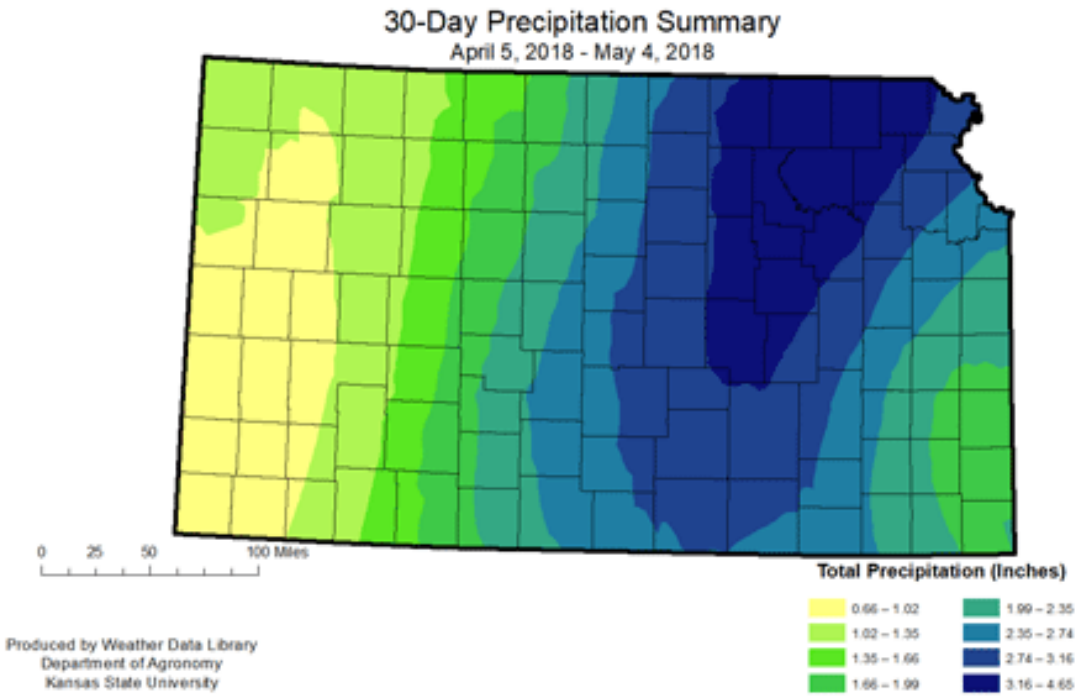

Figure 3. Seasonal precipitation summary, April 5 – May 4, 2018.

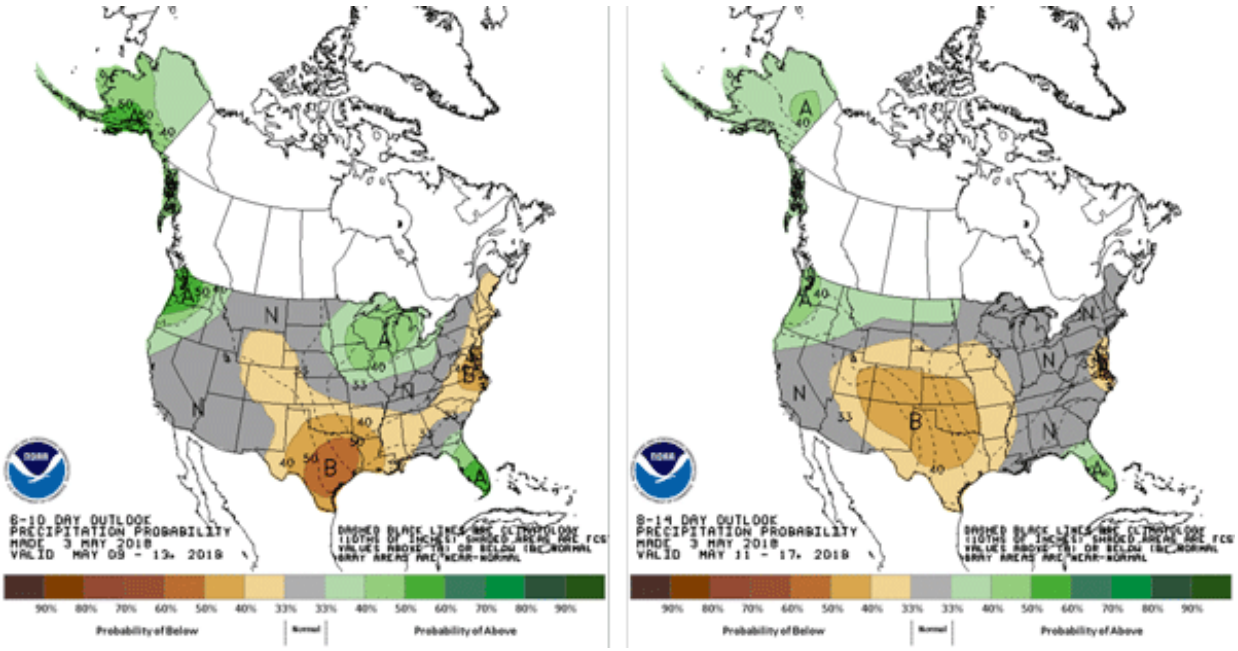

Figure 4. 6-10 (left panel) and 8-14 (right panel) Day Outlook Precipitation Probability from NOAA.

Optimal soil conditions have a large impact on corn uniformity and early growth. Lack of uniformity in emergence can greatly impact corn potential yields.

There is still time to plant corn and get good yield potential. If possible, wait and plant under uniform soil temperature and moisture conditions to guarantee a more uniform early-season stand of plants.

More information about corn planting progress and late-planted corn will be discussed in upcoming issues of the Agronomy eUpdate. Stay tuned!

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5. Spring Crops Field Day: Southeast Research and Extension Center, May 22

The Southeast Research and Extension Center in Parsons will host a Spring Crops Field Day on Tuesday, May 22 to update producers in the region on the latest information on wheat varieties, crop production, and disease management.

The field day starts with registration and a complimentary breakfast courtesy of several sponsors from 7:30 to 8:30 a.m. at the Southeast Research and Extension Center, 25092 Ness Road, (immediately south of U.S. Highway 400), Parsons, Kansas.

The program includes:

Wheat Variety Plot Tour – Allan Fritz, K-State wheat breeder, Lonnie Mengarelli, K-State research assistant, and seed company representatives

2018 Grain Markets: Outlooks and Strategies – Dan O'Brien, Extension Agricultural Agronomist, K-State Research and Extension

Managing Root Diseases of Soybean in Kansas – Chris Little, Plant Pathologist, K-State

Timing of Side-dress Applications of Nitrogen for Corn Grown in Different Tillage Systems – Dan Sweeney, Soil and Water Management, K-State Southeast Agricultural Research Center

There is no cost to attend. In the event of rain, the program will be conducted indoors. Please contact Marla Sexton at 620-820-6133 for more information.

6. Spring Field Day: Southwest Research and Extension Center, May 23

The Southwest Research-Extension Center will host its Spring Field Day on Wednesday, May 23. Registration and introductions will begin at 4:00 p.m. The event will conclude at 7:00 p.m. with supper. The Center is located at 4500 E. Mary Street, Garden City, Kansas.

The Spring Field Day is an annual event hosted at the Southwest Research and Extension Center for more than a decade. It provides an opportunity for K-State researchers to engage with local producers, provide updates, and receive feedback on the status of current research programs.

Producers attending the field day will learn about wheat and canola varieties and agronomy management practices to maximize productivity.

This field day provides a platform to keep producers up-to-date on new research and technology and serves as a medium for dialogue between researchers and producers. Producers should consider this conference as an opportunity to refresh basic principles and to learn new principles they can apply to their own situation.

The event is free and supper will be provided courtesy of industry supporters. Continuing education credits have been applied for and should be available at this meeting.

Advance registration is important to ensure supper will be available for all attendees. Please contact Ashlee Wood at 620-276-8286 or email awood22@ksu.edu by **5 p.m. on May 18** to register.

For more information on the program, contact A.J. Foster at 620-276-9164, or email anserdj@ksu.edu.

SOUTHWEST RESEARCH-EXTENSION
SPRING FIELD DAY
MAY 23, 2018
4:00 – 7:00 PM (CST)

K-State Southwest Research-Extension Center
4500 E. Mary Street, Garden City, KS 67846

Topics & Tours to be covered include:

Wheat Variety Tour
Canola Variety Tour
Agronomy Management Discussion
(fertility, wheat protein, fungicide, weeds, insects, irrigation, PGR etc.)

Cost: None – Sponsored Supper Provided

Advance registration is required by May 18, 2018
RSVP online at http://www.southwest.k-state.edu or contact Ashlee Wood by email awood22@ksu.edu or call (620)276-8286

(CEUs applied for and should be available at this meeting)

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7. K-State Composting School - Last day to register is Friday, May 4

The Kansas Composting Operators' School provides hands-on training in municipal, agricultural, and commercial large-scale composting for operators and managers of compost facilities who want to gain knowledge and experience in composting. Regulatory staff, environmental consultants, and compost equipment company employees also frequently attend. This year there will be two offerings that will cover the same material but the tours will be different (see below):

- **Hays, May 9-10** – Tour a feedyard and learn about dead animal and manure composting. Classroom is located at the Western Kansas Agricultural Research Center in Hays.
    - Instructors: DeAnn Presley, KSU Agronomy; staff from KDHE Bureau of Waste Management; and Brittany Howell, Fort Hays State University.

- **Winfield, May 15-16** – Tour the city of Winfield's compost facility. Classroom is located at the Cowley County Fairgrounds.
    - Instructors: DeAnn Presley, KSU Agronomy; and staff from KDHE Bureau of Waste Management.

The program includes two full days of classroom and laboratory instruction along with field activities. Field activities will include a demonstration of composting equipment such as a turner, and collection of compost samples for testing for maturity as well as chemical and physical properties.

Training topics:

- Composting science and methods
- Compost biology
- Compost feedstocks
- Food waste composting
- Mortality composting
- Determining compost mixes
- Permit and legal requirements
- Site design and maintenance
- Compost equipment
- Windrow construction and aeration
- Compost moisture
- Field and laboratory monitoring
- Learn to measure moisture, temperature, pH, soluble salts, maturity, interpreting laboratory data
- Compost quality and use
- Methods of composting: static versus active

The fee for the school is $180 and includes lunches, breaks, and training materials. Hotels are not included, however both cities have several options for overnight stay. Payment must accompany registration (payable to KSU Agronomy).

A registration form can be downloaded and printed here. Mail to: Extension Agronomy, 2014 Throckmorton Plant Sciences Center, Kansas State University, Manhattan, KS 66506.

Online registration is available for those who wish to pay with a credit card (additional fees apply), http://www.agronomy.k-state.edu/extension/soil-management/

Registration is due by May 4, 2018. Class size is limited to 20 people so don't wait too long to sign up!

For more information contact DeAnn Presley, 785-532-1218, deann@ksu.edu

Kansas Composting Operators' School

K-STATE Research and Extension

Hays: May 9-10, 2018
Winfield: May 15-16, 2018

The Kansas Composting Operators' School provides hands-on training in municipal, agricultural, and commercial large-scale composting for operators and managers of compost facilities who want to gain knowledge and experience in composting. This year we will have two classes.

- Hays, May 9-10, 2018: Tour a feedyard and learn about dead animal and manure composting. Classroom: KSU Research Farm.
- Winfield, May 15-16, 2018: Tour City of Winfield's facility. Classroom: Cowley County Fairgrounds.

The program includes classroom and laboratory instruction along with field activities. Field activities will include a demonstration of composting equipment such as a turner, and collection of compost samples for testing for maturity as well as chemical and physical properties.

For information:

DeAnn Presley
KSU Agronomy Department
2014 Throckmorton Plant Sci. Ctr.
Manhattan, KS 66506
785-532-1218
email: deann@ksu.edu

Training Topics

- ✓ Composting science and methods
- ✓ Compost biology
- ✓ Compost feedstocks
- ✓ Food waste composting
- ✓ Determining compost mixes
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- ✓ Field and laboratory monitoring:
- ✓ Learn to measure moisture, temperature, pH, soluble salts, maturity, interpreting laboratory data
- ✓ Compost quality and use
- ✓ Methods of composting: static versus active

REGISTRATION: Kansas Composting Operators' School

Name_____ I prefer to attend (circle): Hays Winfield

Address_____City_____State_____ZIP_____

Phone_____ E-Mail_____

Company/Agency:_____

Please mention any mobility issues or dietary preferences here:_____

Fee: $180 – Includes lunches, breaks, and training materials. (Hotels are not included, both cities have several options to choose from). Payment (payable to KSU Agronomy) must accompany registration. Mail to: Extension Agronomy, 2014 Throckmorton Plant Sciences Center, Kansas State University, Manhattan, KS 66506. Online registration available for those who want to pay with a credit card (additional fees apply), http://www.agronomy.k-state.edu/extension/soil-management/ Registration due by May 4, 2018. Class size is limited to 20 people.

8. Kansas wheat management survey - Producer input needed

The Wheat Production Group at Kansas State University has joined forces with the Kansas Wheat Commission to learn from wheat producers around Kansas. We are conducting a **wheat management survey** across several fields around the state so we can analyze and evaluate the collected data later in order to **develop best management practices** for different regions around the state.

On-farm research surveys are different than a typical controlled research experiment as they collect management strategies which a producer has adopted on their individual fields. The **main objective** of this project is to collect field-level information about wheat management for hundreds of wheat fields around Kansas so we can **learn about the most successful management practices adopted for each region**. We are currently collecting data from the past two growing seasons (2015-16 and 2016-17), and from 2017-18 in the near future.

This project is funded through the Kansas Wheat Commission and the **survey can be completed on-line, in person, or over the phone** – whichever is the most convenient for you, the wheat producer. Your identity will be confidential and no personally identifiable information will be associated with your responses. Data will only be presented as aggregated and never on a field by field basis.

If you could spend a few minutes to help us learn more about successfully management practices in your own operation, we would be extremely grateful. You will be helping Kansas State University and the Kansas Wheat Commission **improve our current management recommendations with your own experiences.**

To complete the online survey, please visit: http://kswheat.com/on-farm-research-survey

If you prefer in person or a phone survey, please contact Brent Jaenisch at 785-370-1273 or at bjaenisch5@ksu.edu.

By participating in this survey, you will be automatically entitled to a **detailed report in the end of the project** so you learn about our findings before anyone else.

If you have any questions or concerns don't hesitate to contact us.

KANSAS WHEAT | K-STATE Research and Extension

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