Issue 633

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Research and Extension

Extension Agronomy

eUpdate

05/12/2017

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, 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 Steve Watson, 785-532-7105 swatson@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. 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 on 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 N. 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 (Fig. 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.

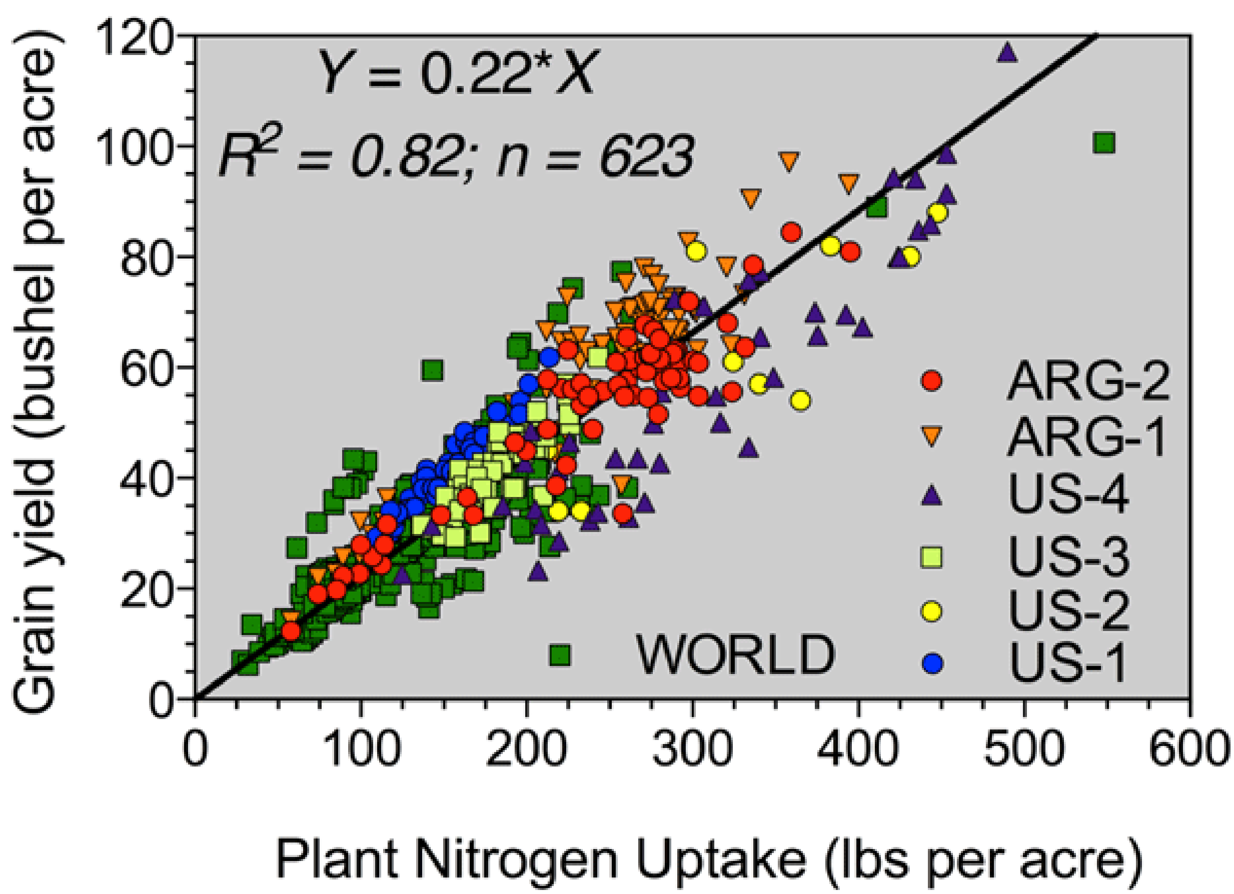

Figure 1. Soybean yield and plant nitrogen uptake relationship from different regions in the US and Argentina. Data reviewed and synthesized by Dr. Ciampitti, K-State Research and

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 lost 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.

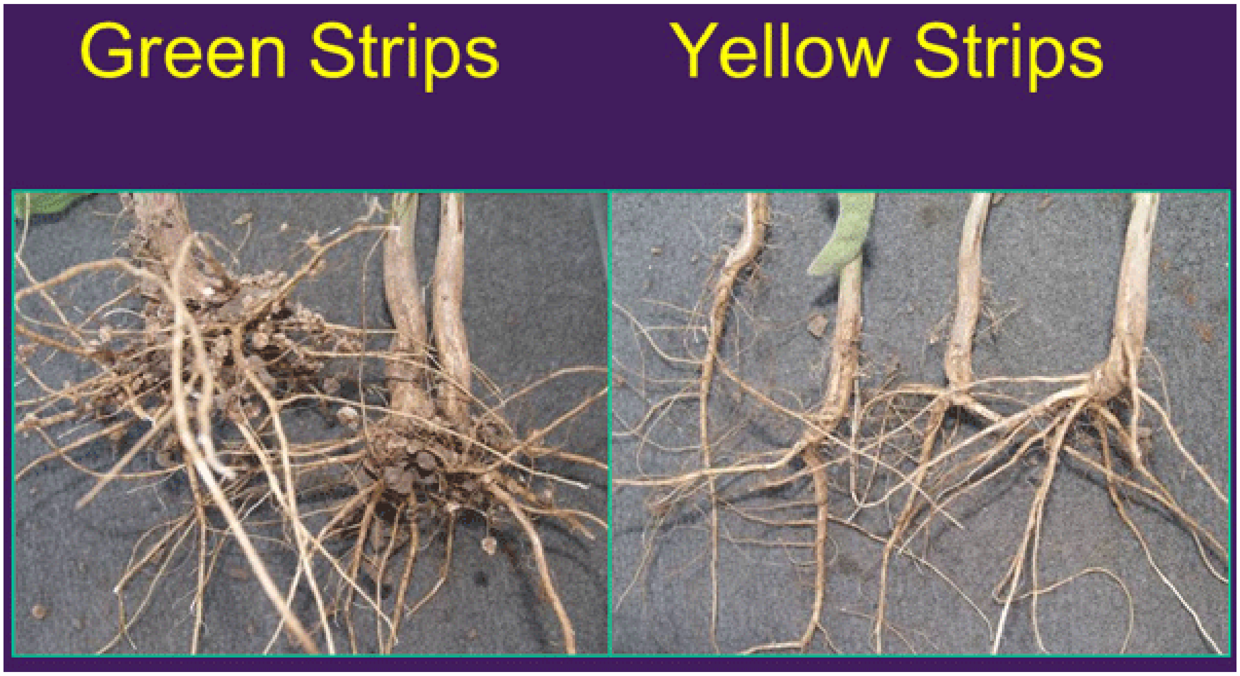

Figure 3. Well-nodulated soybean plants (left) compared to plants without nodulation. Photo by Kraig Roozeboom, K-State Research and Extension.

Soybeans that are poorly nodulated will have to take up most of the N they need from the soil, as would corn, sorghum, wheat, or any non-legume crop. Since 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 from N deficiency. For none or poorly nodulated soybeans, N deficiency is usually evident later in the growing season as the nutrient demand increase more proportionally.

Why is the yield response to inoculation so variable? There are several reasons.

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).

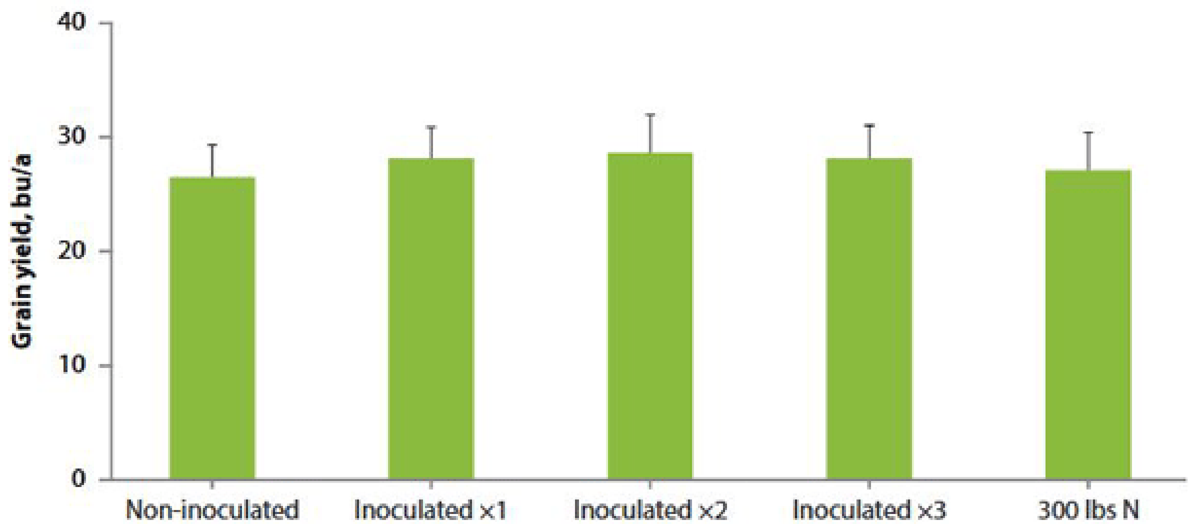

Figure 4. Soybean yield at East Central Experiment Field, 2016. Treatments include inoculation at normal, 2X, and 3X rates; and 300 lbs/acre of N. There were no significant yield differences. Data from K-State agronomists Ignacio Ciampitti, Eric Adee, Jim Kimball, and graduate student G.I. Carmona: http://newprairiepress.org/cgi/viewcontent.cgi?article=1233&cont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

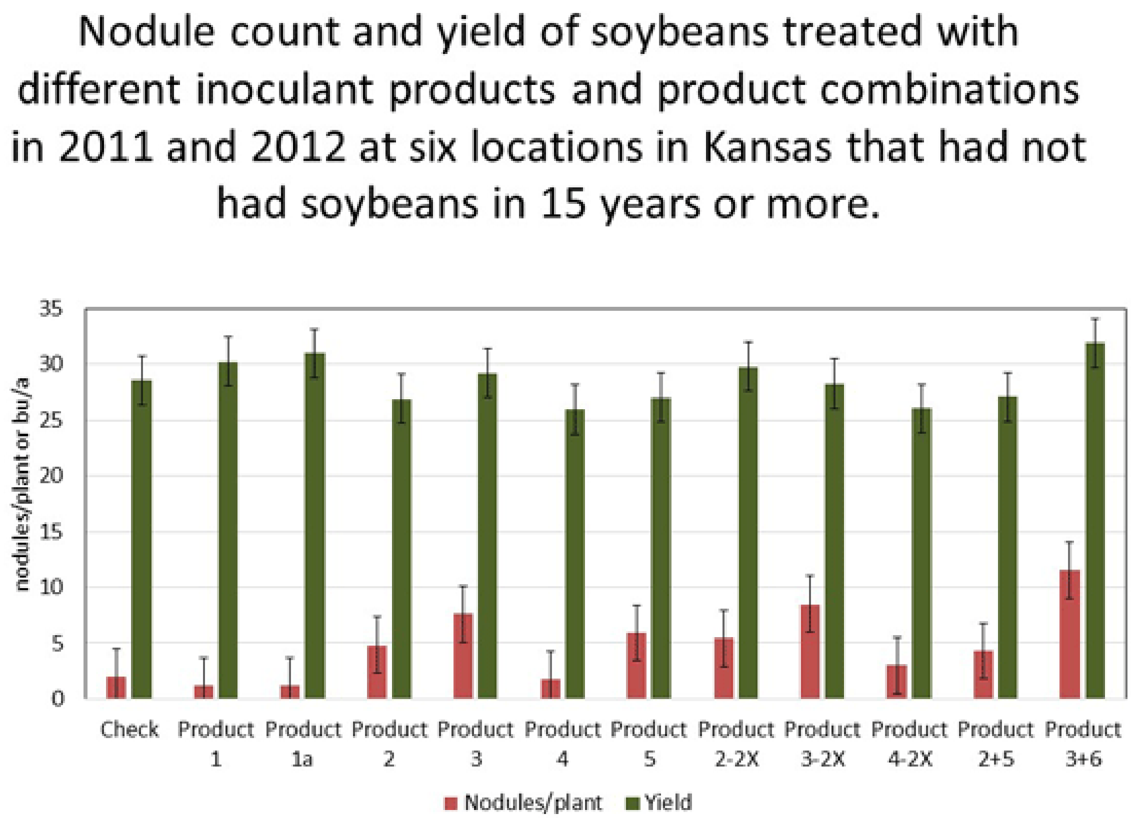

Figure 5. Research by K-State agronomists Kim Larson, Kraig Roozeboom, and Chuck Rice.
http://krex.k-state.edu/dspace/handle/2097/16303

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 875. *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 5.5-7.5, the effect of inoculation will vary with the other conditions mentioned above. Soybean yields will be reduced at pH levels less than 6.5, however (Figure 6).

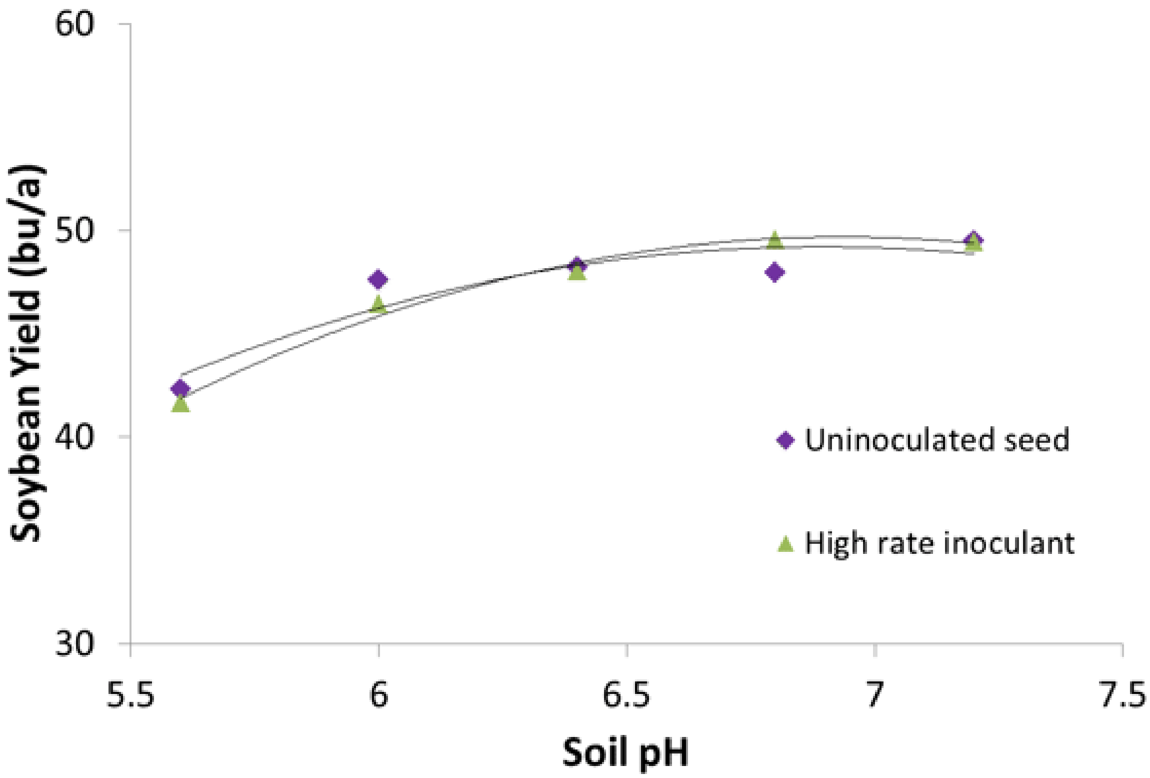

Figure 6. Lower pH levels reduced soybean yields in this research by K-State agronomists Doug Shoup, Dan Sweeney, and Ignacio Ciampitti. In this research, inoculation had no significant effect on yields. This field has beans in the rotation every other year, so a response to inoculation isn't necessarily 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 both 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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2. Factors affecting successful soybean inoculation and nodulation

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

Assessment: In the field, nodules from some soybean plants can be crushed to look at or assess their internal color. In general, pink or reddish interior color of nodules is indicative of the rhizobia actively fixing N. On the other hand, dark gray or whitish interior color of nodules indicate the ineffectiveness of the rhizobia in fixing N.

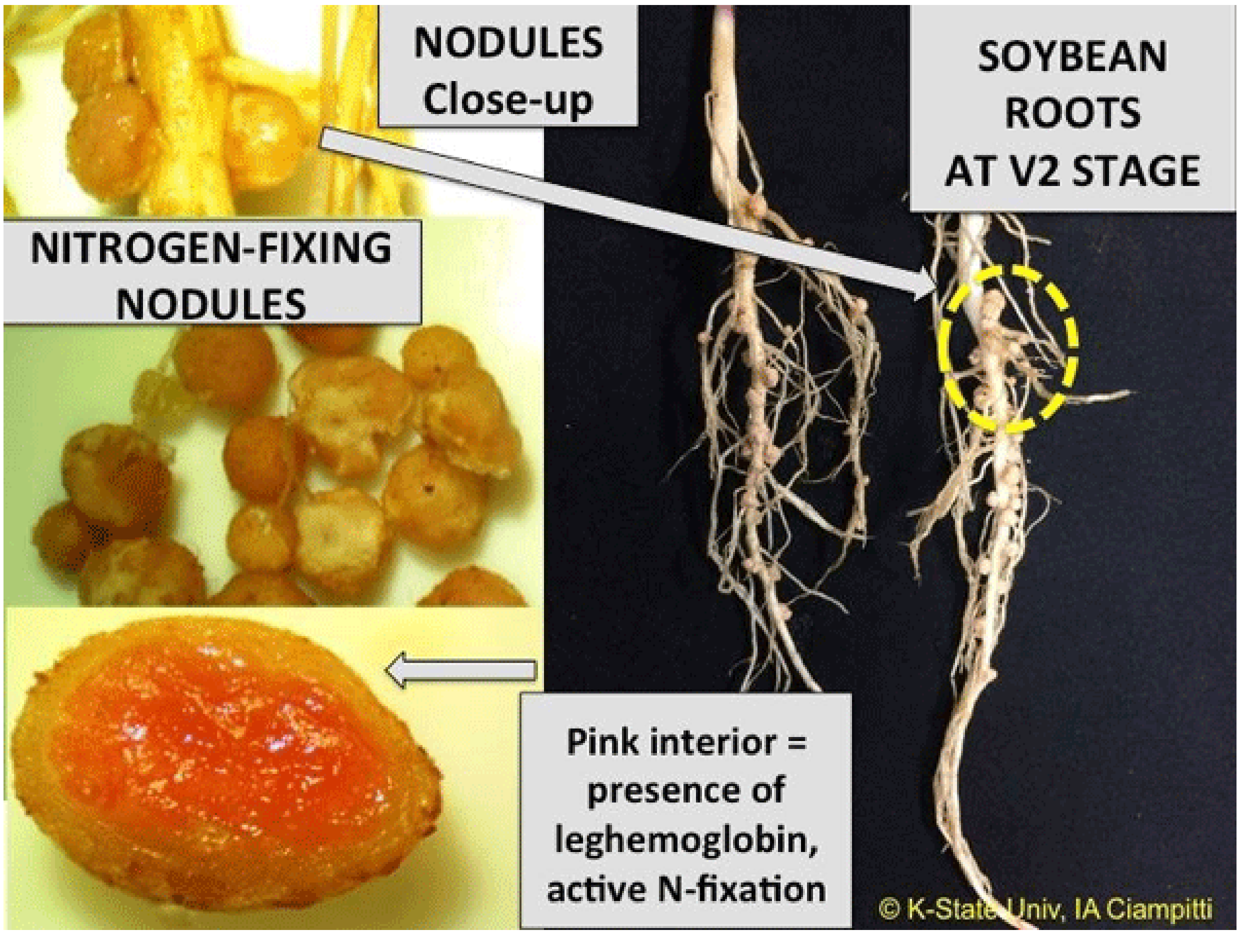

Figure 1. Close-up of soybean nitrogen-fixing nodules. Photos by Ignacio Ciampitti, K-State Research and Extension.

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 other 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 phosphorus 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 an important environmental factor. Most legumes grow and nodulate well at pH 5.6 - 6.7. The best soil pH for *Rhizobium* lies between pH 5.8-6.8. Low pH soils require liming. In general, legume responds well to liming. Low pH (< 5) causes Al and Mn toxicity, and results in P deficiency.
7. Soil nitrate and ammonium levels: High inorganic nitrogen (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 80-100 lbs N/acre in that case.

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3. Pigweed control in double crop soybeans

Getting good control of Palmer amaranth and common waterhemp in Kansas has become more of a challenge in recent years. Many populations are now resistant to either glyphosate, triazine, ALS-inhibitor herbicides, HPPD-inhibitor herbicides, PPO-inhibitor herbicides – or a combination of those modes of action. As wheat harvest approaches over the next few weeks in Kansas, producers should plan now for good weed control ahead of double crop soybean.

There are several ways producers can try to manage pigweeds in doublecrop soybeans. However, all of them involve higher costs than in the past when one or two postemergence applications of glyphosate could control pigweeds in doublecrop Roundup Ready soybeans.

It is common for pigweed to emerge from the early spring through late summer. Because of the ecology of the winter wheat crop, a higher percentage of pigweed emergence can occur a bit later in the season than on fields where wheat is not growing. This can put additional pigweed pressure on double crop soybean.

The critical weed-free period in soybean is through the V3 developmental stage to avoid economic yield loss. However, due to the vast seed production capabilities of pigweed, a better strategy is to reduce pigweed emergence and ultimately seed production throughout the development of the double crop soybean.

There are non-chemical options for controlling pigweeds after harvest. Tillage is an effective option for weed control prior to double crop soybean planting. However there are a few drawbacks to this practice. Long-term tillage studies in southeast Kansas tend to show a yield advantage to no-till double crop soybean vs. tillage prior to soybean planting. This is likely due to having some residue during a hot and dry part of the season to help cool the soil and conserve moisture. In addition, tillage may slow double crop soybean planting in an already shortened growing season that may negatively impact yield.

Burning wheat stubble can provide good weed control, although many producers have moved away from this practice for a number of reasons including loss of residue, loss of nutrients, depletion of soil organic matter, and safety.

Many times producers rely on chemical control for pigweed control prior to double crop soybean planting. Some of the possible chemical options for controlling pigweeds include the following practices:

1. There are a few residual herbicides that can be applied to the standing wheat crop several weeks before harvest, including Prowl H2O and Zidua (check label for wheat growth stage restrictions for application). However, these treatments are usually applied 90 days ahead of wheat harvest and begin to break down prior to the big flush of pigweeds. Consequently, they have shown inconsistent results in controlling pigweeds in the standing wheat crop.

2. Paraquat is an older herbicide but has made a resurgence in use by producers because of how effective it is on pigweeds. Excellent burndown control of emerged pigweeds after wheat harvest has been observed over the last several years. However, paraquat has no residual activity so it does not provide control of later-emerging pigweeds. Therefore it is critical that it be applied in combination with preemerge herbicides that offer residual control of pigweeds.

Some caution should be taken when using paraquat. It is a contact herbicide, so using a minimum of 15-20 gallons per acre is needed for best control. Also, it is one of the most toxic herbicides to humans so producers need to take steps to avoid coming in contact with chemical and spray droplets in order that no one be exposed to the product. In addition, it is very toxic to nearly all plants. If any drift occurs it will be very obvious because of leaf spotting. Producers should not use this product in drift-prone conditions or near sensitive plants.

3. Another possible option for burndown of pigweeds after wheat harvest, if producers choose to plant RR2Xtend Soybean, includes the new dicamba products Xtendimax, Engenia, and FeXapan. These products deliver 0.5 to 1.0 lb ae/acre of dicamba and can provide excellent control of broadleaf herbicides including smaller pigweed. Early work at K-State would suggest this dicamba system does fit well in an integrated weed control system for pigweed control. Note that these new dicamba products are not labeled for preemerge applications ahead of non-RR2Xtend soybean.

4. Regardless of what burndown option a producer uses after wheat harvest, a preemergence residual herbicide is essential for extended pigweed control. A residual herbicide program should include a combination of herbicide modes of action group 5 (triazine such as metribuzin), group 14 (PPO inhibitor such as Authority, Valor, or Flexstar), and/or group 15 (long chain fatty acid inhibitors such as Zidua, Dual, Outlook, or Warrant). These three modes of action provide excellent control of pigweeds when adequate rainfall is received for activation.

By using a combination of two or more of these herbicide modes of action, producers can help guard against selecting herbicide resistance. Also a producer may receive improved control under adverse environmental conditions if two different residual herbicide modes of action are used instead of relying on one. When selecting residual herbicides, consider rotational restrictions to other crops.

5. Many residual premixes are currently available for double crop soybean. Careful consideration must be given to ensure that the premix provides the desired, effective sites of action at the appropriate rate. It is not uncommon to find premixes that offer ineffective sites of action for pigweed (e.g., ALS herbicides) or offer a reduced rate.

6. Recent K-State research indicates that preemergence treatments that provide effective burndown and offer multiple residual sites of action are best; however, season-long pigweed control in the double crop soybean should not be expected. A timely postemergence application to control pigweed escapes will likely be necessary. Examples of effective postemergence tools include PPO-inhibiting herbicides such as Cobra, Blazer, Flexstar, glufosinate for LibertyLink soybean, or Xtendimax, Engenia, and FeXapan dicamba products for RR2Xtend Soybean.

It is imperative to implement an herbicide program as part of an integrated strategy. An example of this is utilizing narrow row spacing when planting double crop soybean. The narrow row spacing can help shade the soil to reduce pigweed emergence as well as suppress pigweed growth. It is important to consider the ecology of the winter wheat crop proceeding the planting of double crop soybean. Thin wheat stands or low-yielding areas will likely have heavier pigweed pressure at the time of double crop soybean planting when compared to high yielding areas.

Regardless of which weed management system a producer chooses, the inclusion of herbicides with multiple effective modes of action are needed to reduce the risk of further development of herbicide resistance in pigweeds. A combination of an effective burndown of paraquat or approved dicamba products in the RR2YXtend system for control of glyphosate resistant pigweeds, need to include a residual herbicide for extended weed control throughout the growing season.

Table 1. Pigweed percent control and double crop soybean yield from 2015 and 2016 at Manhattan and Hutchinson				
Herbicide	Rate	% Control 4 weeks after planting	% Control 8 weeks after planting	Soybean yield (bu/acre)
Gramoxone SL 2.0	3 pt/acre	64	41	29
Prefix	2 pt/acre	51	41	27
Prefix + Gramoxone SL 2.0	2 pt/acre + 3 pt/acre	94	88	40
Authority MTZ + Gramoxone SL 2.0	16 oz/acre + 3 pt/acre	96	93	43
Fierce + Gramoxone SL 2.0	3 oz/acre + 3 pt/acre	94	90	41
Trivence + Gramoxone SL 2.0	8 oz/acre + 3 pt/acre	96	93	45
None	--	--	--	5
LSD 0.05		11	10	5
All herbicide treatments contain 1% v/v crop oil concentrate and were applied at 20 gallons per acre carrier volume with turbo tee-jet nozzles.				
Soybean yield adjusted to 13.5% moisture.				

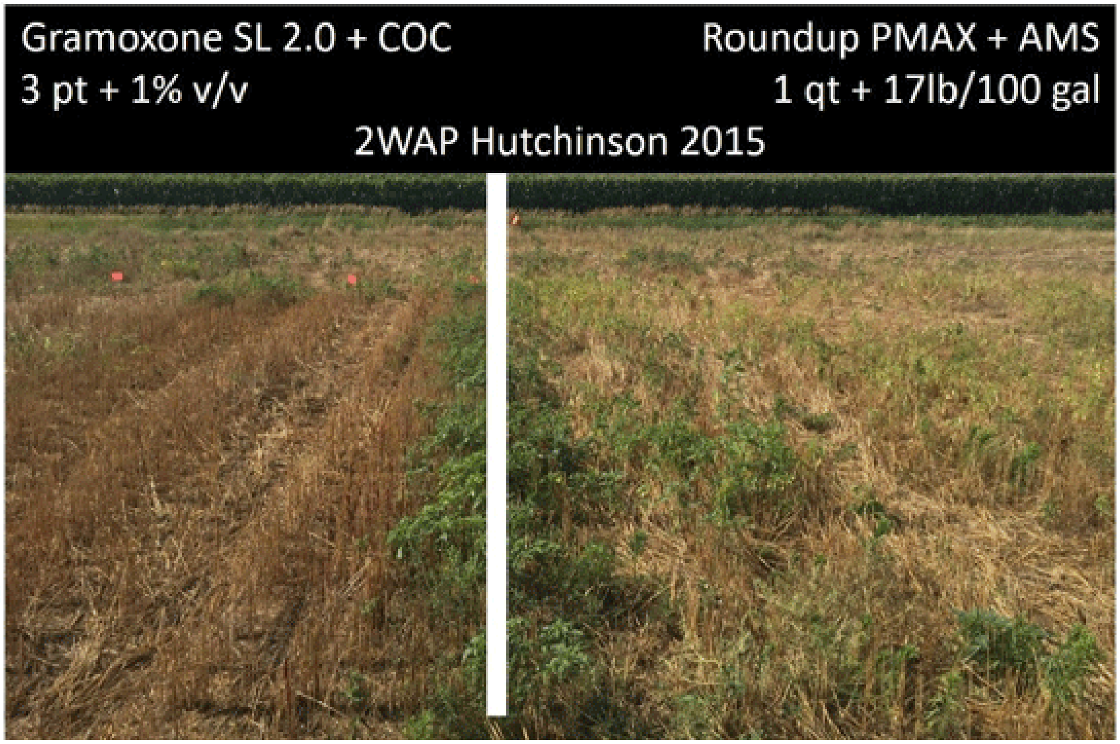

Figure 1. Paraquat (left) and glyphosate (right) were applied in a burndown prior to planting double crop soybean in 2015 near Hutchinson. Excellent burndown control was observed with all treatments that contained paraquat. Photos by Marshall Hay, K-State Research and Extension.

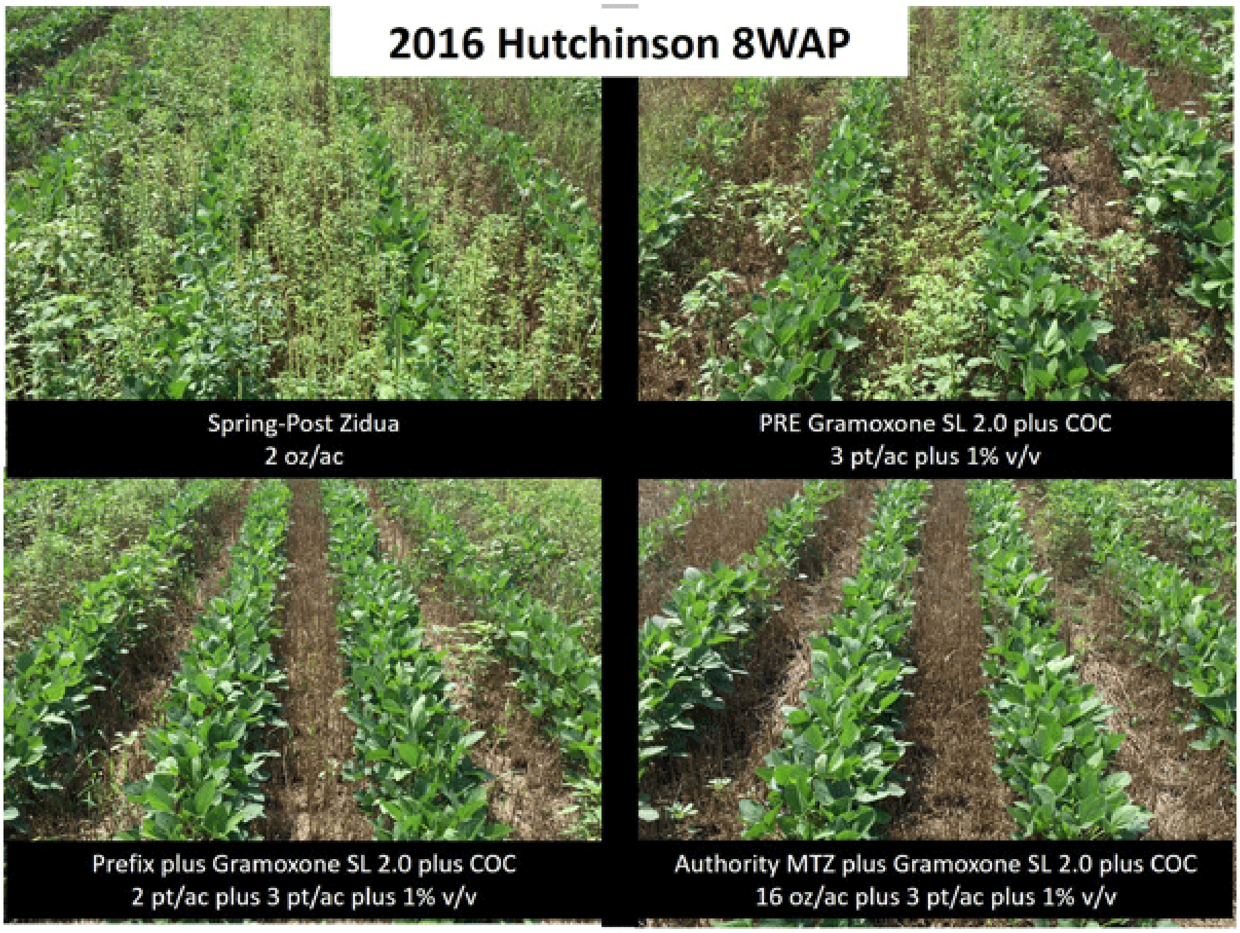

Figure 2. From upper left. Zidua was applied to winter wheat at jointing stage at 2 oz/ac; poor control was observed with this treatment eight weeks after planting (WAP) double crop soybean. Gramoxone SL 2.0 applied alone achieved excellent burndown at double crop soybean planting; however, due to extended pigweed emergence, poor control was later observed. Prefix and Authority MTZ were tank mixed with Gramoxone SL 2.0 to provide excellent control 8WAP; however, a timely postemergence application may still be necessary to control pigweed escapes. Photos by Marshall Hay, K-State Research and Extension.

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4. Corn planting in Kansas: Effects of prior weather and projected conditions

Kansas corn planting progress reached 45% at the state-level during the week May 1-7 (Fig. 1). The eastern half of the state is progressing at a faster pace than the western half, but more rain projected for the coming week will slow down any expected continuous planting progress.

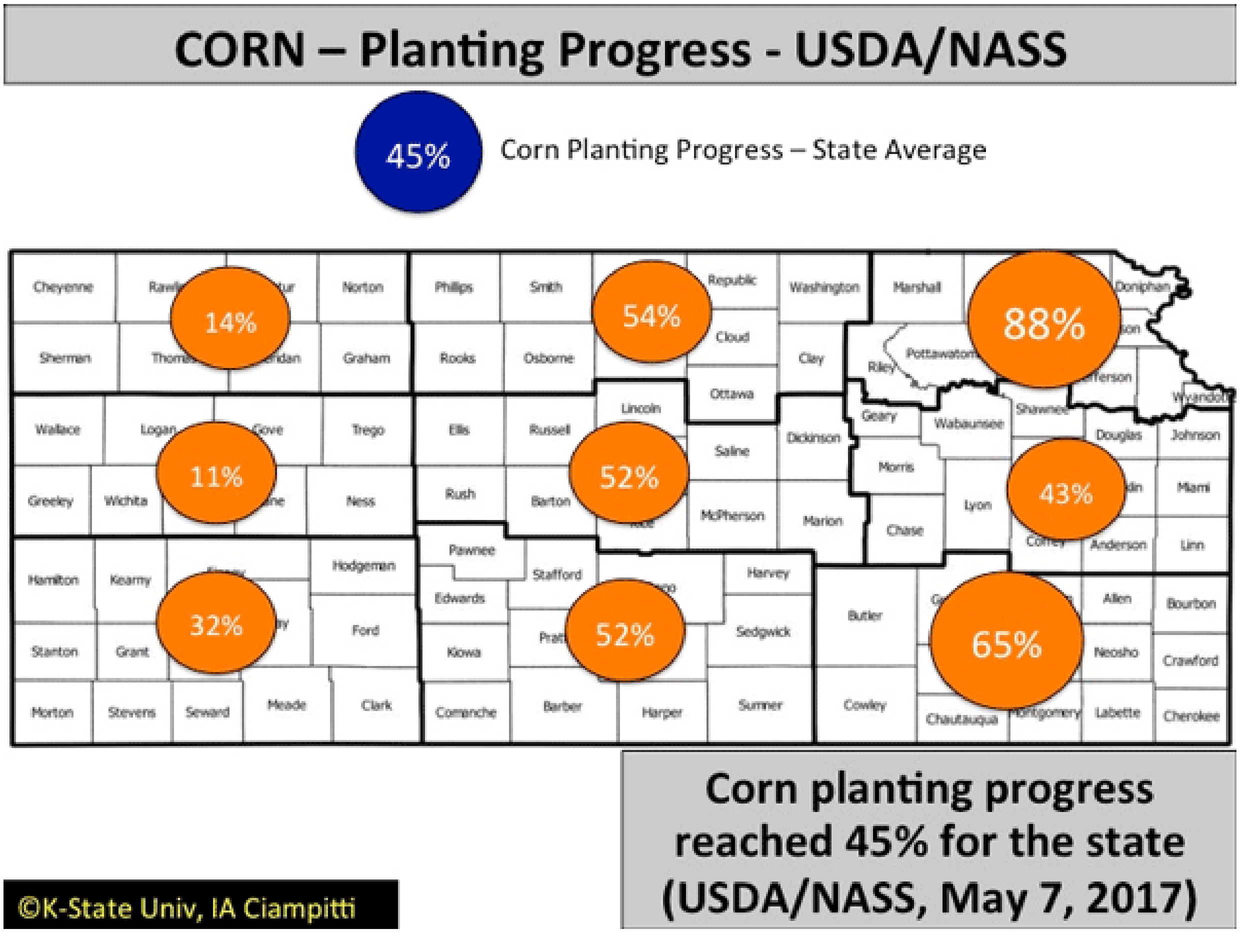


Fig. 1. Corn planting progress, May 7, 2017. Source: USDA/NASS.

Cold and rainy conditions over the last few weeks are presenting challenging soil environments for early corn stand establishment. As a result, corn growth and development progress has been delayed based on the low heat unit accumulation. This has been delaying emergence of the recently planted corn and slowing down growth progress on any emerged crop.

As the growing conditions improve, producers should consider checking early stand establishment and plant growth of April-planted corn.

Some corn planted in April might be at about the same stage of growth and development as recently planted corn.

For the next 7-days, May 12-19 (Fig. 2), the outlook for precipitation shows a probability of receiving from 1.15 (eastern section) to less than 1 inch of rain (western part of the state), adding to the precipitation already received this past month (Fig. 3). This will slow down the soil drying process and impede any field work until conditions are more suitable for planting.

The precipitation outlook for the medium-term (6-10 and 8-14 days) is calling for probabilities of above-normal precipitation for the entire state, especially in the eastern part of the state (east central and southeast Kansas) (Fig. 4). A similar pattern is forecast for other areas of the Great Plains and the Corn Belt regions.

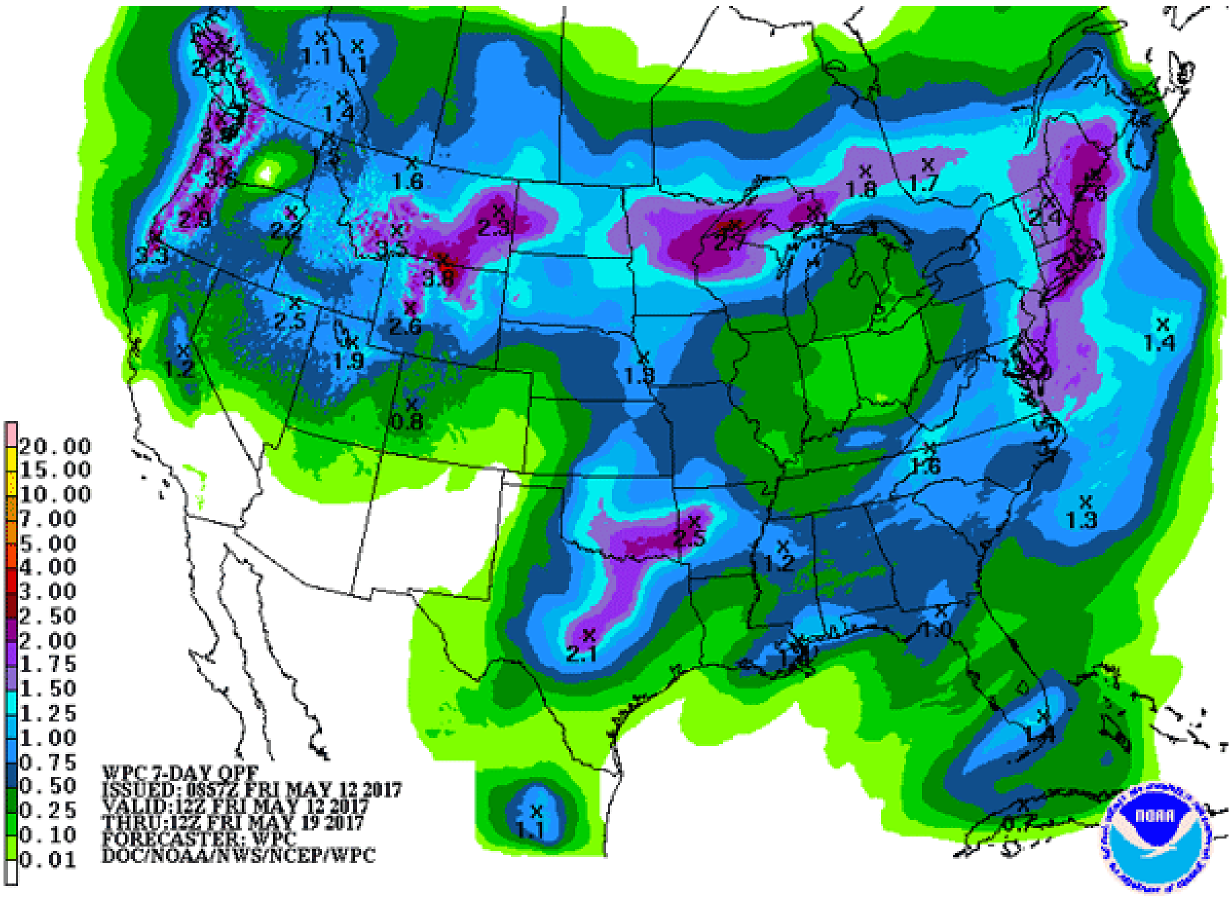


Figure 2. 7-Day Outlook Precipitation Probability from April 28 – May 5, NOAA.

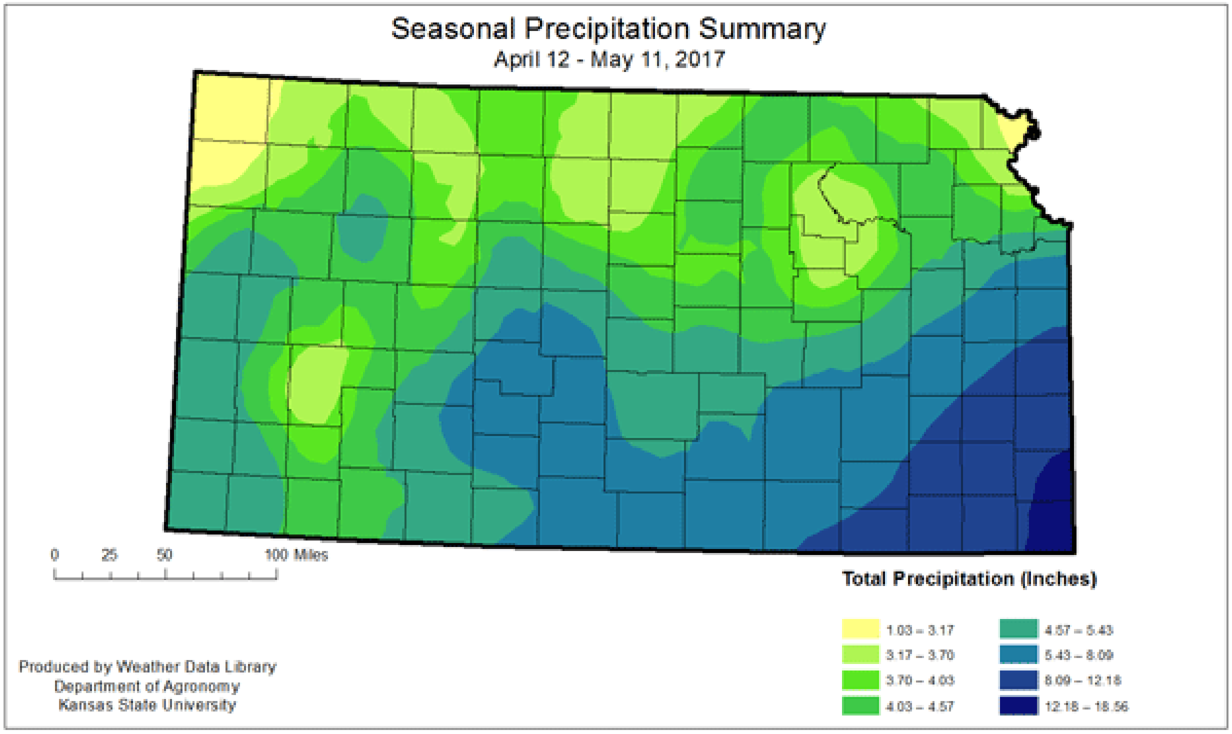
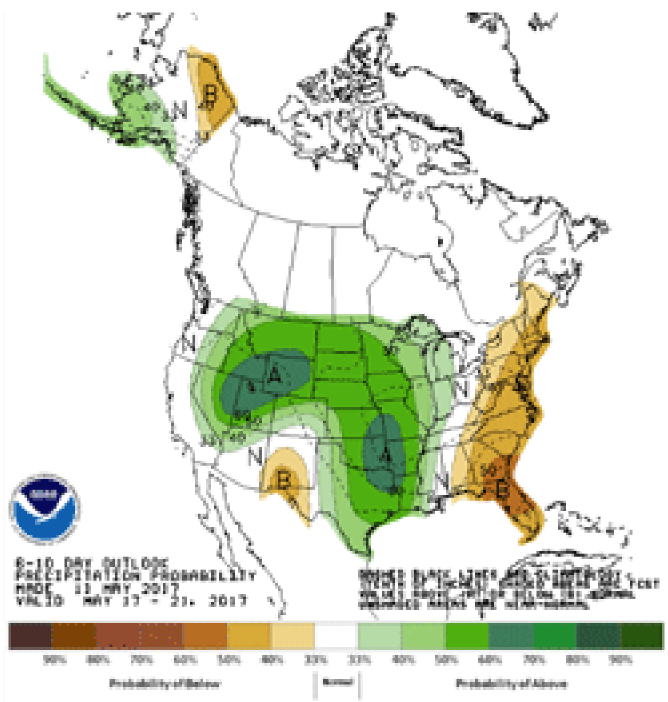


Figure 3. Seasonal precipitation summary, April 12 – May 11.



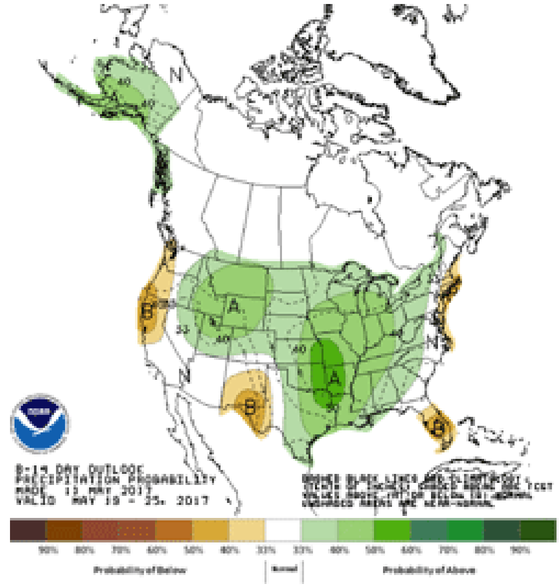


Figure 4. 6-10 (left panel) and 8-14 (right panel) Day Outlook Precipitation Probability from NOAA.

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

Producers should go back and check corn planted in early-to-mid April to check stand establishment, number of plants emerged as compared to target seeding rate, and early-growth uniformity. If plants did not emerge, dig and check for seed that did not germinate or seedlings that died before emergence.

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 delayed planted corn will be discussed in upcoming issues of the Agronomy eUpdate. Stay tuned!

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5. Update on stripe rust and leaf rust

Stripe rust and leaf rust were rapidly increasing in incidence and severity in parts of central Kansas this week. Stripe rust and leaf rust became established in the upper canopy of wheat in south central Kansas a few weeks ago. Observations this week indicate that stripe rust has increased in severity in many fields of susceptible varieties that were unprotected by fungicides. In some cases, more than 30 percent of the flag leaf area has been damaged by the disease. Leaf rust has also moved to the upper leaves on susceptible varieties in the south central region.

Stripe rust and leaf rust were also reported in additional areas of the state this week with many new reports of the disease in middle canopy in west central and northwest regions of the state (Figure 1 and 2). There are a few reports of stripe rust moving to the upper leaves in these areas also, but for the moment this seems to be rare. Many producers in western Kansas are still trying to assess potential damage from freezing temperatures and heavy snowfall a few weeks ago. This damage creates tremendous uncertainty about the yield potential of the crop and complicates the decision to apply fungicides for rust management.

These decisions will need to be made on a field-by-field basis. It may be helpful to prioritize seed production fields and fields of susceptible varieties that appear to have escaped the worst of the freeze/snow damage. Other fields may also benefit from a fungicide application, but the outcome of this investment is uncertain because we just cannot predict how the damaged fields will recover.

In central Kansas, growers should be watching the harvest restrictions on fungicide applications. The flowering stages of growth indicate that the timing window for fungicide applications is coming to an end for many products. Some fungicides have growth stage restrictions and others have a fixed number of days that must be waited after application before the crop can be harvested. The wheat foliar fungicide efficacy publication provides a summary of these restrictions. https://www.bookstore.ksre.ksu.edu/pubs/EP130.pdf. Be sure you understand these limitations before applying fungicides at these critical growth stages.

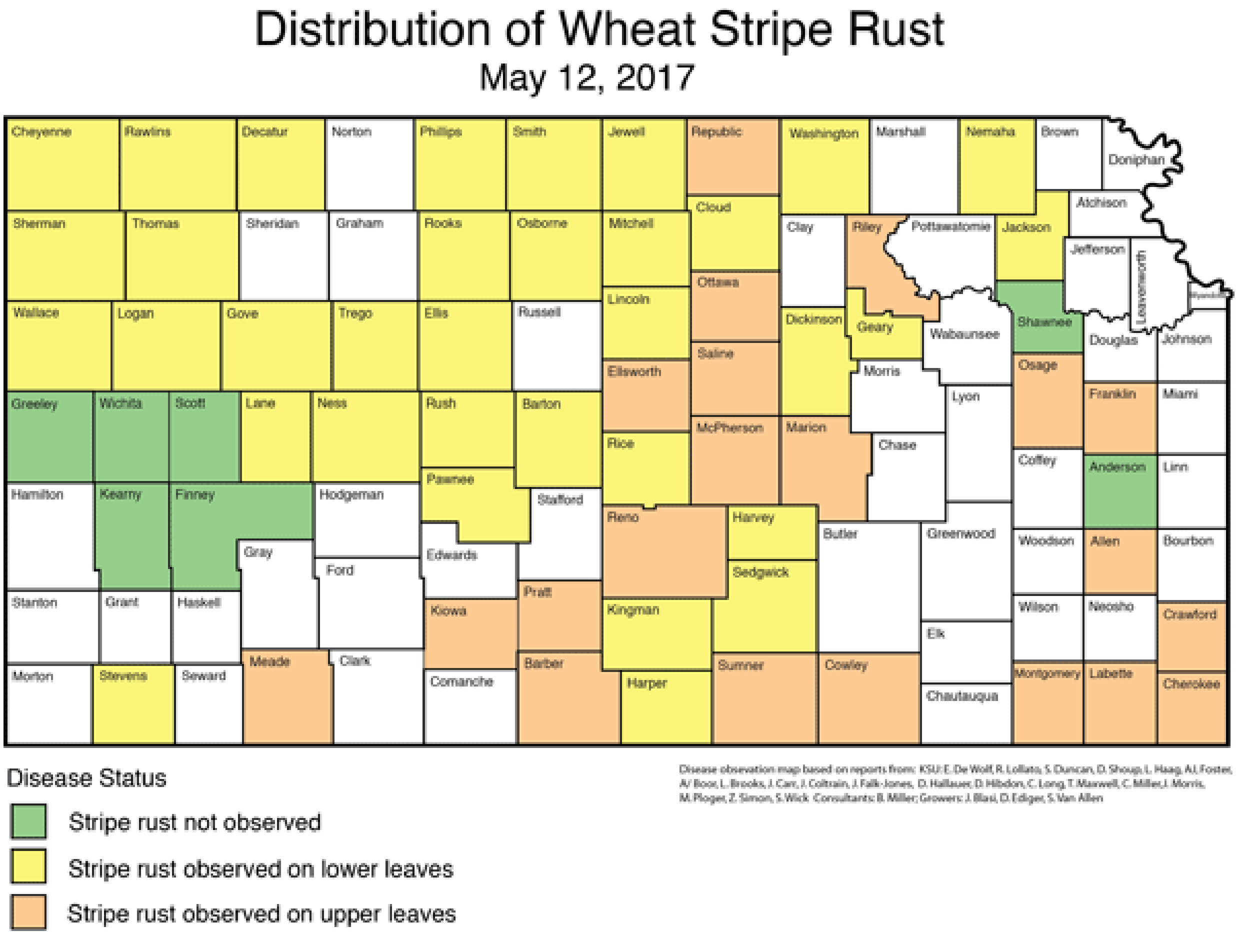

Figure 1. Stripe rust distribution in Kansas as of May 12

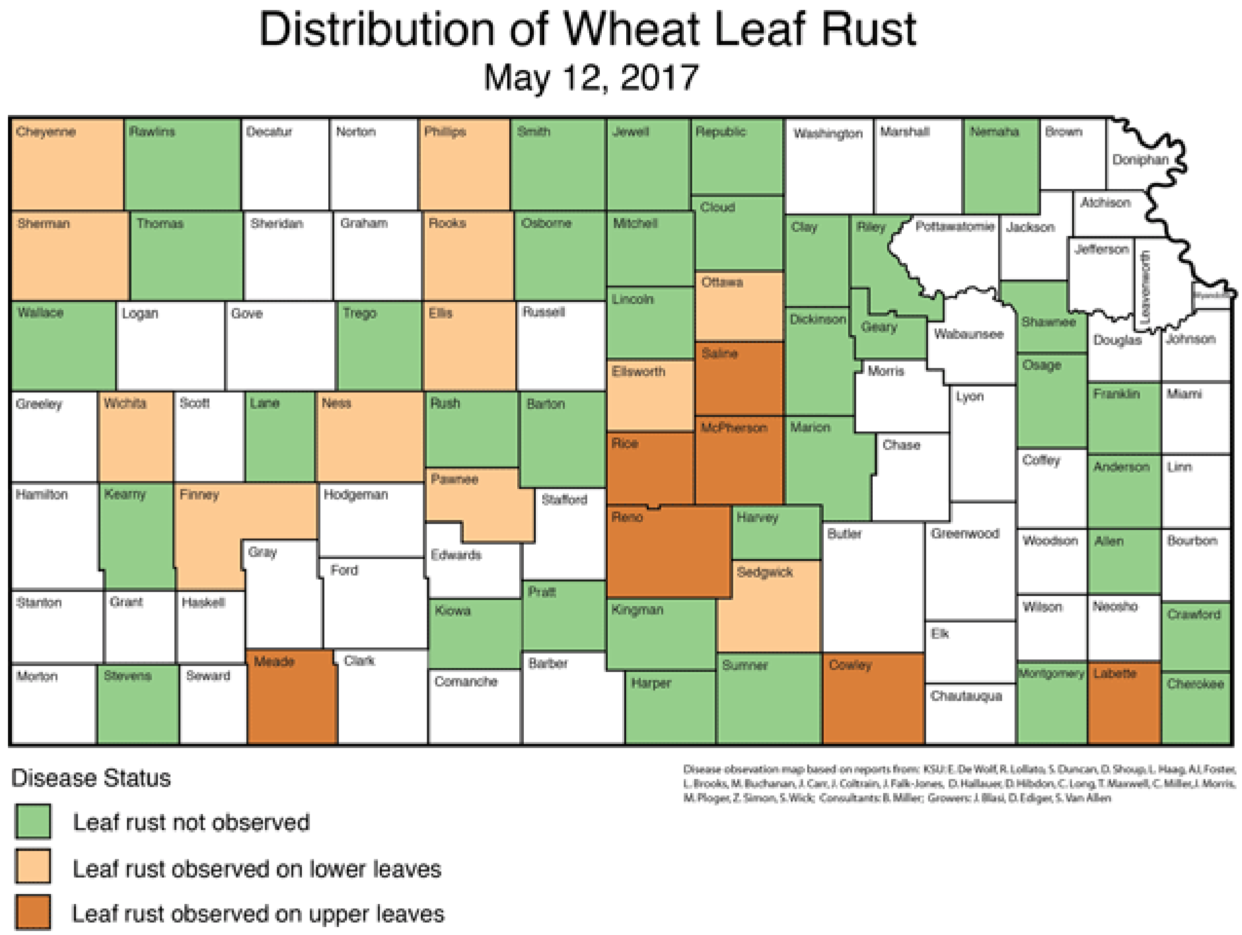

Figure 2. Leaf rust distribution in Kansas as of May 12

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6. K-State wheat plot tours for May 15-19

The week of May 15-19 features 17 wheat plot tours in Kansas. Producers willing to learn about the different varieties can choose to attend one (or several) plot tours in their county or agricultural district.

The plot tours generally include a discussion of wheat conditions across the state, as well as tips on what to look for when selecting wheat varieties for one operation. New and upcoming varieties are discussed, as well as older and more established ones and a discussion of how all these varieties are responding to this growing season's conditions.

For the week of May 15-19, the schedule plot tour locations include:

H. **5/15/2017, 7:30 a.m.**
Location: Russell Co., Russell
Contact: Michelle Buchanan, 785-472-4442, mbuchanan@ksu.edu

Monday, 5/15/2017, 11:30 a.m.
Location: Ellsworth Co., Lorraine
Contact: Michelle Buchanan, 785-472-4442, mbuchanan@ksu.edu

Monday, 5/15/2017, 12:00 p.m.
Location: Edwards Co.
Contact: Marty Gleason, 620-659-2149, mgleason@ksu.edu
Directions: NW 1/4 11-26-18, South of 170th Ave and T Road Intersection

H. **5/15/2017, 6:00 p.m.**
Location: Pawnee Co., Larned
Contact: Shannon Rogge, 620-285-6901, luckiksu@ksu.edu
Directions: Northwest side of Larned off 120th. Located at the corner of 120th Ave & Q Rd.

Tuesday, 5/16/2017, 12:00 p.m.
Location: Stafford Co.
Contact: Glenn Newdigger, 620-549-3502, gnewdigg@ksu.edu
Directions: 0.5 mile west of the junction of Highways 50 and 281 and 1/8 Mile north. (Old Sandyland Experiment Field)

Tuesday, 5/16/2017, 6:00 p.m.
Location: Pratt Co., Pratt
Contact: Mark Ploger, 620-672-6121, mploger@ksu.edu
Directions: From the corner of Hwy 281 and 10th St. (just on the north side of Pratt); go 1/2 mile west

Tuesday, 5/16/2017, 6:00 p.m.
Location: Sumner Co., Belle Plaine
Contacts: Jenni Carr, 620-842-5445, jlcarr@ksu.edu
Randy Hein, 620-326-7477, rvhein@ksu.edu
Directions: Meal - 1459 E. 60th Avenue North southeast of Belle Plaine. Program - 1 1/2 mile southeast, 1/2 mile south of address, west side of road

Wednesday, 5/17/2017, 9:00 a.m.
Location: Harper Co., Harper
Contact: Jenni Carr, 620-842-5445, jlcarr@ksu.edu

Wednesday, 5/17/2017, 10:00 a.m.
Location: Kiowa Co.
Contact: Marty Gleason, 620-659-2149, mgleason@ksu.edu

Wednesday, 5/17/2017, 11:00 a.m.
Location: Sumner Co., Argonia
Contact: 620-842-5445, jlcarr@ksu.edu
Randy Hein, 620-326-7477, rvhein@ksu.edu

Wednesday, 5/17/2017, 6:00 p.m.
Location: Sumner Co., Caldwell
Contact: 620-842-5445, jlcarr@ksu.edu
Randy Hein, 620-326-7477, rvhein@ksu.edu
Directions: From Caldwell, west on Bluff City Rd, 1/4 mile north of town, west side of road, south of cemetery

Wednesday, 5/17/2017, 5:00 p.m.
Location: Marion Co.
Contact: Rickey Roberts, 620-382-2325, rroberts@ksu.edu
Directions: CGS Plot

Wednesday, 5/17/2017, 6:00 p.m.
Location: Harvey Co.
Contact: Ryan Flaming, 316-284-6930, flaming@ksu.edu
Directions: Delange Seeds

Thursday, 5/18/2017, 11:00 a.m.
Location: Reno Co., Hutchinson
Contact: Daryl Strouts, 785-320-4080, kwa@ksu.edu
Directions: Kansas Wheat Alliance field day

Thursday, 5/18/2017, 6:00 p.m.
Location: Kingman Co., Kingman
Contact: Jake Renner, 620-532-5131, jwrenner@ksu.edu

Friday, 5/19/2017, 10:00 a.m.
Location: Barber Co., Isabel
Contact: Tim Marshall, 620-886-3971, tmarshal@ksu.edu
Directions: South of Corwin, NE of Pixley and in Isabel

Friday, 5/19/2017, 6:00 p.m.
Location: Sumner Co., Conway Springs
Contact: Randy Hein, 620-326-7477, rvhein@ksu.edu
Directions: From Conway Springs, go north to 140 Ave N, east 3/4 mile

Romulo Lollato, Extension Wheat Specialist
lollato@ksu.edu

Erick DeWolf, Extension Wheat Pathologist
dewolf1@ksu.edu

7. Cover Crop Field Day planned at K-State HB Ranch in Trego County, May 19

Kansas State University will host a Cover Crop Field Day on Friday, May 19 at 9:30 a.m. at the K-State HB Ranch in southeast Trego County. The ranch is at 39008 147 Highway in Brownell, Kansas.

K-State researchers will discuss ongoing research efforts at the HB Ranch evaluating cover crop management options for farmers growing dryland wheat.

Soil quality, nutrient cycling, weed and pest suppression and wind erosion reduction can be improved through the use of cover crops, but their use is not widely popular where water is limited because of the water they use. Harvesting cover crops for forage, however, can help increase profitability and offset revenue losses linked to any decreases in wheat yield.

Field day presentations include:

K-State cover crop research update;

- Tour of cover crop plots
- Cover crops and beneficial insects
- On-farm cover crop research update
- Cover crops and soil health
- Grazing cover crops

Lunch will be served. There is no fee to attend, but signup is requested by May 12 by calling 785-625-3425 or email milissa@ksu.edu.

8. Winter canola tours scheduled in May

K-State Research and Extension will be co-hosting several opportunities in May to learn more about winter canola varieties and crop production practices.

Having field tours at this time of year gives us a great opportunity to evaluate yield potential of the winter canola crop. As producers gear up for harvest, there are a number of questions we can address to help with those important decisions. We'll also talk about new varieties, variety development, and how well the crop has fared over the growing season.

The following tours are scheduled.

- May 23, starting at 2 p.m. at the South Central Kansas Experiment Field, Redd Foundation Field southwest of Partridge, Kan. To get to the field, drive west of Partridge 1.5 miles on Trail West Rd. Turn south on High Point Rd. and drive 0.5 miles to the field. Attendees will be able to see a National Winter Canola Variety Trial, Roundup Ready canola cultivars under development, fungicide/growth regulator trial, seeding rate trial, and the canola/wheat rotation study. Refreshments will be provided. The South Central Kansas Experiment Field day at the headquarters unit, 10702 S. Dean Rd., will follow at 5 p.m.

- May 25, at the Southwest Research-Extension Center, 4500 E. Mary Street, Garden City, in conjunction with the Center's Spring Field Day. The field day starts at 4:30 p.m. and a meal will be provided. Attendees will hear about canola variety development, production practices, and the National Winter Canola Variety Trial.

- May 26, starting at 10 a.m. near Montezuma. The first stop will be 1 mile north of town on the Ingalls blacktop (12th Road) on the west side of the road. Attendees will learn about canola growth and development, harvest options, and variety development. Lunch will be sponsored by Helena Chemical and Monsanto.

All field days are co-sponsored by K-State Research and Extension and the Great Plains Canola Association. Financial support for these field days was made available through the Great Plains Canola Association's Promote Canola Acres program and the U.S. Department of Agriculture-National Institute of Food and Agriculture Supplemental and Alternative Crops Competitive Grant Program.

Mike Stamm, Canola Breeder
mjstamm@ksu.edu

9. Spring Crops Field Day in Parsons, May 23

The Southeast Research and Extension Center will host a Spring Crops Field Day on May 23 to update producers in the region on the latest information on varieties, production methods, and disease management.

The field day starts with registration and a complimentary breakfast from 7:30 to 8:30 a.m. at the research center, 25092 Ness Road, (immediately south of U.S. Highway 400) in Parsons.

The program includes:

Wheat Variety Plot Tour – Doug Shoup, K-State extension crops and soils specialist, Lonnie Mengarelli, K-State research assistant, and seed company representatives

Effectiveness of Precision Planting Row Units – Ajay Sharda, K-State extension precision agriculture/machine systems engineer

Reducing the Impact of Fusarium Head Blight in Wheat – Gretchen Sassenrath, K-State crop production agronomist

Corn and Soybean Disease Update – Doug Jardine, K-State extension plant pathologist

There is no cost to attend. In case of rain, the program will be conducted indoors. More information is available by calling 620-421-4826.

10. Southwest Research-Extension Center Spring Field Day, May 25

The Southwest Research-Extension Center will host its Spring Field Day on Thursday, May 25 from 4:30 to 7 p.m. at the center, located at 4500 E. Mary St. in Garden City.

The Spring Field Day is an annual event hosted at the research center for more than a decade. It provides an opportunity for K-State researchers to engage local producers, to provide updates and to 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 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.

Supper will be provided courtesy of industry supporters. Continuing education credits have been applied for and should be available at this meeting.

Contact Ashlee Wood at 620-276-8286 or email awood22@ksu.edu by 5 p.m. on May 17 to register. Prior registration is important to ensure supper will be available for all attendees.

For more information on the program contact A.J. Foster at 620-640-1259, or email anserdj@ksu.edu.

A.J. Foster, Southwest Area Crops and Soils Specialist
anserdj@ksu.edu

11. Comparative Vegetation Condition Report: May 2 - 8

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 27-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

The Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography, and his pioneering work in this area is gratefully acknowledged.

The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

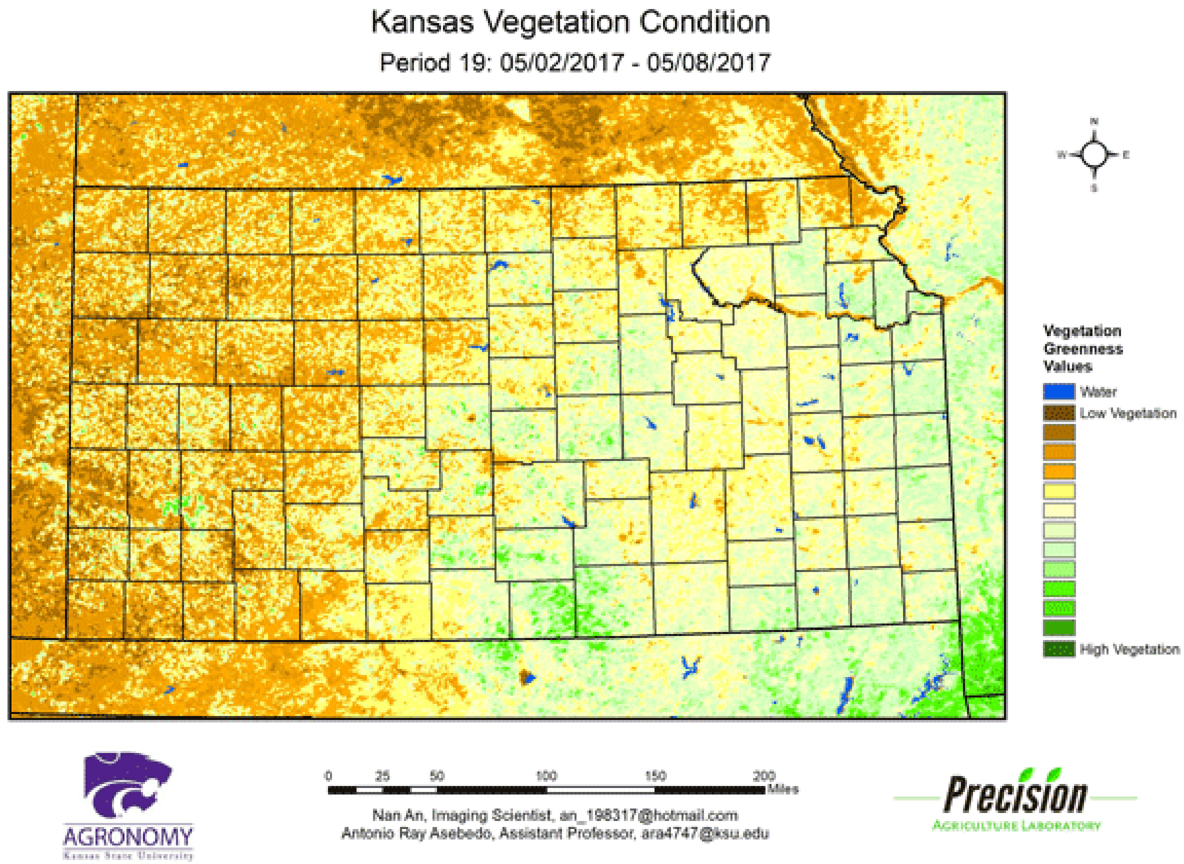

Figure 1. The Vegetation Condition Report for Kansas for May 2 – May 8, 2017 from K-State's Precision Agriculture Laboratory shows a continued increase in vegetative activity eastern Kansas, extending into extreme northeast Kansas. The recent cold weather has slowed vegetative activity in the west, but a pocket of increased activity is visible in the Arkansas River Valley west of Garden City. This is an area of intense alfalfa production.

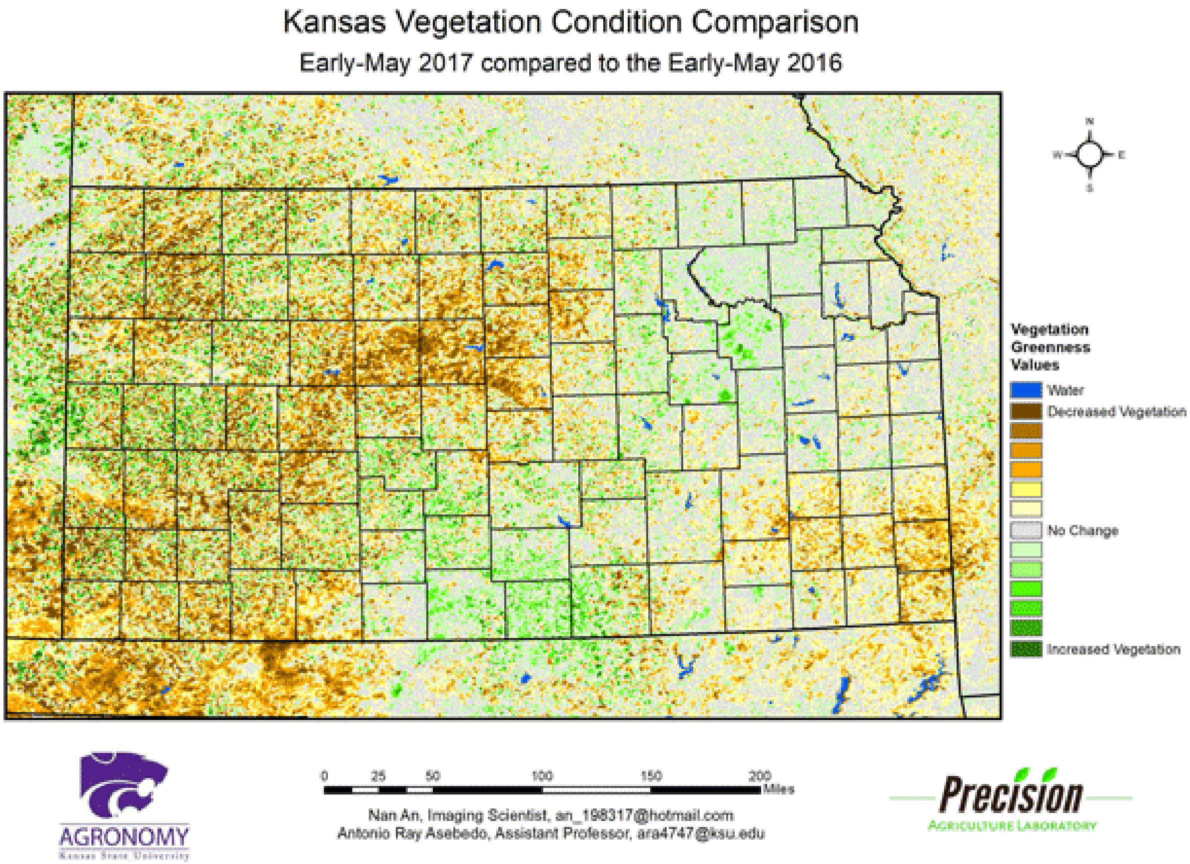

Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for May 2 – May 8, 2017 from K-State's Precision Agriculture Laboratory lower NDVI values are evident in scattered areas of western and central Kansas. The winter wheat is less advanced this year than last, particularly in western Kansas, where dry fall conditions hampered establishment and recent cold weather has slowed development. Southeast Kansas is showing lower vegetative activity due to excessive moisture creating problems in the area.

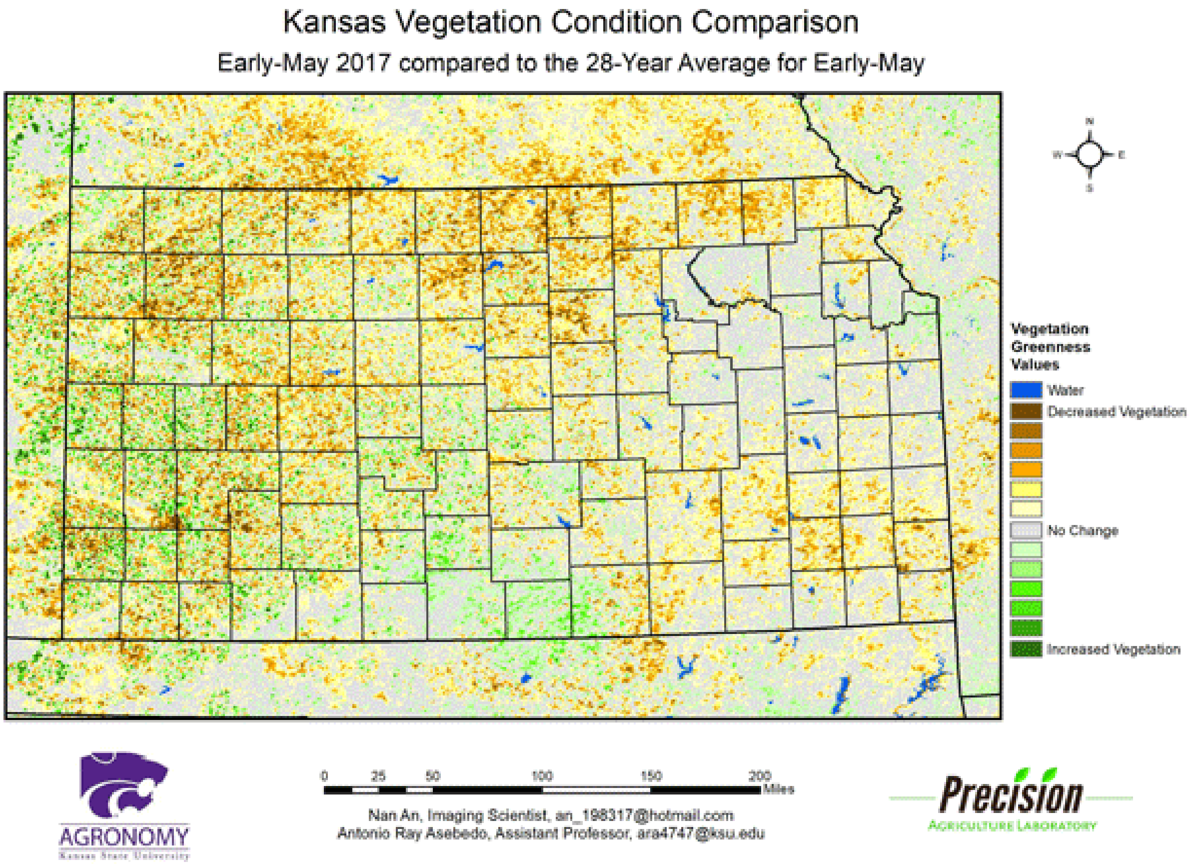

Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for May 2 – May 8, 2017 from K-State's Precision Agriculture Laboratory much of the state has below-average vegetative activity. The wetter-than-normal conditions have slowed spring planting in the northern parts of the state, and excessive moisture has dampened vegetative activity in the Southeastern Division.

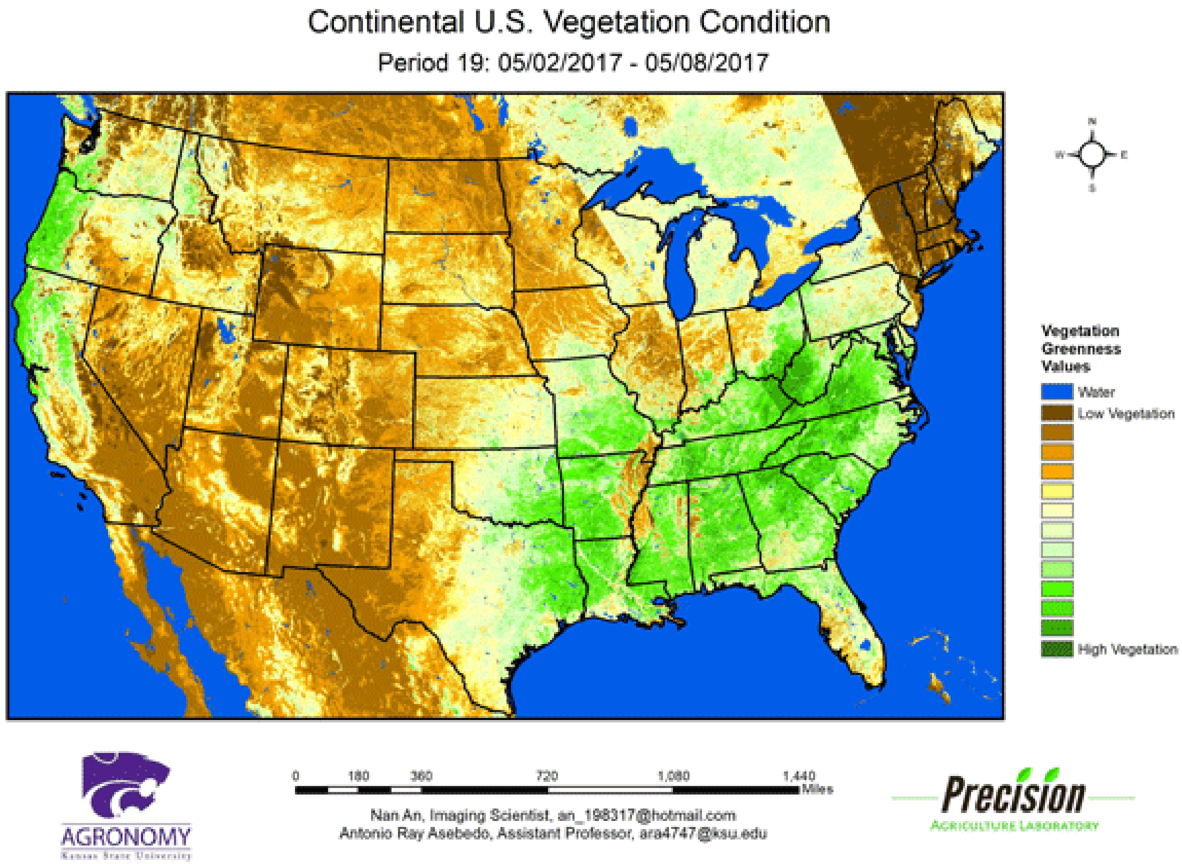

Figure 4. The Vegetation Condition Report for the U.S for May 2 – May 8, 2017 from K-State's Precision Agriculture Laboratory shows the highest NDVI values are confined to the Southern Plains, particularly in east Texas and Louisiana. A second area of higher vegetative activity is also visible along the West Coast, where the wet conditions continue. Low NDVI values are visible along the central Mississippi River Valley, where flooding continues to be an issue.

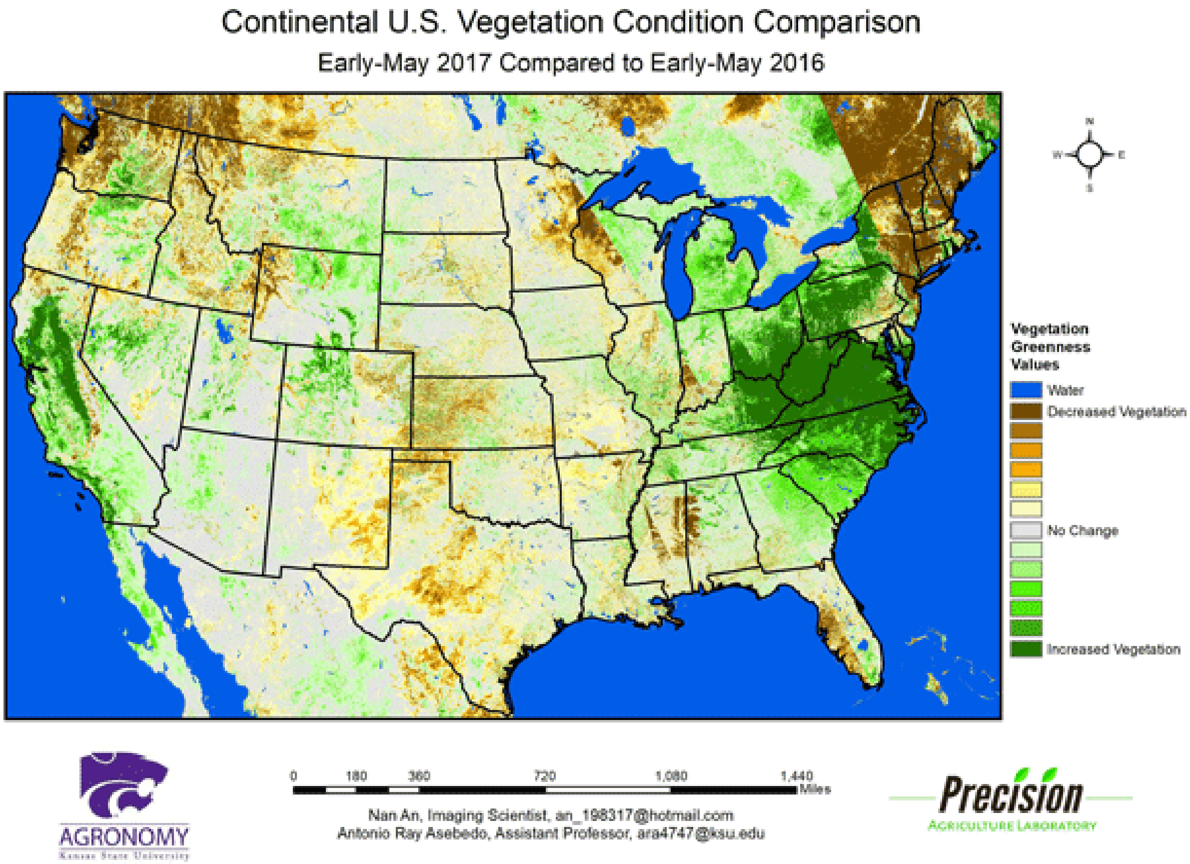

Figure 5. The U.S. comparison to last year at this time for May 2 – May 8, 2017, 2017 from K-State's Precision Agriculture Laboratory again shows the impact that the split in the snow cover has caused this year. Much lower NDVI values are visible in the Cascades and in western Wyoming, where snow packs are still high. The Northern Rockies are showing higher NDVI values as the snow pack is rapidly retreating.

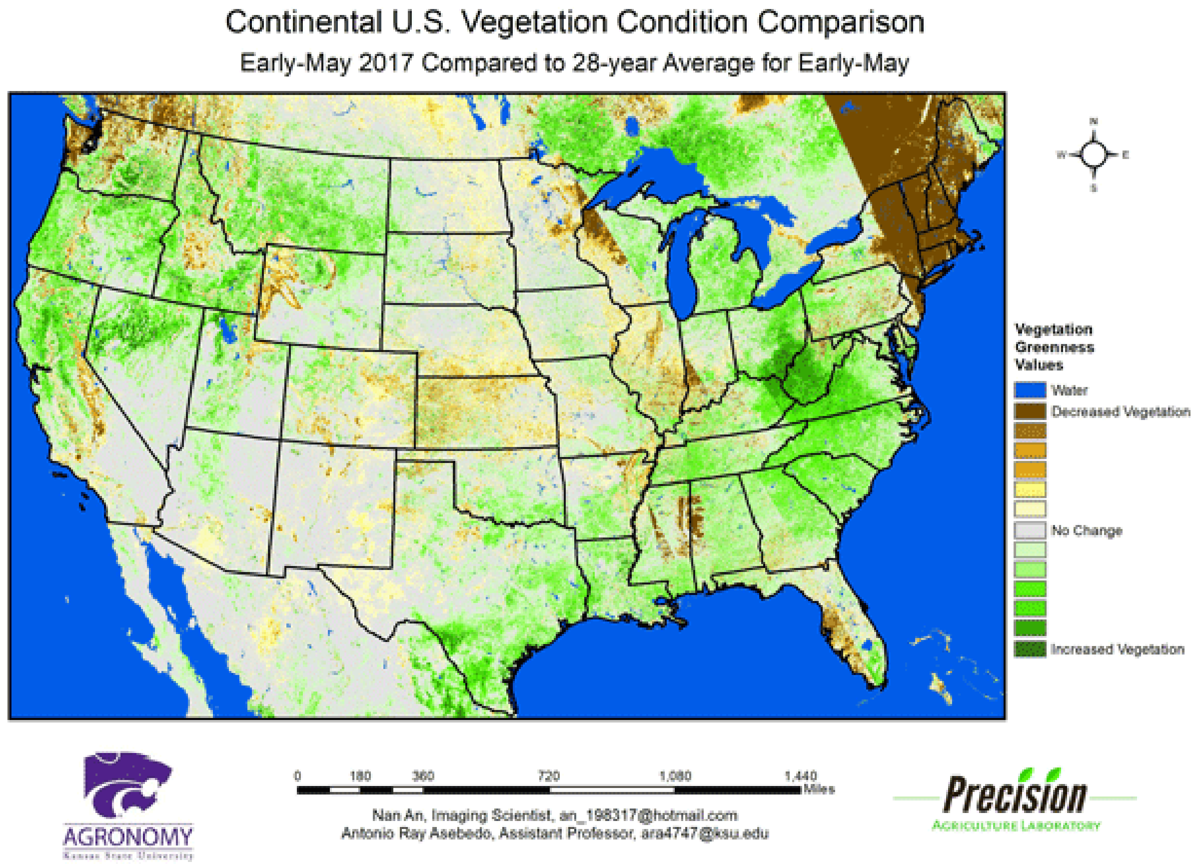

Figure 6. The U.S. comparison to the 27-year average for the period of May 2 – May 8, 2017 from K-State's Precision Agriculture Laboratory shows the area of below-average photosynthetic activity in upper New England, where continuing storm systems have masked vegetative activity. The area including southern Ohio, West Virginia, and into Virginia and eastern Kentucky have above-average photosynthetic activity as favorable moisture and mild temperatures have increased plant production.

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Nan An, Imaging Scientist
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