Issue 581

K-STATE
Research and Extension

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eUpdate

07/22/2016

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. Sugarcane aphid scouting and management on sorghum for 2016

Sugarcane aphid infestations were confirmed on commercial grain sorghum fields near the Sumner/Cowley County border during the week of July 18-22. Based on the size of the aphid populations observed, which included several plants that were producing winged aphids, this field was first infested approximately 3-4 weeks ago. A significant number of natural enemies were observed feeding on aphids, which can help slow aphid growth.

Figure 1. Lady beetle larva feeding on sugarcane aphids. Photo courtesy of Dept. of Entomology, K-State Research and Extension.

This is approximately 10 days sooner than when we found aphids in 2015. Aphid densities are well below threshold, but sorghum producers are encouraged to start scouting fields now.

Report all new infestations by contacting your county extension agent. For myFields.info users, submit reports using the Pest Sampler module (https://www.myfields.info/pest_sampler). To receive pest alerts about sugarcane aphid, create an account (https://www.myfields.info/user/register) and include your state and county information to receive notifications specific to your area.

When scouting, make sure you correctly identify the sugarcane aphid. It can be confused with greenbugs or yellow sugarcane aphid. The sugarcane aphid (Fig.2) is light yellow, with dark, paired "tailpipes" called cornicles and dark "feet" called tarsi. Greenbugs have dark feet, dark antennae, but light colored cornicles (tail pipes). Greenbugs will often have a green stripe down their backs, but this can be hard to see in light-colored aphids. The sugarcane aphid also has dark feet and darker antennae, however it has dark cornicles and no green stripe down its back. The yellow sugarcane aphid (Fig. 3) is bright yellow with many hairs on its body and no extended cornicles.

Figure 2. Sugarcane aphid. Photo courtesy of Dept. of Entomology, K-State Research and Extension.

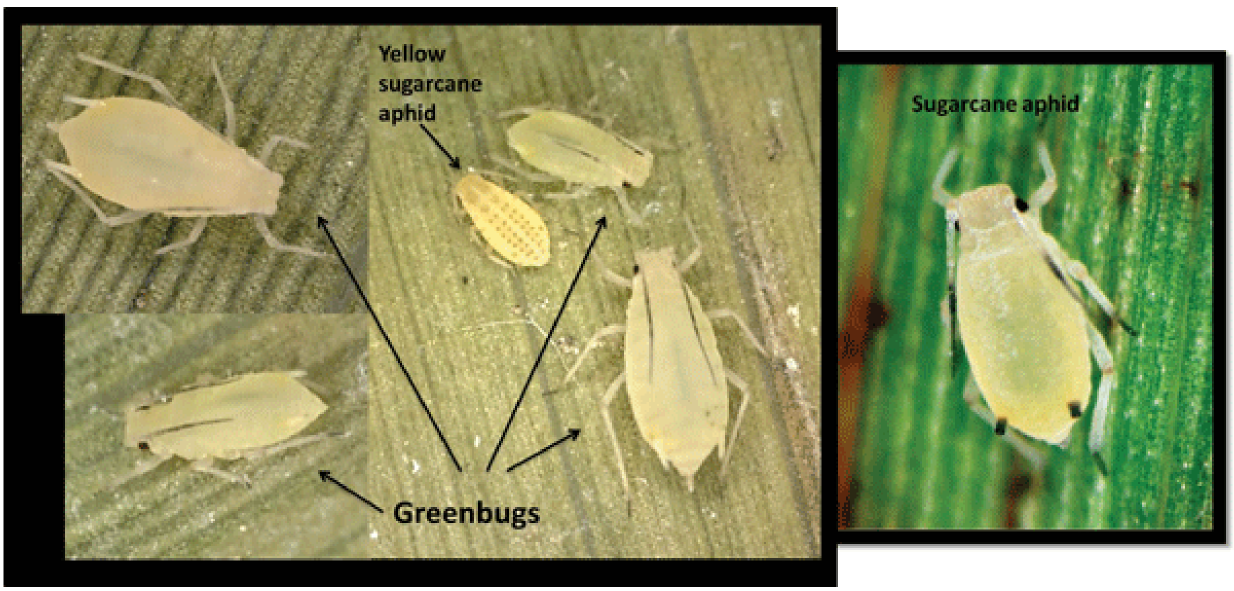

Figure 3. Yellow sugarcane aphid, greenbugs, and sugarcane aphid. Photo courtesy of Dept. of Entomology, Kansas State University.

Quite a bit was learned in Kansas last year about treatment thresholds and management of the sugarcane aphid on sorghum. The current guidelines are displayed below:

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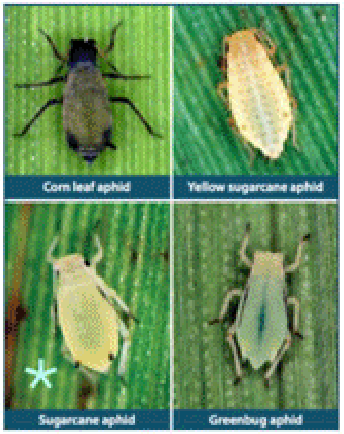
Scouting Sugarcane Aphids

Brian McCornack, Sarah Zukoff, J.P. Michaud & Jeff Whitworth
www.entomology.ksu.edu/extension

myFields www.myfields.info

Adult Sugarcane Aphid (*)



Winged Adult

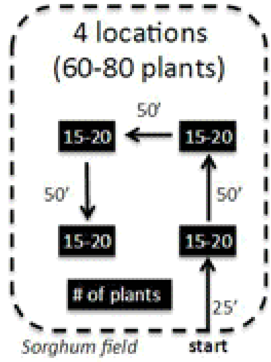
Information adapted from NTO-043, Bowling et al. (2015) TEXAS A&M AGRILIFE

Timing effective treatment to control ***sugarcane aphids*** (SCA) in sorghum depends on the size of the SCA population. To estimate the number of SCA in a field, follow these steps for scouting the field and use the **Sampling Protocol** (**below**) and % plants with honeydew (**on back**) to make treatment decisions.

First Detection: Is the Field at Risk?

Once a week, walk 25 feet into the field and examine plants along 50 feet of row (see right):

- If honeydew is present, look for SCA on the underside of a leaf above the honeydew.
- Inspect the underside of leaves from the upper and lower canopy from 15–20 plants per location.
- Sample each side of the field as well as sites near Johnsongrass and tall mutant plants.
- Check at least 4 locations per field for a total of 60–80 plants.



NOT Present?

If no SCA are present, or only a few wingless/winged aphids are on upper leaves, continue once-a-week scouting (**protocol above**).

or

Present?

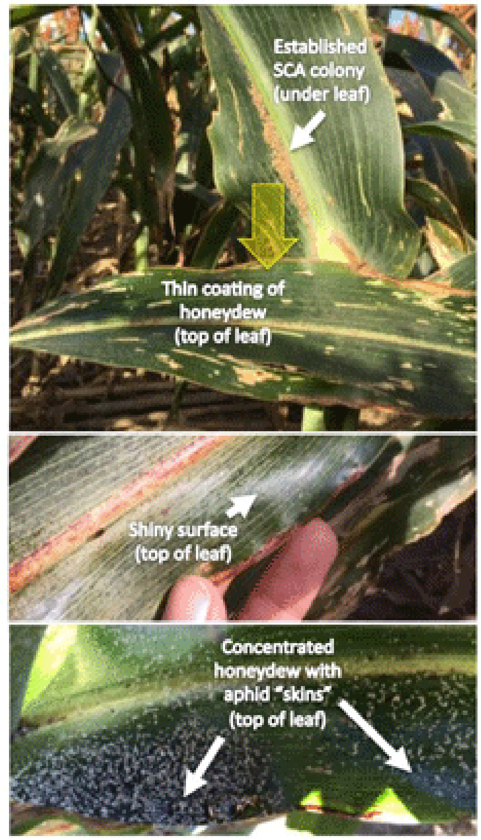
If SCA are found on lower or mid-canopy leaves, begin twice-a-week scouting. Use the Sampling Protocol (**above**) and % plants with honeydew (**on back**).

SCA Threshold by Growth Stage

Estimate the percentage (%) of infested plants with large amounts of sugarcane aphid (SCA) honeydew (see right) to help time foliar insecticides for SCA control on sorghum.

Growth Stage	Threshold
Pre-Boot	20% plants infested with localized area of heavy honeydew and established aphid colonies
Boot	20% plants infested with localized area of heavy honeydew and established aphid colonies
Soft Dough	30% plants infested with localized area of heavy honeydew and established aphid colonies
Dough	30% plants infested with localized area of heavy honeydew and established aphid colonies
Black Layer	Heavy Honeydew and established aphid colonies in head *only treat to prevent harvest problems **observe Preharvest intervals

Table courtesy of Angus Catchot at Mississippi State University



Learn more about sugarcane aphids at: http://myfields.info/pests/sugarcane-aphid

Two insecticides, Sivanto 200 SL, and Transform WD, provide superior control of sugarcane aphid. Sivanto can be applied at 4-7 fluid ounces per acre. Transform WG can be applied at 0.75-1.5 oz. per acre. It is important to achieve complete coverage of the crop in order to obtain the most effective control.

Sivanto and Transform are not toxic to beneficial insects, which can help control populations of the sugarcane aphid.

One of the problems some producers in Kansas faced last year was what to do if both headworms (also known as corn earworm) and sugarcane aphids were present at treatment thresholds. Sivanto and Transform are not effective on headworms. The pyrethroid insecticides most commonly used for headworm control, methomyl and chlorpyrifos, are effective against the sugarcane aphid, but will also kill beneficial insects. It was not uncommon last year to see sugarcane aphid populations explode a few days after the application of a pyrethroid insecticide. Flubendiamide (Belt), chlorantraniliprole (Prevathon), and spinosad (Blackhawk) are non-pyrethroid insecticides which are effective on headworms, but have low impact on beneficial insects.

If headworms are present in damaging numbers, the best advice is to spray an insecticide anyway since headworms can quickly cause significant yield losses if populations are high enough. Fields should be scouted for sugarcane aphids and beneficial insect populations often after the insecticide is applied.

If sorghum has to be treated more than once or twice with an insecticide, producers may hesitate since the cost can add up quickly. However, sugarcane aphid and headworms can cause significant yield losses, which can make the field even less profitable than if multiple insecticide applications were made to help protect yields. It's not an easy choice to make, by any means.

For more information on sampling procedures, action thresholds, or effective insecticides, visit https://www.myfields.info/sca/

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2. Overcoming some of the limiting factors in southeast Kansas wheat production

Producing wheat can be a challenge some years almost anywhere in Kansas, but the reasons for those challenges are often a little different in southeast Kansas than in other regions of the state. While getting good stand establishment and early crop growth is the first challenge everywhere, ultimately the most significant factor impacting wheat yield in southeast Kansas is often excessive late-spring rainfall (Figure 1). Excessive late-season rains can happen anywhere in the state in any given year, of course, but occur more frequently in southeast Kansas than in other regions.

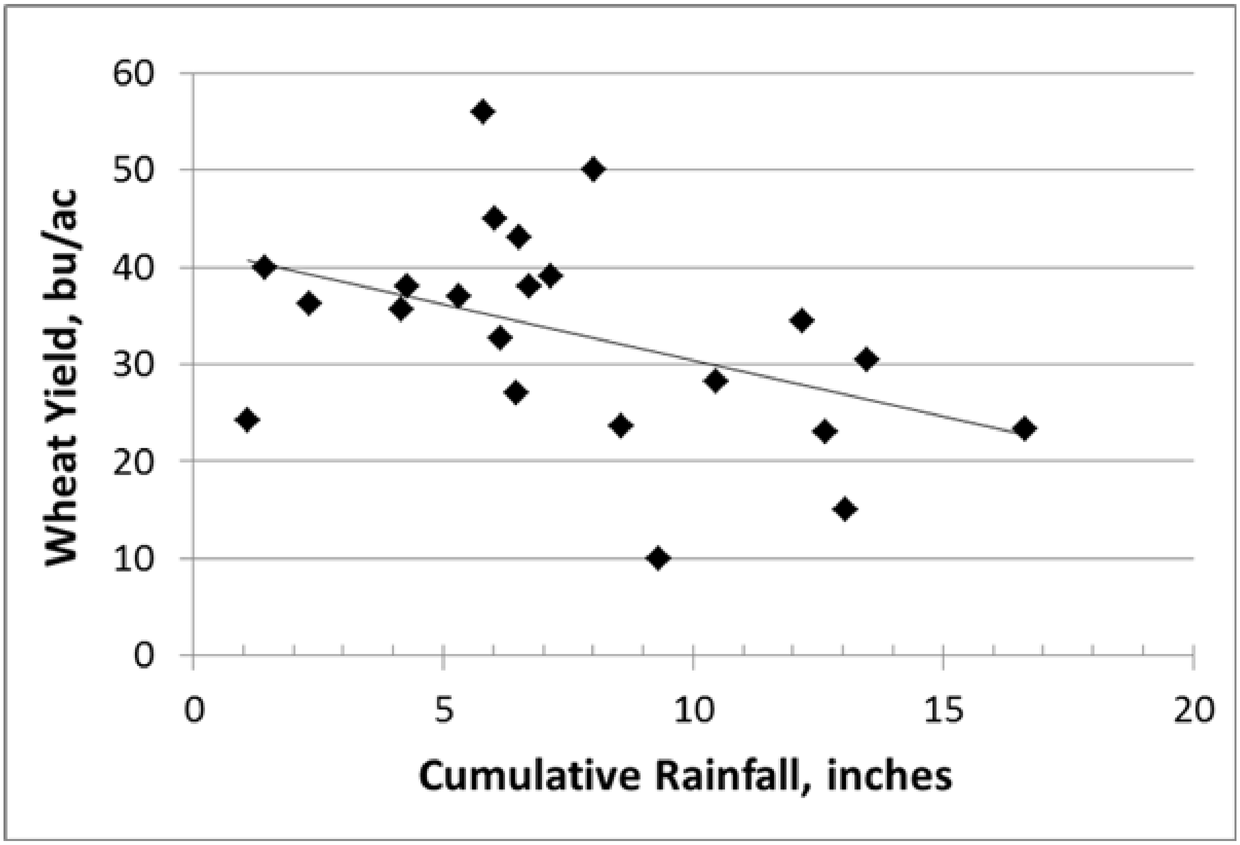

Figure 1. Wheat yield decreases as total rainfall during the spring increases in southeast Kansas.

That the cause of low yields many years could be related to rainfall may be a bit surprising, as adequate moisture is needed for good grain fill. While a moderate amount of rainfall benefits wheat grain development, however, the excessive late-spring rain so common in southeast Kansas decreases yield. What's going on here?

Historical averages show that in southeast Kansas there is more than a 50% chance of rain during the late spring (Figure 2). Most unfortunately, this period of high potential rainfall coincides with wheat maturation.

Late-season rains can have several effects. For one thing, high rainfall amounts in the spring limit when producers can get in the field and harvest the grain. Also, waterlogged soils during grain fill can reduce wheat yields and test weight.

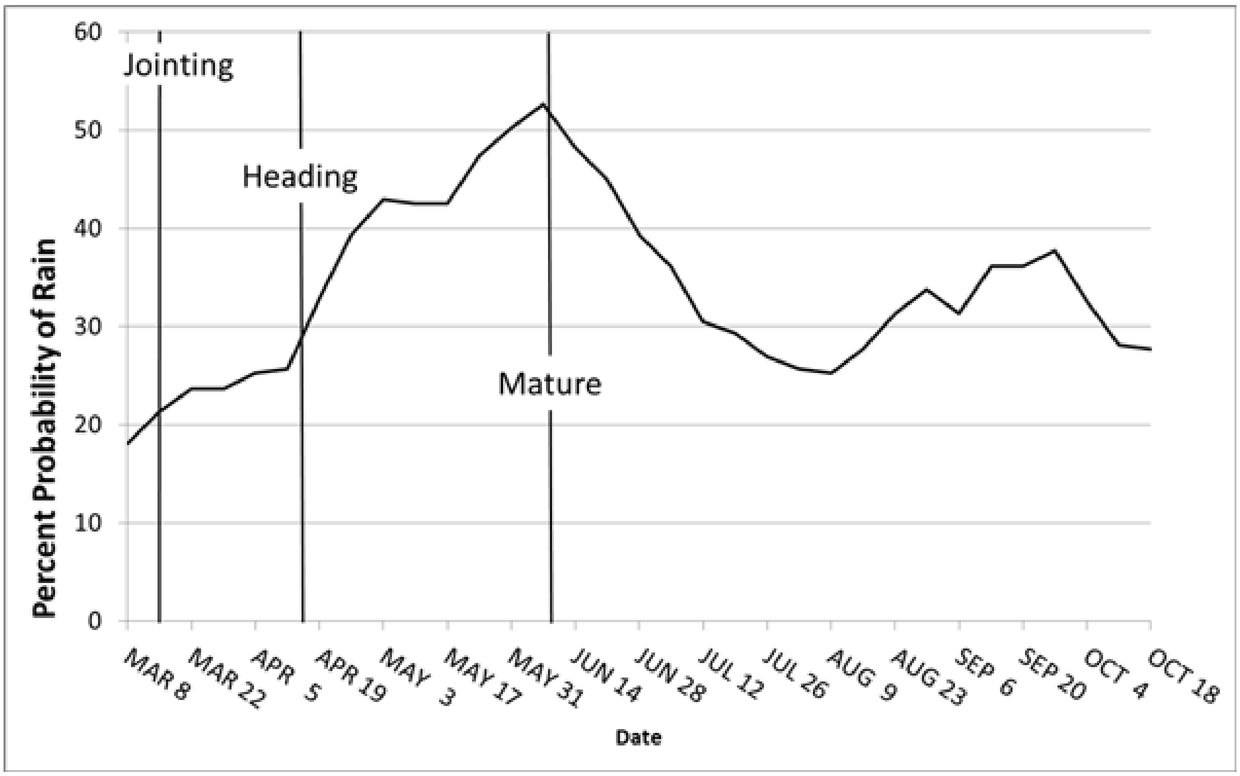

Figure 2. Probability of rainfall in southeast Kansas, and wheat growth stages.

In addition, excessive spring rain contributes to elevated disease pressure, including Fusarium head blight (FHB, often called simply "scab"), stripe rust, leaf rust, tan spot, septoria leaf blotch, glume blotch, and others – all of which have been serious late-season diseases on wheat in recent years in southeast Kansas. This was recently demonstrated by the extreme FHB infestation in 2015 (Figure 3). Rainfall in 2015 was more than 7 inches above normal (Figure 4), and occurred primarily around the time of flowering.

Figure 3. Fusarium head scab in southeast Kansas, 2015. Photo by Doug Shoup, K-State Research and Extension.

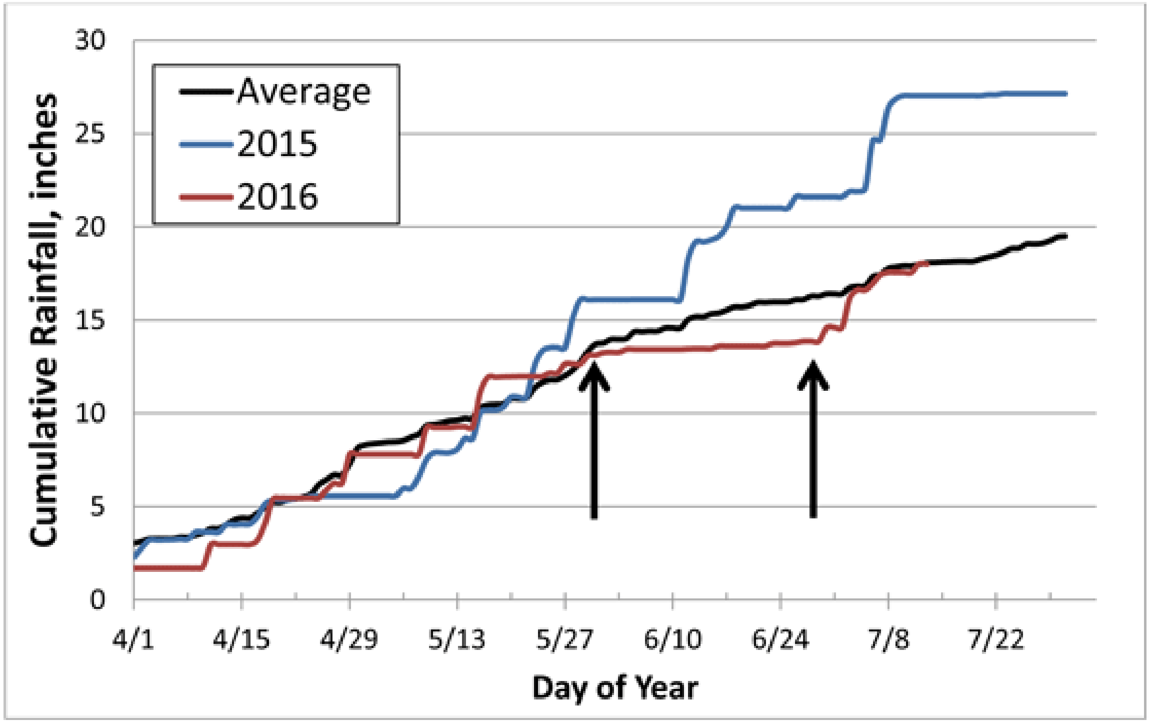

Figure 4. Cumulative rainfall during the spring and early summer in southeast Kansas for 5-year average (black line), 2015 (blue line) and 2016 (red line). Arrows indicate dry spell in 2016 that coincided with wheat harvest.

Effect of persistent cloud cover and limited sunlight during grain fill

Previous research has demonstrated that wheat yields may be limited by lack of sufficient solar radiation in growing seasons when total precipitation is more than approximately 20 inches, especially when the bulk of the precipitation occurs during the interval between anthesis (flowering, which begins shortly after heading) and physiological maturity. Figure 2 shows how the average time of flowering in southeast Kansas matches well with an increased probability of rainfall – and therefore cloudy weather. Decreased solar radiation available to the crop during grain fill reduces the amount of photosynthates produced to fulfill the potential grain size originally planned by the plant, reducing grain yield and test weight.

Management considerations

There are some practical wheat management practices that can help producers overcome the problems caused by excessive late-spring rains in southeast Kansas, at least to some extent.

Variety selection. There are three important traits of wheat varieties for withstanding the late-season environmental conditions of southeast Kansas: tolerance to FHB, resistance to stripe rust and other foliar diseases, and excellent straw strength. Early maturity can also help since varieties that can be harvested early can avoid some of these late-season problems. Unfortunately, no one variety offers all of these traits, so producers have to set priorities.

Everest is currently the most widely grown variety in southeast Kansas. Part of the reason is that Everest is an early maturing variety with good straw strength, and has the strongest tolerance to FHB of any variety on the market. Even though the tolerance of Everest to FHB is limited, it's better than other varieties. FHB is a potentially devastating disease and is difficult to manage with fungicides, so this trait is especially important in southeast Kansas. Everest is susceptible to stripe rust, however, so a foliar fungicide will often be needed. Zenda, a new K-State variety to be released as an Everest replacement, should also be a good candidate for successful performance in southeast Kansas. There are some soft wheat varieties with some level of tolerance to FHB, too.

Varieties with good overall foliar disease resistance can reduce the need for fungicides and can potentially stand better through late-season wet weather. Varieties with good inherent straw strength are also especially useful for the kind of environmental conditions common to southeast Kansas. An updated description of wheat cultivar disease ratings is available online at http://www.bookstore.ksre.ksu.edu/pubs/mf991.pdf/

Seed treatments. Fungicide seed treatments will not help wheat withstand late-season disease pressure, but they can help protect the quality of seed saved from wheat grown in this region. For example, FHB can affect the quality and viability of seed saved for next season's plantings. Good seed cleaning and a fungicide seed treatment are warranted when saving seed after a growing season with heavy FHB incidence and severity.

Research results

To document the effect some of these management practices can have individually and in combination in protecting wheat yields in southeast Kansas, an experiment was conducted at the Southeast Research and Extension Center at Parsons in 2016. This trial compared the effect of a seed treatment alone, an in-season foliar fungicide treatment alone, and a combination of those two practices on Fusarium-infected (poor) seed and uninfected (good) seed (Figure 5).

The results showed a consistent trend towards better yield with the good quality seed compared to the poor quality seed for all fungicide treatments, including a control that had no fungicide application. These results demonstrate how important it is to test your seed for viability and vigor prior to planting.

Also, yields improved with each additional fungicide treatment.

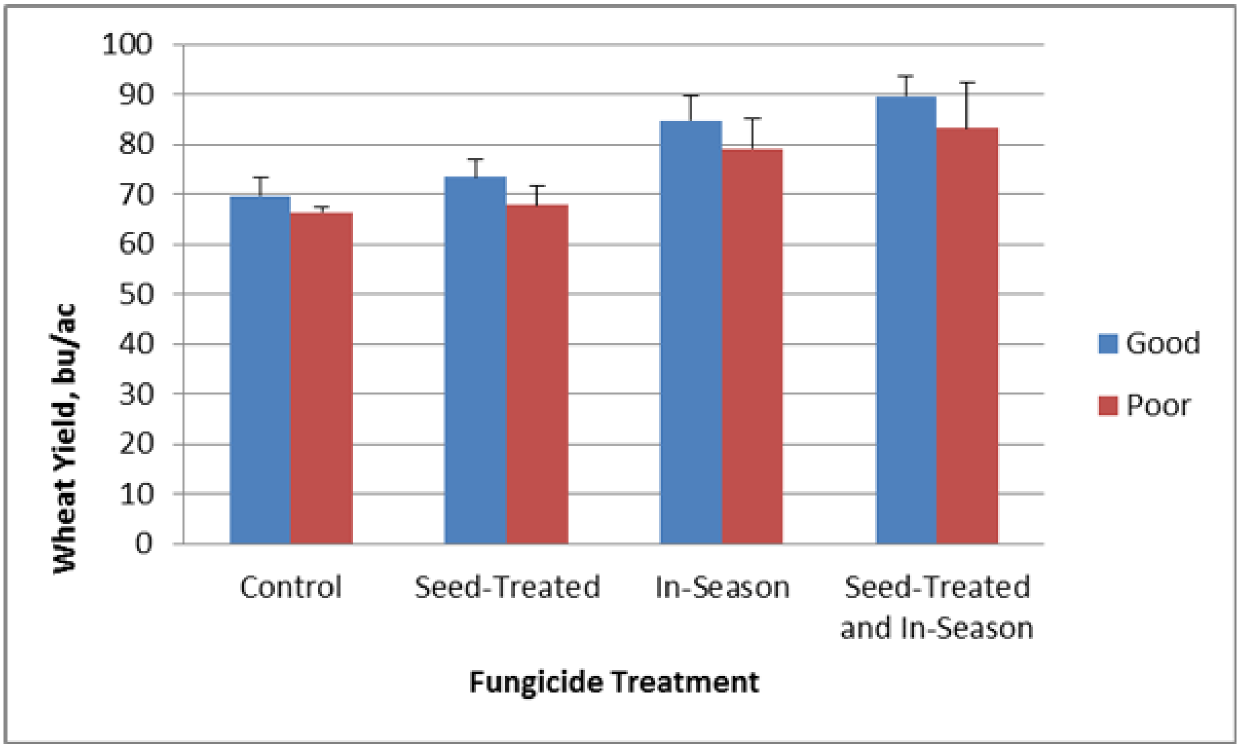

Figure 5. Impact of fungicide treatment on wheat yield in southeast Kansas, 2016.

In 2016, the early arrival of stripe rust in addition to the cool weather in April and May amplified the foliar fungicide response. Preliminary data (Figure 5) indicates that even in a good year without excessive late-season rainfall, such as 2016, fungicide treatments can also increase yield. The 2016 harvest was blessed with a relatively long period of dry weather (May 31 through June 29 had less than ¾ inches of rain – Figure 4, between arrows), resulting in high wheat yields for the area.

Table 1. Summary of fungicide treatments and impact on yield of Everest in southeast Kansas, 2016.

			Good quality seed	Poor quality seed
Treatment	Product	Rate	Yield (bu/acre)	
Control	--	--	70	66
Seed treatment	Warden Cereal HR	6 oz/100 lb	73	67
Foliar fungicide	Headline, flag leaf + Prosaro, flowering	9 oz/acre + 6.5 oz/acre	85	79
Seed treatment + foliar fungicide	Warden Cereal HR + Headline + Prosaro	6 oz/100 lb + 9 oz/acre + 6.6 oz/acre	90	83

Preliminary conclusions from the 2016 research indicate that applying a foliar fungicide to Everest in a year with heavy stripe rust infections protected yield well above the economic threshold (Table 1). Everest is susceptible to stripe rust. Although this large of a yield increase is not expected every year, fungicide trials on wheat in southeast Kansas have showed similar results in past years (KSRE Report of Progress SRP1105, pages 86 and 88).

Summary

In making planting decisions for wheat in southeast Kansas, the critical components are first to select good quality seed of a variety with good resistance to the most common foliar diseases in your area, and second to consider a fungicide seed treatment. Selecting a variety with the best available tolerance to FHB is also helpful, although this limits you in fall 2016 to Everest or one of the soft wheat varieties with some tolerance to FHB – and means you'll be more likely to need a foliar fungicide application in the spring to realize the variety's full yield potential. Another critical step is to test the viability of any saved seed. Following up with scouting for disease presence in the spring, with treatment as needed, can also improve yields.

This research is funded in part by the Kansas Crop Improvement Association. We gratefully acknowledge the farmers who collaborate in our research program.

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3. 2016 Forecasted corn yield potential and attainable yields

At this point in the season, a slightly higher-than-average percentage of Kansas corn has already passed the flowering (pollination) stage and is entering into the grain filling period. The most recent Kansas Agricultural Statistics Service crop progress report (July 17) projected 63% of the Kansas' corn crop is at the silking stage, near last year's number and a bit higher than average (59%). Overall, close to 70% of the corn crop in Kansas was classified by the USDA as in good or better condition. Pollination conditions around the state were OK (for Central and Eastern regions of the state; the West region is at pollination). However, high temperatures and episodic drought stress could present a challenge for the coming weeks, and could potentially affect the final effective grain number and kernel size per ear. From now until harvest, weather will be the main primary factor driving changes and affecting maximum corn yield.

Potential corn yield estimation

Estimating potential corn yields can help us understand the maximum yield attainable if management is optimal and in absence of unmanageable adversities, such as hail or flooding. A research team based at the University of Nebraska is continuing a project (see the full article) for forecasting corn yield using historical and current weather and management information in collaboration with faculty and extension educators from 10 universities across the U.S. Corn Belt (http://cropwatch.unl.edu/2016/2016-corn-yield-forecasts-july-13).

The corn simulation model -- Hybrid-Maize Model (http://hybridmaize.unl.edu) -- was developed by researchers in the Agronomy and Horticulture Department at UNL and takes into consideration several factors such as weather, plant population, hybrid relative maturity, planting date, and soil type, among other factors. The model assumes optimal management, with no limitation imposed by nutrients or biotic factors (weeds, insect pests, pathogens) and no adversities such as flooding, hail or abiotic factors (heat, drought). Thus, the model provides maximum yield is conditions are optimal.

A yield gap, difference between final attainable yield and maximum yield predicted, will develop if management is sub-optimal or there are other adverse factors not accounted by the model that may reduce corn yield. Simulations can be performed to forecast current-season corn yields. Factors such as site-specific weather conditions from planting until the simulation date and historical weather information to simulate the rest of the 2016 growing season are used for the simulation. Myriad yield scenarios could be produced depending on the growing conditions from the simulation date until harvesting time, but forecasts are more accurate and reliable as the simulation time approaches corn maturity.

Simulation results for Kansas

A total of 41 sites were simulated for corn yields across the U.S. Corn Belt, including 5 sites for Kansas – rainfed, irrigated, or both water scenarios -- and 1 site in Missouri (Fig. 1) that is relevant for the northeast Kansas area. Sites include Garden City, Hutchinson, Silver Lake, Manhattan, Scandia, and St. Joseph, Mo. A separate yield forecast was performed for irrigated and dryland corn for Scandia and Silver Lake, while only irrigated corn was simulated at Garden City. The dryland scenarios for corn yield forecast were Manhattan, Hutchinson, and St. Joseph, Mo.

Daily weather data used for simulating these locations were retrieved from the High Plains Regional Climate Center (HPRCC http://www.hprcc.unl.edu/). For Kansas, local agronomists provided information about soil properties and crop management (hybrid maturity, plant populations, and historical and 2016 planting dates) required for the simulations (Table 1). The following agronomists should be properly acknowledged for investing their time and providing their expertise: Eric Adee, Agronomist-in-Charge, Kansas River Valley Experiment Field, Topeka; Gary Cramer, Agronomist-in-Charge, South Central Kansas Experimental Field, Hutchinson; and John Holman, Southwest Research-Extension Center Cropping Systems Agronomist, Garden City.

The current locations represent just a sample of the corn area in the state, but more sites could be added in the coming years to increase the site-specificity of the corn yield forecast analysis.

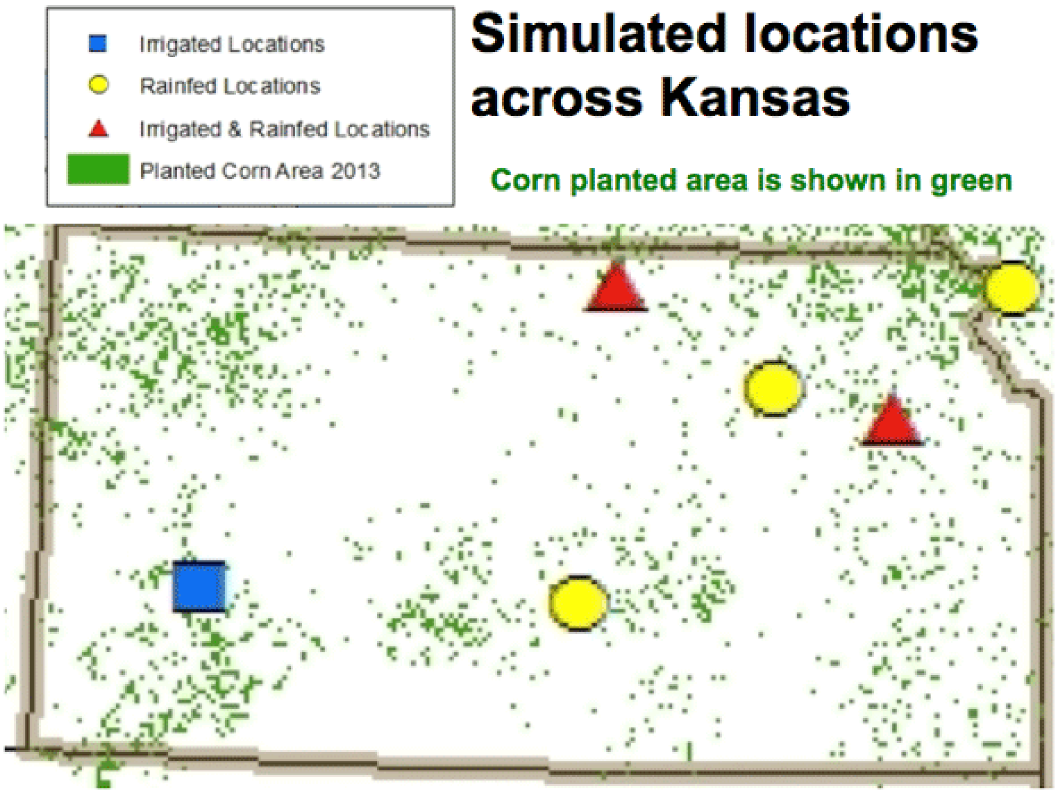

Figure 1. Locations utilized for simulation purposes for Kansas.

Table 1. Management and soil data used for forecasts in Kansas.

Location	Water regime	Density (plant per acre)	Hybrid RM (days)	2016 planting date[1]	Average yield (bu/acre)[2]
Manhattan	Dryland	25,000	110	April 17	109
Scandia	Irrigated	34,000	116	April 27	173

	Dryland	24,000	107	May 2	100
Silver Lake	Irrigated	34,000	117	April 14	171
	Dryland	24,000	109	April 18	99
Hutchinson	Dryland	20,000	105	April 28	74
Garden City	Irrigated	26,000	113	May 8	191

Data were retrieved by state collaborators and DuPont Pioneer agronomists. [1] Approximate date at which 50% of final corn area was planted in 2016 at each location. Soil water balance was initialized around prior crop harvest in the previous year (2015), assuming 50% available soil water. [2] Average (2005-2014) actual yield reported by USDA-NASS for the counties located near the simulated location (source: Global Yield Gap Atlas www.yieldgap.org)

Forecasted corn yield potential was compared to the long-term average yield from 2005-2014. The model then calculated 2016 forecasted yield potential, utilizing current-season weather. The 2016 in-season yield potential forecasts for Kansas is presented in Table 2.

At almost all sites simulated in Kansas, there is close to 50% probability of achieving near average yields for the current season as relative to the long-term yield potential.

Under irrigated conditions (Scandia, Silver Lake, and Garden City), there is a 30% greater probability of having above-average yields (relative to the long-term yield potential) for Scandia and Silver Lake, and a 20% chance of having above-average yields for Garden City. Under rainfed conditions, there is a higher probability of being above average for 2016 corn yields in the northeast corner of the state (if the corn was planted before first week of May; Table 1), but still a fair probability (>=30%) for the rest of the dryland sites (except for Manhattan; 29% - Table 2). It should be emphasized that forecasted yield for corn is showing adequate probabilities for average yield expectation across all locations evaluated in this analysis.

Table 2. 2016 In-season Yield Potential Forecasts for KS (July 13).

			Range of 2016 forecasted yields as of July 13 (bu/acre)		Probability (%) of 2016 yield to be (relative to the long-term average yield):			Simulated current crop stage
Location	Water regime	Long-term (2005-14) avg. yield (bu/a)	25th	75th	Below	Near	Above	
Garden City	Irrigated	191	184	207	10%	70%	20%	R1, Silking
Hutchinson	Dryland	74	71	86	12%	54%	35%	R3, Milk
Manhattan	Dryland	109	104	121	10%	61%	29%	R3, Milk
Scandia	Dryland	100	104	118	0%	57%	43%	R2, Blister

	Irrigated	173	178	203	0%	70%	30%	R2, Blister
Silver Lake	Dryland	99	94	113	17%	50%	33%	R3, Milk
	Irrigated	171	172	204	20%	50%	30%	R3, Milk

Summary

Stress conditions during this week and expected in the coming week, primarily related to heat and episodic drought stress, could have a critical impact on corn yields across the state via an impact on kernel number (abortion process) and also on the kernel weight (grain filling occurring in southeast Kansas).

Further details related to current and expected weather conditions, see our previous Agronomy eUpdate article:
https://webapp.agron.ksu.edu/agr_social/eu_article.throck?article_id=1021

As clarified in the UNL article (see below link), these predictions do not consider current or past production problems (e.g. saturated soils, replanting, hail/flooding, nitrate leaching and nutrient deficiencies), or the influence of biotic (e.g. disease, insects) or abiotic (e.g. heat, drought) stress factors.

You can read the full paper related to forecasted yields in 41 locations around the Corn Belt at:
http://cropwatch.unl.edu/2016/2016-corn-yield-forecasts-july-13

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4. Importance of post-wheat harvest weed control in dryland cropping systems

The wet conditions across western Kansas have not only delayed and prolonged wheat harvest but have also set up conditions especially favorable to weed growth. The wheat crop this year has produced exceptional levels of residue that will go a long ways toward conserving moisture for use by next year's corn or sorghum crop when no-tilled back into the stubble.

However, to maximize the benefit of the stubble and no-till dryland cropping systems, weeds must be controlled. A multi-year study was conducted at the Southwest Research-Extension Center at Tribune to evaluate the effects of weed control timing after wheat harvest. In this study weeds were terminated after harvest in mid-July, and the third week of August.

Timing of post-wheat harvest weed control affected plant-available soil water at the October fallow, corn planting, and July in-season measurements. A numerical trend was evident, starting with the August fallow measurement (Figure 1).

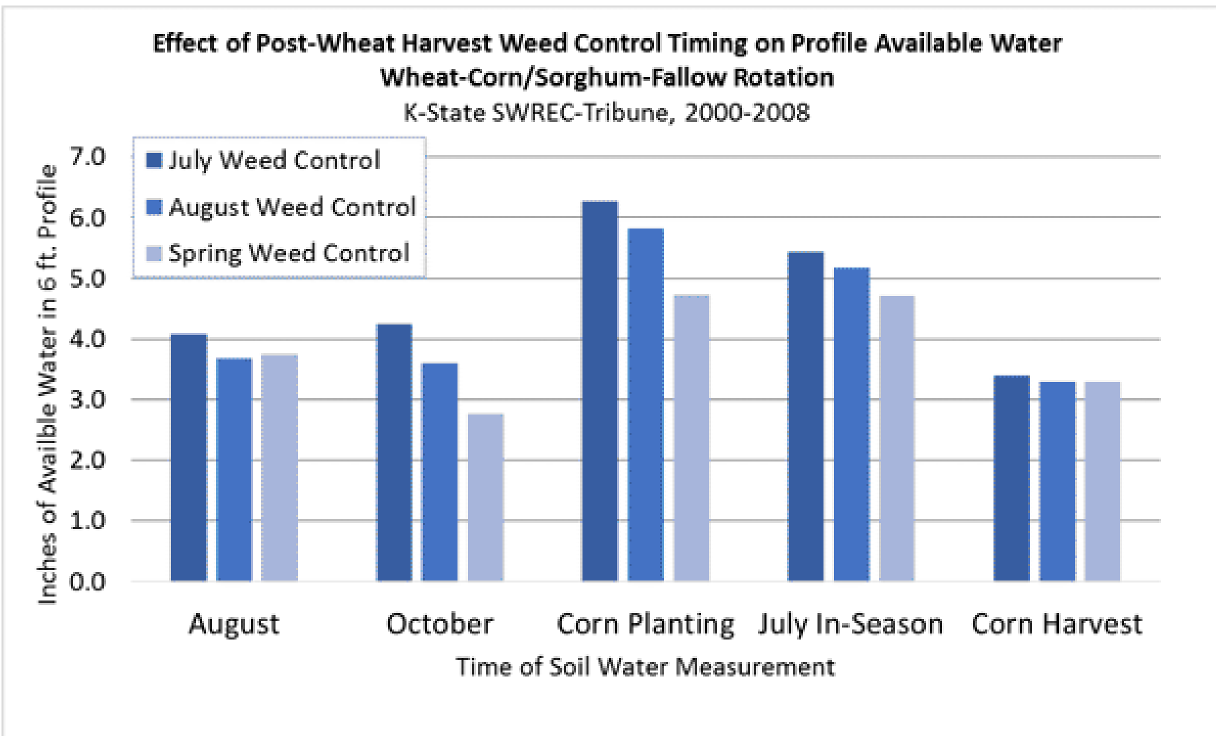

Figure 1. Effect of post-wheat harvest weed control timing on profile available water in a wheat-corn -fallow rotation, Tribune.

Depletion of soil water by weeds allowed to grow from July through August was evident at the

August sampling, at which the July control treatment had an average of 0.4 inches of additional soil water. The effect of growing weeds was evidenced by the greatest depletion of soil water occurring from the surface through the 1.5=-foot depth (Figure 2, Panel A). During this time period, the July control treatment had a fallow efficiency of 25.2%, whereas the August and spring control treatments produced efficiencies of 14.7 and 14.6% respectively.

Allowing weed growth through October in the spring control treatment resulted in further soil water depletion as evidenced by a profile soil water advantage for the July control of 0.6 inches over the August control and 1.4 inches over the spring timing treatment. The difference among weed control timings when measured in October was evident to a depth of 4 feet (Figure 2, Panel B). Within the August to October fallow period, fallow efficiencies for the July and August control timings were both positive at 19.4 and 16.3%, respectively, whereas the spring treatment with uncontrolled weeds produced a fallow efficiency of -24.0%.

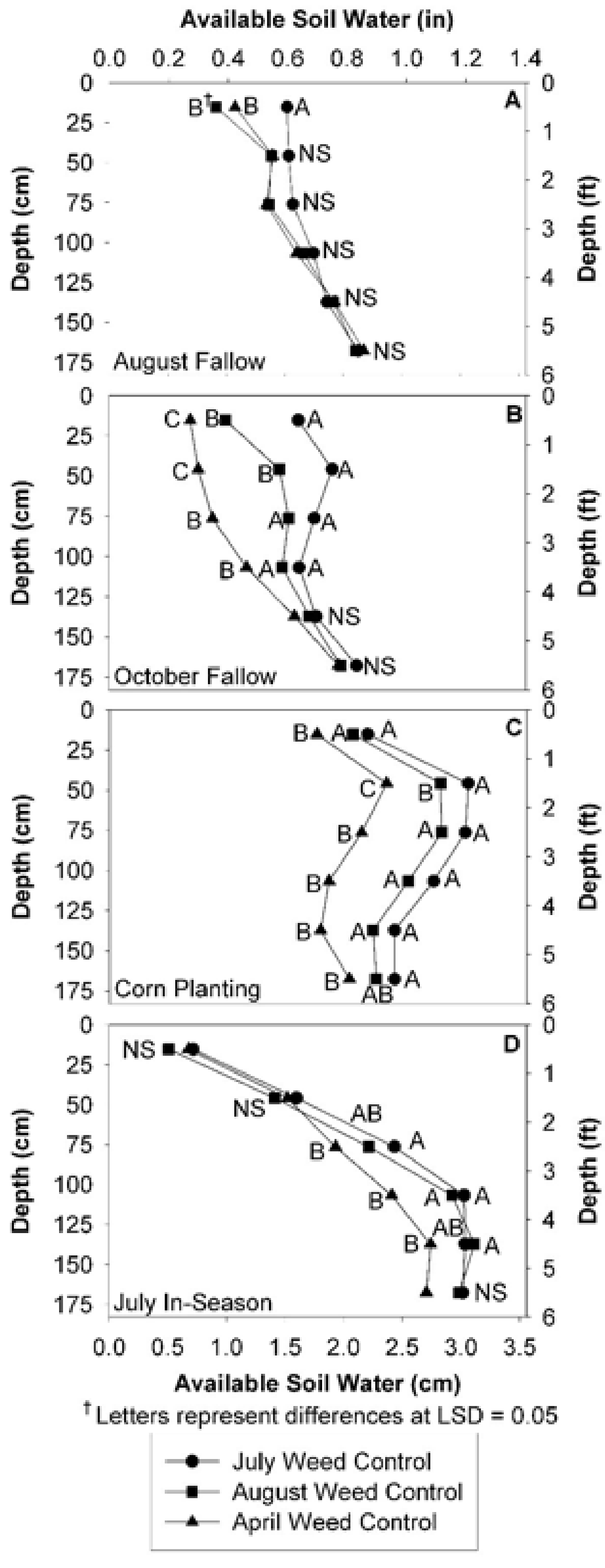

Figure 2. Effect of post-wheat harvest wheat harvest weed control timing on available soil water by depth and time of measurement in a wheat-corn-fallow rotation, Tribune.

Weed control timing resulted in available soil water differences at corn planting (Figure 1). At corn planting, the July and August control treatments had 1.6 and 1.1 inches, respectively, additional available soil water than when weed control was delayed until the spring. Over the entire wheat harvest to row-crop planting period, fallow accumulations were 3.47, 3.09, and 1.89 inches when weed control was performed in July, August, and spring, respectively. This translated into fallow efficiencies ranging from 30.1% for July control to 16.4% for spring control.

July, August, and spring weed control timings resulted in row-crop grain yields of 51, 47, and 36 bu/acre, respectively, when analyzed across years (Figure 3). Both the July and August treatments produced higher grain yields than the spring treatment.

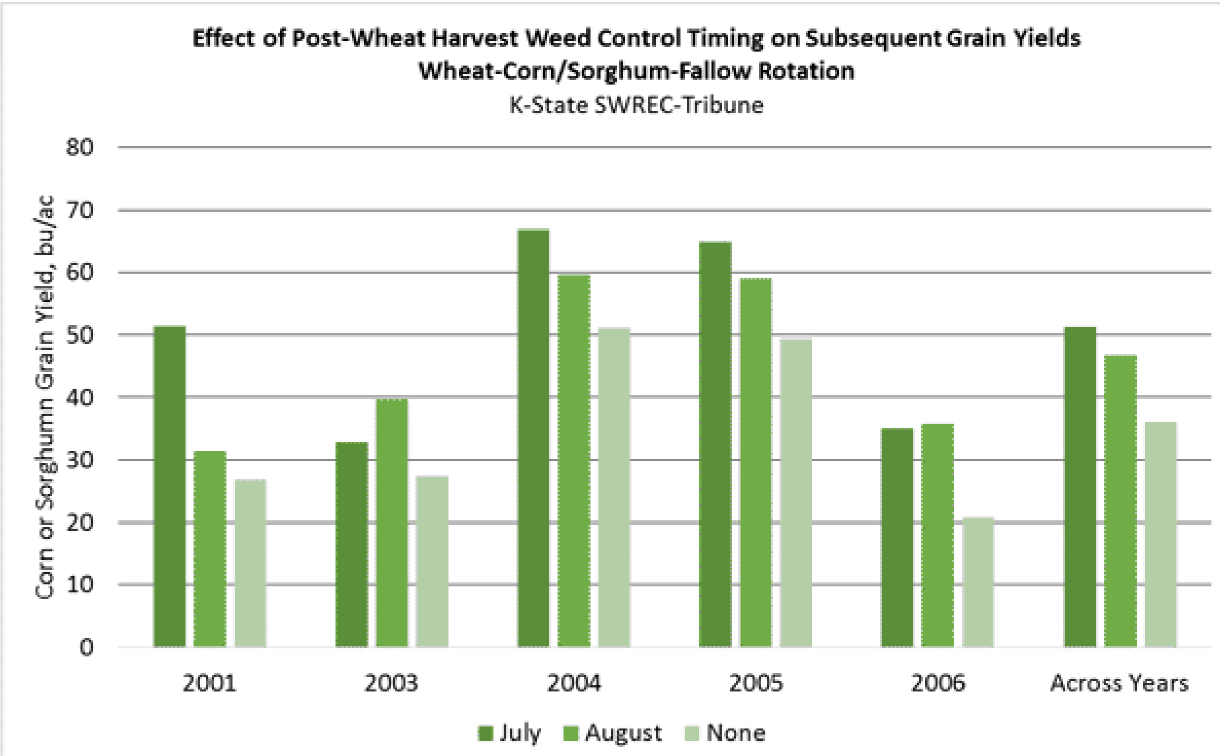

Figure 3. Effect of post-wheat harvest weed control timing on subsequent corn yields (2004 crop is grain sorghum) in a wheat-corn-fallow rotation, Tribune.

In the subsequent corn crop, plant stands were unaffected by weed control timing, whereas the ears per acre yield component declined with delayed weed control, indicating increased barrenness. Spring timing of weed control resulted in the lowest values for water use and water use efficiency. The reduced plant-available water in the spring weed control timing was evident at row-crop planting and this shortfall continued to be present even at the July in-season measurement (Figure 2, Panel D), obviously limiting water use and grain yield potential. By using the differences in plant-available water at planting and grain yields among the treatments in this study, 1 inch of plant-available water was worth an average of 9.4 bu/acre in corn grain yield.

Summary

Delaying weed control in a wheat-corn/sorghum-fallow rotation until spring resulted in soil water depletion that was evident at the first measurement in August. This additional depletion due to weed growth was never recovered, resulting in reduced available soil water at corn planting and persisting throughout the growing season. Differences in plant-available water were clearly reflected in grain yields. Delaying weed control resulted in reductions in grain yields, biomass production, water use, and water use efficiency.

For more information on controlling weeds after wheat harvest, see the article "Control weeds in wheat stubble before they set seed" in eUpdate No. 575, June 17, 2016.

Lucas Haag, Northwest Area Agronomist, Northwest Research-Extension Center

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Alan Schlegel, Agronomist-in-Charge, Southwest Research-Extension Center, Tribune

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5. Saline County dryland corn plot /on-farm research tour, July 28

K-State Research and Extension and the Central Kansas Extension District will host tours of two dryland corn seeding rate plots and one stop featuring site-specific precision ag technology using satellite imagery in Saline County on Thursday, July 28.

Focus of the tour will be a discussion of the on-farm research plots at each farm -- evaluating twin row vs. 30" row corn, the use of satellite imagery in site-specific precision farming, and dryland corn seeding rates.

The first stop will begin at 8:30 a.m. at the Dwight Conley farm located 1 mile south of Gypsum on Gypsum Valley Rd. and then 1/4 mile east on Assaria Rd. An on-farm research plot sponsored by Great Plains Manufacturing, comparing twin row corn vs. 30" row corn at three seeding rates will be discussed.

The second stop will begin at 9:30 a.m. at Shadelawn farm, operated by Justin Knopf, located 1 mile north of Gypsum, just north of the Gypsum Valley Rd. and McReynolds Rd. intersection. An on-farm research plot featuring the use of site-specific precision agriculture tools and satellite imagery will be discussed, as will the use of a triticale cover crop following corn last year, and where no-till soybeans were planted in 2016.

The last stop will begin at 11:00 a.m. at the Mark Pettijohn farm located southwest of Solomon. From Solomon, go 1 ½ mile west on Old Hwy 40 then 3/4 mile south on Donmyer Rd. to Campbell Rd., then east 1 mile to the T intersection, and then south 1 mile to the plot. If coming from the south, from the Donmyer Rd./Country Club Rd. intersection go 4 miles north to Campbell Rd. then east 1 mile to the T intersection and then south 1 mile to the plot. An on-farm research plot, featuring dryland corn seeding rates of 14, 18, 22, 26 and 30,000 seeds per acre, will be discussed.

Speakers include K-State Extension specialists Ignacio Ciampitti, Stu Duncan, and Jeff Whitworth; Tom Maxwell, Central Kansas District extension crop production agent; and the cooperating farmers.

For more information about the tours, contact Tom Maxwell at the CKD3 - Salina office at 785-309-5850. All interested persons are invited to attend any or all of these tour stops. No RSVP is needed.

Tom Maxwell, Central Kansas Extension District crop production agent
tmaxwell@ksu.edu

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist
ciampitti@ksu.edu

6. Kansas River Valley Experiment Field fall field day, August 9

The Kansas River Valley Experiment Field near Rossville will host its fall field day on Tuesday, August 9. The field day begins at 6 p.m. sharp.

Field day topics and K-State presenters include:

- Seed treatments update and current disease issues – Doug Jardine, Extension Plant Pathologist
- Update on planter research at K-State – Ajay Sharda, Extension Biological and Agricultural Engineering
- When does it pay to apply foliar fungicides in the Kaw River Valley? – Stu Duncan, Northeast Area Crops and Soils Specialist
- Tip dieback on corn: Cause and cure – Eric Adee, Agronomist-in-Charge, Kansas River Valley and East Central Experiment Fields

The field is located 1 mile east of Rossville on U.S. Hwy 24, on the south side of the road.

A BBQ meal will be provided after the field day, sponsored by Wilbur-Ellis. To pre-register, call Joanne Domme at the Shawnee County Extension office at 785-232-0062, ext. 100 by 5 p.m. on Monday, August 8. Commercial pesticide applicator continuing education credits have been applied for.

7. East Central Experiment Field fall field day, August 17

The East Central Experiment Field in Ottawa will host its fall field day on Wednesday, August 17. The field day begins at 9 a.m. with registration, coffee and doughnuts, and the program starts at 9:30 a.m. A complimentary lunch will be served.

Field day topics and K-State presenters include:

- Row crop disease update – Doug Jardine
- Crop insect update – Jeff Whitworth
- Mapping soil variability within your field – Gretchen Sassenrath
- Satellite imagery for nitrogen recommendations – Ray Asebedo

From I-35 at the Ottawa exit, the East Central Experiment Field is south 1.7 miles on Kansas Highway 59, then east 1 mile, and south 0.75 mile.

More information, including Certified Crop Advisor Credits, is available by contacting the East Central Experiment Field at 785-242-5616.

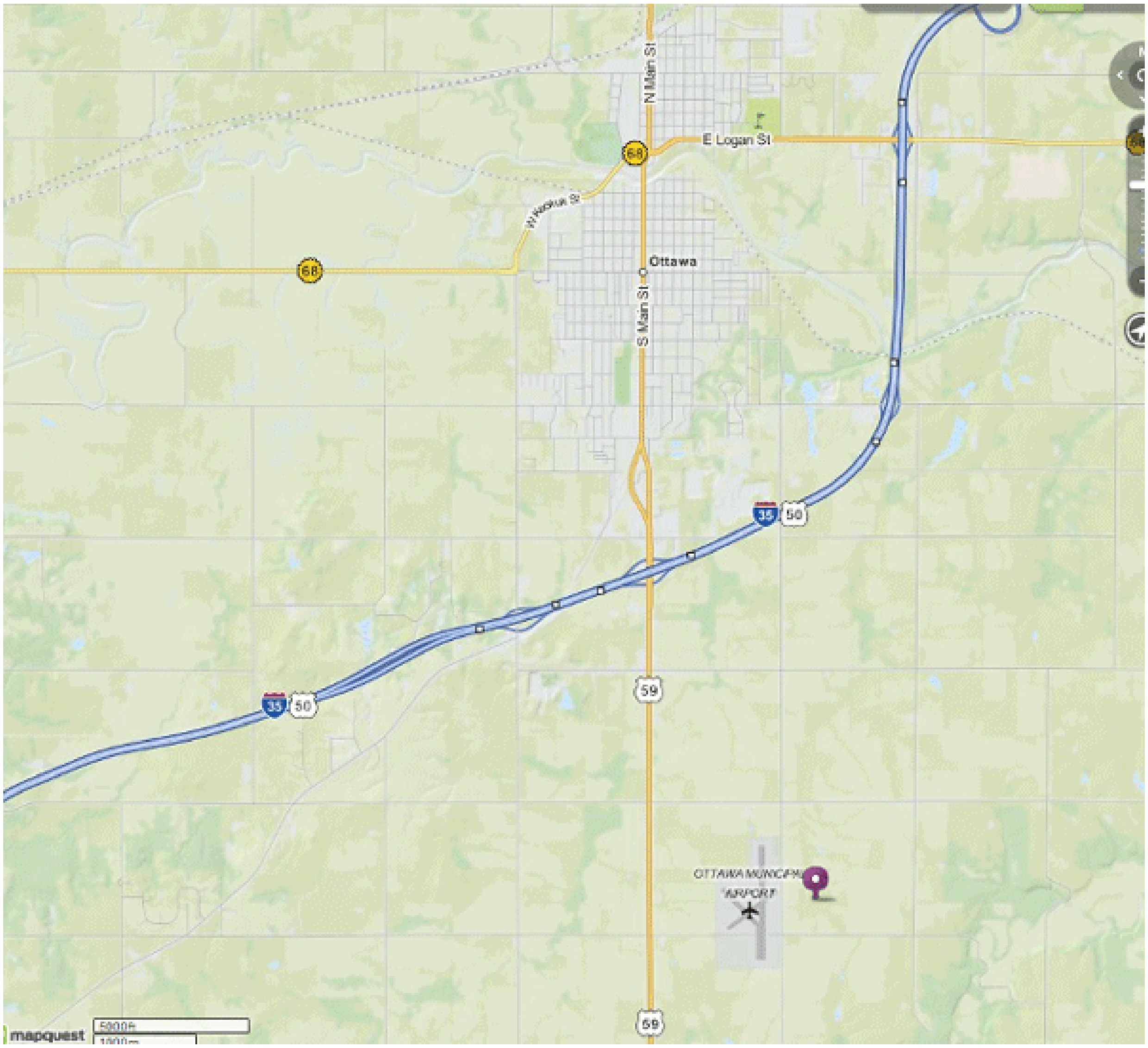

Figure 1. Location of East Central Experiment Field, south of Ottawa.

8. Southwest Research-Extension Center fall field day, August 25

Corn and sorghum will take center stage at the Southwest Research-Extension Center's fall field day Thursday, Aug. 25. The center is located at 4500 E. Mary St. in Garden City.

Registration with time to visit exhibitor booths starts at 8 a.m. The program, followed by field tours, begins at 9:15 a.m. Lunch will be served at noon, compliments of commercial exhibitors, and seminars start at 1 p.m.

One field tour includes:

- Summer annual forages
- Iron chlorosis in grain sorghum
- Weed control in irrigated corn
- Weed control in irrigated sorghum
- Impact of increasing sorghum population and fertility on weed control of ultra-low herbicide inputs

Another field tour includes:

- Mobile drip irrigation for corn production
- Soil water sensors and plant canopy temperature sensors for irrigation scheduling
- Corn and sorghum insect update

The topics of the afternoon seminars are:

- Limited irrigation research update
- Beneficial Insect Blitz (including information on laws, safety labels and environmental concerns)
- Occasional tillage in wheat-sorghum-fallow

Continuing education credits are available for attendees.

More information is available by contacting the K-State Southwest Research-Extension Center at 620-276-8286.

9. Comparative Vegetation Condition Report: July 12 - 18

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. 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:

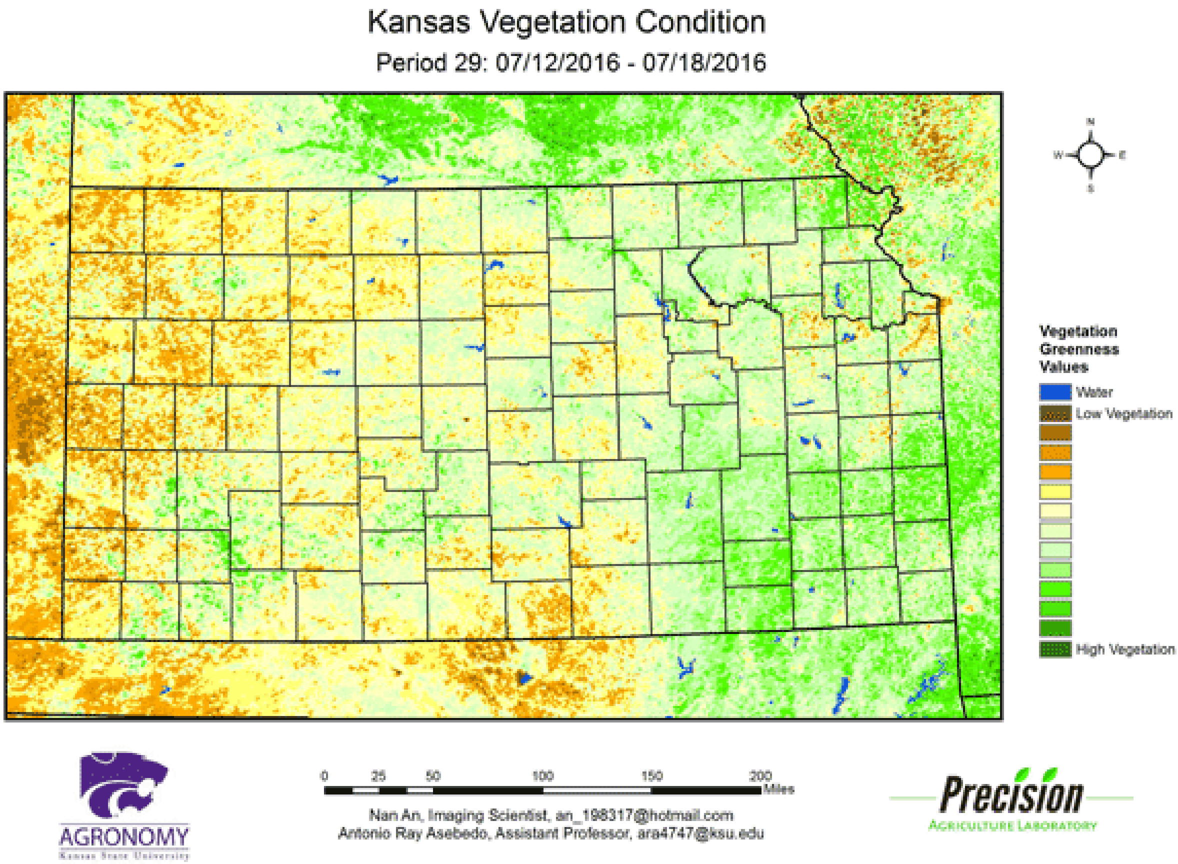

Figure 1. The Vegetation Condition Report for Kansas for July 12 – July 18, 2016 from K-State's Precision Agriculture Laboratory continues to show high NDVI values across most of the eastern third of the state, as well as pockets in central and southwest Kansas. There are higher NDVI values now along the Republican River Basin in north central Kansas. Lower NDVI values are visible in parts of eastern Kansas, south of the Kansas River, where excessive rainfall stunted plant development.

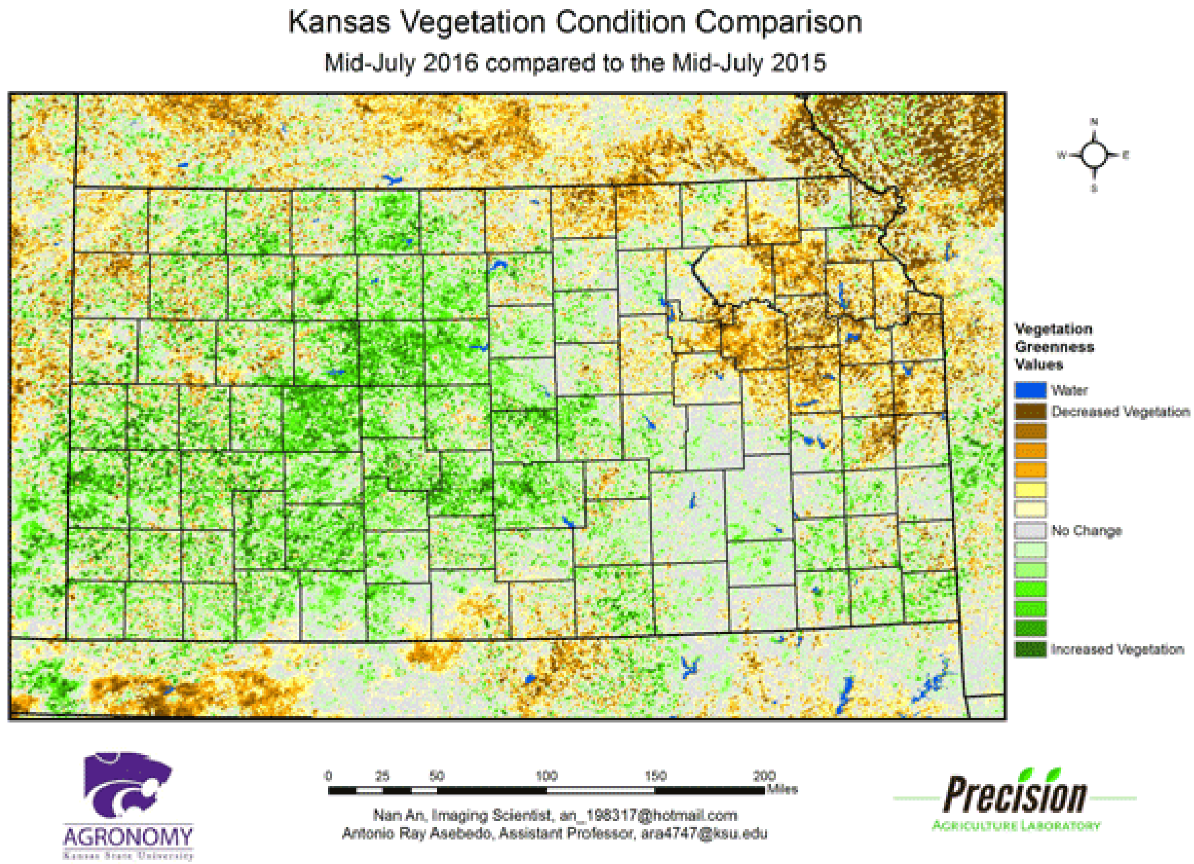

Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for July 12 – July 18, 2016 from K-State's Precision Agriculture Laboratory shows much higher photosynthetic activity across most of the state. The greatest increase in photosynthetic activity is in western Kansas. Rainfall has continued to be well distributed in the region and crop progress continues ahead of last year at this time. In eastern Kansas, the rapid switch from wetter conditions to hot, dry conditions has had a negative impact on vegetative activity this year compared to last year.

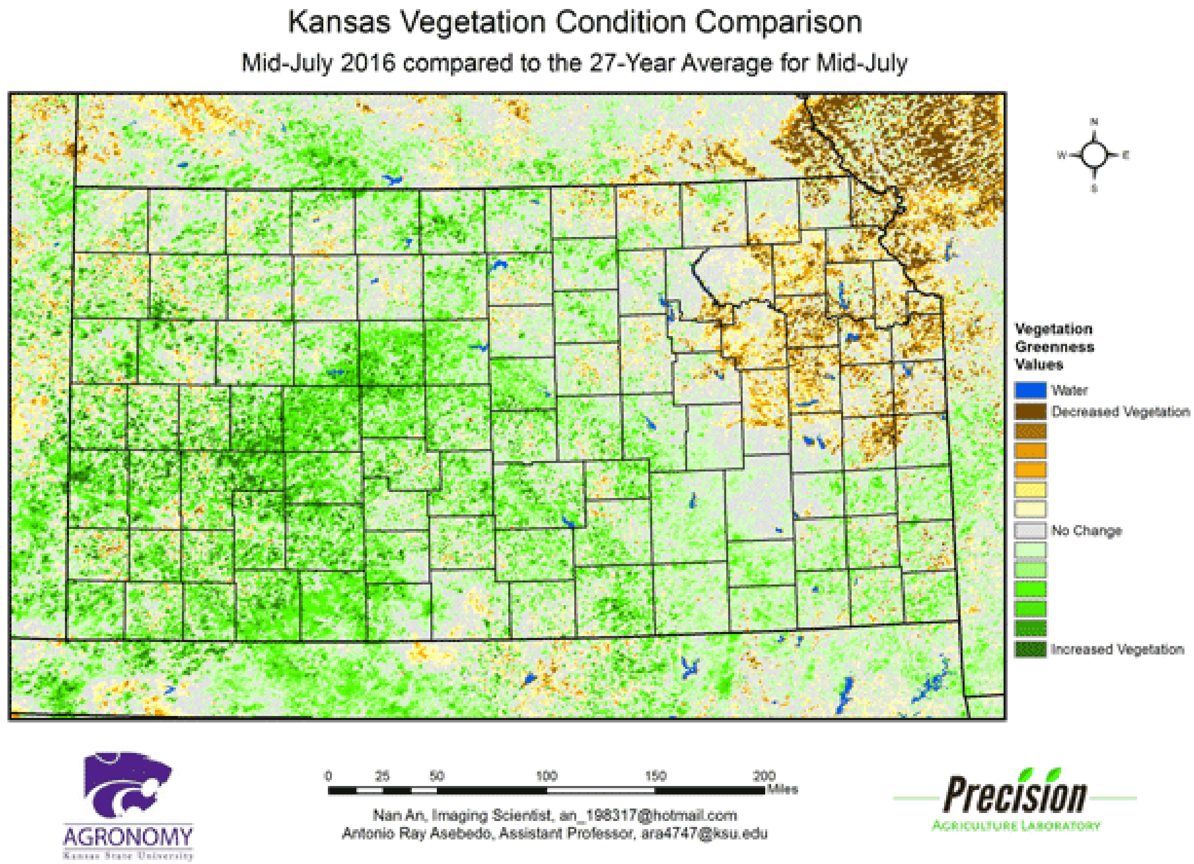

Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for July 12 – July 18, 2016 from K-State's Precision Agriculture Laboratory shows below-average vegetative activity in the northeastern portion of the state. Wet conditions slowed root development, and the rapid switch to hot weather has stressed vegetation.

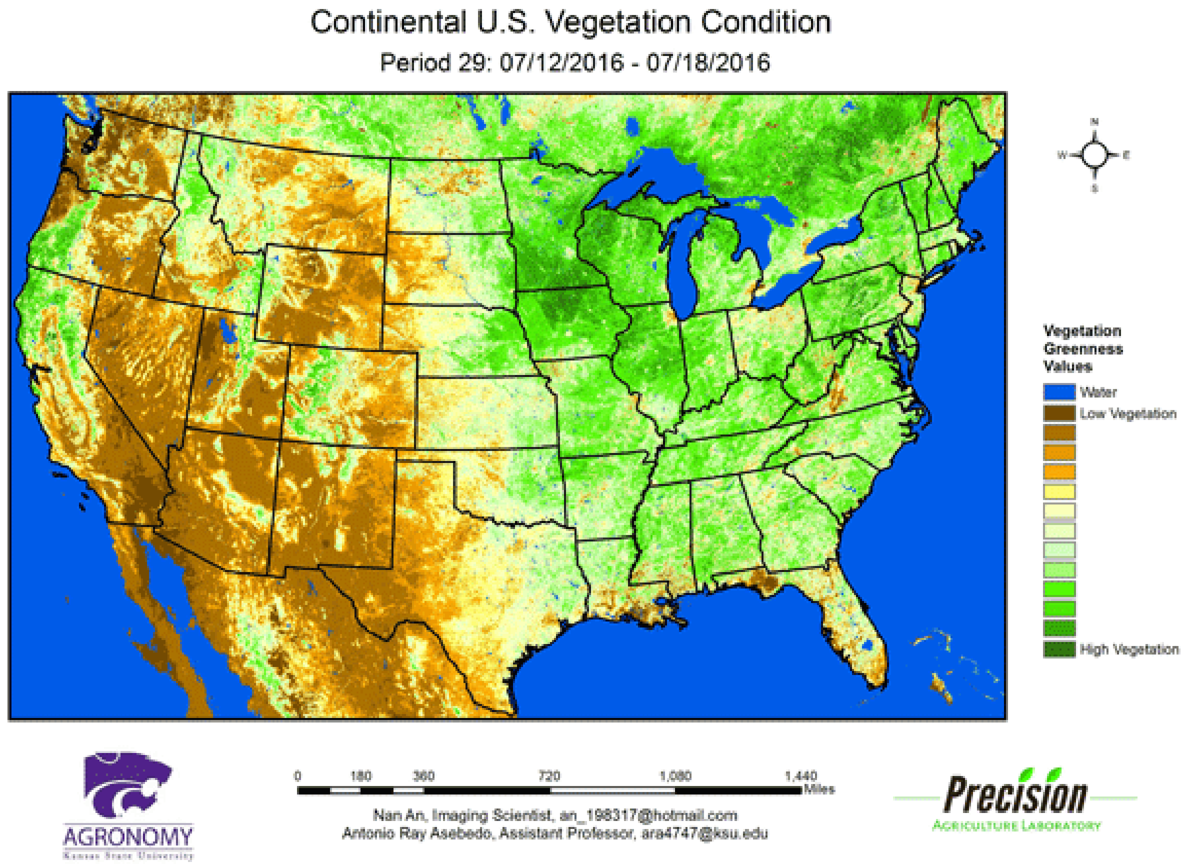

Figure 4. The Vegetation Condition Report for the U.S for July 12 – July 18, 2016 from K-State's Precision Agriculture Laboratory shows high NDVI values in the western Corn Belt. Favorable rainfall and more seasonal temperatures favored photosynthetic activity across the region. In contrast, the western High Plains of South Dakota, eastern Montana and eastern Wyoming have reduced vegetative activity as drought intensifies in these areas. The patch of reduced vegetative activity in western Kentucky marks an area of excessive rainfall. Some locations had more than 8 inches in a 24-hour period.

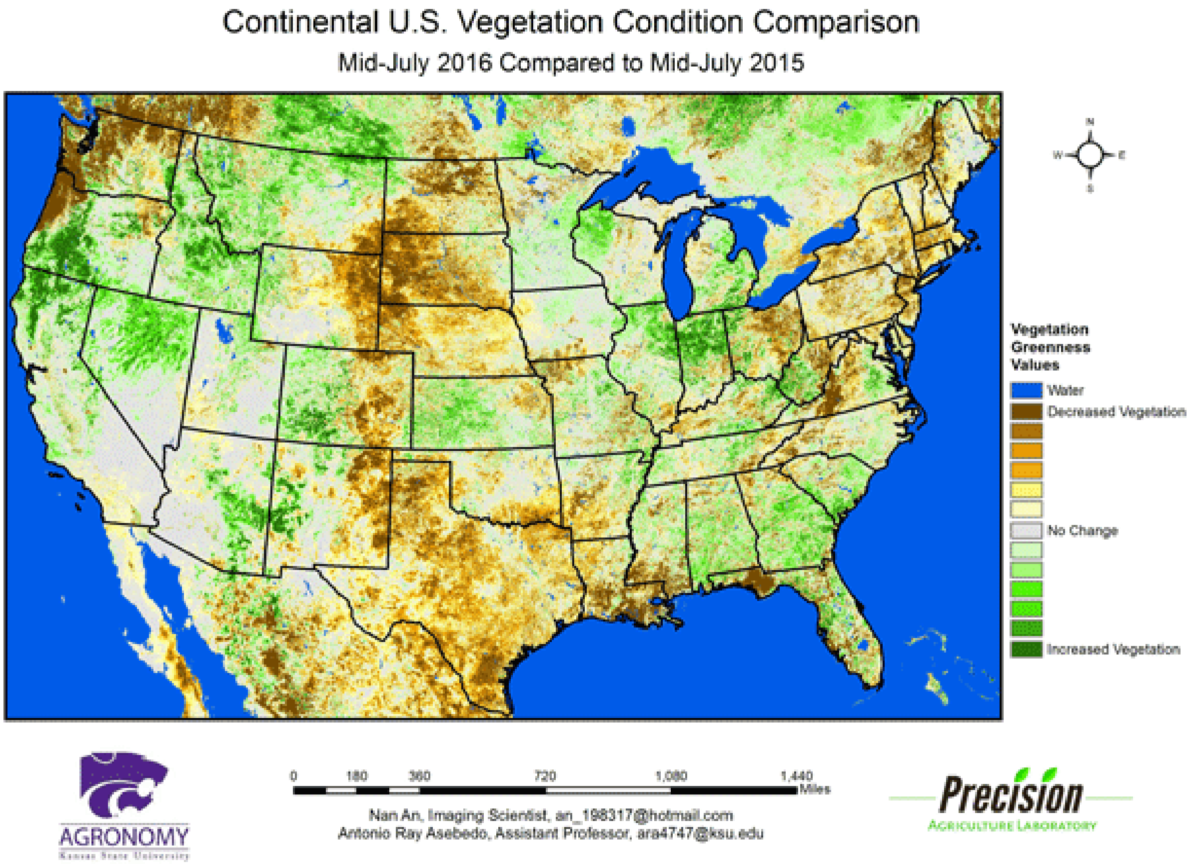

Figure 5. The U.S. comparison to last year at this time for July 12-July 18, 2016 from K-State's Precision Agriculture Laboratory shows that lower NDVI values are most evident in the western High Plains where continued drier-than-average conditions, coupled with extremely hot weather, have stressed vegetation compared to last year. In the East, heavy rains have limited NDVI values.

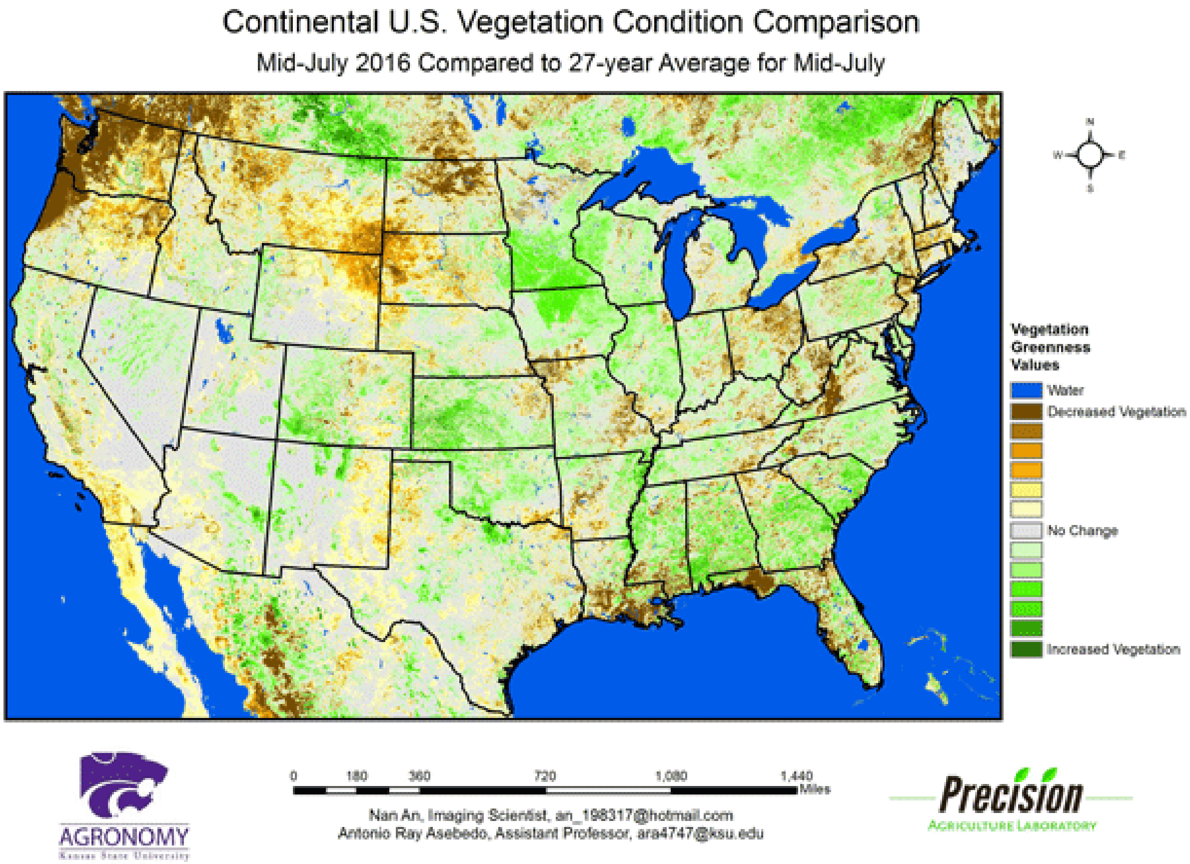

Figure 6. The U.S. comparison to the 27-year average for the period July 12 – July 18, 2016 from K-State's Precision Agriculture Laboratory shows areas of below-average photosynthetic activity across most of the northern continental U.S. Rapidly drying conditions in the Pacific Northwest are the major cause of the lower than NDVI values in that area. Heavy rains reduced NDVI values in western Kentucky, while flash drought conditions are developing in New England.

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