



K-STATE
Research and Extension

Extension Agronomy

eUpdate

05/13/2016

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. Sorghum management considerations..... | 3 |
| 2. Winter canola private-public partnerships at K-State..... | 14 |
| 3. Uncontrolled weeds would lead to billions in lost crop revenue in U.S. and Canada..... | 17 |
| 4. South Central Experiment Field Spring Field Day, May 24..... | 20 |
| 5. Southeast Kansas Spring Crops Field Day May 24 in Parsons..... | 21 |
| 6. Winter canola featured at K-State field days May 24, 25..... | 22 |
| 7. Kansas Wheat Day, Agricultural Research Center-Hays, May 26..... | 23 |
| 8. Spring Field Day, May 26, Garden City..... | 24 |
| 9. Wheat plot tour scheduled at North Central Experiment Field, June 1..... | 25 |
| 10. Dryland Ag Day, June 15, Tribune..... | 26 |
| 11. Comparative Vegetation Condition Report: May 3 - 9..... | 27 |

1. Sorghum management considerations

Sorghum plants can compensate and adjust to diverse environmental conditions through modifications in the number of tillers, head size, and final seed weight. For sorghum, the final number of seeds per head is the plant component that varies the most; and thus has more room for adjustment than the other plant components (seed weight and number of tillers).

Some of the main planting practices affecting yields in sorghum are: row spacing, row arrangement, seeding rate/plant population, planting date, and hybrid maturity.

Seeding rate / plant populations

Sorghum population recommendations range from a desired stand of 24,000 to 100,000 plants per acre depending on annual rainfall:

| Avg. Annual Rainfall (inches) | Seeding rate (x 1,000 seeds/acre)* | Recommended Plant Population (x 1,000 plants/acre) | Within-row Seed Spacing (65% emergence) | | |
|-------------------------------|------------------------------------|--|---|--------------|--------------|
| | | | 10-inch rows | 20-inch rows | 30-inch rows |
| < 20 | 30-35 | 24 | 16.5 | 8.5 | 5.5 |
| 20 to 26 | 54 | 35 | 12.0 | 6.0 | 4.0 |
| 26 to 32 | 69 | 45 | 9.0 | 4.5 | 3.0 |
| > 32 | 108 | 70 | 6.0 | 3.0 | 2.0 |
| Irrigated | 154 | 100 | 4.5 | 2.0 | 1.5 |

* Assuming 65% field emergence.

Because of sorghum's ability to respond to the environment, final stands can vary at least 25 percent from the values listed above, depending on expected growing conditions, without significantly affecting yields. Lower seeding rates minimize risk of crop failure in dry environments. Sorghum can compensate for good growing conditions by adding tillers and adjusting head size, but yields can be reduced in a dry year if populations are too high. For a high-yielding environment (>150 bu/acre), under narrow rows high plant populations can be a critical factor for improving sorghum yields.

Higher seeding rates also should be implemented when planting late. Increase rates by 20-25 percent if planting in mid-June or later. Late planting will restrict the time that the sorghum plants will have in the growing season for producing productive tillers, decreasing the capability of the plant to compensate for inadequate stands.

Recent research in Kansas has confirmed these long-term recommendations. In these studies, sorghum yields were maximized at 25,000 plants per acre (optimum between 20,000 to 30,000 plants per acre) in western Kansas at 17 inches annual precipitation; 40,000 in central Kansas at 30 inches annual precipitation; and 50,000 in eastern Kansas at 32 inches annual precipitation. Studies in Missouri, with substantially more than 32 inches of annual precipitation, maximized yield with about 60,000 plants per acre. For western Kansas, final stands of about 20,000 to 30,000 plants per acre can attain yields of 60 to 80 bushels per acre or more. For central and eastern Kansas, final stands of 50,000 to 70,000 plants per acre can maximize yields, with the final objective of having 1 to 1.5 heads per plant.

Having more than the recommended number of plants per acre results in fewer fertile and productive tillers and thinner stems, which will reduce yield in the drier environments and increase susceptibility to drought. On the other extreme, thin stands can compensate for better-than-expected growing conditions somewhat by producing more and/or larger heads. But under high-yielding environments a higher final plant population will be needed to increase yields as much as possible (Table 1).

Planting date

A summary of research information performed in the last several years has confirmed that the optimum planting date for maximizing yields will be around early June (Figure 1). Still, the decision related to the optimum planting date is complex and should be timed so plants have the best possible chance of avoiding hot, dry weather at the flowering stage, but can still have sufficient time to mature before the first frost.

Planting date has some effect on seeding rates. Sorghum tillers more readily in cool temperatures and less readily under warm conditions. As a result, later plantings in warmer weather should be on the high side of the recommended range of seeding rates for each environment since there will be less tillering. The potential for greater tillering with earlier planting dates makes sorghum yields generally more stable when planted in May and early June compared to late June or July plantings.

A new study was performed in Manhattan during 2014, and the results were similar to our previous research summary. Late-May and early-June planting times were more effective in producing fertile tillers and improving yields under diverse maturity groups (Fig. 2).

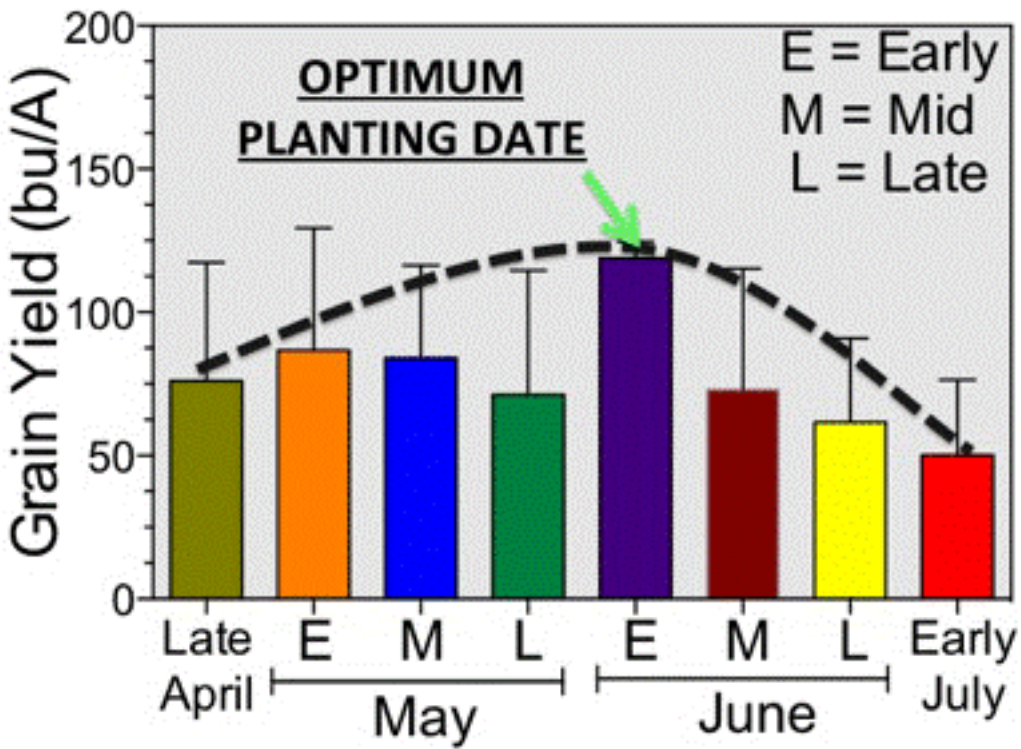


Figure 1. Planting date effect on final sorghum yields (Tribune/ Hutchinson/ Manhattan, Vanderlip; Scandia 1994-96, Gordon; St. John 1993-95, Martin and Vanderlip; Columbus 2000/03, Kelley).

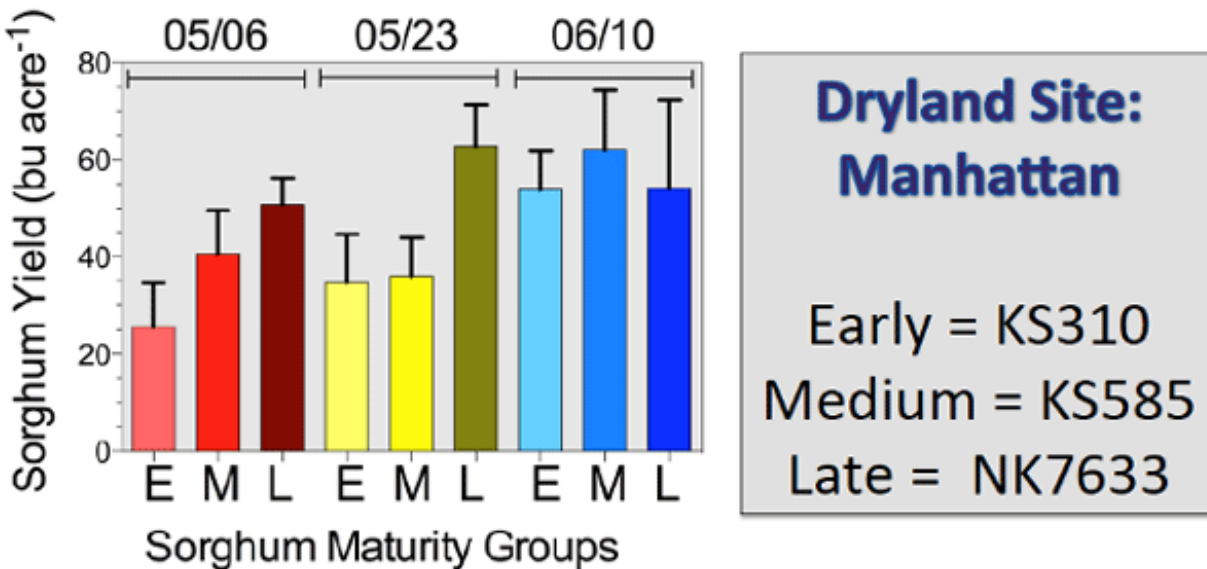


Figure 2. Planting date effect on final sorghum yields, Manhattan, 2014 (Ciampitti et al., 2014).

Planting depth

Seed placement is also a critical factor when planting sorghum. Optimum seed placement for sorghum is about 1-2 inches deep. Shallower or deeper planting depths can affect the time between planting and emergence, affecting early-season plant uniformity. We recently conducted a planting depth study, using late-planting (about mid-June) under uniform soil temperatures) and three seed placements – shallow, 0.5 inch; optimum, 1.5 inches; and deep, 3-inches. Optimum and deep placement resulted in similar shoot growth while shallower placement resulted in delayed development with fewer number of leaves and less total shoot mass (Fig. 3).

Sorghum Planting Depth

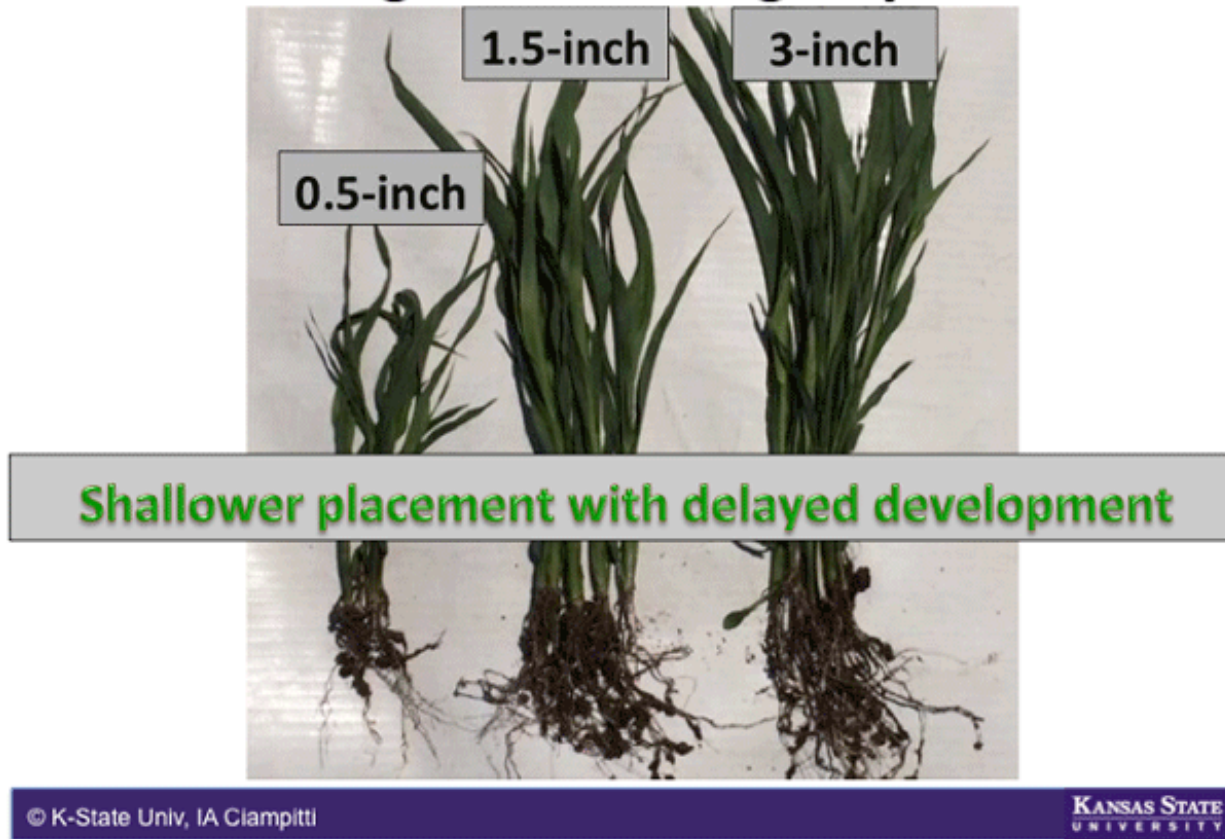


Figure 3. Seed placement effect on early sorghum growth and development, Manhattan, 2014 (Ciampitti et al., 2014).

Row spacing

The other factor that can influence yield is row spacing. The last three columns in Table 1 show that plant spacing within the row becomes greater as row spacing decreases. This greater intra-row plant spacing reduces plant-plant competition early in the growing season when head number and head size are being determined.

A response to narrow row spacing is expected under superior growing environments, when water is a non-limiting factor. Narrow rows increase early light interception, provide faster canopy closure, reduce evaporation losses, can improve suppression of late-emerging weeds (a major issue in sorghum), and maximize yields.

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The influence of row spacing on sorghum yield has not been entirely consistent in K-State tests. In a summary of experiments conducted in Kansas, the comparison between wide (30-inch) vs. narrow (15-inch) row spacing shows a close relationship, with an overall yield benefit of 4 bushels per acre in using narrow rows. In addition, narrow rows outyielded wide rows in 71 percent of all observations evaluated (Fig. 4).

A more consistent response to narrow rows was documented when yields were above 70 bushels per acre, increasing the likelihood of capturing higher yields when narrow spacing was employed. In summary, the potential for a positive yield response to narrow rows is greatest in high-yielding environments, but the response is not always consistent. Under low yielding environments, conventional (30-inch) wide row spacing is the best alternative.

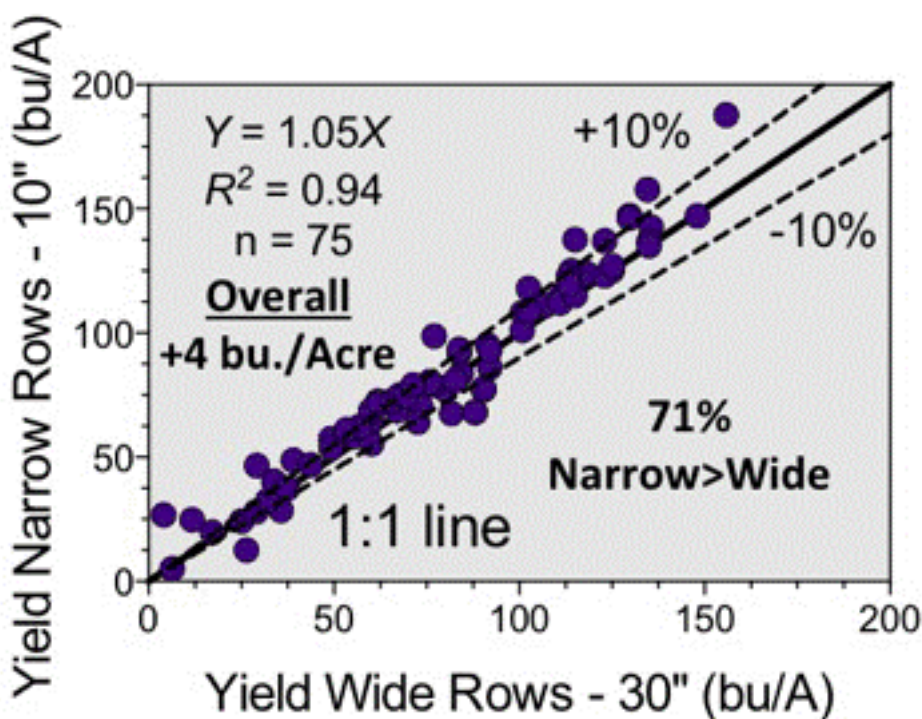


Figure 4. Yield in narrow rows versus yield in wide rows. From a total number of 75 observations, 71% had a greater yield in narrow as compared to wide row spacing.

Should populations be adjusted with narrow rows? Research results indicate that the population producing the greatest yield doesn't change with different row spacings, but the magnitude of response to population potentially can be greater with narrower row spacings in high-yielding environments.

Planting date seems to have an interaction with row spacing. Over three years at the North Central Experiment Field, there was essentially no difference in yield between 15- and 30-inch rows for late-May plantings, but there was a 10-bushel yield advantage for 15-inch rows for late June plantings. A similar response was observed at Manhattan in 2009 when no difference in row spacing was observed for the May planting, but 10-inch rows had an 11-bushel/acre yield advantage over 30-inch rows with the June planting. The opposite response was seen at Hutchinson in 2009 where narrow rows had a 6 bushel/acre yield advantage with a May planting date, but wide rows had a 6 bushel/acre yield advantage with a June planting date. In all cases, yields were less with the June

planting, but the June plantings at Belleville and Manhattan averaged more than 115 bushels/acre, while yields at Hutchinson were less than 92 bushels/acre.

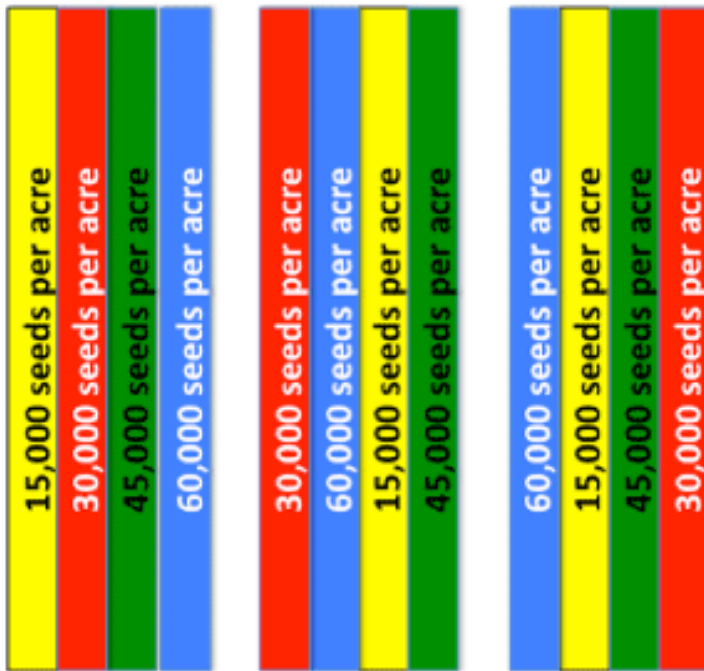
Hybrid selection

The selection of sorghum hybrids should be based not only on maturity, but also in other traits such as resistance to pests, stalk strength, head exertion, seeding vigor, and overall performance. The selection of a sorghum hybrid based on its maturity should be strictly related to the potential planting date, expected duration of the growing season, and the probability the hybrid will mature before the first freeze event. Shorter-season hybrids might be a better fit for late planting dates (mid-June to July depending on the regions); while a longer-season hybrid is recommended when planting time is early and the duration of the growing season is maximized.

For the summary of planting date information in Figure 1, hybrid maturity showed a very complex pattern across the diverse locations. Overall, longer-season hybrids showed a better yield at the mid-May planting time, but yields were less than 100 bushels per acre. For medium and short-season hybrids, the early June planting date produced yields of more than 100 bushels per acre. The goal is to plant a hybrid maturity at each particular site/environment (weather and soil type) so the plants can bloom in favorable conditions, and have adequate grain fill duration before the first fall freeze occurs.

On-farm research experience: 2014 season

During the last growing season, three on-farm research studies were established in collaboration with farmers and Sandra Wick, Postrock District Extension Agent. An example of the experimental layout for the sorghum seeding rate studies is presented below.



On-Farm Research Network



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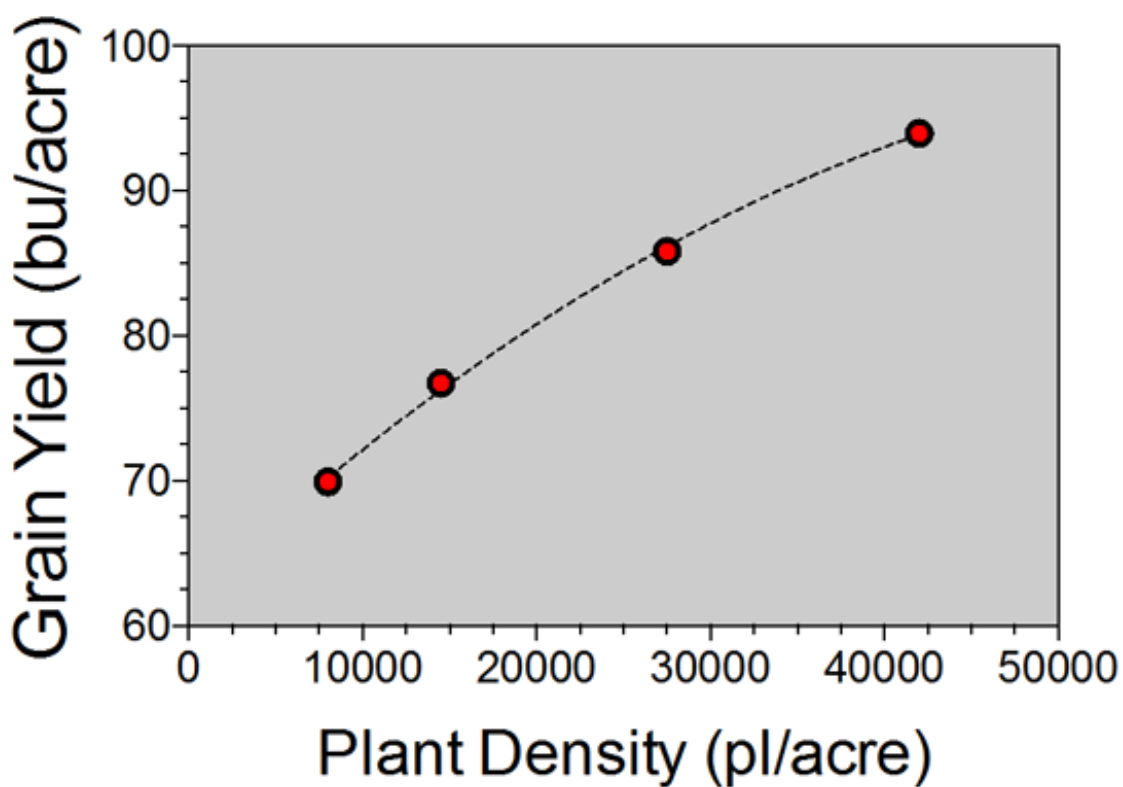
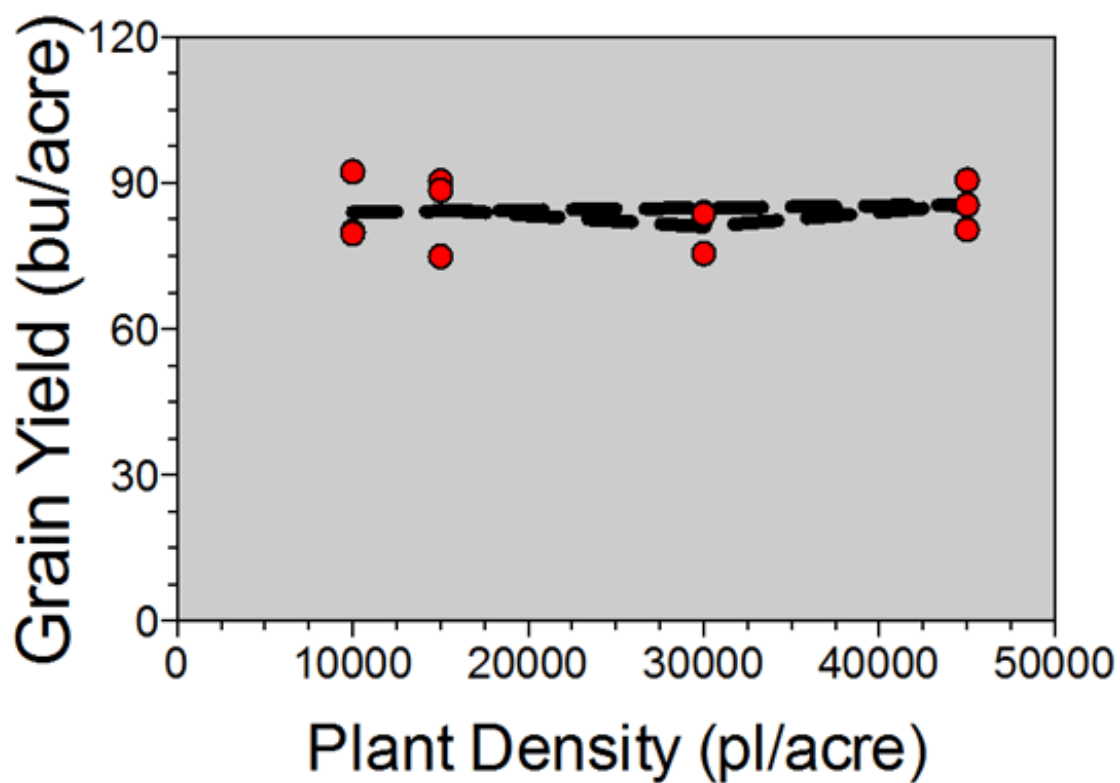
KANSAS STATE UNIVERSITY

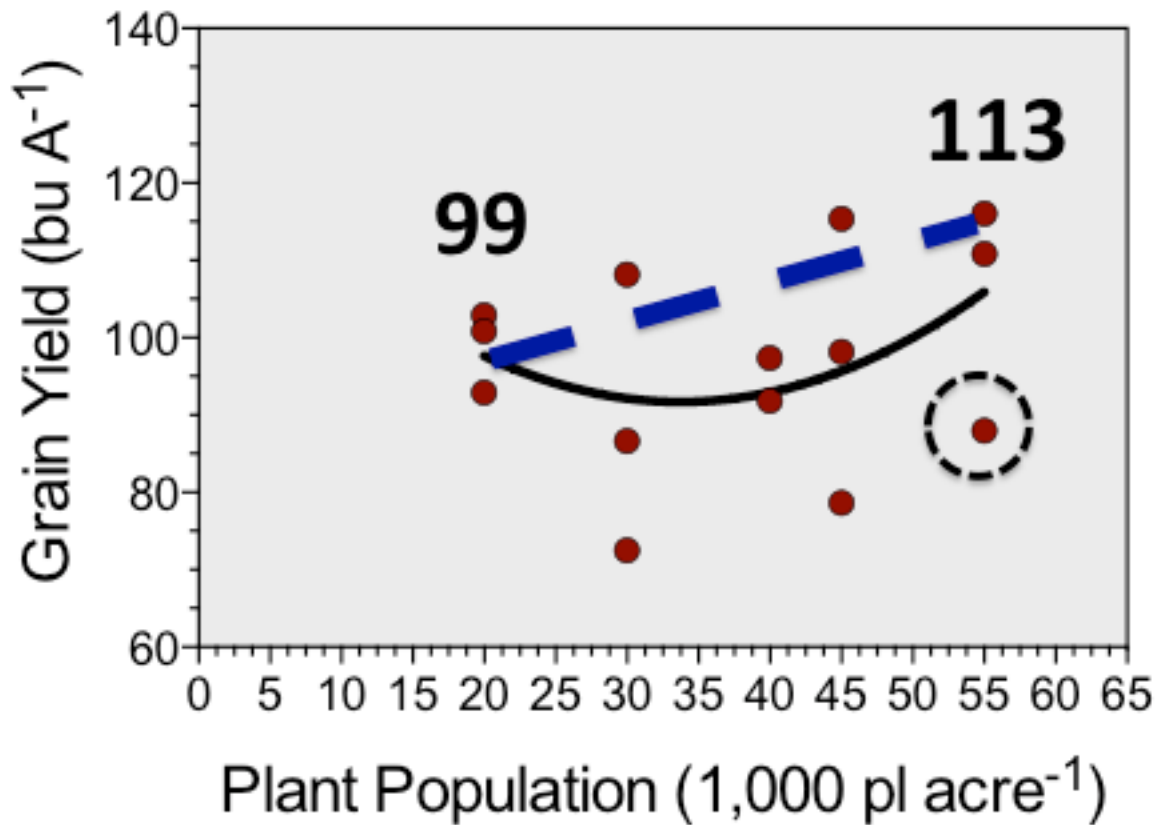
A summary of sorghum plant population response to all three on-farm locations revealed a complex yield response to plant populations. This shows how essential it is to continue the on-farm research efforts for properly identifying optimal plant population and providing a better guidance to key stakeholders in Kansas in the seeding rate decision-making process.

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The difference in yield responses to various plant populations in these on-farm studies is the outcome of using different hybrids and having different soil-environmental conditions. For example, a rainy June as we had in 2014 helped establish good canopies and increase yields by under higher plant populations in some areas of the state. The same might not apply for 2015. The recommendations provided in Table 1 can serve as a guideline for sorghum seeding rates, but more on-farm studies with a local and regional focus are needed in order to fine-tune and better understand sorghum yield responses to seeding rates.

Summary

- Determine your desired population based on average rainfall and expected growing conditions. There is no need to go overboard.
- Make sure you plant enough seed for your desired plant population. About 65-70 percent field germination is a good general rule to use.
- Think about using narrower row spacings to close the canopy sooner and potentially capture greater yields in yield environments of 70 bushels per acre or more.
- Planting data and hybrid selection are tied together, and are related to the conditions experienced by sorghum plants during the late summer. Think about this before deciding your planting time and selecting a hybrid.

For more information related to sorghum production and management, check the following link:
<http://www.agronomy.k-state.edu/extension/crop-production/grain-sorghum/>

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2. Winter canola private-public partnerships at K-State

New canola varieties and private-public partnerships are helping canola producers in Kansas and the Southern Great Plains, according to Kansas State University canola breeder Mike Stamm.

Stamm explains the partnerships in a short Youtube video from Dan Donnert, K-State Research and Extension videographer, at: <https://youtu.be/NPgCxrKw434>

The following are comments by Stamm from the video:



Figure 1. Mike Stamm, K-State canola breeder, says private-public partnerships are benefitting canola producers in Kansas. Source of photos, K-State Research and Extension video: <https://youtu.be/NPgCxrKw434>

Winter canola acres in Kansas have grown from just a few thousand not long ago to 40,000-50,000 acres now in a given year. Producers are growing winter canola in rotation with wheat because they are seeing a benefit to wheat yield and quality, improved weed management, and a reduction in wheat diseases.

In the last three years, K-State has released three winter canola varieties that are adapted to Kansas and the southern Great Plains. We've licensed these winter canola cultivars to major seed companies

that will then market them to producers.

Currently there are about 25 commercial varieties of winter canola that can be grown in Kansas. Some are more adapted to the southern tier of counties; others are more adapted to the central part of the state.

Kansas State University has a very active winter canola breeding program. In the last 3 to 4 years we have released three Roundup Ready winter canola cultivars. We currently have one of those cultivars licensed to Monsanto and two of those cultivars licensed to Croplan Genetics. This is a great private-public relationship where we're working on developing Roundup Ready cultivars that are adapted to Kansas and the southern Great Plains. Then we work with these major seed companies to market those varieties to producers in the state.



Figure 2. K-State has a very active winter canola breeding and production management research program.

In addition to the Roundup Ready winter canola breeding we're doing, we're also developing conventional varieties that have excellent disease tolerance and winter survival characteristics that will allow the planting of winter canola across the entire state.

Another private-public partnership we have is with AGCO. What we are looking at with AGCO is a novel residue management system for planting winter canola.

Over the years, we've had some struggles seeding winter canola in a no-till cropping system. The biggest issue we see is managing the residue from the previous crop, and getting that residue out of the seed row. AGCO approached us with the idea of evaluating this novel residue management system for winter canola and comparing that residue management system with producer practices that are commonly used across the state.



Figure 3. Managing crop residue from the previous crop has been a challenge in getting good stand establishment of winter canola in the southern Great Plains.

Some of the common producer practices are burning the previous crop residue and then using a no-till planter or drill to seed canola. Others are just using no-till planters to move the previous crop's residue so that the canola will establish and overwinter.

There are 10 other breeding companies or marketing groups that are interested in bringing more winter canola cultivars to the southern Great Plains for producers. This shows great interest in our southern Great Plains region and we hope through this interest we're able to increase the amount of winter canola acreage in our state and the southern Great Plains as a whole, and become one of the major winter canola growing regions in the U.S.

Steve Watson, Agronomy eUpdate Editor
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3. Uncontrolled weeds would lead to billions in lost crop revenue in U.S. and Canada

Imagine that weeds were left to grow uncontrolled in corn and soybean fields across North America. That scenario would cut U.S. and Canadian yields by about 50 percent, resulting in \$43 billion in annual economic losses to those two crops alone, according to a new study.

The research, conducted by the [Weed Science Society of America](#) and led by K-State weed scientist Anita Dille, spanned seven years from 2007 to 2013. Details about the study are available at [Crop Loss](#).

“We were interested in trying to understand just how much impact weeds still have on our crops. Despite the great improvements we have in crop genetics and fertility, we’re still having to manage weeds,” Dille said, noting that weeds compete with crops for everything from sunlight to moisture to nutrients in the soil.

Dille explains the findings in a short Youtube video from Dan Donnert, K-State Research and Extension videographer, at: https://youtu.be/F4R_AP4LKGU



Figure 1. Weeds are still a significant pest to manage, and we need to maintain all the different weed control practices that we have, says Anita Dille, K-State weed scientist.

“What we saw in corn is that we’d lose over half of our yield if we didn’t manage those weeds – a 52 percent yield loss,” Dille said. “And in soybeans, almost the same – 49.5 percent total yield loss on average.”

According to the [Weed Science Society of America study](#), Kansas alone would potentially have lost 52.6 percent of soybeans at an average financial cost of \$666,435 per year over the seven years of the study (2007-2013) if weeds had been left to grow unchecked.

The study indicated a potential yield loss of 46.3 percent of dryland corn per year at a value of just over \$500,000 without any sort of weed management.

“We wanted to document that weeds were still a significant pest to manage, that we need to maintain all the different weed control practices that we have. There’s a lot of pressure on the industry to say, ‘hey, stop doing this or that.’ We wanted to highlight that these weeds are still so important and that we need to come up with every option that we can to manage them.”

A recent dramatic reduction in research funding for weed management in crops is a trend she and other scientists find disturbing.

Weed scientists conduct a number of weed control studies each year, Dille said, so the WSSA team asked them to provide the yield data from corn and soybean trials, specifically the untreated plot yield, and yield from plots with their best weed control methods. The team looked at the yields from both and took the difference to calculate how much yield loss happened.

“So, the idea,” she said, “was they did everything right to produce their best crop – their best seed, they fertilized it, they irrigated it – whatever they needed to do, but they just didn’t control the weeds in the untreated plots, so we could see what kind of yield loss impact that would have.”



Figure 4. Plots with uncontrolled weeds and plots with good weed control. Source, K-State Research and Extension video: https://youtu.be/F4R_AP4LKGU

In comprising the WSSA report, the scientists used data from these trials, plus the U.S. Department of

Agriculture's National Agricultural Statistics Service and Statistics Canada on how many acres were harvested of those crops and the value of the crops over the years studied to determine the total potential impact of weeds on the crops.

Dille likes to break weed management into four categories:

- Chemical weed control – herbicides.
- Biological – in some crops, insects will eat certain weeds and in others, livestock grazing helps, but those methods don't work in row crops.
- Cultural – narrow row crop spacing (to limit the area where weeds can develop) or fertilizing just the crop and not the weeds are examples.
- Mechanical – Tillage is sometimes used before the crop is planted or after it's established.

Dille recommends crop producers identify exactly what weed species are a problem on their farm, and to use more than one strategy to control them.

"Weeds are smart. They keep figuring out how to survive whatever we throw at them," Dille said, including altering their genetic makeup to tolerate some herbicides. "The reason some people ended up with herbicide-resistant weeds is that they often used a really good product over and over again and the weeds weren't exposed to other control practices. If we change it up, keep the weeds on the defensive, then they potentially won't become resistant because we've controlled those resistant ones with a different technique."

Know what your weed species is, she advises. When does it come up? How fast does it grow? How long does it compete with the crop?

"Once we know about their biology, then we can design and pick the best practices to go after the plants before they're a problem," she said, adding that many resources are available to help producers identify weeds, including online fact sheets and publications with photos. "County extension agents and university faculty and extension specialists are ready and willing to look at pictures or specimens to determine what plant a grower has."

The WSSA researchers are planning to release similar reports across winter and spring wheats, grain sorghum, vegetable crops, rice and cotton.

-- Adapted from a K-State Research and Extension news article by Mary Lou Peter, KSRE Communications
mlpeter@ksu.edu

4. South Central Experiment Field Spring Field Day, May 24

The Spring Field Day at the South Central Experiment Field will be held May 24, starting at 5 p.m. The event will be held at the field headquarters, 10702 S. Dean Road.

The main topics will include:

- Dual-Purpose Wheat Varieties – Romulo Lollato, Wheat and Forages Specialist
- Wheat Breeding Research, Variety Plots – Allan Fritz, K-State Wheat Breeder, Manhattan
- 2016 Wheat Disease Situation and Fungicide Performance – Erick DeWolf, Extension Plant Pathologist
- Wildcat Genetics: The Future of Winter Wheat Development – Daryl Strouts, President, Kansas Wheat Alliance
- Canola Update on Variety Development – Mike Stamm, Canola breeder

In addition, graduate student research will be presented.

- Marshall Hay: Evaluation of Soil-Applied Herbicides for Pigweed Control
- Tyler Gardner: Normalized Difference Vegetation Index (NDVI) Based N Recommendation for Dual-Purpose Wheat Varieties
- Nathan Thompson: Pigweed Control in Double Crop Herbicide-Resistant Soybeans
- Baylee Showalter: Canola Seeding Rate in 30-inch Rows

More information about the field day is available by calling Gary Cramer, agronomist-in-charge, at 620-662-9021, or gcramer@ksu.edu. A meal will follow the field day.

5. Southeast Kansas Spring Crops Field Day May 24 in Parsons

Recent corn and wheat research will be on display at the Southeast Research and Extension Center Spring Crops Field Day and Tour, Tuesday, May 24, in Parsons. It will be hosted at the K-State Southeast Research and Extension Center, 25092 Ness Road (immediately south of U.S. Highway 400 on Ness Road).

Registration and breakfast, compliments of commercial sponsors, starts at 7:30 a.m. The program begins at 8:30 a.m., including:

Tour of wheat (43 varieties) plots – Allan Fritz, K-State wheat breeder; Lonnie Mengarelli, K-State research assistant; and seed company representatives

Wheat disease management – Doug Shoup, K-State southeast area crops and soils specialist

Using NDVI (Normalized Difference Vegetation Index) for nitrogen recommendations – Ray Asebedo, K-State precision agriculture agronomist

Corn management – Gretchen Sassenrath, southeast area crop production agronomist

The program will be hosted rain or shine. More information is available by calling 620-421-4826.

6. Winter canola featured at K-State field days May 24, 25

The latest research and production information on winter canola will be featured at a series of K-State Research and Extension field days on May 24 and 25.

The field days will give producers several opportunities to see winter canola research plots and producer fields. Current research being conducted at the South Central Experiment Field near Hutchinson, as well as canola production fields near Concordia, Haven, and Andale will be on tap. Harvest management will one of the main topics.

With harvest season fast approaching, harvest management is critical for any crop, especially canola. We will talk about how to appropriately stage canola for swathing, desiccating and direct cutting at each location.

The schedule for the field days includes:

May 24. First up is the South Central Kansas Experiment Field spring field day on Tuesday, May 24. The program begins at 5 p.m. at the field headquarters, 10702 S. Dean Road, Hutchinson. Canola topics will include harvest management, a seeding-rate-by-variety-by-row-spacing study and a variety demonstration plot. Ten commercial canola varieties from five different seed suppliers will be on display.

May 25. On Wednesday, May 25, KSRE will partner with Rubisco Seeds to highlight three canola producers in Kansas. "The producers we will visit are growing hybrid canola," Stamm said. "We will be discussing advanced production practices and how those practices have helped make these canola growers successful." Refreshments will be provided by Rubisco Seeds.

The first stop will be at 10 a.m. south of Concordia. From the US-81 and Oat Road junction, drive 4.5 miles east to 200th Road. This field was drilled on 7.5-inch row spacings following double-cropped wheat.

The second stop will be at 2 p.m. east of Hutchinson. From the intersection of US-50 and K61 highways, go 5 miles east on US-50. The field is located at the intersection of US-50 and Kent Road. A second canola field planted after corn and under irrigation will also be included on this stop.

The third stop will be at 5 p.m. in Sedgwick County. From Andale, drive 3 miles west on W 61st St N and 1 ¼ miles south on N 295th St W. In this field, the previous crop residue was burned, then canola was seeded using a no-till planter on 30-inch rows.

For more information, contact Mike Stamm at 785-532-3871 or mjstamm@ksu.edu.

Mike Stamm, Canola Breeder
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7. Kansas Wheat Day, Agricultural Research Center-Hays, May 26

The KSU Ag Research Center will be hosting the Kansas Wheat Day on May 26, 2016.

Registration begins at 8:30 a.m. Coffee, drinks, and donuts will be available, sponsored by the Kansas Wheat Alliance. Opening remarks from Bob Gillen, Western Kansas Agricultural Research Center (WKARC) department head, will be at 9 a.m.

The schedule for the remainder of the morning is:

9:15 Wheat Variety Tour --- Guorong Zhang, WKARC Wheat Breeder

10:15 Weed Management in Wheat-based Cropping Systems---Phillip Stahlman, WKARC Weed Scientist

10:40 Tillage Effects and Nitrogen Application --- Augustine Obour, WKARC Soil Scientist

11:00 Utilizing UAS Imaging Capacity in Wheat Breeding Programs --- Robert Aiken, WKARC Plant Physiologist

11:30 Emerging Issue with Wheat Stem Sawfly --- JP Michaud, KSU Entomologist

12:00 Lunch --- Sponsored by Kansas Wheat Commission

1:00 Adjourn

8. Spring Field Day, May 26, Garden City

9. Wheat plot tour scheduled at North Central Experiment Field, June 1

The North Central Experiment Field Wheat Plot Tour is scheduled for Wednesday, June 1, starting at 7:30 a.m. The field is located about two miles west of Belleville on Kansas Highway 36. Juice and rolls will be served ahead of the tour.

K-State speakers will include Romulo Lollato, Wheat and Forages Specialist; Erick DeWolf, Extension Wheat Disease Specialist; and Stu Duncan, Northeast Area Crops and Soils Specialist. Tour topics include:

- Wheat Varieties
- Intensive Wheat Management

More information is available by calling the North Central Experiment Field at 785-335-2836 or contacting Andrew Resser, Agronomist-in-Charge, at aresser@ksu.edu.

10. Dryland Ag Day, June 15, Tribune

Dryland Ag Day is scheduled for June 15 at the Southwest Research-Extension Center Tribune location, 1 mile west of Tribune on Highway 96. Registration is at 8:30 a.m. (MDT) and the field tours begin at 9 a.m.

Field tours will feature:

- Wheat Varieties
- In-furrow Nitrogen on Wheat
- Update on Solid Stem Wheat Varieties
- Wheat Seeding Rates
- Tillage in Dryland Systems
- Dryland Crop Rotations (wheat, corn, and grain sorghum)
- Rainfall Simulator Demonstration

Indoor seminars will start at 11:15 a.m., and feature:

- Soil Test Trends in Western Kansas
- Weed Management Update

Presenters include:

Lucas Haag, K-State Northwest Area Crops and Soils Specialist
Curtis Thompson, K-State Weed Management Specialist
Fred Vocasek, Servi-Tech Laboratory, Dodge City
Dale Younker, USDA-NRCS, Garden City
Alan Schlegel, Agronomist, Southwest Research-Extension Center, Tribune

A complimentary lunch will be served at noon. There will be an optional tour of irrigated weed management trials after lunch.

11. Comparative Vegetation Condition Report: May 3 - 9

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:

Kansas Vegetation Condition

Period 19: 05/03/2016 - 05/09/2016

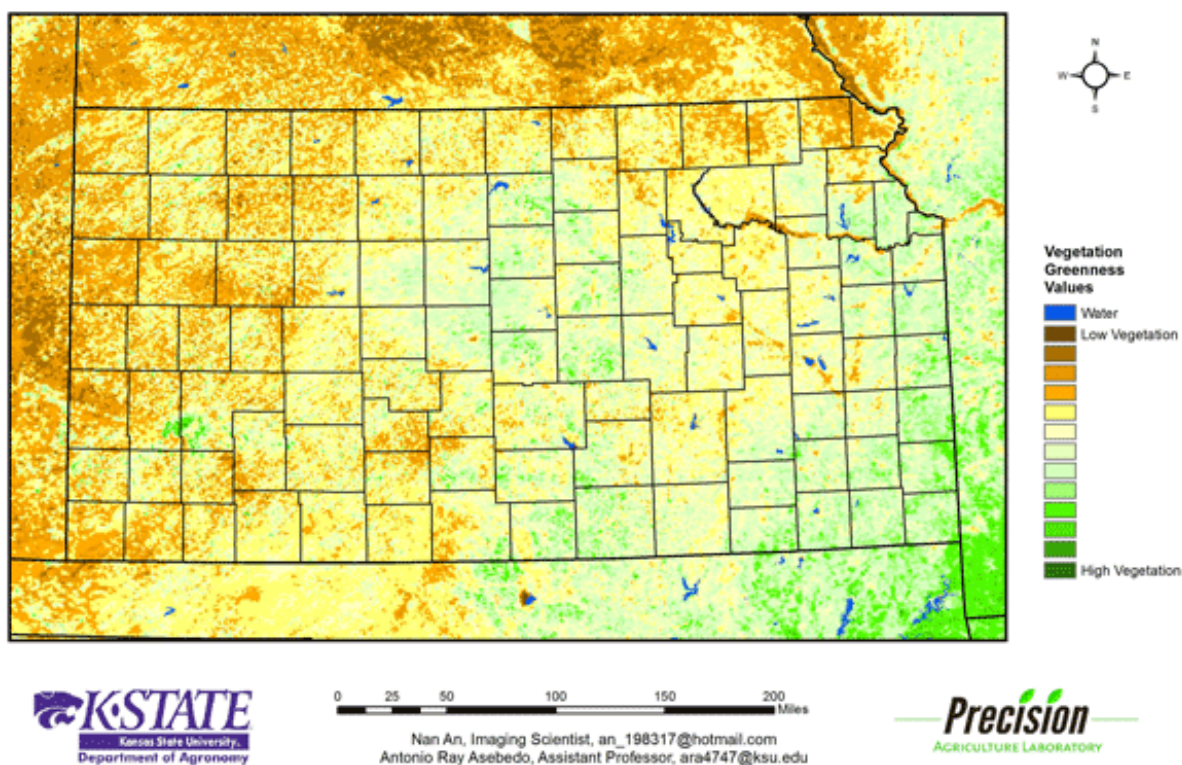


Figure 1. The Vegetation Condition Report for Kansas for May 3 – 9 from K-State’s Precision Agriculture Laboratory continues to show widespread low NDVI values. This is due largely to the rainy pattern of the previous week that delayed vegetative activity. Moderate photosynthetic activity is visible in the South Central and Southeastern Divisions, where rainfall was less extreme. The Flint Hills continue to show relatively low photosynthetic activity where cool temperatures and cloudy conditions have limited green up.

Kansas Vegetation Condition Comparison Early-May 2016 compared to the Early-May 2015

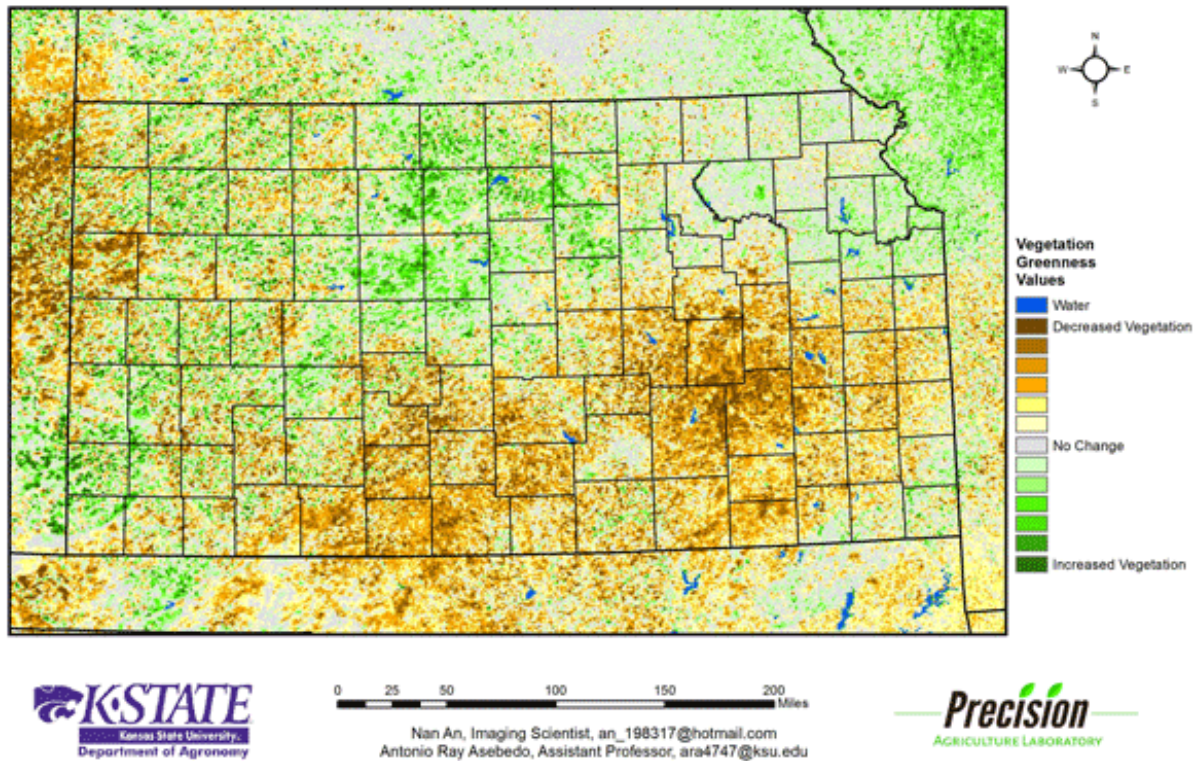


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for May 3 – 9 from K-State’s Precision Agriculture Laboratory shows vegetative production much lower across the northeast and east central areas of the state. Much of this is due to excessive rainfall this year, as compared to last. In extreme northwest Kansas, cool temperatures and a late-season snow have delayed vegetative activity this year.

Kansas Vegetation Condition Comparison Early-May 2016 compared to the 27-Year Average for Early-May

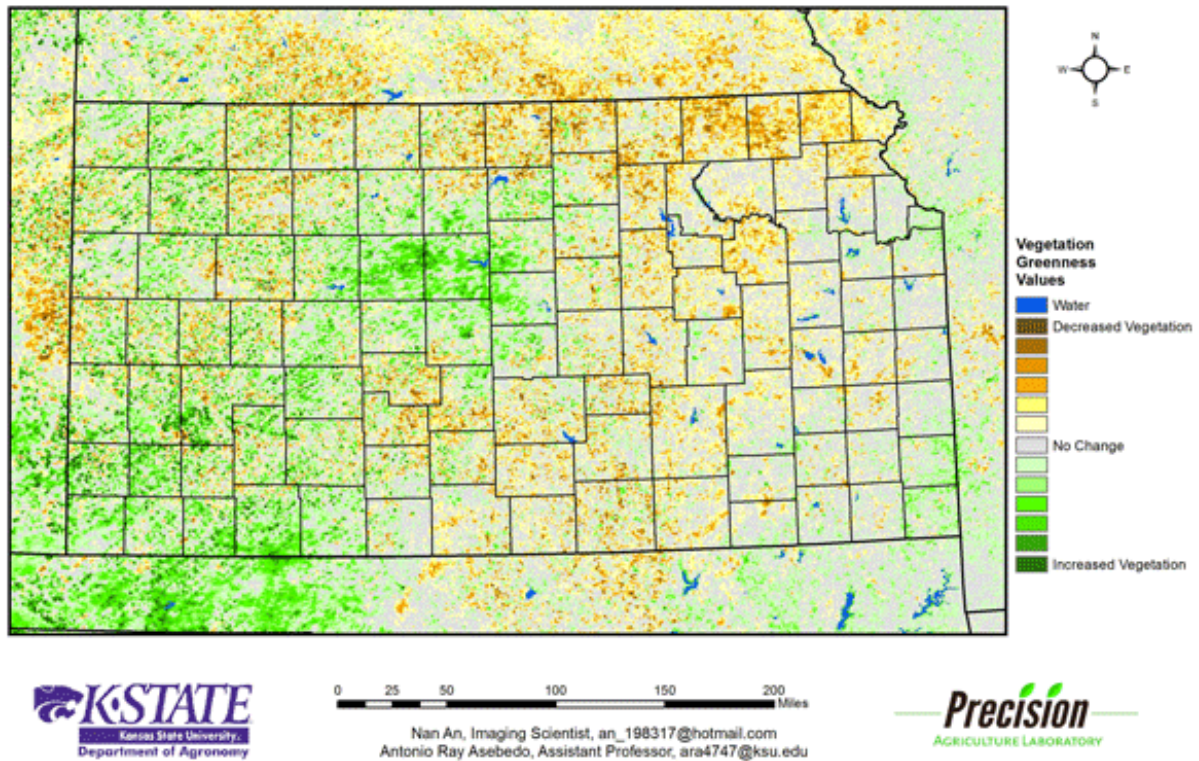


Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for May 3 – 9 from K-State's Precision Agriculture Laboratory shows below-average vegetative activity continues in the extreme northeastern areas of the state, where rain lingered. Increased photosynthetic activity is most visible in the Southwest and Central Divisions. Warmer temperatures in these regions have allowed vegetation to capitalize on the wetter-than-average April.

Continental U.S. Vegetation Condition

Period 19: 05/03/2016 - 05/09/2016

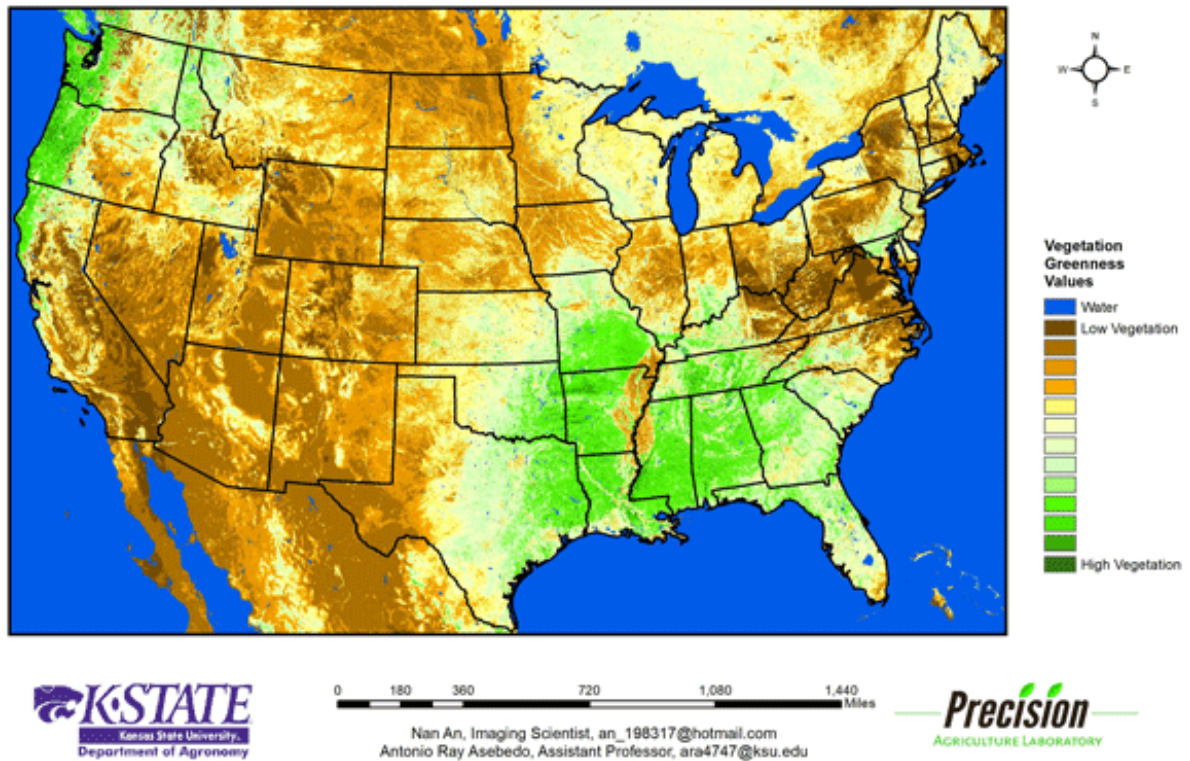


Figure 4. The Vegetation Condition Report for the U.S for May 2 - 9 from K-State's Precision Agriculture Laboratory shows high NDVI values along much of the West Coast, and in northern Idaho. Favorable moisture continues to drive active photosynthetic activity in these areas. A pocket of lower photosynthetic activity continues to be visible along the lower Mississippi River, where flooding is an issue. Low photosynthetic activity from the Central Plains through the Ohio River Valley is due to heavy rainfall and lingering cloud cover.

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Continental U.S. Vegetation Condition Comparison
Late-Apr/Early-May 2016 Compared to Late-Apr/Early-May 2015

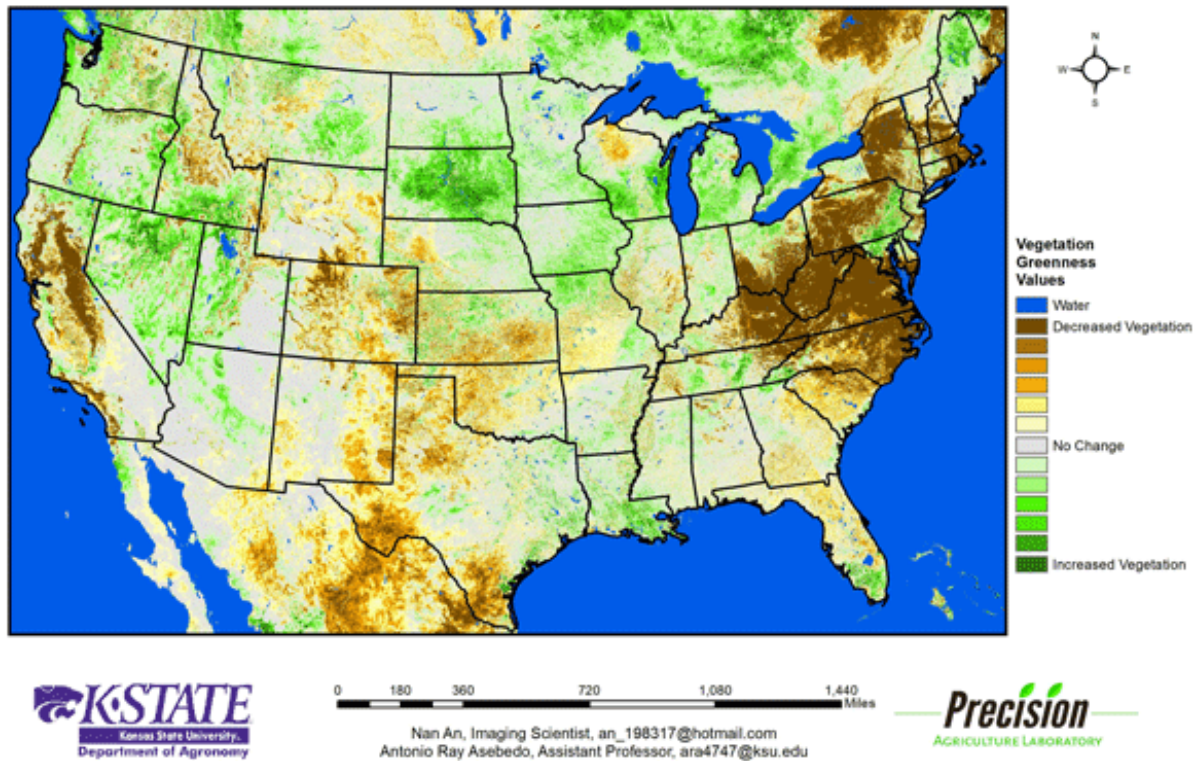


Figure 5. The U.S. comparison to last year at this time for the period May 3 – 9 from K-State’s Precision Agriculture Laboratory shows that lower NDVI values are most evident in the eastern U.S. Drier-than-average conditions have delayed vegetation compared to last year. In contrast, the lower NDVI values in northern California are due to a much larger snow pack in the region this year. South Dakota stands out in the Plains with much higher photosynthetic activity, as the vegetation broke dormancy early and is taking advantage of favorable soil moisture.

Continental U.S. Vegetation Condition Comparison
Early-May 2016 Compared to 27-year Average for Early-May

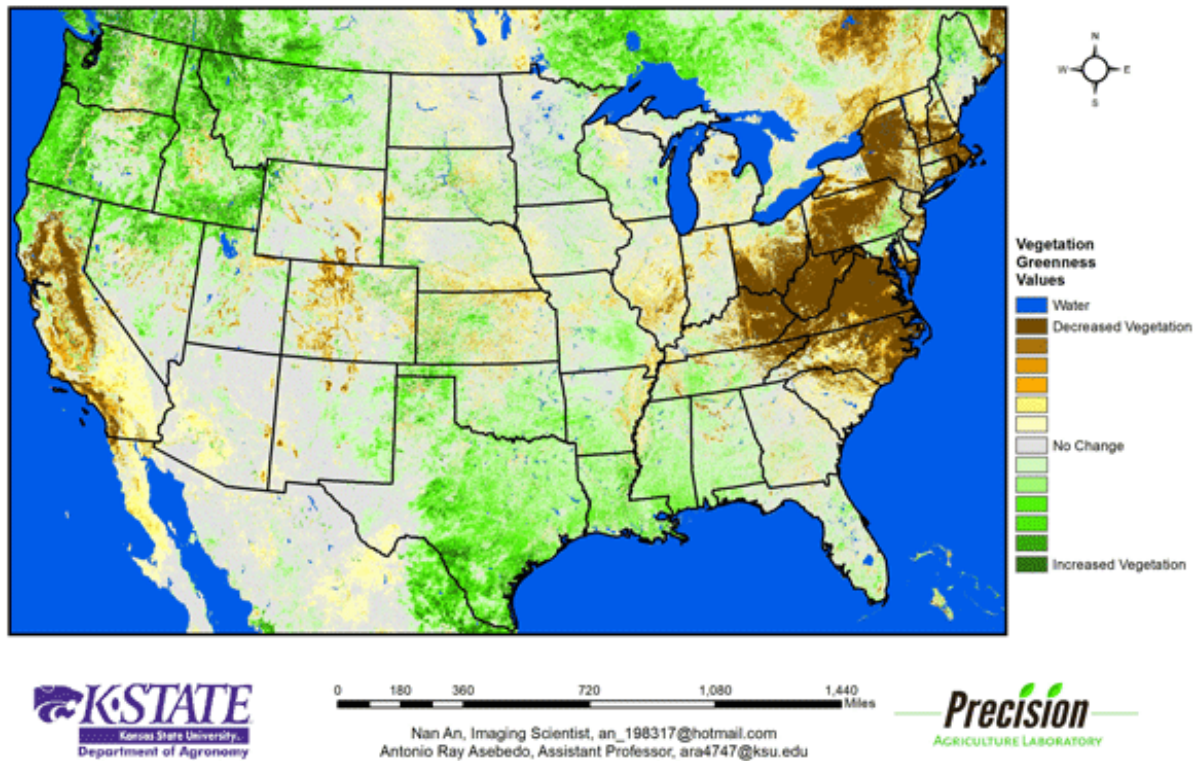


Figure 6. The U.S. comparison to the 27-year average for the period May 3 - 9 from K-State's Precision Agriculture Laboratory shows above-average photosynthetic across the Pacific Northwest, where winter moisture has reduced drought impacts. Snow pack from the late-season storms in the central Rockies has reduced photosynthetic activity in these areas. The heavy rains from last week moved east, and the resulting cloud cover has reduced NDVI readings in those areas. Vegetative activity has rebounded in east Texas as the floods of April recede.

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