



Extension Agronomy

eUpdate

05/22/2015

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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@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

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).

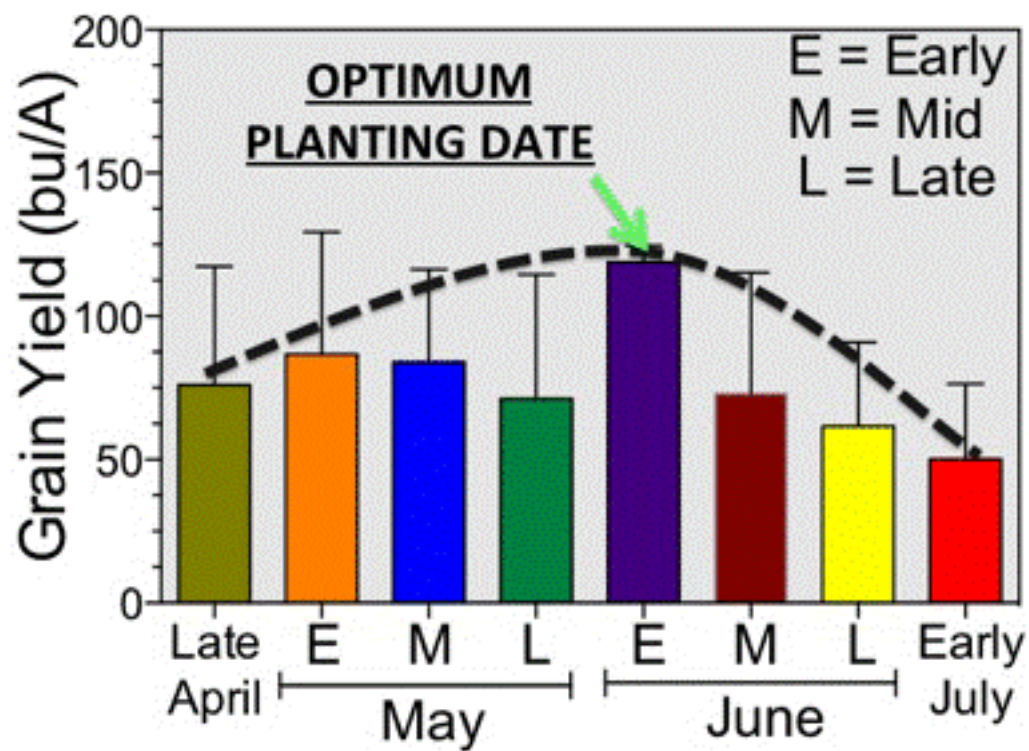


Figure 1. Planting date effect on final sorghum yields (Tribune/ Hutchinson/ Manhattan, Vanderlip; Scandia 1994-96, Gordon; St. John 1993-95, Martin and Vanderlip; Columbus 2000/03, Kelley).

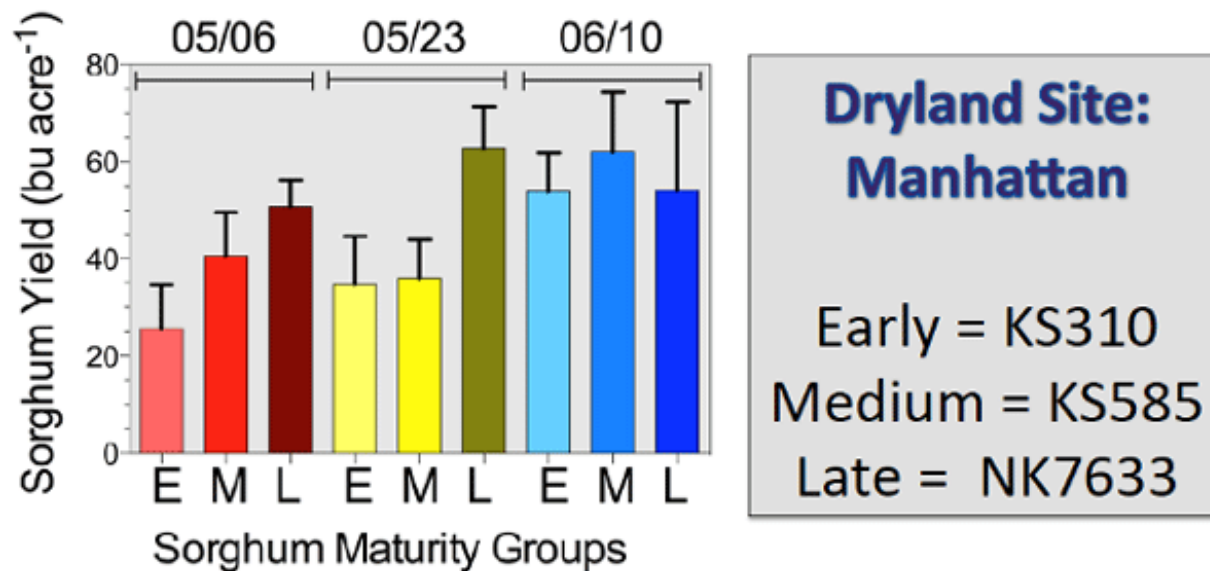


Figure 2. Planting date effect on final sorghum yields, Manhattan, 2014 (Ciampitti et al., 2014).

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

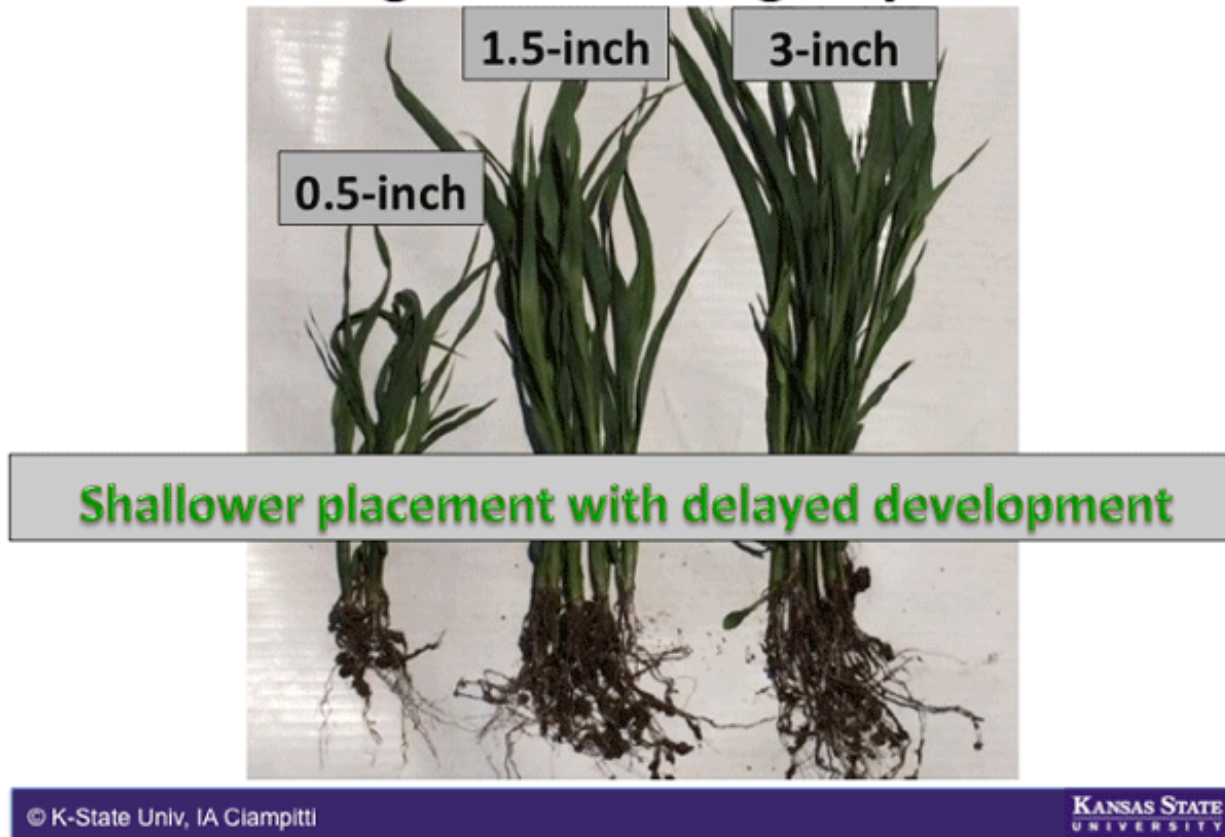


Figure 3. Seed placement effect on early sorghum growth and development, Manhattan, 2014 (Ciampitti et al., 2014).

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.

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.

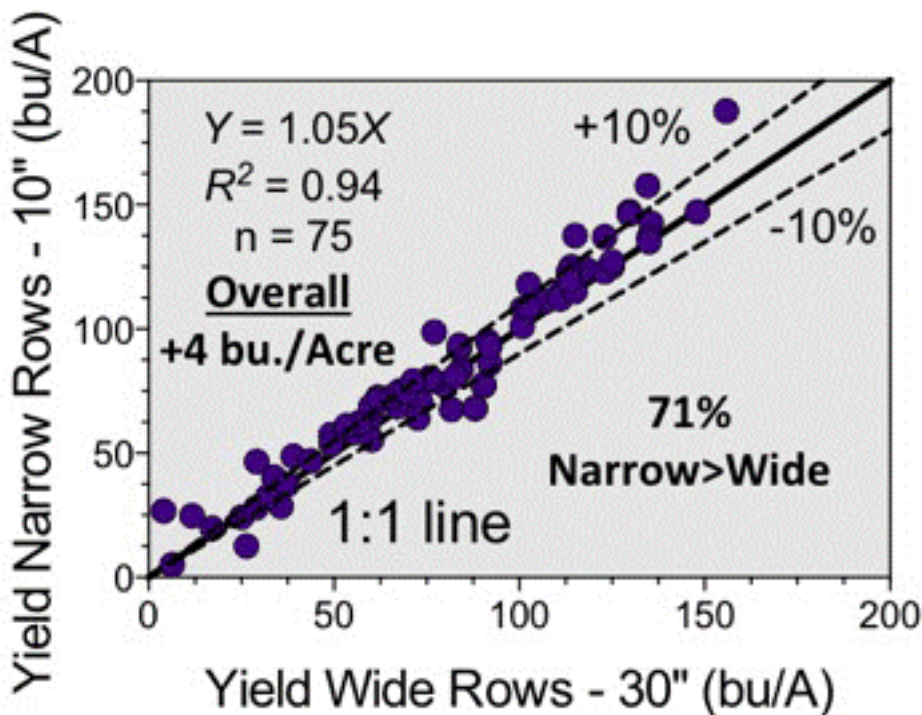


Figure 4. Yield in narrow rows versus yield in wide rows. From a total number of 75 observations, 71% had a greater yield in narrow as compared to wide row spacing.

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.

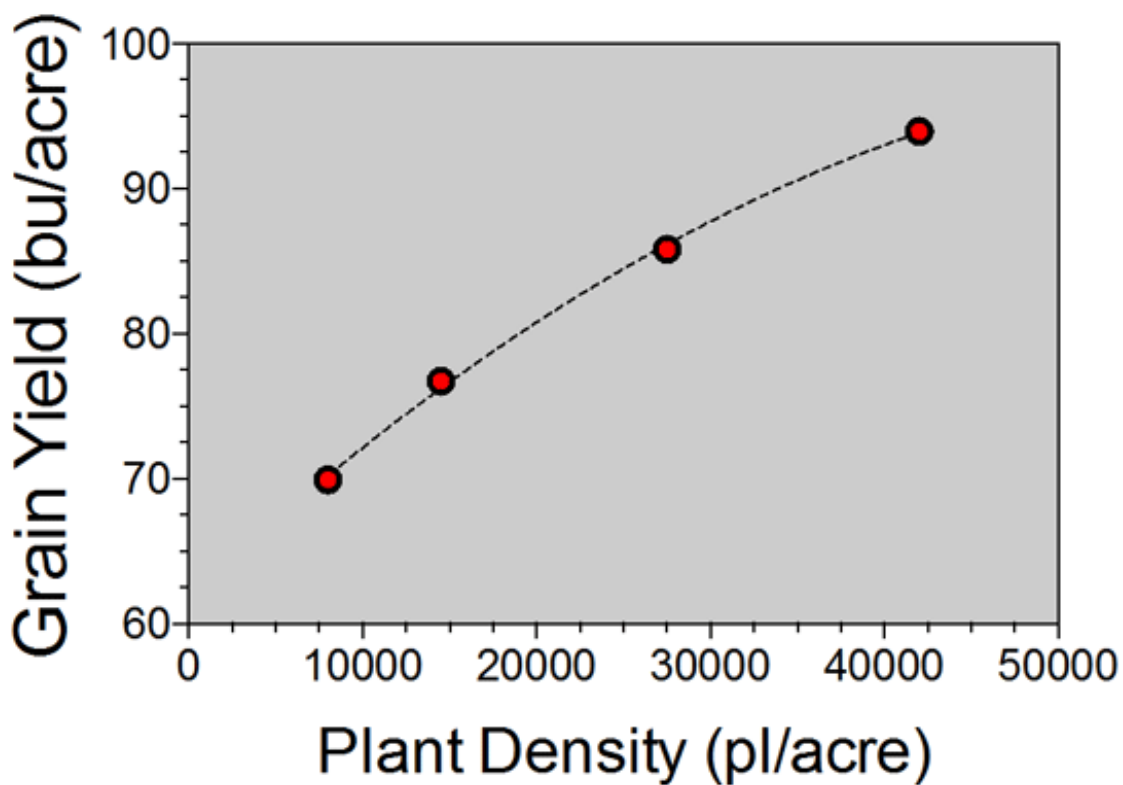
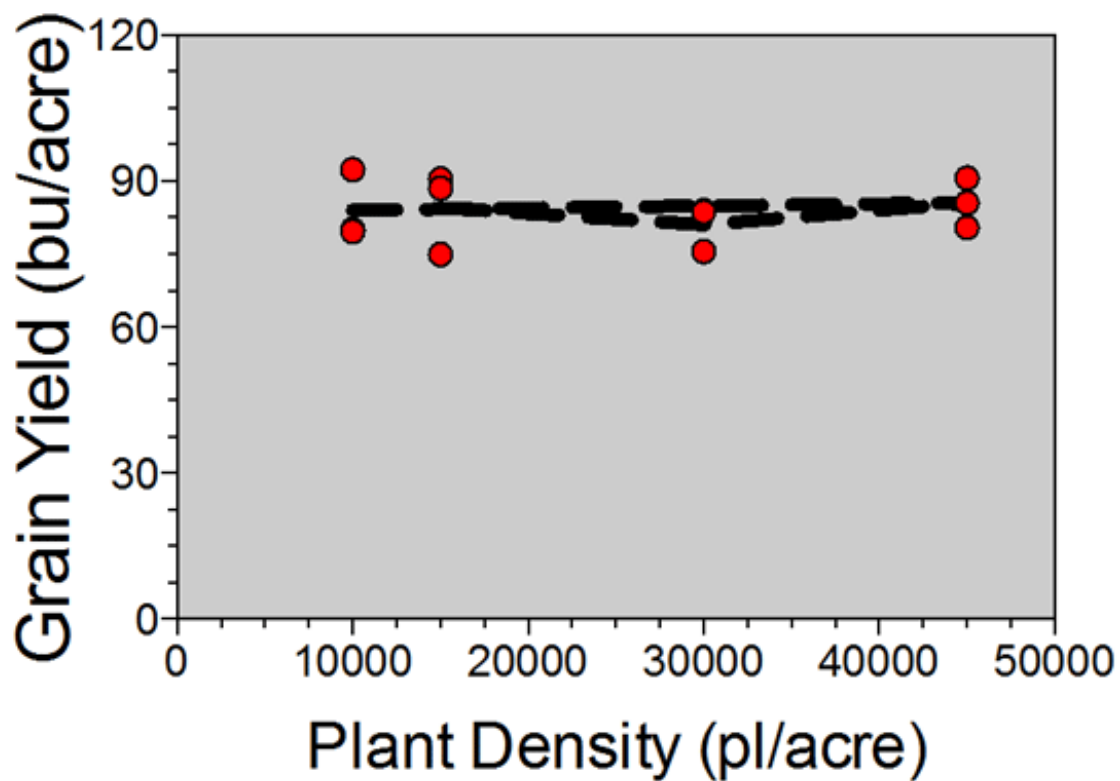
For the summary of planting date information in Figure 1, hybrid maturity showed a very complex pattern across the diverse locations. Overall, longer-season hybrids showed a better yield at the mid-May planting time, but yields were less than 100 bushels per acre. For medium and short-season hybrids, 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.

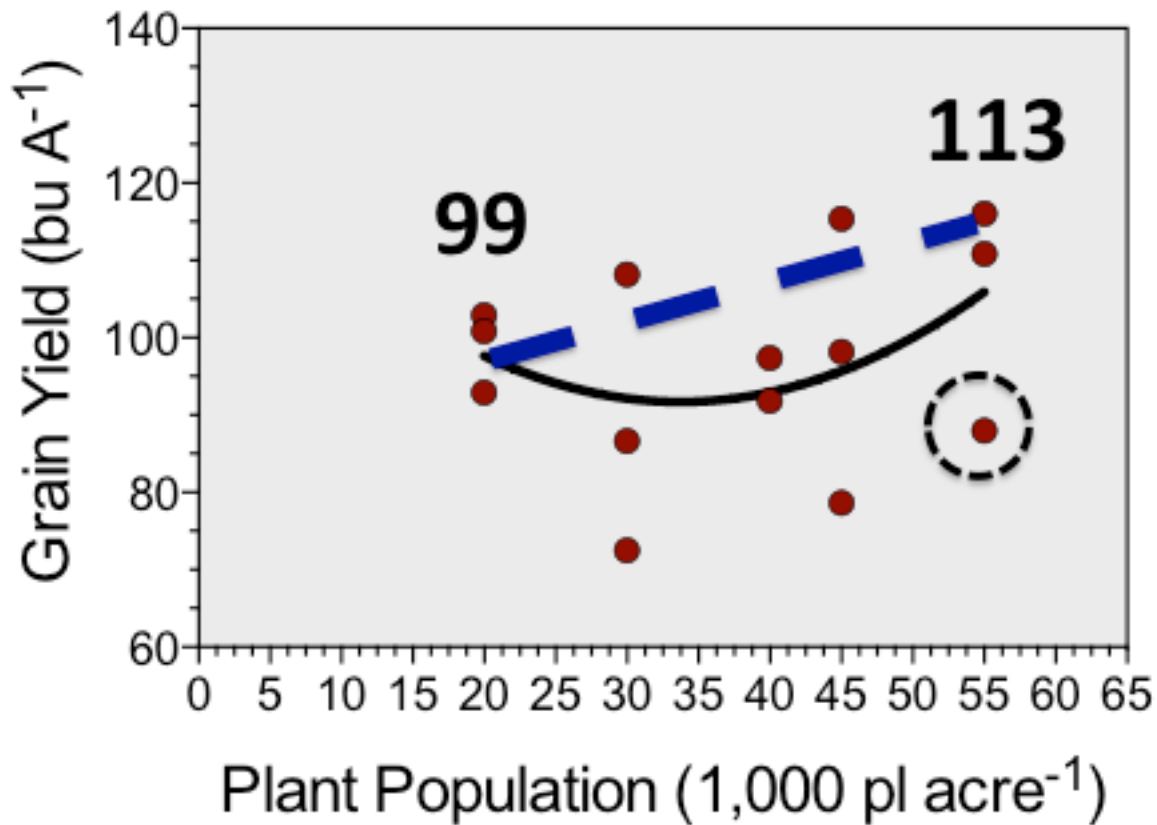
On-farm research experience: 2014 season

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.



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.





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. Purple color in corn seedlings: Cause for concern?

The rainy season in combination with unusual low temperatures are causing slow plant growth for all summer crops, including corn. Cold temperatures and saturated soils are not only affecting corn stands through uneven emergence and lack of uniformity, but are also causing a phenomenon in young corn seedlings known as “purple corn.”

In many cases when the purple color is identified in small corn plants, the first thought that comes to the mind of agronomists and producers is that this could be an indication of “phosphorus deficiency.” Phosphorus deficiency is also generally associated with stunted plants and thin stalks. Other potential causes of purple color can be hybrid-related, a buildup of sugars (sunny days/cold nights), and restricted root growth. Thus, the question becomes: What is the main factor affecting the plant color if the crop otherwise looks very healthy, uniform, and vigorous?

In recent years, purple coloring on corn seedlings has been documented in different environments under diverse management practices and hybrids. The color is coming from the expression of genes for anthocyanin pigment formation. Multiple genes govern the expression of this color, and certain “cold sensitive” genes react to low temperatures (40-50 degrees F). Therefore, low nighttime temperatures such as those we have experienced at times over the past several days/weeks will promote purpling in corn seedlings. This condition is only expressed up until the six-leaf (V6) stage. Producers do not need to worry about this phenomenon. As soon as the temperature warms up and plants grow rapidly, the purple color should disappear (after the six-leaf stage). If not, then consider taking a soil sample for potential phosphorous deficiency.

At this point, the purple color is simply the result of a small degree of cold temperature stress -- nothing severe. The plant is growing very slowly due to the cool weather (not related to the purple color), but good growth and development should resume after the temperatures go back to the normal for this time of year.



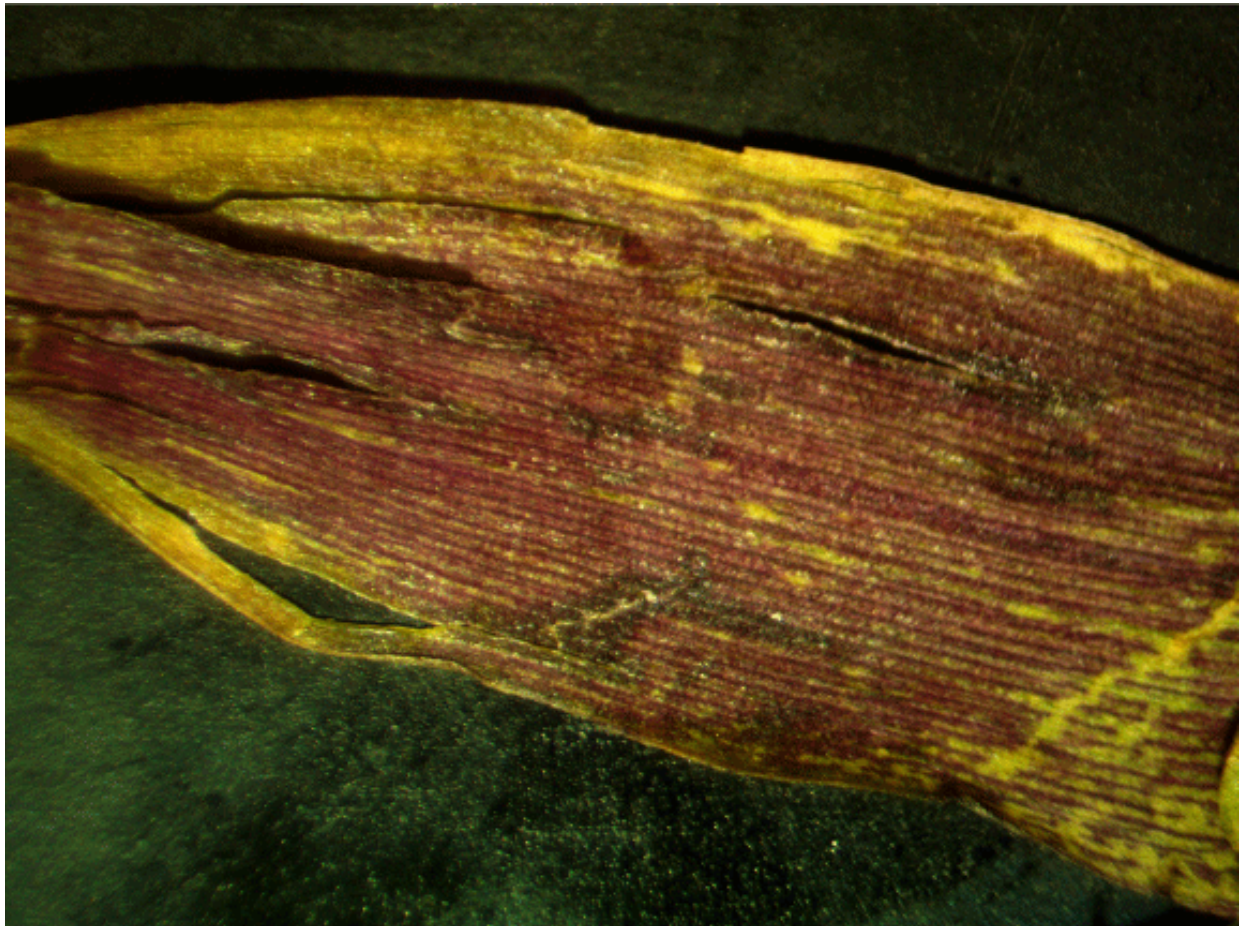






Figure 1. Purple coloration in corn at diverse growth stages -- a result of the expression of genes for anthocyanin pigment formation. A close-up look with a microscope reveals that the pigment is only present on the top layer of the leaf tissues, without affecting the chlorophyll. The purpling effects varied with the leaf position in the canopy, with no clear pattern. Photos by Ignacio Ciampitti, K-State Research and Extension.

Will the yield be affected by this stress? Previous information collected by several researchers concluded that yield is not likely to be affected by this phenomenon. Still, it is always good to continue scouting your acres for early identification of any potential problem affecting your crops.

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3. Effect of delayed planting on corn yield

With soils continuing to be very wet in parts of Kansas, more questions have been coming in about the effect of delayed planting on corn yield. A series of studies at K-State looking at delayed corn planting was conducted a few years ago.

Three hybrid maturities were tested: 100-, 108-, and 112-day. Over the two years and three locations (Belleville, Manhattan, and Hutchinson), there were three distinct environments (as related to the environmental stress):

- Low Stress – where rainfall was favorable during the entire growing season
- Early Stress – where cool temperatures and wet conditions limited early corn growth
- High Stress -- where conditions (rainfall and temperatures) were favorable early in the season, but the mid-summer was hot and dry

In the *Low Stress* environments, yields were reduced by less than 20% when planting was as late as mid-June. Yields were not statistically different for any planting date before May 20 (starting from early April). Maximum yield in these non-irrigated environments was 176 bu/acre. The yield responses were similar for hybrids of all maturities.

In the *Early Stress* environments, yields actually increased as planting was delayed until late June. This response was similar for all hybrid maturities. These environments had favorable temperatures and rainfall throughout July and early August. Maximum yield in these environments was 145 bu/acre.

In the *High Stress* environments (hot, dry mid-summer conditions), yields dropped by about 1% per day of planting delay, depending on hybrid maturity. The shorter-season hybrids had the best yields if they were planted before late May (maximum yield = 150 bu/acre), but all hybrids had yield reductions of more than 50% when planting was delayed until early to mid-June.

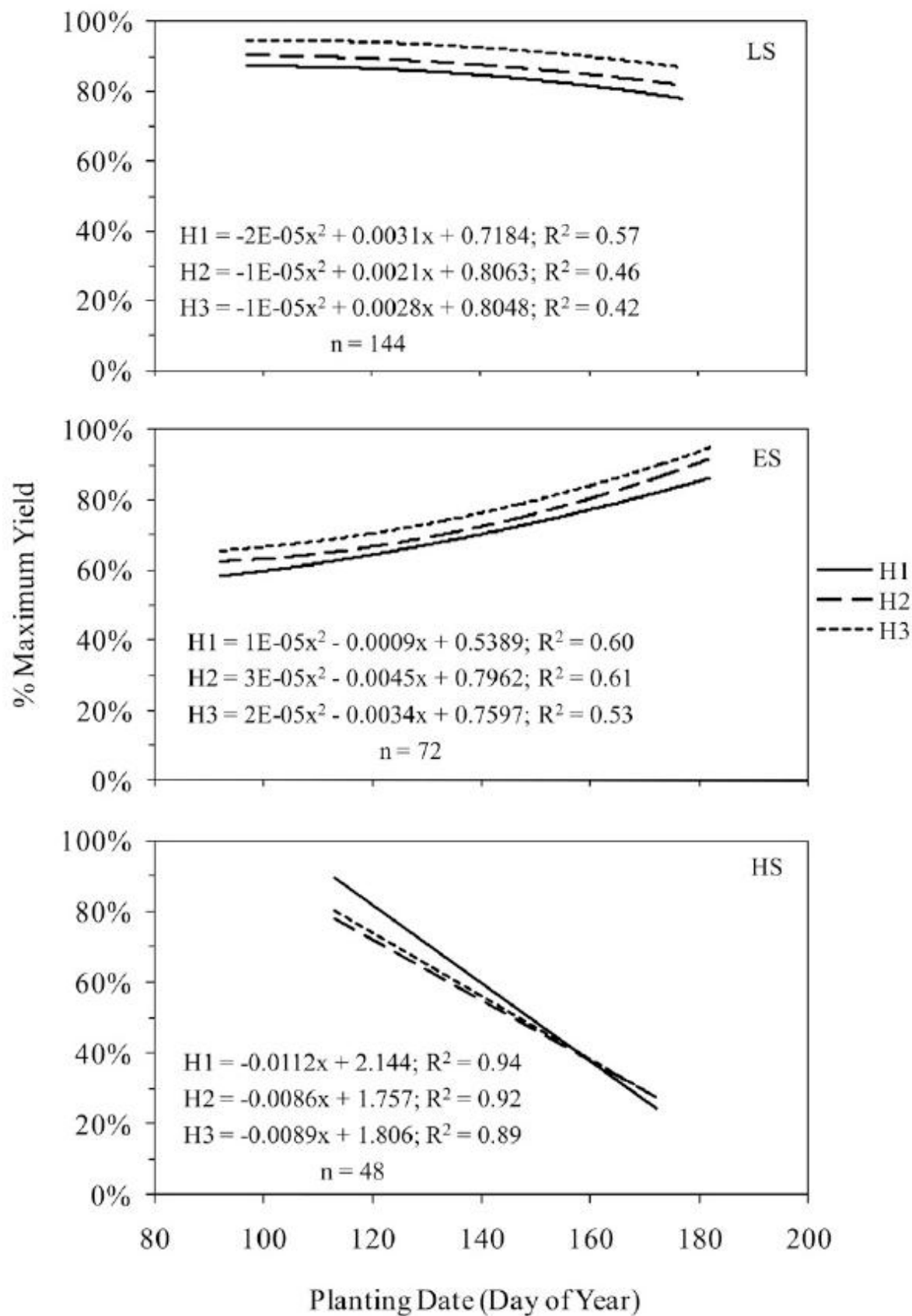


Figure 1. The top chart (LS, or Low Stress) shows how little corn yields changed as planting dates got later when growing conditions were good through the remainder of the season. The middle chart

(ES, or Early Stress) shows that corn yields actually increased with later planting dates when conditions were too cool and wet early, but then became more favorable. The lower chart (HS, or High Stress) shows how dramatically corn yields decreased when conditions were favorable early in the season, but the mid-summer was hot and dry. H1 refers to the 100-day hybrid. H2 refers to the 108-day hybrid. H3 refers to the 112-day hybrid.

In many ways, the current growing season is shaping up like the “Early Stress” scenario above, with cool conditions early in the season. Will this cool spring be followed by favorable temperatures and rainfall, or by hot and dry conditions during the rest of the growing season?

While long-term weather predictions are highly unreliable, the National Weather Service Climate Prediction Center (<http://www.cpc.ncep.noaa.gov/>) three-month outlook indicates a 40% likelihood of above-normal temperatures and an equal chance of above- or below-normal precipitation for most of the state. The extreme west has a 33% probability of below-normal precipitation.

Using a Web-Support Decision Tool: “Useful to Usable” (mygeohub.org)

For example, for the Manhattan location, if a 111-comparative relative maturity (CRM) corn hybrid was planted on April 15, it will take 2,670 growing degree days (GDD) from planting to physiological maturity (black layer). That means it will reach black layer around the last week of August or beginning of September. The earliest first freeze experienced at this location was early October (in 1985); thus, mid-April planting is not risking early termination of the crop by fall frost (Fig. 2). Of course, we are well past that date now.

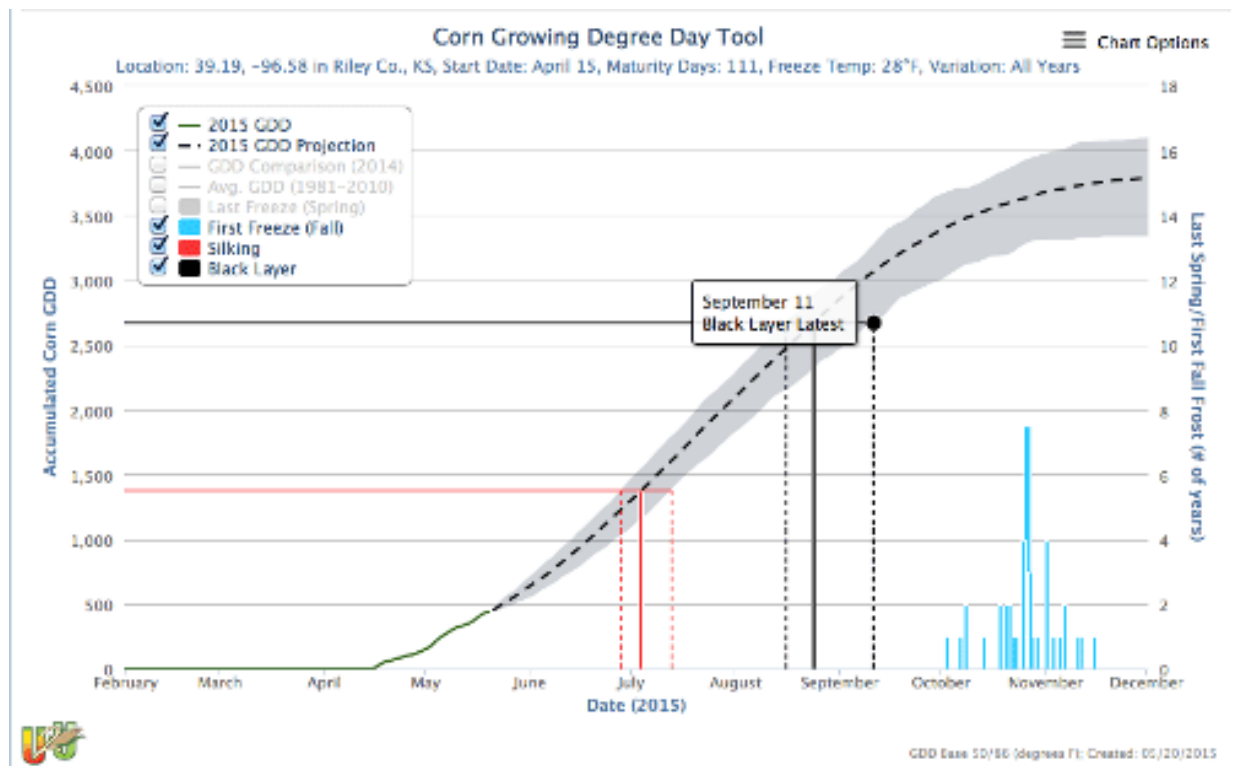


Figure 2. Corn growing degree day tool for a 111-CRM planted April 15, 2015. From

<https://mygeohub.org/groups/u2u/gdd> ("Usable to Useful" website).

If the planting date is this Friday, May 22, without changing the CRM, the final GDD required is similar -- 2,673. Nonetheless, black layer will be reached sometime from mid-September to mid-October. This situation increases the risk of damage from an early fall freeze, but the impact is predicted to be minimal (Fig. 3).

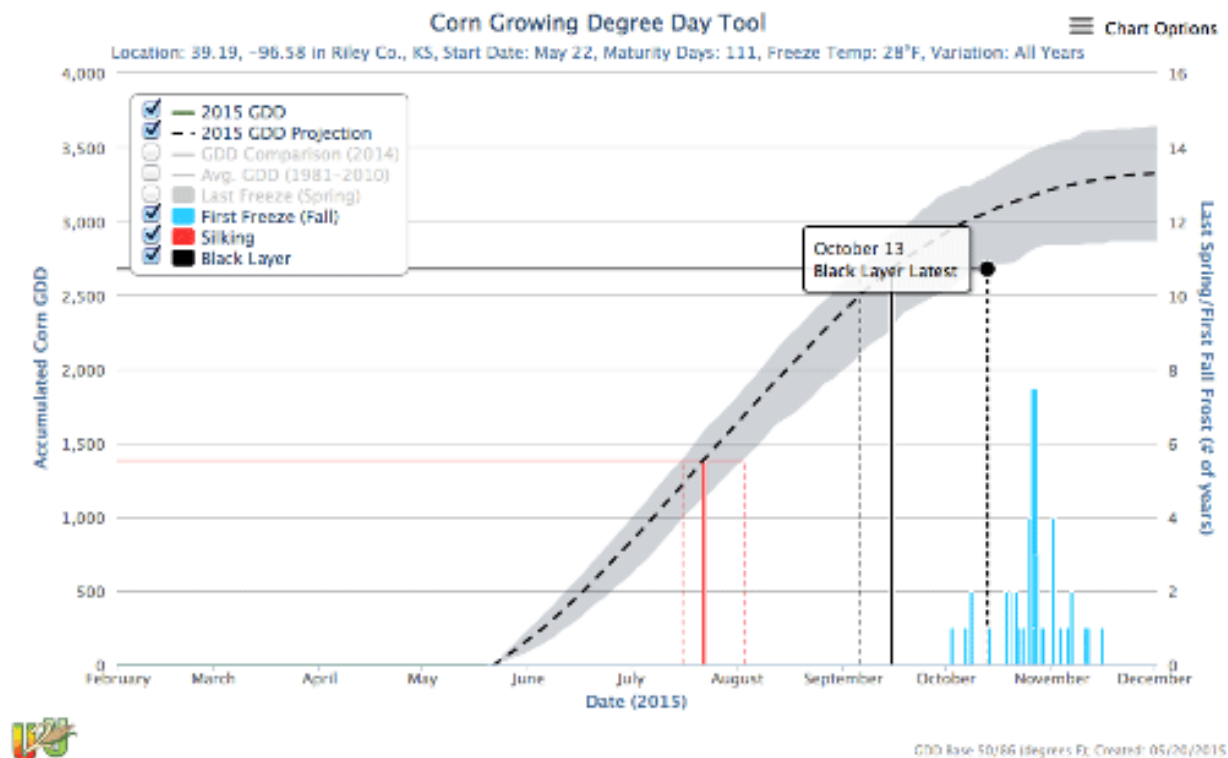


Figure 3. Corn growing degree day tool for a 111-CRM planted May 22, 2015. From <https://mygeohub.org/groups/u2u/gdd> ("Usable to Useful" website).

If planting is delayed to June 1, the same CRM corn hybrid will reach maturity sometime from about early October to the beginning of November. This will increase the likelihood of a killing frost (high probability for mid-October), which will result in a low-test weight and high moisture content in the grain due to a shortening of the grain filling and drying down period (Fig. 4 – left panel). By keeping the same planting time, but switching to a shorter CRM corn hybrid (e.g. 103 CRM), the corn would reach black layer about the same time as the 111-CRM hybrid planted May 22 (Fig. 4 – right panel). Thus, changing to a shorter CRM will increase the probability of reaching maturity with a small risk of being impacted by an early fall freeze.

As you move south and east from Manhattan, the risk of early termination from a fall freeze will decrease, but the risk will increase as you move north and west from Manhattan.

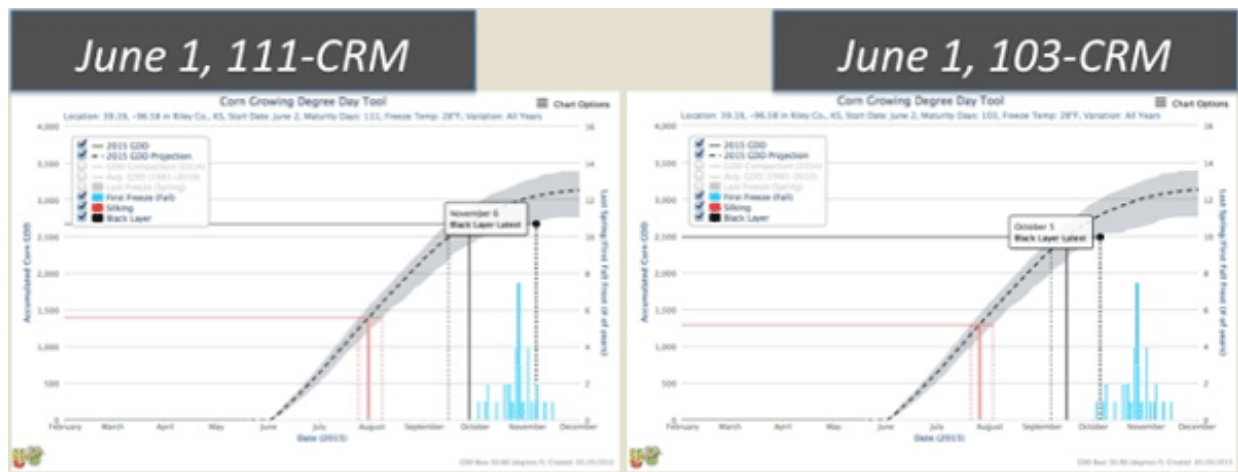


Figure 4. Corn growing degree day tool for a 111-CRM planted June 1, 2015 (left panel) and for a 103-CRM planted at the same time. From <https://mygeohub.org/groups/u2u/gdd> ("Usable to Useful" website).

So, depending on your location and depending on what you believe will happen during the rest of the growing season, delayed planting may or may not have much of an effect on corn yields. A previous eUpdate (April 26, 2013, No. 400) article on historical yield and planting date relationships confirmed that planting date is not necessarily a strong predictor of corn yield.

When making decisions on delayed planting of corn, crop insurance considerations are often an important factor as well as agronomic considerations.

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4. Causes of white heads in wheat

White heads may appear in some wheat fields around the state this year. Sometimes the white heads are just single tillers scattered throughout part or all of a field. And sometimes the white heads occur in small to large patches. There are many causes of white heads. Here are some of the most common causes and their diagnosis.

Premature dying (drowning, hot dry winds, etc.). As wheat begins to mature, plants in some areas of the field may have an off-white color similar to take-all. This is premature dying, which could be due to drowning, hot dry winds, or some other stress. The pattern of off-colored heads will often follow soil types or topography. The grain will be shriveled and have low test weight.

Freeze injury to stem or crown. Depending on the stage of growth at the time of a late spring freeze, parts or all of the heads may die and turn white. In years when the freeze occurs about the boot stage or a little earlier, there can be injury to the lower stem, which then cuts off water and nutrients to the developing head. In years when the wheat is in the early heading stage at the time of the freeze, the freeze can damage the heads directly. Often, wheat on north-facing slopes, on ridge tops, or in low-lying areas will be most affected by freeze injury. But freeze injury can also be so severe that it occurs throughout the fields, in no particular pattern. Crown rot is another potential problem that can be traced back to freeze injury. When the crown is damaged by cold temperatures or a freeze, part or all of the tillers can die. If the tiller from a damaged crown forms a head, this head will almost always be white. The crown will have internal browning, and stands will usually be thinner than normal.

Hail. Hail can occasionally damage just a portion of a head, and cause that damaged portion to turn white.

Dryland root rot (also known as dryland foot rot). This disease, caused by the *Fusarium* fungus, causes white heads and often turns the base of the plants pinkish. As with take-all, dryland root rot causes all the tillers on an infected plant to have white heads. This disease is usually most common under drought stress conditions, and is often mistaken for either drought stress or take-all.

Head scab. When there are periods of rainy weather or sprinkler irrigation applications made while the wheat is flowering, some heads may become infected with *Fusarium* head blight and turn white. The heads of some red-chaffed varieties turn a darker red when infected with scab, but the heads of most varieties turn white. Often, only the upper half of the head is white. Head scab is most common where wheat is grown after corn, or after a wheat crop that had head scab the previous year.

Take-all. This disease often causes patches of white heads scattered throughout the field. It occurs most frequently in continuous wheat, and where there is a moderate to high level of surface residue. To diagnose take-all, pull up a plant and scrape back the leaf sheaths at the base of a tiller. If the base of the tiller is shiny and either black or dark brown, it is take-all. All tillers on a plant infected with take-all will have white heads. Plants will pull up easily.

Sharp eyespot. This disease is common in Kansas, but rarely causes significant yield loss. Sharp eyespot causes lesions with light tan centers and dark brown margins on the lower stems. The ends of the lesions are typically pointed. If the stems are girdled by the fungus, the tiller may be stunted with a white head. Each tiller on a plant may be affected differently.

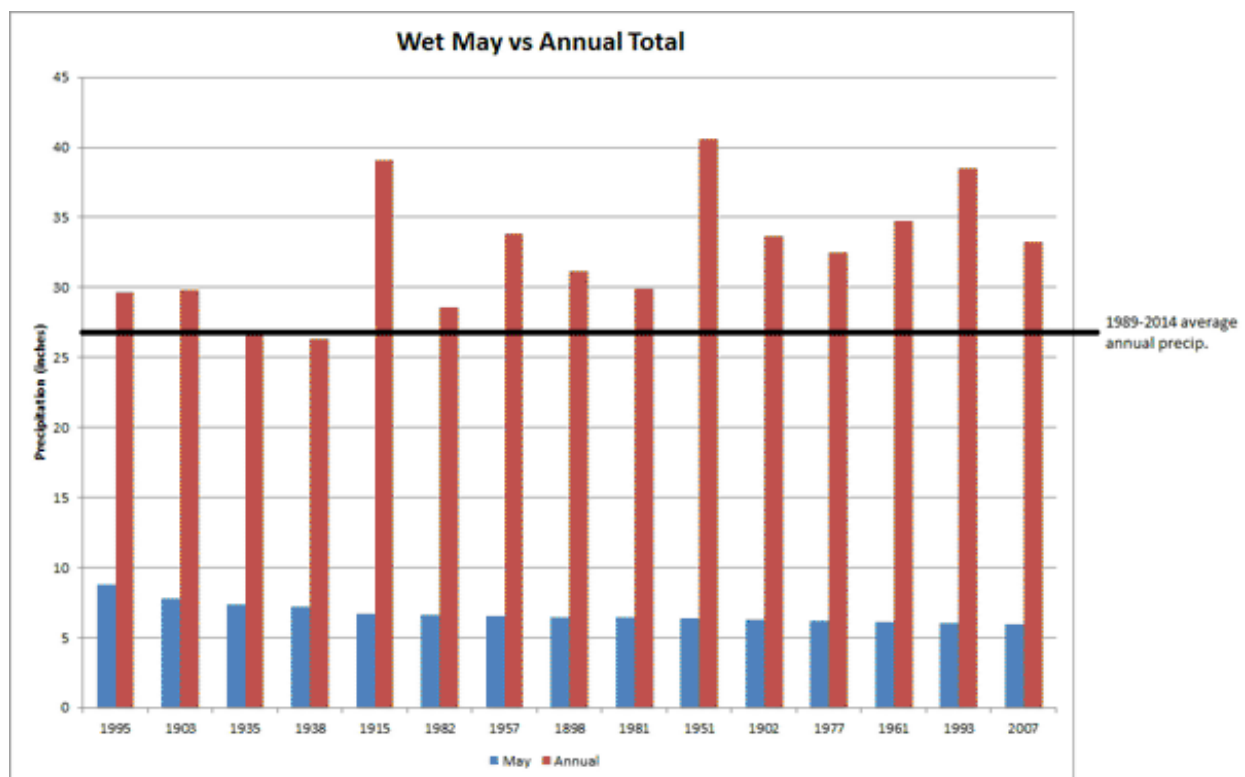
Wheat stem maggot. Wheat stem maggot damage is common every year in Kansas, but rarely results in significant yield loss. It usually causes a single white head on a tiller, scattered more or less randomly through part or all of a field. If you can grab the head and pull the stem up easily just above the uppermost node, the tiller has probably been infested with wheat stem maggot.

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As the wet weather continues, particularly to our south, questions arise as to the cause and whether it will continue. El Niño is often listed as one of the factors involved. An El Niño is declared when Pacific waters along the equator are at least 0.5 degrees C warmer than average for five, 3-month periods. Normally, this pattern develops in the fall and continues through the winter. Some events have lasted for multiple years. Depending on its strength, the impacts can be felt around the world. Southern California often sees excessive winter rains while the Pacific Northwest frequently sees drought conditions develop during an El Niño event. The further from the coast, however, the less direct and the less consistent the impacts.

In Kansas, an El Niño generally means normal to wetter-than-normal summers, and a milder-than-normal winter, with a greater likelihood of wetter conditions in the southern tier of counties

The current El Niño is still ranked as a weak event. However, the sea-surface temperature anomalies are at some of the highest levels seen at this time of the year. There are three previous El Niño events that followed a similar pattern of a rapid spring onset: 1957, 1968-69, and 1986-87. Only 1957 falls in both the top 15 wettest Mays and in the top 15 wettest years.



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6. Wheat tours scheduled in north central and northwest Kansas

Many wheat tours and field days are scheduled for the coming weeks in north central and northwest Kansas. The link below is a complete listing of all locations and dates, and describes which varieties are at each location. We hope you can make one or more of the wheat tours and field days.

<http://www.northwest.ksu.edu/p.aspx?tabid=96>

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7. Southeast Agricultural Research Center Spring Crops Field Day planned May 27

Wheat, weather and cropping systems will take center stage at the Southeast Agricultural Research Center's Spring Crops Field Day on Wednesday, May 27 in Parsons.

The event will be held just south of U.S. Highway 400 on Ness Road (North 32nd St.). It starts with registration and a complimentary breakfast from 7:30 to 8:30 a.m.

Doug Shoup, Southeast Area Crops and Soil Specialist and Lonnie Mengarelli, Agricultural Technician along with seed company representatives, will lead a tour of 30 wheat variety plots.

Chip Redmond, Weather Data Library manager, will present "Weather Tools for Agriculture and Future Weather Outlook."

Ignacio Ciampitti, K-State Research and Extension crop production specialist will present "Fine-tuning Cropping Systems via Integration of New Technologies."

In case of rain, the field day will be held indoors.

More information is available by calling 620-421-4826.

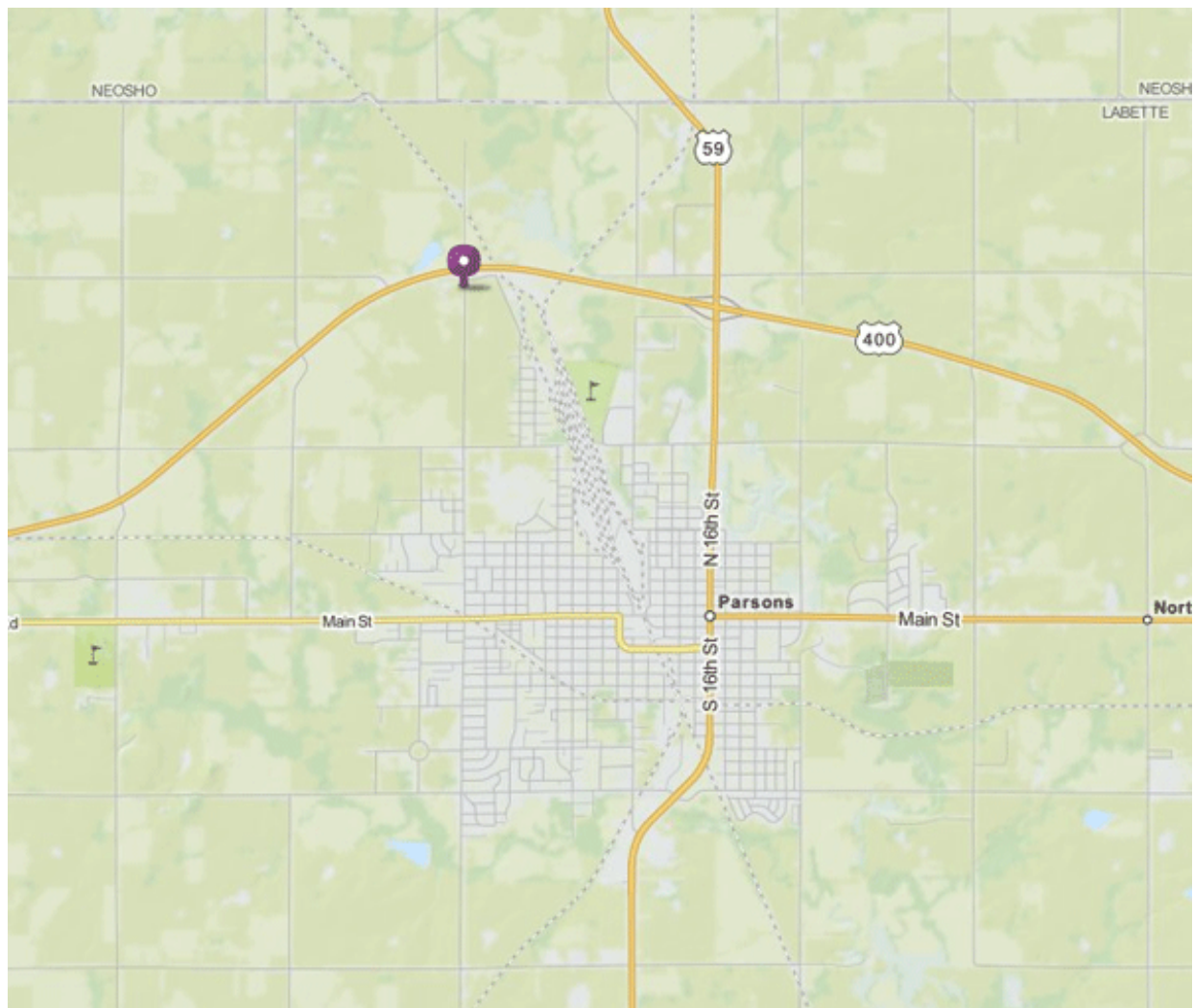


Figure 1. Map to Southeast Agricultural Research Center, Parsons.

Growing Growers is offering a workshop titled “Conservation Agriculture and Sustaining Soils” at the Douglas County Extension office, 210 Harper St., Lawrence on May 28 from 9 a.m. to 3:30 p.m. Topics include:

- Principles of Sustaining Soil Health – Steve Woodruff, USDA-NRCS
- Benefits of Cover Crops and Recommendations for the Great Plains – DeAnn Presley, K-State Soil Management Specialist
- The Role of Healthy Soils in Water Conservation – Peter Tomlinson, K-State Environmental Quality Specialist
- Rainfall Simulator Demonstration – Peter Tomlinson, Steve Woodruff, DeAnn Presley
- Soil Conservation Tactics on the Farm – Steve Woodruff
- No-Till and Soil Conservation Research at KSU – Cary Rivard, K-State Extension Specialist
- Farm Tour, Common Harvest Farm

This workshop is a function of the Growing Growers program. The cost to attend is \$30. To register or for more information, contact Kimberly Oxley at koxley@ksu.edu. Registration is requested by May 26, but walk-ins are welcome.

9. Wheat plot tour scheduled at North Central Experiment Field, June 3

The North Central Experiment Field Wheat Plot Tour is scheduled for Wednesday, June 3, 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. Tour topics include:

- Wheat Varieties
- Wheat Disease Update
- Production Updates

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. Northwest Research-Extension Center Spring Field Day, June 4

The Northwest Research-Extension Center in Colby will host its 2015 Spring Field Day on Thursday, June 4, with a complimentary lunch to follow.

Registration, coffee and donuts plus introductions start at 8:30 a.m. Field tours and presentations begin at 9 a.m.

- Solid stem wheat varieties for Kansas – Lucas Haag, Northwest Area Crops and Soils Specialist
- Emerging crop pests: Wheat stem sawfly and sugarcane aphid – J.P. Michaud, Agricultural Research Center-Hays entomologist
- Nitrogen management with crop sensors – Jeanne Falk-Jones, Sunflower District Agronomy
- Kochia management in wheat stubble and fallow – Curtis Thompson, Weed Management Specialist and Extension Agronomy State Leader
- Field peas for fallow replacement – Lucas Haag
- Why are some wheat varieties more drought resistant? – Rob Aiken, Northwest Research-Extension Center Agronomist
- Wheat marketing and management outlook – Dan O'Brien, Northwest Area Agricultural Economist

Lunch, compliments of several sponsors, will be served at noon, following the last presentation.

More information is available at <http://www.wkarc.org> or by calling 785-259-2723.

11. Southwest Research-Extension Center-Tribune Dryland Wheat Tour, June 5

The Southwest Research-Extension Center will host its 2015 Dryland Wheat Tour on Friday, June 5 at the Tribune Unit, 1474 State Highway 96 (one mile west of Tribune).

K-State Research and Extension specialists will give updates on the latest research linked to dryland wheat varieties, as well as disease and insect management.

Registration begins at 8:30 a.m. MDT, with the tour and presentations starting at 8:45 a.m.

More information is available by calling 620-376-4761.

12. Southwest Research-Extension Center-Garden City Spring Field Day, June 5

The focus is on wheat and triticale at the 2015 Spring Field Day planned for Friday, June 5 at the Southwest Research-Extension Center in Garden City.

The educational event begins with registration and introductions at 4:30 p.m. K-State Research and Extension specialists will provide the latest information on wheat varieties, plus managing diseases and insects that pose a challenge to wheat production.

A presentation on triticale forage varieties wraps up the program, which is followed by a complimentary supper.

More information about the Spring Field Day is available by calling 620-276-8286.

The 2015 Kansas Composting Operators' School will be held June 9-10 in Pottorf Hall on the Riley County Fairgrounds in Manhattan. The school is co-sponsored by K-State Research and Extension Department of Agronomy and the KDHE Bureau of Waste Management.

The School provides hands-on training in municipal, agricultural, and commercial large-scale composting for operators and managers of compost facilities who want to gain knowledge and experience in composting. The program includes classroom and laboratory instruction along with field activities at the K-State Agronomy Education-Demonstration-Research Compost Site at the Agronomy Research Farm in Manhattan.

The School is a two-day training program beginning at 8:30 a.m. and running until 5:00 p.m. the second day.

Who Should Attend?

- Composting operators, managers, staff
- Composting firms
- Consultants and technology providers
- Waste management officials
- Compost users
- Interested individuals

There is a fee for the school. Class size for the school is limited to 20 people on a first-come-first-served basis. The first 20 paid reservations will be accepted.

Online registration with a credit card is available at: <https://www.eventbrite.com/e/2015-compost-school-manhattan-tickets-16859032821>

For more information, contact either:

DeAnn Presley or Troy Lynn Eckart, K-State Agronomy, 785-532-5776, deann@ksu.edu

or

Ken Powell, KDHE, 785-296-1121, kpowell@kdheks.gov

14. Comparative Vegetation Condition Report: May 5 - May 18

K-State's Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:

<http://www.youtube.com/watch?v=CRP3Y5Nlggw>

<http://www.youtube.com/watch?v=tUdOK94efxc>

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 26-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.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you'd like digital copies of the entire map series please contact Nan An at nanan@ksu.edu and we can place you on our email list to receive the entire dataset each week as they are produced. The maps are normally first available on Wednesday of each week, unless there is a delay in the posting of the data by EROS Data Center where we obtain the raw data used to make the maps. These maps are provided for free as a service of the Department of Agronomy and K-State Research and Extension.

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

Kansas Vegetation Condition

Period 20: 05/05/2015 - 05/18/2015

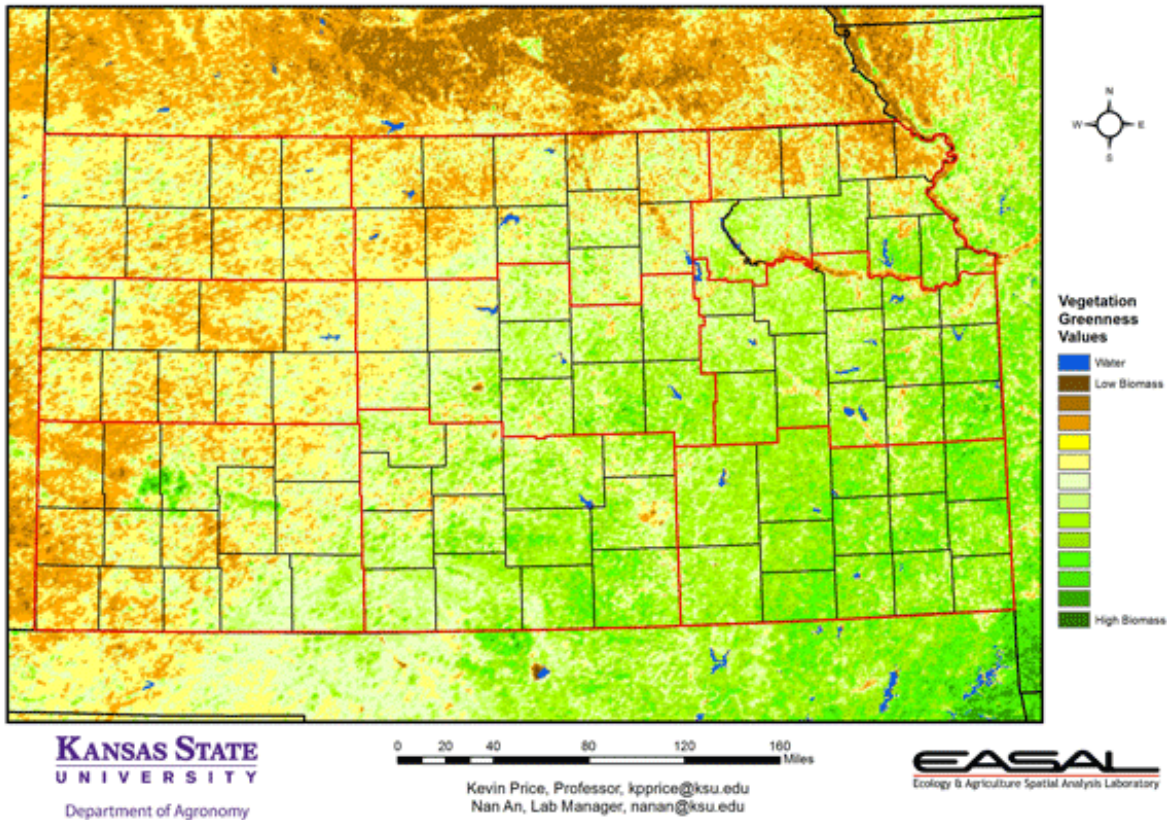


Figure 1. The Vegetation Condition Report for Kansas for May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that vegetative development continues in the eastern portions of the state. Photosynthetic activity is highest in the Southeast and East Central Divisions, where temperatures have been the warmest.

Kansas Vegetation Condition Comparison

Early-May 2015 compared to the Early-May 2014

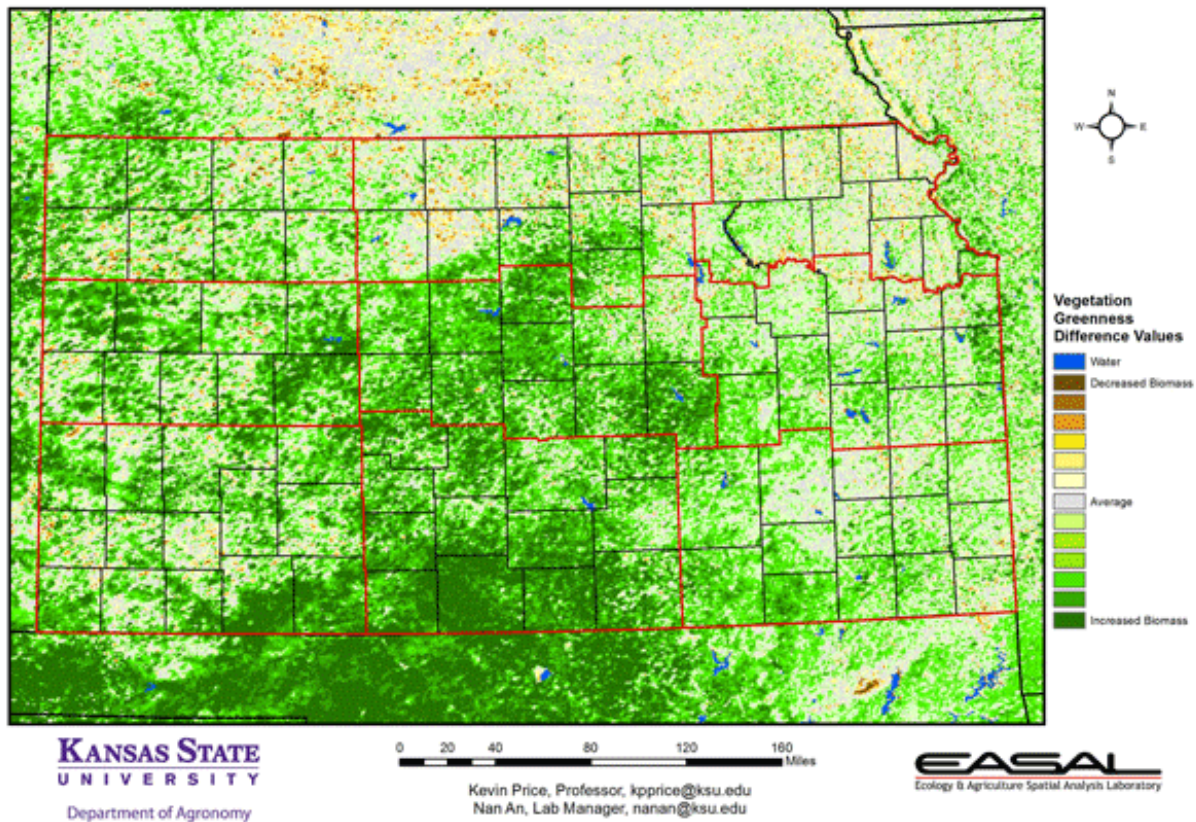


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows most of the state has higher NDVI values. The greatest concentration of higher photosynthetic activity is in south central Kansas. April had twice the precipitation as last year in that region.

Kansas Vegetation Condition Comparison
Early-May 2015 compared to the 26-Year Average for Early-May

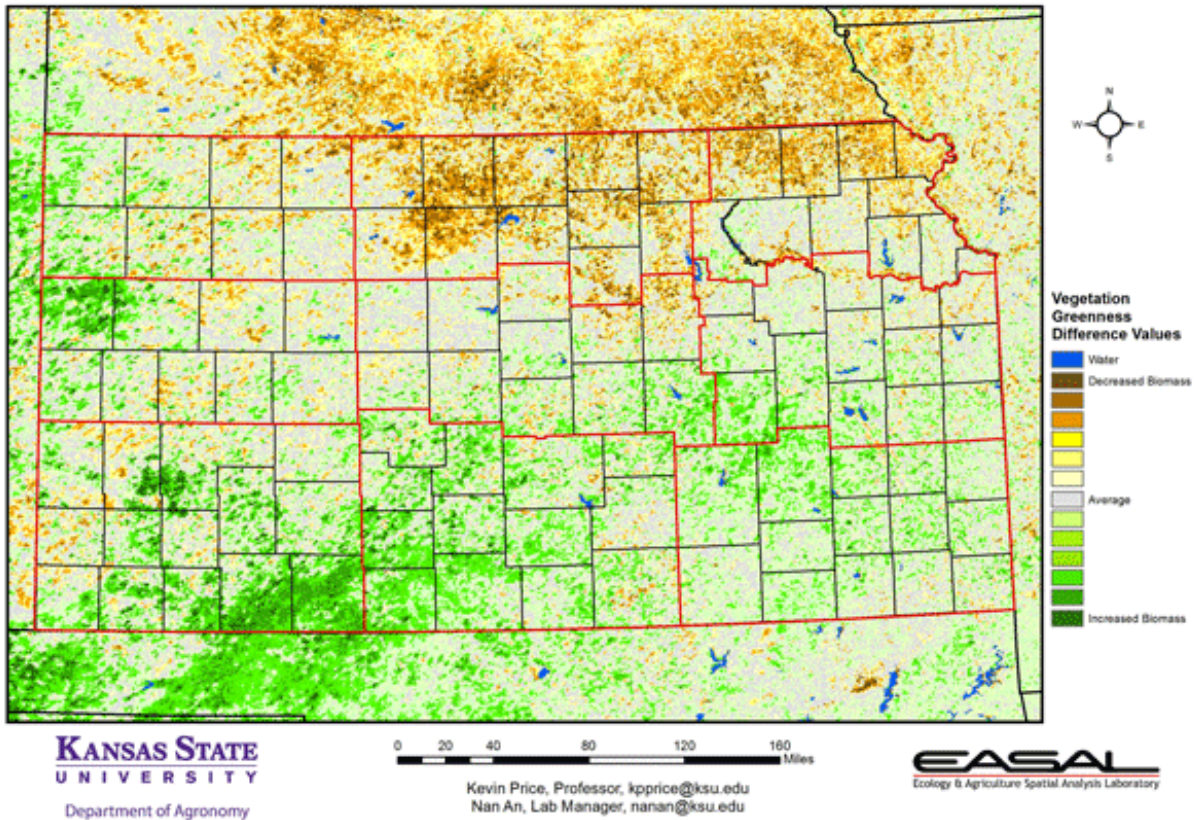


Figure 3. Compared to the 26-year average at this time for Kansas, this year's Vegetation Condition Report for May 5 – 18 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the northern divisions, particularly north central and northeast Kansas have below-average photosynthetic activity. Rainfall has been later arriving in this region and temperatures have been cooler.

U.S. Corn Belt Vegetation Condition

Period 20: 05/05/2015 - 05/18/2015

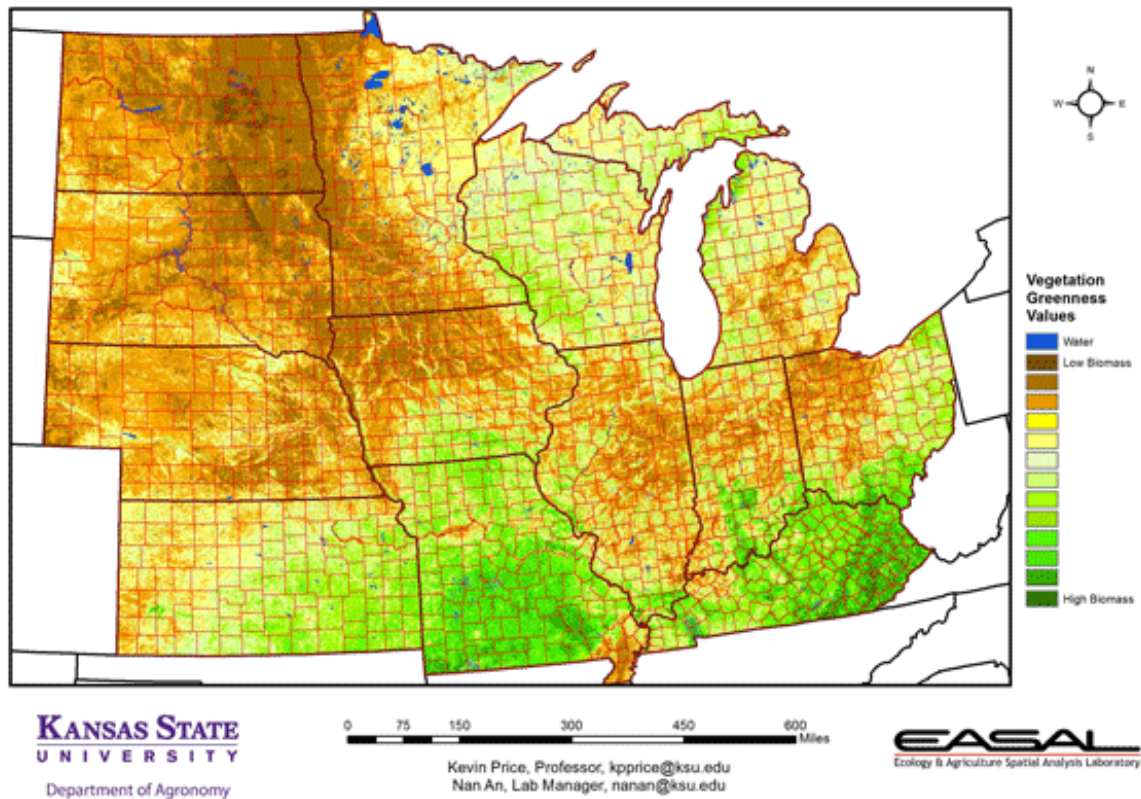


Figure 4. The Vegetation Condition Report for the Corn Belt for May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that photosynthetic activity continues to be most limited in the northern parts of the region. Cold, wet weather in the recent weeks has delayed development.

U.S. Corn Belt Vegetation Condition Comparison Early-May 2015 Compared to Early-May 2014

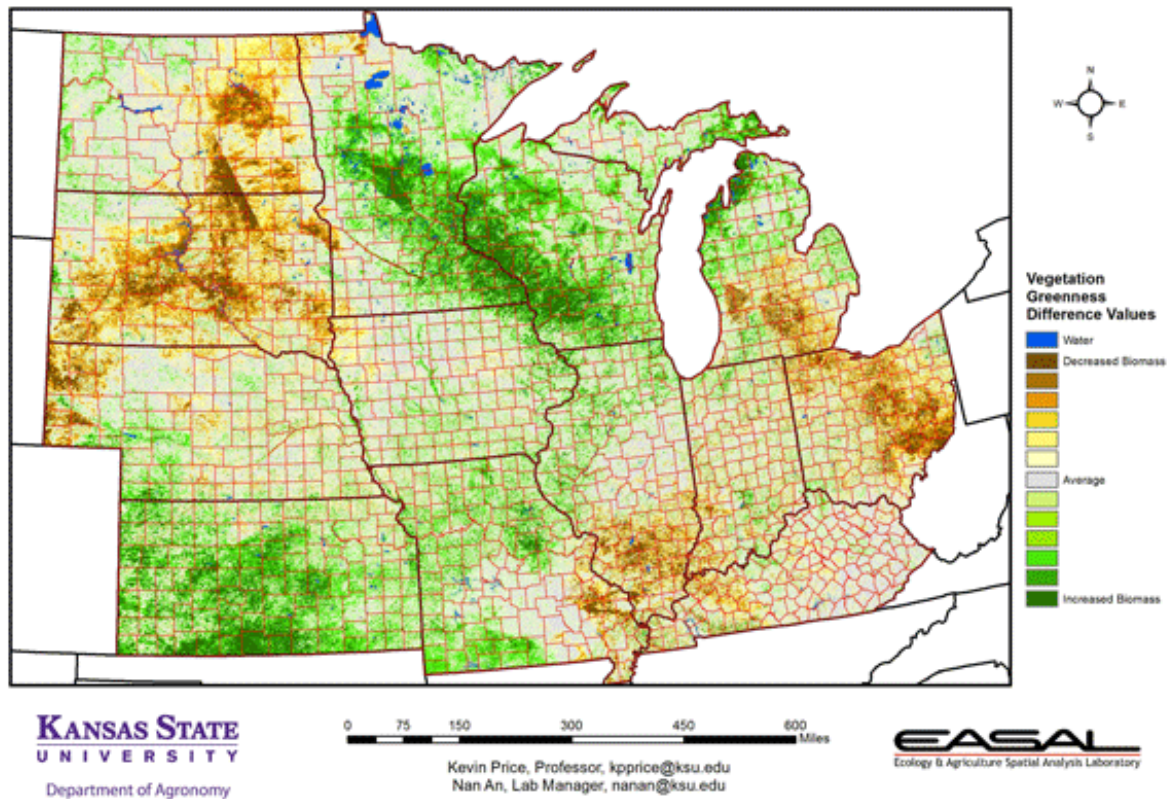


Figure 5. The comparison to last year in the Corn Belt for the period May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows Kansas and the Upper Mississippi Valley have had the biggest increase in photosynthetic activity. In Kansas, more plentiful moisture has been the driver, while in the Upper Mississippi Valley, an early end to snow cover has been the big influence in early plant development.

U.S. Corn Belt Vegetation Condition Comparison
 Early-May 2015 Compared to the 26-Year Average for Early-May

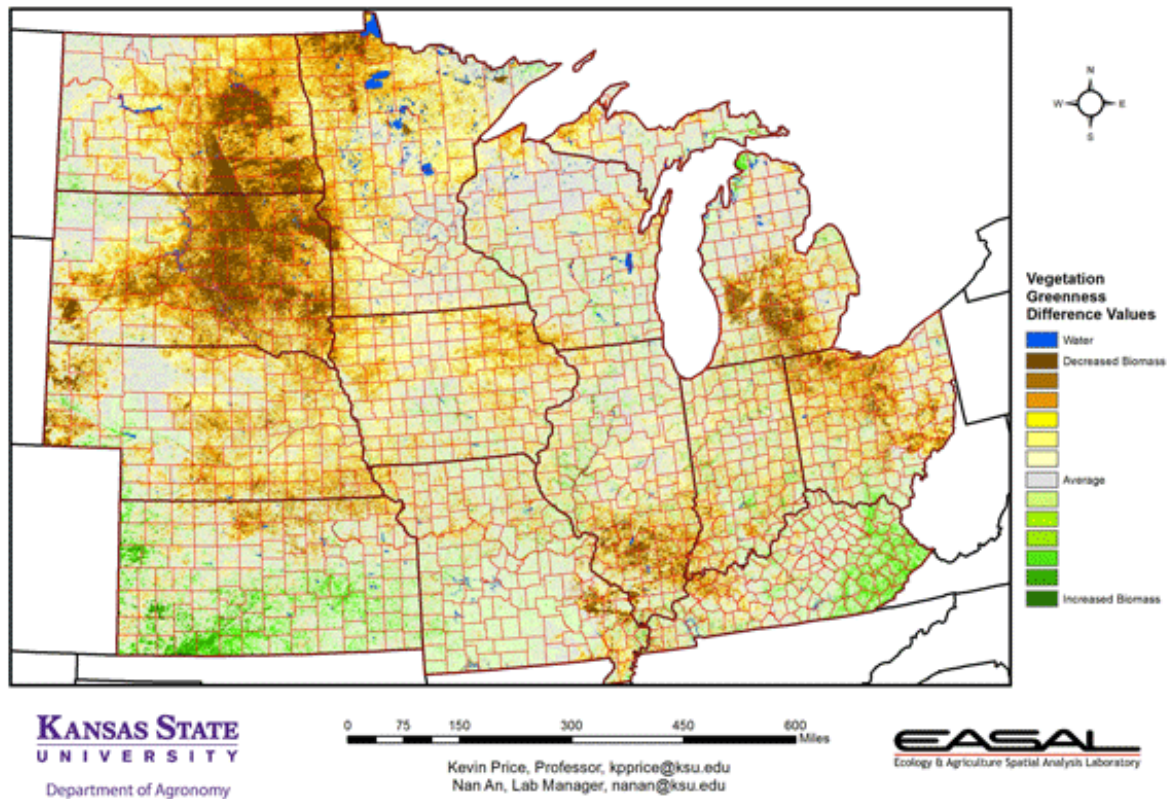


Figure 6. Compared to the 26-year average at this time for the Corn Belt, this year's Vegetation Condition Report for May 5 – 18 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows much lower-than-average biomass production in the northern areas. Lack of moisture, followed by a cool spring, has delayed plant development.

Continental U.S. Vegetation Condition

Period 20: 05/05/2015 - 05/18/2015

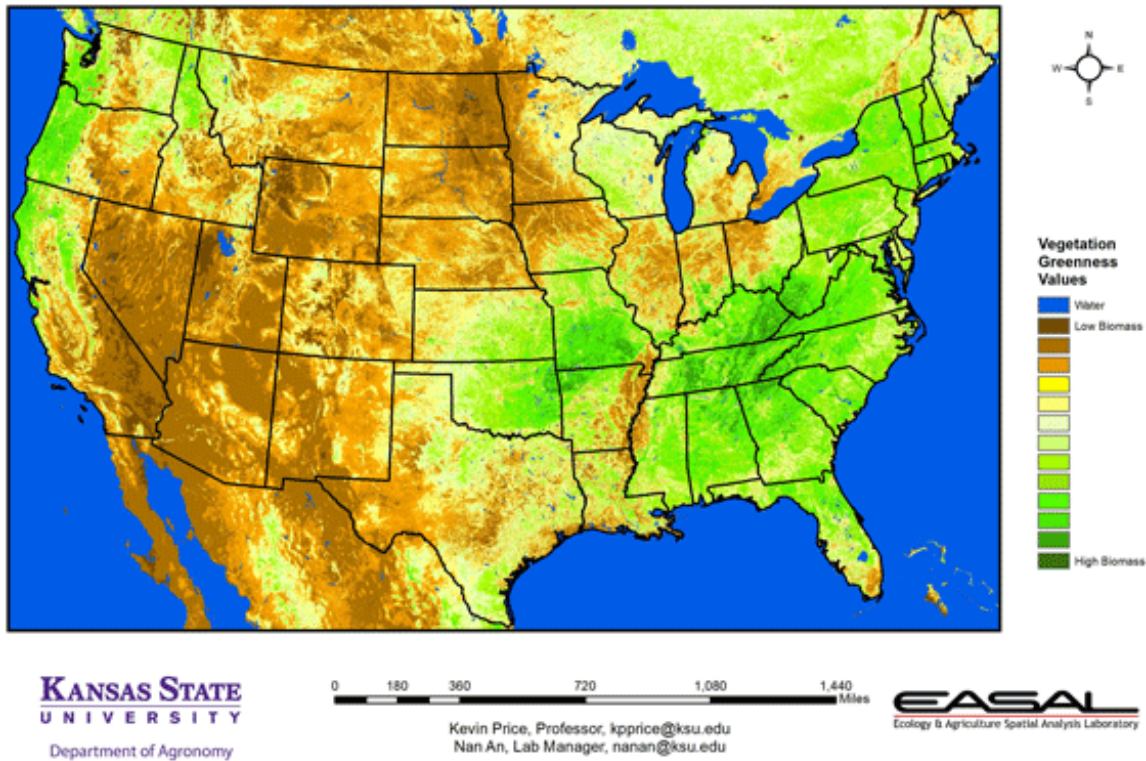


Figure 7. The Vegetation Condition Report for the U.S. for May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that there is an area of low photosynthetic activity along the Ohio River Valley and into the southern Mississippi Valley. Excess moisture is the major culprit there.

Continental U.S. Vegetation Condition Comparison
Early-May 2015 Compared to Early-May 2014

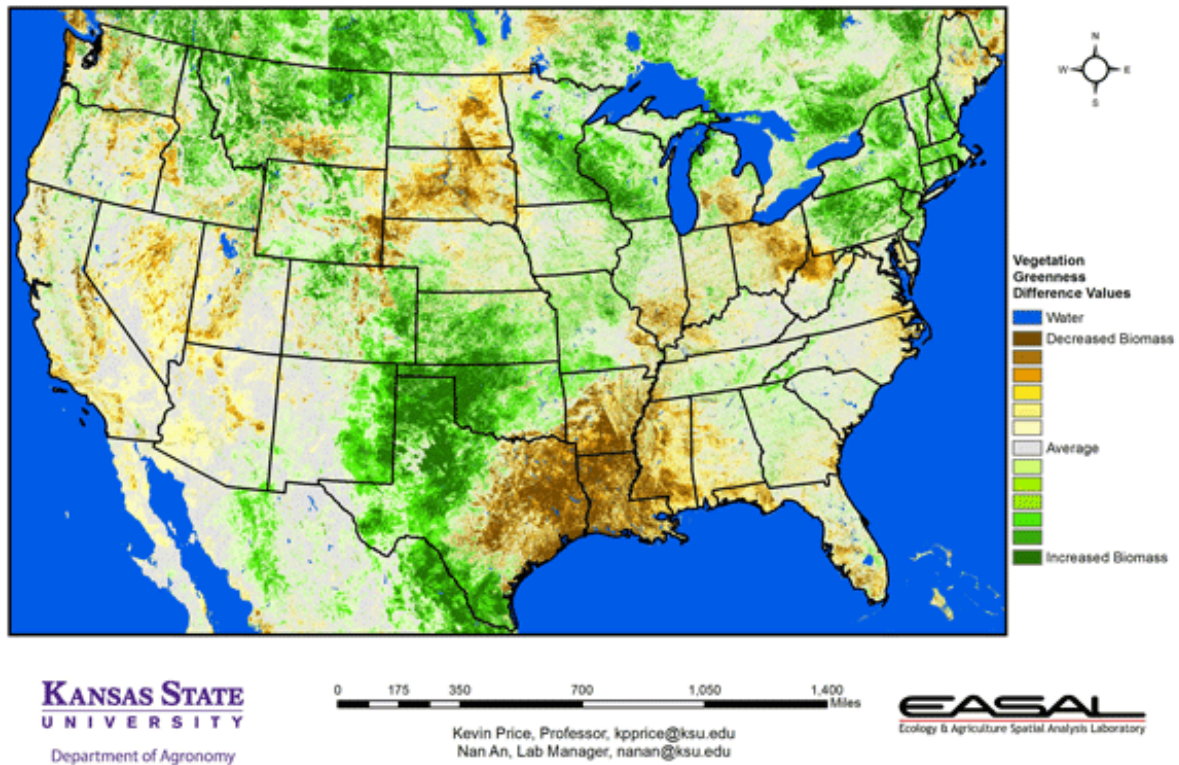


Figure 8. The U.S. comparison to last year at this time for the period May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows much higher biomass production in the Central Plains and West Texas, where favorable moisture has spurred plant development. In east Texas, excess moisture has been a problem.

Continental U.S. Vegetation Condition Comparison
Early-May 2015 Compared to 26-year Average for Early-May

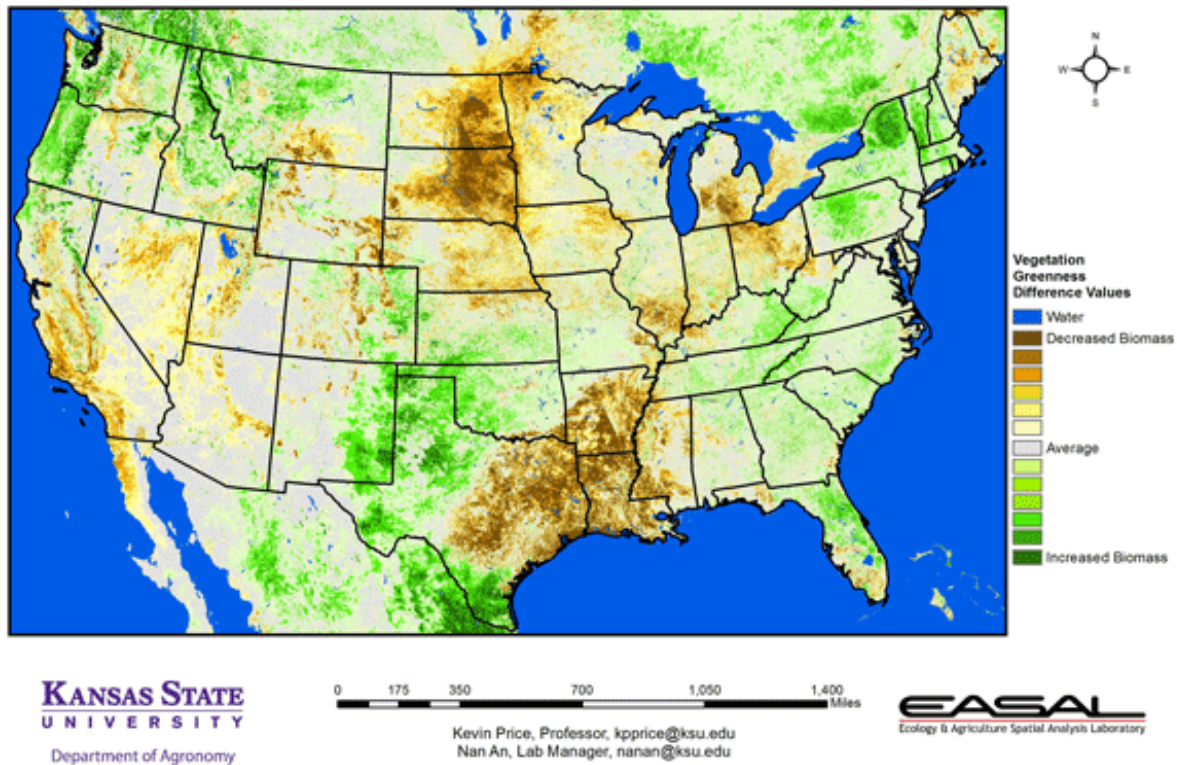


Figure 9. The U.S. comparison to the 26-year average for the period May 5 – 18 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the biggest departures from average NDVI values are in the Plains. To the north, drought and cold temperatures have delayed plant development. To the south, particularly in east Texas, Arkansas, and Louisiana, excessive moisture has been the cause of most of the reduction.

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