



## Extension Agronomy

# eUpdate

---

*05/26/2017*

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 [swatson@ksu.edu](mailto:swatson@ksu.edu), or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 [cthompso@ksu.edu](mailto:cthompso@ksu.edu).

Subscribe to the eUpdate mailing list: <https://listserv.ksu.edu/cgi-bin?SUBED1=EUPDATE&A=1>

---

<b>1. Sorghum management considerations.....</b>	<b>3</b>
<b>2. Slow planting and emergence progress for corn.....</b>	<b>9</b>
<b>3. Effect of delayed planting on corn yield.....</b>	<b>16</b>
<b>4. Purple color in corn seedlings: A valid concern affecting yields?.....</b>	<b>21</b>
<b>5. Rootless Corn syndrome.....</b>	<b>25</b>
<b>6. K-State wheat plot tours for May 30 - June 2.....</b>	<b>29</b>
<b>7. Wheat field day scheduled at North Central Experiment Field, June 7.....</b>	<b>31</b>
<b>8. Dryland Ag Day planned in Tribune, June 8.....</b>	<b>32</b>
<b>9. Field pea plot tours, June 15.....</b>	<b>33</b>
<b>10. Summer weather outlook for Kansas.....</b>	<b>35</b>
<b>11. Comparative Vegetation Condition Report: May 16 - 22.....</b>	<b>40</b>

## 1. Sorghum management considerations

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

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).

### 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 used when planting late. Increase rates by 20-25 percent if planting in late-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

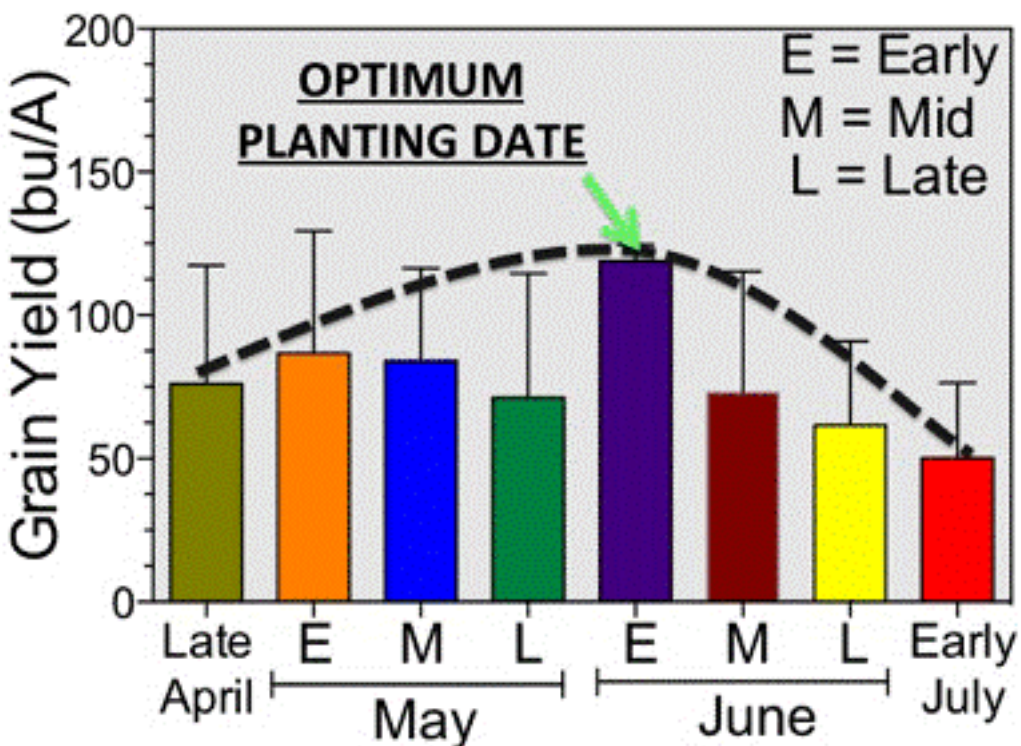
50,000 to 70,000 plants per acre can maximize yields, with the final objective of having 1 to 1.5 heads per plant.

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 (Fig. 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.

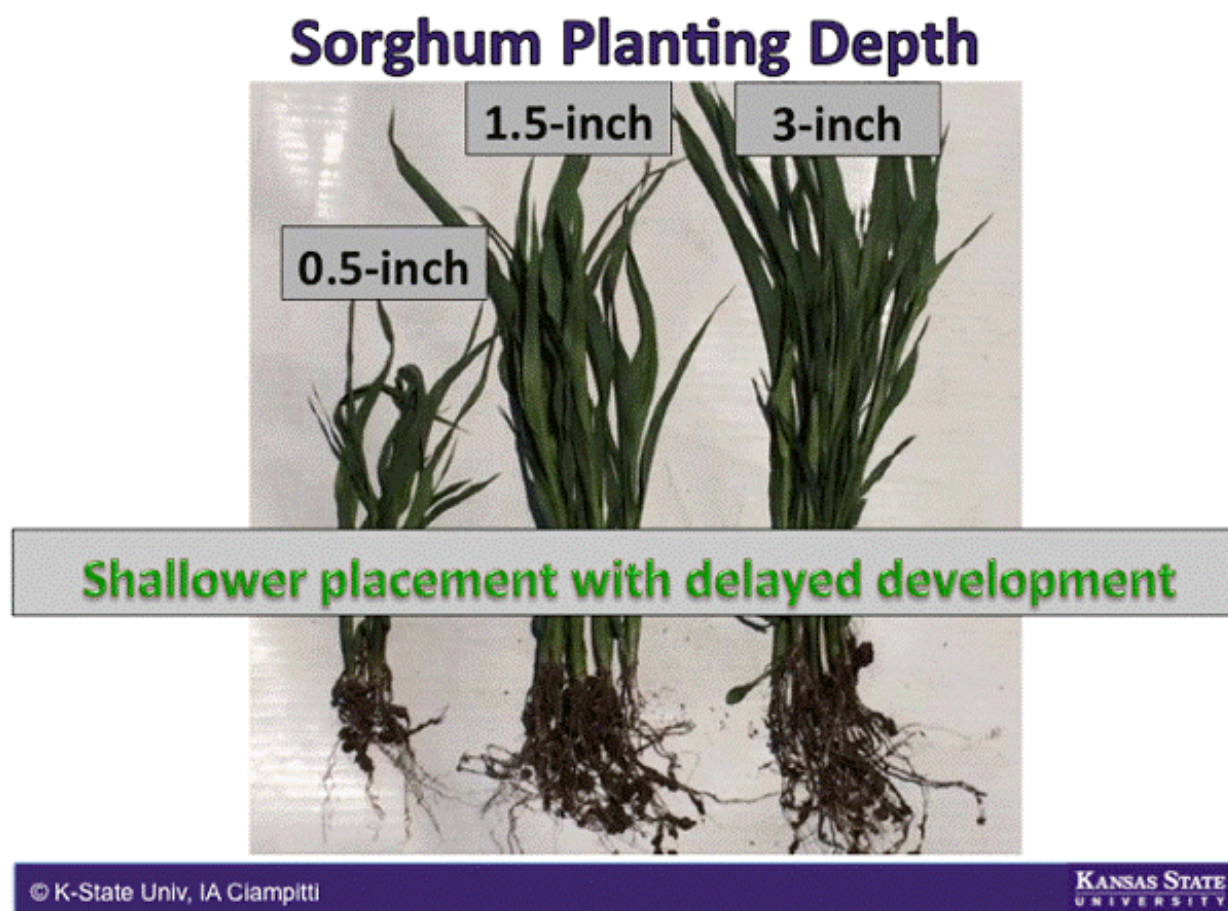
Planting date has some effect on seeding rates. Sorghum tillers more readily in cool temperatures and less readily under warm conditions. As a result, later plantings in warmer weather should be on the high side of the recommended range of seeding rates for each environment since there will be less tillering. 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.



**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). From Sorghum: State of the Art and Future Perspectives, Agronomy**

### 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. 2).



**Figure 2. Seed placement effect on early sorghum growth and development, Manhattan, 2014 (Ciampitti et al., 2014).**



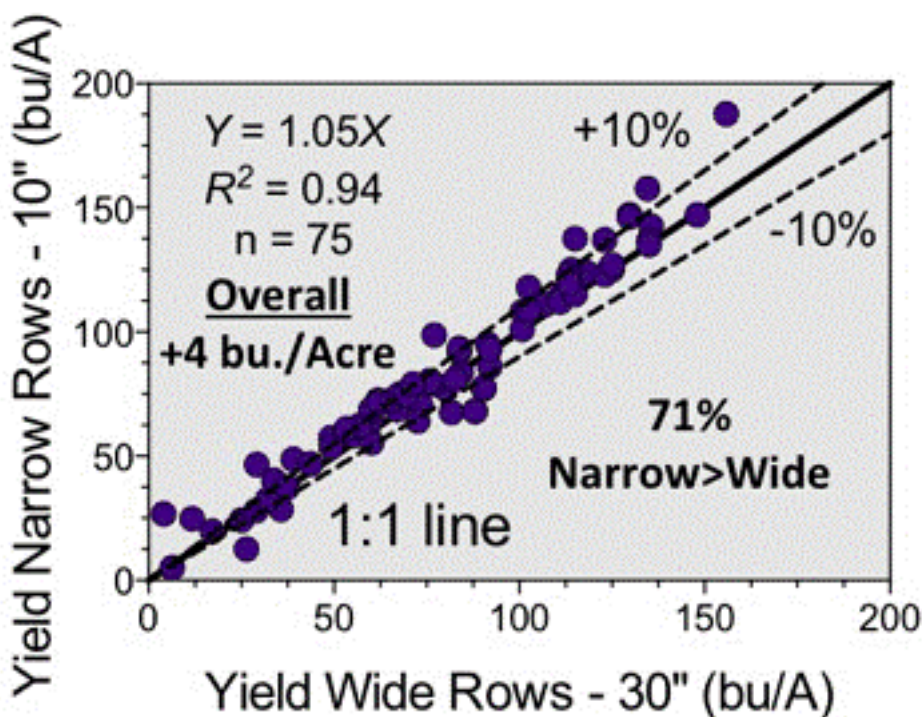
## Row spacing

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 with narrow rows. In addition, narrow rows outyielded wide rows in 71 percent of all observations evaluated (Fig. 3).

A more consistent response to narrow rows was documented when yields were above 70 bushels per acre, with a greater chance of having higher yields when using narrow rows. 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 3. 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 on 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 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.

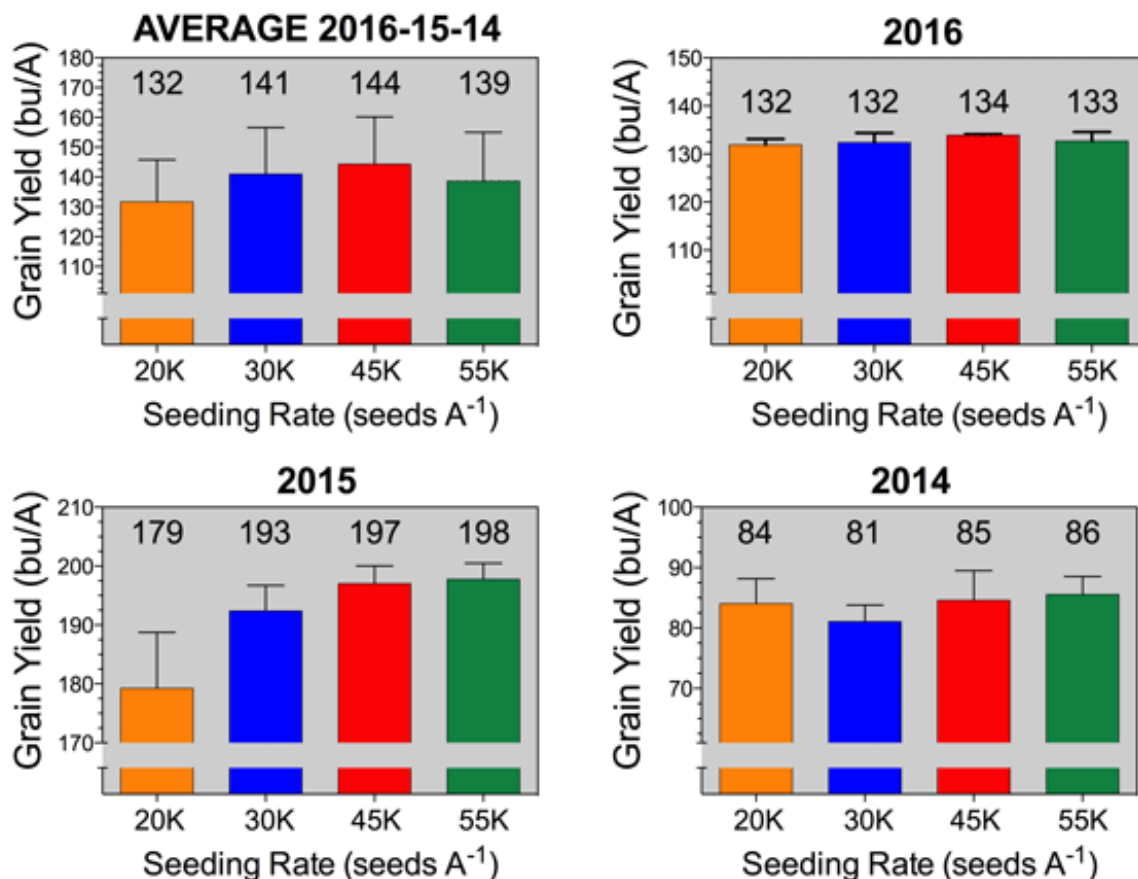
For the summary of planting date information in Figure 1, hybrid maturity showed a very complex pattern across the diverse locations. Overall, longer-season hybrids showed a better yield at the mid-May planting time, but yields were less than 100 bushels per acre. For medium- and short-season hybrids, 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: 2014-2016 seasons**

During the last three growing seasons, on-farm research studies were established in collaboration with farmers and Sandra Wick, Post Rock District Extension Agent.

A summary of sorghum plant population response to all years of on-farm research revealed an optimal response to plant population at around 30 to 45 thousand seeds per acre (Fig. 4). 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.

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.



**Figure 4. On-farm sorghum seeding rate studies performed in collaboration with Sandra Wick, Post Rock Extension District, sorghum farmers, and KSUCROPS Lab - Dr. Ciampitti.**

### Summary

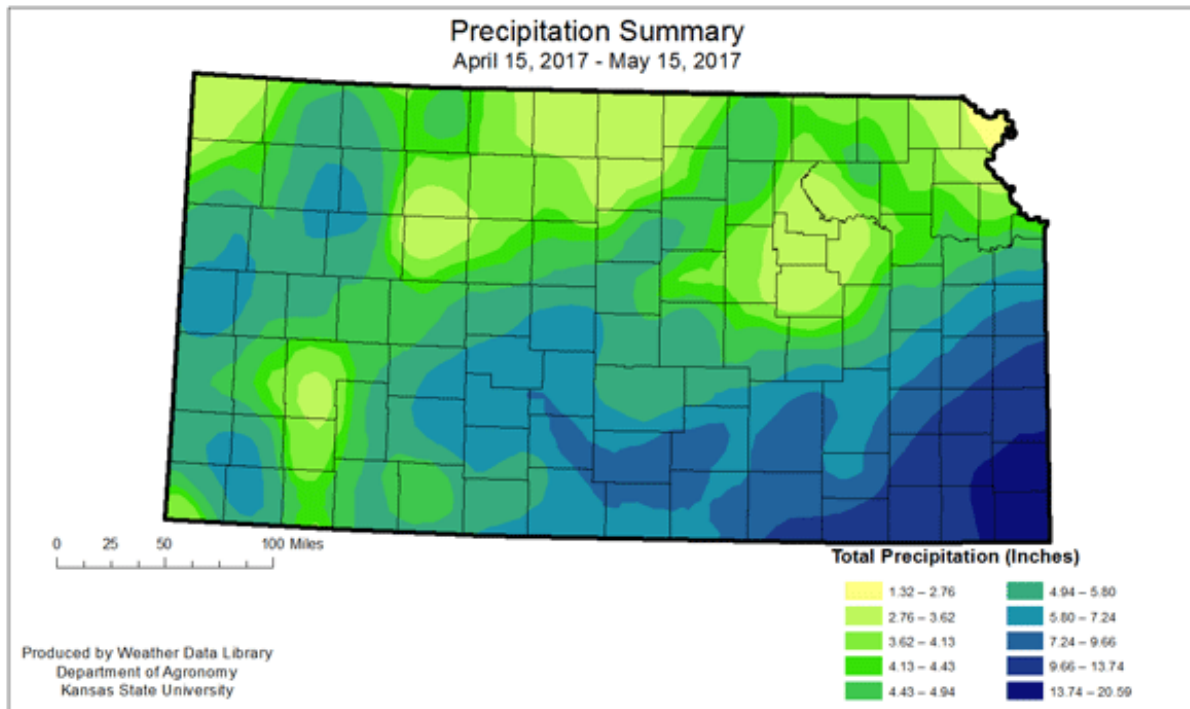
- Determine your desired population based on average rainfall and expected growing conditions. There is no need to go overboard.
- Make sure you plant enough seed for your desired plant population. About 65-70 percent field germination is a good general rule to use.
- Think about using narrower row spacings 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.

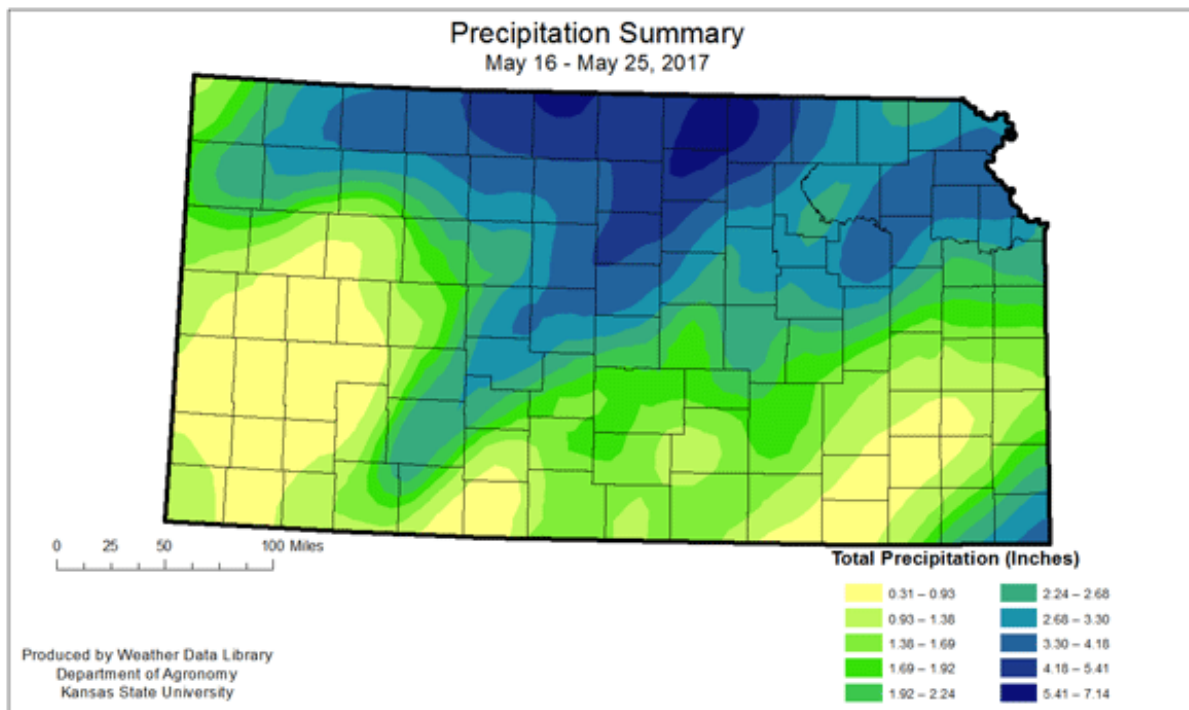
Ignacio Ciampitti, Crop Production and Cropping Systems Specialist  
[ciampitti@ksu.edu](mailto:ciampitti@ksu.edu)



## 2. Slow planting and emergence progress for corn

For the week starting May 22, temperatures were 6 to 8 degrees below normal across the state. Rain over the past month has presented challenges to corn planting for farmers in Kansas. Several areas received large quantities of rain from April 15 to May 25. Muddy fields are common now in many areas of the state.





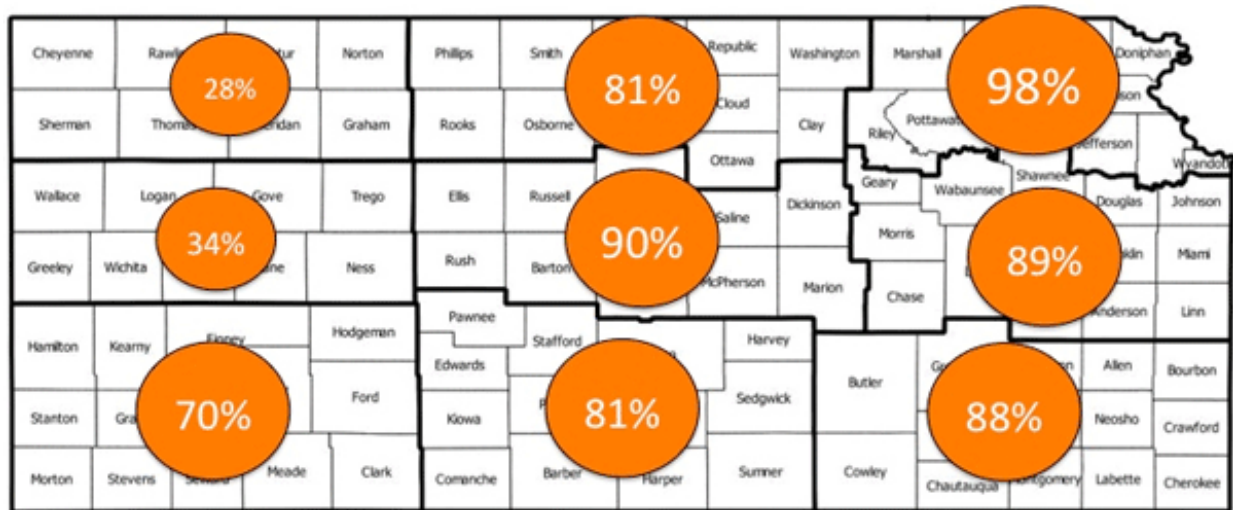
**Figure 1. Precipitation summary for the periods of April 15-May 15 (upper panel) 15 and May 15-25 (lower panel). Source: K-State Weather Data Library.**

Corn planting status across the entire state is 70% as of May 22 (Fig. 2, upper panel), with close to 50% of all corn emerged (Fig. 2, lower panel). The crop reporting districts of Northwest and West Central are the ones where the most progress is still needed on planting corn.

# CORN – Planting Progress - USDA/NASS

70%

Corn Planting Progress – State Average



**Corn planting progress  
reached 70% for the state  
(USDA/NASS, May 22, 2017)**

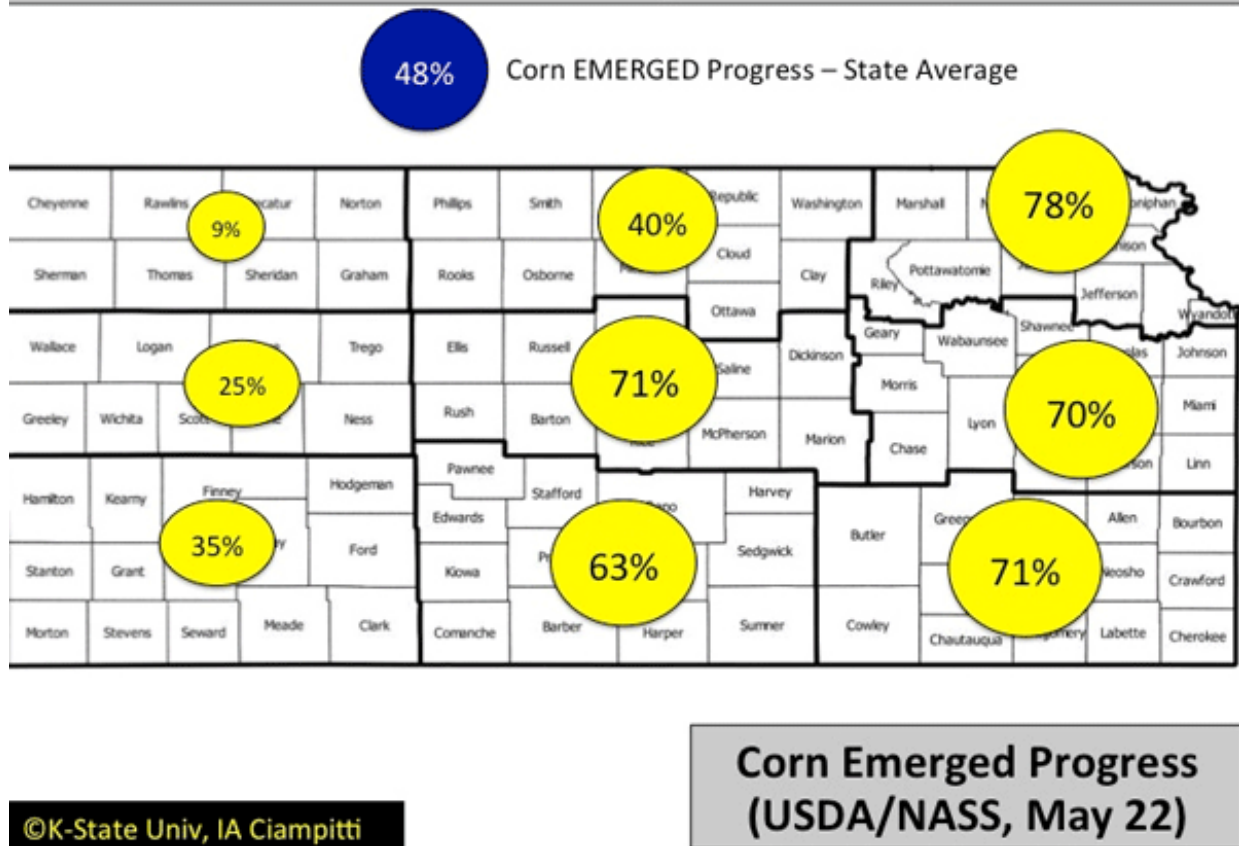
©K-State Univ, IA Ciampitti

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

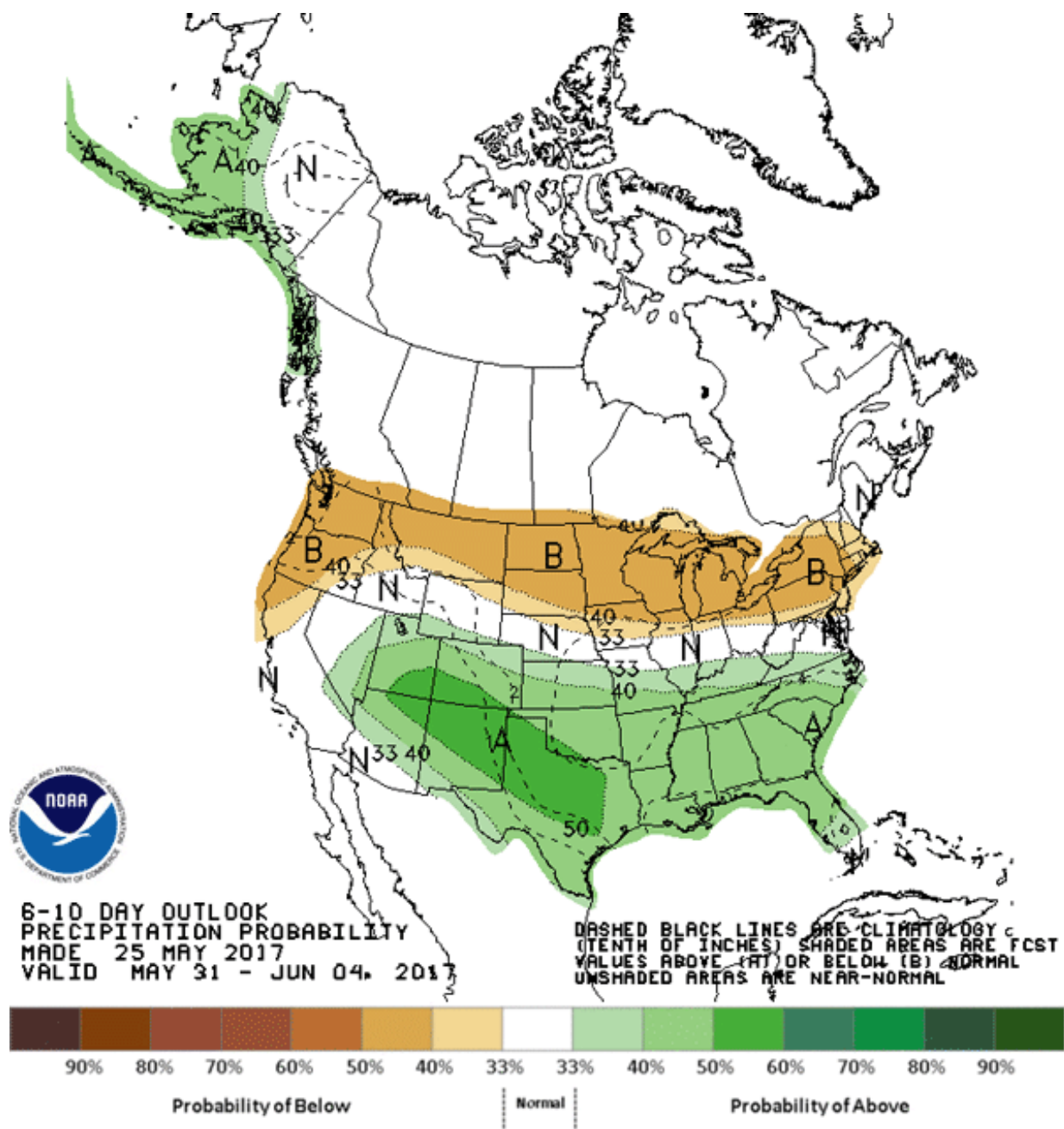
# CORN – EMERGED Progress - USDA/NASS



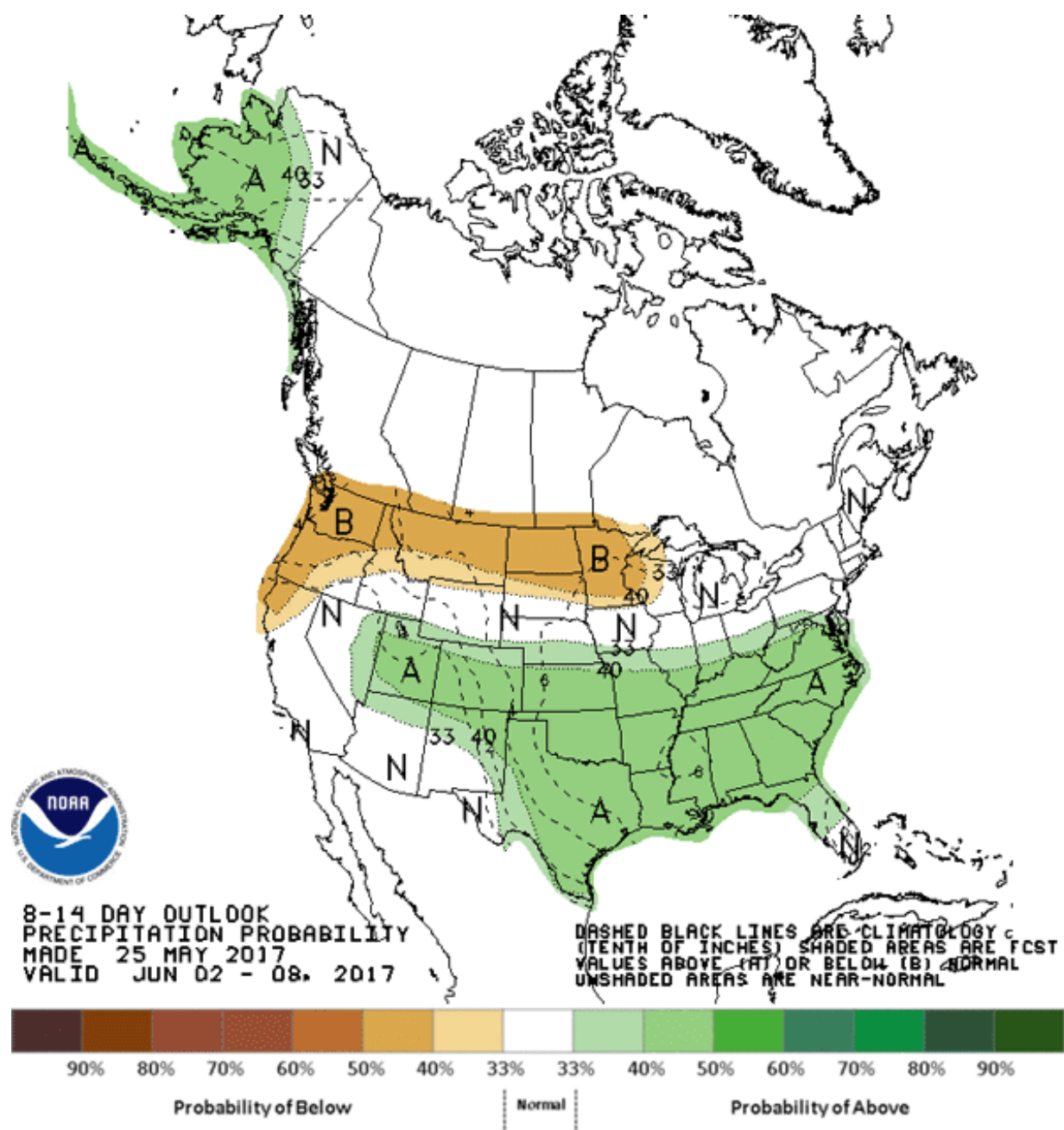
**Figure 2. Corn planting (upper panel) and emergence (lower panel) progress based on USDA/NASS report of May 22, 2017.**

## Short-term weather outlook

The short-term 6-10 day weather outlook (Fig. 3, upper panel) calls for above-normal precipitation. The 8-14 day weather outlook also calls for above “normal” probability of precipitation across the state (Fig. 3, lower panel).

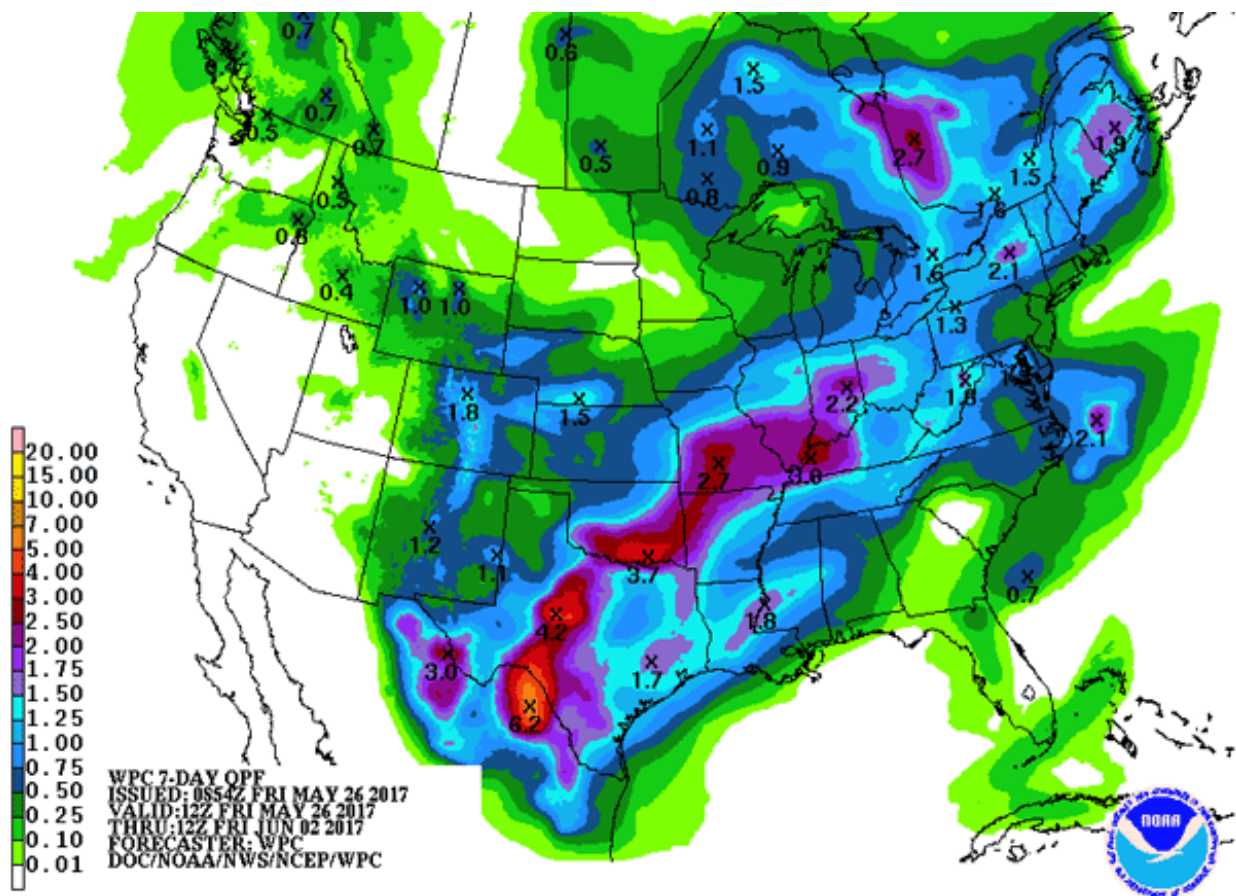






**Figure 3. Weather outlook, 6-10 day (top panel) and 8-14 day (bottom panel). Source: NOAA.**

The amount of precipitation forecast for the upcoming 7-day period ranges from 0.5-inch in the SW and SC parts of the state to about 1 inch or so in the eastern side, and close to 1.5-inch in the NW and SE corners of the state (Fig. 4).



**Figure 4. Quantitative precipitation forecast, 7-day total precipitation. Source: NOAA.**

Considering the weather outlook for the coming week, planting in the next coming days/weeks will still be quite challenging with much-narrowed planting windows.

The main concerns and management considerations from now on are related to the effects of standing water and saturated soils, early-season production problems, additional nitrogen (N) needs, and herbicide applications.

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist  
[ciampitti@ksu.edu](mailto:ciampitti@ksu.edu)

Mary Knapp, Weather Data Library  
[mknapp@ksu.edu](mailto:mknapp@ksu.edu)

### 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 (Fig. 1).

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 growing season 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, followed by favorable growing conditions
- 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 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 (max. yield = 150 bu/acre), but all hybrids had yield reductions of more than 50% when planting was delayed until early to mid-June.

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 precipitation and near-normal temperatures for most of the state.

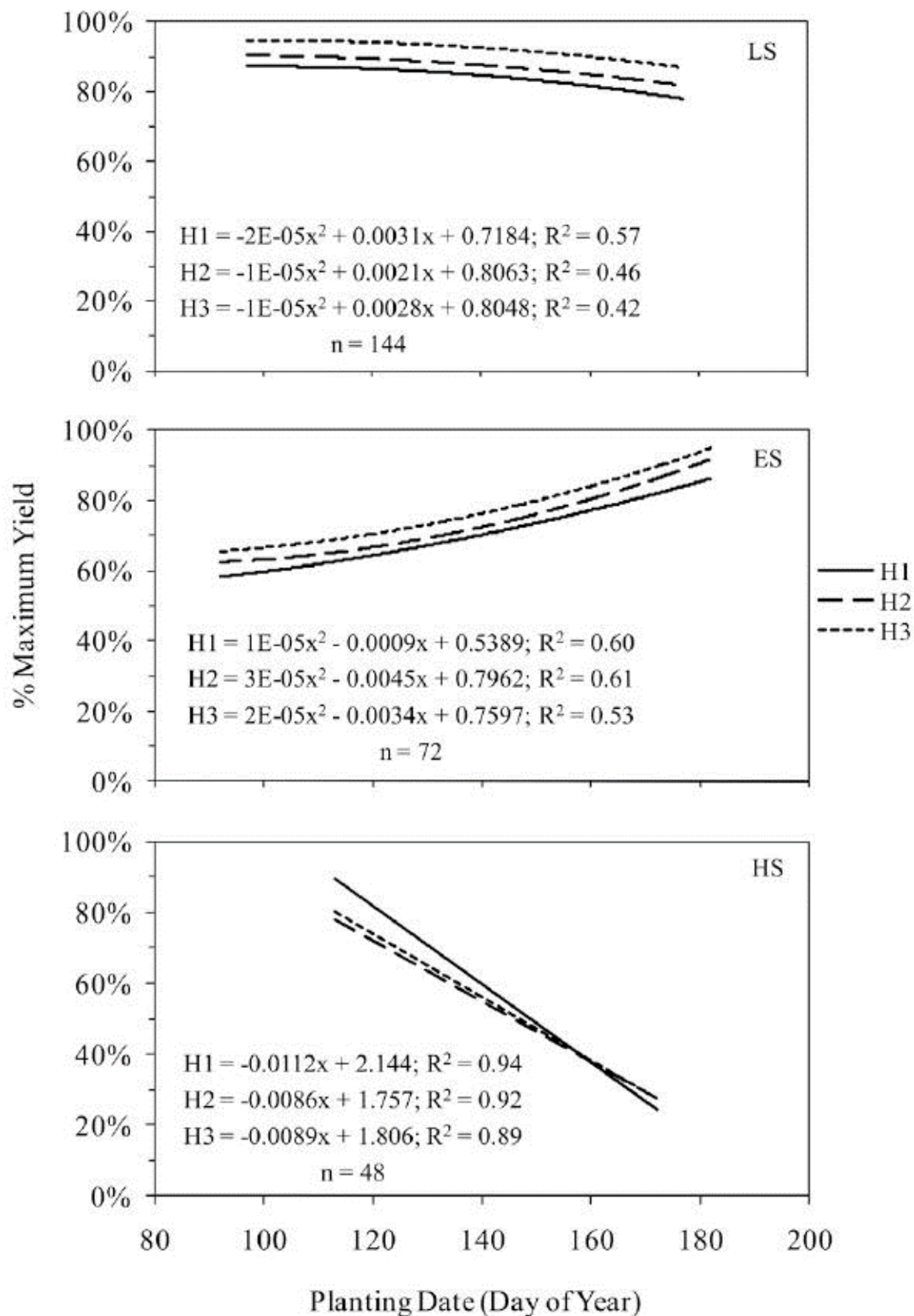
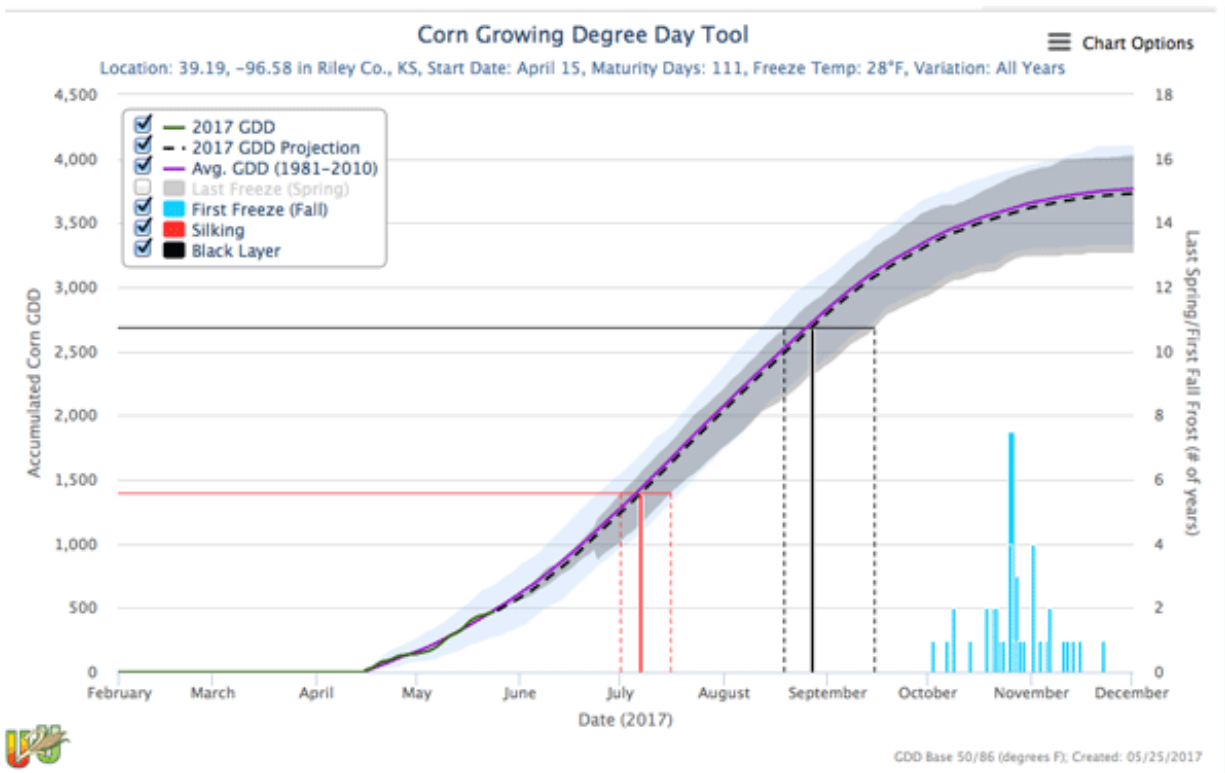


Figure 1. The top chart (LS, or Low Stress) shows how little corn yields changed as planting dates got later when growing conditions were good through the remainder of the season. The middle chart (ES, or Early Stress) shows that corn yields actually increased with later planting dates when conditions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

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

A web-support decision tool called “Useful to Usable” (mygeohub.org) can help in making hybrid maturity decisions when planting late. 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, planting in mid-April planting does not risk early termination of the crop by fall frost (Fig. 2). Of course, we are well past that date now.

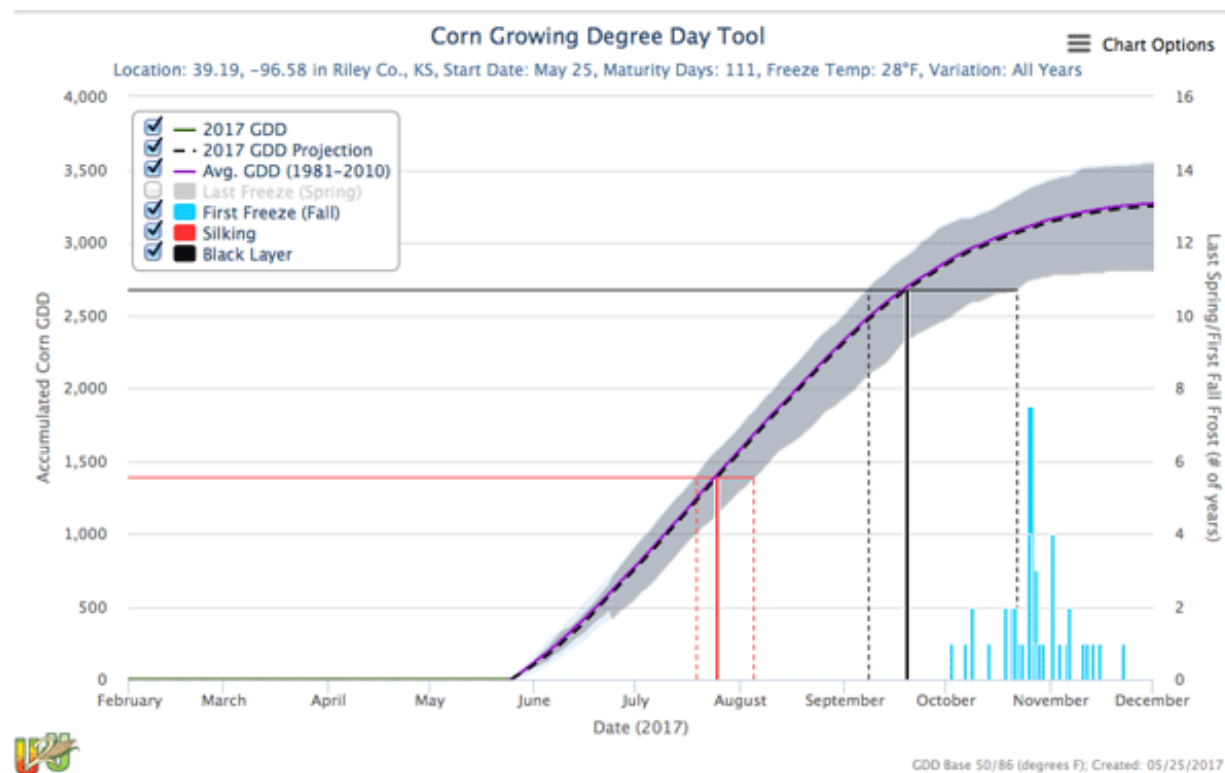


**Figure 2. Corn growing degree day tool for a 111-CRM planted April 15, 2017.**  
From <https://mygeohub.org/groups/u2u/gdd> (“Useful to Usable” website).

If the planting date is Friday, May 25, without changing the CRM, the final GDD is similar. 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 25, 2017.**  
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 frost by 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. 105 CRM), corn would reach black layer about the same time as the 111-CRM hybrid planted May 25 (Fig. 4 – right panel). Thus, changing to a shorter CRM would 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.

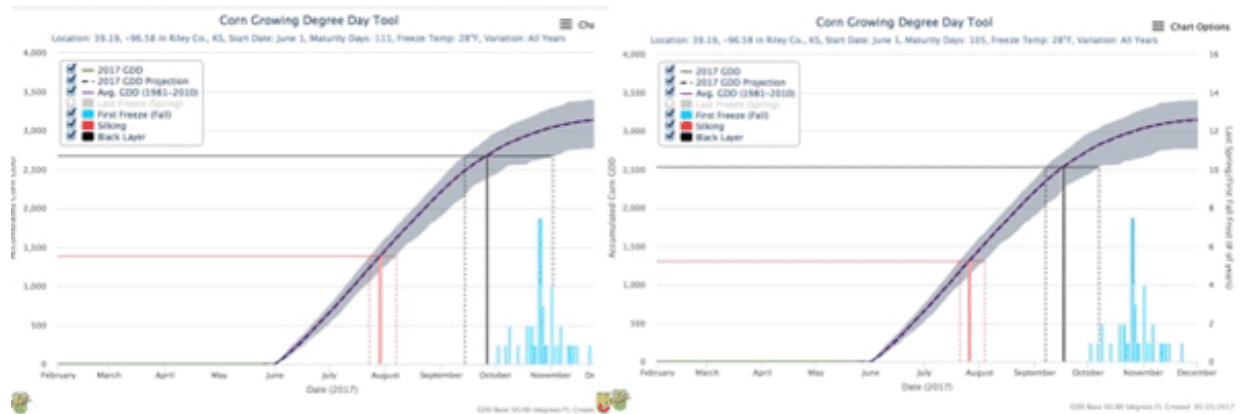
# Planting Date in Corn and Hybrid CRM Interaction

*June 1, 111-CRM*

*Maturity from early October to the beginning of November, increasing the probability of a killing frost.*

*June 1, 105-CRM*

*Maturity from mid September to mid October, with a very low probability of a killing frost.*



© IA Ciampitti, K-State Univ

KANSAS STATE UNIVERSITY

**Figure 4. Corn growing degree day tool for a 111-CRM (left panel) and for a 105-CRM both planted June 1, 2017. From <https://mygeoHub.org/groups/u2u/gdd> ("Usable to Useful").**

So, depending on your location and 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.

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

Kraig Roozeboom, Cropping Systems Agronomist  
[kraig@ksu.edu](mailto:kraig@ksu.edu)

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist  
[ciampitti@ksu.edu](mailto:ciampitti@ksu.edu)

#### 4. Purple color in corn seedlings: A valid concern affecting yields?

The rainy season in combination with a long period of 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 mind 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. In many cases, 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.

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. 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.

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. Producers do not need to worry about this phenomenon. Still, it is always good to continue scouting your acres for early identification of any potential problem affecting your crops.









**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.**

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist  
[ciampitti@ksu.edu](mailto:ciampitti@ksu.edu)

## 5. Rootless Corn syndrome

Wet conditions recently could lead to some issues in corn that may start showing up over the next few weeks. For example, producers may be seeing corn that is falling over or flopping in the wind this year. Occasionally plants are standing, but exhibit wilting or stunting symptoms.

To diagnose the problem, start by digging up some plants and examining the root system. Corn in the V4 to V6 stages and beyond should have a well-established secondary root system. These are larger and thicker than the primary roots. If the corn plants have not established a viable secondary, or nodal, root system, the problem is often termed “rootless” or “floppy” corn.



**Figure 1. Plant with poorly developed secondary root system. Crown was exposed above soil surface. Photo by K-State Research and Extension.**





**Figure 2. Plants with adequate (left) and poor (right) root development. Photo by Ignacio Ciampitti, K-State Research and Extension.**

When corn germinates, the first roots to emerge from the seed are the primary, seminal, or seed roots. These roots support the plant through emergence and the appearance of the first few leaves. At emergence, exposure of the coleoptile to light will cause it and the mesocotyl to stop growth and will position the crown at  $\frac{3}{4}$ " to 1" or more below the soil surface. As the plant grows, the first four or five nodes do not elongate, keeping the growing point below the soil surface until V6 when the stem begins to elongate rapidly.





**Figure 3. Plants with poor root development (left), sidewall compaction issues, and delayed development of root systems (right). Photos by Stu Duncan, K-State Research and Extension.**

The roots that develop from these compressed nodes at the crown form the secondary root system. This is a bit confusing because this “secondary” root system is of primary importance for the rest of the life of the corn plant. It is called secondary because it is the second to appear chronologically. These secondary roots rapidly take over water and nutrient uptake and are important for anchoring the plant as it moves through the V4 to V6 growth stages and beyond. If something prevents establishment of these secondary roots, the plants can fall over or flop in the wind or the plants may be stunted or wilted.

Several situations may cause poor secondary root development:

- Saturated soils may prevent adequate root development.
- If the surface soil dries rapidly just as the secondary roots begin to grow, the roots desiccate and the tips die before they reach more moist soil below.
- If the crown becomes exposed for any reason, the secondary roots can dry out and die before they grow into the soil. Crowns can be exposed if heavy rains have compacted the seedbed or washed away the soil (erosion) from around the developing crown.
- Occasionally the mesocotyl (the connection between the seed and the crown) will continue to grow after the coleoptile emerges from the soil, causing the crown to be positioned close to or at the soil surface. The reasons for continued growth of the mesocotyl and the resulting exposed position of the crown are poorly understood. Some believe it could be due to growth-regulating herbicides (e.g., 2,4-D, dicamba) or cloudy conditions, but cause-effect relationships have not been well established. Several instances of exposed crowns have been documented with no application of growth-regulating herbicides.
- Shallow planting could be the cause of the problem in a few cases. Although shallow planting can cause exposed crowns and poor secondary root development, most fields observed this spring with “rootless” corn have been planted at an adequate depth.

Is there any hope for “rootless” or “floppy” corn? Possibly, depending on whether soils are able to dry out enough to provide good aeration for the roots. Even if plants have fallen over, new secondary roots can continue to form and establish a viable root system if soil aeration and moisture conditions

are adequate. Inter-row lay-by cultivation to move soil around the exposed crowns can help if not too many plants have fallen over.

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist  
[ciampitti@ksu.edu](mailto:ciampitti@ksu.edu)

Stu Duncan, Northeast Area Crops and Soils Specialist  
[sduncan@ksu.edu](mailto:sduncan@ksu.edu)



## 6. K-State wheat plot tours for May 30 - June 2

The week of May 30 – June 2 has nine wheat plot tours in Kansas. Producers willing to learn about the different varieties can choose to attend one (or several) plot tours in their county or agricultural district.

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

For the week of May 30 – June 2, the scheduled plot tour locations include:

**? 5/30/2017, 8:30 a.m.**

**Location: Ness Co., Ness City**

Contact: Chris Long, 1-877-798-3921, [clong@ksu.edu](mailto:clong@ksu.edu)

Directions: From Ness City, go 7 miles south on 283 for 7 miles to 60, west 7 miles to L, south 1 1/2 miles, on east side

**Tuesday, 5/30/2017, 1:30 p.m.**

**Location: Rush Co., McCracken**

Contact: Chris Long, 1-877-798-3921, [clong@ksu.edu](mailto:clong@ksu.edu)

Directions: From McCracken, go south of the curve of Hwy 4, on CR 110 for 1 mile, turn east on Ave. L for 1/4 mile, on south side

**Tuesday, 5/30/2017, 5:00 p.m.**

**Location: Barton Co., Galatia**

Contact: Alicia Boor, 620-793-1910, [aboor@ksu.edu](mailto:aboor@ksu.edu)

Directions: SW ¼ 26-16-15 South of intersection NW 190 and 100 AVE in Barton County (southeast of Galatia); the producer is David Strecker.

**U. 5/31/2017, 9:00 a.m.**

**Location: Brown/Nemaha Co., Sabetha**

Contact: David Hallauer, 785-336-2184, [dhallaue@ksu.edu](mailto:dhallaue@ksu.edu)

Directions: SW of Sabetha, 5.75 miles west of Hwy. 75 on 176th Rd.; GPS Coordinates: 39.883242, -95.893622

**Wednesday, 5/31/2017, 8:30 a.m.**

**Location: Lane Co., Dighton**

Contact: Chris Long, 1-877-798-3921, [clong@ksu.edu](mailto:clong@ksu.edu)

Directions: From Dighton, go west on 96 for about 7 miles, turn south on Eagle Road for 1 1/2 miles, on east side

**Wednesday, 5/31/2017, 6:00 p.m.**

**Location: Ellis Co., Hays**

Contact: Stacy Campbell, 785-628-9430, [scampbel@ksu.edu](mailto:scampbel@ksu.edu)

Directions: From I-70 take the Victoria exit 168 go 2.5 miles N. on Cathedral Ave./HWY. 255, turn W. onto Fairground Rd. Go 1 mile, turn S. onto 330 Ave., then go ½ mile. From Catharine go ½ E. turn S. onto 310, go 1 mile and turn E. onto Fairground Rd., go 2 miles and turn S. onto 330th Ave and go ½

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

mile.

**Thursday, 6/01/2017, 5:30 p.m.**

**Location: Scott Co., Scott City**

Contacts: John Beckman, 620-872-2930, [jbeckman@ksu.edu](mailto:jbeckman@ksu.edu)

Directions: 4 miles East on Hwy 96 from the intersection of Hwy 83 & 96. Turn north on Pawnee Road and drive for 1.1 miles. The plot is located on the west side of Pawnee Road.

**Thursday, 6/01/2017, 9:00 a.m.**

**Location: Logan Co., Winona**

Contact: Candice Fitch-Deitz, 785-673-4805, [cfitchdeitz@ksu.edu](mailto:cfitchdeitz@ksu.edu)

Directions: Meet at Winona Methodist Church for breakfast. Plot directions: Ward Taylor farm, 1209 Vista, Winona. From Winona head west on Old Highway 40 for ½ mile to Road 220, turn south for 3 miles to Vista. Golden Prairie District Wheat Plot Sign on corner and plot is located 300 yards south of sign.

**Friday, 6/02/2017, 9:00 a.m.**

**Location: Gove Co., Quinter**

Contact: Candice Fitch-Deitz, 785-673-4805, [cfitchdeitz@ksu.edu](mailto:cfitchdeitz@ksu.edu)

Directions: Paramount Seed Farm, 7682 County Road Z7682 County Rd Z, Quinter.

Romulo Lollato, Extension Wheat Specialist  
[lolato@ksu.edu](mailto:lolato@ksu.edu)

Erick DeWolf, Extension Wheat Pathologist  
[dewolf1@ksu.edu](mailto:dewolf1@ksu.edu)

## 7. Wheat field day scheduled at North Central Experiment Field, June 7

The North Central Experiment Field Wheat Field Day is scheduled for Wednesday, June 7, 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, provided by Belleville Chamber & Main St.

K-State speakers will include Romulo Lollato, Wheat and Forages Specialist. Tour topics include:

- Wheat Varieties (40 varieties)
- Wheat Management Research

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](mailto:aresser@ksu.edu).

## 8. Dryland Ag Day planned in Tribune, June 8

Against the backdrop of a diminishing Ogallala Aquifer, dryland farming is increasingly moving into sharper focus. A K-State field day planned in Tribune will feature research related to growing dryland crops in western Kansas.

The Dryland Ag Day will be held June 8 at K-State's Southwest Research-Extension Center one mile west of Tribune on Kansas Highway 96. Registration and refreshments are available at 8:30 a.m. MDT, followed by field tours, indoor seminars and a lunch sponsored by TBK Bank.

Field tours starting at 9:00 a.m. MDT include:

- Wheat varieties
- Wheat streak mosaic and varietal resistance
- Wheat seeding rates
- Solid stem wheat update
- Tillage in dryland systems
- Dryland crop rotations
- Weed control in fallow and row crop

Indoor seminar topics beginning at 11:15 a.m. MDT include:

- Control of Palmer amaranth
- Seeding depth for wheat.
- Weather forecast development and long-range forecast

Speakers include:

Erick DeWolf, Extension Wheat Plant Pathologist

Lucas Haag, Northwest Area Crops and Soils Specialist

Jeanne Falk Jones, Sunflower District Extension Agronomist

Curtis Thompson, Weed Management Specialist

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

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

## 9. Field pea plot tours, June 15

Three field pea plot tours from K-State Research and Extension have been scheduled for June 15.

1. Gove County, 8:30 a.m. CT. From Grainfield/Hoxie exit on I-70 go 2 ¾ miles south on Road 50, then 2 ½ miles east on Road Z.

- Variety performance test with 17 entries
- Seeding rate study, seed treatment study, and in-furrow fertilizer study

2. Northwest Research-Extension Center, 1 p.m. CT. 105 Experiment Farm Road, Colby. Come in the main drive and follow the signs.

- Variety performance test with 19 entries
- Seeding rate study
- In-furrow fertilizer application study
- Lentil variety evaluation

3. Rawlins County, 4 p.m. CT. From the intersection of Hwy US 36 and K-25 in Atwood go 6 miles north on K-25, then 1/8 mile west on Road X.

- Variety performance test with 17 entries
- Seeding rate study
- Seed treatment study
- Wheat plot tour to follow at 5:30 p.m. CT

K-State faculty, industry representatives, and experienced producers will be on hand to discuss pea growth and development, variety selection, herbicide options, production practices, disease management and producer experiences.

For more information contact:

Lucas Haag, K-State Northwest Area Agronomist (785) 462-6281, [LHaag@ksu.edu](mailto:LHaag@ksu.edu)

Golden Prairie Extension District (785) 673-4805

Rawlins County Extension (785) 626-3192





## **2017 Field Pea Plot Tours June 15<sup>th</sup>**

### **Gove County, 8:30 AM CT**

- Variety Performance Test with 17 entries
- Seeding rate study, seed treatment study, and in-furrow fertilizer study
- From Grainfield/Hoxie exit on I-70 go 2 ¼ miles south on Road 50, then 2 ½ miles east on Road Z.

### **Northwest Research-Extension Center – 1:00 PM CT**

- Variety Performance Test with 19 entries
- Seeding Rate Study
- In-Furrow Fertilizer Application Study
- Lentil variety evaluation
- 105 Experiment Farm Road, Colby, KS. Come in the main drive and follow the signs

### **Rawlins County– 4:00 PM CT**

- Variety Performance Test with 17 entries
- Seeding Rate Study
- Seed Treatment Study
- Wheat plot tour to follow at 5:30 CT
- From the intersection of Hwy US 36 and K-25 in Atwood go 6 miles north on K-25, then 1/8 mile west on Road X

**K-State faculty, industry representatives, and experienced producers will be on hand to discuss pea growth and development, variety selection, herbicide options, production practices, disease management and producer experiences.**

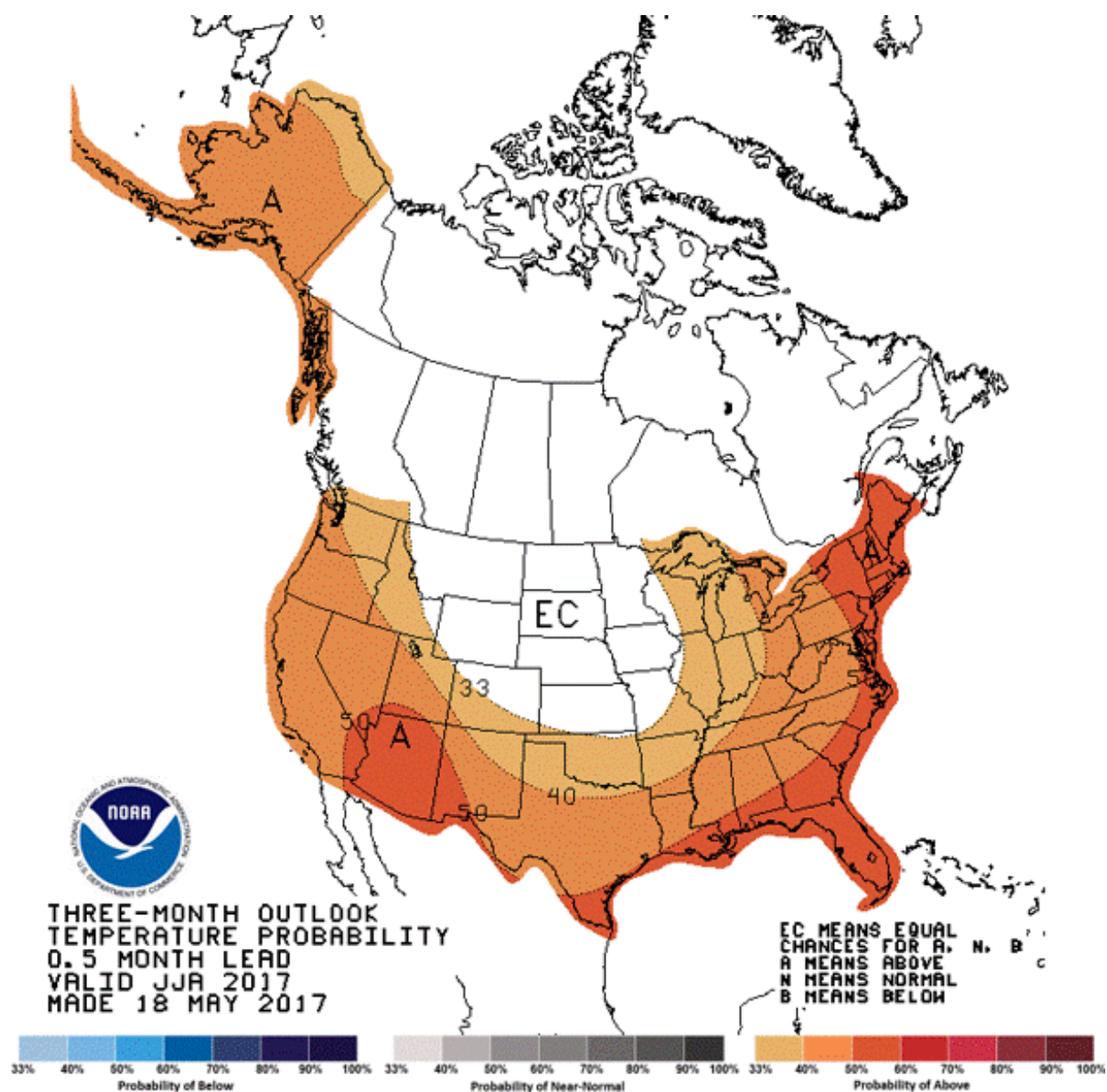
#### ***For questions or more information contact:***

Lucas Haag, K-State Northwest Area Agronomist (785) 462-6281, [LHaag@ksu.edu](mailto:LHaag@ksu.edu)  
Golden Prairie Extension District (785) 673-4805  
Rawlins County Extension (785) 626-3192

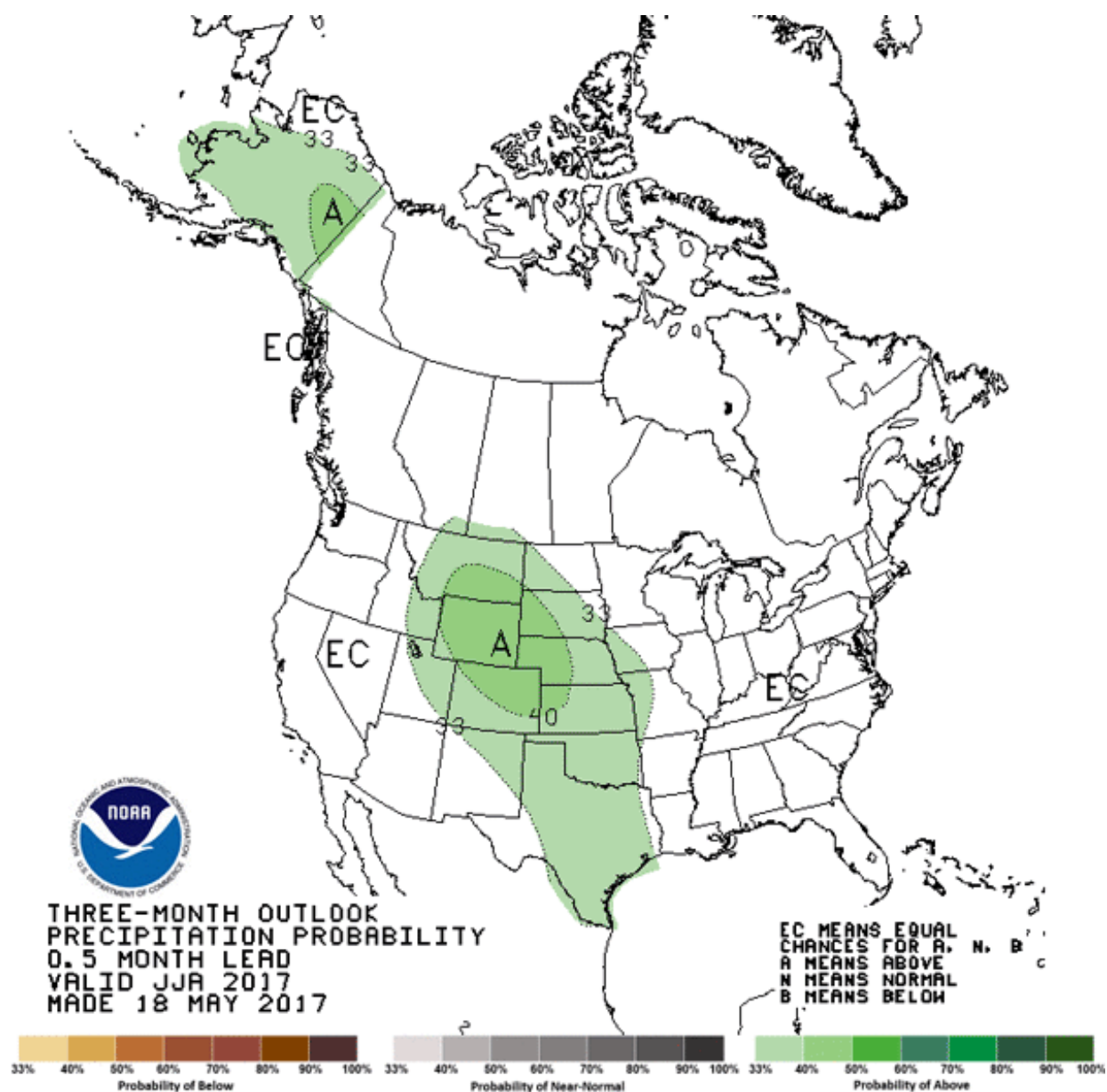
## 10. Summer weather outlook for Kansas

With cool weather dominating the last few weeks, interest has increased in what might be expected for the summer season. Summer for the Northern Hemisphere is defined in the meteorological community as the months of June, July and August. The Climate Prediction Center has recently released the long lead outlook for the summer. These outlooks are based on a suite of climate and weather models.

On the temperature side, Kansas is basically on the dividing line, with equal chances for above or below normal temperatures throughout the state and to the north, including eastern Colorado and western Missouri. The Southern Plains states of Texas and Oklahoma face an increased chance of warmer-than-normal temperatures, continuing the trend they have experienced this spring. Unfortunately, the outlooks do not indicate the degree of difference, nor does it indicate how the temperatures might be distributed across the three-month period.

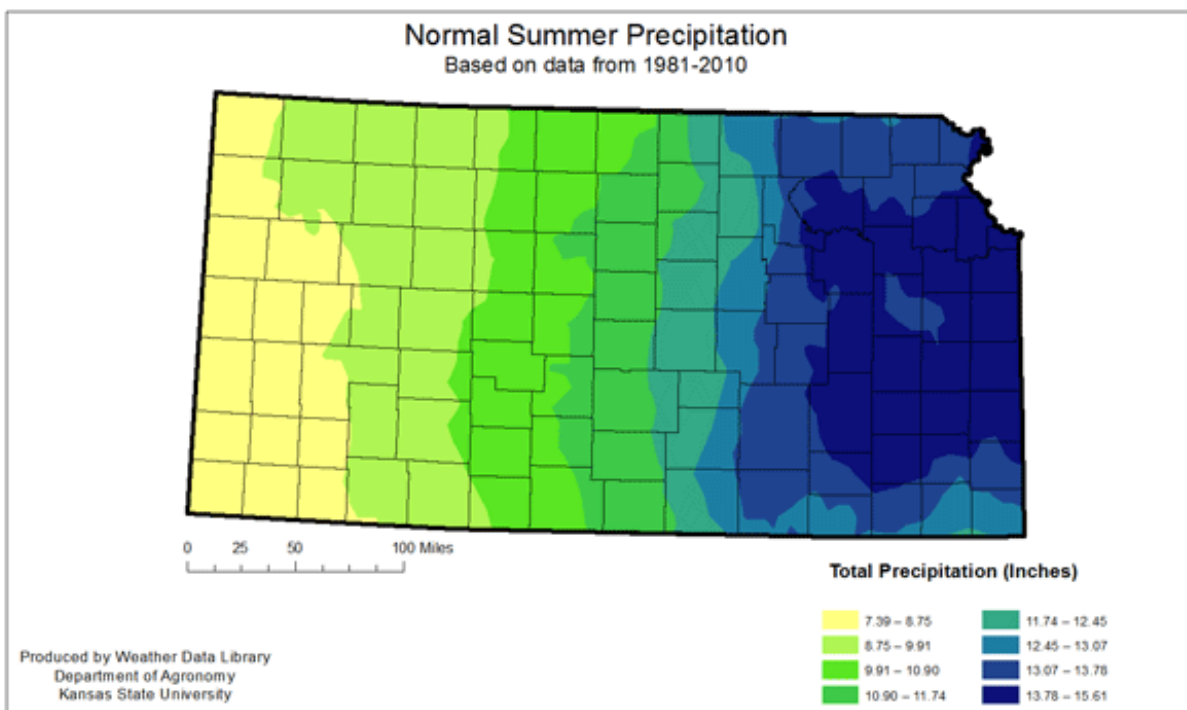
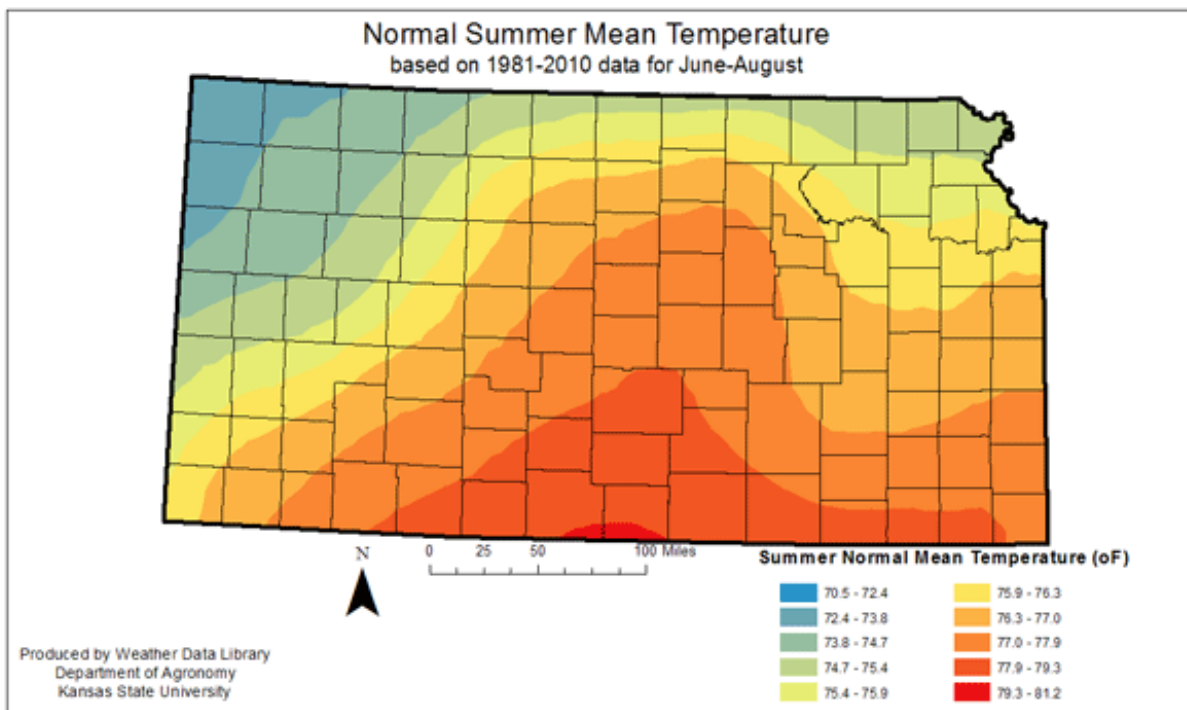


On the precipitation side, the entire Plains region from Texas to the southwestern North Dakota have an increased chance of wetter-than-normal conditions this summer. A wetter-than-normal summer in the Plains would also favor normal to cooler-than-normal temperatures. While warmer-than-normal temperatures are possible during a wet summer, the heat is usually due to higher dew points and the resulting warmer-than-normal minimum temperatures, rather than increased number of days above 100 °F. The greatest chance for these wetter-than-normal conditions are centered around Wyoming, southern Montana, northeastern Colorado, the Nebraska Panhandle, and northwest Kansas. While these wetter conditions, particularly if they are spread throughout the season, will favor grasslands, they could complicate harvest of winter wheat and hay. A continued wet pattern in June will also hinder planting of soybeans and sorghum.

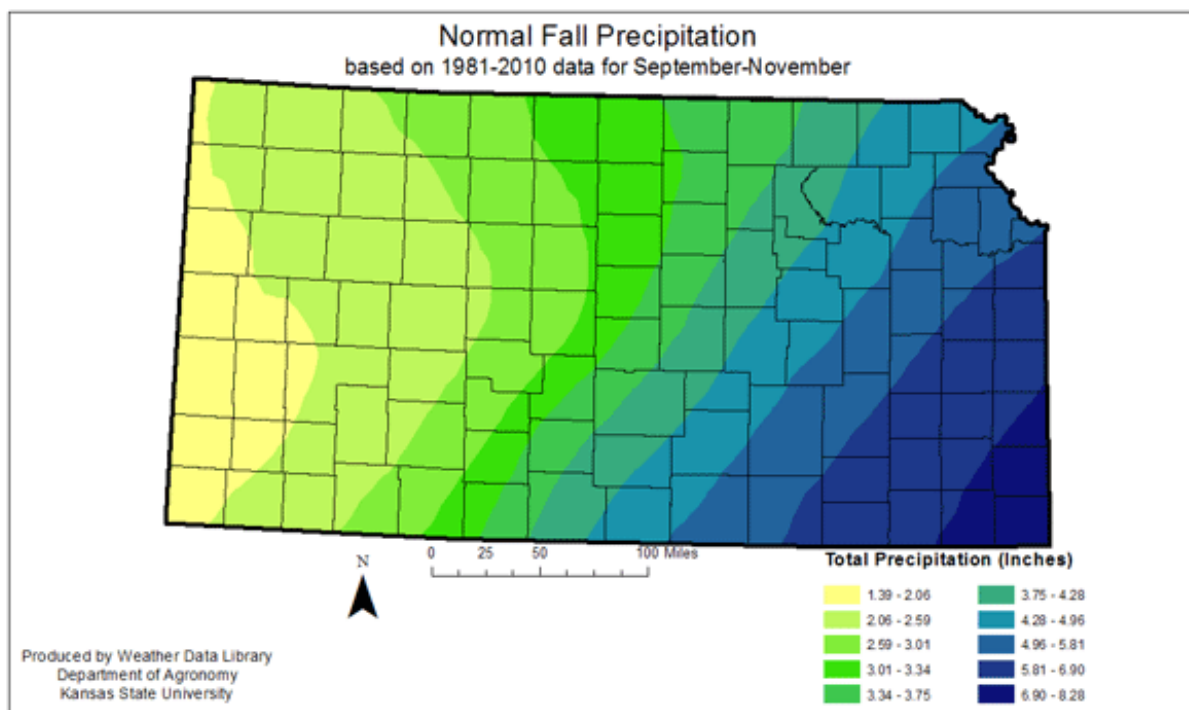
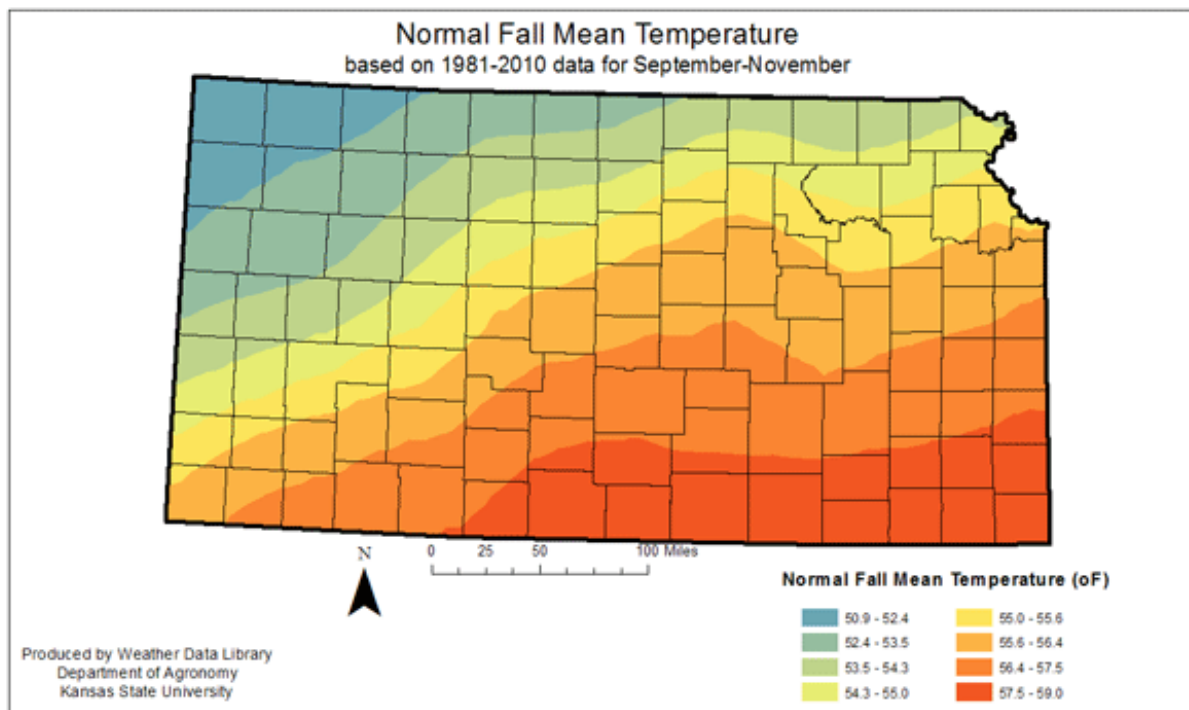


At this point the ENSO cycle is neutral. There is a slight increase in the probability of the development of an El Niño by late summer/early fall. A fall onset of an El Niño favors wetter-than-normal conditions in Kansas. The maps below show the normal temperature and precipitation for both the summer (June-August) and the fall ((September-November) seasons.









Mary Knapp, Weather Data Library  
[mknapp@ksu.edu](mailto:mknapp@ksu.edu)

## 11. Comparative Vegetation Condition Report: May 16 - 22

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

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

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

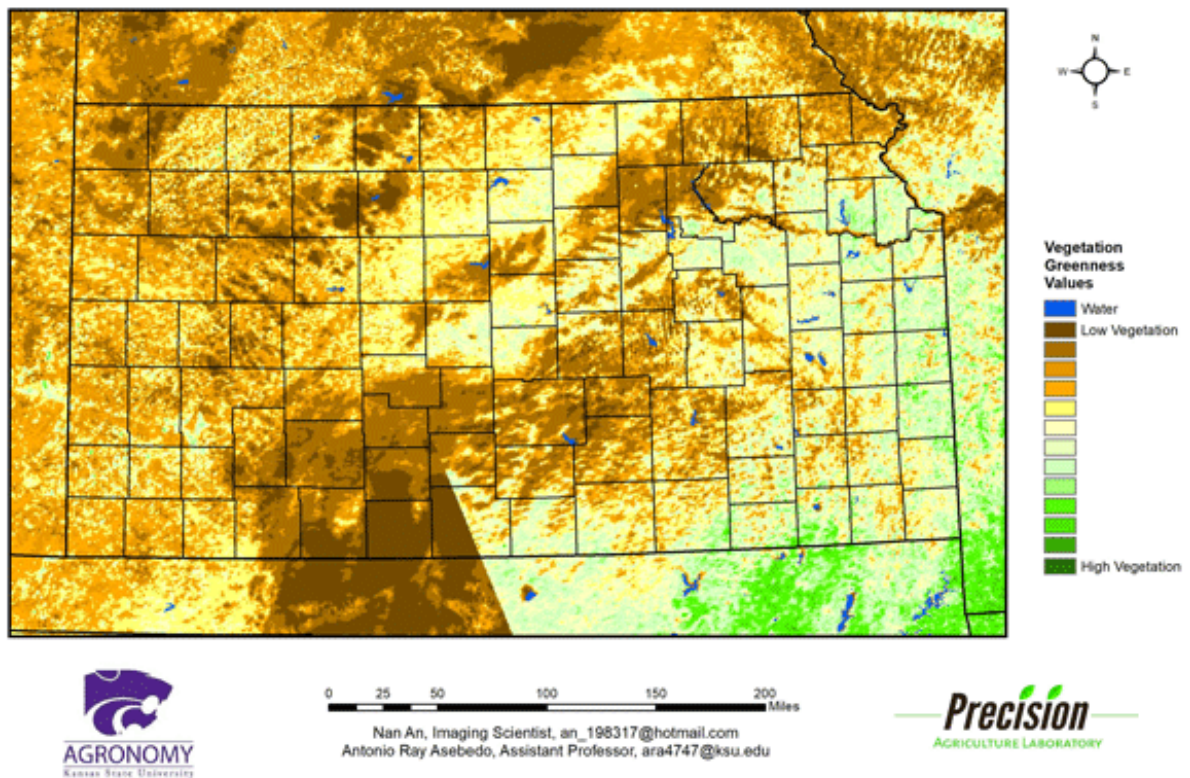
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new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

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

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

## Kansas Vegetation Condition

Period 21: 05/16/2017 - 05/22/2017



**Figure 1. The Vegetation Condition Report for Kansas for May 16 – May 22, 2017 from K-State’s Precision Agriculture Laboratory shows slow vegetative development across much of the state. The recent cold weather has slowed vegetative activity in the west. The greatest area of high vegetative activity is in the southeast, where temperatures have been consistently warmer than the rest of the state.**

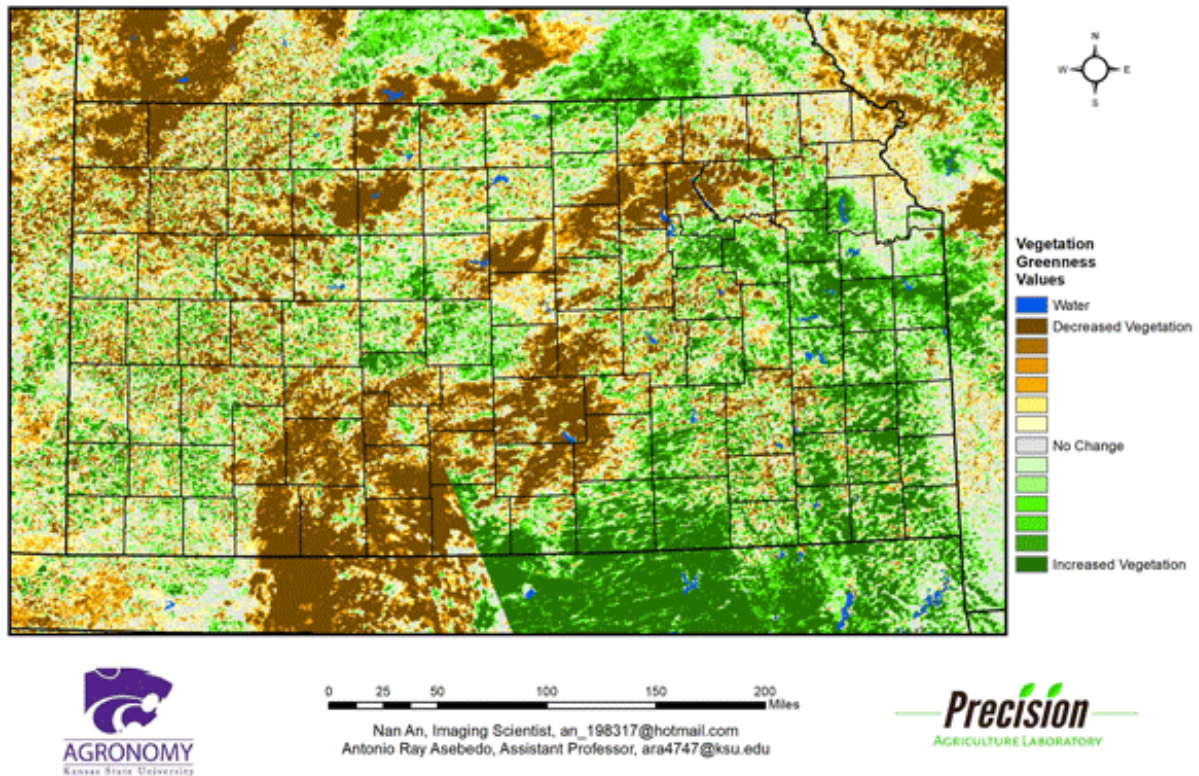
Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

## Kansas Vegetation Condition Comparison

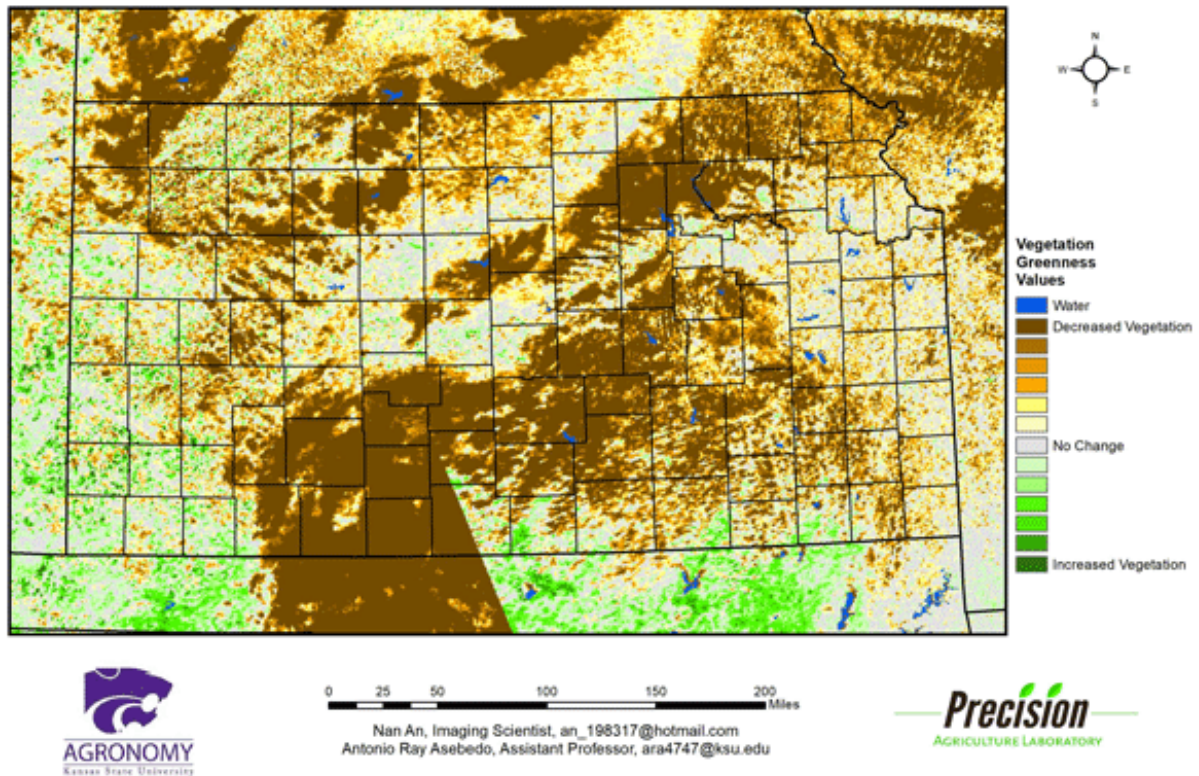
### Mid-May 2017 compared to the Mid-May 2016



**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for May 16 – May 22, 2017 from K-State’s Precision Agriculture Laboratory shows a mix of conditions. In parts of southwest Kansas much lower NDVI values are visible. This is particularly true in Meade and Clark counties. The winter wheat is less advanced this year than last, particularly in western Kansas, where dry fall conditions hampered establishment and recent cold weather has slowed development. Other areas reflect the cooler temperatures this year. Higher NDVI values in the east, particularly in the Flint Hills, reflect the more favorable moisture received this year.**



Kansas Vegetation Condition Comparison  
Mid-May 2017 compared to the 28-Year Average for Mid-May

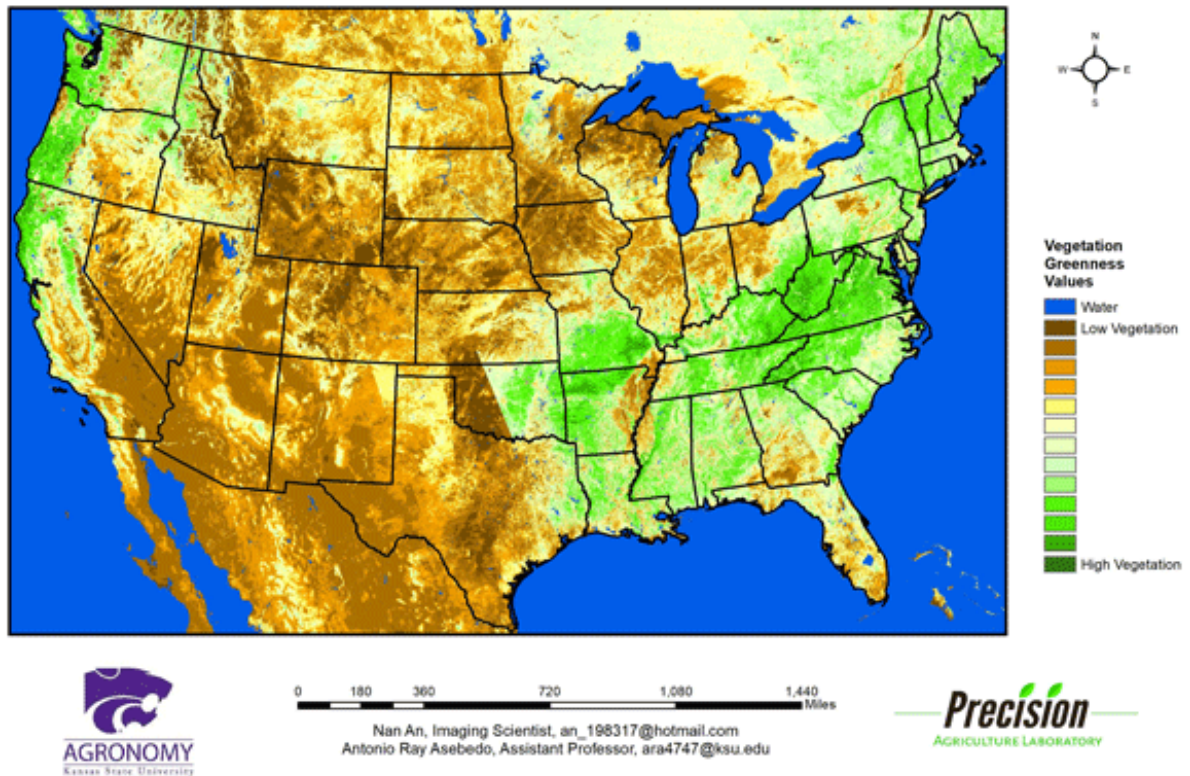


**Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for May 16 – May 22, 2017 from K-State's Precision Agriculture Laboratory much of the state has below-average vegetative activity. The wetter-than-normal conditions have slowed spring planting in the northern parts of the state, and excessive moisture has dampened vegetative activity in the Southeastern Division.**



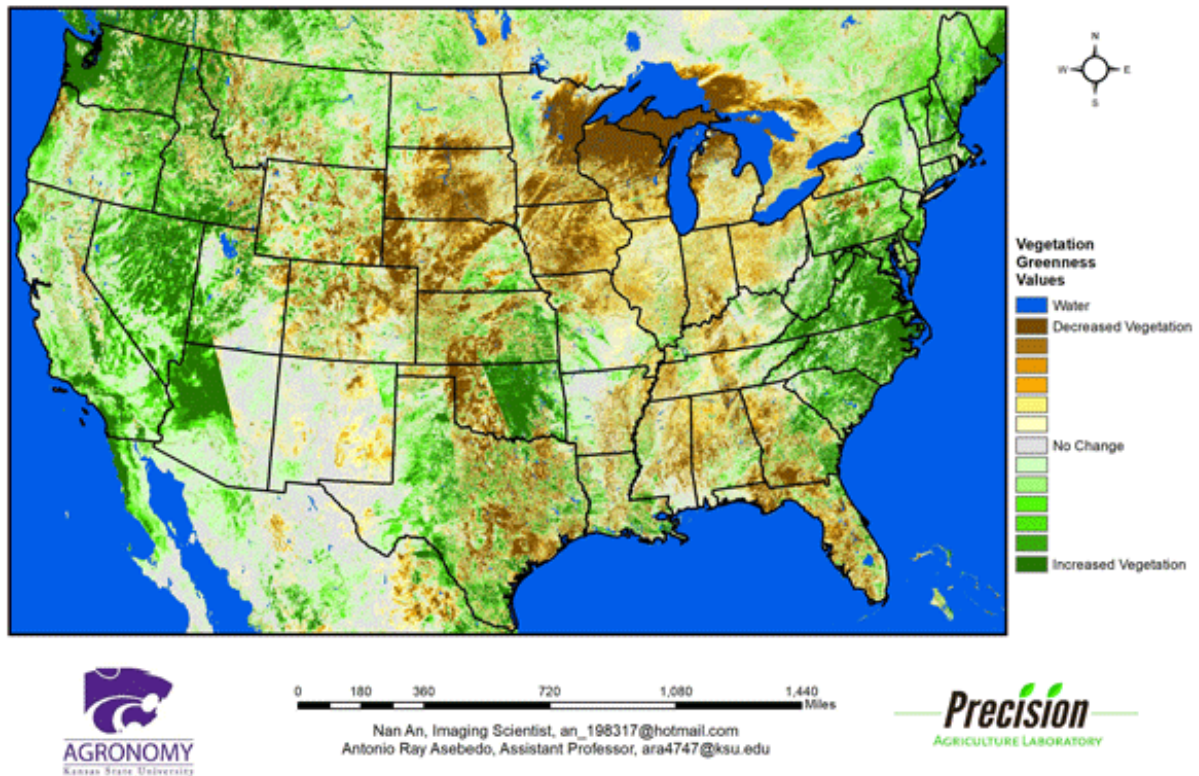
## Continental U.S. Vegetation Condition

Period 21: 05/16/2017 - 05/22/2017



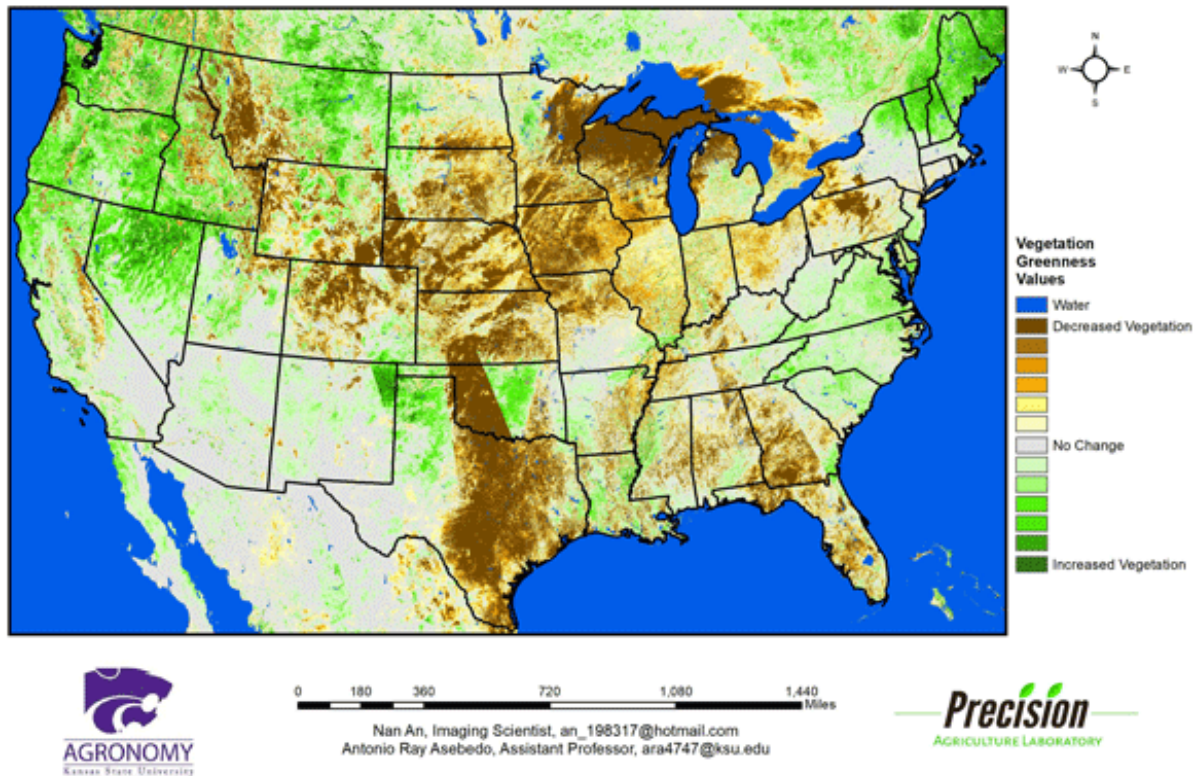
**Figure 4. The Vegetation Condition Report for the U.S. for May 16 – May 22, 2017 from K-State’s Precision Agriculture Laboratory shows the highest NDVI values are confined to the South, particularly in east Texas and Louisiana. A second area of higher vegetative activity is also visible along the West Coast, where wet conditions continue. Low NDVI values are visible along the central Mississippi River Valley, where flooding continues to be an issue.**

# Continental U.S. Vegetation Condition Comparison Mid-May 2017 Compared to Mid-May 2016



**Figure 5. The U.S. comparison to last year at this time for May 16 – May 22, 2017 from K-State’s Precision Agriculture Laboratory shows the impact that split in the snow cover has caused this year. Ample moisture from the winter snows has resulted in higher vegetative activity in the West. Much lower NDVI values are visible in the Great Lakes due mainly to persistent cloud cover.**

Continental U.S. Vegetation Condition Comparison  
Mid-May 2017 Compared to 28-year Average for Mid-May



**Figure 6. The U.S. comparison to the 27-year average for the period of May 16 – May 22, 2017 from K-State’s Precision Agriculture Laboratory shows below-average photosynthetic activity concentrated in the central region, from Texas through the Great Lakes. This is due mainly to persistent cloudy, wet weather. The lower-than-average NDVI values in Florida, Georgia, and Alabama reflect the persistent drought in this region.**

Mary Knapp, Weather Data Library  
[mknapp@ksu.edu](mailto:mknapp@ksu.edu)

Ray Asebedo, Precision Agriculture  
[ara4747@ksu.edu](mailto:ara4747@ksu.edu)

Nan An, Imaging Scientist  
[an\\_198317@hotmail.com](mailto:an_198317@hotmail.com)