Issue 563

K-STATE
Research and Extension

# Extension Agronomy

# eUpdate

04/15/2016

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, 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. Soybean planting dates and maturity group: Trends and K-State recommendations

**Trends in Kansas**

After considering the effects of genetic yield potential and the environment, planting date is one of the primary management practices under the farmer's control that can highly influence soybean yields. In recent decades, Kansas producers have been planting soybeans slightly earlier -- at the rate of about a half-day per year (Fig. 1). The past two growing seasons, however, the "50% planting date" mark was achieved at a similar time (mid-May) statewide.

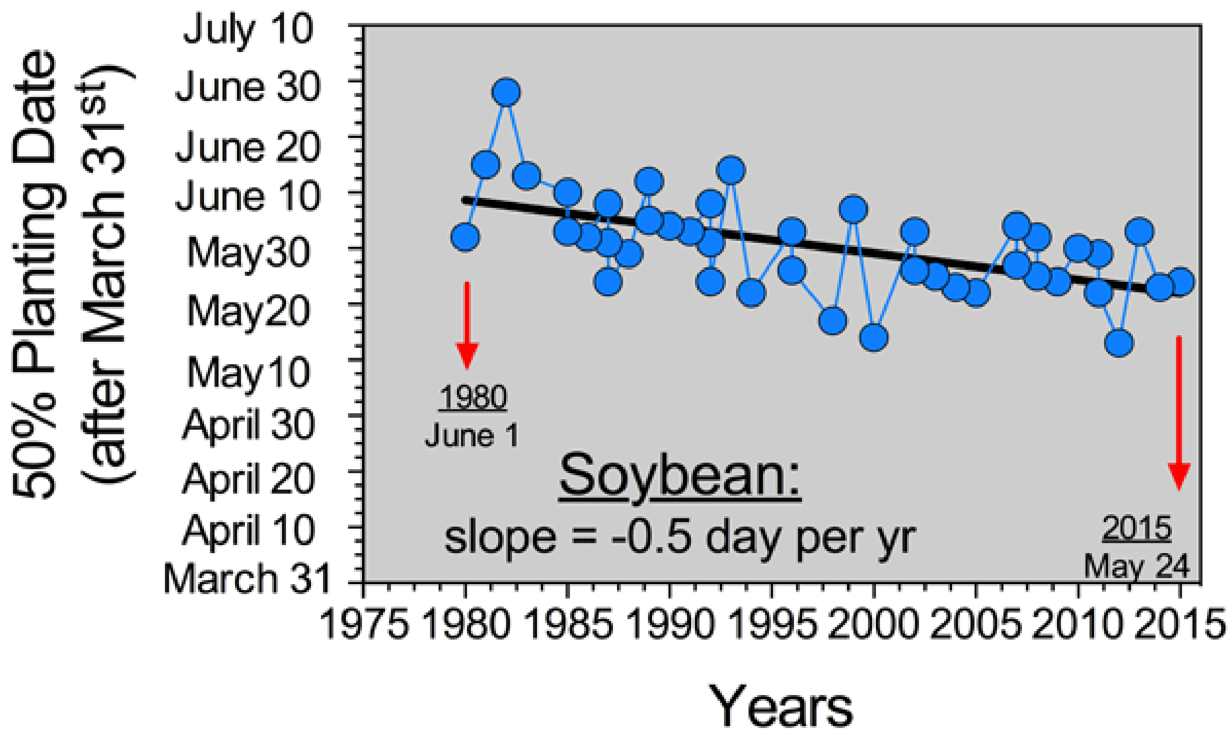
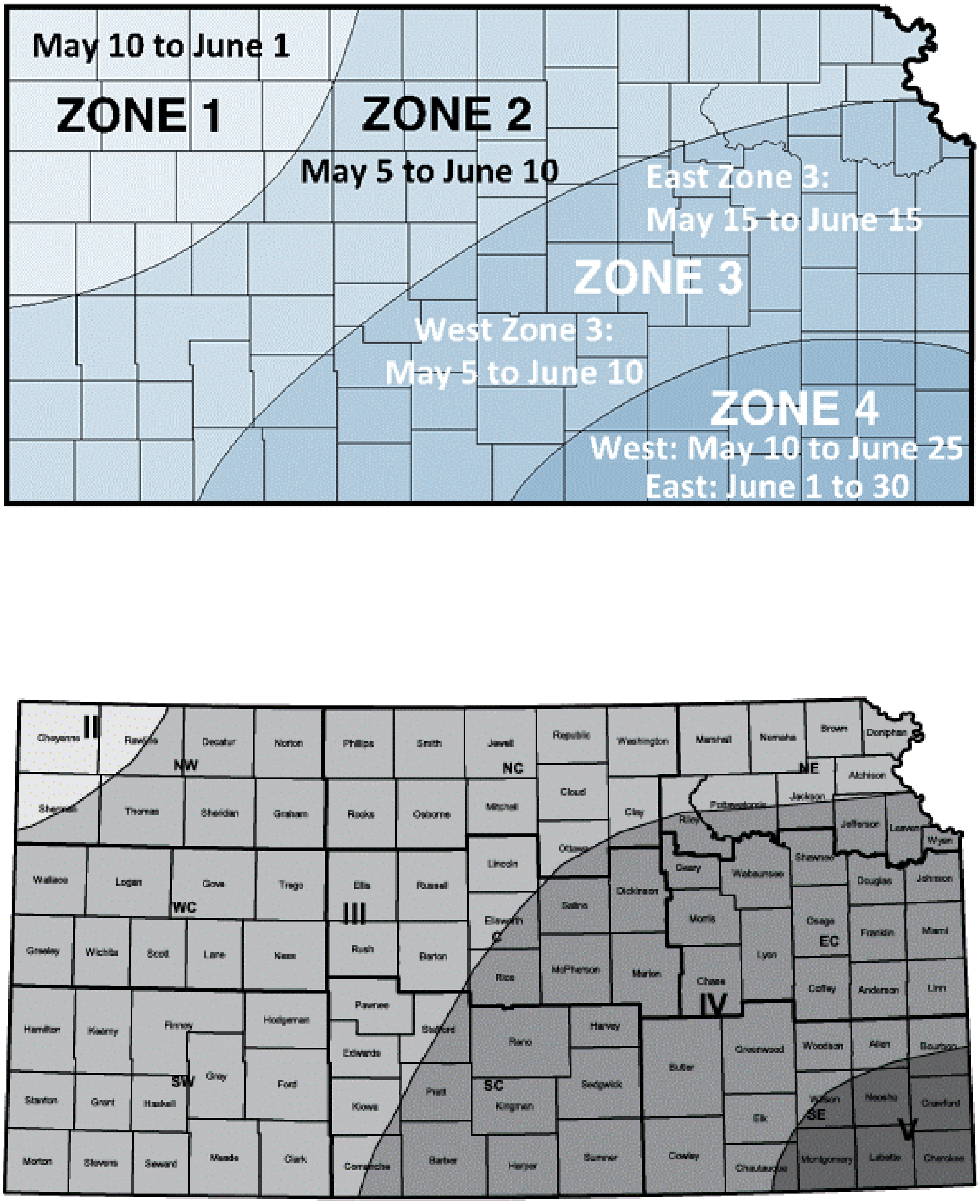



**Figure 1. Trend in the date at which 50% of planting progress was achieved for soybean from 1980 to 2015 in Kansas. Source: USDA-NASS.**

**Kansas Planting Dates and Maturity Groups**

Soybean can be planted over a wide range of planting dates (Fig. 2, upper panel) with adequate soil moisture conditions, although germination and emergence could be reduced and/or delayed in cool soils, less than 60 degrees F. The recommended maturity groups vary by the area across the state (Fig 2, lower panel).




**Figures 2. Recommended soybean planting dates (upper panel) and suggested maturity groups (bottom panel) across Kansas.**

**K-State research: Planting dates**

A summary of research studies on planting dates and relative yield advantages or disadvantages of early May planting in Kansas is presented Table 1.

**Table 1. Effect of planting dates on soybean yields at seven locations in Kansas. The information in this table was calculated as the yield obtained in early May planting date compared to later planting dates (mid-late May, early-mid June, and mid-late June).**

| | Planting Date | | |
|---|---|---|---|
| | Mid-Late May | Early-Mid June | Mid-Late June |
| Location, Year | Yield (bu/acre) compared to Early May planting | | |
| Powhattan, 2000-02[1] | 1.7 | 11.4 | -9.0 |
| Belleville, 1999, 2001[1] | 4.4 | -26.2 | -55.2 |
| Topeka, 2000-02[1] | -4.8 | -15.1 | -19.2 |
| Ottawa, 1999-2002[1] | 6.6 | -0.3 | -25.8 |
| Belleville, 2009-10 | | -6.5 | |
| Scandia, 2009-10 | | -4.5 | |
| Manhattan, 2010 | -7.7 | -15.3 | -26.1 |
| [1] No seed treatment in these studies | | | |

The results can be summarized as follows:

- For the Topeka and Manhattan sites, planting in early May consistently produced higher yields than other planting dates. Each day that planting was delayed from early May up to mid-late June, yields declined at an overall rate of close to 0.5 bu/acre/day.
- In Belleville (1999, 2001), mid-May planting presented a small yield benefit (4.4 bu/acre) compared to the early May planting time, with yields declining as the date was delayed beyond mid-late May. Research at Belleville and Scandia in 2009-2010 confirmed this trend, with a clear yield advantage for early May as compared with early-mid June planting.
- In Powhattan, under lower soybean yield environments (<30 bu/acre), yield declined with mid-late June planting dates, and was maximized with the early-mid June planting time. Thus, for Powhattan, there was no yield benefit in planting in early May.
- In Ottawa, planting in mid-May resulted in a yield benefit of 6.6 bu/acre compared to planting in early May.

Recommendations for other regions:

*Southeast*: Planting from mid-May to the end of June is recommended for this region (Fig. 2). For Parsons, early-to-mid June and early July planting dates maximize yield production. Those planting dates tend to increase soybean production because they usually allow the beans to avoid heat-drought stress and increase the probability of catching late summer rains during the reproductive period.

*South Central*: Early planting dates are recommended for this region. For Hutchinson and Wellington, yields in K-State tests were maximized by planting in late April, which is a couple of days before the range of dates recommended in our K-State soybean management guide for planting dates (Fig. 2).

*Western Kansas*: Low yields were recorded in K-State tests and planting dates did not affect yields.

**K-State research: Planting date by maturity group**

A summary of four studies on soybean planting date by maturity group performed during the 2014 season is available at: Ciampitti, I. A.; Shoup, D. E.; Sassenrath, G.; Kimball, J.; and Adee, E. A. (2015), *Soybean Planting Date × Maturity Group: Eastern Kansas Summary*, *Kansas Agricultural Experiment Station Research Reports*:1:2. http://newprairiepress.org/kaesrr/vol1/iss2/21/

During the 2015 growing season, a similar study was conducted in 5 sites across Kansas. The optimum combination of soybean planting date x maturity group was governed by the environment (site) evaluated.

In this research, three soybean varieties (early, medium, and late maturity groups) were planted at three planting dates during both the 2014 and 2015 seasons, at Topeka/Rossville, Manhattan, Hutchinson, Parsons, and Ottawa. A full description of all planting dates and maturity groups evaluated is summarized in Table 2.

**Table 2. Location, year, planting date, soybean maturity group and water condition.**

| Location | Year | Planting Date | Maturity Group | Water |
|---|---|---|---|---|
| Manhattan | 2014 | April 22, May 15, and June 3 | 2.0, 3.8, and 4.8 | Dryland |
| Topeka | 2014 | May 2, May 20, and June 18 | 2.0, 3.8, and 4.8 | Irrigated |
| Ottawa | 2014 | May 5, May 28, and June 26 | 3.7, 4.2, and 4.8 | Dryland |
| Parsons | 2014 | May 2, June 3, and June 26 | 3.9, 4.8, and 5.6 | Dryland |
| Hutchinson | 2014 | June 3 and July 2 | 3.7, 4.5, and 5.6 | Dryland |
| Manhattan | 2015 | April 14, May 12, and June 5 | 3.0, 3.7, and 4.5 | Dryland |
| Rossville | 2015 | April 30, May 13, and June 9 | 3.0, 3.7, and 4.5 | Irrigated |
| Ottawa | 2015 | May 4, June 10, and June 29 | 3.7, 4.2, and 4.8 | Dryland |
| Parson | 2015 | May 5, June 2, and July 1 | 3.9, 4.8, and 5.6 | Dryland |
| Hutchinson | 2015 | April 29, June 10, and July 6 | 3.7, 4.5, and 5.2 | Dryland |

**2014 Results**

The 2014 yield results of these tests are presented in Figure 3.

Under rainfed conditions at Manhattan, the mid-maturity group (3.8) was the highest-yielding at both early and late planting date. The late maturity group (4.8) outyielded the other maturity groups at the mid planting date (May 15).

Under irrigation at Topeka, group 3.8 and 4.8 (medium and late) varieties maximized yields at the earliest planting date (May 2), with yields above 70 bu/acre. Lower yields were observed for the mid-May planting date, with the exception of the late-maturing group (4.8). For the late planting time (June 18), group 3.8 (yields >60 bu/a) significantly outyielded groups 2.0 and 4.8 (yields <45 bu/a).

Under rainfed conditions at Ottawa, yields were similar, but generally greater for May 28 (mid-planting date) as compared with May 5 (early) across all maturity groups (about 35 bu/acre). At the late planting date (June 26), yields increased with the later maturity groups. At Parsons (rainfed), group 3.9 (early) outyielded the other maturity groups for the May 2 planting date. Conversely, later-maturing soybean groups yielded better at the other planting dates (June 3 and 26). Although a trend in the data supported timing of planting to capture fall rains to enhance yield, the results were not statistically significant between the later maturity groups. At Hutchinson (rainfed), early planting (June 3) produced a significant yield benefit as compared with the late planting time (July 2).

At Ottawa, cumulative precipitation decreased as the planting date was delayed in 2014 (Figure 4). Overall, the later planting date received close to 10 inches less precipitation over the growing season than the early and mid-planting times. Despite that, yields were slightly higher at the later planting dates. For this site, the timing of the rain on the latest planting date was more critical than the quantity. Soybean planted at the early- and mid-planting date received close to 50% of the total rainfall in the first months of the growing season. The importance of adequate moisture for soybean yield development is most apparent from the lower yields for the late planting date at Hutchinson. This location received the lowest cumulative precipitation compared to the early planting date and compared to other locations.

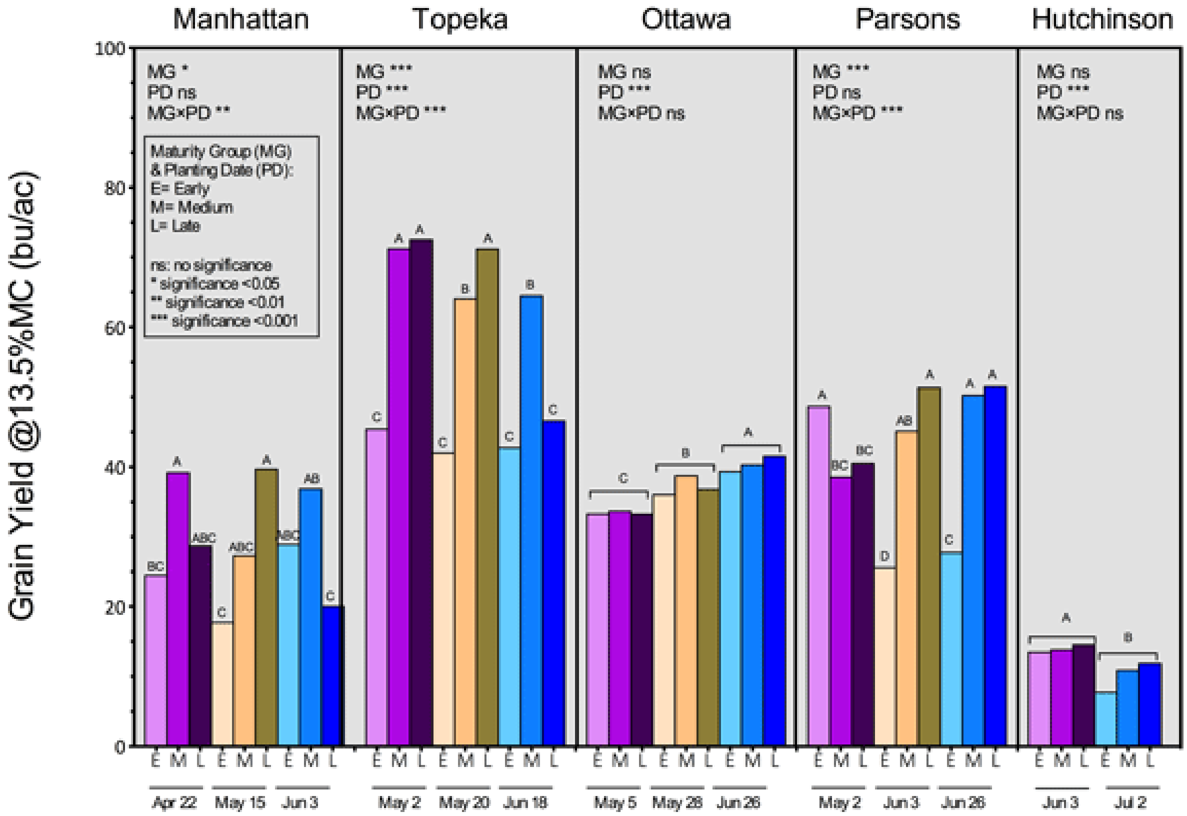



**Figure 3. Soybean yields with different planting dates (early, mid, and late) and maturity groups (E = early, M = medium, L = late maturing groups) at five locations across Kansas for the 2014 growing season. Information related to maturity groups (MG) is presented in Table 2.**

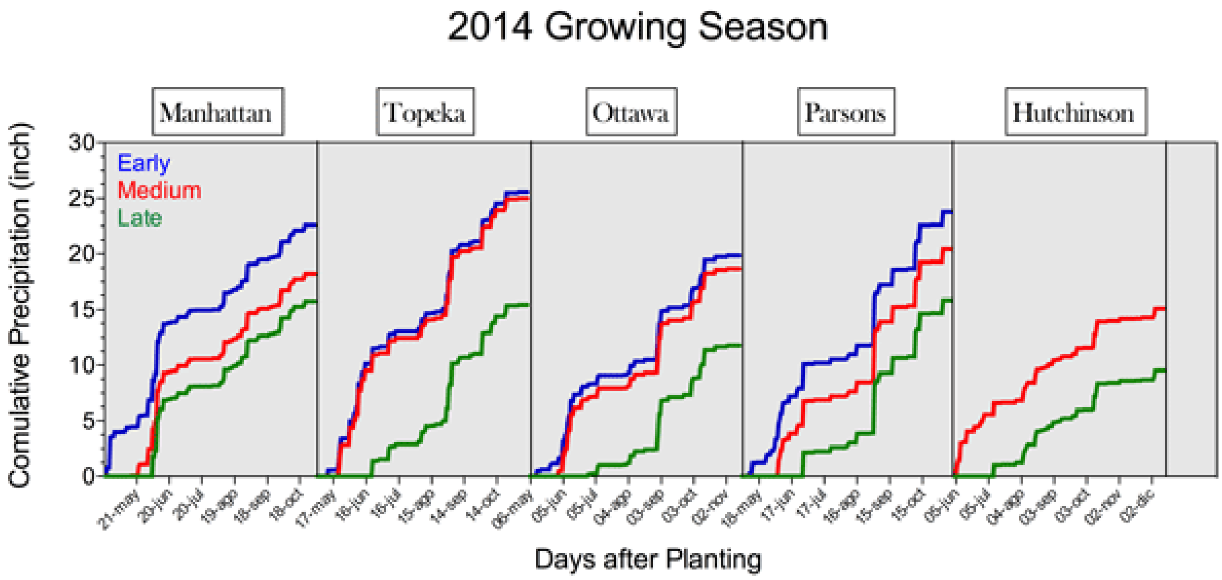



**Figure 4. Cumulative precipitation (inches, without including the irrigation at Topeka site) for different planting dates (early, mid, and late) at five locations across Kansas for the 2014 growing season. Information related to specific planting dates per site is presented in Table 2.**

**2015 Results**

The 2015 yield results of these tests are presented in Figure 5.

For the 2015 season at Manhattan, both mid- (3.7) and late-maturity group (4.5) resulted in the highest yield across all planting dates, and outyielded the early-maturity (3.0). Under irrigation at Rossville, the early planting date produced the highest soybean yield (>70 bu/a) in both the mid- (3.7) and late-maturity groups (4.5). At later planting dates, the mid-maturity group (3.7) outyielded both the early and late-maturity groups. Potential soybean yields were reduced when planting date was delayed. Under rainfed conditions at Ottawa, yields were similar for early (May 4) and mid-planting dates (June 10). Yield was reduced when planting on June 29 (late planting date), with a maximum of close to 40 bu/acre. At all planting dates, maturity groups did not present a significant yield difference at Ottawa.

For Parsons, yields in 2015 were strikingly different from those observed in 2014. The lowest yield reported at this site was 53 bu/acre for the earlier maturity group (3.9) for the early planting date. This was greater than any yield reported for any maturity group or planting date in 2014. A trend was documented with the mid-maturity group (4.8) having the highest yield of all cultivars at 75 bu/acre for the earliest planting date. No differences in yield were observed between maturity groups planted at the later dates. While there was a trend for lower yields at the later planting date (58 bu/acre at July 1 vs. 64 bu/acre at June 2 across all cultivars), the difference was not significant.

For Hutchinson, soybean planted at the late April and early June planting dates outyielded the late planting time (July 6) by more than 10 bu/acre. When considering maturity group, the early- and mid-maturity groups (3.7 and 4.5) showed a yield increase for the early June planting date, but a significant decrease for the early July planting time.

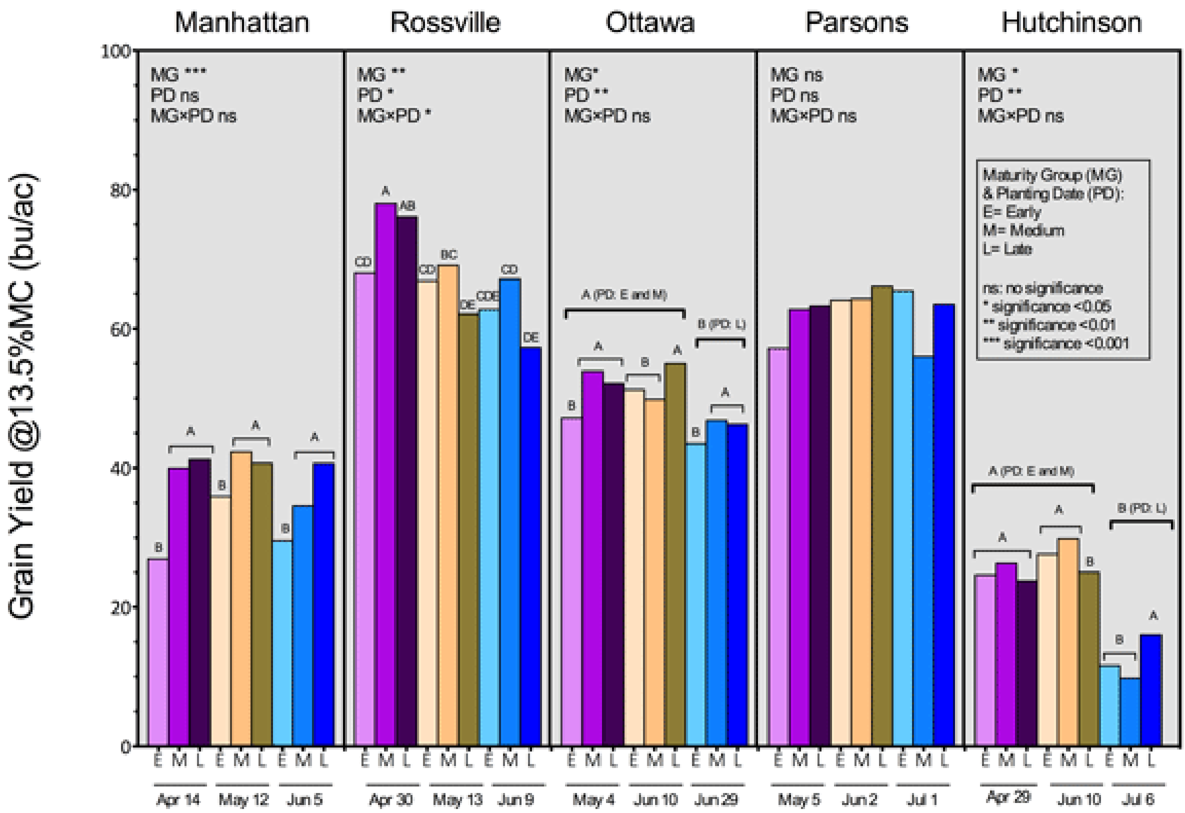



**Figure 5. Soybean yields with different planting dates (early, mid, and late) and maturity groups (E = early, M = medium, L = late maturing groups) at five locations across the state of Kansas for 2015 growing season. Information related to maturity groups (MG) is presented in Table 2.**

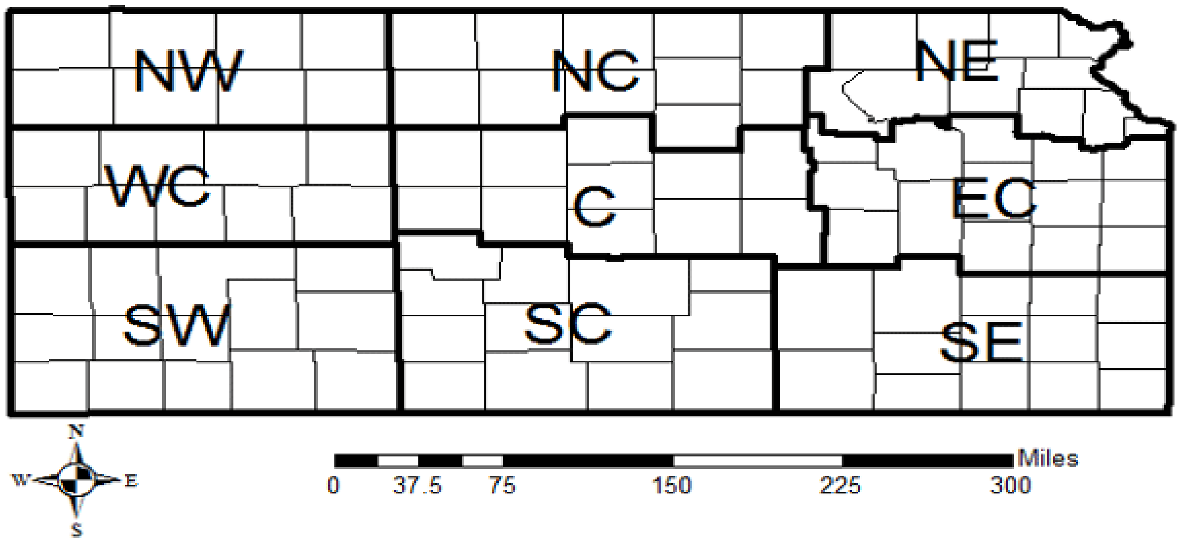



**Figure 6. Cumulative precipitation (inches, without including the irrigation at Rossville site) for different planting dates (early, mid, and late) at five locations across the state of Kansas for the 2015 growing season. Information related to specific planting dates per site is presented in Table 2.**

At Rossville, the main difference for the latest planting date compared to the early- and mid-planting times was the lower amount of cumulative precipitation received (Fig. 6). At Ottawa, cumulative precipitation decreased from early to mid-and late planting dates. For this site, lower yields were documented for the latest planting date, and this was correlated lower precipitation and timing of the precipitation. Shorter season cultivars suffered from low precipitation during grain-filling. A similar analysis could be extended to the yield pattern measured at Hutchinson during the 2015 growing season. Soybean at the latest planting date received less cumulative precipitation in a shorter growing season, penalizing the crop with an approximately 10 bu/acre yield reduction as compared with early- and mid-planting date.

**Conclusions and recommendations**

- Ultimately, weather patterns dictate soybean yields, especially under dryland conditions. There is no guarantee that any certain planting date will always work out the best when it comes to soybean yields in Kansas. In fact, the distribution and amount of rainfall and the day/night temperature variations around flowering and during the grain filling periods have large impacts in defining soybean yield potential. Thus, when the risk of drought stress during the growing season is high, diversifying planting dates may be a good approach to consider.
- When planting early, seed should be treated with a fungicide and insecticide. Selecting varieties with resistance to soybean cyst nematode and sudden death syndrome is advisable. Do not plant into soils that are too wet, however. Also, do not plant until soil temperatures

are close to 60 degrees F. If planted into soils cooler than that, seedlings may eventually emerge but will have poor vigor.

- In drier areas of Kansas and on shallow soils, yields have been most consistent when planting soybeans in late May to early June. By planting in that timeframe, soybeans will bloom and fill seed in August and early September, when nights are cooler and the worst of heat and drought stress is usually over.
- In our 2014 and 2015 planting date by maturity group studies, interactions with the environment were the primary factor in the yields and maturity group responses. Under full irrigation, the earliest planting date maximized yields for cultivars from the late 3, mid- and late 4 maturity groups at Topeka and Rossville sites. For our rainfed sites (both 2014 and 2015), no single rule can apply to all conditions, but late planting (June 26) showed good yields at Ottawa and Parsons for later-maturing groups in 2014, with a different pattern for the 2015 season (for example, Ottawa had the highest yields at early and mid-planting dates).
- Cumulative amount and timing of precipitation primarily influenced soybean planted later in the growing season.
- New studies are planned for the 2016 growing season for similar locations.

Ignacio Ciampitti, Cropping Systems Specialist, KSUCROPS Production Lab
ciampitti@ksu.edu

Osler Antonio Ortez, MS Graduate Student, KSUCROPS Production Lab
oaortez@ksu.edu

Guillermo Balboa, PhD Fulbright Scholar, KSUCROPS Production Lab
balboa@ksu.edu

Eric Adee, Agronomist-In-Charge, Kansas River Valley and East Central Experiment Fields
eadee@ksu.edu

Jim Kimball, East Central Kansas Experimental Field
jkimball@ksu.edu

Gary Cramer, Agronomist-in-Charge, South Central Experiment Field
gcramer@ksu.edu

Gretchen Sassenrath, Southeast Agricultural Research Center Crop Production Agronomist
gsassenrath@ksu.edu

Stu Duncan, Northeast Area Crops and Soils Specialist
sduncan@ksu.edu

Doug Shoup, Southeast Area Crops and Soils Specialist
dshoup@ksu.edu

## 2. Expected number of days available to plant summer crops in Kansas

Weather and workday probabilities vary over time and across Kansas. Knowledge of workday probabilities and the number of expected suitable days to conduct fieldwork impacts crop choice and machinery investment decisions.

Using the "most active" dates to plant Kansas crops as estimated from USDA NASS weekly Crop Progress and Condition Reports (Tables 1-4), the number of days suitable from 1981 to 2015 period were graphed for corn, soybean, and grain sorghum for each Kansas crop reporting district (see Figure 1 for districts). The "most active" dates are defined as between the 20$^{th}$ and 80$^{th}$ percentile for the 5-year average from 2011 to 2015 period. When two or more planting periods overlap, crop acreage "competes" for field equipment. It should be noted that these dates are not necessarily the best timing for highest yields, but when farmers have been observed to actively conduct these field operations.

The number of days suitable for planting based on historical observations (34-year period) for all crop reporting districts are presented here. We present the number of suitable days for planting summer crops. A separate section and set of graphs for number of days suitable for planting were developed for each crop, by each of the nine Kansas crop reporting districts.

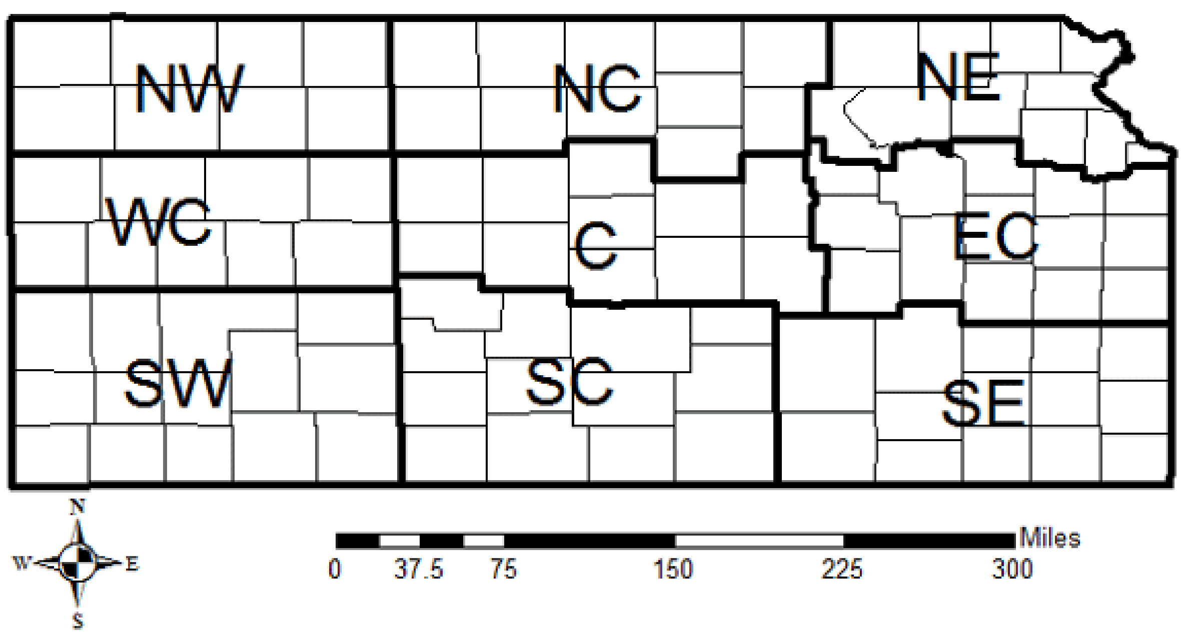



**Figure 1. Map of the nine USDA Kansas crop reporting districts.**

**Table 1. Most active crop planting and harvest dates in Kansas, average of 2011-2015 growing**

**seasons.**

| | Planting | | Harvest | |
|---|---|---|---|---|
| | Start | End | Start | End |
| **Corn** | April 19 | May 17 | Sept. 13 | Oct. 25 |
| **Soybeans** | May 10 | June 7 | Oct. 4 | Nov. 1 |
| **Sorghum** | May 24 | June 21 | Oct. 11 | Nov. 8 |

Most active progress is defined as between the $20^{th}$ to $80^{th}$ percentile.

**Corn planting**

Most corn acreage in Kansas is planted between April 19 and May 17 (Table 1). However, the most active planting dates for each crop reporting district varies. Using the most active planting dates by Crop Reporting District (Table 2), the distribution of the number of days suitable during that time period were graphed in histograms (Figure 2). Most active corn planting starts as early as April 5 in southeast Kansas and as late as May 3 in the western part of Kansas (Northwest and West Central districts). The Southeast district appears to have fewer days suitable for corn planting than the other districts but it should be noted that corn planting had already begun before crop progress or "days suitable for planting" data were reported each year. The most active corn planting dates end as early as May 3 in southeast Kansas and as late as May 24 in western Kansas. The most active corn planting dates in the rest of the crop reporting districts end about mid-May (from May 10 to 17) (Table 2).

**Table 2. Most active corn planting and harvest dates by Kansas crop reporting districts, average of 2011-2015 growing seasons.**

| | Planting | | Harvest | |
|---|---|---|---|---|
| | Start | End | Start | End |
| **Northwest** | May 3 | May 24 | Sept. 27 | Oct. 25 |
| **West Central** | May 3 | May 24 | Sept. 20 | Oct. 25 |
| **Southwest** | April 26 | May 17 | Sept. 20 | Oct. 18 |
| **North Central** | April 26 | May 17 | Sept. 20 | Oct. 25 |
| **Central** | April 12 | May 10 | Aug. 30 | Oct. 4 |
| **South Central** | April 19 | May 10 | Aug. 16 | Oct. 4 |
| **Northeast** | April 19 | May 10 | Sept. 13 | Nov. 1 |
| **East Central** | April 12 | May 10 | Aug. 30 | Oct. 18 |
| **Southeast** | April 5 | May 3 | Aug. 9 | Aug. 23 |

Most active progress is defined as between the $20^{th}$ to $80^{th}$ percentile.

Each crop reporting district had a different number of days suitable to plant corn during the most active dates (Fig. 2). All 9 districts had less than 10 days suitable during the respective dates at least once over the last 35 years. Farms in the Central district had more than 30 days at least once over the last 35 years (Fig. 2). The Southwest district has a more peaked distribution, frequently having 24 to 25 of days suitable for corn planting.

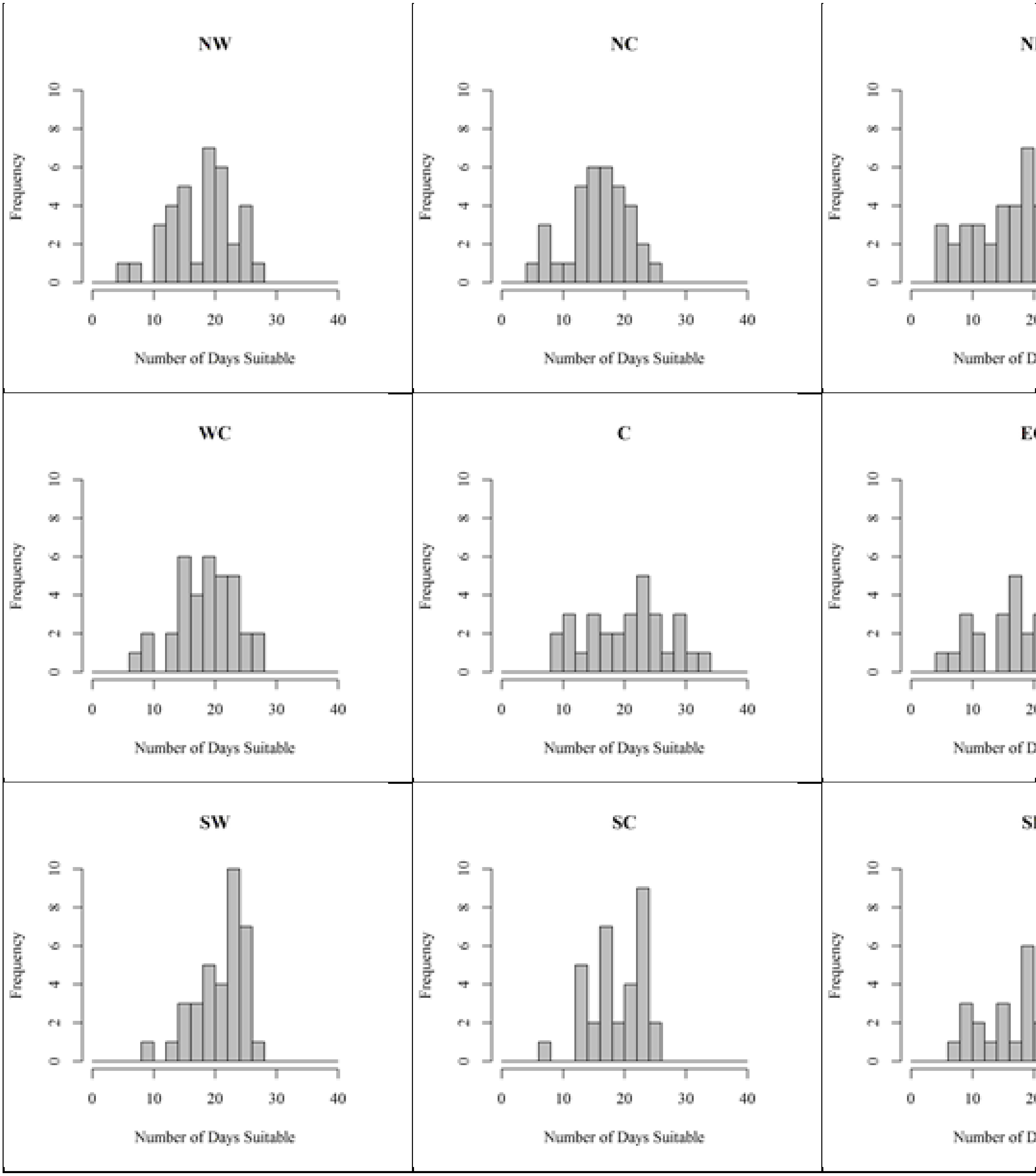



**Figure 2. Distribution of days suitable for corn planting in each district of Kansas. Source: USDA NASS Kansas 1981-2015.**

**Soybean planting**

Soybean is mostly planted between May 10 and June 7 at the state level (Table 1), however the most active planting dates varied by Crop Reporting District (Table 3). The most active planting dates for soybean start as early as May 10 and as late as May 24 (Table 3). The most active planting dates end as early as June 7 in four districts and as late as June 21 in the Southeast district (Table 3).

**Table 3. Most active soybean planting and harvest dates by Kansas crop reporting districts, average of 2011-2015 growing seasons.**

| | **Planting** | | **Harvest** | |
|---|---|---|---|---|
| | Start | End | Start | End |
| **Northwest** | May 17 | June 7 | Oct. 4 | Oct. 18 |
| **West Central** | May 24 | June 14 | Oct. 4 | Oct. 25 |
| **Southwest** | May 17 | June 14 | Oct. 11 | Nov. 1 |
| **North Central** | May 10 | June 7 | Oct. 4 | Oct. 25 |
| **Central** | May 10 | June 7 | Oct. 11 | Oct. 25 |
| **South Central** | May 10 | June 14 | Oct. 4 | Nov. 1 |
| **Northeast** | May 10 | June 7 | Oct. 4 | Oct. 25 |
| **East Central** | May 17 | June 14 | Oct. 11 | Nov. 8 |
| **Southeast** | May 17 | June 21 | Oct. 18 | Nov. 15 |

Most active progress is defined as between the $20^{th}$ to $80^{th}$ percentile.

Only the Southwest district has not had at least one year with 10 or fewer days suitable for planting soybean (Figure 3). In the Southwest district, farmers had between 14 and 34 days suitable for planting during this period. In the Northeast district, the soybean planting window is open, but depending on the weather conditions and other factors farmers might have from very few to about 30 days of suitable days to plant soybean. For the Southeast district the suitable number of days ranged mostly from 16 to more than 35, presenting one the widest-open windows to plant soybean of all the crop reporting districts.

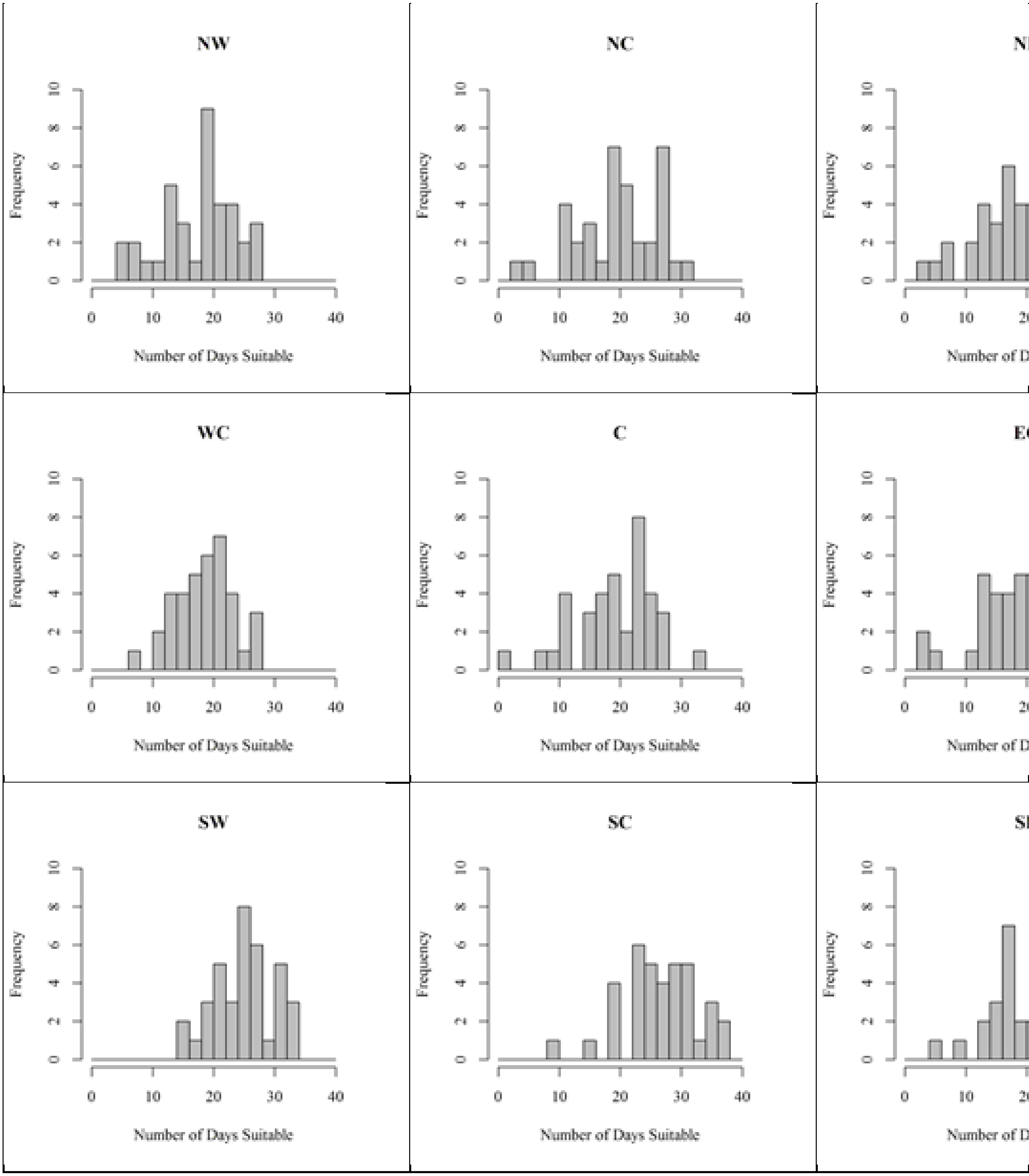



**Figure 3. Distribution of days suitable for soybean planting in each district of Kansas. Source: USDA NASS Kansas 1981-2015.**

## Grain sorghum planting

Grain sorghum is mostly planted between May 24 and June 21 at the state level (Table 1), however the most active planting dates varied by Crop Reporting District (Table 4). The most active grain sorghum planting dates began as early as May 10 in the Southeast District and as late as May 31 in three districts. The most active ending planting dates in Kansas for sorghum are concentrated in a one-week span, ending as early as June 14 in four districts and as late as June 21 in five districts.

**Table 4. Most active grain sorghum planting and harvest dates by Kansas crop reporting districts, average of 2011-2015 growing seasons.**

| | **Planting** | | **Harvest** | |
|---|---|---|---|---|
| | Start | End | Start | End |
| **Northwest** | May 24 | June 14 | Oct. 18 | Nov. 8 |
| **West Central** | May 31 | June 21 | Oct. 18 | Nov.8 |
| **Southwest** | May 31 | June 21 | Oct. 11 | Nov. 15 |
| **North Central** | May 31 | June 21 | Oct. 18 | Nov. 8 |
| **Central** | May 24 | June 14 | Oct. 11 | Nov. 8 |
| **South Central** | May 17 | June 21 | Oct. 4 | Nov. 8 |
| **Northeast** | May 24 | June 14 | Oct. 18 | Nov. 8 |
| **East Central** | May 24 | June 21 | Oct. 4 | Nov. 15 |
| **Southeast** | May 10 | June 14 | Oct. 4 | Nov. 1 |

Most active progress is defined as between the $20^{th}$ to $80^{th}$ percentile.

Seven crop reporting districts had at least one year with 10 or fewer days suitable for planting, only the Southwest and South Central districts had more (Fig. 4). In the Southwest district, producers had between 10 and 27 days to plant during this period. The Southeast, South Central, and East Central Districts had more than 30 days suitable for planting.

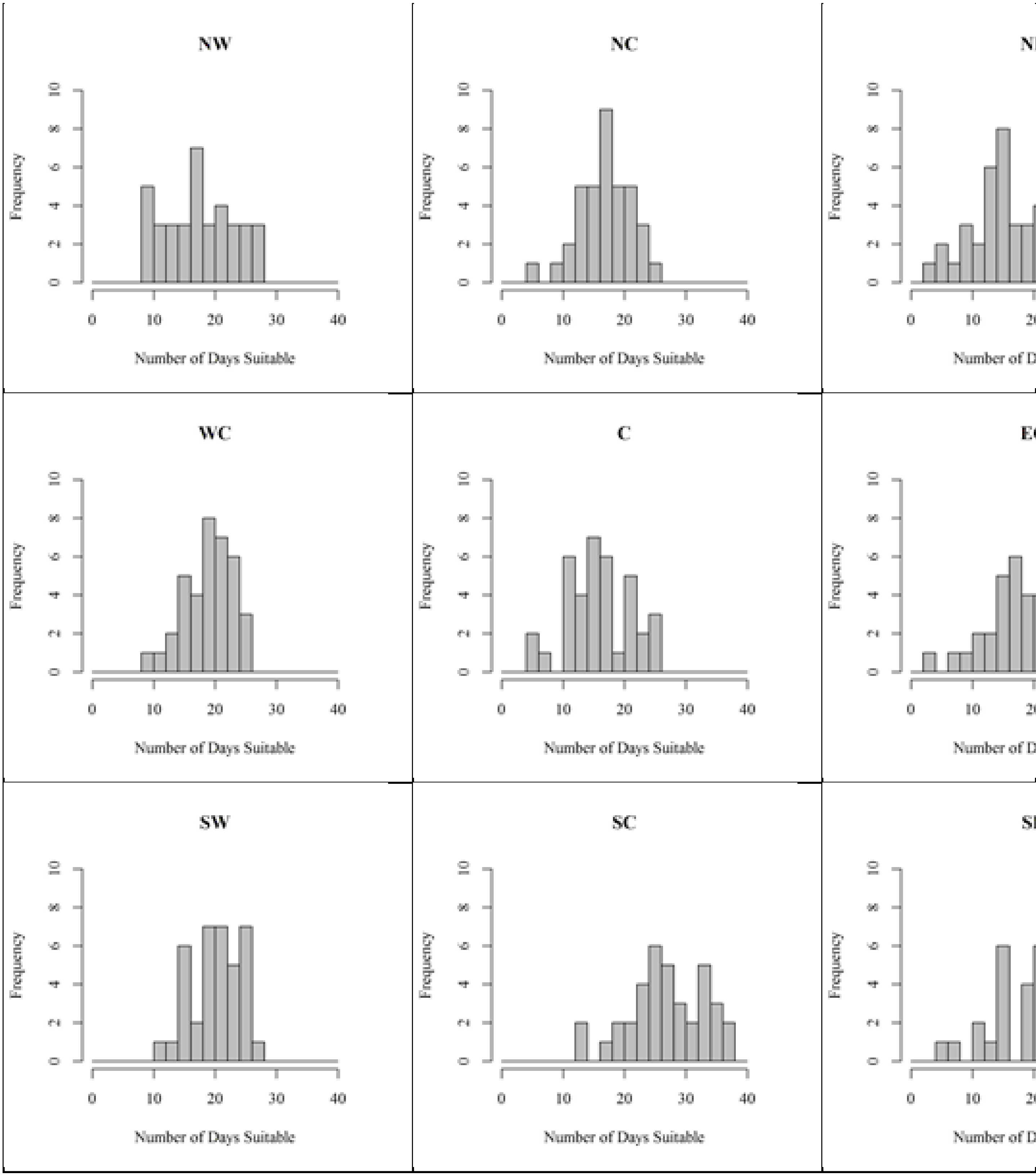



**Figure 4. Distribution of days suitable for grain sorghum planting in each district of Kansas. Source: USDA NASS Kansas 1981-2015.**

**Summary**

Using historical observed planting progress data gives an indication of the expected number of days suitable for planting in the current year. We are grateful to USDA NASS Northern Plains Region Field Office for providing days suitable for fieldwork data for all Crop Reporting Districts.

Terry Griffin, Cropping Systems Economist
twgriffin@ksu.edu

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

Christian Torrez, Graduate Research Assistant, Department of Agricultural Economics

## 3. Short K-State video on current wheat disease situation in Kansas

K-State Extension Plant Pathologist Erick DeWolf examines the threat to Kansas wheat in 2016 and when to consider a fungicide treatment: https://youtu.be/ztWamQaPVgo

Dan Donnert, K-State Research and Extension videographer
ddonnert@ksu.edu

## 4. Two canola field tours to be held in south central Kansas April 28

Two canola field tours will be held in Kansas in the next two weeks. The first tour will be on Thursday morning, April 28, near Conway Springs. At this tour producers will see a 30-entry winter canola variety trial. Producers will also observe an on-farm study evaluating the AGCO residue management system for canola and common producer planting practices. Presentations will cover winter canola varieties, how the crop has handled the dry spring weather and fluctuating temperatures, and different canola establishment strategies.

The second tour will be Thursday afternoon, April 28, near Kiowa. Here producers will observe the National Winter Canola Variety Trial, which includes 24 open pollinated varieties and 24 hybrids in side-by-side trials. Producers will also see a second site of the AGCO residue management system and producer planting practices. Presentations will be similar to the first site.

More details will be available next week including start times and directions to the trial sites.

Mike Stamm, Canola Breeder
mjstamm@ksu.edu

## 5. K-State Cover Crop Field Day, HB Ranch - Hays, May 13

K-State will hold a Cover Crop Field Day at its HB Ranch location south of Cedar Bluff Reservoir on Friday, May 13. The field day will begin at 10 a.m. To get to the HB Ranch field, take exit 135/Ogallah on I-70 and go south on Hwy 147. HB Ranch is located about 4 miles south of Cedar Bluff Reservoir on Hwy 147. From Brownell, drive 5 miles north of Hwy 147.

During this field day and tour, K-State researchers will discuss ongoing research efforts at the HB Ranch evaluating cover crop management options in dryland wheat-based production systems.

Topics and speakers:

- K-State cover crop research – John Holman, Agronomist, Southwest Research-Extension Center
- Cover crops plot tour at HB Ranch – Augustine Obour, Soil Scientist, KSU Ag Research Center-Hays
- Growers perspective – Brice Custer and Larry Manhart
- Cover crops and soil health – Candy Thomas, USDA-NRCS
- Grazing cover crops – Sandy Johnson, Livestock Specialist, Northwest Research-Extension Center

A lunch will be provided at no cost. Funding for this field day is provided in part by the USDA Ogallala Aquifer Program and a USDA-NRCS Conservation Innovation Grant.

## 6. Wheat In-Depth Diagnostic School in Colby, May 17-18

The Northwest Research and Extension Center (NREC) will hold its 2016 Wheat In-Depth Diagnostic School on May 17 and 18 at the NREC, 105 Experiment Farm Road, Colby. On May 17, the hours are from 9 a.m. until 6 p.m. On May 18, the school begins at 8 a.m. and ends at 1 p.m.

Topics presented by K-State agronomists will include:

- Wheat Growth and Development
- General Wheat Production Problems
- Wheat Diseases and Treatment Options
- Water Use of Wheat As Part of Rotations
- Weed Identification
- Weed Control in Wheat
- Soil Fertility Needs of Wheat
- Sprayer Calibration
- Wheat Insects and Their Interaction with Diseases
- New Technology in Wheat Breeding

This field day is tailored to be a hands-on learning opportunity for agronomy professionals, farmers and anyone interested in wheat production. It has approval for Certified Crop Advisor and Commercial Pesticide Applicator credits. The cost is $140 for both days for those who RSVP by May 9. After that date, the cost is $180 for both days.

To register for the school, register online at www.northwest.ksu.edu/WheatSchool

For more information, contact the Northwest Research and Extension Center at 785-462-6281 or jfalkjones@ksu.edu or lhaag@ksu.edu.

Jeanne Falk Jones, Sunflower District Agronomist
jfalkjones@ksu.edu

Lucas Haag, Northwest Area Crops and Soils Specialist
lhaag@ksu.edu

## 7. Comparative Vegetation Condition Report: April 5 - 11

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

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

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

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

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

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

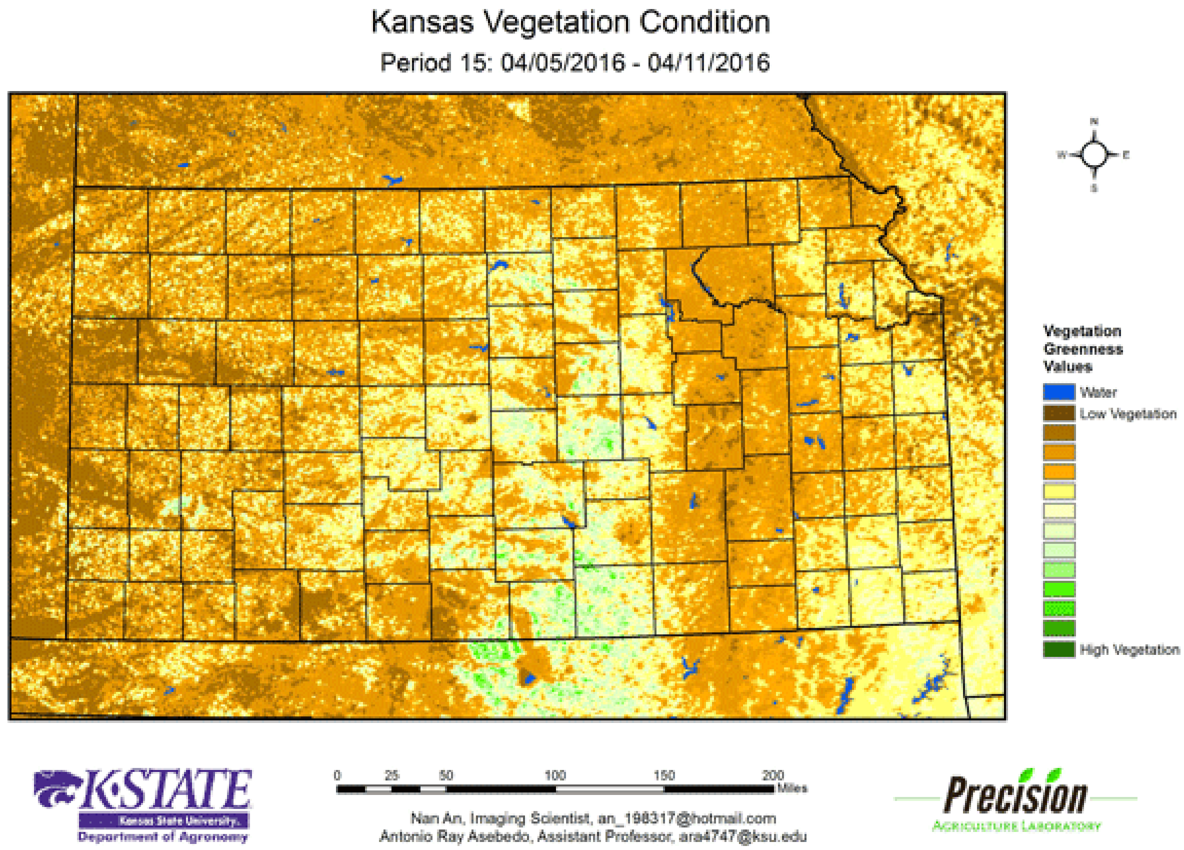



**Figure 1. The Vegetation Condition Report for Kansas for April 5 – 11, 2016 from K-State's Precision Agriculture Laboratory continues to show slightly more expansion of the area of highest plant production. The highest NDVI values are still in Sumner and Harper counties. The Flint Hills continue to show relatively low photosynthetic activity.**

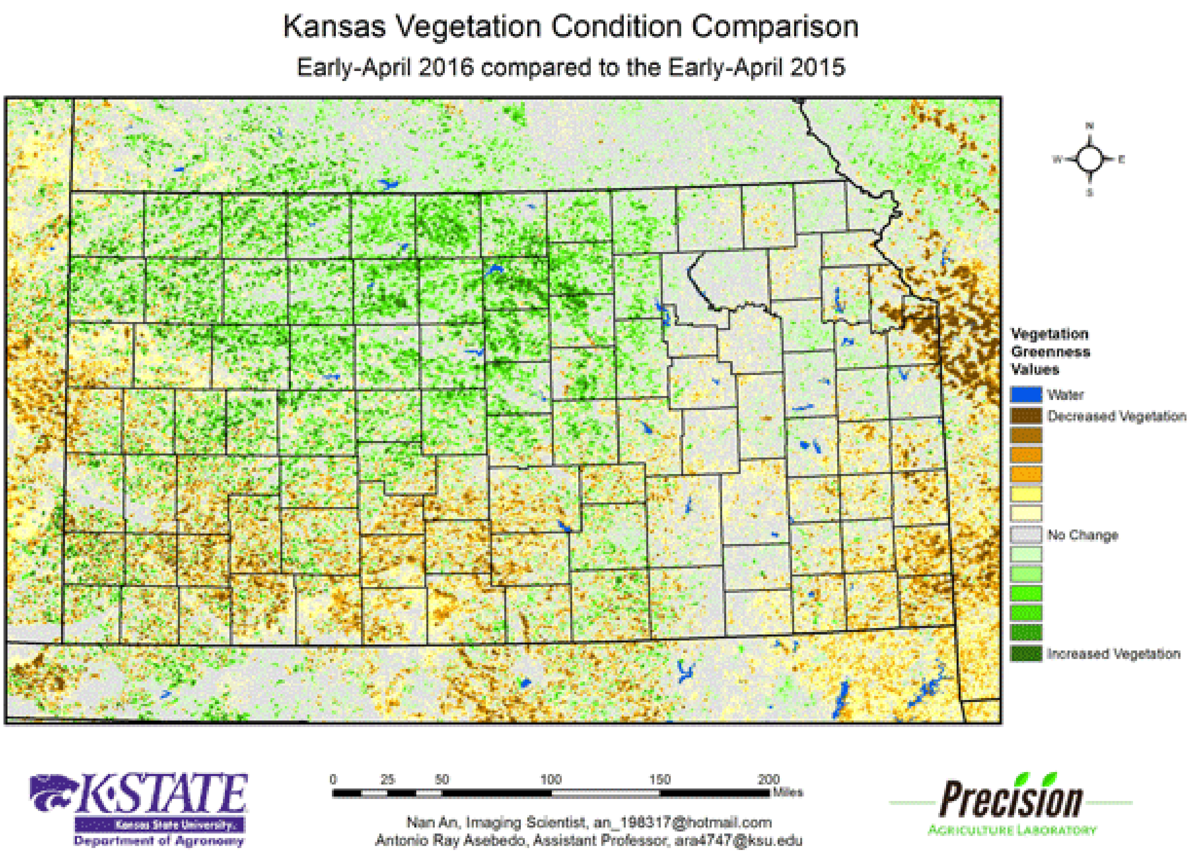



**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for April 5 - 11, 2016 from K-State's Precision Agriculture Laboratory shows vegetative production in the southern half of the state lags behind last year's level of production at this time. Dry conditions in March and early April have slowed production. In contrast, above-normal moisture in February in the Northwest and North Central Divisions has buffered vegetation in those areas. Lack of moisture as vegetation emerges from dormancy is decreasing photosynthetic activity.**

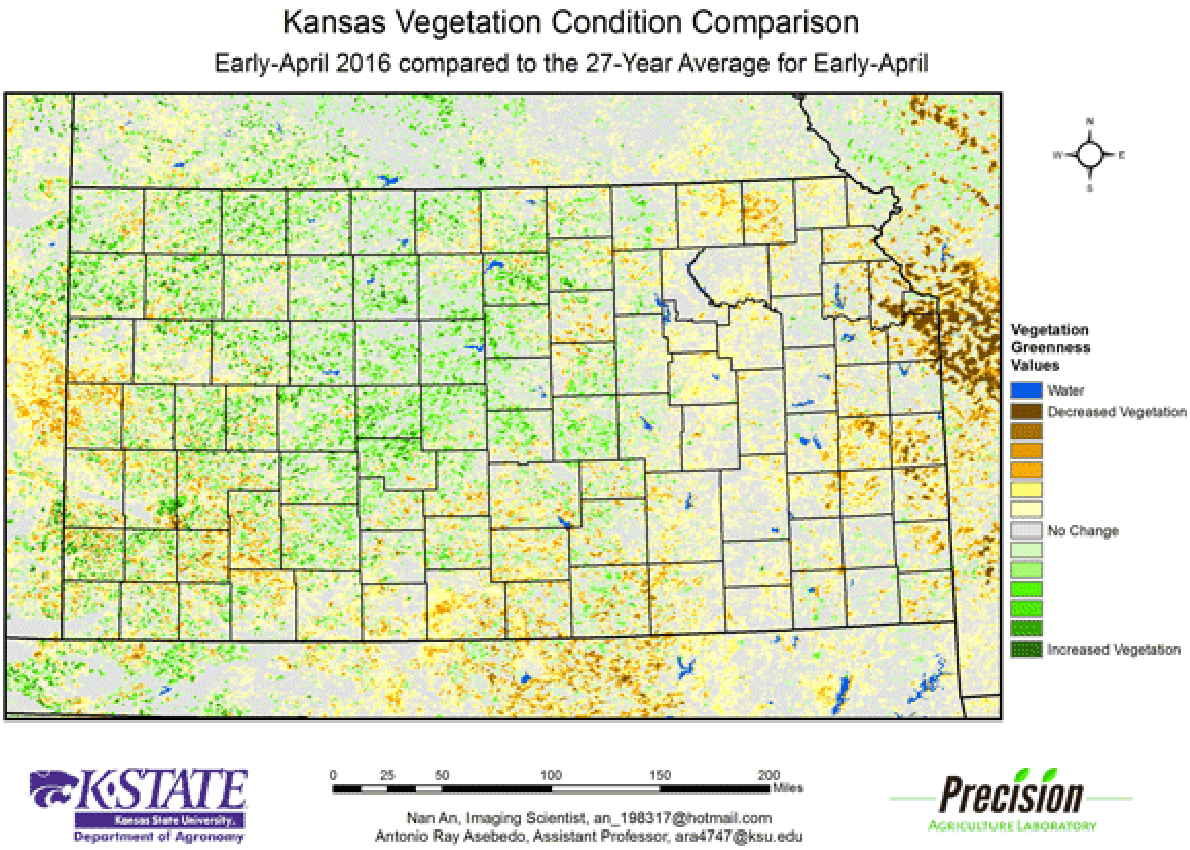



**Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for April 5 – 11 from K-State's Precision Agriculture Laboratory shows that the area of above-average photosynthetic activity continues to decline. The largest areas with the greatest increase are in central Kansas. Even with the recent cool weather, temperatures continue above normal across the state. An exception to the generally greater photosynthetic activity can be seen in western Barber County. Lack of precipitation has slowed the plant recovery from the fire in that area. The much lower NDVI values in extreme northeast Kansas are just imaging artifacts of the cloud cover from recent rains in those counties.**

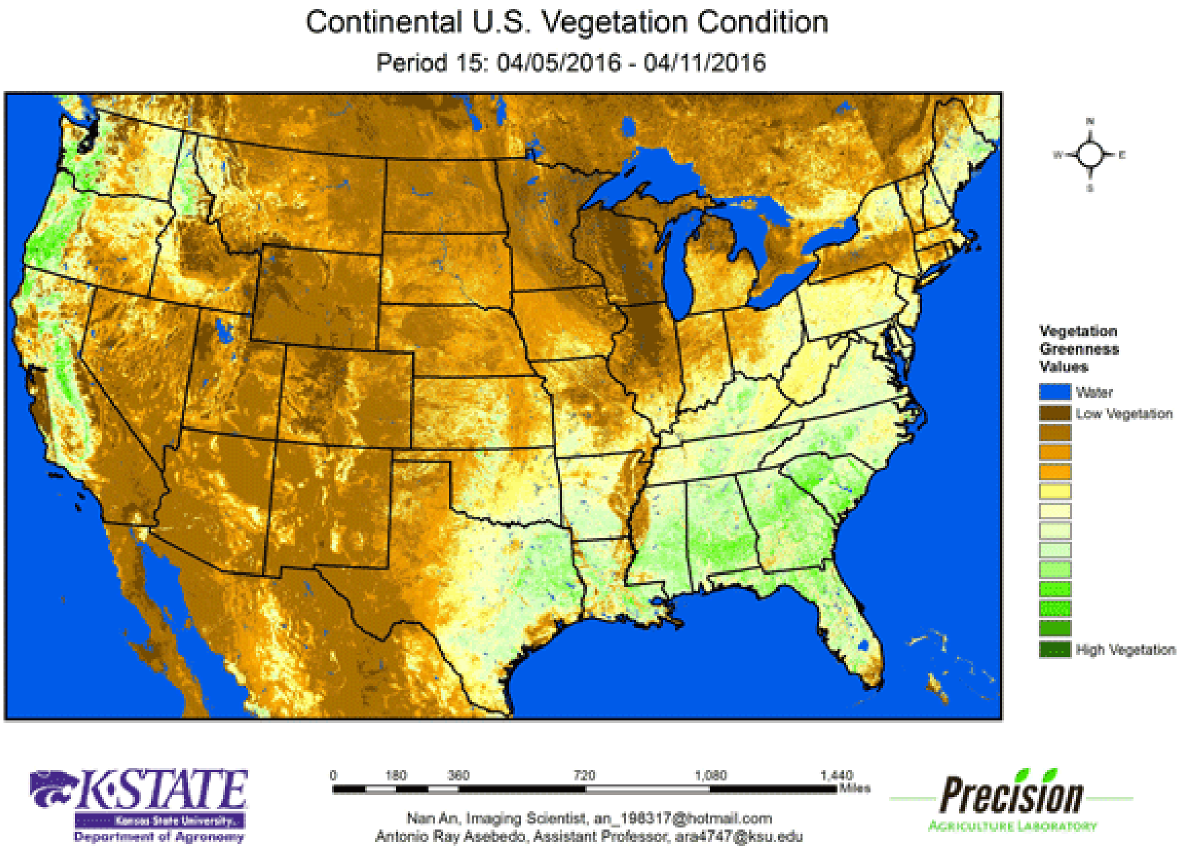



**Figure 4. The Vegetation Condition Report for the U.S for April 5 – 11 from K-State's Precision Agriculture Laboratory shows high NDVI values much of the West Coast and along the Gulf Coast. Favorable moisture continues to drive active photosynthesis in these areas. A pocket of lower photosynthetic activity can be seen in the middle Mississippi Valley region, where the impact from winter floods is still being felt.**

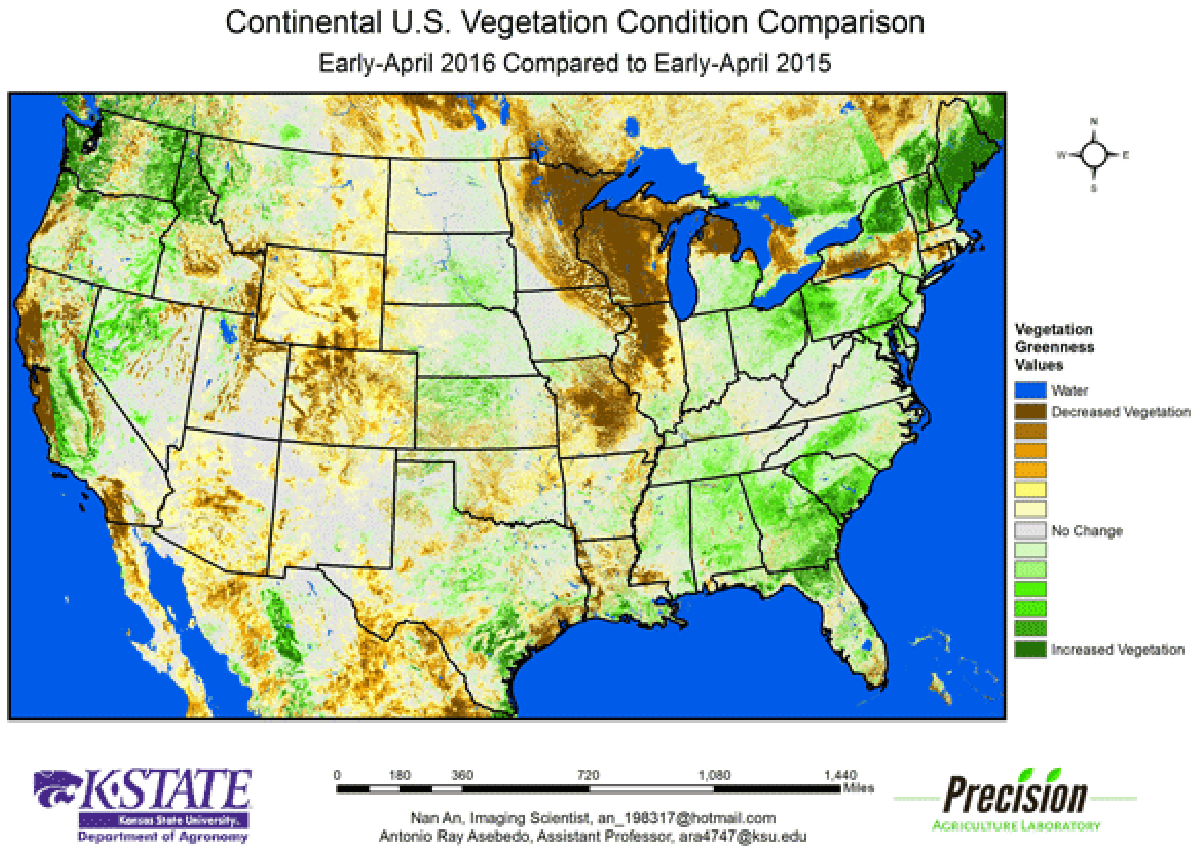



**Figure 5. The U.S. comparison to last year at this time for the period April 5 – 11 from K-State's Precision Agriculture Laboratory shows that lower NDVI values are most evident in Minnesota and Wisconsin, thanks to a late-season snow event. In contrast, much higher NDVI values are visible in New England. Despite the recent snows in this area, the overall snow depth is less than last year, and more vegetation is active.**

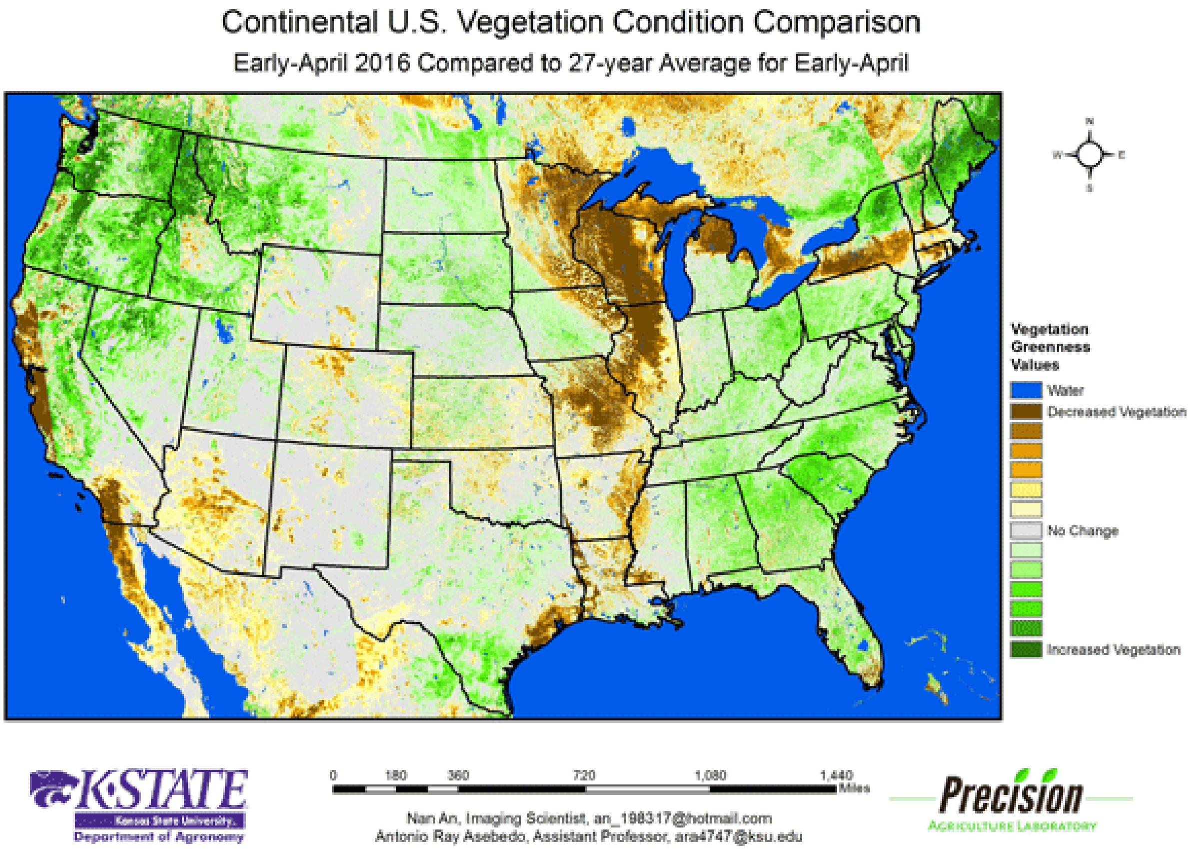



**Figure 6. The U.S. comparison to the 27-year average for the period April 5 – 11 from K-State's Precision Agriculture Laboratory shows above-average photosynthetic across the Pacific Northwest, where winter moisture has reduced drought impacts. Snow pack from the late-season storms in the Great Lakes region has reduced photosynthetic activity in that area. There is concern in this area about damage to the fruit crop due to recent freezing temperatures.**

Mary Knapp, Weather Data Library
mknapp@ksu.edu

Ray Asebedo, Precision Agriculture
ara4747@ksu.edu

Nan An, Imaging Scientist
an_198317@hotmail.com