Issue 747

K-STATE Research and Extension

Extension Agronomy

eUpdate

05/17/2019

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy eUpdate 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 Kathy Gehl, 785-532-3354 kgehl@ksu.edu, or Dalas Peterson, Extension Agronomy State Leader and Weed Management Specialist 785-532-0405 dpeterso@ksu.edu.

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

eUpdate Table of Contents | 05/17/2019 | Issue 747

1. Sorghum management considerations: Planting practices

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 23,000 to more than 100,000 plants per acre depending on annual rainfall Table 1:

Table 1. Grain sorghum recommended seeding rate, plant population and row spacing at different average annual rainfall.
Source: https://www.bookstore.ksre.ksu.edu/pubs/MF3046.pdf

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	23-27	21-18	10-9	7-6
20 to 26	35-64	25-45	18-10	9-5	6-3
26 to 32	50-80	35-55	13-8	6-4	4-3
> 32	70-125	50-90	9-5	4-2	3-2
Irrigated	110-150	80-110	5-4	3-2	2-1

* 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 15-20 percent if planting in late-June or later. Late planting will restrict the time that sorghum plants will have in the season for producing productive tillers, thus decreasing the plants' ability 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. However, 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 data 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 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 will tiller 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.

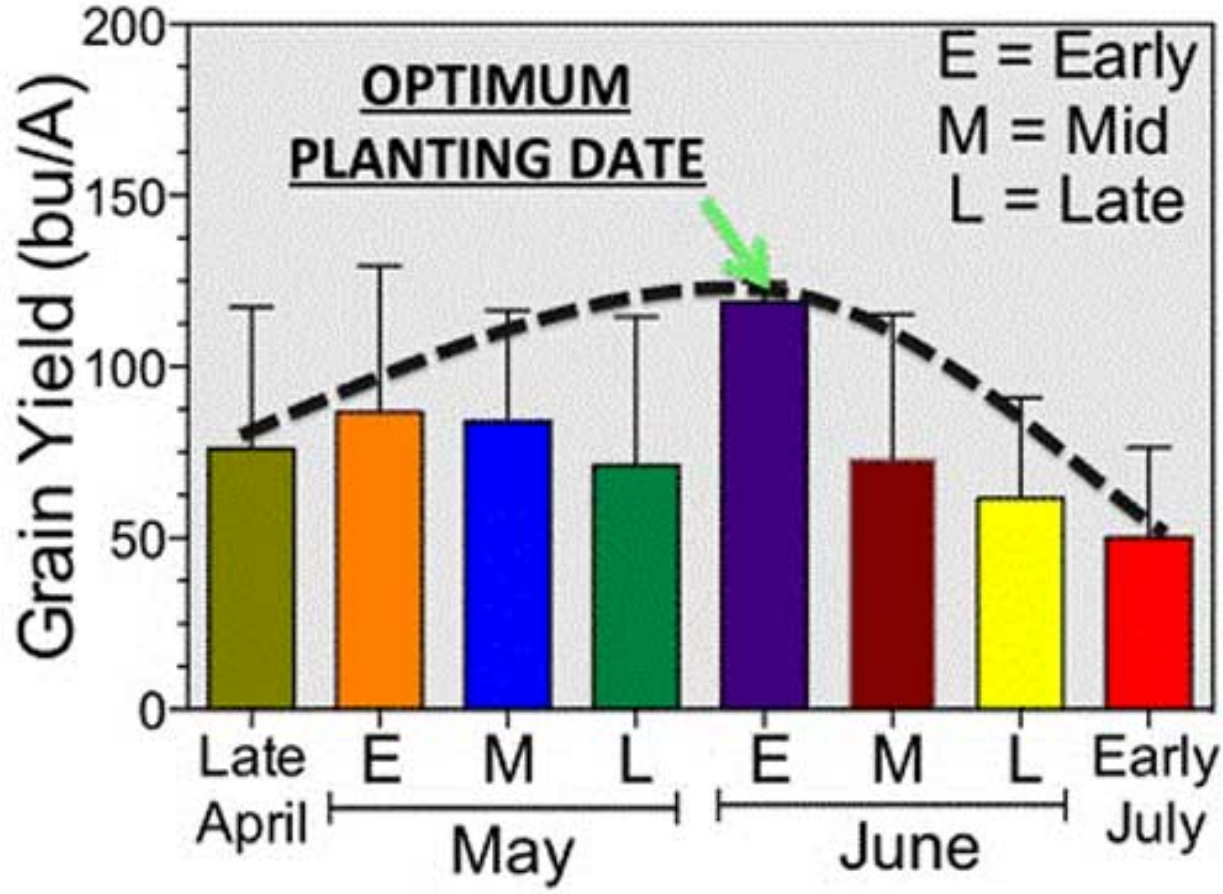

Figure 1. Planting date effect on final sorghum yields (Tribune/ Hutchinson/ Manhattan, Vanderlip; Scandia 1994-96, Gordon; St. John 1993-95, Martin and Vanderlip; Columbus 2000/03, Kelley). From Sorghum: State of the Art and Future Perspectives**, Agronomy Monographs 58, 2016, chapter "Genotype × Environment × Management Interactions: US Sorghum Cropping Systems" doi:10.2134/agronmonogr58.2014.0067, Ignacio A. Ciampitti and P.V.V. Prasad (Eds).**

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 (Figure 2).

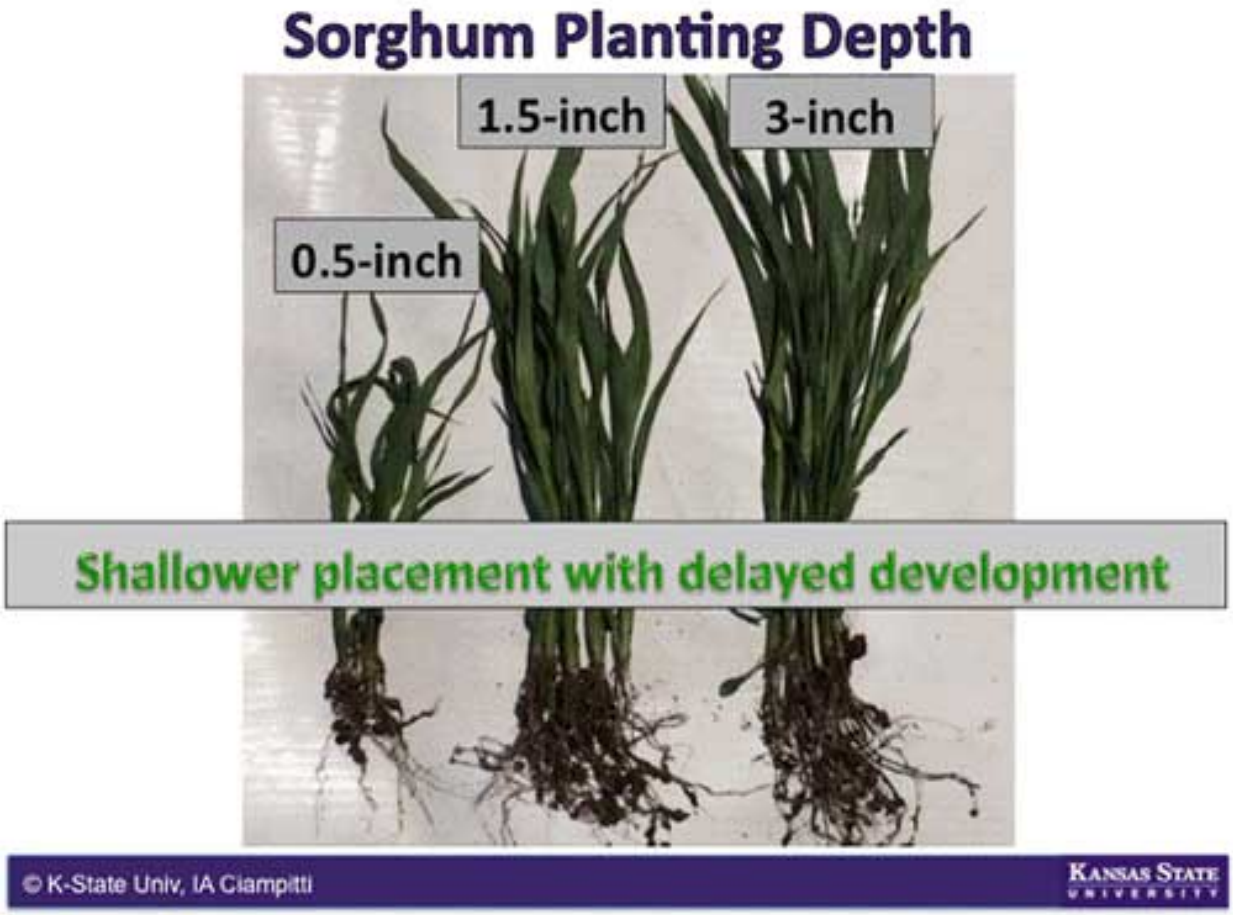

Figure 2. Seed placement effect on early sorghum growth and development, Manhattan, 2014 (Ciampitti et al., 2014).

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 out yielded wide rows in 71 percent of all observations evaluated (Figure 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.

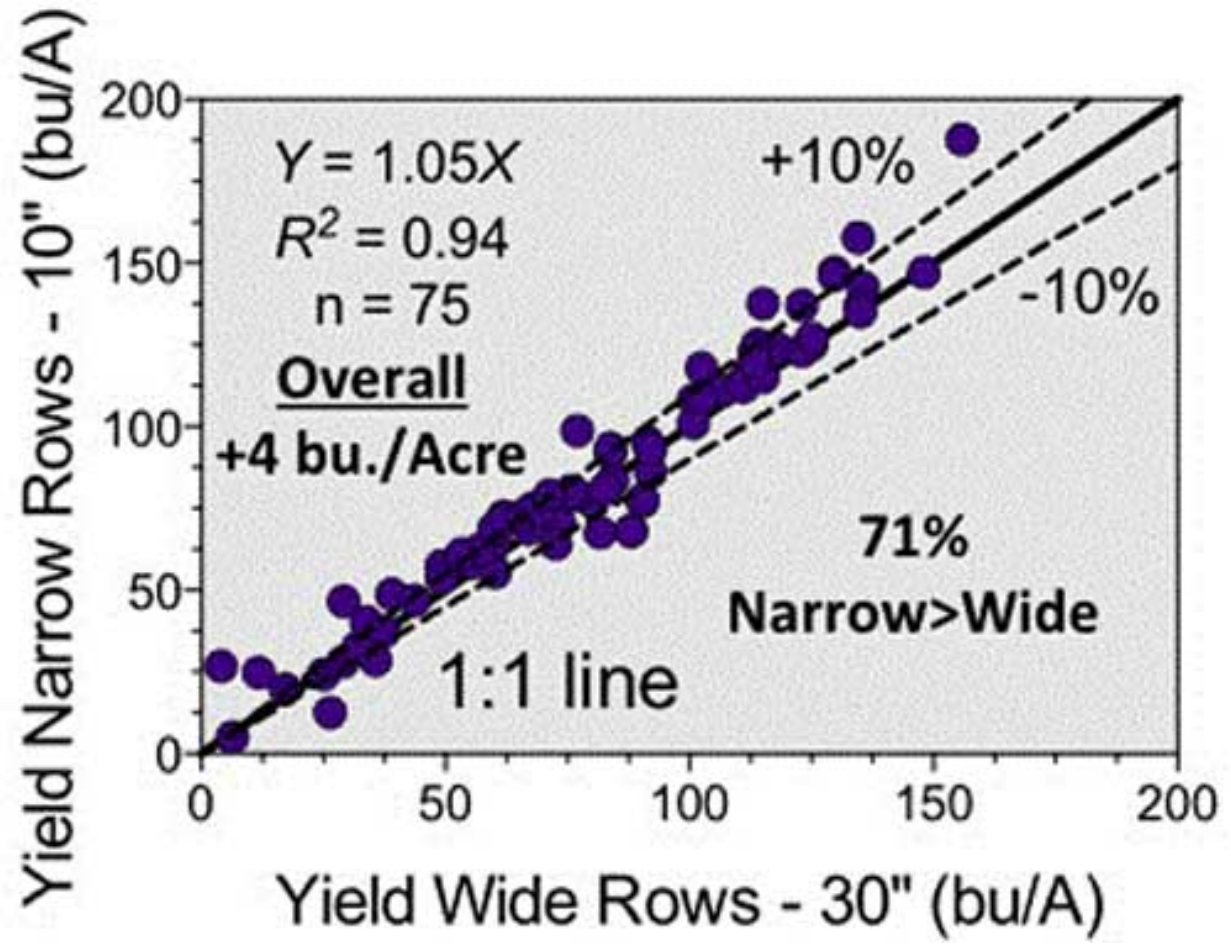

Figure 3. Yield in narrow rows versus yield in wide rows. From a total number of 75 observations, 71% had a greater yield in narrow as compared to wide row spacing.

Should populations be adjusted with narrow rows?

Research results indicate that the population producing the greatest yield doesn't change with different row spacing, but the magnitude of response to population potentially can be greater with narrower row spacing 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 exsertion, 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 (Figure 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.

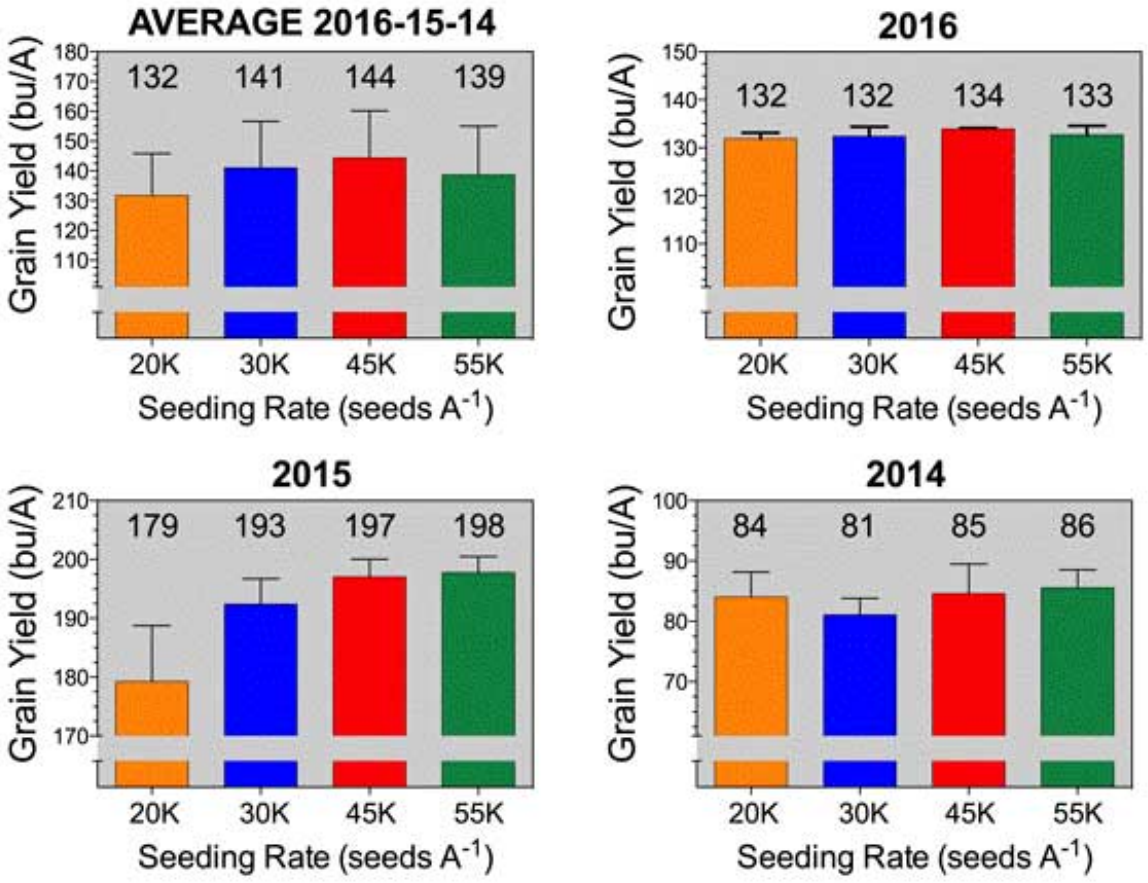

Figure 4. On-farm sorghum seeding rate studies performed in collaboration with Sandra Wick, Post Rock Extension District, sorghum farmers, and KSUCROPS Lab - Dr. Ciampitti.

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 spacing 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

2. Herbicide carryover considerations when recropping damaged wheat

Growers who decide to terminate their wheat crop this spring because of poor stands or recent weather-related damage need to consider crop rotation restrictions relative to any herbicides that may have been applied to the wheat. Many of the commonly used sulfonylurea type herbicides, including metsulfuron, Ally, Ally Extra, Agility SG, Finesse, Glean, Amber, Peak, Rave, OutriderOlympus, and Power Flex HL are persistent and have fairly long crop rotation guidelines.

In general, the most tolerant summer crop to residues of these herbicides, is STS soybeans, followed by grain sorghum. Product labels tend to specify grain sorghum, but forage sorghum and sudangrasses would likely have similar levels of tolerance. One major exception to this guideline is sorghum and Outrider herbicide. Sorghum is extremely susceptible to Outrider and should not be planted for at least 22 months after application. In addition, fields should not be planted to sorghum for at least 14 months following Amber or Rave application according to label guidelines.

Producers who want to recrop to sorghum on their wheat acres that have received one of the other residual sulfonylurea herbicides should wait as long as possible to plant. Ideally, sorghum should not be planted on these fields until mid-June.

Cotton and non-STS soybeans are generally intermediate in tolerance to these herbicides. Many of these product labels recommend not planting cotton or non-STS soybeans until the following year, while others have a 3 or 4 month waiting interval or a clause that allows shorter recrop intervals in the case of catastrophic events if a field bioassay indicates it is safe to plant the crop. However, in those situations, the grower assumes all risk of crop injury.

Corn, sunflowers, canola, and alfalfa tend to be the most susceptible crops to the sulfonylurea herbicides and generally have rotation guidelines of 12 months or longer with most of these herbicides. With the high price of corn, many farmers may be interested in planting corn, but corn is very susceptible to residues of these herbicides.

Several herbicide labels make reference to shorter recrop intervals if planting IR corn. However, IR corn is obsolete and current Clearfield corn hybrids do not have the same level of cross resistance to sulfonylurea herbicides as did the IR corns.

Wheat fields that have been treated with Beyond herbicide can be recropped in the spring with any type of soybean or Clearfield sunflowers, but not to sorghum or corn.

Most other commonly used wheat herbicides in Kansas have short crop rotation restrictions. In fields where herbicide carryover is a concern, it would be best to wait until later in the spring before planting to allow as much time as possible for herbicide dissipation. Tilling the soil to try to “dilute” the herbicide residue likely will not have a great benefit and could increase the risk of soil erosion and moisture loss. Lowering residue managers on planters so that an inch or two of topsoil is thrown out of the rows could help get the seed into soil with lower herbicide levels.

Another consideration is how to kill the wheat crop if producers plan to recrop. For glyphosate to be effective, it has to be absorbed by healthy, growing plant parts. Wheat that has been injured and is not dead yet, but not growing well, may be hard to kill with glyphosate.

The best approach is to wait until the wheat is actively regrowing before applying glyphosate. Paraquat is not a good alternative as it burns back the treated leaves, and is not translocated to the crowns and lower buds, thus the wheat plant often can regrow from these structures.

Always refer to the specific herbicide label regarding crop rotation guidelines and restrictions. Label guidelines for crop rotation are often complicated by soil pH and geography. Some product labels have very rigid crop rotation restrictions, while other labels allow shorter intervals in the case of catastrophic crop failure, as long as the producer is willing to accept the risk of crop injury. Another confusing issue may be the existence of supplemental herbicide labels with shorter crop rotation guidelines than the regular label.

Dallas Peterson, Weed Management Specialist
dpeterso@ksu.edu

3. Common questions about soil sampling for pH and liming in continuous no-till fields

One question that commonly comes up with continuous no-till operations is: "How deep should I sample soils for pH?" Another common question is: "How should the lime be applied if the soil is acidic and the field needs lime?". This article addresses several common questions related to soil sampling for pH and lime applications in fields under continuous no-tillage.

Sampling depth in continuous no-till

Our standard recommendation for pH is to take one set of samples at the 0-6 inch depth. On continuous no-till fields where most or all of the nitrogen (N) is surface applied, we recommend taking a second sample to a 0-3-inch depth. We make the same recommendation for long-term pasture or grass hayfields, such as a bromegrass field, that has been fertilized with urea annually for several years.

Nitrogen fertilizer is the primary driving force in lowering soil pH levels, so N application rates and methods must be considered when determining how deep to sample for pH. In no-till, the effects of N fertilizer on lowering pH are most pronounced in the area where the fertilizer is actually applied. In a tilled system the applied N, or acid produced through nitrification, is mixed in through the action of tillage and distributed throughout the tilled area.

Where N sources such as urea or liquid UAN solutions are broadcast on the surface in no-till system, the pH effects of the acid formed by nitrification of the ammonium will be confined to the surface few inches of soil. Initially this may be just the top 1 to 2 inches but over time, and as N rates increase, the effect of acidity become more pronounced, and the pH drops at deeper depths (Figure 1). How deep and how quickly the acidity develops over time is primarily a function of N rate and soil CEC (cation exchange capacity), or buffering capacity.

Where anhydrous ammonia is applied, or liquid UAN banded with the strip-till below the surface, an acid zone will develop deeper in the soil. As with long-term surface applications, these bands will expand over time as more and more N fertilizer is placed in the same general area. The graphic below (Figure 1) illustrates the effect of repeated nitrogen and phosphorus application with strip-till in the same area in the row middle on a high CEC soil for more than 12 years.

Stratification of soil pH after 25 years of NT	Soil pH after banded fertilizer with strip-till

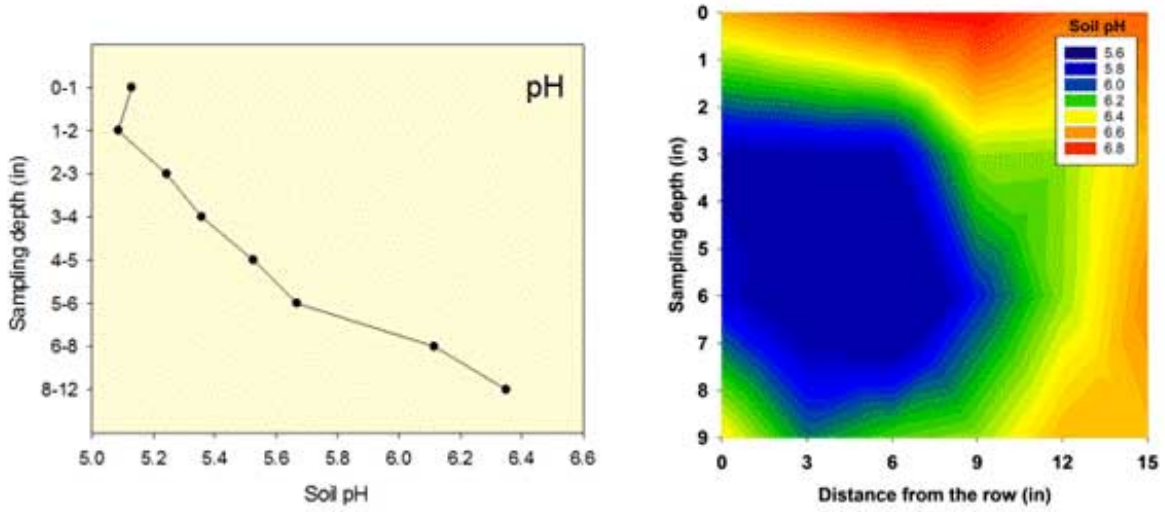

Figure 1. Soil pH stratification after 25 years of no-till and surface nitrogen fertilizer application, and the effect of repeated fertilizer application with strip-till in the same area after 12 years.

Liming application methods in continuous no-till

Where do you place the lime in continuous no-till?

If you surface apply N, then surface apply the lime. That is a simple but effective rule. Remember that surface-applied lime will likely only neutralize the acidity in the top 2-3 inches of soil. So if a producer hasn't limed for 20 years of continuous no-till and has applied 100 to 150 pounds of N per year, there will probably be a 4-5 inch thick acid zone, and the bottom half of that zone may not be neutralized from surface-applied lime. So, if a producer is only able to neutralize the top 3 inches of a 5-inch deep surface zone of acid soil, would that suggest he needs to incorporate lime? Not really. Research has shown that as long as the surface is in an appropriate range and the remainder of the acid soil is above pH 5, crops will do fine.

Liming benefits crop production in large part by reducing toxic aluminum, supplying calcium and magnesium, and enhancing the activity of some herbicides. Aluminum toxicity doesn't occur until the soil pH is normally below about 5.2 to 5.5 and KCl-extractable (free aluminum) levels are greater than 25 parts per million (ppm). At that pH the Al in soil solution begins to increase dramatically as pH declines further. Aluminum is toxic to plant roots, and at worse the roots would not grow well in the remaining acid zone.

This implies that the acid zones from ammonia or banded UAN are probably not a major problem. We have monitored ammonia bands in the row middles of long-term no-till for many years and while the pH dropped very low, we never saw any adverse impacts on the crop that would justify liming and using tillage to incorporate the lime. In fact, some nutrients such as zinc, manganese, and iron can become more available at low pH, which can be an advantage at times.

Yield enhancement is not the only concern with low-pH soils, however. Herbicide effectiveness must also be considered. The most commonly used soil-applied herbicide impacted by pH is atrazine. As pH goes down, activity and performance goes down. So in acidic soils, weed control may be impacted. We do see that happen in corn and sorghum production.

Liming products for no-till

When choosing a liming product, is there any value to using dolomitic lime (which contains a large percentage of magnesium in addition to calcium) over a purely calcium-based lime product?

Most Kansas soils have high magnesium content. So as long as we maintain a reasonable soil pH, there normally is enough magnesium present to supply the needs of a crop. Calcium content is normally significantly higher than magnesium, so calcium deficiency is very, very rare in Kansas. The soil pH would need to be below 4.5 before calcium deficiency would become an issue. Before calcium deficiency would occur, aluminum toxicity or manganese toxicity would be severely impacting crop growth. So producers really don't have to worry about a deficiency of calcium or magnesium on most Kansas soils.

What about the use of pelletized lime as a pH management tool on no-till fields?

The idea has been around for a while to use pel-lime in low doses to neutralize the acidity created from nitrogen and prevent acid zones from developing. Pel-lime is a very high-quality product, normally having 1800 to 2000 pounds of effective calcium carbonate (ECC) per ton, and can be blended with fertilizers such as MAP or DAP or potash easily. Therefore, if you apply enough product this can be an excellent source of lime. Lime can be from various sources and with different qualities. Consecutively, to ensure a standardized unit of soil-acidity neutralizing potential, we use units of ECC.

Summary

Applying N fertilizer to soil will cause the soil to become acidic over time. Placement of the applied N and the level of soil mixing done through tillage determine where the acid zones will develop. Make sure your soil testing program is focused on the area in the soil becoming acidic, and apply the lime accordingly.

Dorivar Ruiz Diaz, Nutrient Management Specialist
ruizdiaz@ksu.edu

4. Summer weather outlook for Kansas - June, July, and August

For most of Kansas, excess moisture has been the theme for the first half of May. Many locations, particularly in the eastern third of the state, have already received more than the total normal precipitation for May.

The outlook for June calls for continuation of that pattern, with an increased chance of wetter-than-normal conditions across the state. The signal is strongest in the western third and weakest in the east. The temperature outlook favors a cooler-than-normal pattern across the entire Central Plains. A normal or slightly below-normal precipitation pattern for June would be favorable in the eastern divisions where saturated soils continue to present problems. However, cool temperatures would slow the normal drying pattern. While cooler temperatures would favor grain fill in the fall-planted crops, this would also increase disease pressure. In addition, flooding could also be an issue due to the fact that streams, ponds, and reservoirs are full.

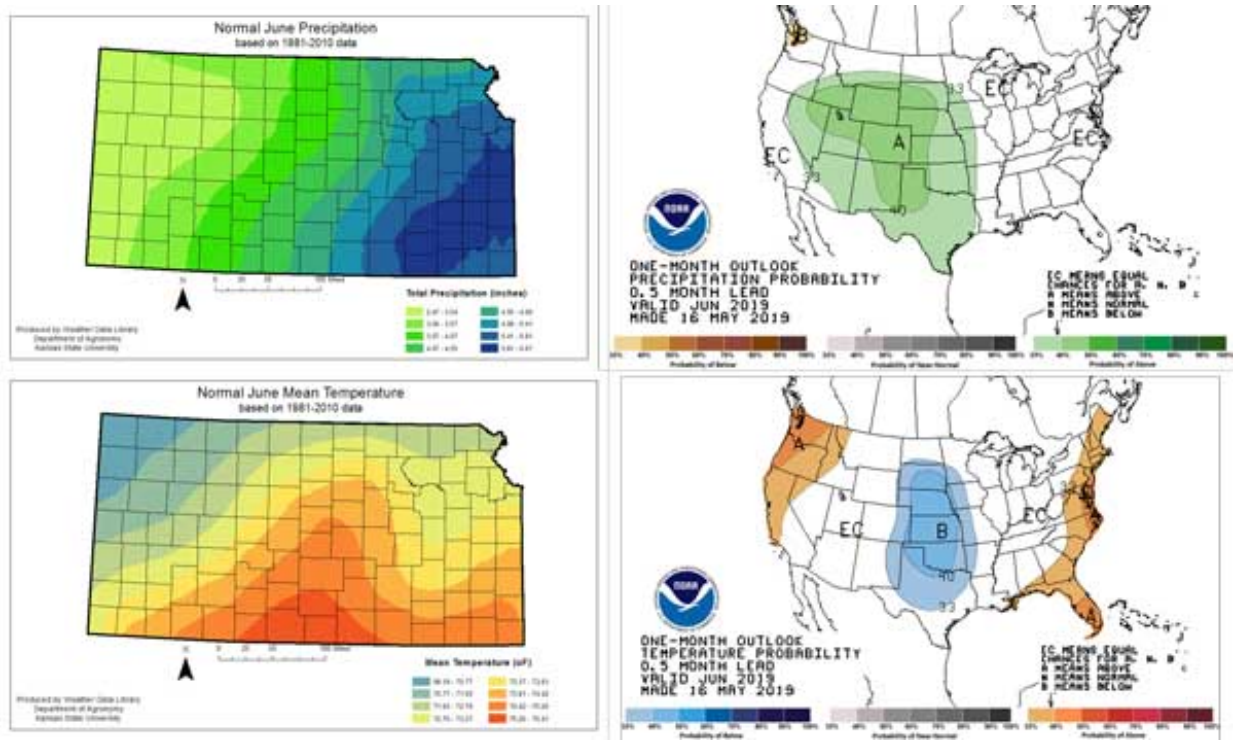

Figure 1. June temperature and precipitation outlooks (right panels) versus normal (Weather Data Library and Climate Prediction Center).

As the outlook is extended to the full summer season, the temperature outlook continues to favor cooler-than-normal temperatures across the state. However, this does not indicate how those temperatures might be distributed. An untimely period of warm temperatures at flowering/pollination could still create problems. An additional issue is that root development on spring-seeded crops is likely to be compromised by the cool, wet soils that have dominated the spring. This poor root development will make the crops more vulnerable to a relatively short dry period.

There is a slight chance for above-normal precipitation state-wide for the period. Again, this does not indicate the distribution pattern. A slightly drier-than-normal summer, with well distributed rains would be much more beneficial than a continuation of the rainy pattern. Planting has already been delayed, as well as cutting of alfalfa. The western third of the state has drier soil at the surface and would benefit more from a normal precipitation pattern.

An El Niño has been officially declared, but it continues to be weak. An El Niño generally favors wetter-than-normal conditions in the Central Plains.

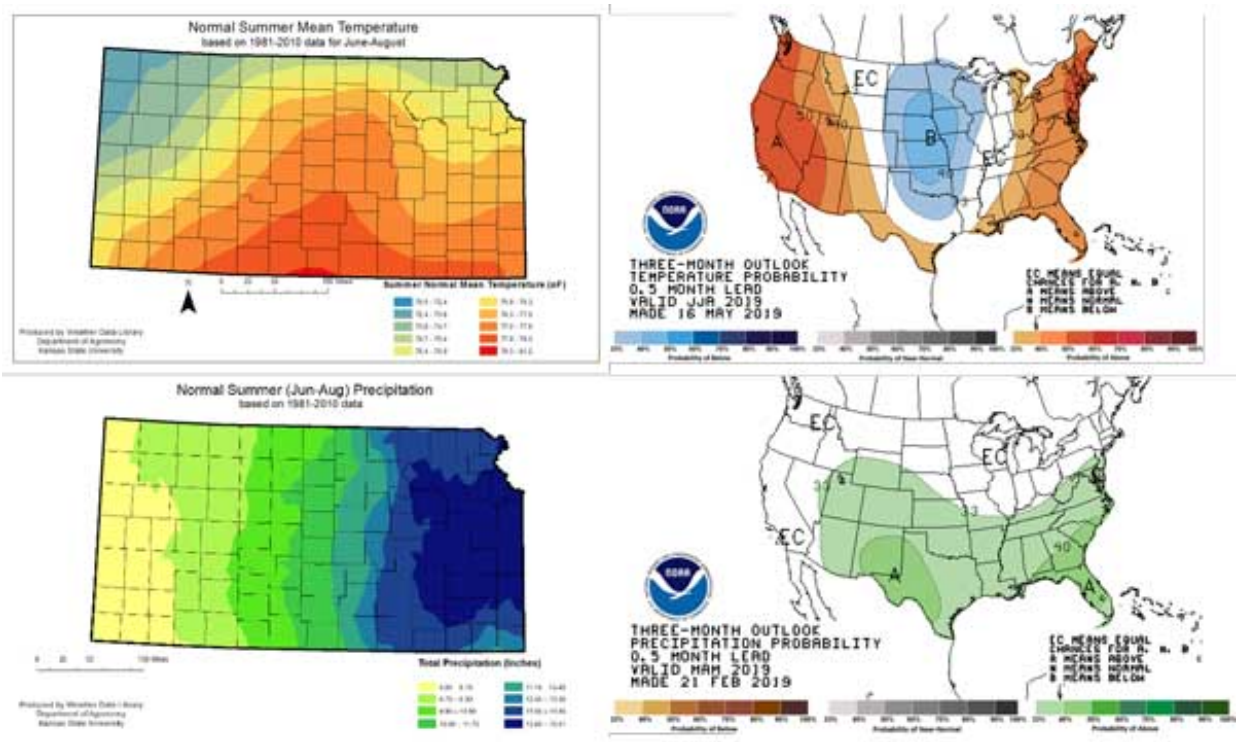

Figure 2. Spring temperature and precipitation outlooks versus normal for the June, July, August period (Weather Data Library and Climate Prediction Center).

Mary Knapp, Weather Data Library/Mesonet
mknapp@ksu.edu

Chip Redmond, Weather Data Library/Mesonet
christopherredmond@ksu.edu

5. New publication on spatial characterization of soybean yield and quality

A new publication, titled "Spatial Characterization of Soybean Yield and Quality" is now available through K-State Research and Extension. The authors include K-State cropping system specialist Ignacio Ciampitti and post-doctoral researcher Yared Assefa, along with agronomists from Iowa State University, Purdue University, Illinois Soybean Association, South Dakota State University, and the University of Minnesota.

Introduction

Harvested U.S. soybean acres increased from 72 to 89 million acres from 2000 to 2017. A primary driving factor for the growing trend in soybean production is its economic importance due to versatile end uses, serving as an oil seed crop, feed for animals, protein source, and biofuel feedstock.

Study Objective and Methods

Seed amino acid composition is one of the main factors determining overall soybean quality, leading to this study of the variation in seed amino acid concentration across the country. This study assessed the spatial association in amino acids concentration for the major U.S. soybean producing regions; and investigated relationships between seed quality indicators.

Data was collected from soybean testing programs in 14 states (Figure 1) from 2012 to 2016. Annual measurements of yield, oil, protein, and amino acid concentrations were all determined for each site. As a part of the overall evaluation, amino acids measured included arginine, cysteine, isoleucine, leucine, lysine, methionine, threonine, tryptophan, and valine.

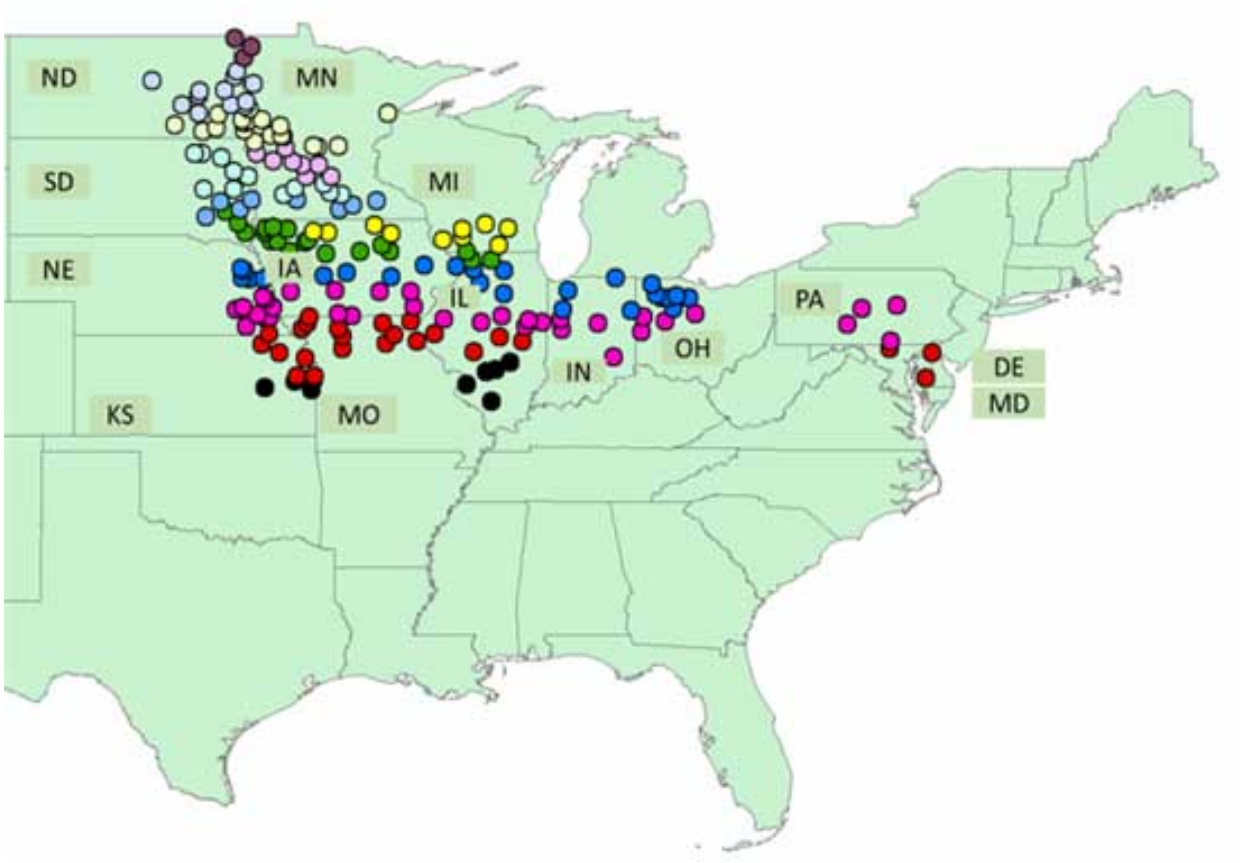

Figure 1. Soybean testing trial locations. Circles represent locations and colors represent regions with similar maturity groups. Graphic from MF3455 "Spatial Characterization of Soybean Yield and Quality", K-State Research and Extension.

Conclusions

This study confirmed the correlation between the concentration of protein and oil with latitude. It also found some correlation between essential amino acids and latitude. This geographical analysis reflects overall amino acid concentrations for soybean sourced from northern regions are lower than southern areas.

The entire publication with more information detailing the data collected, charts and figures, and results can be found online at: https://www.bookstore.ksre.ksu.edu/pubs/MF3455.pdf

The United Soybean Board (USB Project #1820-152-0108) and K-State Research and Extension provided funding to support this work. The authors appreciate the contribution of FIRST Seed Tests in providing the database presented in this synthesis-analysis.

Ignacio Ciampitti, Kansas State University
ciampitti@ksu.edu

Sotirios V. Archontoulis, Iowa State University

Shaun N. Casteel, Purdue University

Daniel Davidson, Illinois Soybean Association

Péter Kovács, South Dakota State University

Seth Naeve, University of Minnesota

Kansas State University Department of Agronomy
2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506
www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

6. K-State wheat plot tours for May 20-24, 2019

The week of May 20-24 features several wheat plot tours in Kansas. Producers wanting 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. 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 20-24, the plot tour locations include:

Monday, 5/20/2019, 6:00 pm
Location: Caldwell, Sumner Co.
Contact: Randy Hein, rvhein@ksu.edu
Directions: 6:00 pm (meal sponsored by Farmers Grain Co). From Caldwell, west on Bluff City Rd, 1/4 mile north of town, west side of road, south of cemetery.

Tuesday, 5/21/2019, 8:30 am
Location: Andale, Sedgewick Co.
Contact: Jeffrey Seiler, jseiler4@ksu.edu
Directions: Corner of 247th St W & 6th St S (GPS Cord: 37.678316 – 97.622728)

Tuesday, 5/21/2019, 10:30 am
Location: Clearwater, Sedgewick Co.
Contact: Jeffrey Seiler, jseiler4@ksu.edu
Directions: 1/3 of a mile west of intersection 151st ST W & 95th St S north side of the road, E. of the bridge (GPS Cord: 37.519075-97.520814)

Tuesday, 5/21/2019, 6:00 pm
Location: Belle Plaine, Sumner Co.
Contact: Randy Hein, rvhein@ksu.edu
Directions: 2mi. 6:00 pm (meal sponsored by Hysken Ag - Belle Plaine) at 1459 E 60th Avenue North southeast of BellePlaine. Plot located 1/2 mile east, 1/8 mile north of address, east side of the road.

Wednesday, 5/22/2019, 8:30 am
Location: Harper, Harper Co.
Contact: Jenni Carr, jlcarr@ksu.edu
Directions: From K-2 and Hwy 160 Jct at Harper, go 2 miles east and 1/2 south. Watch for signs.

Wednesday, 5/22/2019, 10:00 am
Location: Lyons, Rice Co.
Contact: Wendy Hughes, wshughes@ksu.edu
Directions: NE corner of 12th road and 56 Hwy

Wednesday, 5/22/2019, 4:00 pm
Location: Conway Springs, Sumner Co.

Contact: Daryl Strouts, dstrouts@ksu.edu
Directions: From Conway Springs, head north to 140 Ave N, then east 1.1 miles. Plot is on the south side of the road.

Wednesday, 5/22/2019, 6:00 pm
Location: Conway Springs, Sumner Co.
Contact: Randy Hein, rvhein@ksu.edu
Directions: 6:00 pm meal sponsored by Tom Pauly Seed at 922 West 140th avenue north; plots located: from Conway Springs, go north to 140 Ave N, east 1.1 miles, plots on the south side of the road.

Wednesday, 5/22/2019, 5:00 pm
Location: Winfield, Cowley Co.
Contact: Elizabeth Espino, eespino@ksu.edu
Directions: Plot located on the corner of West 202 and HW 77, Winfield, KS

Wednesday, 5/22/2019, 7:00 pm
Location: Winfield, Cowley Co.
Contact: Elizabeth Espino, eespino@ksu.edu
Directions: Ray Enterprise Wheat Plot at 1500-15998 51st Rd. Winfield,KS. Following the Ray plot dinner is provided by American Ag Credit and attendees are welcome to stay and chat and have dinner or leave.

Thursday, 5/23/2019, 10:00 am
Location: Assaria
Contact: Daryl Strouts, dstrouts@ksu.edu
Directions: From Assaria, head south 2 miles to Lapsley Rd, go 1/4 mile east. Plot is on the north side.

Thursday, 5/23/2019, 11:00 am
Location: Phillipsburg, Phillips Co.
Contact: Cody Miller, codym@ksu.edu
Directions: Patrick Plot- North of Phillipsburg on HWY 183 1.5 miles

Thursday, 5/23/2019, 2:30 pm
Location: Stockton, Rooks Co.
Contact: Cody Miller, codym@ksu.edu
Directions: North of Stockton on HWY 183 5 miles, East 2 miles on E RD, south ½ mile on 20 RD, (Plot is on the West Side of the Road)

Thursday, 5/23/2019, 6:00 pm
Location: Victoria, Ellis Co.
Contact: Stacy Campbell, scampbel@ksu.edu
Directions: Directions from I-70 take the Victoria exit 168 go 2.5miles N. on Cathedral Ave./HWY. 255, turn W. onto Fairground Rd. go 1.5 mile. From Catharine go ½ E., turn S. onto 310, go 1 mile and turn E. onto Fairground Rd., go 1.5 miles.)

Friday, 5/24/2019, 10:30 am
Location: Mentor, Saline Co.
Contact: Jay Wisbey, jwisbey@ksu.edu

Directions: Plot is located ½ mile west of Mentor at intersection of Old Hwy 81/Mentor Rd. Noon – A complimentary meal will be served courtesy of Phillips Seed Farms, Inc. at the Mentor Fire Station.

Friday, 5/24/2019, 1:30 pm
Location: Minneapolis, Ottawa Co.
Contact: Jay Wisbey, jwisbey@ksu.edu
Directions: Plot is located 1 ½ miles west of K-106 Hwy on Justice Rd.

The eUpdate will highlight upcoming tours each week. Stay tuned!

Romulo Lollato, Extension Wheat Specialist
lollato@ksu.edu

Erick DeWolf, Extension Wheat Pathologist
dewolf1@ksu.edu

7. Three winter canola 2019 field days scheduled for late May

The latest research, variety, and production information on winter canola will be featured at K-State Research and Extension (KSRE) field days on May 20, 24, and 29.

The field days are excellent opportunities to see winter canola variety trials and producer fields. New and experimental varieties will be on display and a discussion will be held on the current growing season. With harvest season approaching, harvest management options will also be discussed. Producers will have opportunities to get their questions answered about making winter canola a viable rotation option in Kansas.

According to K-State canola breeder, Mike Stamm, the production year has been another interesting one, starting with moist conditions for planting last fall and fluctuating temperatures over the winter. The crop is poised for a good harvest, and the aim is to reassure producers that there are many benefits to growing canola in rotation.

The schedules and locations for the field days include:

Monday, May 20 - Kingman County starting at 10:00 a.m.

The program will be held at the canola variety trials south of Norwich. From the KS-2 and SE 160th Street intersection, drive ½ mile east. The plots are on the south side of the road. See the National Winter Canola Variety Trial (NWCVT), learn about new winter canola varieties on the market, and hear how local producers are using canola in rotation. Refreshments will be provided.

Friday, May 24 - Reno County starting at 10:00 a.m.

The program begins at the South Central Kansas Experiment Field, 10620 South Dean Road, Hutchinson. The NWCVT and K-State variety trials will be on display. Learn about new winter canola varieties on the market. Attendees will hear about a new canola establishment study in cooperation with industry. Refreshments will be provided.

Wednesday, May 29 - Gray County starting at 10:00 a.m.

The program will be held at a canola field located 2 miles east of Montezuma at the intersection of US-56 and 15 Road. Hear how a local producer is incorporating canola into rotation, learn about new canola varieties, and assess the prospects for canola production in southwest Kansas. Lunch will be sponsored by Helena.

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

8. Kansas Composting Operators' School, June 11-12 in Manhattan

The Kansas Composting Operators' 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 school will take place on June 11-12 at Pottorf Hall on the Riley County Fairgrounds, 1710 Avery Ave, Manhattan, 66503.

The program includes classroom and laboratory instruction along with field activities. Field activities will include a demonstration of composting equipment such as a turner, and collection of compost samples for testing for maturity as well as chemical and physical properties.

Instructors for this year will be DeAnn Presley, K-State Agronomy Department and Emery Wiens, Kansas Department of Health and Environment.

Training topics will include:

- Composting science and methods
- Compost biology
- Compost feedstocks
- Food waste composting
- Determining compost mixes
- Permit and legal requirements
- Site design and maintenance
- Compost equipment
- Windrow construction and aeration
- Compost moisture
- Field and laboratory monitoring
- Learn to measure moisture, temperature, pH, soluble salts, maturity, and interpreting lab data
- Compost quality and use
- Methods of composting: static vs. active

Registration is due by **June 3** and class size is limited to 20 people. The registration fee ($195) will include lunches, breaks, and training materials. Participants are responsible for travel and lodging. Payment (payable to KSU Agronomy) must accompany registration. Mail payment and the registration portion on the flyer included below to: Extension Agronomy, 2014 Throckmorton Plant Sciences Center, Kansas State University, Manhattan, KS 66506. Online registration is available for credit card payment (additional fees apply): http://www.agronomy.k-state.edu/extension/soil-management/.

DeAnn Presley, Soil Management Specialist
deann@ksu.edu

Kansas Composting Operators' School

K-STATE Research and Extension

June 11-12, 2019
Pottorf Hall, Riley County Fairgrounds
1710 Avery Ave, Manhattan, KS 66503

KANSAS DON'T SPOIL IT!

The Kansas Composting Operators' 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. Field activities will include a demonstration of composting equipment such as a turner, and collection of compost samples for testing for maturity as well as chemical and physical properties.

Training Topics

- ✓ Composting science and methods
- ✓ Compost biology
- ✓ Compost feedstocks
- ✓ Food waste composting
- ✓ Determining compost mixes
- ✓ Permit and legal requirements
- ✓ Site design and maintenance
- ✓ Compost equipment
- ✓ Windrow construction and aeration
- ✓ Compost moisture
- ✓ Field and laboratory monitoring:
- ✓ Learn to measure moisture, temperature, pH, soluble salts, maturity, interpreting laboratory data
- ✓ Compost quality and use
- ✓ Methods of composting: static versus active

Instructors

DeAnn Presley
KSU Agronomy Department
Email: deann@ksu.edu

Emery Wiens
Kansas Department of Health & Environment
Email: emery.wiens@ks.gov

REGISTRATION: Kansas Composting Operators' School

Name_____ Company or Employer_____

Address_____City_____State____ZIP_____

Phone_____ E-Mail_____

Company/Agency:_____

Please mention any mobility issues or dietary preferences here:_____

Fee: $195 – Includes lunches, breaks, and training materials. Participants are responsible for travel and lodging. Payment (payable to KSU Agronomy) must accompany registration. Mail to: Extension Agronomy, 2014 Throckmorton Plant Sciences Center, Kansas State University, Manhattan, KS 66506. Online registration available for those who want to pay with a credit card (additional fees apply), http://www.agronomy.k-state.edu/extension/soil-management/
Registration due by June 3, 2019. Class size is limited to 20 people.