



Extension Agronomy

eUpdate

07/13/2018

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.

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1. Plant analysis for testing nutrient levels in soybeans.....	3
2. First report of sugarcane aphid on grain sorghum in Kansas.....	6
3. Canola yields in Kansas in 2018.....	11
4. Kansas River Valley Fall Field Day - August 14.....	15
5. East Central Experiment Field fall field day - August 15.....	17
6. Soil health summer tour - July 27	19

1. Plant analysis for testing nutrient levels in soybeans

When crop fields appear variable, one question commonly asked is whether this is due to a nutrient problem. An excellent tool that can be used to answer this question is plant analysis or tissue testing.

As with corn, wheat, and other crops, there are two primary ways plant analysis can be used: as a *routine monitoring tool* to ensure nutrient levels are adequate in the plant in normal or good looking crops, and as a *diagnostic tool* to help explain some of the variability and problems we see in soybean growth and appearance in fields.

Plant analysis as a routine monitoring tool

For monitoring nutrient levels purposes, collect 20-30 sets of the upper, fully developed trifoliolate leaves, less the petiole, at random from the field anytime between flowering and initial pod set (growth stages R1-4). The top fully developed leaves are generally the dark green leaves visible at the top of the canopy, which are attached at the second or third node down from the top of the stem.

Sampling later, once seed development begins, will give lower nutrient contents since the soybean plant begins to translocate nutrients from the leaves to the developing seed very quickly. Sampling leaf tissue under severe stress conditions for monitoring purposes can also give misleading results and is not recommended.

The sampled leaves should be allowed to wilt overnight to remove excess moisture, placed in a paper bag or mailing envelope, and shipped to a lab for analysis. Producers should not place the leaves in a plastic bag or other tightly sealed container, as they will begin to rot and decompose during transport, and the sample won't be usable.

Which nutrients should you request analysis?

In Kansas, nitrogen (N), phosphorus (P), potassium (K), sulfur (S), zinc (Zn) and iron (Fe) are the nutrients most likely to be deficient in soybeans. Normally the best values are the “bundles” or “packages” of tests offered through many of the labs. The packages can be as simple as N, P and K, or can consist of all of the 14 mineral elements considered essential to plants. K-State offers a package that includes N, P, K, Ca, Mg, S, Fe, Cu, Zn, and Mn for \$32.00.

The data returned from the lab will be reported as the concentration of nutrient elements, or potentially toxic elements in the plants. Units reported will normally be in terms of “percent” for the primary and secondary nutrients (N, P, K, Ca, Mg, and S) and “ppm,” or parts per million, for the micronutrients (Zn, Cu, Fe, Mn, B, Mo, and Al). Most labs/agronomists compare plant nutrient concentrations to published sufficiency ranges. A sufficiency range is simply the range of concentrations normally found in healthy, productive plants during surveys. A diagram explaining this concept is shown in Figure 1.

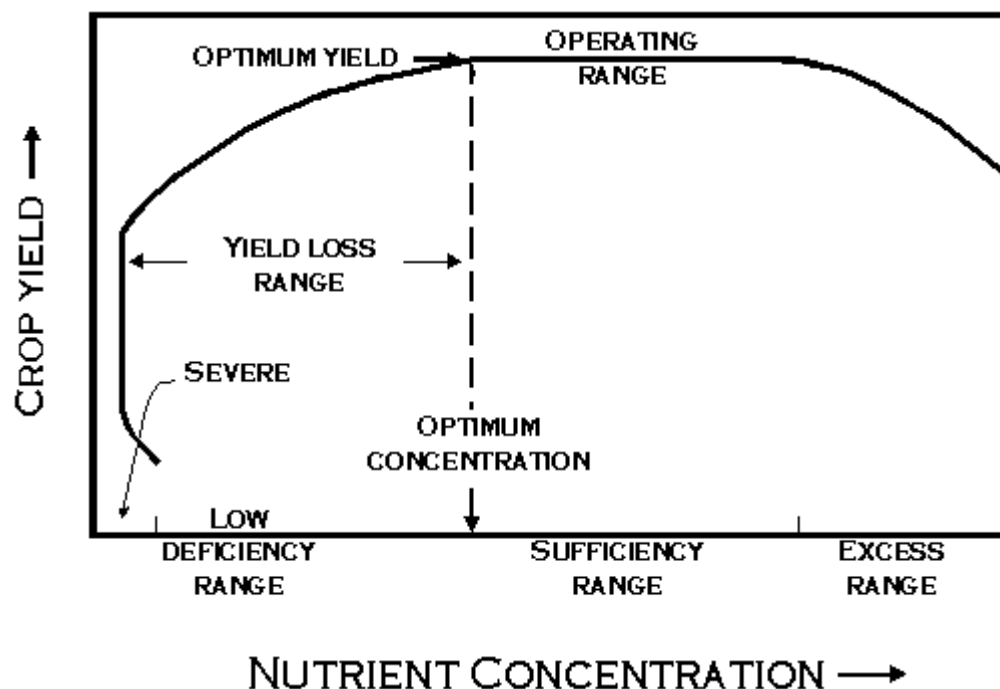


Figure 1. Example of plant analysis interpretation using the concept of a sufficiency range.

Table 1 gives the range of nutrient content considered to be "normal" or "sufficient" for top, fully developed soybean leaves at early pod set. Keep in mind that these are the ranges normally found in healthy, productive soybeans.

Table 1. Nutrient content considered "normal" or "sufficient" for soybeans

Nutrient	Units	Growth Stage (Top, fully developed leaves at pod set)
Nitrogen	%	4.25-5.50
Phosphorus	%	0.25-0.5
Potassium	%	1.70-2.50
Calcium	%	0.35-2.00
Magnesium	%	0.26-1.00
Sulfur	%	0.15-0.50
Copper	ppm	10-30
Iron	ppm	50-350
Manganese	ppm	20-100
Zinc	ppm	20-50
Boron	ppm	20-55
Molybdenum	ppm	1.0-5.0
Aluminum	ppm	<200

Plant analysis as a diagnostic tool

Plant analysis is an excellent diagnostic tool to help understand some of the variation seen in the field. When using plant analysis to diagnose field problems, producers should try to take comparison samples from both good/normal areas of the field, and problem areas. Collect soil samples from the same good and bad areas, and don't wait for flowering to sample soybeans. Early in the season, when plants are 8-10 inches tall, collect whole plants from 15 to 20 different places in the sampling areas. Later in the season, collect 20-30 sets of top, fully developed leaves. Handle the samples the same as those for monitoring, allowing them to wilt to remove excess moisture, and avoiding mailing in plastic bags.

Soil samples are important in diagnostic work, because while a plant may be deficient in a nutrient, it may not be due to a shortage in the soil. Other factors such as soil compaction, insect or disease damage to the roots, low pH limiting nodulation, or many other issues can limit nutrient uptake in soybeans.

Plant samples can be sent to the K-State Soil Testing Laboratory for analysis at:

K-State Research and Extension
2308 Throckmorton PSC
1712 Claflin Rd.
Manhattan, KS 66506-5503

For more information on plant analysis testing, including available tests, forms, and costs, please visit the K-State Soil Testing Lab website at:

<http://www.agronomy.k-state.edu/services/soiltesting/index.html>

Summary

In summary, plant analysis is a good tool producers can use to monitor the sufficiency of soil fertility levels and inoculant effectiveness, and a very effective diagnostic tool. Producers should consider adding this to their toolbox.

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2. First report of sugarcane aphid on grain sorghum in Kansas

The sugarcane aphid (SCA) has now been reported in Cowley County. Grain sorghum producers in Kansas should begin scouting their fields on a routine basis.

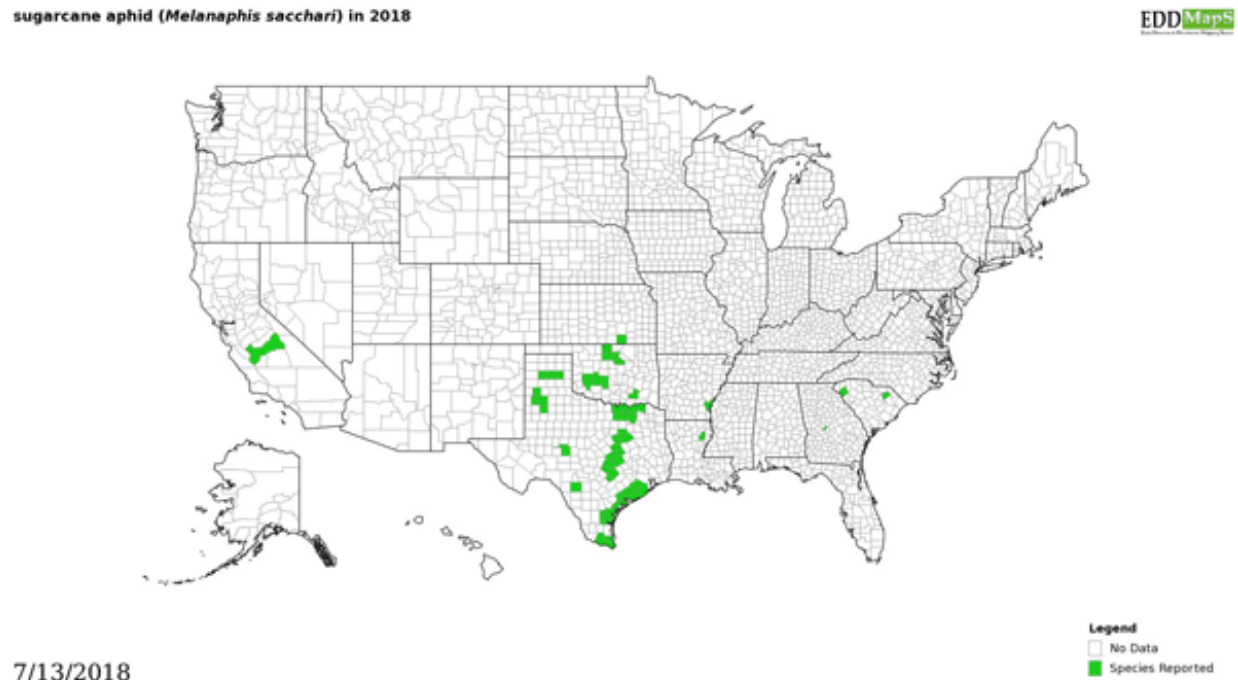


Figure 1. Current status of the SCA. The map indicates only the counties in which the SCA has been found, and does not indicate how many or how few aphids were found in that county.

Source: <https://www.myfields.info/pests/sugarcane-aphid>

What can we expect this season? It's impossible to know for sure at this time. Infestations in Kansas in 2017 were sporadic, and most issues were late season (Figure 2). But in 2016, sugarcane aphids were a significant problem on grain sorghum in Kansas, Texas, Oklahoma, and most southern states, and fields were justifiably sprayed to protect yields.

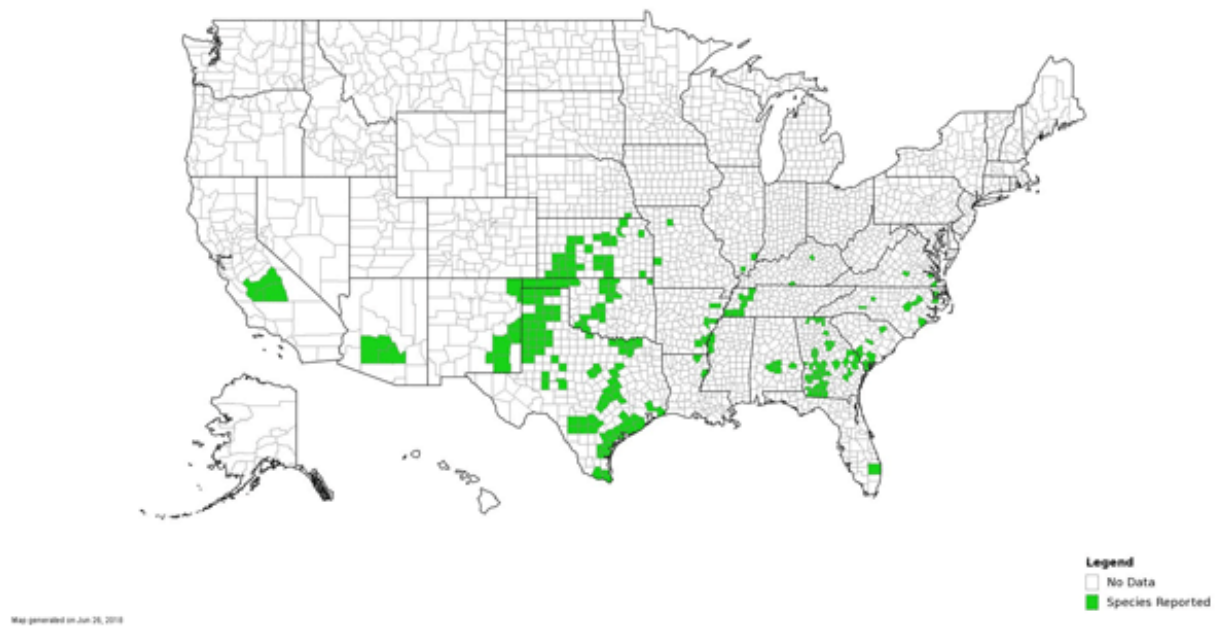
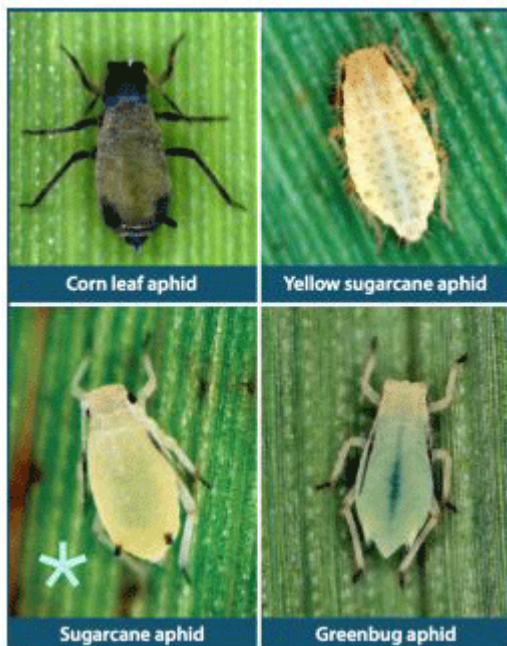


Figure 2. The distribution of SCA in 2017.

Early detection is key to the management of this pest, but treatments should be based on established thresholds. One heavily infested plant does not equal a yield loss. Applying insecticides too soon can result in repeated applications, which occurred during the 2015 season. See scouting and treatment recommendations below.



Scouting time

Plants are vulnerable to infestation by SCA at any growth stage, but Kansas sorghum is most at risk from boot stage onward. The ability of sugarcane aphid to overwinter on Johnsongrass and re-sprouting sorghum stubble represents challenges to the management of this pest in more southerly regions.

In 2017, the SCA overwintered as asexual females on Johnsongrass rhizomes in south central Texas and northern Mexico. Infestations begin when swarms of winged aphids settle in a field and begin to establish colonies, which usually occurs after a large storm front pushes aphids from south to north. Once winged adults deposit nymphs, these immature aphids can mature in less than a week, lack wings, and have a much higher reproductive rate than their winged mothers. Established colonies of wingless aphids quickly become large and crowded, which causes winged forms to develop, until the final generation is exclusively winged once again. Thus, the trend will be for Kansas to receive SCA only after infestations to the south mature and produce winged migrants. Growers are advised to plant sorghum as early as agronomically feasible to maximize plant growth and maturity before aphids arrive. In 2017, large flights of winged sugarcane aphid arrived in Kansas somewhat later than in 2016 and a smaller area of the state was affected, despite cold wet spring weather in the south that delayed the aphids initially. It remains to be seen how the 2018 season will develop, but given the slow march across Texas and Oklahoma, we expect to see something similar to last year.

Sampling method

- Once a week, walk 25 feet into the field and examine plants along 50 feet of row:
- If honeydew is present, look for SCA on the underside of a leaf above the honeydew.
- Inspect the underside of leaves from the upper and lower canopy from 15–20 plants per location.
- Sample each side of the field as well as sites near Johnsongrass and tall mutant plants.
- Check at least 4 locations per field for a total 4 locations per field for a total of 60-80 plants.

If no SCA are present, or only a few wingless/winged aphids are on upper leaves, repeat this sampling method once a week thereafter.

If SCA are found on lower or mid-canopy leaves, begin twice-a-week scouting. Use the same sampling method, but be sure to include % plants with honeydew. Estimate the % of infested plants with large amounts of SCA honeydew (shiny, sticky substance on leaf surface) to help time foliar insecticides for SCA control on sorghum (Table 1).

Table 1. SCA Thresholds

Growth Stage	Threshold
Pre-Boot	20% plants infested with localized area of heavy honeydew and established aphid colonies
Boot	20% plants infested with localized area of heavy honeydew and established aphid colonies

Soft dough	30% plants infested with localized area of heavy honeydew and established aphid colonies
Dough	30% plants infested with localized area of heavy honeydew and established aphid colonies
Black Layer	Heavy honeydew and established aphid colonies in head *only treat to prevent harvest problems **observe preharvest intervals

The myFields web site: Keeping updated on SCA in Kansas and reporting findings

For ongoing current information on SCA in Kansas, check out the myFields web site often in the coming weeks and months: <https://www.myfields.info/pests/sugarcane-aphid>

It would be helpful if producers would report findings of SCA in their fields on the myFields web site as soon as the insects are found. Reports of findings are used in developing the maps seen in Figures 1 and 2.

The reports used to develop each map are, in part, those submitted through the myFields web site from account holders that also have special permissions as "Verified Samplers." Only reports submitted by these verified samplers get mapped so that we can account for data quality. However, we do encourage any account holder to report their observations on the SCA. Web site administrators can see these reports and can contact the submitter for a confirmation, a great way to get an early detection in new areas. Web site visitors will need to: 1) sign up for an account, 2) log in, 3) to get access to the 'Scout a Field' feature to make reports. The *Scout a Field* tool is easy, you just map the observation location and select yes or no for SCA presence.

Here is the sign up page: <https://www.myfields.info/user/register>

Also, if sorghum producers are interested in receiving alerts, which are triggered by new reports submitted by verified samplers, they just need to sign up for a free myFields.info account using the link above. Signing up for an account automatically signs them up for SCA alerts, but they can also opt out of them in their user preferences. The alerts include a statewide email notice when SCA is first detected in the state, and then are localized by county as SCA moves into the state. The notices will also contain latest recommendations and contact info for local Extension experts.

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3. Canola yields in Kansas in 2018

Canola yields at K-State Research and Extension trial sites and producer fields were lower than recent years. Similar to the state's wheat crop, canola was affected by challenging weather conditions. Limited soil moisture, cold winter temperatures, a cool start to spring, and a warmer-than-normal May contributed to reduced biomass, shorter flowering and grain filling periods, and lower yield potential. Despite these challenges, yields tended to be somewhat better than expected.

Yields were the lowest where plant stands were thinned by cold temperatures in late December 2017 and early January 2018. Yields were the highest where plant stands remained relatively intact. This was particularly true near Manhattan. Variety trials were planted in mid-September after a three-quarters inch rain, allowing the plants to achieve adequate fall growth going into the winter months. Even though temperatures dropped below 0 degrees F six times, with a minimum low temperature of -8 degrees F, winter survival still averaged near 90%.

Trial sites for the canola breeding program were harvested at Colby, Garden City, Manhattan, and Norwich. Cultivar averages were in the upper 30s near Manhattan and upper 20s/low 30s near Norwich. The Colby and Garden City trial sites was negatively affected by hail (results are pending). Trial sites near Hutchinson and Kiowa were lost to poor establishment. Trial sites near Belleville and Troy were lost to poor establishment and eventually winterkill because the plants were too small for overwintering.

One positive outcome to the challenging year is that 2018 was a good year for rating winter survival. Winterkill does not occur every year in canola so in colder years it is important to see differences in survivability. We continue to add to our knowledge base about how particular cultivars handle the cold. This information provides us with a means for making better variety recommendations and advancements.

The 2018 National Winter Canola Variety Trial (NWCVT) entries are provided in Table 1. Yields for Manhattan and Norwich are summarized for the open-pollinated (OP) and hybrid entries in Figures 1 and 2, respectively.

Table 1. Entries for the 2018 National Winter Canola Variety Trial

Name	Source	Type [†]	Trait [‡]
KS4670	Kansas State University	OP	
KSR4723	Kansas State University	OP	Roundup Ready
KSR4724S	Kansas State University	OP	Roundup Ready/SURT
Surefire	KSU / Spectrum Crop Development	OP	SURT
Riley	Kansas State University	OP	
Sumner	Kansas State University	OP	SURT
Wichita	Kansas State University	OP	
Torrington	Ohlde Seed Farms	OP	
QUARTZ	KWS-MOMONT / Photosyntech	OP	
HIDYLLE	KWS-MOMONT	H	
HARMOUR	KWS-MOMONT	H	

MH 15HIB001	KWS-MOMONT	H	Clearfield
MH 15HIB002	KWS-MOMONT	H	Clearfield
MH 15AY085	KWS-MOMONT	H	
MH 15HT229	KWS-MOMONT	H	
Edimax CL	Rubisco Seeds	H	Clearfield
Inspiration	Rubisco Seeds	H	
Mercedes	Rubisco Seeds	H	
Popular	Rubisco Seeds	H	
Atora	DL Seeds	H	
Event	DL Seeds	H	
Phoenix CL	DL Seeds	H	Clearfield
Plurax CL	DL Seeds	H	Clearfield
Temptation	DL Seeds	H	
HyCLASS115W	CROPLAN by WinField	OP	Roundup Ready/SURT
HyCLASS225W	CROPLAN by WinField	OP	Roundup Ready/SURT
CP320W	CROPLAN by WinField	OP	Roundup Ready
Star 915W	Star Specialty Seeds	OP	Roundup Ready/SURT
Star 930W	Star Specialty Seeds	OP	Roundup Ready
DKW44-10	Monsanto / DEKALB	OP	Roundup Ready
DKW45-25	Monsanto / DEKALB	OP	Roundup Ready/SURT
DKW46-15	Monsanto / DEKALB	OP	Roundup Ready/SURT
DK Imiron CL	Monsanto / DEKALB	H	Semi-dwarf, Clearfield
DK Imistar CL	Monsanto / DEKALB	H	Semi-dwarf, Clearfield
DK Sensei	Monsanto / DEKALB	H	Semi-dwarf
DK Severnyi	Monsanto / DEKALB	H	Semi-dwarf
[†] OP=open pollinated; H=hybrid			
[‡] SURT: sulfonylurea herbicide carryover tolerant			

At Manhattan, Surefire was the highest yielding OP at 46.4 bu/acre. Surefire is a new variety release from K-State in 2017 that has been licensed to Spectrum Crop Development. The next highest yielding variety was DKW44-10 at 46.2 bu/acre. Rounding out the top 5 included K-State experimental varieties KS4675 (46.0 bu/acre) and KS4670 (42.2 bu/acre), and Star 930W (39.9 bu/acre). Star 930W is a K-State-released variety (KSR07363) that was recently licensed to Star Specialty Seeds.

At Norwich, the highest yielding OP was Wichita at 34.2 bu/acre. Rounding out the top 5 included Riley (33.7 bu/acre), Surefire (32.8 bu/acre), CP320W (32.6 bu/acre), and KS4670 at 32.3 bu/acre. CP320W is a 2017 K-State-released variety that was licensed to CROPLAN by WinField.

Harmour, a conventional hybrid from KWS-MOMONT was the highest yielding hybrid at 46.1 bu/acre in Manhattan. DK Imiron CL (46.0 bu/acre), DK Imistar CL (45.8 bu/acre), Event (45.0 bu/acre), and Plurax CL (43.8 bu/acre) rounded out the top 5. In Norwich, Plurax CL was the top yielding hybrid at 38.0 bu/acre followed by Event (38.0 bu/acre), DK Severnyi (37.9 bu/acre), Popular (37.0 bu/acre), and Mercedes (36.4 bu/acre).

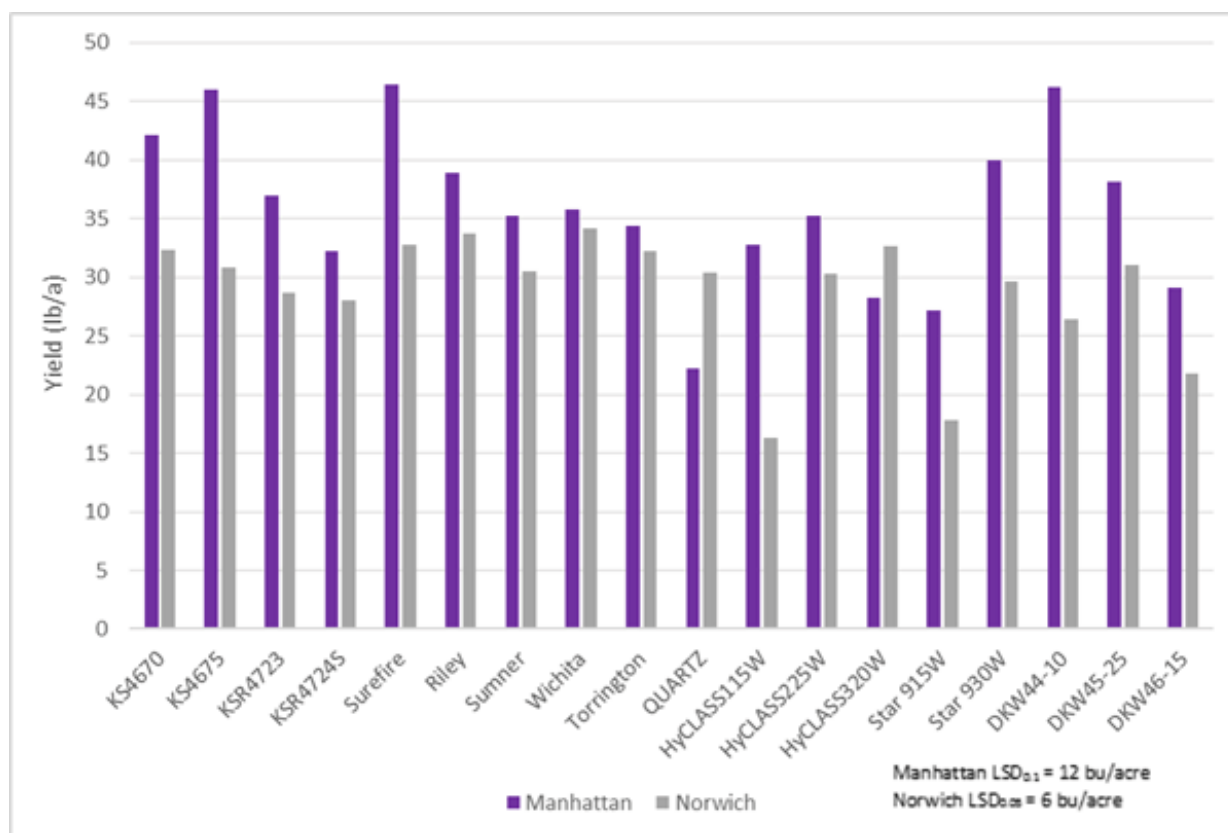


Figure 1. Yield results for the Manhattan and Norwich OP NWCVT in 2018.

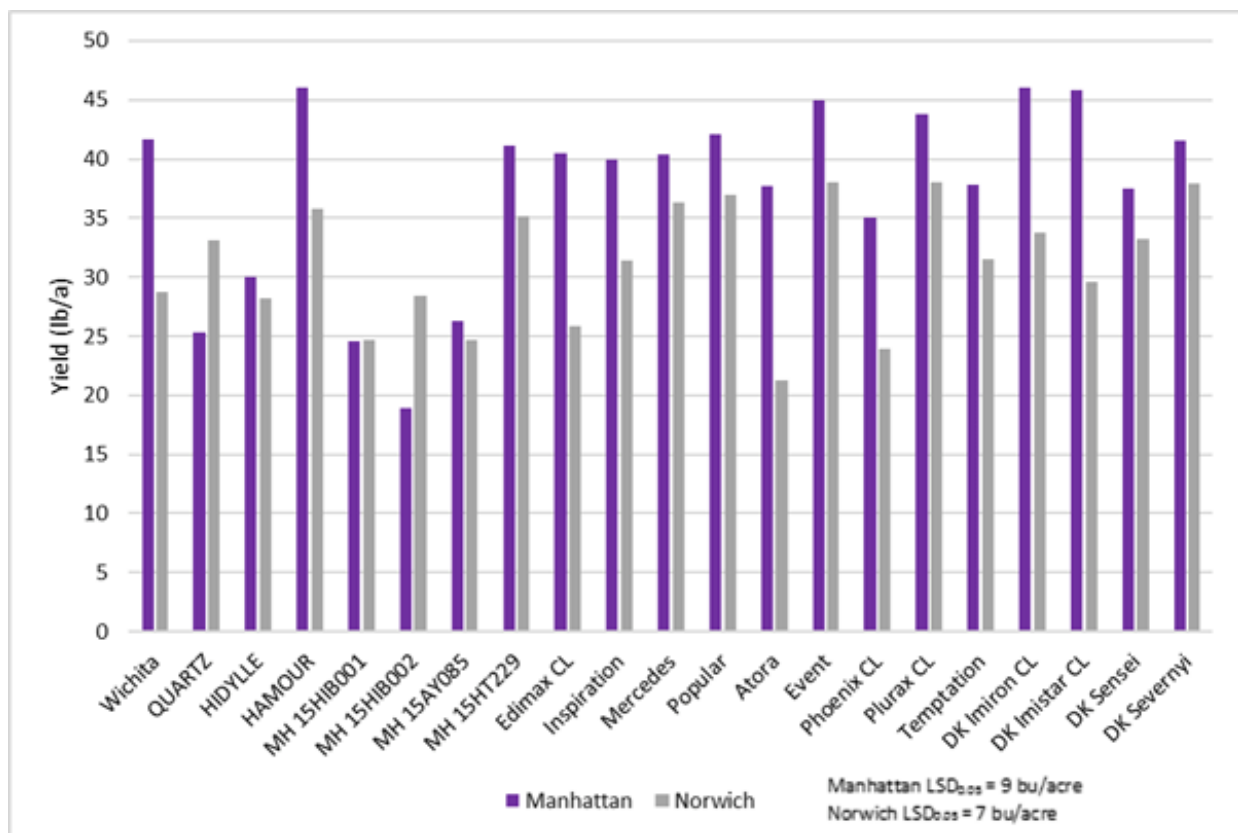


Figure 2. Yield results for the Manhattan and Norwich Hybrid NWCVT in 2018.

Careful variety selection is very important for successful winter canola production. Watch future Agronomy eUpdates for additional trial site results and suggestions to help with variety selection.

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4. Kansas River Valley Fall Field Day - August 14

All crop producers are invited to attend the **2018 Kansas River Valley Experiment Field Day** on **Tuesday, August 14 at 5:00 p.m.** The field day will be held at the Rossville field located 1 mile east of Rossville on Hwy. 24 on the south side of the road.

This is free event for all and will included a barbeque meal sponsored by Wilbur-Ellis. Presentations will be geared to having a more profitable and efficient crop production operation. Topics and speakers will include:

- **Dr. Anita Dille – Integrating cover crops into your weed management plans**
- **Dr. Nathan Nelson – Utilizing cover crops for erosion control**
- **Dr. Stu Duncan – Early weed control strategies in corn and soybeans**
- **Dr. Ignacio Ciampitti – Evolution of production management practices for corn and soybeans**

To pre-register for the catered meal, please call Michelle Wilson at the Shawnee County Extension office at 785-232-0062, Ext. 100, by **5:00 p.m. on Monday, August 13**. Additional field day sponsorship includes the Kansas Corn Commission. Certified Crop Advisor and Commercial Pesticide Applicator credits have been applied for.

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Kansas State Research & Extension

KSU Agronomy



Kansas River Valley Experiment Field 2018 Fall Field Day

Tuesday, August 14 - 5:00 p.m. Sharp!

Rossville Field — 1 mile east of Rossville on U.S.
Highway 24 on the south side of the road

Dr. Anita Dille – Integrating cover crop into your weed management plans

Dr. Nathan Nelson – Utilizing cover crops for erosion control.

Dr. Stewart Duncan--Early weed control strategies in corn & soybeans.

Dr. Ignacio Ciampitti – Evolution of production management practices for corn & soybean crops.

To pre-register for the catered BBQ meal sponsored by Wilbur-Ellis, call Michelle Wilson at the Shawnee County Extension Office at 785-232-0062 — Ext. 100 by 5:00 p.m. on Monday, August 13. Additional Field Day sponsorship in-part by the Kansas Corn Commission. **Certified Crop Advisor and Commercial Pesticide Applicator Credits have been applied for.**

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Kansas State University Department of Agronomy

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5. East Central Experiment Field fall field day - August 15

The East Central Experiment Field in Ottawa will host its fall field day on **Wednesday, August 15**. The event will begin at 9:00 a.m. with registration, coffee, and doughnuts. The field day program will begin at 9:30 a.m. A complimentary lunch will be served at noon to conclude the event.

Field day topics and speakers include:

- **Dr. Anita Dille – Integrating cover crops into your weed management plans**
- **Dr. Nathan Nelson – Utilizing cover crops for erosion control**
- **Dr. Stu Duncan – Early weed control strategies in corn and soybeans**
- **Dr. Ignacio Ciampitti – Evolution of production management practices for corn and soybeans**

The field day is located at the East-Central Experiment field near Ottawa. From I-35 at the Ottawa exit, go south 1.7 miles on Hwy 59, then east 1 mile, and south 0.75 mile.

Certified Crop Advisor and Commercial Pesticide Applicator credits have been applied for. Please contact the East-Central Research Station at 785-242-5616 at least two days prior to the event if accommodations are needed for persons with disabilities or special requirements. The field day is sponsored in part by the Kansas Corn Commission.



Kansas State Research & Extension



KSU Agronomy Ottawa Field Day

Wednesday, August 15th, 2018

East-Central Experiment Field

Ottawa, KS

**From I-35 at Ottawa: South 1.7 miles on
59 Hwy, East 1.0 mile, South 0.75 mile**

9:00Registration, coffee, and doughnuts

9:30Program begins

**Dr. Anita Dille – Integrating cover crop into your weed management
plans**

Dr. Nathan Nelson – Utilizing cover crops for erosion control

Dr. Stewart Duncan--Early weed control strategies in corn & soybeans

**Dr. Ignacio Ciampitti – Evolution of production management practices
for corn & soybean crops**

12:00Lunch

**Certified Crop Advisor and Commercial Pesticide Applicator Credits have been applied for.
Please contact the East-Central Research Station at 785-242-5616 at least two days prior to
this event if accommodations are needed for persons with disabilities or special requirements.
Field Day sponsored in-part by the Kansas Corn Commission.**

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6. Soil health summer tour - July 27

K-State Research and Extension and the Department of Agronomy, in conjunction with the Kansas Corn Growers Association and the Soil Health Partnership, is hosting a Soil Health Summer Tour on Friday, July 27th.

The tour will consist of a field day at two locations on July 27:

- **Glen Elder – 10:00 a.m. to noon**
 - Palen Family Farms, 1031 180 Road, Glen Elder, KS 67446
- **Spring Hill – 5:00 p.m. to 7:00 p.m.**
 - Guetterman Brothers Family Farms, 14633 West 239th Street, Spring Hill, KS 66083

The program will include a discussion of management practices to improve overall productivity and soil health to benefit farmers. Presenters on the tour include:

- Dr. Charles Rice, Soil Microbiologist
- Dr. Ignacio Ciampitti, Crop Production and Cropping Systems Specialist
- Dr. Dorivar Ruiz Diaz, Soil Fertility Specialist

A meal will be provided at each location courtesy of the sponsors. Please RSVP by July 20 for the location you plan to attend. You can send the RSVP to Troy Lynn Eckart at sprite@ksu.edu or 785-532-0400, or the individuals listed below.

Glen Elder, KS – Sandra Wick, Crop Production Extension Agent, Post Rock District, swick@ksu.edu, 785-282-6823

Spring Hill, KS – Katelyn Barthol, Agriculture and Natural Resources Agent, Marais des Cygnes District, kbarth25@ksu.edu, 913-294-4306.

SOIL HEALTH SUMMER TOUR – Field Day

Friday, July 27th

Glen Elder, KS – 10 am to 12pm

1031 180 Rd, KS 67446

Palen Family Farms

Spring Hill, KS – 5 pm to 7pm

14633 West 239th St, KS 66083

Guetterman Brothers Family Farms

**We will be discussing management practices to
improve overall productivity and soil health to
benefit farmers.**

PRESENTERS

Dr. Charles Rice
Soil Microbiology



Scan me

Dr. Ignacio Ciampitti
Crop Production



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Dr. Dorivar Ruiz Diaz
Soil Fertility



Scan me

* Lunch and dinner provided by sponsors