Issue 866

K-STATE
Research and Extension

Extension Agronomy

eUpdate

07/29/2021

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. Planting spring oats and turnips in the fall for forage

Enhanced forage allowance in late fall and early winter improves the forage budget in forage-based livestock systems. Spring oats and turnips can be an alternative, especially when farmers want to extend the grazing period.

Most producers plant spring oats in spring. However, spring oats can be planted in late summer as well for fall and early winter grazing. Spring oats will die out after the first hard freeze in the mid 20's. Oats are a high-quality forage, almost as good as wheat. Since oats do not have awns, cattle can graze them easily.

Is it possible to plant oats and turnip at the same time? The answer is yes. Some wildlife hunters plant oats and turnips for their deer food plots in the fall. Producers can use the same concept for beef grazing in the fall.

Forage turnip is one of the forage brassicas (forage rape, turnip, kale, and swedes) and has very high nutritive value with 24 - 25% crude protein in leaves and 16-18% crude protein in the bulbs. Forage turnip has a high moisture content, so it's not suitable for hay. The high moisture content of forage turnip can also be too "washy" for livestock, so it is recommended that animals have free choice of dry hay or dry forage along with the turnips.

Oats and turnip can be planted at the same time using a grain drill with a second, small seed box for turnip seeds. If a small seed box isn't available, the turnips can be broadcast ahead of oat drilling. The soil disturbance from the drill is generally enough to get the turnip started after a rain. The seeding rate for oats is 50 to 75 pounds per acre, depending on how early it's planted and moisture availability. For example, in eastern Kansas and under irrigation, seeding rates would be at the higher end of this range, or even higher. Seeding rates would also be higher when planting dates are later, although at later planting dates there will be less forage and higher seed costs. For turnip, the seeding rate is 2 pounds per acre.

Turnip is more winter hardy than oats, and can continue to grow into winter while maintaining its greenness even under snow cover. To have more growth, about 50 lbs nitrogen per acre can be applied at planting. If the oats and turnips are planted after a failed corn or sorghum crop, the oats and turnips may not need this much applied nitrogen. Both oats and turnips can accumulate high nitrates, so be careful. Forage should be tested before grazing. Samples can be submitted for analysis through the local county Extension office.

Potential yield for oats and turnip mixture might be 2 to 3 tons of dry matter per acre. Depending on the soil moisture condition, producers can start grazing about 6 to 8 weeks after oats and turnips are planted.

Figure 1. Spring oats and turnip pasture. Photo by D. Shoup, K-State Research and Extension.

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2. Estimating corn yield potential

Once pollination is near completion or fully complete, producers can begin to estimate corn yield potential. To get a reasonable yield estimate, corn should be (at least) in the milk stage. Before the milk stage, it is difficult to tell which kernels will develop and which ones will abort.

Producers can get some estimate of the success of pollination by examining ear silks. With successful pollination, the exposed silks should be turning brown and should easily separate from the ear when the husks are removed. Silks that have not been successfully pollinated will stay green, possibly growing to several inches in length (Figure 1). Unpollinated silks also will be connected securely to the ovaries (the undeveloped kernels) when the husks are removed.

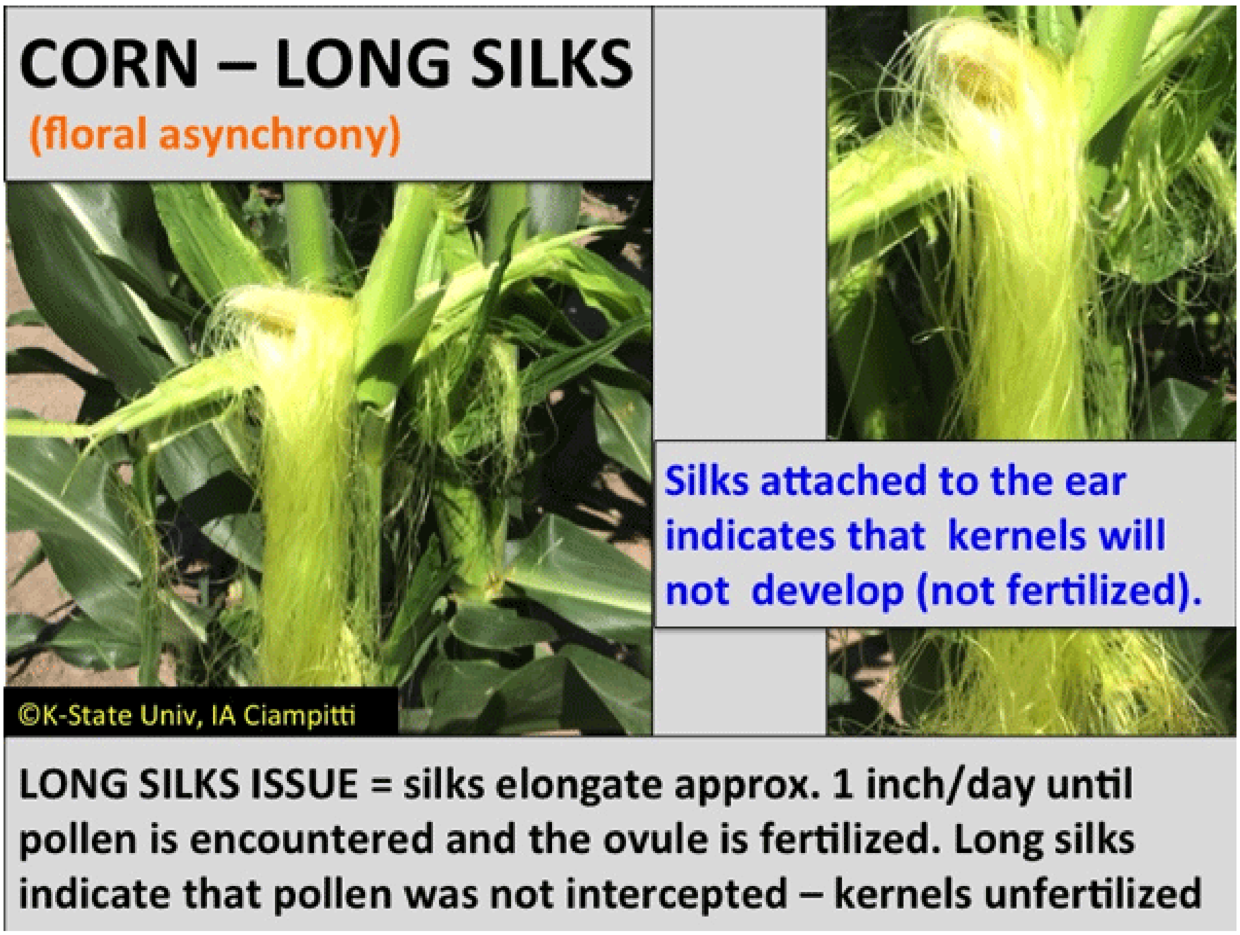

Figure 1. Long silks primarily reflecting floral asynchrony. Silks that have not been successfully pollinated will stay green. Infographic by Ignacio Ciampitti, K-State Research and Extension.

Estimating corn yield

Yield estimates can be made using the *yield component method*. This method uses a combination of known and projected yield components of corn to calculate an estimate of the potential yield. It is "potential" yield because one of the critical yield components, kernel size, will not be known until physiological maturity. Before then, one can use only an estimate of predicted yield based on what you think the grain filling period might be like (e.g. favorable, average, or poor). Estimating potential corn yield using yield components uses the following elements:

1. Ears per acre: This is determined by counting the number of ears in a known area. With 30-inch rows, 17.4 feet of row = 1,000th of an acre. This is probably the minimum area that should be used. The number of ears in 17.4 feet of row x 1,000 = the number of ears per acre. Counting a longer length of row is fine, just be sure to convert it to the correct portion of an acre when determining the number of ears per acre. Make ear counts in 10 to 15 representative parts of the field or management zones to get a good average estimate. The more ear counts you make (assuming they accurately represent the field or zone of interest), the more confidence you have in the yield estimate.

2. Kernels per ear: This is determined by counting the number of ear rows and number of kernels in each row. Multiply those two items to arrive at kernels per ear (number of rows x kernels per row). Do not count aborted kernels or the kernels on the butt of the ear; count only kernels that are in complete rings around the ear. Do this for every 5th or 6th plant in each of your ear count areas. Avoid odd, non-representative ears.

3. Kernels per acre = Ears per acre x kernels per ear

4. Kernels per bushel: This will have to be estimated until the plants reach physiological maturity. Common values range from 75,000 to 80,000 for excellent, 85,000 to 90,000 for average, and 95,000 to 105,000 for poor grain filling conditions. The best you can do at this point is estimate a range of potential yields depending on expectations for the rest of the season.

Example:

Ears per acre: (30-inch rows)

- 10 different 17.4-foot lengths of row offered counts: 25, 24, 22, 21, 24, 26, 20, 21, 22, 20
- average of these counts is (25 + 24 + 22 + 21 + 24 + 26 + 20 + 21 + 22 + 20)/10 = 225/10 = 22.5
- scaling up to an acre gives 22.5 x 1,000 = **22,500 ears per acre**

Kernels per ear:

- The 4 or 5 ears from each 17.4-foot area had an average of 14 rows and 27 kernels per row
- 14 x 27 = **378 kernels per ear**

Kernels per acre:

- 22,500 ears per acre x 378 kernels per ear = **8,505,000 kernels per acre**

Kernels per bushel:

- Given that this field has been exposed to 100° F and above with no significant precipitation for the past couple of weeks and the prediction for the next 7-10 days is for triple digits every day and no rain, it may not hurt to assume below-average fill conditions and use a fairly large number of kernels per bushel (because kernels will be small). Based on the ranges mentioned above, a reasonable value might be **105,000 kernels per bushel.**

Bushels per acre:

- 8,505,000 kernels per acre ÷ 105,000 kernels per bushel = about **81 bushels per acre**

If these estimates are close to correct, the field in this example is probably worth taking to grain harvest provided it is still living and likely to keep filling grain. Past experience indicates that this method of estimating yield usually provides fairly optimistic estimates. Use a larger number for kernels per bushel if you want the process to be a bit more "pessimistic."

Further details on corn growth and development can be found at:

http://www.bookstore.ksre.ksu.edu/pubs/MF3305.pdf

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3. Exceptional winter canola yields observed in 2021

Winter canola yields attained superior levels at testing sites in Kansas in 2021. The primary reason for the high yields was ideal flowering and grain-filling temperatures during April and May. Dense canopies, filled with an abundance of seed pods and flowering late into the growing season, were witnessed at multiple locations. The high yields were obviously a positive outcome as we were reminded what the yield potential of winter canola can be when planting conditions are favorable, moisture is not limiting, and temperatures are cooler than normal during the reproductive stages.

Canola trials were seeded in fall 2020 into optimum soil moisture conditions following early September rainfall. After emergence, occasional showers throughout the fall set the crop up for optimal growth going into the winter months. Overall, winter temperatures were trending mild until the major cold snap in February. Drought conditions plagued trial sites in south central and southwest Kansas in the spring. In combination with the drought, a late April freeze also negatively affected yields. Yields in northern Kansas were the highest because rainfall amounts were greater.

It was anticipated that we would observe winterkill following the unprecedented cold snap; however, very little winterkill was recorded. This occurred because of a few reasons. First, the cold occurred during February when the crop was fully acclimated (its most winter hardy state) to withstand bitterly cold temperatures. If the cold would have occurred in November on a poorly acclimated crop, the results would have been much more devastating. Second, a blanket of snow helped protect the crop across much of the state. Three, the level of winter hardiness in today's varieties continues to be elevated. Winter hardiness is affected by genetics, environment, and management; thus, all three play a factor in determining whether or not a variety will survive Kansas climatic conditions.

National Winter Canola Variety Trial (NWCVT) sites for the canola breeding program were harvested at Belleville, Colby (not yet reported), Garden City, Hutchinson, Manhattan, and Norwich. Each trial is split into open-pollinated (OP) and hybrid varieties. Yields in the OP and hybrid trials in Belleville averaged 79 and 91 bu/acre, respectively. For the first time in its history, the canola program harvested entries that yielded over 100 bu/acre at this site. The Garden City OP and hybrid trials averaged 43 and 47 bu/acre, respectively. The Hutchinson OP and hybrid trials averaged 60 and 67 bu/acre, respectively, and the Manhattan OP and hybrid trials each averaged 74 bu/acre, mostly because of timely spring rainfall and dense crop canopies. The Norwich site was the most drought stressed location and as a result the OP and hybrid yields were 42 and 45 bu/acre, respectively. Greater losses from the late April freeze were observed at this location as well.

NWCVT yields for Belleville and Manhattan (northern Kansas) are summarized for the OP and hybrid entries in Figures 1 and 2, respectively. Yields for Hutchinson and Norwich (south central Kansas) are summarized for the OP and hybrid entries in Figures 3 and 4, respectively. Yields for Garden City (southwest Kansas) are summarized for the OP and hybrid entries in Figures 5 and 6, respectively.

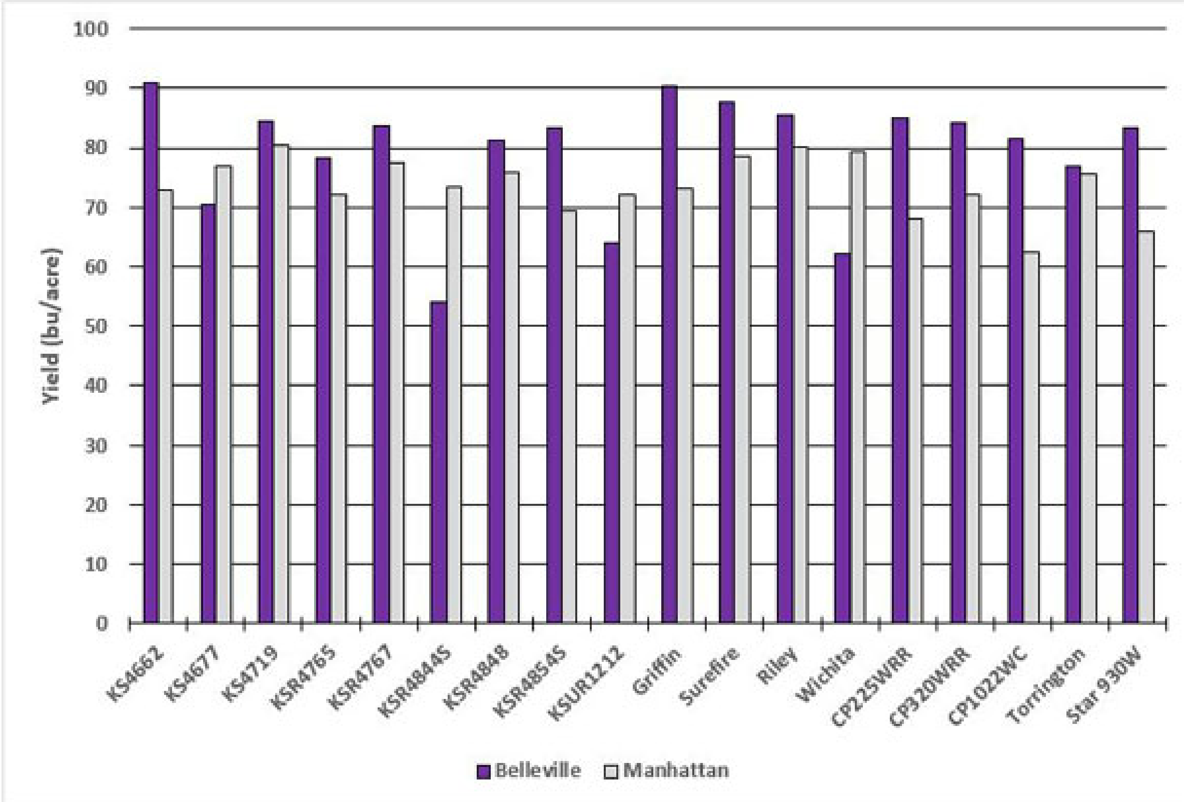

Figure 1. Yield results for northern Kansas (Belleville, Manhattan) OP variety trials. Belleville LSD (0.05) = 17 bu/acre; Manhattan LSD (0.2) = 7 bu/acre.

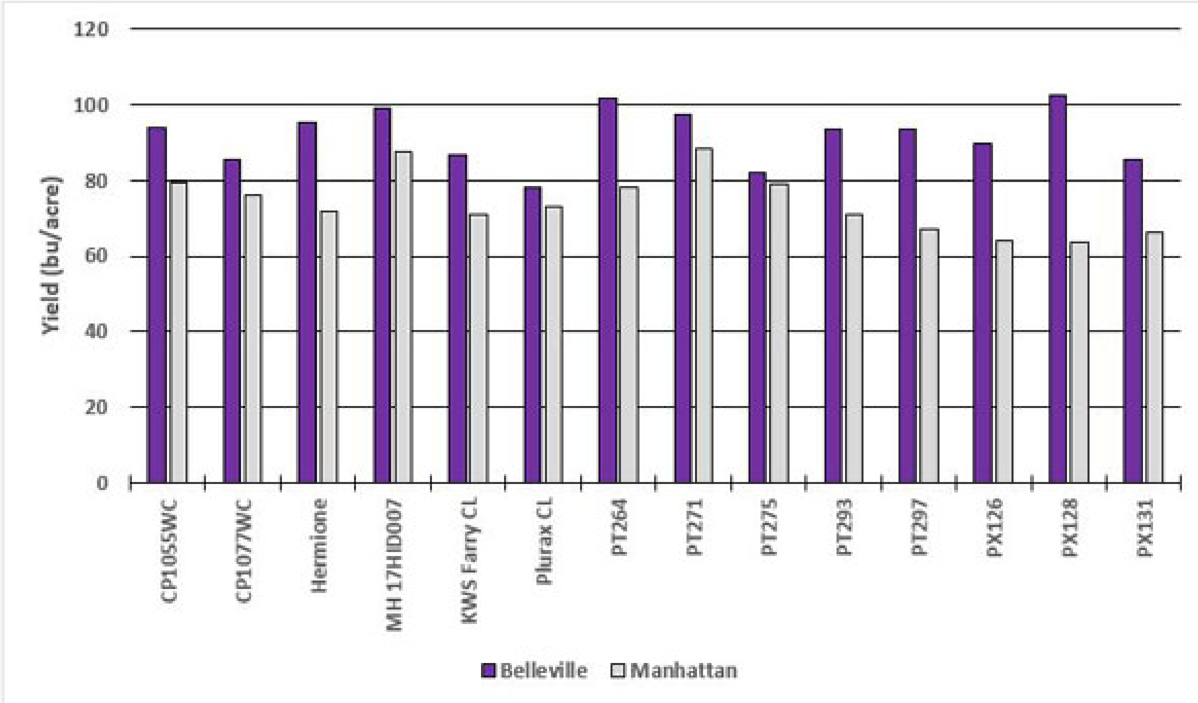

Figure 2. Yield results for northern Kansas (Belleville, Manhattan) hybrid variety trials. Belleville LSD (0.05) = 13 bu/acre; Manhattan LSD (0.05) = 9 bu/acre.

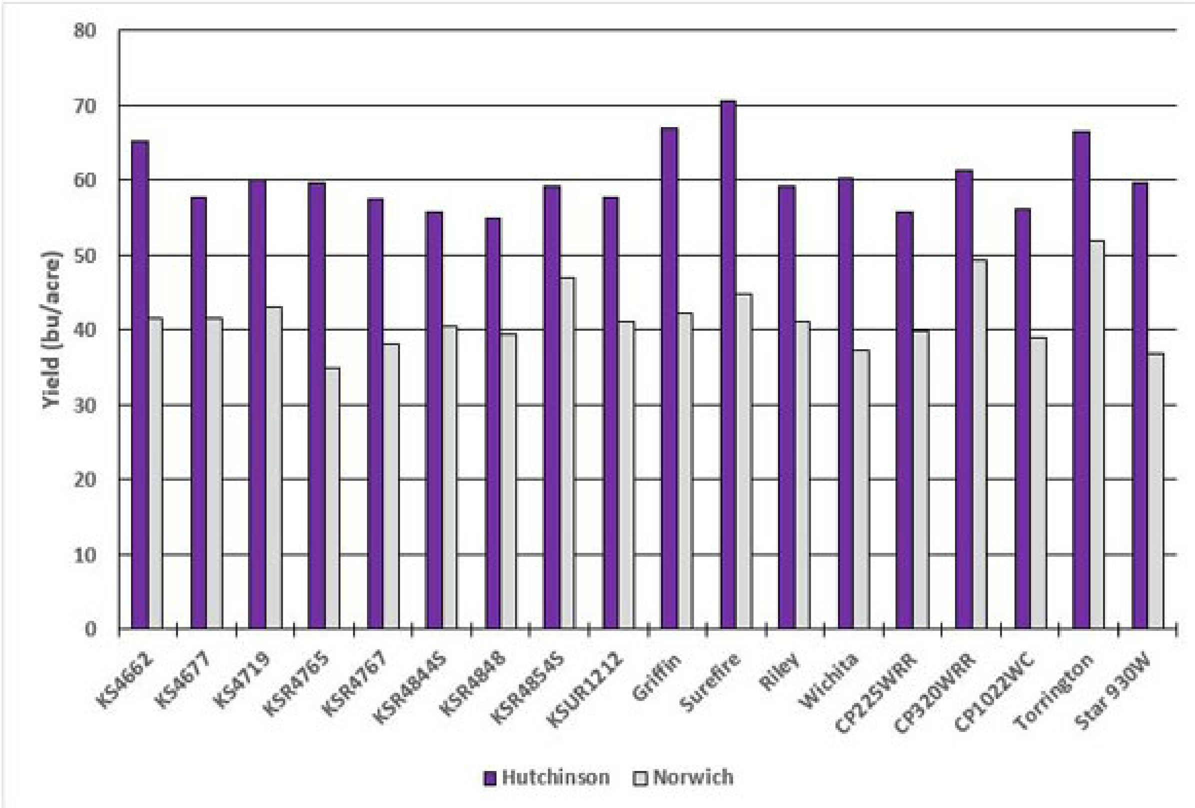

Figure 3. Yield results for south central Kansas (Hutchinson, Norwich) OP variety trials. Hutchinson = no significant difference; Norwich LSD (0.05) = 9 bu/acre.

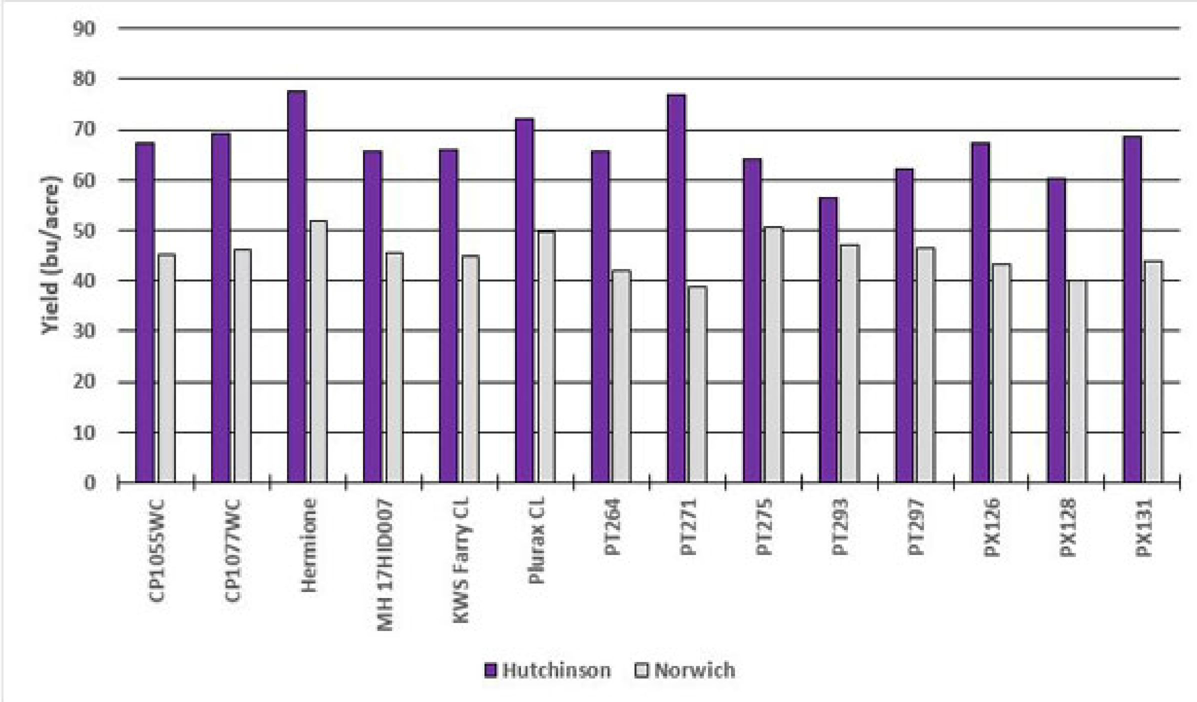

Figure 4. Yield results for south central Kansas (Hutchinson, Norwich) hybrid variety trials. Hutchinson LSD (0.3) = 7 bu/acre; Norwich = no significant difference.

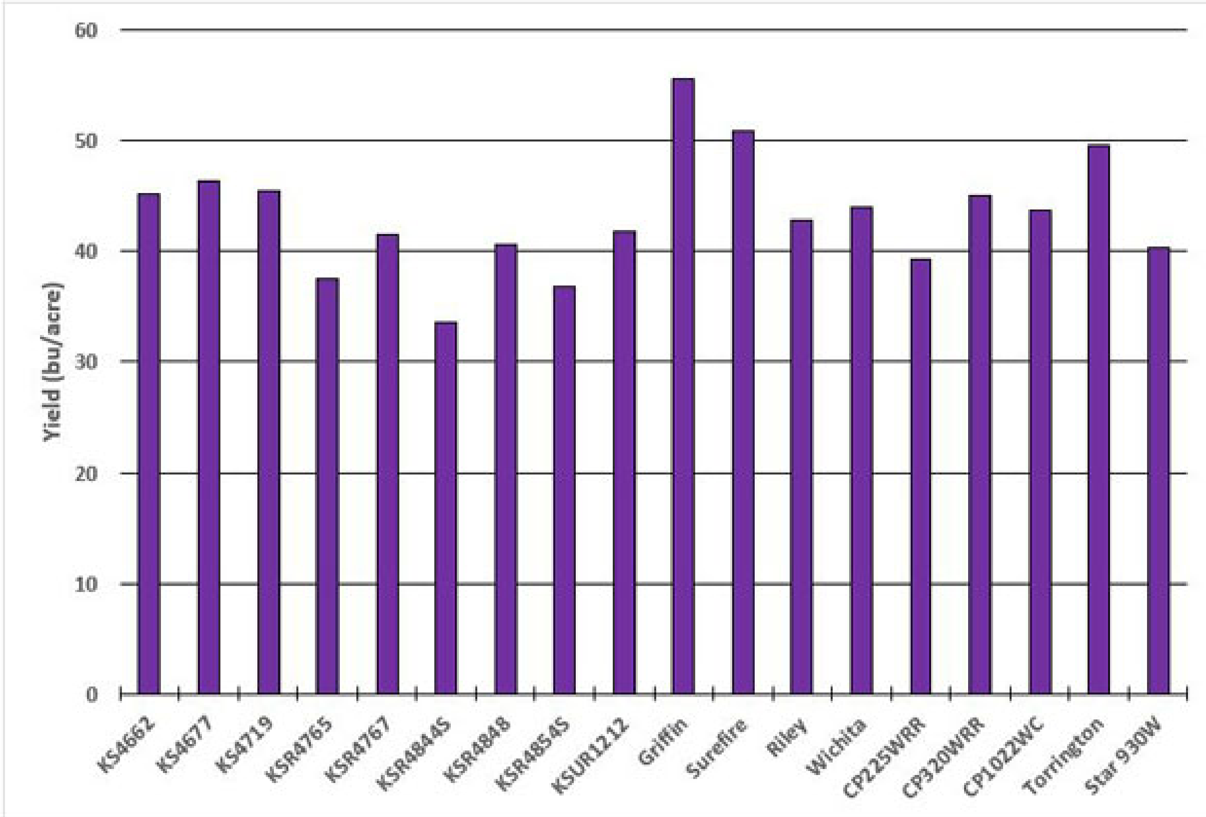

Figure 5. Yield results for southwest Kansas (Garden City) OP variety trials. Garden City LSD (0.05) = 8 bu/acre.

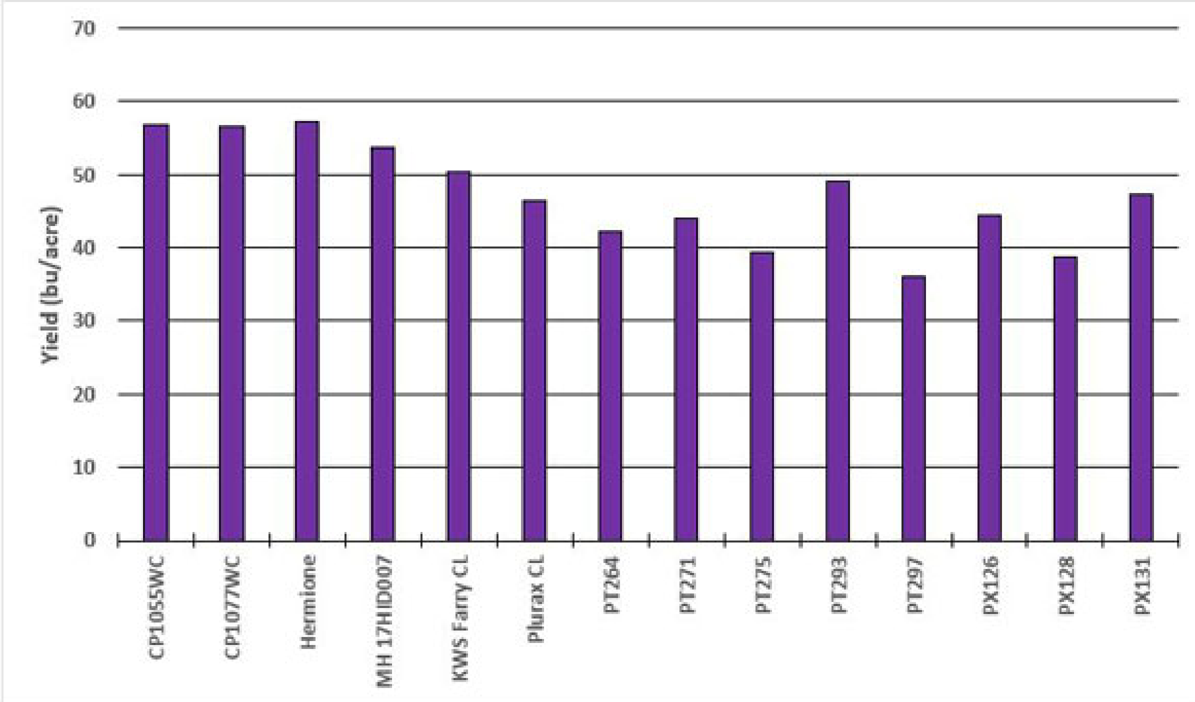

Figure 6. Yield results for southwest Kansas (Garden City) hybrid variety trials. Garden City LSD (0.05) = 6 bu/acre.

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

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4. Riley County Soil Health Workshop, August 30

Join us for a tour of corn and soybeans planted in a variety of cover crops located 2 miles south of Leonardville on Alembic Road.

When: **Monday, August 30th, 2021 from 10:00 am to 2:00 pm**

Where: **Leonardville Community Center, 118 Erpelding Street, Leonardville, Kansas**

After looking at the corn and soybeans, we will head west and north to look at fields planted for summer grazing.

Program speakers and topics:

- **Discussion of an ongoing cereal rye study** - Jason Waite, Ph.D., Agronomist, Manhattan Plant Materials Center, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)
- **"Cover Crops for Weed Suppression"** - Dr. Sarah Lancaster, Assistant Professor, Kansas State Research and Extension.
- **"Selecting Winter Cereal Cover Crops to Protect Water Quality and Promote Soil Health"** - Elliott Carver, Ph.D. Candidate, Department of Agronomy, Kansas State University
- "**Managing soil health for soil carbon and soil carbon markets"** - Dr. DeAnn Presley, Professor, Kansas State University Research and Extension.

Coffee, water, and cookies from the Tasty Pastry. Lunch after the tour at the Leonardville Community Center.

To reserve your space, please contact the Riley County Conservation District at 785-537-8764 or Jazmyn.gaither@ks.nacdnet.net by **Monday, August 23, 2021**