Issue 912

K-STATE Research and Extension

Extension Agronomy

eUpdate

06/23/2022

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 corn

Plant analysis is an excellent in-season "quality control" tool. It can be especially valuable for managing secondary and micronutrients that do not have high-quality, reliable soil tests available, and for providing insight into how efficiently you are using applied nutrients.

Plant analysis can be used by Kansas farmers in two basic ways: for diagnostic purposes, and for monitoring nutrient levels at a common growth stage. Diagnostics can be done any time and is especially valuable early in the season when corrective actions can easily be taken. Monitoring is generally done at the beginning of reproductive growth.

General sampling guidelines:

- Plants are less than 12 inches tall: Collect the whole plant; cut the plant off at ground level.
- Plants more than 12 inches tall and until reproductive growth begins: Collect the top fully developed leaves (those which show leaf collars).
- After reproductive growth starts: Collect the ear leaves (below the uppermost developing ear), samples should be collected at random from the field at silk emergence.

Figure 1. Corn sampling during different growth stage. Photos by Dorivar Ruiz Diaz, K-State Research and Extension.

Plant analysis for diagnostic sampling

When sampling for diagnostic purposes, collecting specific plant parts is less important than obtaining comparison samples from good and bad areas of the field.

Plant analysis is an excellent diagnostic tool to help understand some of the variation among corn plants in the field. When using plant analysis to diagnose field problems, try to take comparison samples from both good/normal areas of the field, and problem spots. This can be done at any growth stage.

Along with taking plant tissue samples, it is also helpful to collect a soil sample from both good and bad areas when doing diagnostics. Define your areas, and collect both soil and plant tissue from areas that represent good and bad areas of plant growth. Soil samples can help define why a problem may be occurring. The soil sample may find certain nutrient levels are very low in the soil, helping to explain why a deficiency is occurring. However, other factors can also cause nutrient problems. Soil compaction, or saturation of soils for example, often limits the uptake of nutrients, especially potassium, which are otherwise present in adequate amounts in the soil.

Plant analysis for nutrient monitoring

For general monitoring or quality control purposes, plant leaves should be collected as the plant enters reproductive growth. Sampling under stress conditions for monitoring purposes can give misleading results, and is not recommended. Stresses such as drought or saturated soils will generally limit nutrient uptake, and result in a general reduction in nutrient content in the plant.

How should you handle samples and where should you send the samples?

The collected leaves should be allowed to wilt over night to remove excess moisture, placed in a paper bag or mailing envelope, and shipped to a lab for analysis. Do not place the leaves in a plastic bag or other tightly sealed container, as the leaves will begin to rot and decompose during transport, and the sample won't be usable. Most of the soil testing labs working in the region provide plant analysis services, including the K-State Testing Lab. For questions about the plant tissue testing services at the K-State Testing Lab, email soiltesting@ksu.edu or call 785-532-7897.

What nutrients should be included in the plant analysis?

In Kansas, nitrogen (N), phosphorus (P), potassium (K), sulfur (S), zinc (Zn), chloride (Cl), and iron (Fe) are the nutrients most likely to be found deficient. Recently, questions have been raised concerning copper (Cu), manganese (Mn), and molybdenum (Mo), though widespread deficiencies of those micronutrients have not been found in the state. Normally the best values are the "bundles" or "packages" of tests offered through many of the labs. They can be as simple as N, P and K, or can be all the mineral elements considered essential to plants. K-State offers a package which includes N, P, K, Ca, Mg, S, Fe, Cu, Zn, and Mn.

What will you get back from the lab?

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 "percent" for the primary and secondary nutrients (N, P, K, Ca, Mg, S, and Cl) and "ppm" (parts per million) for most of 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. It can be thought of as the range of values optimum for plant growth. The medical profession uses a similar range of normal values to evaluate blood work. The sufficiency ranges change with plant age (generally being higher in young plants), vary between plant parts, and can differ between hybrids. A value slightly below the sufficiency range does not always mean the plant is deficient in that nutrient. It is an indication that the nutrient is relatively low. Values on the low end of the range are common in extremely high-yielding crops. However, if that nutrient is significantly

below the sufficiency range, you should ask some serious questions about the availability and supply of that nutrient.

Keep in mind that any plant stress (drought, heat, soil compaction, saturated soils, etc.) can have a serious impact on nutrient uptake and plant tissue nutrient concentrations. A low value of a nutrient in the plant does not always mean the nutrient is low in the soil and the plant will respond to fertilizer. It may be that the nutrient is present in adequate amounts in the soil, but is either not available or not being taken up by the plant for a variety of reasons. Two examples are drought, which can reduce plant uptake of nutrients and cause low nutrient values in the plant, and high-pH soils, which can cause low iron availability.

On the other extreme, levels above "sufficiency" can also indicate problems. High values might indicate over-fertilization and luxury consumption of nutrients. Plants will also sometimes try to compensate for a shortage of one nutrient by loading up on another. This occurs at times with nutrients such as iron, zinc, and manganese.

Table 1 gives the range of nutrient contents considered to be "normal" or "sufficient" for corn seedlings below 12 inches tall and for the ear leaf of corn at silking. Keep in mind that these are the ranges normally found in healthy, productive crops.

Table 1. Range of nutrient contents considered "normal" or "sufficient" at two growth stages in corn.

Nutrient	Unit	Whole Plant <12" tall	Corn Ear Leaf at Green Silk
Nitrogen (N)	%	3.5-5.0	2.75-3.50
Phosphorus (P)	%	0.3-0.5	0.25-0.45
Potassium (K)	%	2.5-4.0	1.75-2.25
Calcium (Ca)	%	0.3-0.7	0.25-0.50
Magnesium (Mg)	%	0.15-0.45	0.16-0.60
Sulfur (S)	%	0.20-0.50	0.15-0.50
Chloride (Cl)	%	Not established	0.18-0.60
Copper (Cu)	ppm	5-20	5-25
Iron (Fe)	ppm	50-250	20-200
Manganese (Mn)	ppm	20-150	20-150
Zinc (Zn)	ppm	20-60	15-70
Boron (B)	ppm	5-25	4-25
Molybdenum (Mo)	ppm	0.1-10	0.1-3.0
Aluminum (Al)	ppm	<400	<200

Summary

In summary, plant analysis is a good tool to monitor the effectiveness of your fertilizer and lime program and as a very effective diagnostic tool. Consider adding this to your toolbox.

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2. Fungicide considerations for corn diseases in 2022

We are entering the time window in Kansas where corn producers should be scouting fields and assessing the need for a foliar fungicide application. Several fields in eastern and central Kansas are approaching V10-V14 development stage, with a few weeks to go until pollination.

Now is the time to be out scouting for the following fungal diseases of corn:

1. Gray leaf spot (Figure
2. Southern rust (Figure 2, left)
3. Common Rust (Figure 2, right)

Figure 1. Early development of gray leaf spot lesions showing a distinct yellow halo. Photo courtesy of Doug Jardine, K-State Research and Extension.

Figure 2. Typical symptoms of southern rust (left) and common rust (right). Photo courtesy of Rodrigo Borba Onofre, K-State Research and Extension.

Gray leaf spot scouting. Begin scouting for gray leaf spot in corn about two weeks before expected tassel emergence. Gray leaf spot is characterized by rectangular lesions that are 1-2 inches in length and cover the entire area between the leaf veins. Early lesions are small, necrotic spots with yellow halos that gradually expand to full-sized lesions. Lesions are usually tan in color but may turn gray during foggy or rainy conditions. The key diagnostic feature is that the lesions are usually very rectangular in shape.

Southern rust scouting. Southern rust is typically first reported in Kansas in mid-July. Pustules will appear on the upper leaf surface (unlike common rust which can be found on either side of the leaf). Pustules will be scattered on the leaf surface and spores will appear orange and will rub off on fingers (and clothes!). Severe infections can be seen on the leaf sheaths.

Factors that influence corn yield response to fungicide applications

Years of fungicide application research clearly demonstrates that the single best time to apply a fungicide to corn for gray leaf spot control is from VT to R1. A single application at V7 – V8 will not hold up against late-season pressure. Those who choose to put a fungicide down with their last herbicide treatment will most likely have to apply second cover at VT – R1 if there is any gray leaf spot pressure at all. A VT – R1 application may also provide some suppression of southern rust, should it arrive early enough to cause yield loss. There is evidence that foliar fungicides can control southern rust when applied prior to R5, when dealing with a susceptible hybrid and high disease pressure. Some fungicides that are good to excellent for gray leaf spot are also very good for southern rust control.

Summaries of multi-year university research about fungicide efficacy can be found here:

https://cropprotectionnetwork.s3.amazonaws.com/CPN2011_FungicideEfficacyControlCornDiseases

_04_2022-1650470887.pdf

Disease risk factors to consider when weighing the benefits of a fungicide application:

Susceptibility level of corn hybrid. Seed companies typically provide information on the susceptibility of their hybrids to gray leaf spot and southern rust. In general, hybrids that are more susceptible to fungal foliar diseases will have a greater response to a foliar fungicide (if disease pressure is high enough).

Previous crop. Because gray leaf spot survives in corn residue, the risk of disease increases when corn is planted back into a field that was in corn the previous year. Fields with a history of gray leaf spot should be closely scouted. Southern rust, on the other hand, blows in from the south each year. It is important to watch regional updates about southern rust pressure in the state.

Weather. Rainy and/or humid weather generally is most favorable to gray leaf spot. In growing seasons when these conditions prevail, the risk for disease development increases. Southern rust is favored by warm days and nights (> 80 degrees) as well as high humidity.

Field history. Some field locations may have a history of high foliar disease severity. Fields in river bottoms or low areas or surrounded by trees may be more prone to having gray leaf spot.

Current disease management guidelines suggest the following criteria for considering an application of foliar fungicide:

- **For susceptible hybrids** (those with the lowest rating within a company's lineup): Fungicide applications should be considered if disease symptoms are present on the third leaf below the ear or higher on 50 percent of the plants examined.
- **For intermediate hybrids** (those with an average rating within a company's lineup): Fungicide applications should be considered if disease symptoms are present on the third leaf below the ear or higher on 50 percent of the plants examined, if the field is in an area with a history of foliar disease problems, if the previous crop was corn, if there is 35 percent or more surface residue, and if the weather is warm and humid.
- **For resistant hybrids** (those with the best rating within a company's lineup): Fungicide applications generally are not recommended.

According to the data from Illinois corn fungicide trials, if at least 5 percent of the ear leaf area is affected by disease at the end of the season, a foliar fungicide applied at VT and R1 would likely have been beneficial. Using the disease risk factors and scouting observations collected just before tassel emergence will help you predict how severe disease may be several weeks after the VT to R1 stages, and help you decide whether to apply a foliar fungicide.

If no disease is present or pressure is low, I recommend holding off on the R1 application since efficacy will begin to wane in three to four weeks, just as late season pressure may begin to develop. Data exists that would suggest that if pressure begins to develop later, an R2 application can be economical and will provide protection later into the grain fill period. This later application could also protect against any late-season southern rust pressure.

Distinguishing between gray leaf spot and bacterial streak

Bacterial streak, identified as a new corn disease in the U.S. in 2016, is now active in most of western Kansas. While yield loss potential for this disease remains unknown, we do know that it can be misidentified as gray leaf spot, resulting in unwarranted fungicide applications. Fungicides will not have any effect on bacterial streak. Keep in mind that gray leaf spot typically has very sharp edges defined by the leaf veins, whereas bacterial streak will have a wavy edge that can cross the leaf vein (Figure 3). Also, when backlit with light, gray leaf spot lesions will have an opaque appearance while bacterial streak lesions are more translucent (Figure 4). If you are unsure about symptoms, please contact the K-State plant disease diagnostic clinic via email at clinic@ksu.edu.

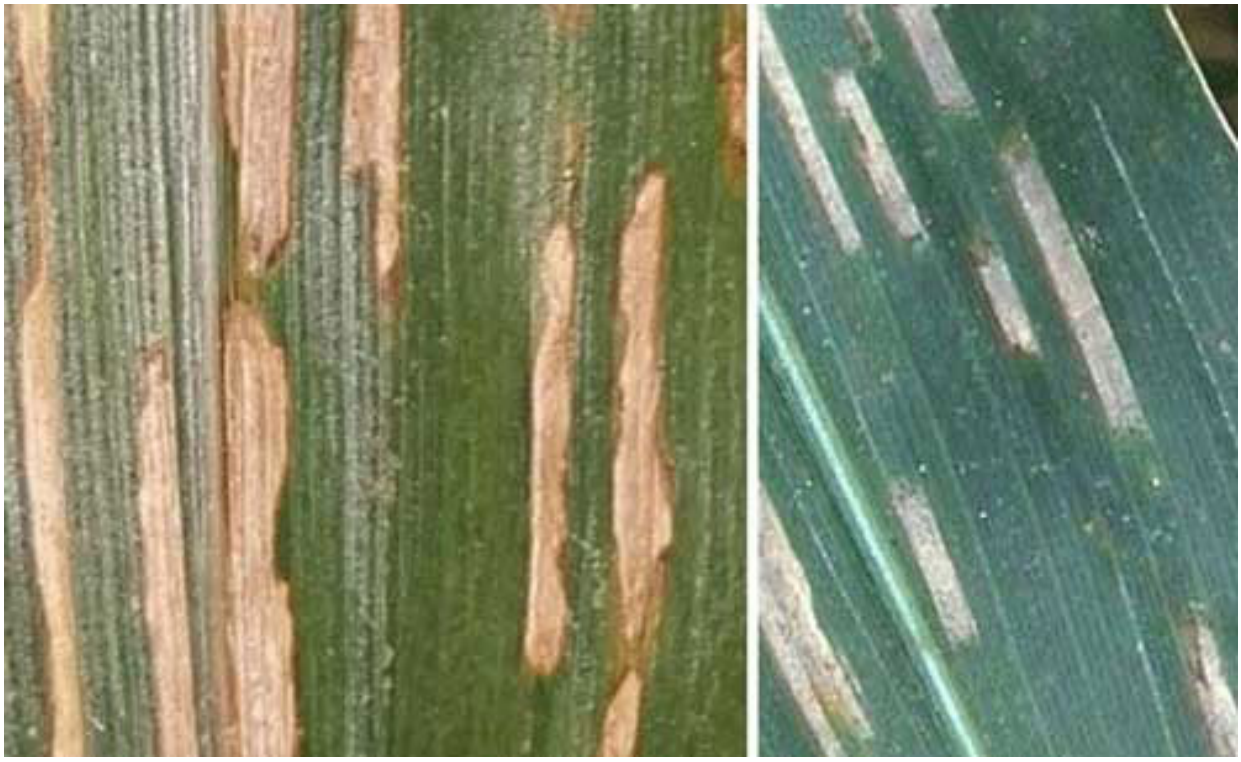

Figure 3. Comparison of sharp-edged gray leaf spot lesions (right) with wavy-edged bacterial streak lesions (left). Photo courtesy of the University of Nebraska.

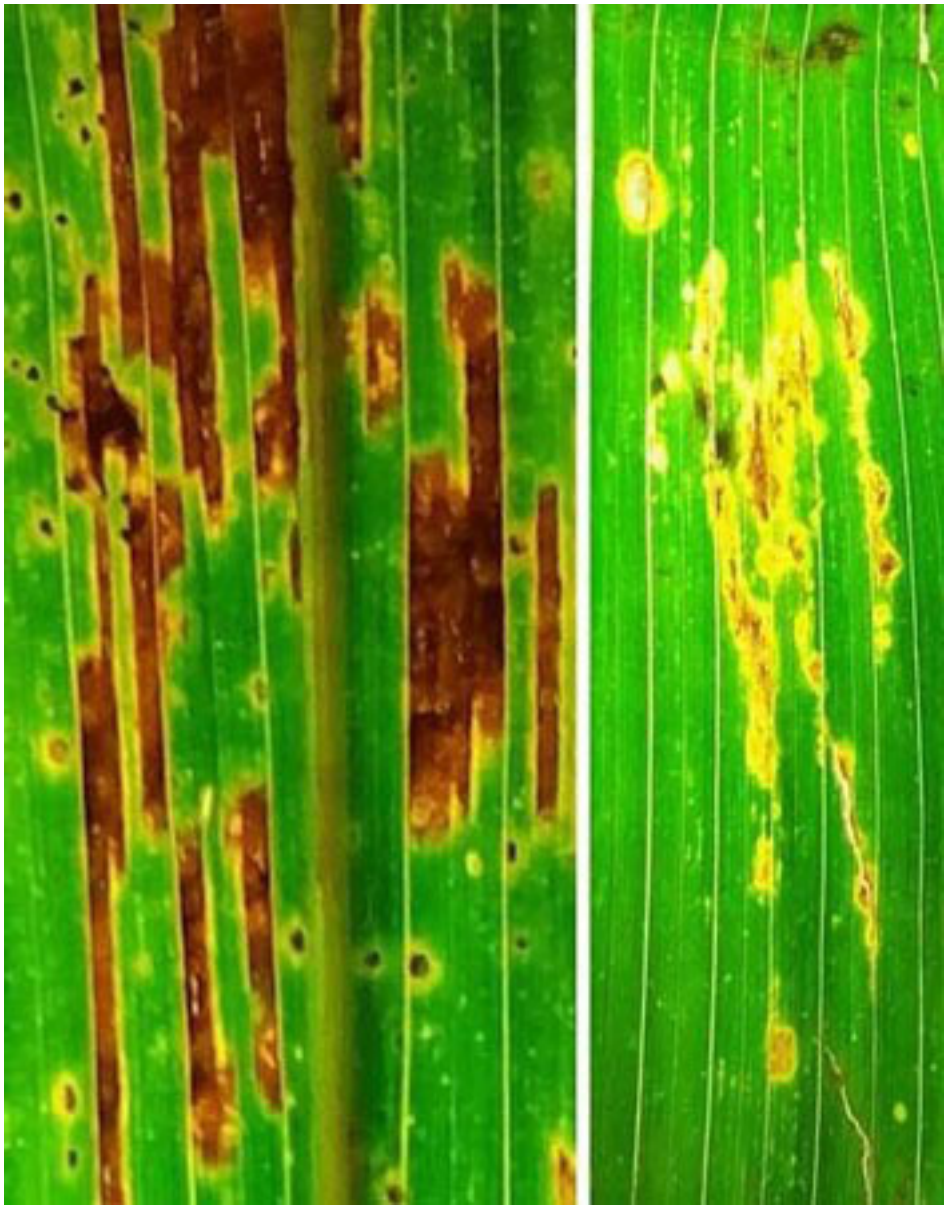

Figure 4. Gray leaf spot lesions (left) have an opaque appearance whereas as bacterial streak allows light to more easily pass through giving it a translucent appearance (right). Photo by Doug Jardine, K-State Research and Extension.

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3. Weather conditions during the cattle loss event in southwest Kansas in mid-June 2022

The recent heat wave gripping the central United States has been felt across Kansas, and evidence of its intensity can be found by looking at data from the Kansas Mesonet. The peak of the heat wave was on June 13, when the average high air temperature on the Mesonet was a sizzling 101.1° statewide, the hottest day so far this year. The hottest temperature recorded was 107.6° at the Satanta (Seward County) station on June 12. Thanks to drier air, the peak heat index was only 102.6° at Satanta that day. However, across southwest Kansas there were reports of cattle succumbing to the heat. The heat index wasn't even at Heat Advisory criteria (105° or higher). So, what happened?

A look at the Cattle Comfort Index (CCI), and the components which comprise it, tells a different, disastrous story. The CCI is a measure of apparent temperature, similar to the heat index. While heat index is only a function of temperature and relative humidity, the CCI includes two additional variables: wind speed and solar radiation. Let's take a look at Satanta, and the conditions at 12:00 pm on June 12 (Table 1).

Table 1. Observations at Satanta, KS at 12 pm on June 12, 2022, and their individual contributions to the value of the Cattle Comfort Index.

	Observations	Contribution to Cattle Comfort Index Value
Temperature	101.0° F	101.0° F
Relative Humidity (Dewpoint)	22.9% (56.3° F)	-1.7° F
Wind Speed	0.2 mph	+5.9° F
Solar Radiation	1077 W/m^2 (sunny)	+20.9° F
	Heat Index	**Cattle Comfort Index**
	100.1° F	126.1° F

The air temperature was 101.0° F, with a low relative humidity of 22.9%, which resulted in a heat index of 100.1° F, slightly cooler than the air temperature. How did relative humidity impact the CCI? By definition, a relative humidity less than 30% results in a negative contribution to the CCI, with 22.9% humidity resulting in a 1.7° decrease in the CCI. The winds were nearly calm with no cooling effect resulting in an increase of 5.9°F. The solar radiation was 1077 W/m^2, basically cloud free increasing the CCI another 20.9°F. The resultant CCI at 12 pm was a sweltering 126.1° F. When the CCI is 105° F or greater, there is danger of loss of livestock. The CCI remained above 105° at Satanta from 9:45 am until 3:50 pm (Figure 1), peaking at 126.7° F at 12:05 pm. So while the traditional Heat Advisory criteria were never met that day, the CCI was at extreme values for an extended period.

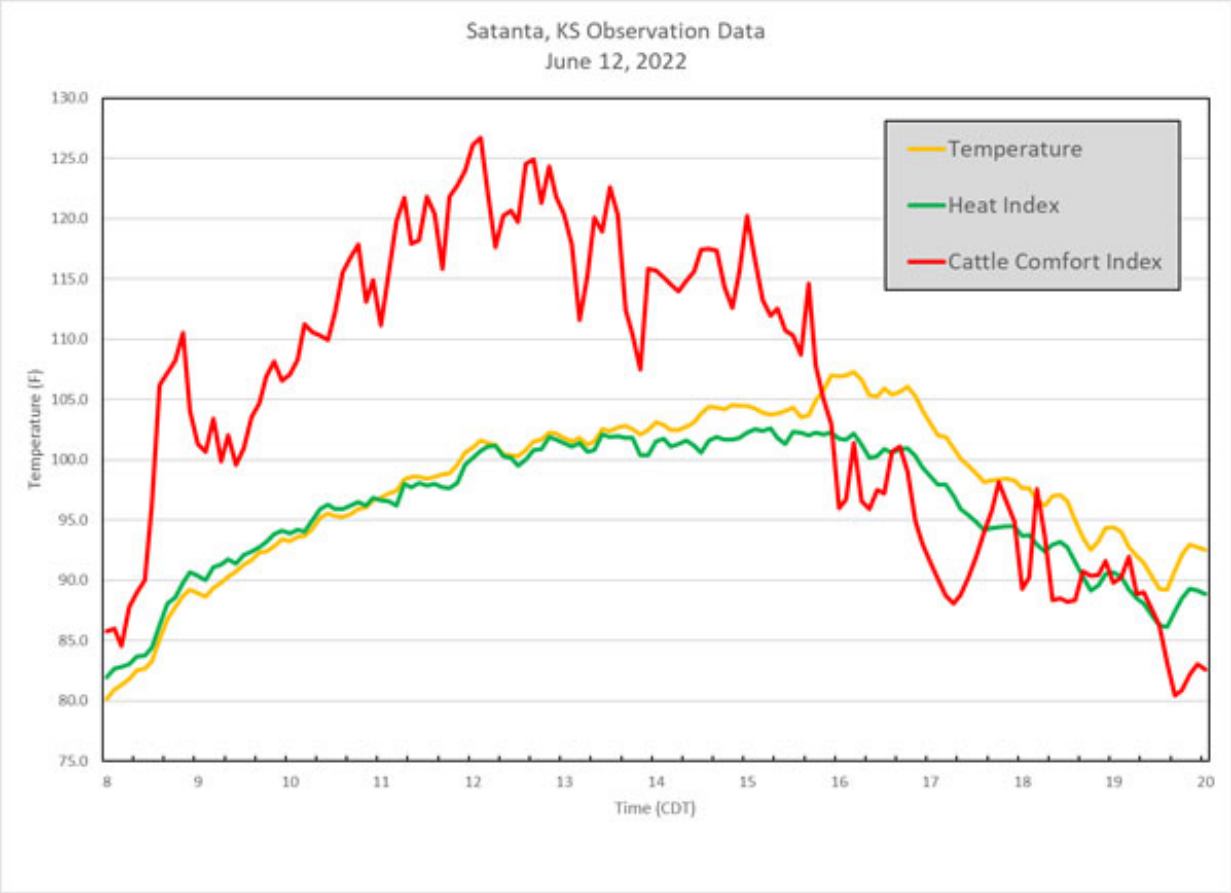

Figure 1. Temperature, heat index and Cattle Comfort Index at Satanta, KS between 8 am and 8 pm CDT on June 12, 2022.

June 12 was the third of a five-day period with extreme heat following a cool start to the month. The rapid increase in temperature gave little time for cattle to properly adjust to the warm extremes. Figure 2 shows that extreme CCI values occurred all across southwest Kansas on June 11 as well. Table 2 lists the highest CCI values recorded at selected locations in southwest Kansas during the heat wave, based on hourly average observations from the Kansas Mesonet. Table 3 lists the number of hours each of those locations spent above different CCI thresholds.

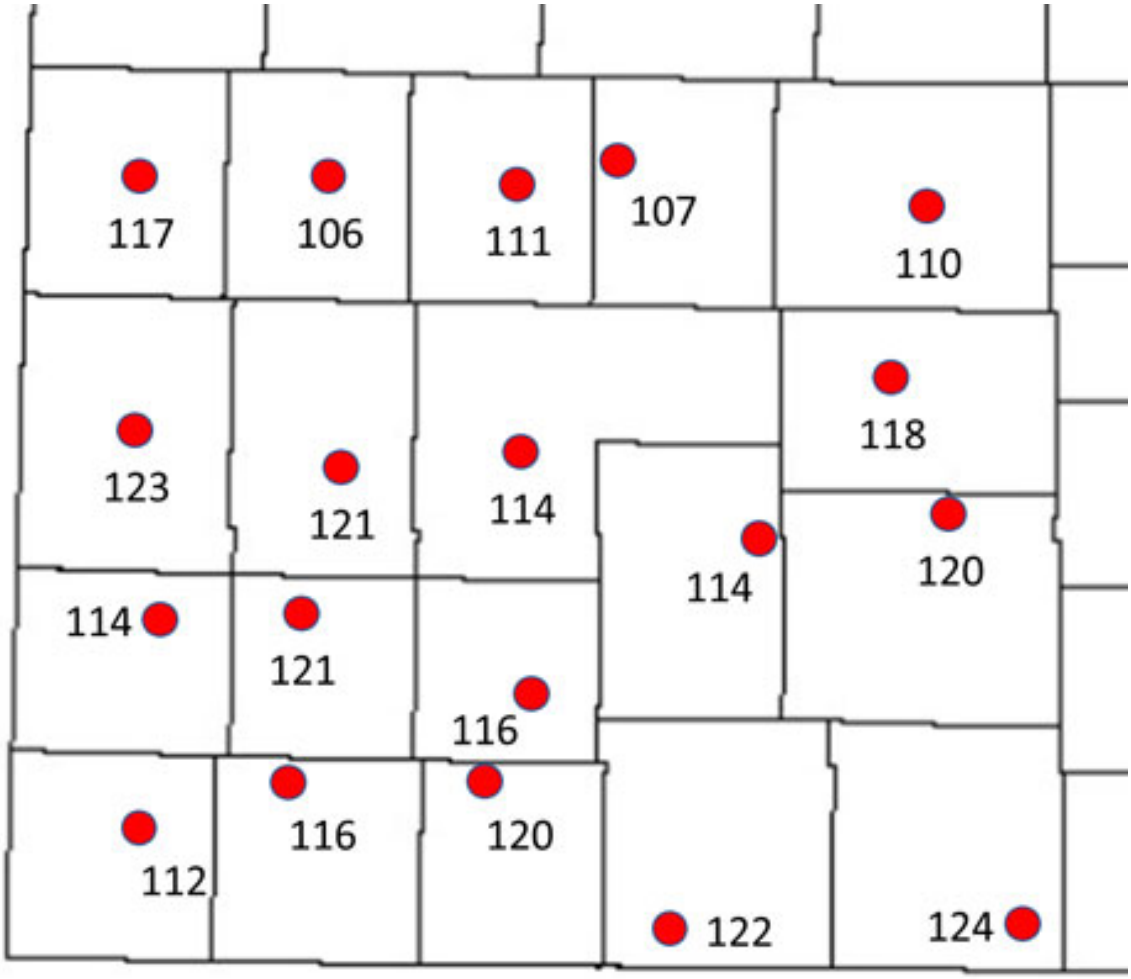

Figure 2. Cattle Comfort Index across southwest Kansas at 4 pm on June 11, 2022. Indices derived from Kansas Mesonet observations at the plotted locations.

Table 2. Peak hourly average Cattle Comfort Index values (in degrees F) at selected Mesonet stations across southwest Kansas between June 10-14, 2022. Shaded values are over 110°F.

	June 10	June 11	June 12	June 13	June 14
Ashland 8S	115.5	124.3	125.7	102.0	101.7
Garden City	98.5	113.9	109.0	100.9	107.5
Grant	97.9	120.6	114.7	100.3	107.8
Ness City	96.5	114.2	99.6	102.9	106.0
Sublette 1E	100.3	116.1	111.0	99.5	107.2
Tribune	99.0	117.0	113.8	100.7	99.3

Table 3. Number of hours with average Cattle Comfort Index values above particular thresholds for the period June 10-14, 2022.

	Heat Caution		Heat Danger	

	>= 95° F	>= 100° F	>= 105° F	>= 110° F
Ashland 8S	41	32	21	15
Garden City	35	23	11	3
Grant	34	21	15	10
Ness City	28	14	7	3
Sublette 1E	31	20	12	6
Tribune	32	19	13	10

Historical comparison of the June 2022 event

While most Mesonet sites have short periods of record, the Garden City site has been online since 1985, so we can draw some historical perspective on the rarity of CCI values this extreme. The peak value of 113.9° F at 3 pm CDT on June 11 was the highest reading since June 17, 2017, and was the 7th highest ever recorded at 3 pm during any month. The highest CCI ever recorded at Garden City was 122.7° F on June 8, 1988. The average CCI for 3 pm in the month of June at Garden City is 89.5° F. Garden City averages 35 hours a year with CCI values at or above 105° F, but only 7 hours above 110° F. Keep in mind, these are measurements taken on site over a grass surface with good exposure. Conditions will vary significantly with cover type, shade, exposure, and other practices.

Coinciding with the warm Cattle Comfort Indices, the warmest afternoon air temperature readings occurred on June 12 and June 13 with readings as high as 106.4°F. On the flip side, recovering temperatures overnight remained very warm; Ashland, Grant, and Ness City all had lows above 80° on the morning of June 13. The warm overnight readings occurred mostly due to overnight heat bursts with decaying thunderstorms. Fortunately, cattle had adjusted to the increased temperatures and/or managers had been able to adapt to conditions. In addition, these conditions yielded much drier air and breezy conditions – both conducive to relaxed CCI values.

Finding data online

To access current and the preceding seven days of Cattle Comfort Index data, navigate to mesonet.ksu.edu/agriculture/animal. To see the historical seven-day data, select "Charts" further down the page (if using a desktop computer, it is on the left side). If you need data further back than the last seven days, please reach out to the authors of this article.

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4. 2021 National Winter Canola Variety Trial results

The results of the 2021 National Winter Canola Variety Trial (NWCVT) are now available online at https://bookstore.ksre.ksu.edu/pubs/SRP1171.pdf

The objectives of the NWCVT are to evaluate the performance of released and experimental varieties, determine where these varieties are best adapted, and increase the visibility of winter canola across the United States. Breeders, marketers, and producers use data collected from the trials to make informed variety selections. The NWCVT is planted at locations in the Great Plains, Northern Plains, Midwest, and Southeast.

Seed for the NWCVT was distributed to 32 test sites in 13 states for the 2020–2021 growing season. The locations receiving seed are illustrated on the map on the front cover (see above). See the back cover for a listing of participating cooperators. Of the 32 entries, 18 are commercial and 14 are experimental. These entries were provided by seven seed suppliers. All entries in the trial were treated with insecticide and fungicide seed treatments to control insects and seedling diseases through the late fall and early winter months.

In general, the 2020–2021 growing season was marked by cool and wet spring conditions that resulted in extremely high yields. Temperatures were moderate going into the winter months, and February was highlighted by a massive temperature drop to record low levels. However, winterkill was not a major factor because the crop was well acclimated to the bitter cold and snow cover blanketed many locations. Only minor damage was observed following late freezes at the reproductive stage.

Eighteen harvested test sites in eleven states are included in this report: Akron, CO; Dallas Center, IA; Vincennes, IN; Belleville, Colby, Garden City, Hutchinson, Manhattan, and Norwich, KS: Creston, MT; Clovis, NM; Miami, OK: Ashland City and Springfield, TN: Bushland and Chillicothe, TX: Orange, VA; and Alburgh, VT. Fourteen locations were not harvested or had poor data quality because of inadequate stand establishment, winterkill, or heavy rainfall.

Acknowledgments

This work was funded in part by the fees paid by seed suppliers, the United States Department of Agriculture National Institute of Food and Agriculture Supplemental and Alternative Crops Competitive Grants Program, and the Kansas Agricultural Experiment Station. Allison Aubert assisted with organizing, packaging, planting, harvesting, data collection, and publication writing. Sincere appreciation is expressed to all participating researchers and seed suppliers who have a vested interest in expanding winter canola acres and increasing production in the United States.

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5. Registration is open for the 2022 K-State/KARA Summer Field School

Kansas State University and the Kansas Agribusiness Retailers Association (KARA) will be hosting two, 2-day field schools on July 12-13 and July 14-15 at the K-State Agronomy North Farm (2200 Kimball Ave) located just north of the football stadium. This year's program will focus on corn and sorghum production and fertility. In addition, there will be comprehensive hands-on training in herbicide efficacy and injury, weed identification, soil and water management, crop diseases, and insects. Agendas for both sessions are included at the end of this article.

The complete program and registration link can be found at https://www.ksagretailers.org/events-training/ksu-field-days/. The cost for the program is $210 and includes lunch on both days and the opportunity to earn 12 CCA credits and multiple 1A credits.

Please note: KSRE agents should register via the registration link distributed over the Ag Agent email list serve.

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Agenda for Session 1: July 12 and July 13

Kansas State University/KARA Summer Field School (Session 1)

North Agronomy Farm, Manhattan, KS, July 12-15 2022

	Tuesday 7/12/2022		
8:00 AM	Registration – **North Agronomy Farm**		
8:30 AM	Welcome, Instructions		
	Group A	**Group B**	**Group C**
8:45 AM	Herbicide Efficacy/Injury (Lancaster)	Weed ID (Dille)	Corn/Sorghum Growth & Development (Correndo, Ciampitti)
9:35 AM	Adjuvants (Lancaster)	Weed ID (Dille)	Corn/Sorghum production issues (Correndo, Ciampitti)
10:25 AM	**Break**		
10:40 AM	Weed ID (Dille)	Corn/Sorghum Growth & Development (Correndo, Ciampitti)	Crop Insect Pests (Whitworth)
11:30 AM	Weed ID (Dille)	Corn/Sorghum production issues (Correndo, Ciampitti)	Crop Diseases (Onofre)
12:20 PM	**Lunch – North Agronomy Farm**		
1:10 PM	Corn/Sorghum Growth & Development (Correndo, Ciampitti)	Crop Insect Pests (Whitworth)	Weed ID (Dille)
2:00 PM	Corn/Sorghum production issues (Correndo, Ciampitti)	Crop Diseases (Onofre)	Weed ID (Dille)
2:50 PM	**Adjourn**		
	Wednesday 7/13/2022		
7:00 AM	Registration – **North Agronomy Farm**		
	Group A	**Group B**	**Group C**
7:30 AM	Corn Fertility (Ruiz Diaz, Haag)	Herbicide Efficacy/Injury (Lancaster)	Forage Production (Pedreira)
8:20 AM	Sorghum Fertility (Ruiz Diaz, Haag)	Adjuvants (Lancaster)	Water Quality (Tomlinson)
9:10 AM	**Break**		
9:25 AM	Forage Production (Pedreira)	Corn Fertility (Ruiz Diaz, Haag)	Herbicide Efficacy/Injury (Lancaster)
10:15 AM	Water Quality (Tomlinson)	Sorghum Fertility (Ruiz Diaz, Haag)	Adjuvants (Lancaster)
11:05 AM	**Lunch – North Agronomy Farm**		
11:55 AM	Crop Insect Pests (Whitworth)	Forage Production (Pedreira)	Corn Fertility (Ruiz Diaz, Haag)
12:45 PM	Crop Diseases (Onofre)	Water Quality (Tomlinson)	Sorghum Fertility (Ruiz Diaz, Haag)
1:35 PM	**Adjourn**		

Agenda for Session 2: July 14 and July 15

Kansas State University/KARA Summer Field School (Session 2)

North Agronomy Farm, Manhattan, KS, July 12-15 2022

K-STATE Research and Extension

	Thursday 7/14/2022		
8:00 AM	Registration – **North Agronomy Farm**		
8:30 AM	Welcome, Instructions		
	Group A	**Group B**	**Group C**
8:45 AM	Corn Fertility (Ruiz Diaz, Haag)	Herbicide Efficacy/Injury (Lancaster)	Forage Production (Pedreira)
9:35 AM	Sorghum Fertility (Ruiz Diaz, Haag)	Adjuvants (Lancaster)	Water Quality (Tomlinson)
10:25 AM	**Break**		
10:40 AM	Forage Production (Pedreira)	Corn Fertility (Ruiz Diaz, Haag)	Herbicide Efficacy/Injury (Lancaster)
11:30 AM	Water Quality (Tomlinson)	Sorghum Fertility (Ruiz Diaz, Haag)	Adjuvants (Lancaster)
12:20 PM	**Lunch – North Agronomy Farm**		
1:10 PM	Crop Insect Pests (Whitworth)	Forage Production (Pedreira)	Corn Fertility (Ruiz Diaz, Haag)
2:00 PM	Crop Diseases (Onofre)	Water Quality (Tomlinson)	Sorghum Fertility (Ruiz Diaz, Haag)
2:50 PM	**Adjourn**		
	Friday 7/15/2022		
7:00 AM	Registration – **North Agronomy Farm**		
	Group A	**Group B**	**Group C**
7:30 AM	Herbicide Efficacy/Injury (Lancaster)	Weed ID (Dille)	Corn/Sorghum Growth & Development (Correndo)
8:20 AM	Adjuvants (Lancaster)	Weed ID (Dille)	Corn/Sorghum production issues (Correndo)
9:10 AM	**Break**		
9:25 AM	Weed ID (Dille)	Corn/Sorghum Growth & Development (Correndo)	Crop Insect Pests (Whitworth)
10:15 AM	Weed ID (Dille)	Corn/Sorghum production issues (Correndo)	Crop Diseases (Onofre)
11:05 AM	**Lunch – North Agronomy Farm**		
11:55 AM	Corn/Sorghum Growth & Development (Correndo)	Crop Insect Pests (Whitworth)	Weed ID (Dille)
12:45 PM	Corn/Sorghum production issues (Correndo)	Crop Diseases (Onofre)	Weed ID (Dille)
1:35 PM	**Adjourn**		

6. K-State Weed Science Field Day - July 13

The Department of Agronomy is hosting a Weed Science Field Day! The event will be held on July 13, 2022, from 3:30 pm to 8:30 pm at the Ashland Bottoms Research Farm, 2850 32nd Ave., Manhattan, KS. This field day will fall between two KARA Summer Field School sessions (see companion eUpdate article for the details of the Summer Field School). There is no registration fee for the Weed Science Field Day.

This program will provide an opportunity to browse extension weed science herbicide evaluation trials, network with K-State Weed Science faculty and industry representatives, learn more about weed management and new sprayer technology, and receive 1A credit. Attendees will be entered in a drawing for special door prizes. Remember to bring your lawn chairs!

Registration is due by July 5! Timely registration will help us know how many are coming so we can plan the meal, seating, and transportation.

Agenda

3:30 TO 5:00 pm – Browsing K-State industry sponsored trials (self-guided)

5:00 to 6:00 pm – Presentations

- "Efficacy of alternative cover crop termination methods"
- "Grazed cover crops: Are we affecting their ability to suppress weeds?"
- "Impact of spray volume on residual herbicide efficacy"
- "Influence of planting date on weed management in soybeans"

6:00 to 6:45 pm – Atrazine update from Kansas Corn Commission and Syngenta

6:45 to 8:00 pm – Dinner and Industry panel

8:00 to 8:30 pm – Xarvio Sprayer technology demonstration

Please register for the K-State Weed Science Field Day at:
https://www.eventbrite.com/e/kansas-state-univerisity-weed-science-field-day-tickets-362568109977

You can also email Tyler Meyeres at tpmeyeres@ksu.edu.

KSU Weed Science Field Day

July 13th, 2022

3:30pm – 8:30pm

THIS PROGRAM WILL PROVIDE AN OPPORTUNITY TO BROWSE EXTENSION WEED SCIENCE HERBCIDE EFFICACY TRIALS, NETWORK WITH KSU WEED SCIENCE FACULTY AND INDUSTRY REPRESENTATIVES, LEARN MORE ABOUT WEED MANAGEMENT AND NEW SPRAYER TECHNOLOGY, AND RECEIVE 1A CREDIT.

Where:
Ashland Bottom Research Center
2850 32nd Ave., Manhattan, KS, 66502

Registration:
Register by July 5th at:
https://www.eventbrite.com/e/kansas-state-univerisity-weed-science-field-day-tickets-362568109977
Or email Tyler Meyeres (tpmeyeres@ksu.edu)

Presenters:
Dr. Sarah Lancaster (KSU Weed Science Extension Specialist)
Dr. Anita Dille (KSU Weed Ecologist)
Dr. Marshall Hay (Syngenta)
Zoe Schultz (Kansas Corn Commission)
Kalvin Miller (Xarvio)
Isaac Barnhart (Ph.D. Student)
Tyler Meyeres (Ph.D. Candidate)
Lily Woitaszewski (M.S. Student)

Agenda:
3:30 TO 5:00 PM – BROWSING KSU INDUSTRY SPONSORED TRIALS (SELF-GUIDED)

5:00 to 6:00 pm – Presentations

- "Efficacy of alternative cover crop termination methods"
- "Grazed cover crops: Are we affecting their ability to suppress weeds?"
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Contributors and Sponsors:

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