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Extension Agronomy

eUpdate

07/13/2023

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. Assessing hail damage to corn

Severe thunderstorms and hail are nothing new to Kansas farmers. During this time of year, the threat level is high and parts of Kansas have already seen some destructive hail events in late June and early July (Figure 1). After every storm, the first question often is how will this affect my crops?



Figure 1. Irrigated corn field with hail damage from a severe storm on July 8, 2023, in Cheyenne County, Kansas. Photo by Jeanne Falk Jones, K-State Research and Extension.

The first question you need to answer is:

How far along in development is your corn?

- At the very early stages of the crop, there might be not enough of the plant above ground to sustain any damage.
- The growing point is likely below ground if the corn has less than five leaves before the hail. This is good because young corn has a great capacity to recover from early-season hail damage. The growing point of a corn plant is the top of the stem which contains the actively dividing and elongating cells that will become the tassel. Even if the hail took the leaves off and pounded that little plant into the ground, it should grow out of it with few long-term problems.
- The current situation - If the growing point was out of the ground, then there could be major

damage. Wait a few days then go back out to look for these signs:

- If the main stem starts to grow again and new leaves come out of the main stem, then there is little damage.
- If you start to see tillers, you may be in trouble. Tillers on corn are vegetative or reproductive shoots that grow from the axillary buds on the lower stalk nodes of a corn plant. These tillers will start growing outward from the base of the damaged plant and even though they look okay now, the plant will not be productive at tasseling and ear forming time. This plant should not be counted for stand count when evaluating whether to replant.

So, let's say you were hit by a hail storm last night, and you go out today to look at your crop. The best thing you can do is get back in the pick-up truck and drive away (*unless the crop is completely damaged!*). Don't make any decisions right away, time is your friend. Wait a few days and then come back to check the signs of growth. Even the little plants need a few days to grow so that you can get a stand count of the field.

An accurate estimate of plant survival should be done in the coming days to more precisely determine damaged plants that will survive vs. missing plants – causing stand reductions. Young corn has a great capacity to recover from early-season hail damage. Scout your fields and check for the final number of plants and potential problems associated with these weather events such as lowered disease resistance (Figure 2).



Figure 2. Corn plants damaged by hail such as this one could be at a greater threat for disease. Photo provided by Kansas Corn.

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Dale Fjell, former Kansas Corn Director of Research and Sustainability

2. On-site wastewater systems: Tips to avoid system failure

Last week, the eUpdate featured an [article on the two main on-site wastewater treatment systems](#) – septic systems and lagoon ponds. While wastewater systems can last many years with proper maintenance, on occasion those systems will fail. Failure can mean wastewater backing up into the house and it can also be water standing in the lateral field. These failures can happen for a variety of reasons, such as abuse, overuse, or when tree roots get into the pipes or from heaving as the result of settling over time.

Tips for good system function

- Install risers to the surface from the inspection ports and access manholes to facilitate inspection and maintenance.
- Inspect and pump the septic tank as needed, typically every 3 to 5 years.
- Remove trees and shrubs within 50 feet of the dispersal field or install a structural root barrier.
- Before and after field construction, avoid animal pens, traffic, or heavy equipment on and downslope from the dispersal field area. Soil compaction from frequent use and heavy equipment reduces permeability and causes premature field failure.
- Do not install the dispersal system in wet soil. Compaction and smearing often result from working wet soil. This reduces permeability and causes early system failure.
- Assure that dispersal laterals are level and allow wastewater to reach all parts of the field. Settling, frost action, or trees can cause shifting that may overload a part of the field while another part remains part dry.
- Install an inspection port for each lateral to enable easy checking of dispersal.
- Measure and mark on a permanent map the location of the tank and dispersal laterals for future reference.
- Prevent runoff onto the dispersal field from impervious surfaces (buildings, pavement, etc.) and adjacent areas. The extra water on the field increases the wetness and may contribute to system malfunction or failure. Downspouts from gutters are good to route into a lagoon, but for a septic system with a soil dispersal field (lateral lines), it would be best to divert that water elsewhere (away from the dispersal field).
- Maintain healthy, perennial, cool-season grass over the dispersal field.
- Use water-saving fixtures and habits. Low-flow toilets, showers, dishwashers, clothes washers, and water-conserving habits can substantially reduce wastewater flow and extend the life of underground systems.
- Examine current and past water bills to evaluate usage. The average maximum water use is about 75 gallons per day per person. If water use increases drastically for no obvious reason, it may indicate a leaky faucet or toilet. This wastes water while increasing costs and hydraulically overloads the system.
- A septic tank ahead of a lagoon reduces solids accumulation and delays required solids removal; however, the tank should be pumped periodically (See Septic Tank Maintenance, MF947).
- Maintain a non-climb secure fence around the lagoon for the safety of people and animals.
- Remove tall vegetation at the lagoon edge and inside the fence, and trees within 50 feet of the lagoon.

More information about on-site wastewater systems is available in publications from K-State

Research and Extension, including:

[Onsite Wastewater Systems — Overview](#)

[Site and Soil Evaluation for Onsite Wastewater Systems](#)

[Selecting an Onsite Wastewater or Septic System](#)

[Septic Tank Maintenance – A key to longer system life](#)

[Why Do Onsite Wastewater \(Septic\) Systems Fail?](#)

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3. Fall armyworm activity in Kansas

Fall armyworm, *Spodoptera frugiperda*, can damage several important Kansas crops as well as pasture, turf, and home landscaping. This insect does not overwinter in Kansas. Rather, it is native to the tropical regions of the western hemisphere and is active year-round along the gulf coast and southern Florida, migrating in from these locations each year. Two full generations are possible in Kansas with defoliation and grain damage being the biggest concerns.

The first detected fall armyworm for the season was on June 16 in the Central Kansas district. Moths were also captured in southwest Kansas in the final week of June. Overall, the numbers were very low (Figure 1). The total number of moths caught so far in July has been low as well and restricted to the southwest (Figure 2).

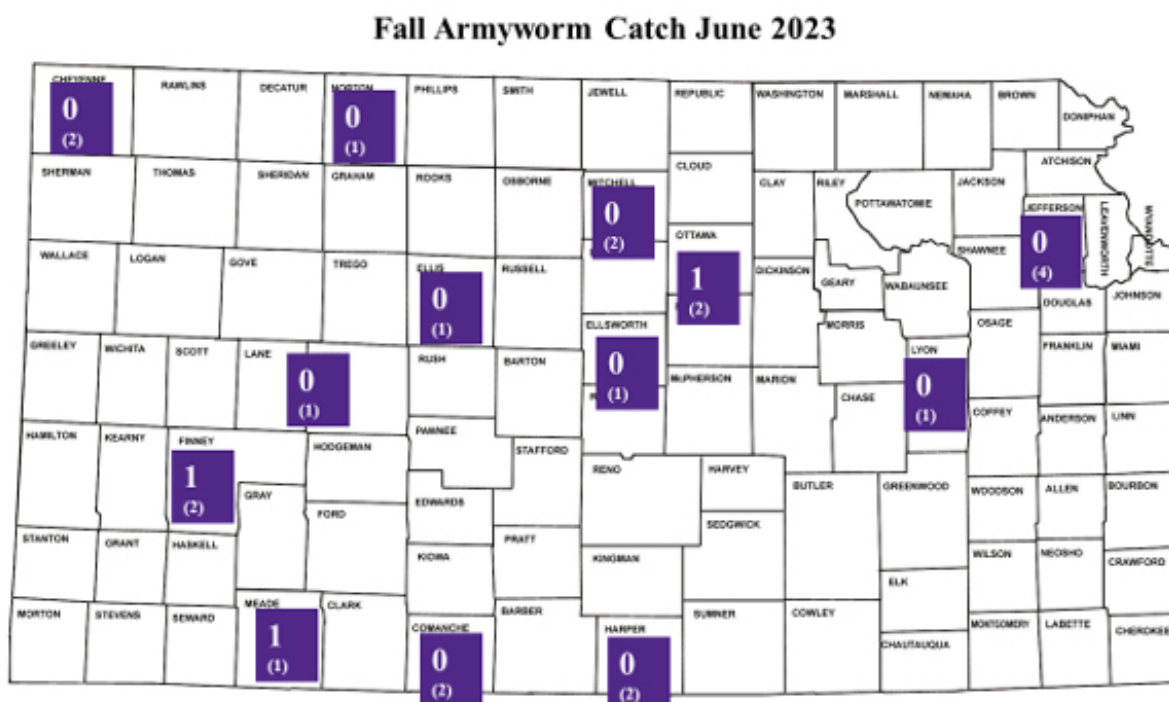


Figure 1. Fall armyworm moth captures in June. The number in parentheses indicates the total number of traps in the county. Map by Anthony Zukoff, K-State Research and Extension.

Fall Armyworm Catch July 2023

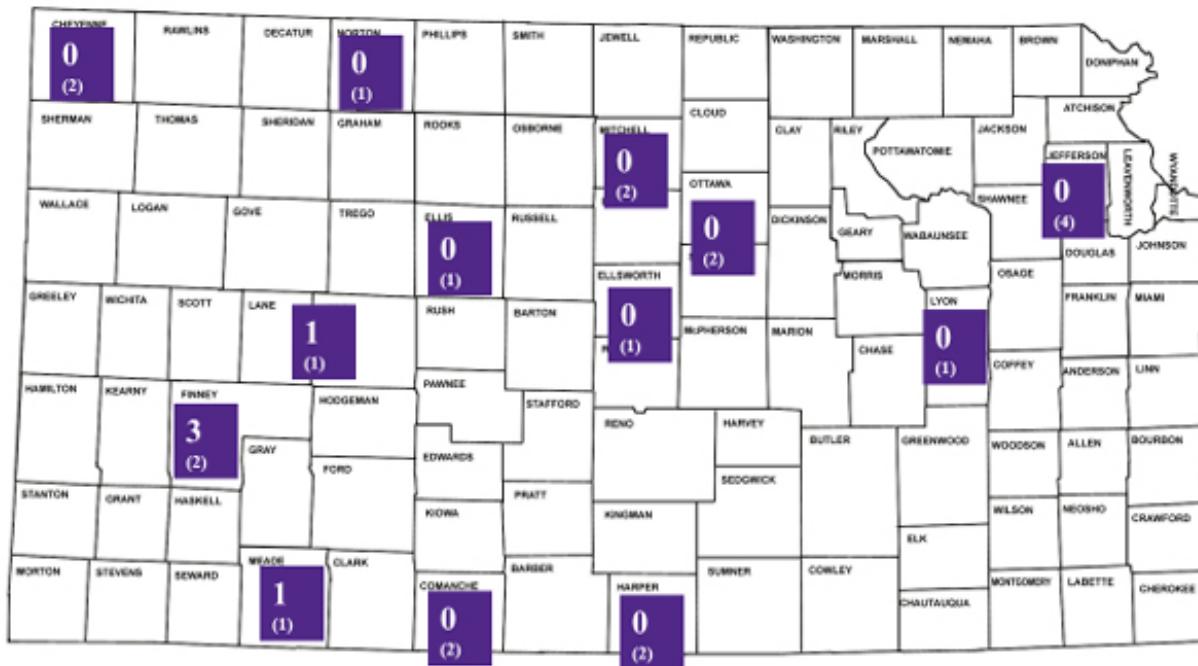


Figure 2. Fall armyworm moth captures in July. The number in parentheses indicates the total number of traps in the county. Map by Anthony Zukoff, K-State Research and Extension.

The number of moths entering Kansas will likely increase through July and at-risk crops should be scouted regularly for the remainder of the growing season. Caterpillars increase in size at an exponential rate and a majority of feeding occurs during the later stage of development. It is critical to scout thoroughly and treat if needed before the caterpillars are over ½ inch long. Larger caterpillars are harder to control and do the most damage. Keep in mind that it is the second generation of fall armyworm that poses the greatest risk, especially for heading sorghum. The first generation is usually small, and crops are in vegetative stages. Caterpillar feeding will make plants look bad, but yield is not at risk with the first generation. Additionally, use caution when making control decisions in alfalfa as flaring aphids is possible. Recommended thresholds can be found below.

Fall Armyworm Thresholds

Alfalfa

- 1-2 caterpillars per square foot can destroy seedling alfalfa
- 10-15 per square foot can destroy 12-inch tall plants.

Corn

- damage to whorl stage in early summer
- treatment may be needed if 75% of plants are damaged
- Bt corn may prevent ear damage.

Sorghum

- damage to whorl stage in early summer
- treatment may be needed if 75% of plants are damaged
- 1-2 larvae/head during flowering to soft dough reduces yield 5-10%

Wheat

- Larval “window-paning” in early planted wheat can be a concern
- If 25-30% of plants show damage, examine the field frequently
- Treat at 2-3 active larvae/ft.

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4. Chinch bugs are active in Kansas

Chinch bugs have historically been a problem in Kansas--in lawns, golf courses, turf farms, etc. But in agriculture, they are mainly a problem in sorghum. However, they can also affect corn and occasionally wheat. Since they are true bugs, chinch bugs may attack any grass where they insert their mouthparts into the plants and suck out the juice. This often has little to no effect on the plant unless there are large numbers of bugs and/or the plants are growing under less-than-ideal conditions so that they are already stressed. Chinch bug feeding simply adds to this stress.

Sampling for chinch bugs the week of July 4 indicated that 95% of the chinch bug population in north central Kansas were adults (Figure 1). Adults don't feed as much as nymphs but are more concerned with mating, oviposition, etc. This means the majority of feeding in crops (sorghum, corn, etc.) is still to come after the nymphs hatch (Figure 2).

Treating for chinch bugs needs to be accomplished using as much carrier (water) as practical to ensure the insecticide gets good coverage on the plants, including the base of the plants (sprays directed at the base of the plants will help). Nymphs produced now will most likely become adults in 3-4 weeks, then mate and start the process all over again for another generation, which will then move to fall-planted wheat, then on to overwintering sites. They overwinter in bunch grasses then move to wheat in the spring to deposit eggs and start all over again.

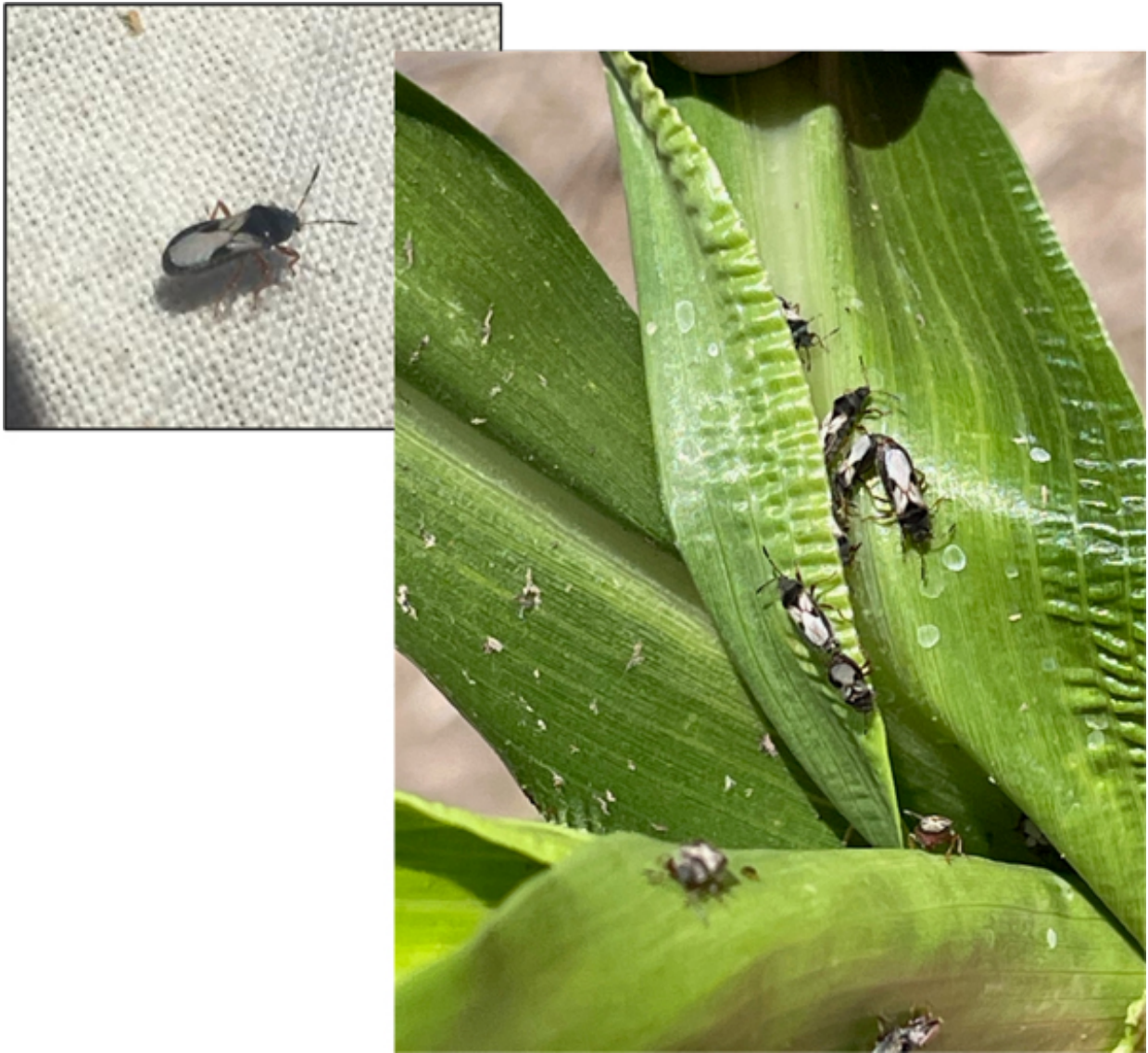


Figure 1. Adult chinch bugs. Photos by K-State Entomology.

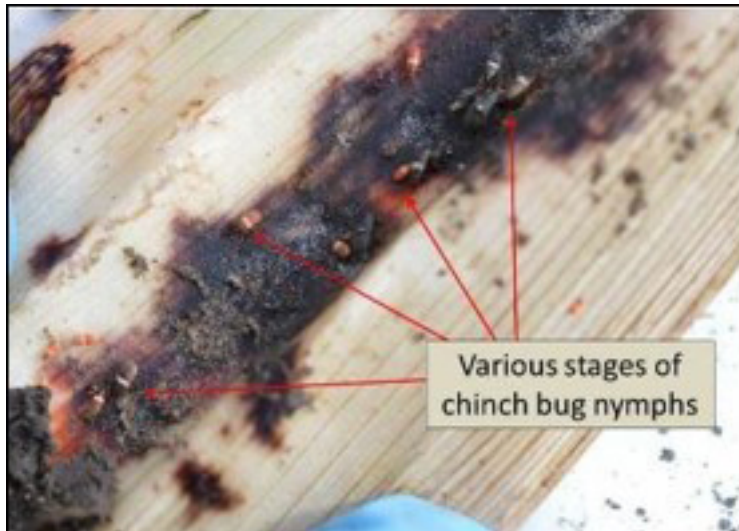


Figure 2. Chinch bugs as nymphs. Photos by K-State Entomology.

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5. Growing season weather summary for Kansas in 2023

This past Sunday, July 9, marks exactly 100 days since April 1, a date that meteorologists often use to define the start of the summer growing season. In practice, the start of the growing season varies by year, crop, and location, but selecting a common start date is useful for comparing different years. In this article, we take a look at how the 2023 growing season to date has compared to 2022, and how 2023 compares to normal for Kansas.

Table 1 contains data for 27 locations across Kansas, three from each of Kansas' nine climate divisions. There are two columns for temperature, specifically the number of days on which the high temperature reached at least 90°F between April 1 and July 9 for this year and 2022. The last four columns contain precipitation data. The first two of those four columns contain total precipitation from April 1 to July 9 for 2023 and 2022, and the last two columns contain normal precipitation for this period and the departure from normal for the period in 2023.

High-temperature days are lower in 2023

The number of 90-degree days has been lower at every single location in 2023 than it was in 2022. Goodland has only reached 90 degrees three times. Of these three days, the warmest was a 93°F reading on April 12. While Liberal has had 13 days of 90-degree temperatures since April 1, the warmest day was 98°F back on May 9. Liberal averages 80 days at or above 90° each year, and 16 days at or above 100°. The fewest 90-degree days in Liberal in a year is 36, and every year on record has had at least three days with highs at or above 100°F. Is it possible that this year could be 100-degree free at Liberal? Yes, but there's still plenty of summer to go. Garden City has had just 7 90-degree days this year, compared to 35 by this time last year. Manhattan's 10 is exactly half the count from last year. Topeka is closest to matching 2022's count, with 23 90-degree days so far, just three shy of 2022's count. It's worth noting that Topeka had 50 more 90-degree days after July 9 in 2022, and averages 21 such days on or after August 1.

Western Kansas outpaces Eastern Kansas for rainfall

One reason for the lack of heat has been an abundance of precipitation, particularly in western Kansas. All nine locations in western Kansas have had more precipitation in 2023 since April 1 than in 2022, and all but one of them are above normal for the growing season. Liberal is one of the above-normal locations; their 10.43-inch total is over double the total for the same 100 days in 2022. The normal rainfall for Liberal during this same period is 8.72 inches. Goodland's 12.43 inches since April 1 is 150% of their normal precipitation of 8.29 inches. Garden City is almost 4 inches above normal for the growing season. In addition, Garden City has received over 10 inches more precipitation in 2023's growing season than in 2022 (<2 inches).

Not all parts of Kansas are wetter than last year. All nine locations in eastern Kansas are below their 2022 growing season totals as of July 9. In addition, all of them are at least 3 inches below normal for the growing season to date. The differences are most notable in east central and southeast Kansas where Topeka and Chanute are more than 7 inches below their 2022 totals. Chanute is running over 8 inches below normal for the growing season, while Topeka is over 6 inches below normal. In central Kansas, most locations are below the 2022 totals, but Great Bend and Medicine Lodge are ahead of last year. Medicine Lodge is the wettest of the 27 locations, with over 17 inches of precipitation since April 1. So far in the first 9 days of July, Medicine Lodge has had 6.45 inches of rain, more than twice

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their normal amount for the entire month of July! Medicine Lodge is the only location in central Kansas above normal; the other eight sites have growing season precipitation deficits ranging from 0.87 inches (Salina) to 4.27 inches (Hutchinson).

Table 1. Comparison of 2023 and 2022 counts of 90-degree days and growing season precipitation total, normal, and departure from normal (in inches) for the period April 1-July 9 (Source: SC-ACIS). Bold numbers indicate the higher value in each pair.

Division	Location	Number of days with highs \geq 90°F		Growing Season Precipitation (inches)			
		April 1-July 9		April 1-July 9			
		2023	2022	2023	2022	Normal	2023 Dep.
Northwest	Colby	9	30	12.46	4.97	8.52	+3.94
	Goodland	3	26	12.43	5.35	8.29	+4.14
	Hill City	20	32	9.42	4.97	9.08	+0.34
North Central	Concordia	17	25	9.72	11.28	11.90	-2.18
	Plainville	18	28	7.55	8.77	10.66	-3.11
	Washington	12	21	10.52	20.06	13.68	-3.16
Northeast	Holton	5	18	11.34	13.80	15.20	-3.86
	Manhattan	10	20	12.24	19.04	15.50	-3.26
	Marysville	11	18	10.03	15.65	14.25	-4.22
West Central	Russell Springs	12	37	11.29	3.96	7.67	+3.62
	Tribune	6	26	11.15	5.51	7.36	+3.79
	WaKeeney	14	28	5.93	5.62	10.11	-4.18
Central	Great Bend	10	33	10.22	7.19	11.74	-1.52
	Russell	16	30	7.24	8.52	10.50	-3.26
	Salina	19	29	11.74	16.40	12.61	-0.87
East	Emporia	15	24	10.57	16.54	14.58	-4.01
	Olathe-Indust. Airport	14	25	9.49	15.20	15.66	-6.17
Central	Topeka	23	26	8.99	16.17	15.11	-6.12
Southwest	Dodge City	11	40	12.67	4.26	9.19	+3.48
	Garden City	7	35	12.52	1.79	8.53	+3.99
	Liberal	13	42	10.43	4.41	8.72	+1.71
South Central	Hutchinson	22	31	8.07	11.60	12.34	-4.27
	Medicine Lodge	18	40	17.17	11.97	10.39	+6.78
	Wichita	13	29	11.96	18.57	14.42	-2.46
Southeast	Chanute	24	29	8.50	15.56	17.08	-8.58
	Coffeyville	21	29	10.32	15.01	17.00	-6.68
	Winfield	19	30	12.38	19.79	15.69	-3.31

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6. Save the Date - North Central Kansas Experiment Field Day, August 17

All interested individuals are encouraged to save the date for the North Central Kansas Experiment Field Day. The event is scheduled for August 17 at 5:30 p.m. and is free to attend. The program is still being finalized but some topics will include updates on corn and soybeans. A free meal will be provided at the conclusion of the program.

Check back next week in the eUpdate for the full program details and location.

**Kansas State University
North Central Kansas Experiment Field
Fall Field Day**

Thursday, August 17, 2023 at 5:30 PM

Location:

1300 60 RD, Courtland, KS 66939

-OR-

2 miles N of HWY 36 on 60 RD

Save the date - still finalizing topics

Updates on corn and soybeans

Free dinner provided after presentations



Please contact Scott Dooley at 785-706-8450 or sjdooley@ksu.edu prior to this event if accommodations are needed for persons with disabilities or special requirements.
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