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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. Biomass production and nutrient uptake of drought-damaged corn

A number of farmers are asking some pretty difficult questions on the value of drought-damaged corn for various uses, including as feed and for soil protection. There are a number of variables that go into that answer, some of which include:

- Does the farmer have a need or market for the corn as hay or silage, which will also be influenced by plant nitrate content? (Nitrate toxicity is discussed in more detail in a companion article in this eUpdate issue.)
- The plant nutrient content of the crop and what portion of those nutrients would be available to future crops.
- The need for residue cover to prevent wind or water erosion.
- The value of additional soil moisture for future crops from maintaining residue cover.

Range of vegetative growth and grain yields

Previous data collected in Kansas on drought-affected corn used measurements of the plant stand, height, dry matter, and moisture content to estimate biomass production and nutrient uptake/value of the biomass.

Forage yield. A general rule of thumb is that corn with <20-bushel yield potential is best used as forage, while corn with > 50 bushels per acre yield should be harvested for grain. What do these different yield levels look like? Figure 1 gives the dry matter content found in corn standing in the field (data collected in 2011) versus plant height (from the ground to the base on the tassel).

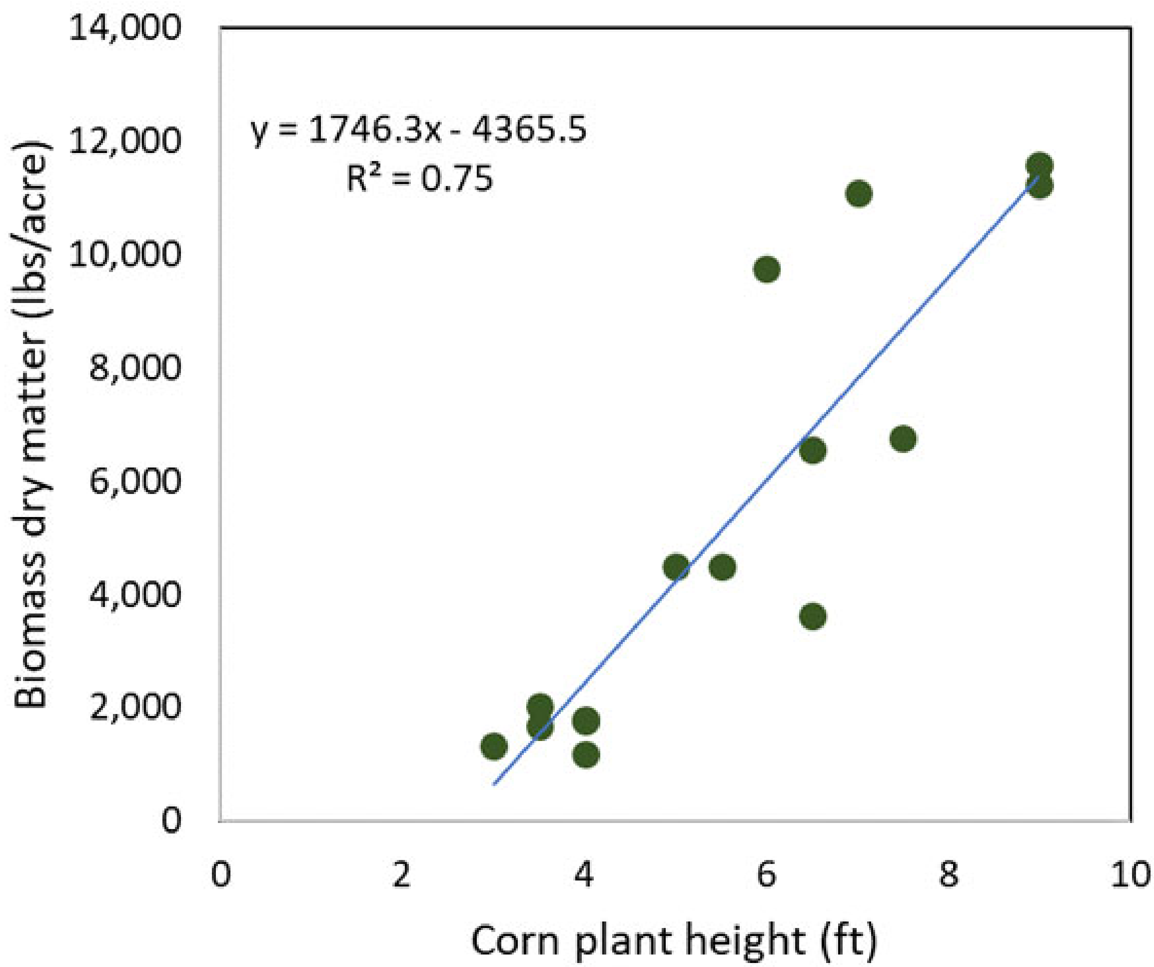

Figure 1. Dry biomass production vs. corn plant height of drought-affected corn collected in Kansas.

Nutrient content of the vegetation. What is the potential value of the crop left in the field for residue cover? There are several benefits that have to be considered in making that decision. The nutrient content of the plants and subsequent effects on soil test levels and fertilizer rates for next year's crop is one factor to consider. The nutrient content of the plant material harvested in July 2011 is given in Figure 2. The nutrient content of the material is relatively high at these stages of growth and increases on an acre basis with dry matter yield. But, how do these numbers relate to future fertilizer needs?

The majority of the nitrogen (N), phosphorus (P), and sulfur (S) in plant material are generally present as protein and other organic compounds. For these nutrients to become available to plants, these compounds must be broken down and the N and P mineralized. This process will normally take 3 or more years to complete, with the C:N ratio being the primary factor controlling the release rate. Corn stalks are normally a very high C:N material, with a C:N ratio of around 60 to 1. In high C:N materials, very little net N mineralization will occur until the organisms utilizing this material as a food stuff reduce the carbon content of the residue to a C:N ratio of roughly 25:1. In these severely drought-damaged crops, the N content is much higher than normal, since there is little or no grain present. The C:N ratio in many of these severely damaged crops is less than 35:1. So net mineralization will occur much quicker, in a matter of months rather than years. In very severely damaged corn where N content is around 2% or more, roughly 50% of this N, P, and S is likely to be available for a summer crop planted next spring.

Corn silage with much more stalk and grain contains about 25 pounds K2O per dry ton. When the biomass is removed, the amount of K2O removed from the field is usually much higher than nitrogen. Potassium can leach from the residue and back to the soil in a few months and is K that will be likely available for the next crop.

Unfortunately, wheat planted this fall into these residues will not benefit nearly as much from the N, P, and S present in the vegetation as there will not be as much time for soil organisms to break the residues down and mineralize these nutrients. Winter wheat planted in October will essentially be done taking up nutrients by the end of May, when soil organisms will be getting into high gear!

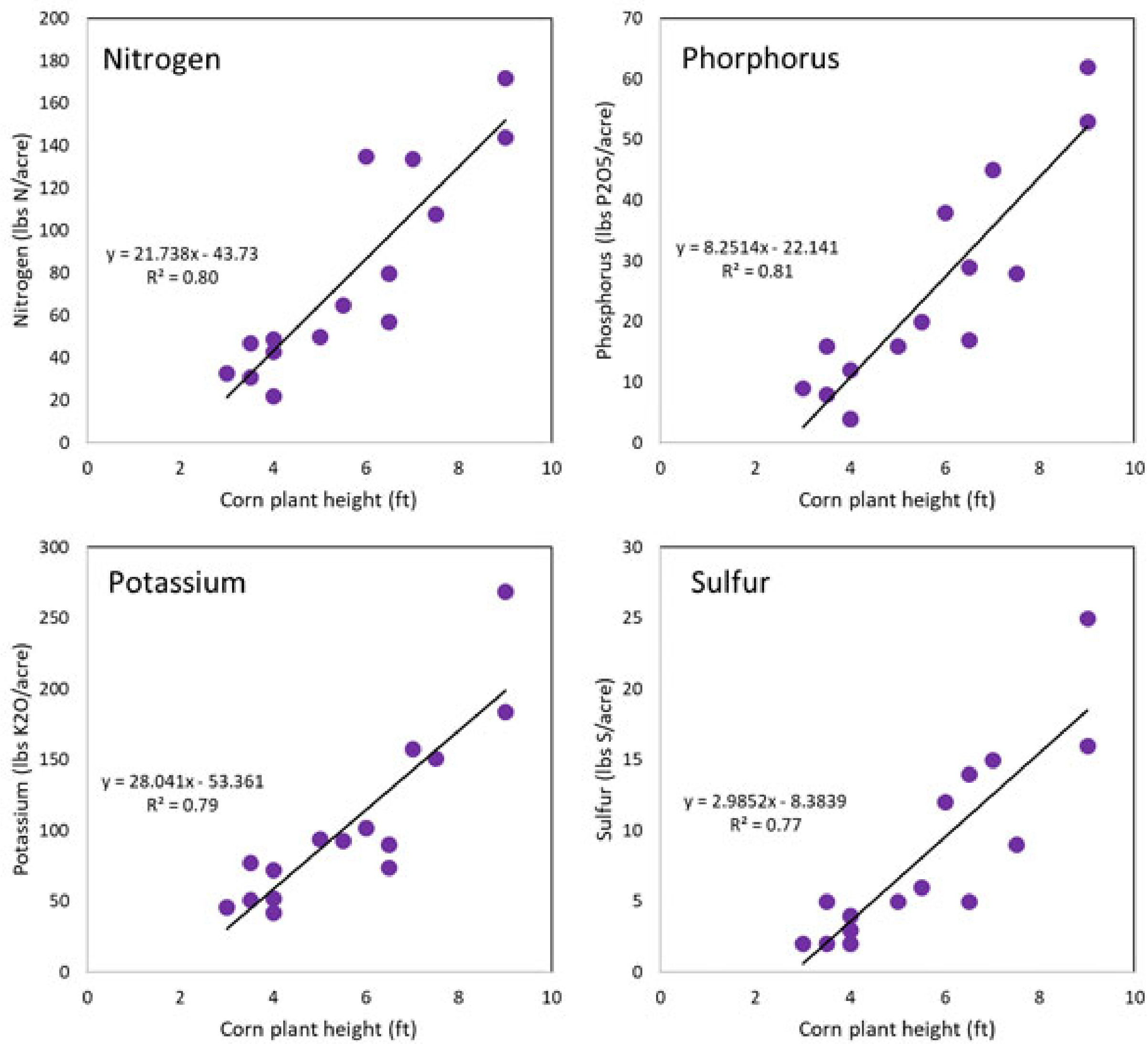

Figure 2. Nutrient uptake (N, P, K and S) vs corn plant height from drought-affected corn collected in Kansas.

Summary

A number of factors should be considered when assigning a value to drought-damaged corn. Nutrient removal from the field is one key aspect since biomass can export significant amounts of nutrients. Some nutrients like K can are primarily present in the plant biomass, and in a typical grain production system, most of the K stays in the field/crop residue and is available for the subsequent crops. Other nutrients such as N, P, and S will become available after residue decomposition and mineralization, which will require time and may be only partially available in the short term.

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2. Nitrate toxicity in drought-stressed corn and sorghum

Drought-stressed crops such as corn and sorghum tend to accumulate high nitrate levels in the lower leaves and stalk of the plant (Figure 1). Nitrates accumulate in the lower portion of these plants when stresses reduce crop yields to less than expected, based on the supplied nitrogen fertility level. Nitrate toxicity in livestock is because of its absorption into the bloodstream and binding to hemoglobin, rendering it unable to carry oxygen throughout the body. The result is eventual asphyxiation and death.

Figure 1. Drought-stressed corn plants. Photo by Sandy Johnson, K-State Research and Extension.

Forage testing

It is wise for producers to test their drought-stricken forage prior to harvest. Levels of nitrates can increase in drought-stressed plants after a rain and delaying harvest may be beneficial. Nitrate testing can be done through several labs, including the K-State Soil Testing Laboratory. Harvesting the forage 6-to-12 inches above the ground to avoid the highest concentrations of nitrate in the plant is a good practice. Producers should collect a good representative forage sample above this cutting height to get an accurate determination of the nitrate concentration. Factors to consider in setting the harvest height would include actual nitrate concentration, storing and feeding methods and forage availability, Toxicity is related to the total amount of nitrate in the diet (including water) and how quickly it is eaten, but, generally, if forages contain more than 6,000 ppm nitrate, they should be considered potentially toxic (Table 1). Animals under physiological stress (sick, hungry, lactating, or pregnant) are more susceptible to nitrate toxicity than healthy animals.

Table 1. Level of forage nitrate (dry matter basis) and the potential effect on animals.

ppm Nitrate (NO_3)	Effect on Animals
0-3,000	Virtually safe
3,000-6,000	Moderately safe in most situations; limit use for stressed animals to 50% of total ration.
6,000-9,000	Potentially toxic to cattle depending on the situation; should not be the only source of feed.
9,000 and above	Dangerous to cattle and often will cause death.

Management options

Depending on the planned feeding method, a producer may wish to harvest different parts of the plant. If wrapping the forage into a bale and feeding it directly to livestock, a producer may want to test the lowest part of the stalk to determine the greatest risk of nitrate forage that the animal could ingest. If a producer was planning on grinding the bale, a whole-plant sample above what will be left in the field may be a more accurate representation of what will be eaten. If a harvested forage is high in nitrate, grinding and mixing the feed with another forage such as prairie hay or brome will dilute the total nitrates in the animal's diet and could potentially reduce the risk of poisoning.

High-nitrate forages chopped for silage and properly ensiled are a safer option for livestock feeding. During the ensile process, potentially 50 percent of the nitrates in the forage will be metabolized by the microbes and can vastly reduce the risk of poisoning. It is still not a bad idea to leave 6 inches of stubble in the field. That is the portion of the stem with the highest concentration of nitrates.

Grazing high nitrate forages can be a dangerous practice. Grazing pressure should be limited so that animals do not consume the parts of the plant forage testing showed to be dangerous. Although animals tend to consume the leaves and the top portions of the plant, which contain less nitrates, the risk of consuming a high-nitrate portion of the plant still exists. In addition, the longer the animal is left on a field and the more that animal is forced to eat the remaining forage at the lower portions of the plant, the greater risk of nitrate poisoning.

For more information, see K-State Research and Extension publication MF3029, "Nitrate Toxicity", at your local county Extension office, or at https://bookstore.ksre.ksu.edu/pubs/MF3029.pdf

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3. Wheat streak mosaic virus: Problematic in central Kansas for the second year in a row

For the second year in a row, wheat streak mosaic virus was problematic in wheat in the central corridor of Kansas. Several factors likely contributed to this including late summer rainfall in 2021 which was favorable for volunteer wheat establishment in some areas. One of the best preventative measures for wheat streak is the control of volunteer wheat early and often after harvest. If volunteer wheat is allowed to stand, it creates a "green bridge", allowing wheat streak mosaic and wheat curl mites to survive locally. Volunteer wheat should be terminated at least two weeks prior to planting to allow sufficient time for mites to die off. Growers should be mindful of volunteer wheat that may "hide" in double cropped soybeans or cover crops.

Figure 1. Volunteer wheat that has emerged in wheat residue. Photo by Sarah Lancaster, K-State Research and Extension.

Breaking the "green bridge"

Wheat curl mites will move off growing wheat as the green tissue dries down and dies. After moving off the existing wheat at or near harvest time, the mites need to find green tissue of a suitable host soon or they will die (death of the whole population will take approximately 2 weeks).

Producers often like to wait several weeks after harvest before making their first herbicide application to control volunteer wheat. This allows as much volunteer as possible to emerge before spraying it or tilling it the first time. Glyphosate and atrazine are two herbicides that are often used for this purpose. Additional information about controlling volunteer wheat can be found in a recent eUpdate article: "Considerations for weed control following wheat harvest". Often, a second application or tillage operation will be needed later in the summer to eliminate the green bridge to fall-planted wheat by making sure all volunteer is dead within ½ mile of wheat being planted in the fall. As we saw in 2021, wet weather through late summer often favors multiple flushes of volunteer wheat (Figure 2) and also favors the growth of other grassy weeds that can also support moderate populations of the curl mites and virus.

Figure 2. Thick stand of volunteer wheat after wheat harvest (left panel) and detail of volunteer wheat development (right panel). Photos taken in Edwards County, KS by Romulo Lollato, K-State Research and Extension.

Management with genetic resistance: One tool in the toolbox

Other than timely control of volunteer, genetic resistance is also an important tool for WSMV control. Genetic resistance to wheat streak mosaic can also reduce the risk of severe disease problems. There are currently a several that have wheat streak mosaic resistance, including KS Dallas (red), KS Hamilton (red), Guardian (red), Oakley CL (red), Joe (white), and Clara CL (white). Some of these varieties have a gene named *WSM2*. These resistance genes help, but have some serious limitations. For example, they are effective against wheat streak mosaic virus, but not against triticum mosaic or High Plains virus, two other viral diseases spread by wheat curl mites, sometimes simultaneously. The resistance conferred by WSM2 is also temperature sensitive and is much less effective at high temperatures, although resistance in KS Dallas and KS Hamilton seem to endure greater temperatures before breaking down (~ 70º F). If wheat is planted early for grazing or if high temperatures persist into October, the resistance is much less effective. KS Silverado (white) also has temperature sensitive resistance to wheat streak mosaic, although from a different source than WSM2.

In addition, there are a handful of varieties with resistance to the wheat curl mite, including TAM 112, Byrd, Avery, Langin, Kivari AX, KS Western Star, Whistler, Canvas, Guardian, Crescent AX, Incline AX, Fortify SF, TAM 115, TAM 204, and T158. These varieties remain susceptible to the viral diseases, but they generally slow the development of the mite populations in the fall. This resistance can help reduce the risk of severe disease but will not provide enough protection if wheat is planted in close proximity to volunteer wheat or other hosts infested with large populations of the curl mites and virus.

Unfortunately, many of these varieties are adapted to Western Kansas and may not be the best options for production systems in the central corridor. There are some central Kansas adapted varieties that tolerate WSMV infection better than others, including Rockstar, SY Wolverine, LCS Photon AX, LCS Helix AX, and LCS Julep. These varieties will still show symptoms of WSMV, but may yield better than other varieties that are more susceptible.

More information on variety selection can be found here: MF991 *Wheat Variety Disease and Insect Ratings* https://bookstore.ksre.ksu.edu/pubs/MF991.pdf

Figure 3. Close-up of wheat showing symptoms of a wheat streak mosaic virus infection in the fall. Photo by Kelsey Andersen Onofre, K-State Research and Extension.

Other hosts for the wheat curl mite

Volunteer wheat is not the only host of the wheat curl mite. Over the years, multiple research studies have evaluated the suitability of wild grasses as hosts for both the curl mite and the wheat streak virus. There is considerable range in the ability of a grassy weed species to host the mite and the virus. Barnyardgrass is among the more suitable hosts for both virus and mites, but fortunately it is not that common in wheat fields. In contrast, various foxtails, although rather poor hosts, could be important disease reservoirs simply because of their abundance. These grasses may play an important role in allowing the mites and virus to survive during the summer, months particularly in the absence of volunteer wheat.

The K-State Research and Extension publication, MF3383 - *Wheat Streak Mosaic*, includes information about grassy weed hosts of the mite and virus, and the contribution of these hosts to the risk of severe wheat streak mosaic infections. Take note of significant stands of these grasses in marginal areas and control them as you would volunteer wheat.

If volunteer wheat and other hosts are not controlled throughout the summer and become infested with wheat curl mites, the mites will survive until fall and could infest newly planted wheat. Wheat curl mite infestations of wheat often lead to wheat streak mosaic infections (Figures 2 and 3).

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4. Critical timing in Kansas: High temperatures and corn development

The July heatwave came at a particularly critical period for the Kansas corn crop this year. During this period the statewide average of corn silking/tasseling has eclipsed the halfway point. According to the USDA National Agricultural Statistics, the percent of corn reaching silking has increased from 47% last week to 61% as of July 24, 2022. This is the latest it has reached this percentage since 1995 (Figure 1). Most likely this was the result of late planting due to spring moisture. However, it meant that the corn was subject to extreme heat while in this vulnerable stage.

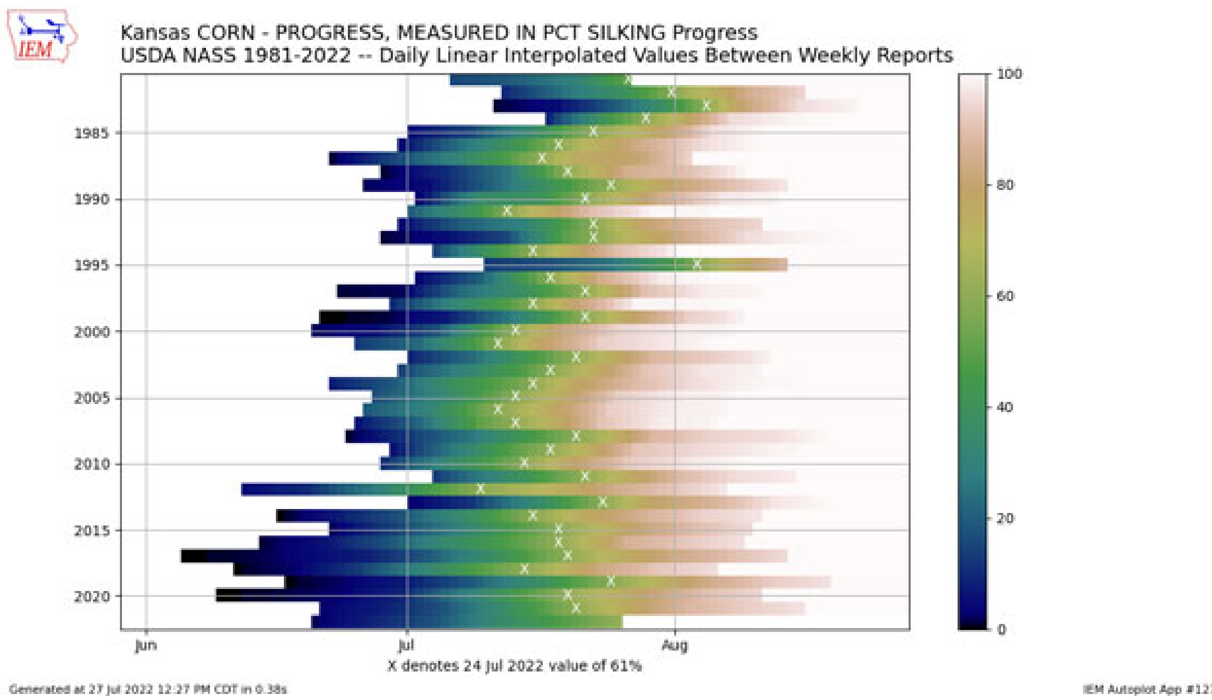

Figure 1. Statewide Kansas average progress of corn at the silking stage since 1981. Source: NASS/IEM.

So far in July, temperatures have consistently reached 100°F or more in many locations of the state (Figure 2). Both the Meade and Ashland Mesonet stations have been above the century mark over 65% of the days. To compound the stress concerns, overnight lows have also been above 70°F consistently as well (Figure 3). While the higher percentage of days with temperatures above 7 °F were further east than the highest afternoon maximums, there remains quite a bit of overlap in south-central and southeastern Kansas of unrelenting heat. Areas in the southeast observed temperatures staying above 70°F for as much as 70% of the time in July thus far. Conditions have also been remarkably dry across the state during this period.

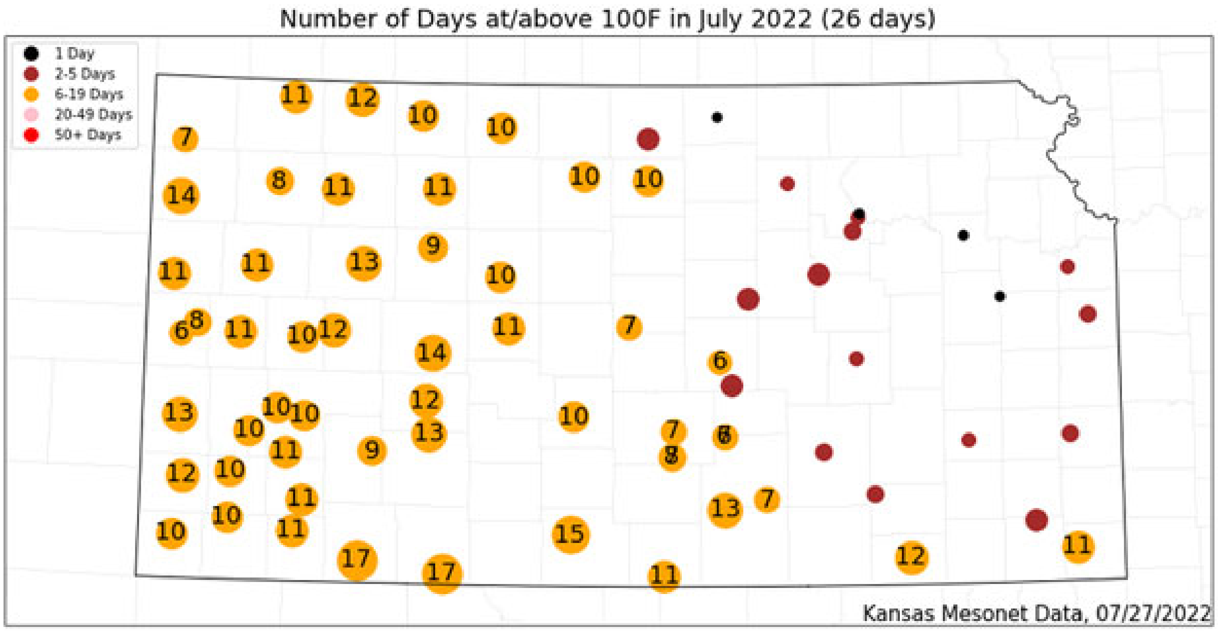

Figure 2. Total days with maximum temperature greater than 100 °F. Source: Kansas Mesonet

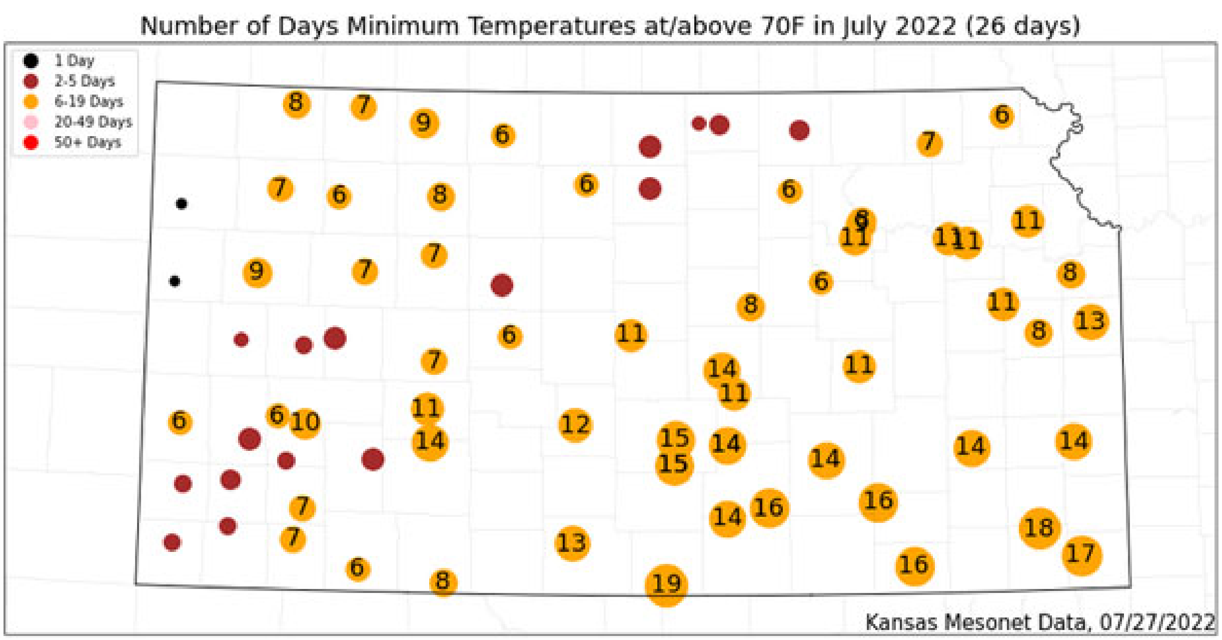

Figure 3. Total days with minimum temperature greater than 70 °F. Source: Kansas Mesonet

Heat stress will have more of an impact on corn at this stage of growth when combined with drought stress. Even in the absence of drought stress, heat stress alone can still increase the asynchrony between pollen shed and silk extrusion when corn reaches flowering time, ultimately reducing the final number of kernels (Figure 4). In addition, if stress conditions are prolonged, those effects will be reflected in a larger kernel abortion and impacts of the final size, kernel weight, negatively impacting final yields.

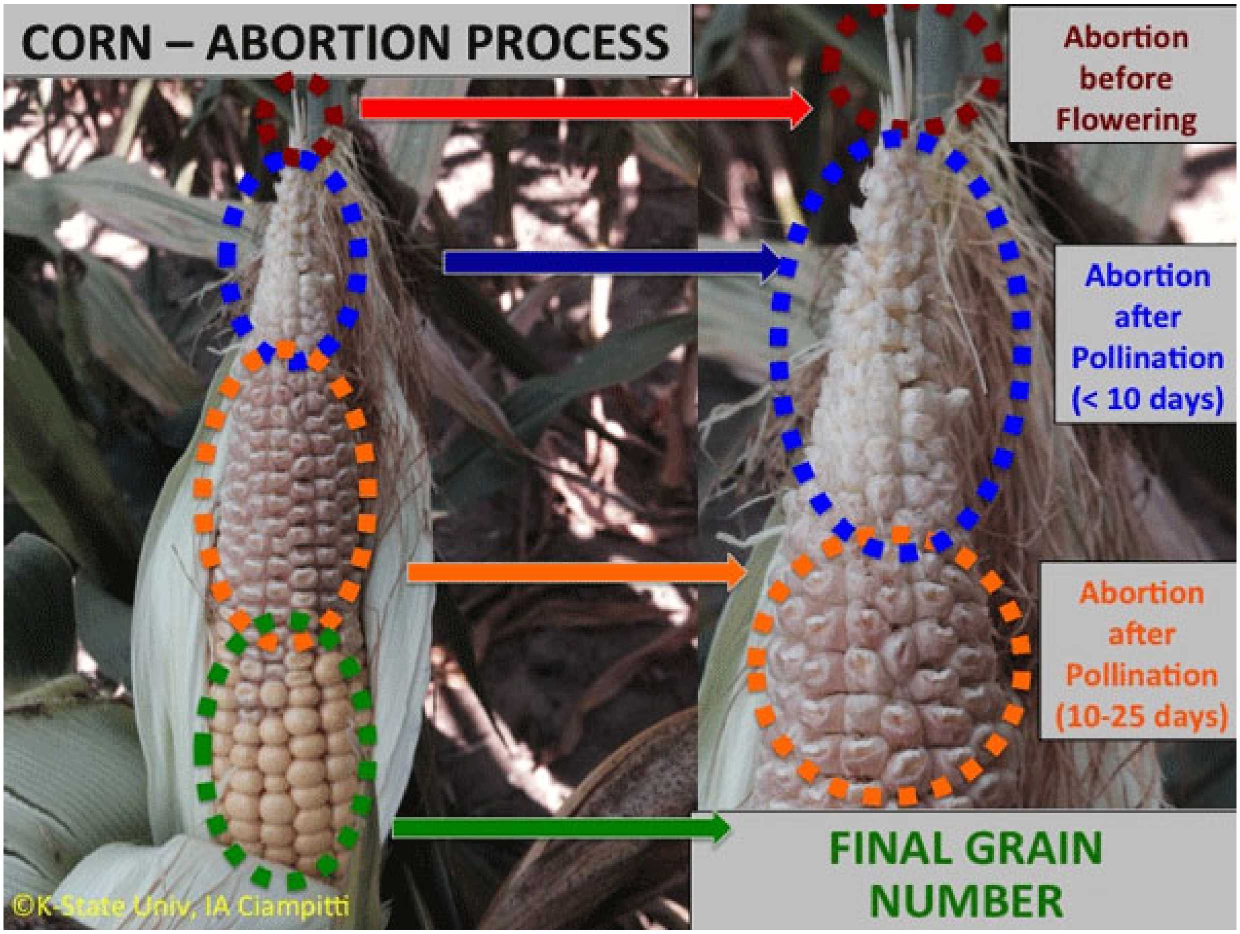

Figure 4. Ear abortion in corn from the combined effect of heat and drought stresses at the critical period around flowering. Photo by Ignacio Ciampitti, K-State Research and Extension.

Growing degree day tool on Kansas Mesonet

The Kansas Mesonet has a useful tool that tracks growing degree accumulation for multiple crops. With this tool, you can pick the planting/emergence date for the start of the interval. Selecting the graph will illustrate the growing degree accumulation for this season versus normal and the plant stage. You can access the page at: https://mesonet.k-state.edu/agriculture/degreedays/. You can also access the Maximum and Minimum temperature data here: https://mesonet.ksu.edu/weather/maxmin. Mesonet data updates in real-time with data from 79 weather stations.

Example of grain abortion from heat and drought stress

The following example depicts the occurrence of grain abortion resulting from a combination of heat and drought stress during various reproductive stages in corn plots at the KSU North Farm (Figure 5). The picture shows the upper section of the corn ears with several grains aborted. This grain abortion is due to multiple processes, including sterility of flowers, lack of pollination, pollination but lack of effective grain formation, and grain formation but late abortion (after pollination), all mainly due to heat and drought conditions. The failure of pollination is mainly due to an asynchrony between pollen availability for the last silks emerging (from tip of the ears). However, it also shows pollination failures at the middle and base of the ears, indicating issues with pollen viability due to heat stress (Stress Degree Days ~ 170-200 around R1).

Besides the heat stress starting right before VT stage, the crop also started to suffer drought conditions due to the absence of precipitations between June 29 and July 25. This combined stress (both heat + drought) caused additional grain abortion during R2-R3 stages, even after a successful pollination (upper-middle section of the ears). As demonstrated on Figure 4, grain abortion can occur several weeks after pollination, affecting not only grain number but most likely maximum grain weight as well.

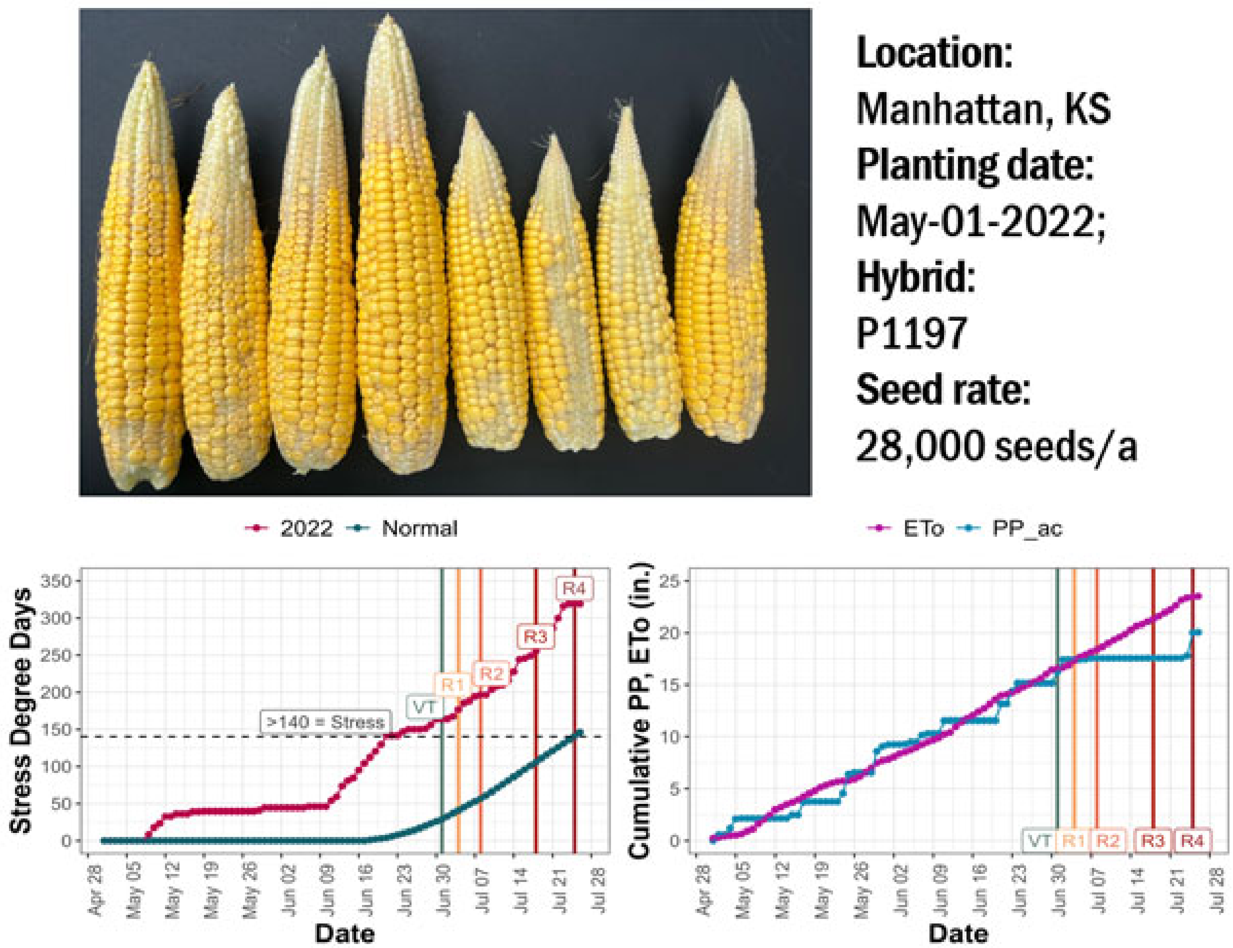

Figure 5. **Corn ears at R4 stage (dough) showing grain abortion at different sections due to heat and water stress at variable moments during reproductive stages, since VT (tasseling). Corn plots were planted at the North Farm (Manhattan, KS) on May-01-2022. Photo source: Ciampitti Lab. Precipitations (PP) and Evapotranspiration (ETo) source:** https://mesonet.k-state.edu/weather/historical/. **Stress Degree Days source:** https://mesonet.k-state.edu/agriculture/degreedays/.

Stress conditions were very severe in parts of central, south central, and southeast Kansas, compromising yields and presenting a large impact on potential productivity. Farmers should scout their fields and perform yield estimates (https://bit.ly/3PJw9JN) and consider making a decision on the crop for the coming weeks. Stay tuned for more information on the effects of stress conditions for corn fields across the state.

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5. First report of southern rust in Kansas

Southern rust has been detected in northeast Kansas (Figure 1). Unlike some other corn diseases, such as gray leaf spot, southern rust does not survive in Kansas during winter months and blows in annually from more tropical regions. The severity is dependent on the weather and southern rust likes 90-degree days, warm nights, and high humidity.

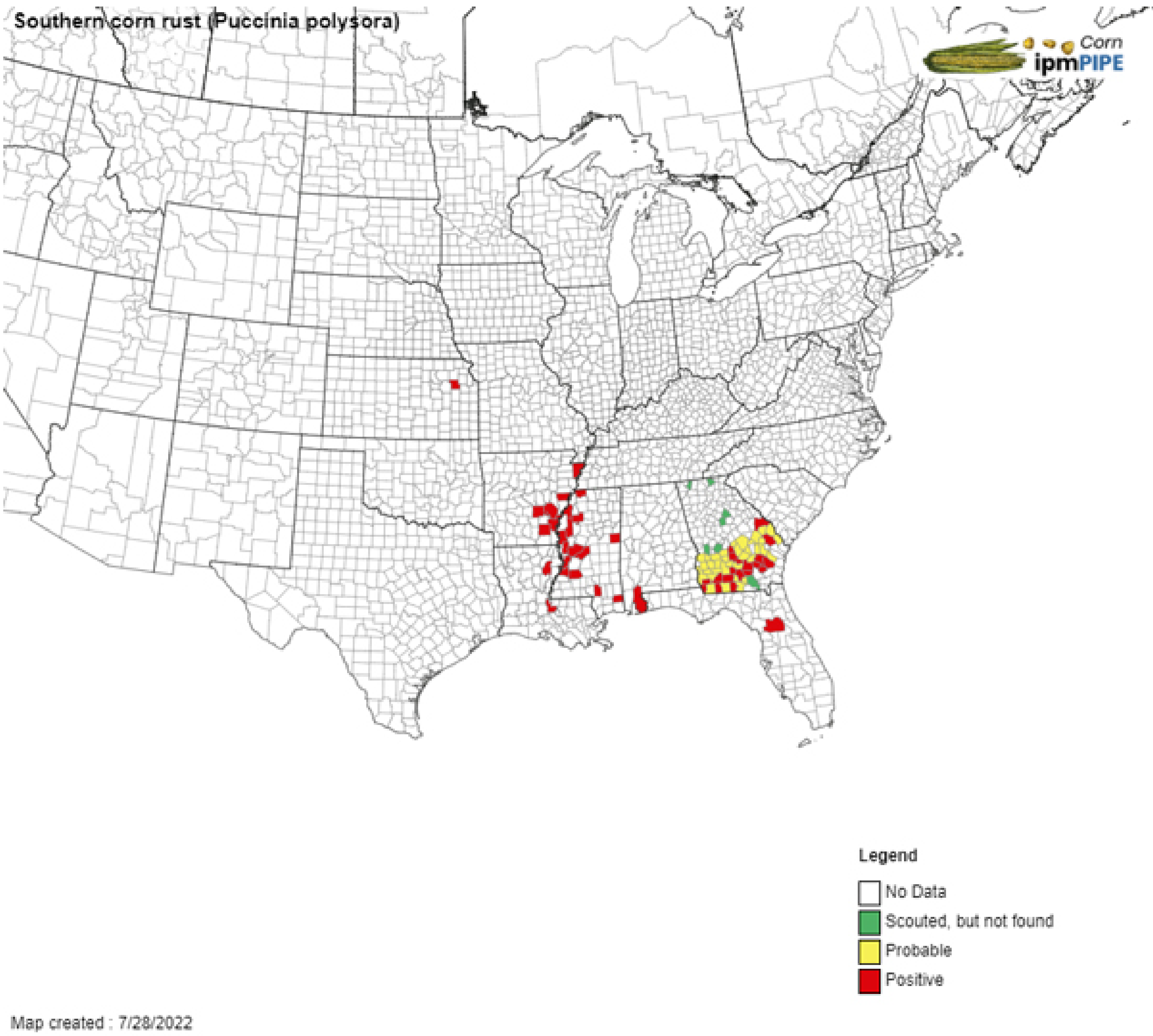

Figure 1. Southern corn rust (Puccinia polyspora**) in Kansas as of July 28, 2022. Source: https://corn.ipmpipe.org/southerncornrust/.**

Here are some frequent questions related to managing southern rust in Kansas:

Q1. Should I apply a fungicide prior to observing southern rust?

A1. It is not recommended to apply a fungicide to control southern rust unless disease has been observed in the canopy. Now that southern rust has been reported in the Kansas, it is time to be out scouting corn fields. Once pustules are observed, the pathogen can reproduce rapidly if temperatures and humidity are high.

Q2. What factors should I consider when making the decision to spray for southern rust?

A2. It is important to consider hybrid susceptibility, disease incidence (how many plants are affected), and the growth stage of the crop. Infection early in the season on a susceptible hybrid, coupled with conducive weather conditions, pose the highest risk for yield loss.

Q3. If I apply a foliar fungicide at tasseling (VT) or silking (R1) to control gray leaf spot, will this application have efficacy against southern rust?

A3. Yes. Most fungicides that are labeled for gray leaf spot are also effective for southern rust and will have residual activity for approximately three weeks after application, depending on the product. Fields should be carefully monitored for disease development. Research has suggested that applications can be effective at preserving yield up until dent (R5) when dealing with a susceptible hybrid and high disease pressure.

Q4. What fungicides are best to control southern rust?

A4. Efficacy ratings for corn fungicide management of southern rust have been compiled by a working group of corn researchers and can be found here:

https://crop-protection-network.s3.amazonaws.com/publications/fungicide-efficacy-for-control-of-corn-diseases-filename-2021-03-09-163332.pdf

Q5. How do I know if what I'm seeing is southern rust?

A5. Southern rust produces characteristic orange pustules of spores, primarily on the upper side of the leaf (Figure 2). If you run your finger across the pustules, the orange spores will be visible on your hand. The Kansas State Plant Diagnostic Lab can also confirm southern rust by observing spores under the microscope. Additional information about sending in a sample can be found here: https://www.plantpath.k-state.edu/extension/diagnostic-lab/.

Figure 2. Southern rust on corn. Photo courtesy of Rodrigo Borba Onofre, K-State Plant Pathology.

For more information on identifying corn rusts, see K-State Research and Extension Bulletin MF3016, Corn Rust Identification and Management in Kansas.

Additional information on important considerations for identification of various corn leaf diseases was published in a recent eUpdate article, "Fungicide considerations for corn diseases in 2022".

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6. Large numbers of fall armyworm in Texas, moths appearing in southern Kansas

Fall armyworm, *Spodoptera frugiperda*, (Figure 1) is known to feed on over 80 host plants. In Kansas, it can damage several important 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.

Figure 1. Full grown fall armyworm caterpillar. Photo from Department of Entomology, Kansas State University.

In late June, large numbers of fall armyworm were being recovered from pheromone traps in the Lubbock, Texas area and the Texas panhandle. The offspring from these large flights have been emerging and are continuing to move north. Fall armyworm adults were detected in southwest Kansas pheromone traps during the first week of July and trap numbers are beginning to increase. Adult moths are most likely active throughout the southern portion of the state.

Start scouting now

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. Recommended thresholds and products labeled for control of fall armyworm caterpillars (Table 1) 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" 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" (Figure 2) in early planted wheat can be a concern. If 25-30% of plants show damage, examine field frequently. Treat at 2-3 active larvae/ft.

Table 1. Registered products for the control of fall armyworm in Kansas crops. Always refer to the actual label on the product for more specific information relative to any insecticide.

Chemical Name	Trade Name	Mode of Action Class	Alfalfa	Corn	Sorghum	Wheat
alpha-cypermethrin	Fastac CS	3A	yes	yes	yes	yes
beta-cyfluthrin	Baythroid XL	3A	yes	yes	yes	yes
bifenthrin	numerous products	3A		yes		
biological insecticide	Fawligen	-			yes	
carbaryl	Sevin	1A	yes			
chlorantraniliprole	Vantacore	28		yes	yes	yes
cyfluthrin	Tombstone	3A	yes	yes		
deltamethrin	Delta Gold	3A		yes	yes	
gamma-cyhalothrin	Proaxis	3A	yes	yes	yes	yes
indoxacarb	Steward EC	22A		yes		
lambda-cyhalothrin+chlorantraniliprole	Besiege	3A+28	yes	yes		
lambda-cyhalothrin	numerous products	3A	yes	yes	yes	yes
methomyl	Lannate	1A	yes	yes	yes	
methoxyfenozide	Intrepid 2F	18			yes	
permethrin	numerous products	3A	yes			
spinosad	Blackhawk	5		yes	yes	yes

zeta-cypermethrin	Mustang MAXX	3A	yes	yes	yes	yes
zeta-cypermethrin+bifenthrin	Hero	3A		yes		

Figure 2. Window-paning from young caterpillar feeding. Photo from Department of Entomology, Kansas State University.

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7. Be on the lookout for the soybean gall midge

The Soybean Gall Midge (*Resseliella maxima*) was first observed in Nebraska in 2011, but was not officially described as a new species until 2018 when this tiny fly established itself as an emerging pest of soybeans in South Dakota, Nebraska, Minnesota, and Iowa. New infestations have been documented every year since and its range has expanded into Missouri. Soybean gall midge has been documented in Nebraska along the Kansas border as recently as 2021. To date, soybean gall midge has not been documented in Kansas, however this pest should be actively scouted for during the growing season, especially in counties along the Nebraska border.

Losses from soybean gall midge infestation are due to plant death and lodging (Figure 1). Heavily infested fields have shown the potential for complete yield losses from the edge of the field up to 100 feet into the field and a 20% yield loss from 200 to 400 feet into the field.

Figure 1. Soybean field with damage by soybean gall midge. Photo by Justin McMechan, Univ. of Nebraska.

Identification and Life Cycle

Adults: tiny (2-3mm), delicate flies with an orange abdomen, slender bodies and mottled wings. Long legs are banded with alternating light and dark markings (Figure 2).

Figure 2. Adult soybean gall midge. Photo by Mitchell Helton, Iowa State Univ.

Larvae: small, legless, maggots that are clear to white-colored when young but turn bright orange when mature (Figure 3).

Figure 3. Soybean gall midge larvae. Photo by Justin McMechan, Univ. of Nebraska.

Soybean gall midge overwinter as larvae in the first few inches of soil. After pupation in the early spring, adult midges emerge and lay their eggs on the lower portions of stems or at the base of soybean plants. The eggs hatch and the larvae feed within the stems. Infestation does not occur until the V2 stage when natural fissures and cracks appear in stems allowing entry by larvae. Infestation can continue into the reproductive growth stages. So far, there appears to be at least two generations per growing season. The adult soybean gall midges do not feed on soybeans.

Scouting

Begin scouting soybean plants at the V2 growth stage. Symptoms of infestation include:

1. wilting or dead soybeans along field edges with decreasing damage into the center of the field (Figure 4),
2. darkening and swelling at the base of stems (Figure 5),
3. brittle stems that break easily near their base, and
4. small orange larvae present in split open stems.

Figure 4. Wilting soybean plant from gall midge infestation. Photo by Justin McMechan, Univ. of Nebraska.

Figure 5. Darkening and swelling of stem. Photo by Adam Varenhorst, South Dakota State Univ.

Management

Being such a new pest, there are currently no published research-based management recommendations. On-farm studies in impacted states are examining the effects of cultural practices and insecticides on preventing losses. Seed treatments have not shown to be effective.

Please report any occurrence of soybean gall midge to your local extension professional or contact the K-State Entomology Department. The Soybean Gall Midge Alert Network, https://soybeangallmidge.org/, can be used to track developments regarding this new pest.

Anthony Zukoff, Extension Entomology, Southwest Research and Extension Center
azukoff@ksu.edu

8. EPA seeking public comment on atrazine re-registration review decision

On June 30, the Environmental Protection Agency re-opened the atrazine reregistration process and is proposing additional mitigations to reduce potential exposure and risk to aquatic plant communities from atrazine via runoff from agricultural uses in field corn, sweet corn, sorghum and sugarcane. Details regarding the proposed changes can be found at https://www.regulations.gov/docket/EPA-HQ-OPP-2013-0266/document.

The EPA has requested additional public comment on these revisions. If you would like to submit comments about the role of atrazine in your cropping systems, you can submit them on the EPA website listed previously, or you can go to www.kscorn.com. Comments must be received by the EPA on or before **September 6**.

Sarah Lancaster, Weed Science Extension Specialist
slancaster@ksu.edu

9. K-State North Central Experiment Field Fall Field Day, August 16

All interested individuals are invited to attend the **2022 North Central Experiment Field Day** on **Tuesday, August 16, at 4:00 p.m**. The location is the intersection of 60 RD and Hwy 36 (3 miles east of Courtland or 2.5 miles west of Scandia).

This is a free event and no pre-registration is required.

Topics and speakers:

Improving N use efficiency and return to N fertilizer dollars in the field – Dorivar Ruiz Diaz, Soil Fertility

Corn foliar and in-furrow fungicide updates – Rodrigo Onofre, Plant Pathology

Cover crops for weed management – Sarah Lancaster, Weed Science

For questions about the event, please contact Scott Dooley at 785-706-8450 or sjdooley@ksu.edu

Kansas State University
North Central Kansas Experiment Field
Fall Field Day

Tuesday, August 16, 2022 at 4:00 PM

Location:
Intersection of 60 RD and HWY 36
3 miles East of Courtland
OR 2.5 miles West of Scandia

Topics:
Improving N Use Efficiency and Return to N Fertilizer Dollars in the Field
Dorivar Ruiz Diaz

Corn Foliar and In-furrow Fungicide Updates
Rodrigo Onofre

Cover Crops for Weed Management
Sarah Lancaster

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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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