Issue 969

K-STATE Research and Extension

Extension Agronomy

eUpdate

08/10/2023

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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eUpdate Table of Contents | 08/10/2023 | Issue 969

1. Pre-emergence herbicides in wheat

Pre-emergence herbicides with residual activity are an important component of high-yielding cropping systems. They are used less frequently in wheat production compared to other cropping systems in Kansas, but residual herbicides applied prior to wheat emergence can be part of a good weed management system in wheat production. Selected products for this use are described in Table 1.

Most residual herbicides labeled for pre-emergence application in wheat are Group 2 (ALS-inhibiting) herbicides, which are associated with herbicide-resistant populations of kochia, marestail (horseweed), bushy wallflower, flixweed, henbit, and brome species in Kansas. Products in Groups 14 (the PPO-inhibiting herbicides) and 15 (the long-chain fatty acid-inhibiting herbicides) are also labeled; however, they are generally more dependent on rainfall for activation than the Group 2 herbicides.

Herbicides without residual activity may be applied with or without residual herbicides in the weeks prior to planting wheat. Older products include the Group 2 herbicides Amber, Olympus, and Pre-Pare, as well as Group 4 (plant growth regulating) herbicides like 2,4-D, dicamba, or fluroxypyr. It is especially important to know planting interval restrictions for Group 4 herbicides, which range from 10 to 45 days.

When selecting pre-emergence herbicides for use in wheat production, keep in mind that many of these products are also labeled for use in emerged wheat. Unless using a planned split application, avoid repeated use of products from the same herbicide group to slow the development of herbicide-resistant weed populations in your fields.

Table 1. Select herbicides for pre-emergence or pre-plant applications in winter wheat.

Trade name	Common name	Herbicide group	Application timing*	Comments
Amber	Triasulfuron	2	BD, PRE or POST	Requires tank mix or sequential application of herbicide from different group
Anthem Flex	Pyroxafulfone + carfentrazone	15 + 14	DPRE	Plant wheat 1 – 1.5″ deep
several	Dicamba	4	BD	Apply at least 45 days before planting wheat
Facet	Quinclorac	4	BD	Plant wheat at least 1″ deep
Finesse	Chlorsulfuron + metsulfuron	2 + 2	PRE, POST	Suppression only of cheat, downy brome, and Japanese brome
Kochiavore	Fluroxypyr + bromoxynil	4 + 6	BD	Apply at least 30 days before planting wheat
Olympus	Propoxycarbazone	2	PRE, POST	Mix with glyphosate for BD
Outrider	Sulfosulfuron	2	PRE, POST	Apply after planting but before wheat emergence; If dry, apply POST

Pixxaro	Fluroxypyr + halauxifen	4 + 4	BD, POST	Do not use multiple applications or in successive years at the same site
Pre-Pare	Flucarbazone	2	BD, PRE	Mix with glyphosate for BD; Rainfall necessary for activation to control PRE
Quelex	Halauxifen + florasulam	4 + 2	BD, POST	Broadleaf weed control only
Scorch	Fluroxypyr + dicamba	4 + 4	BD	Apply at least 30 days before planting wheat
Sharpen	Saflufenacil	14	BD, PRE	Rainfall required for activation; Injury may occur to exposed wheat seed
Zidua	Pyroxasulfone	15	DPRE	Rainfall required for activation; Plant wheat 1 – 1.5" deep
several	2,4-D	4	PRE, POST	Apply at least 2 weeks after a 0.5" rainfall before planting wheat

*BD = burndown; PRE = preemergence to wheat and weeds; DPRE = Delayed preemergence application after wheat emergence; POST = postemergence

For additional information, see the "2023 Chemical Weed Control for Field Crops, Pastures, and Noncropland" guide available online at https://bookstore.ksre.ksu.edu/pubs/SRP1176.pdf or check with your local K-State Research and Extension office for a paper copy.

The use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current use requirements.

Sarah Lancaster, Extension Weed Science Specialist
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2. Field bindweed can be difficult to control

Field bindweed (Figure 1) is a particularly troublesome weed to control. In a 12-year experiment conducted at the Agricultural Research Center in Hays, field bindweed reduced wheat yield by 2 to 50%. Management of this weed during wheat establishment is important because field bindweed continues to grow until temperatures drop below 20°F.

The herbicides most commonly recommended for field bindweed control include various formulations of 2,4-D, dicamba, and glyphosate. Dicamba tends to provide greater control for fall applications compared to 2,4-D or glyphosate, especially if plants are drought-stressed. Another commonly used product is Facet (quinclorac). It is most effective when applied just before the first killing frost. Other herbicides that are labeled for fall application to control or suppress field bindweed in wheat include Affinity, Aim, and Cimarron.

A single herbicide application will not achieve satisfactory control of field bindweed. It will take multiple years of herbicide applications to deplete the energy stored in the root system and control an established infestation.

Figure 1. Field bindweed growing in a harvested wheat field. Photo by Sarah Lancaster, K-State Research and Extension.

For additional information, see the "2023 Chemical Weed Control for Field Crops, Pastures, and Noncropland" guide available online at https://bookstore.ksre.ksu.edu/pubs/SRP1176.pdf or check with your local K-State Research and Extension office for a paper copy.

The use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current use requirements.

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3. Southern rust is now active in central and eastern Kansas

Southern corn rust continues to spread in the southern part of the US and is now detected in 7 counties across central and eastern 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.

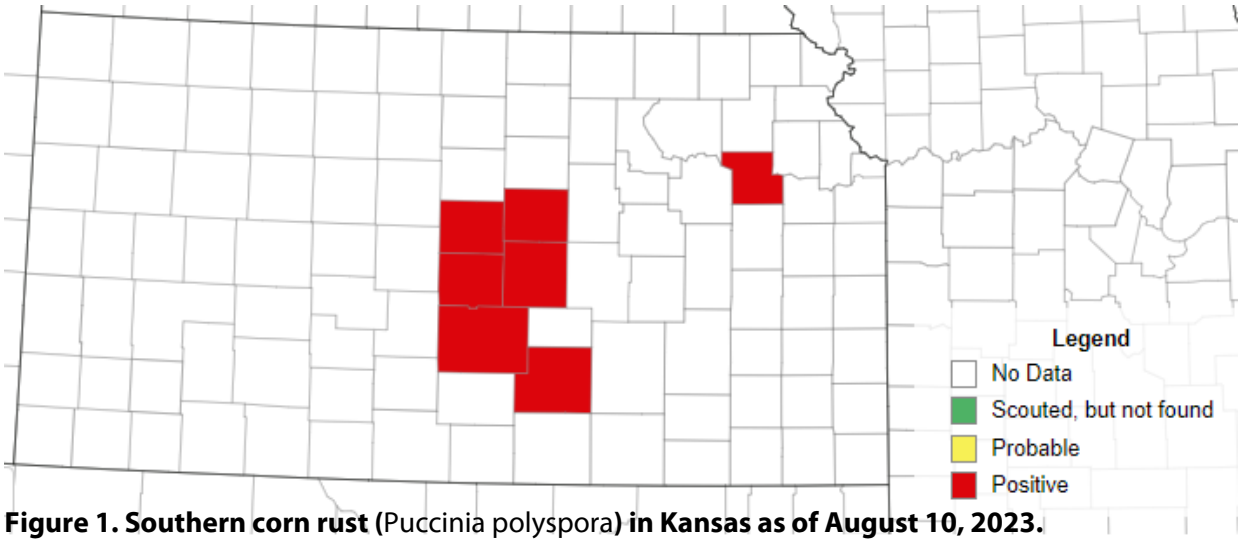

Figure 1. Southern corn rust (Puccinia polyspora) **in Kansas as of August 10, 2023. Source: https://corn.ipmpipe.org/southerncornrust/**

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 the disease has been observed in the canopy. Now that southern rust has been reported in 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.

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4. Update on tar spot of corn - August 10, 2023

Tar spot of corn, a disease caused by the fungus *Phyllachora maydis*, has now been confirmed in Doniphan (6/26), Atchison (6/30), Jefferson (6/30), Brown (7/05), Nemaha (7/28), and Jackson (8/8) counties in Kansas (Figure 1). Tar Spot is now active in all counties previously reported during the 2022 season, which was first detected late in the season (9/15/2022).

Tar spot prevalence and severity seem to be much higher than in the 2022 season. Right now is a critical time to identify fields with tar spot as these locations may be at higher risk for the disease next year. Producers should also consider harvesting fields confirmed to have tar spot last to mitigate additional disease spread. Because of this, scouting prior to harvest is critical.

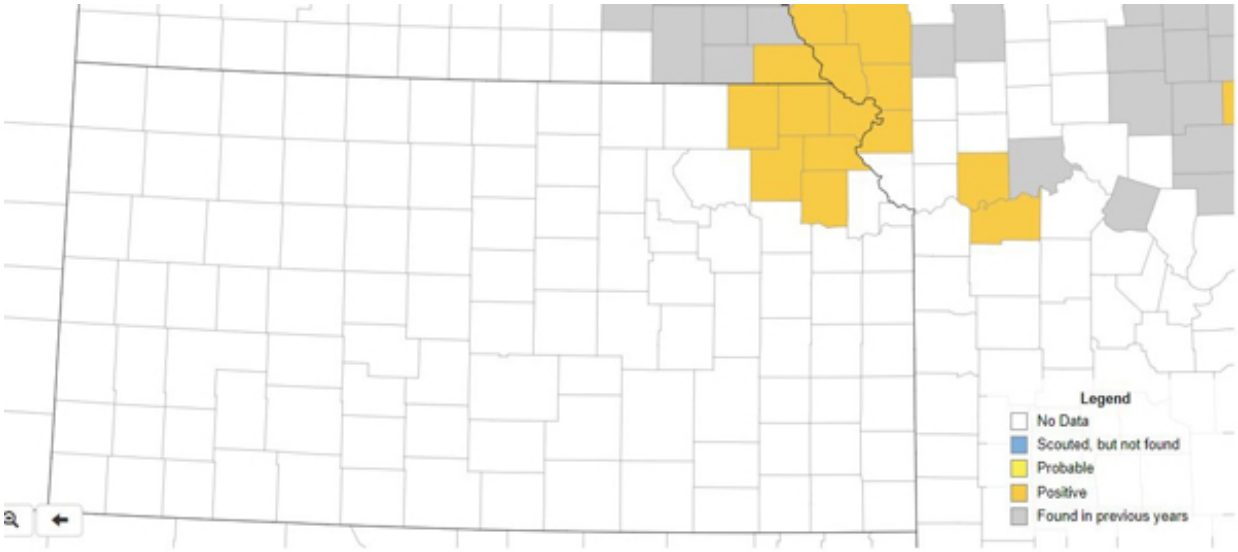

Figure 1. Tar Spot of Corn (Phyllachora maydis**) in Kansas and surrounding states in 2023. Source:** https://corn.ipmpipe.org/tarspot/

What am I scouting for?

Tar spot develops as small, black, raised spots (circular or oval) that develop on infected plants, and may appear on one or both sides of the leaves, leaf sheaths, and husks. Spots may be found on both healthy (green) and dying (brown) tissue. Tar spot can be easily confused with insect poop, which can appear as black spots on the surface of the leaf **(**Figure 2**)**. For assistance in confirming tar spot, please contact your local county extension office or the K-State plant diagnostic clinic at https://www.plantpath.k-state.edu/extension/plant-disease-diagnostic-lab/.

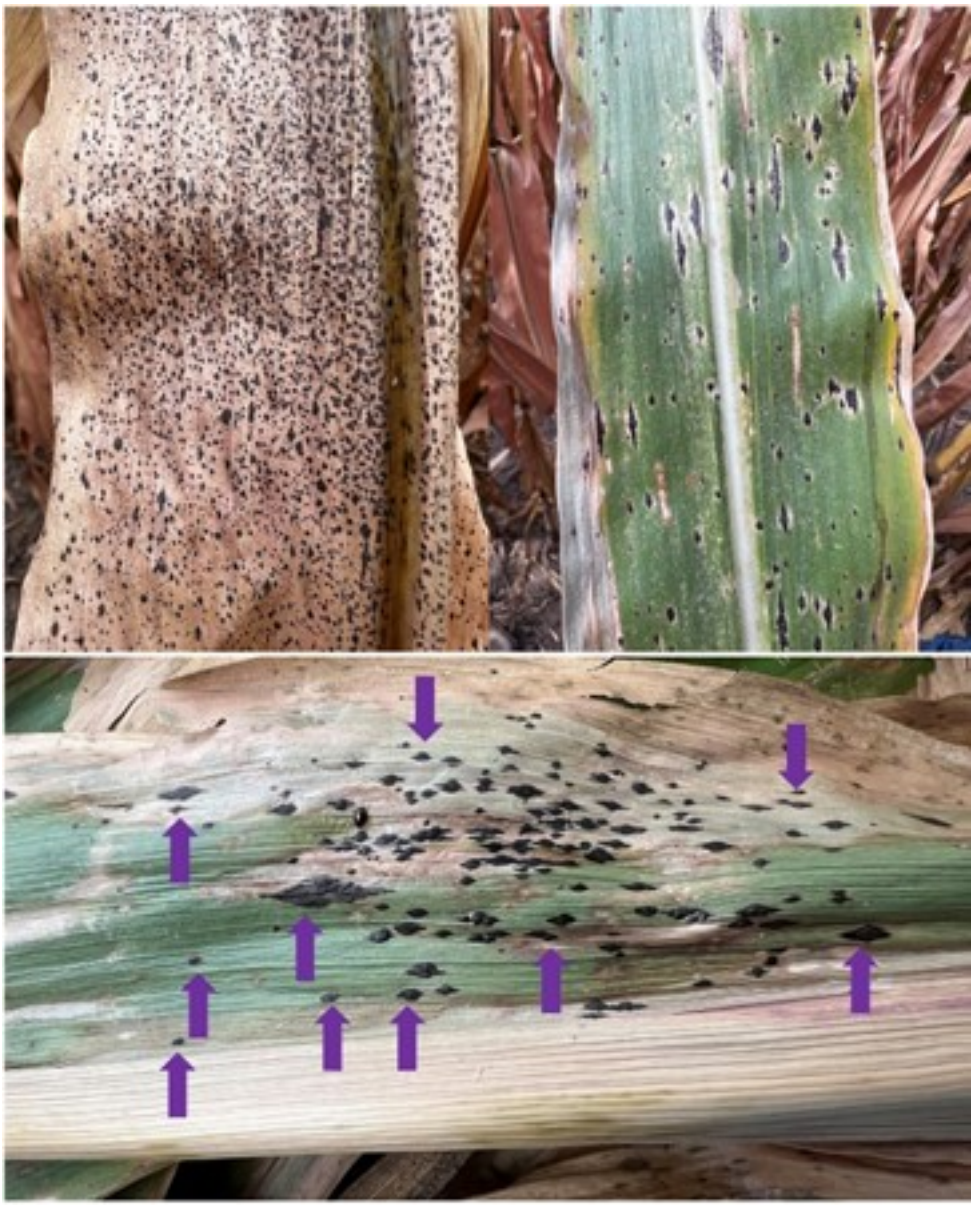

Figure 2. **Tar Spot of Corn. Purple arrows are indicating a few of the tar spot lesions. Photos courtesy of Rodrigo Onofre, K-State Research and Extension.**

Is there a history of disease in this field or neighboring fields?

Tar spot overwinters on infested corn residue on the soil surface, which serves as a source of inoculum for the subsequent growing season. Spores can be dispersed by wind and rain splash and can move to nearby fields if conditions are favorable.

What growth stage is the field?

Research has shown that making an application just after first detection and at or after VT is effective if lesions are detected early. If you wait until there is significant disease in the upper canopy, then a fungicide application may be too late. Here you can find a guide for growth stages in corn: https://bookstore.ksre.ksu.edu/pubs/MF3305.pdf.

How does moisture influence disease development?

The recent rains likely helped to promote tar spot development. Additionally, irrigated corn may be at particularly high risk for yield or silage loss. Forecasted rainfall and high humidity will favor tar spot development and spread.

Should I apply a fungicide?

Fungicides are an effective tool for controlling tar spot if they are timed well. Research has shown the best return on investment from a fungicide application on corn occurs when **fungal diseases are active** in the corn canopy. A **well-timed, informed fungicide application** will be important to reduce disease severity when it is needed, and we recommend holding off until the disease is active in your field and corn is at least nearing VT/R1 (tassel/silk) or even R2 (blister). Scouting will be especially important if wet weather continues. There are several fungicides that are highly effective at controlling tar spot when applied from tassel (VT) to R2 (blister). I would recommend picking a product with multiple modes of action. The National Corn Disease Working Group has put together efficacy ratings for fungicides labeled for the control of tar spot can be found at the Crop Protection Network website, link: https://cropprotectionnetwork.org/publications/fungicide-efficacy-for-control-of-corn-diseases.

If there is high disease pressure early in the season, a second application may be warranted. Fields should be scouted 14-21 days after the first application to see if tar spot has become active again. Fungicides will not provide benefits after R5. Always consult fungicide labels for any use restrictions prior to application.

Help with tracking tar spot in Kansas

Please help us track tar spot! You can contact me (785-477-0171) directly if you suspect a field has tar spot and/or submit a sample to the K-State Plant Disease Diagnostic Lab at https://www.plantpath.k-state.edu/extension/diagnostic-lab/documents/2021_PP_DiseaseLabChecksheet.pdf.pdf. This will help us monitor the situation in the state.

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5. Soybean aphids detected in Northeast Kansas

Soybean aphids have been detected for the first time this year in Riley County, Kansas (Figures 1 and 2). Soybean aphids have migrated into the state every year since 2002. These are very small green to lime-green aphids with 2 black cornicles (tailpipes). They are the only aphids that may actually colonize soybeans in Kansas, and thus do any damage. They are usually first detected by noticing ants on the leaves in the canopy, as ants seem to be exceedingly good at detecting the honeydew produced by these aphids.

Since 2002, soybean aphids have only reached densities justifying insecticide applications in 2 or 3 years. These aphids seem to do best in cooler temperatures, so if the average August temperatures persist again this year in Kansas these aphids should not become a problem. However, if August temperatures are cooler than average, soybean aphids can reach treatable densities quite quickly. Soybean producers should monitor for soybean aphids, especially if August/September temperatures are cooler than average.

For management guidelines, please refer to the KSRE publication "Soybean Insect Management 2023" at https://bookstore.ksre.ksu.edu/pubs/MF743.pdf

Figure 1. Tiny aphids were identified on soybeans in Riley County, Kansas. Photo by Rene Hessel, K-State Research and Extension.

Figure 2. Varied size aphids on soybeans in Riley County, Kansas. Photo by Rene Hessel, K-State Research and Extension.

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6. Rainfall in southwest Kansas this growing season ranks in the top five since 1895

The meteorological start of the 2023 growing season was on April 1. Since that date, above-normal precipitation has fallen in four of Kansas' nine climate divisions: northwest, west central, southwest, and south central. Of these four, the division that normally averages the least precipitation, southwest Kansas has surprisingly been the wettest division in the state (Figure 1). When compared to previous years, southwest Kansas' total precipitation from April 1 through July 31 this year has been unusually wet. The average precipitation across southwest Kansas for this 4-month period is 16.29 inches which rank as the 5th wettest April-July on record in that division, dating back to the start of official climate records in 1895 (Figure 1). This is the wettest April-July since 2015. Based on the period 1991-2020, the average precipitation for this period in southwest Kansas is 10.49 inches; this year precipitation is 5.80 inches above normal. By contrast, April-July 2022 was the 28th driest on record, when there was an average of just 7.71 inches of precipitation.

For the first 7 months of 2023, the average total precipitation in southwest Kansas is 17.25 inches, which ranks as the 9th wettest January-July on record. Thanks to the wetter-than-normal conditions this year, drought conditions across the southwest have greatly improved since this time last year (Figure 2).

Rank	Year	Precipitation
1	1944	17.21"
2	1951	17.11"
3	2015	17.05"
4	1949	16.66"
5	2023	16.29"
6	1915	16.17"
7	2016	15.71"
8	1928	15.47"
9	1958	15.45"
10	1941	15.40"

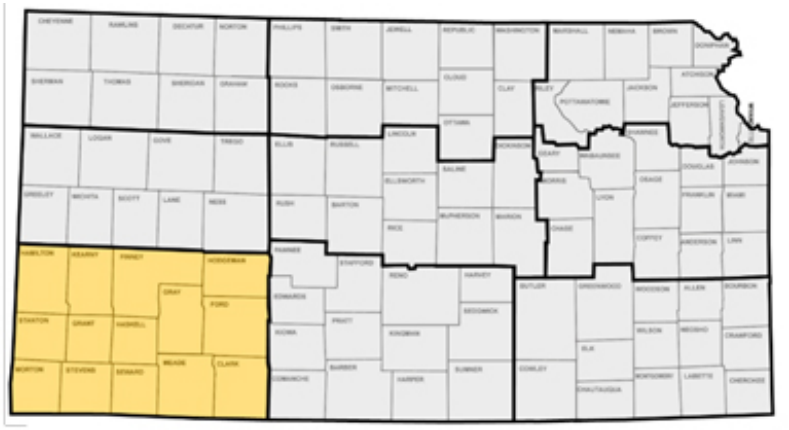

Figure 1. The ten wettest April-July periods on record in southwest Kansas (shaded area), dating back to 1895. Source: National Centers for Environmental Information (https://www.ncei.noaa.gov).

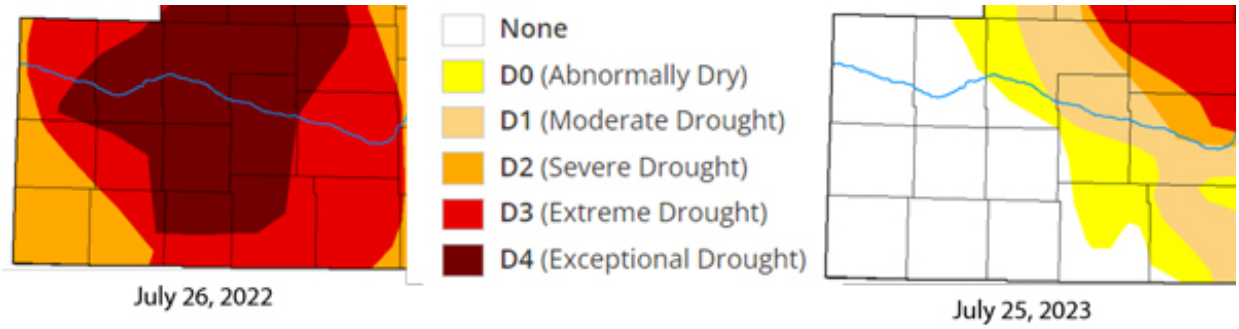

Figure 2. US Drought Monitor status for southwest Kansas for July 26, 2022 (left) and July 25, 2023 (right). Source: National Drought Mitigation Center (https://droughtmonitor.unl.edu).

Of the 14 counties in southwest Kansas, Clark County has had the most precipitation this growing season (Table 1), with 19.23 inches. With respect to normal, Morton County is the most above normal, with a departure of +7.75 inches. The highest-ranked counties are Kearny and Stanton, where the growing season to date ranks as the 2nd wettest on record. The total rainfall amounts for Kearny, Morton, and Stanton County are the wettest since 1944, a period of 79 years, the longest in the division.

Table 1. Precipitation data for April 1-July 31, 2023 compared to historical records and 30-year normals (1991-2020). Source: National Centers for Environmental Information (https://www.ncei.noaa.gov). Shaded values represent the highest totals/ranks.

County	Precipitation Apr. 1-Jul. 31, 2023	Apr. 1-Jul. 31, 2023 Rank Wettest	Apr. 1-Jul. 31, 2023 Wettest Since	Normal Apr. 1-Jul. 31 Precipitation	Departure from Normal
Clark	19.23″	4th	2015	11.78″	+7.45″
Finney	15.09″	9th	2015	10.69″	+4.40″
Ford	15.69″	10th	2015	12.16″	+3.53″
Grant	15.77″	5th	1949	9.33″	+6.44″
Gray	16.01″	8th	2016	11.09″	+4.92″
Hamilton	15.96″	3rd	1949	9.34″	+6.62″
Haskell	16.24″	10th	2016	10.30″	+5.94″
Hodgeman	13.52″	32nd	2020	12.15″	+1.37″
Kearny	16.64″	2nd	1944	9.92″	+6.72″
Meade	18.05″	4th	2015	11.17″	+6.88″
Morton	16.41″	3rd	1944	8.66″	+7.75″
Seward	17.18″	4th	2015	10.25″	+6.93″
Stanton	15.75″	2nd	1944	8.87″	+6.88″
Stevens	16.77″	5th	2015	9.31″	+7.46″

South Central Kansas Rainfall

The wettest counties in Kansas for the 2023 growing season to date are in south central Kansas. Comanche (19.76 inches, their 4th wettest on record), Harper (19.47 inches, 12th wettest), and Barber (19.44 inches, 6th wettest) are the top three. Southwest Kansas' wettest county, Clark, ranks 4th in the state. Collectively, south central Kansas' average precipitation since April 1st is 16.10 inches, less than two-tenths below southwest Kansas' total. But since south central Kansas averages 4.40 inches more precipitation for this period (14.89 inches) than the southwest, their 2023 growing season total only ranks as the 31st wettest.

Looking ahead

So far, August is running a bit above normal; an estimated average of 1.09 inches has fallen across southwest Kansas since August 1st (as of August 8th; normal for the first 8 days of August is 0.83 inches). Normal precipitation for the entire month of August is 2.94 inches. The Climate Prediction Center's outlook for August calls for above-normal precipitation statewide. For southwest Kansas to stay in the top 5 wettest growing seasons on record, at least 3.02 inches of rain must fall in August. Only 1.96 inches is needed to stay in the top 10. If August totals 3.92 inches or more, April-August 2023 would be the wettest on record in southwest Kansas for those five months. Will it happen? Stay tuned!

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7. Have problems with Sudden Death Syndrome in soybeans?

We are in search of grower fields with symptomatic Sudden Death Syndrome (SDS) plants for us to sample. Within the past two weeks, Sudden Death Syndrome has been reported in several counties in the eastern and central parts of Kansas.

What is Sudden Death Syndrome?

It is a soil-borne fungal disease caused by *Fusarium virguliforme*. Infection and colonization begin shortly after planting and the pathogen produces a toxin that causes above-ground symptoms later in the season.

What are the symptoms?

Root symptoms include necrosis and above-ground symptoms include interveinal leaf chlorosis and necrosis (Figure 1). Under the right environmental conditions, these symptoms appear as early as the start of flowering.

Figure 1. Sudden Death Syndrome foliar symptoms.

What are the environmental conditions?

SDS is observed more when planted in cool, wet soils followed by wet conditions at the beginning of flowering, and fields infested with soybean cyst nematode.

What are the management options?

Seed treatment, resistant cultivars, planting date, tillage, and crop rotation.

If you are or know of someone willing to participate, please contact us:

Madison Kessler

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8. 2023 National Sorghum Yield Contest - Entry deadline Nov. 15

National Sorghum Producers is accepting entries for the 2023 National Sorghum Yield Contest. State and national winners are selected from contestants split into east and west regions for each division, which includes irrigated, dryland no-till, dryland tillage, and one overall winner for food grade.

The entry deadline for the 2023 National Sorghum Yield Contest is November 15. A complete field of 10 or more continuous acres, planted in the sorghum seed variety named on the entry form, will be designated as the contest field. The contestants must harvest and report at least 1.5 contiguous acres. Harvest reports will now be made available to contest entrants beginning May 1, and all completed forms must be received at the NSP office or postmarked no later than November 25.

The goal of the National Sorghum Yield Contest is to increase grower yields, transfer knowledge between growers to enhance management, and identify sorghum producers who excel in each state and throughout the country. In order to enroll, contestants must be an NSP member at the time of entry. More than one member of a family may enroll, but each member must have a separate membership. All entries will be reviewed and divisions will be placed off of yield only. National and state winners will be recognized at the 2024 Commodity Classic in Houston, Texas.

To find the entry form, 2023 yield contest rules, and more information, interested contestants can visit www.sorghumgrowers.com/yield-contest/ or contact NSP Director of Operations Julie Barclay at 806-749-3478.

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9. Kansas Ag-Climate Update for July 2023

The Kansas Ag-Climate Update is a joint effort between our climate and extension specialists. Every month the update includes a brief summary of that month, agronomic impacts, relevant maps and graphs, 1-month temperature, and precipitation outlooks, monthly extremes, and notable highlights.

July 2023: Precipitation improved drought conditions

The average temperature for July was 78.3°F, or 0.7°F below normal. This ranked as the 56th coldest July out of 129 years of records, dating back to 1895. Seven of Kansas' nine climate divisions were below normal; only east central and southeast were above normal. Anomalies ranged from -1.4°F (northwest) to +0.3°F (southeast).

Average precipitation for July was 4.39", or 114% of normal. This was 0.54" above normal, and ranked as the 33rd wettest July on record. Southwest (6.09") and south central (6.01") Kansas were the two wettest divisions; their totals ranked as the 6th and 7th wettest Julys on record, respectively. North central and central Kansas tied for driest division (3.14").

When combined with April, May, and June, the past 4-month period is the 5th wettest on record in southwest Kansas. Their total of 16.29" is 5.80" above normal.

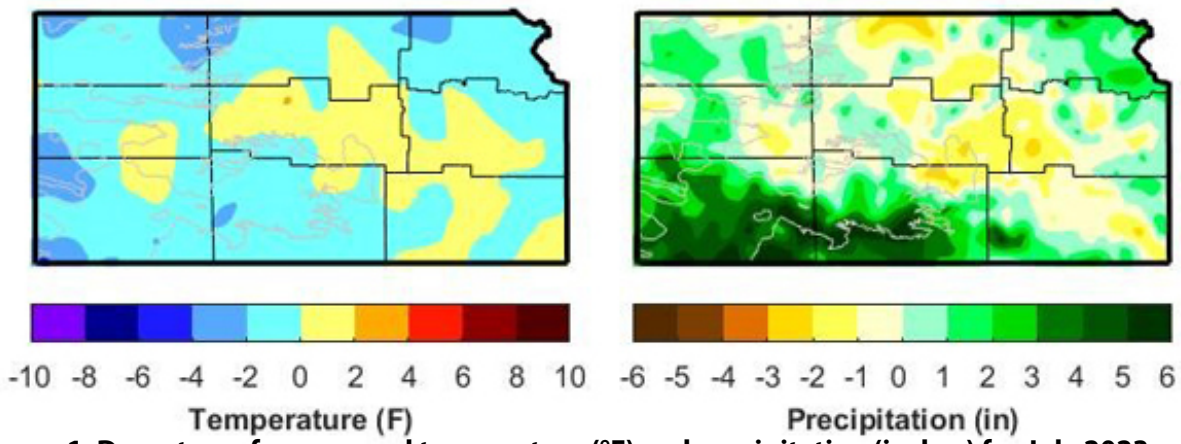

Figure 1. Departures from normal temperature (°F) and precipitation (inches) for July 2023.

View the entire July 2023 Ag-Climate Update, including the accompanying maps and graphics (not shown in this eUpdate article), at http://climate.k-state.edu/ag/updates/

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10. Updated - Western Kansas Fall Field Days set for three locations in late August

Join K-State agronomists and extension specialists at one or more of the Western Kansas Fall Field Days. A series of three programs will take place in late August in Tribune (Aug. 22), Hays (Aug. 23), and Garden City (Aug. 24). These events are open to the public and are free to attend with a meal provided at each location.

Registration is requested to have an accurate meal count. Please register for the location you wish to attend using the appropriate link below.

Tribune – August 22, 8:30 a.m. (MT)

- Lunch will be provided
- Nitrogen management for dryland and irrigated row crops
- Management of limited irrigation corn

Directions: 4 miles east of Tribune on Hwy 96 (to Whitelaw), then 4.5 miles north and ¾ mile east

Registration for Tribune: https://kstate.qualtrics.com/jfe/form/SV_8kVWF3xGrrAcyTI

Hays – August 23, 2:30 - 6:30 p.m. (CT)

- Dinner will be provided
- Sorghum hybrids for early planting
- Occasional tillage in wheat-sorghum-fallow rotation

Location: 1232 240th Ave, Hays

Registration for Hays: https://kstate.qualtrics.com/jfe/form/SV_01EEP2tdjeRZTv0

Garden City – August 24, 8:30 a.m. – 2:00 p.m. (CT)

- Lunch will be provided
- Crop water use
- Weed management

Registration for Garden City: https://kstate.qualtrics.com/jfe/form/SV_3y11xSdN4deXK2G

For questions, contact:

Tribune: Lucas Haag – lhaag@ksu.edu

Hays: Augustine Obour – aobour@ksu.edu

Garden City: Jonathan Aguilar - jaguilar@ksu.edu

K-STATE
Research and Extension

KSU FIELD DAYS

WHEN
August 22-24, 2023

WHERE
KSU Western Kansas Research-Extension Centers

Tribune · 4 mile east of Tribune on Highway 96 (to Whitelaw), then 4.5 mile north and ¾ mile east
Hays · 1232 240th Ave
Garden City · 4500 E Mary St

For Any Questions Contact:
Tribune: Lucas Haag – lhaag@ksu.edu
Hays: Augustine Obour – aobour@ksu.edu
Garden City: Jonathan Aguilar: jaguilar@ksu.edu

TRIBUNE: AUGUST 22 8:30 AM MT
- Lunch will be Provided.
- Nitrogen Mgmt for Dryland & Irrigated Row-Crop
- Management of Limited Irrigation Corn

HAYS: AUGUST 23 2:30-6:30 PM CT
- Dinner will be Provided.
- Sorghum hybrids for early planting
- Occasional Tillage in Wheat-Sorghum-Fallow Rotation

GARDEN CITY: AUGUST 24 8:30AM-2PM CT
- Lunch will be Provided.
- Crop Water Use
- Weed Management

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