Issue 1018

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Extension Agronomy

eUpdate

08/29/2024

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. Low levels of corn stunt disease have been confirmed in Kansas

Corn stunt disease and its associated vector, the corn leafhopper (*Dalbulus maidis*), have been recently confirmed in Kansas. To our knowledge, this is the first detection of the disease in Kansas, and it came shortly after the disease was first reported in Oklahoma and Missouri. Corn stunt disease and associated symptoms have been confirmed in Sedgewick, Pratt, Stafford, and Edwards Counties in field corn and Riley County in sweet corn (Figure 1). Recent scouting efforts across Kansas confirm active leaf hoppers in many additional counties in Central and Southwest Kansas. Disease incidence was low overall, and most corn is reaching later stages of maturity.

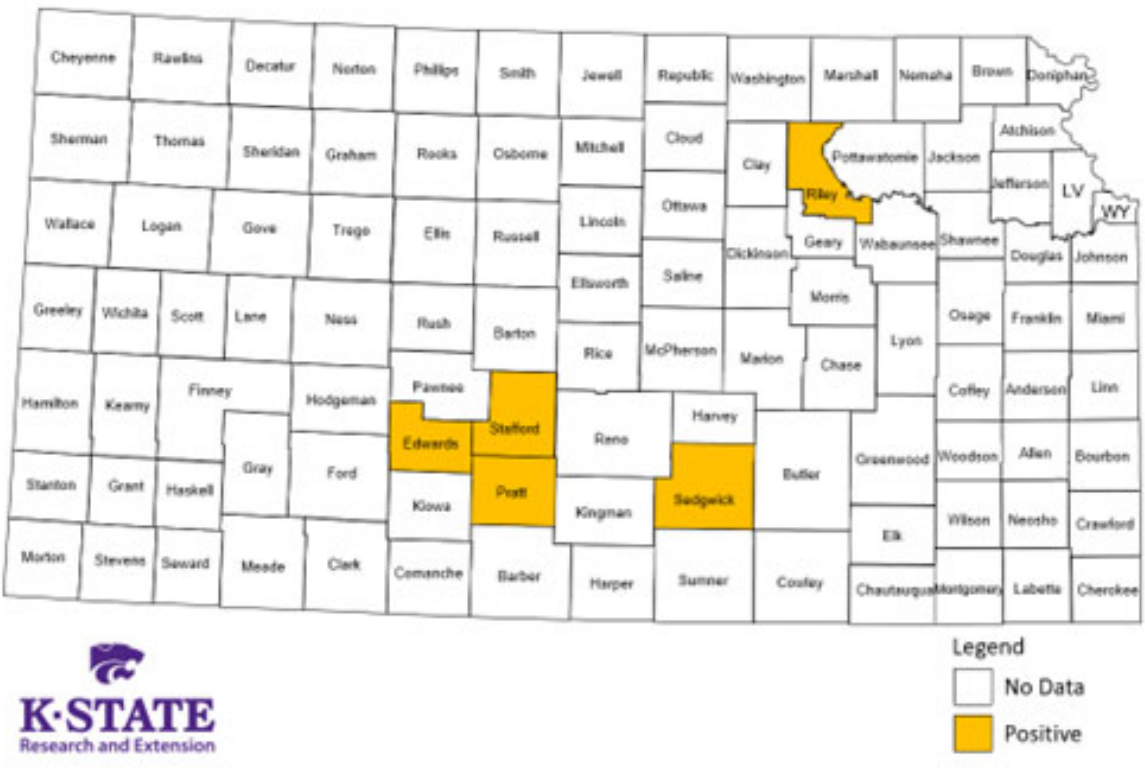

Figure 1. **Corn stunt disease distribution in Kansas in 2024 as of August 29, 2024. Yellow represents counties from which laboratory testing confirmed positive samples and may not reflect complete distribution in the state.**

Symptoms of the disease may include shortened internodes, which can result in a stunted stature of the corn plant, as well as leaves with red discoloration (Figure 2). Because other biotic and abiotic factors can cause red or purple discoloration in corn, laboratory testing is important to diagnose corn stunt disease and distinguish it from other stressors.

In the past, corn stunt disease has been limited in distribution to southern Texas, Florida, and California in the United States. Corn stunt is caused by a wall-less bacterial pathogen called **corn stunt spiroplasma** (CSS, *Spiroplasma kunkelii*). The corn leafhopper can also transmit additional pathogens, either singly or in combination with the corn stunt spiroplasma. To date, only corn stunt spiroplasma has been detected in Kansas. Additional research is needed to determine the presence of other pathogens vectored by the corn leafhopper in Kansas.

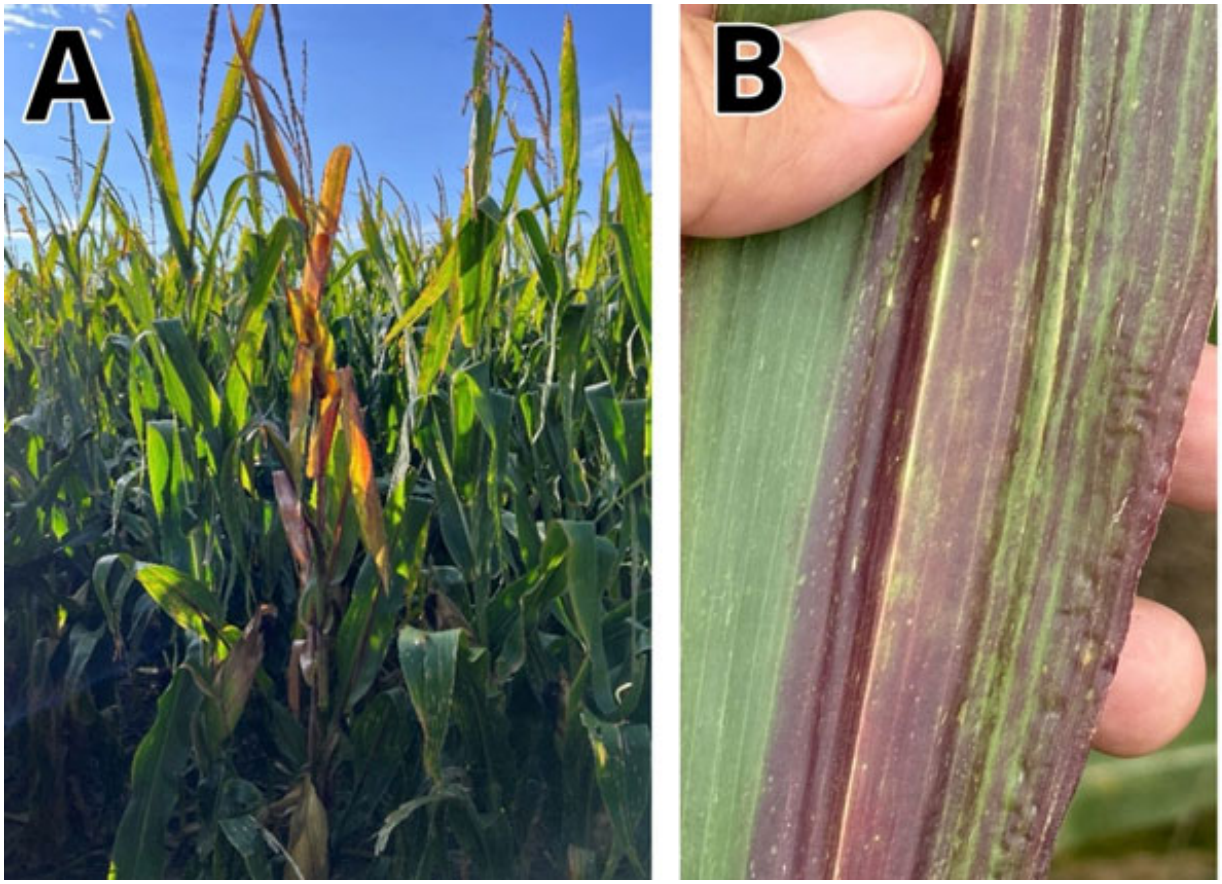

Figure 2. **Symptomatic corn plant and a close-up of a leaf showing red discoloration and streaking. Photo courtesy of Rodrigo Onofre, K-State Research and Extension.**

This disease is spread only by the corn leafhopper (*Dalbulus maidis*) (Figure 3), which was also just confirmed in Kansas. The corn leafhopper acquires pathogens within minutes of feeding on infected corn plants, but it can take up to 30 days for the leafhopper to infect healthy corn plants during feeding events.

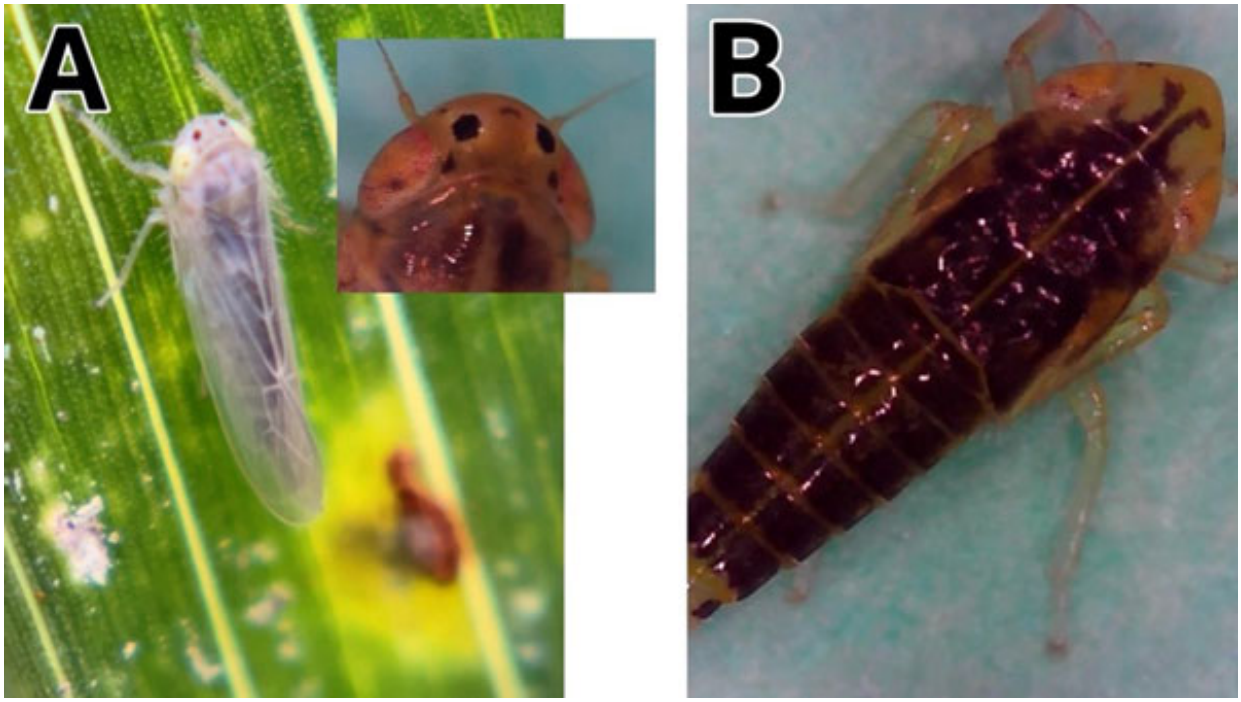

Figure 3. **Images of a corn leafhopper A) adult on a corn leaf and magnified view of the two, black spots between the eyes; and B) nymph showing dark brown coloration and developing wing pads. Photo courtesy of Brian McCornack, K-State Research and Extension.**

The corn leafhopper is relatively simple to identify under magnification. These leafhoppers are light tan to yellowish-white in color and approximately 1/8" long. Two distinct dark spots between the antennae and eyes are very characteristic of this species. Nymphs lack wings and can vary in color. Like most leafhoppers, all stages move quickly when disturbed and hide in shaded areas of corn plants. All stages can be sampled using a sweep net; a video showing how to sample for corn leafhoppers in mature corn canopies can be found here: https://tinyurl.com/KSUCLH. You can also view the video by scanning the QR code below.

If you suspect a field has corn stunt, submit a sample to the K-State Plant Disease Diagnostic Lab. The best type of sample for corn stunt testing is living symptomatic leaf tissue (Figure 4- right side). Dry/senesced corn leaves are not recommended (Figure 4 – left side) and may lead to inconclusive results. Entire plants are not required to test for this disease, as only the midrib will be used in testing.

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Figure 4. Poor dry/senesced corn leaves (left) and LIVING symptomatic corn leaves (right).

Collection and shipping instructions can be found below:

- Collect and ship samples on or before Wednesday to avoid weekend storage
- Collect symptomatic living leaves (ideally from multiple symptomatic plants)
- Label and use plastic bags; Do not use paper bags, and do not add water.
- Fill out the submission form. Include variety/hybrid info.
- Ship leaves ASAP overnight via UPS or FedEx when possible. USPS can take up to 14 days
- Send photos to clinic@ksu.edu with tracking number or date shipped
    - Three types of images to send:
        - Symptom/problem close up and in focus
        - Entire plant from ground level to the top of plant
        - Site – capture the pattern in the field, transition areas, terraces, etc.

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2. Winter canola planting considerations

Winter canola varieties exist today that make production possible across much of Kansas. When a winter-hardy variety is planted at the right time into good soil moisture and temperature conditions, plant development and growth is optimized, and the crop will have the best chance at overwintering.

Deciding when to plant canola this fall may be challenging because soil moisture in the planting zone varies across the state. High August temperatures have parts of the state lacking in topsoil moisture. It is often said that it is easier to get a fall stand when planting canola after rain than before. However, it may be too dry to plant in some cases because the risks of delayed emergence and loss to an early freeze are too great.

The planting window for winter canola arrives in Kansas by early September. This article presents the most critical aspects, ranging from variety selection to seedbed preparation, to ensure a successful start to the 2024-2025 growing season. A companion article in this eUpdate addresses other management considerations, including seeding date, seeding rate, row spacing, soil fertility, and pest management.

Variety Selection

Variety selection should be based on the following traits: winter survival, open-pollinated variety or hybrid, yield, oil content, herbicide tolerance, disease resistance, maturity, lodging susceptibility, and shatter tolerance. Winter hardiness should be the number one consideration if the crop is being grown in a new area.

Producers have the option of selecting either open-pollinated varieties or hybrids. The majority of the varieties grown in the southern Great Plains are open pollinated. Open-pollinated varieties consistently overwinter and have high yield potential. In addition, producers interested in broad spectrum weed control can select Roundup Ready open-pollinated varieties.

Hybrids are being grown in the region and tend to have larger seed size for easier seed metering, vigorous fall and spring growth, and greater yield potential without limitation of resources. Clearfield herbicide tolerance is available in hybrids.

Varieties with tolerance to carryover of sulfonylurea (SU) herbicides applied to a previous crop (e.g. Finesse) can be planted in the fall to avoid the long plant-back restrictions these herbicides have for canola. Some varieties that are Roundup Ready also possess SU herbicide carryover tolerance.

Consider selecting two or more varieties with differing relative maturities to spread out harvest operations and reduce risk. If interested in selecting a new variety, consider selecting one variety with known performance in your area in addition to the new variety.

Site Selection

Although canola grows over a wide range of soil textures, well-drained, medium-textured soils are best. Soils where water stands for several days or those prone to waterlogging are poor choices. The soil pH should be between 5.5 and 7.0. Soil pH correction with lime should be considered when growing canola in soil with low pH (less than 5.5).

Be mindful when planting canola following crops like sunflower, soybean, alfalfa, or cotton. These crops share similar diseases with canola. Planting canola continuously is not recommended and it is not insurable. Plant canola after grass crops such as wheat or corn because these crops do not share diseases with canola.

Canola will perform best when adequate time is given after the preceding crop to allow for soil moisture recharge and weed control, and where there is adequate time to get the canola planted early enough to help the plants survive over winter.

Avoid fields with heavy winter annual broadleaf weed pressure if possible. If planting where heavy broadleaf weed pressure exists, consider planting a Roundup Ready variety. Grassy winter annual weeds are easily controlled by using clethodim, quizalofop, or sethoxydim in conventional canola, or by using the Roundup Ready or Clearfield canola systems. Make sure you are aware of the herbicide history of potential sites. Winter canola varieties are sensitive to Group 2 and triazine herbicide carryover. These products may have long plant back restrictions (often 18 months or greater). Be especially cautious about herbicide carryover restrictions when following corn.

Seedbed Preparation

Because of its small seed size, a properly prepared seedbed is critical for successful canola establishment. Open-pollinated varieties typically range from 100,000 to 125,000 seeds per pound and hybrids range from 70,000 to 100,000 seeds per pound.

A level, firm seedbed with adequate moisture within the top inch is preferred. A seedbed with many large clumps results in poor seed placement and seed-to-soil contact. An overworked seedbed may

be depleted of moisture and will crust easily, potentially inhibiting emergence. In addition, this could promote deep placement of the seed.

No-till planting is an option, and some long-term no-till producers have grown canola successfully using this practice (Figure 1). With proper settings, no-till planting can result in very good stands. However, maintaining stands over the winter can be difficult with low soil disturbance in heavy residue cover. This challenge has been overcome by burning surface residue immediately before planting, removing the residue (i.e. baling), vertical tillage, or by using a more aggressive residue manager that removes residue from the seed row. Research in south central Kansas indicates that even with good winter survival, no-till canola yields under heavy residue were lower than where residue was burned or where tillage has been performed.

Figure 1. Overwintering canola established under no-tillage in 30-inch rows in southwest Kansas. Photo by Mike Stamm, K-State Research and Extension.

No-till producers should ensure that drills and planters are properly set and consider using a setup that creates a more disturbed seed row. Using a high-disturbance opener (such as a coulter, residue manager, or hoe-type opener) in no-till can improve winter survival and result in yields comparable to those obtained in tilled fields.

If using tillage, perform the most aggressive tillage as early as possible, with each succeeding tillage operation being shallower than the last. Incorporate fertilizer and herbicide with the last tillage

operation. Some producers perform one aggressive tillage operation as early as possible and then control newly emerged weeds chemically. Planting into this "stale" seedbed will help ensure adequate moisture for establishment.

Weeds must be controlled chemically, mechanically, or with a combination of both methods prior to planting because canola seedlings are not competitive with established weeds.

Additional Resources

2023 National Winter Canola Variety Trial
https://bookstore.ksre.ksu.edu/item/2023-national-winter-canola-variety-trial_SRP1185

Great Plains Canola Production Handbook. Contact your local Extension office for a copy or download it online: https://www.bookstore.ksre.ksu.edu/pubs/mf2734.pdf.

Canola Growth and Development poster https://www.bookstore.ksre.ksu.edu/pubs/MF3236.pdf.

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3. Winter canola management considerations

In this article, we outline critical management factors for a successful canola growing season. A companion article in this eUpdate addresses other planting aspects, such as variety and site selection and seedbed preparation.

Seeding Date

The general rule is to plant canola six weeks before the average date of the first killing frost (28°F) in central and south central Kansas or six to eight weeks for southwest and northern Kansas. This allows adequate time for plant canopy development and root growth to improve the chances of winter survival. Planting too late will result in small plants with inadequate reserves to maximize winter survival. Planting too early may result in excessive growth that can deplete soil moisture. Excessive growth may also elevate the growing point or crown too far above the soil surface, increasing the chance of winterkill. This can also be a problem when heavy residue remains in the seed row without correct management.

Winter canola should be planted in northern and southwest Kansas by September 15 and central Kansas by September 25. In far south-central Kansas (Barber, Harper, and Sumner counties), winter canola should be planted by October 1 to avoid problems with winterkill.

Monitor short-term and long-term weather forecasts to help gauge planting time decisions. The most recent 8-14 day outlook from NOAA projects that normal to above-normal temperatures and normal to below-normal precipitation are likely. The 3-month outlook is for above-normal temperatures and below-normal moisture.

Seeding Rate, Depth, and Row Spacing

Winter canola will compensate for a poor plant stand; however, it is important to obtain as uniform a stand as possible to facilitate optimum plant development, winter survival, weed control, and uniform plant maturity.

A seeding rate of 3.5 to 5 pounds per acre (approximately 350,000 to 500,000 seeds per acre at 100,000 seeds per lb seed size) is recommended for open-pollinated varieties in narrow row spacing. Because hybrids have higher seed costs and a greater ability to branch out, it is recommended to plant them on a pure live seed basis. The recommended seeding rate is 250,000 to 300,000 pure live seeds per acre in narrow rows.

More producers are experimenting with canola planted in 30-inch rows. Producers can obtain accurate depth control, precision seed metering, and residue removal from the seed row with row crop planters. Generally, yields may be slightly reduced when moving from 15 inches to 30 inches under dryland conditions. However, producers can reduce their seeding rate to 1.5 to 3.0 lb per acre (about 135,000 to 270,000 pure live seeds per acre at a 90,000 seed per lb seed weight). Planting an open-pollinated variety or hybrid with prolific branching will also increase the profitability of canola planted in 30-inch rows.

It is important to check drill calibration. Some drills may require a speed reduction kit to obtain the optimum rate without damaging the seed. Some producers planting at 7.5-inch spacing will plug every other row unit and plant at a 15-inch spacing, so the drill does not have to be slowed as much.

Seed placement is critical for successful germination, emergence, and stand establishment. Optimal germination occurs with seed placed ½ to 1 inch deep. Under drier conditions, canola may be planted deeper (not greater than 1.5 inches), but delayed emergence and reduced vigor may occur. Soil crusting following a heavy rain can result in a poor stand. Canola emergence can be greatly reduced when using a deep furrow opener followed by heavy rain before emergence since soil can fill in the furrow, resulting in a deeper-than-intended seeding depth. To ensure proper seeding depth, producers must plant slower than when planting wheat (preferably five mph or slower). Finally, it is important to check the seeding depth in each field.

Rows spaced between 7.5 and 15 inches allow for rapid canopy closure (improved light interception) and weed control (Figure 1). Yields are similar across these row spacings. Plant-to-plant uniformity at emergence is critical for optimum plant development and growth, overwintering, and weed control.

Figure 1. Canola established under conventional tillage in narrow rows in south central Kansas. Photo by Mike Stamm, K-State Research and Extension.

Plant Nutrition and Soil Fertility

Soil testing, including a profile sample for nitrogen (N) and sulfur (S), is important in determining fertilizer needs. If you have questions, contact your local Extension office. Canola fertility recommendation programs, based on soil test levels, can be found at http://www.agronomy.ksu.edu/soiltesting/

Fertility needs are similar to winter wheat; however, canola needs slightly greater N and S. Applying high rates of fertilizer in-row at planting is not recommended because canola is sensitive to ammonia and salt damage (phytotoxic effects). However, research by Oklahoma State indicates that a low rate of DAP or MAP (30 to 40 lb/acre of product) is beneficial and not detrimental to yield. The best management practice for banding fertilizer should separate the fertilizer from the seed by two inches to avoid direct contact. Pre-plant broadcast application is also acceptable.

- **Lime**: Apply lime so that pH is in the range of 5.5-7.0 and early enough so the lime has time to react in the soil.
- **Phosphorus (P) and Potassium (K):** No P should be added if the P soil test is above 30 ppm. Additional K should be applied when soil test levels are less than 125 ppm.
- **Sulfur**: Canola requires S because of its high content of sulfur-containing proteins. Sulfur deficiency is more common in coarse-textured and low-organic-matter soils; however, a sulfur application is still recommended for all soil types. Sulfur can be applied at any time from pre-plant until the canola plant breaks dormancy in late winter. Apply S based on the soil test recommendation. Sulfate-sulfur (SO_4-S) soil tests should be above 10 ppm, or fertilizer should be applied. If no soil test is available, an application of 20-30 lb/acre S is recommended.
- **Nitrogen**: Pre-plant N applications must be carefully balanced, as too little or too much fall-applied N may negatively affect winter survival. One-third to one-half of total N (based on expected yield) should be fall-applied. At least 30 lb/acre but no more than 80 lb/acre of actual N is the general rule for fall applications. Winter survival, plant vigor, and yield potential can decrease without applying fall N.

Weed Management

A clean seedbed is critical to establishing winter canola. Small canola seedlings compete poorly with established weeds. However, once a good stand and canopy are established, canola suppresses and outcompetes most winter annual weeds. Regardless of your herbicide program, the most important thing to remember is to control weeds early in the fall.

- Trifluralin and ethalfluralin are effective at controlling winter annual weeds pre-plant, but each requires mechanical incorporation.
- Grass herbicides such as clethodim, quizalofop, and sethoxydim are labeled for cool-season grass control in canola.
- Roundup Ready (glyphosate-tolerant) canola varieties are available, providing excellent control of many problem weeds. Glyphosate is not labeled for application once the plant has bolted after dormancy.
- Clearfield canola varieties are available and provide another herbicide resistance option for controlling winter annual grasses.
- Before applying any herbicides, care must be taken to ensure that the sprayer equipment does not contain traces of problem herbicides, such as sulfonylurea herbicides.

Insect Management

An insecticide seed treatment is highly recommended to control green peach aphids and turnip aphids through fall and early winter. Monitor canola stands for the following fall insect pests: grasshoppers, diamondback moth larvae, flea beetles, aphids, and root maggots. Several products are labeled and provide good to excellent control.

Disease Management

Careful rotation is the best way to control canola diseases. Canola should not be planted on the same field more than once every three years and should never be planted continuously.

Blackleg (*Leptosphaeria maculans*) is the most serious disease threat to canola. Maintaining proper rotation intervals, planting disease-free seed, and using fungicide seed treatments are important management practices to slow the spread of blackleg. Damping-off of young seedlings, which resembles the pinching of the stem at or just below the soil line, is caused by several fungi, including *Pythium*, *Fusarium*, and *Rhizoctonia*. A fungicide seed treatment can lessen the effects of these soil-borne diseases.

Additional Resources

Great Plains Canola Production Handbook. Contact your local Extension office for a copy or download it online: https://www.bookstore.ksre.ksu.edu/pubs/mf2734.pdf.

Canola Growth and Development poster is available online at:
https://www.bookstore.ksre.ksu.edu/pubs/MF3236.pdf.

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4. Planting winter canola? Be aware of rotation restrictions with herbicides

Recent developments associated with market opportunities for winter canola may lead to increased planting in the fall of 2024 and beyond. As you make seeding plans, be sure to consider the herbicides you use or have used in your fall and summer crops. Table 1 highlights some herbicides used in fall and summer crops that may or may not have rotation restrictions for canola. As you consider this information, please remember that rotation intervals required by the EPA only consider the time that is required to ensure no illegal herbicide residues are found in the second crop. However, in some cases, additional information can be provided by the herbicide registrant regarding the potential for injury. When appropriate, that information will be noted in Table 1.

Table 1. Active ingredients, field half-lives, and crop rotation intervals of some herbicides applied to summer crops that may be of concern for winter canola.

Herbicide	Active ingredient	Half-life (days)	Rotation interval	Comments
Aatrex, others	atrazine	29	one year to avoid crop injury	--
Component of Acuron, others	bicyclopyrone	213	18 months	--
Balance Flexx, others	isoxaflutole	1.3	18 months	Also requires 15" of precipitation
*Beyond **	imazamox	30-60	18 months	--
Callisto, others	mesotrione	5	10 months	--
Classic	chlorimuron	28	9 to 18 months	See label for details
Dimetric, others	metribuzin	19	18 months	
Dual II Magnum, others	S-metolachlor	23	12 months	--
*Finesse **	chlorsulfuron metsulfuron	14-42	None listed	Field bioassay required
FirstRate	cloransulam	10	18 months	--
Harmony, others	thifensulfuron	10	45 days	--
Harness, Warrant, others	acetochlor	12	Not listed	--
Huskie	pyrasulfotole	30	9 months	--
Outlook, others	dimethenamid-P	16	4 to 6 months	Interval increases with increasing rate
Permit, others	halosulfuron	14	15 months	Bioassay if drought or cool conditions
Powerflex HL	pyroxsulam	13	9 months	--
Pursuit	imazethapyr	51	40 months	Also requires bioassay
Python, others	flumetsulam	45	26 months	Also requires bioassay

Reflex	fomesafen	86	18 months	--
Spartan, others	sulfentrazone	541	24 months	--
Valor, others	flumioxazin	18	6 or 12 months	6 months if tilled
Zidua, others	pyroxasulfone	22	12 to 18 months	Interval increases with increasing rate

* *To avoid plant back restrictions for canola, consider planting a Clearfield® winter canola after applying Beyond in wheat, and a sulfonylurea herbicide carryover tolerant winter canola after applying Finesse or similar Group 2 herbicides in wheat.*

For producers using the CoAXium® wheat system, remember that there is no rotation restriction for canola. However, to protect the efficacy of controlling weeds in both crops, it is recommended to rotate herbicide modes of action.

For more detailed information, see the "2024 Chemical Weed Control for Field Crops, Pastures, and Noncropland" guide available online at https://bookstore.ksre.ksu.edu/pubs/SRP1183.pdf or check with your local K-State Research and Extension office for a paper copy.

For more information on canola planting considerations, see the "Great Plains Canola Production Handbook" available at https://www.bookstore.ksre.ksu.edu/pubs/mf2734.pdf.

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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5. Update on the registration of over-the-top dicamba products

As the 2024 growing season wraps up and growers start to think about seeding plans for 2025,

questions are resurfacing about dicamba-resistant soybeans and cotton. Readers may remember the February announcement that the EPA vacated the labels for XtendiMax, Engenia, and Tavium but granted an existing stocks order that allowed the use of the product on hand through the labeled application cut-off dates of June 30, 2024, for soybeans and July 30, 2024, for cotton.

This spring, a new herbicide label for a dicamba-only product to be applied over the top of cotton and soybeans was submitted for EPA approval. Most of the restrictions are similar to the existing labels, including the cotton application cut-off date, with one major change for soybean growers. The proposed application cut-off date for soybeans is June 21 or soybean emergence, whichever is earlier. An application to re-register Tavium (dicamba + S-metolachlor) has also been submitted. That label includes a proposed application cut-off of V2 soybean or June 12. In cotton, the proposed cut-off is 6-leaf cotton or July 30. There has also been discussion of a 75-degree temperature cutoff for dicamba applications over the top of cotton or soybean, although that is not listed in the labels that have been submitted to the EPA.

The biggest challenge for planning comes in the EPA approval process. It is expected that the review process will require a 17-month review period by the EPA, followed by consultations required by the Endangered Species Act. The review period for the dicamba-only product began on May 3, 2024, when the proposed label was submitted. The review period for the Tavium registration began with the June 13, 2024, submission of the proposed label. Syngenta employees have stated that they do not expect the product to be registered in 2025.

At the time of this article's publication in the Agronomy eUpdate, the February existing stocks order is the last document related to dicamba registration published on the EPA website.

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6. Conduct soil bioassays to determine herbicide carryover potential

Many factors can influence herbicide degradation, namely precipitation and temperature. But, regardless of the environmental conditions, herbicides require time to break down in the soil. When drought, hail, or other situations change crop rotation plans, it can result in concerns about herbicide injury due to inadequate time for a potentially injurious herbicide to break down. A bioassay is one of the simplest things to do to determine the potential for herbicide residues to injure a subsequent crop. A bioassay is an easy at-home test to see how your seeds will grow in the field soil. There are three steps to conducting a bioassay.

1. **Collect soil**. You need to collect both treated soil from the field you are concerned about and similar, nontreated soil. The non-treated soil can come from a neighboring field that is being planted to the same crop that you are doing the bioassay for. The soil sample should include the top 2 to 4 inches of the soil profile. You'll want to collect enough soil to fill two or three pots for each field.

2. **Plant your crop seeds in the soil you collected.** Within a day or two of collecting soil, place soil in pots and plant the seeds. Depending on the pot size and seed quality, consider planting 25 to 50 seeds per pot. Another consideration is to plant in rows or another pattern that will make it easy to determine if plants have not germinated.

3. **Monitor crop growth.** Put the pots in a sunny place and water them as needed. Monitor seedling emergence over two to three weeks and evaluate seedlings for herbicide injury symptoms. Having the soil from both fields allows you to compare the seedlings that emerged for any injury symptoms easily. A guide to herbicide injury symptoms is available in the KSRE Bookstore.

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7. K-State survey of cotton grower perspectives

In 2020, southern Kansas farmers planted 195,000 acres of cotton, which produced 300,000 480-lb bales of cotton lint and 99,000 tons of cottonseed, with a combined economic value of $97,164,000! Cotton has established a place in Kansas, and K-State Research & Extension wants to hear from our cotton growers to better understand the current status of cotton production and emerging challenges in cotton production in Kansas.

This Qualtrics survey of Kansas Cotton Grower Perspectives was developed under the leadership of Dr. Logan Simon, Southwest Area Agronomist, in collaboration with the K-State Extension Cotton Working Group. The survey should take less than 10 minutes to complete and includes questions regarding 1) rotations and tillage, 2) variety selection, 3) planting methods, 4) irrigation strategies, 5) soil fertility, 6) plant growth regulators, 7) weed management, 8) insect management, 9) disease management, and 10) harvest and harvest aids.

The value of survey participation

Responses will help guide cotton research & extension programming at Kansas State University to meet the priorities and concerns of cotton producers. Survey results will potentially be used as justification when seeking funding for research and extension programming for cotton in Kansas. Responses may be shared within the K-State Extension Cotton Working Group and used for quantitative and qualitative analysis to develop extension bulletins, presentations, and scientific

journal articles.

Respondents will have the option to provide their contact information (email address and phone number) for potential follow-up phone conversations and field visits. However, identities will be kept confidential outside the K-State Extension Cotton Working Group. Participant information, even if identities are removed, will not be used or distributed for future research studies.

The survey can be accessed by scanning the QR code below or at
https://kstate.qualtrics.com/jfe/form/SV_3drJeSXR94YPPpA

For questions about the survey, please contact Logan Simon at (620)276-8286 or lsimon@ksu.edu.

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8. Using drone technology in agriculture - Sept. 10 in Garnett, KS

All are invited to attend a field day featuring the use of drone technology in agriculture hosted by K-State Research and Extension Frontier District. The event will start at 10:00 AM on September 10 at the Garnett Community Building in Garnett, KS.

The event will feature presentations on several topics related to using drones in agriculture and drone flight demonstrations. The full line-up of speakers and topics can be found on the flyer below.

A free lunch will provided, so please register by September 6 to reserve your spot. You can register by phone at 785-448-6826 or by emailing Ryan Schaub at reschaub@ksu.edu.

Using Drone Technology in Agriculture

Register:

phone: (785) 448-6826

email: reschaub@ksu.edu

Register by Friday, Sept. 6

Lunch Provided

Presentations:

The State of the Industry: DRONES
Spencer Schrader, K-State Salina, Uncrewed Aircraft Systems (UAS) Flight Operations Manager

Using Drones to Measure Pasture Biomass
Jaymelynn Farney, K-State Research and Extension Beef Systems Specialist

Practical Applications of Drone Remote Sensing for Natural Resource Conservation: Working with LiDAR
Trevor Witt, Owner of Kairos Geospatial

KDA's Role When Applying Herbicides Using Drones
Kelly Navinsky-Wenzl, Kansas Department of Agriculture Program Manager, Pesticide and Fertilizer Division

Applications for Drone Use in the Feedyard
Haley Larson, K-State Olathe Professor in Animal Health and Nutrition

Questions and Discussion
Panel: Jaymelynn Farney, Trevor Witt, Kelly Navinsky-Wenzl, and Haley Larson

Drone Flight Demonstrations

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