



K-STATE
Research and Extension

Extension Agronomy

eUpdate

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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. Late winter kochia control in fields going to corn or grain sorghum

Last week, we shared some general information about applying pre-emergence herbicides for kochia control. This week, we are going to focus on specific recommendations for fields going to corn or grain sorghum this growing season. Next week, we'll discuss fields going to soybean, sunflower, and wheat.

Kochia control in fields going to corn

Kochia start emerging in mid-February to early March and continue its emergence through spring into summer (Figure. 1). Any effective kochia control plan for fields going to corn should include early spring application of a burndown herbicide with an effective soil-residual herbicide for controlling early flushes. For example, an application of dicamba alone can control kochia; however, a combination of atrazine and dicamba will provide extended residual activity and address dicamba-resistance biotypes. Tank mixing 8 to 16 oz. of dicamba with 1 to 2 pints of atrazine will control existing broadleaf and grass weeds, and will provide extended pre-emergence control of kochia often into May.



Figure 1. A mat of kochia seedlings emerged before corn planting in early March at K-State Ag Research Center in Hays, KS. Photo by Vipin Kumar, K-State Research and Extension.

A study published in 2019 by weed scientists from across the Great Plains reported excellent control

(99%) of glyphosate-resistant kochia can be attained in corn by Degree Xtra followed by Impact, Verdict followed by Status, or Balance Flexx followed by Laudis + atrazine. Adding atrazine to group 27 herbicides like Balance Flexx is likely to improve control.

Data collected by Dr. Kumar at Hays, KS is shown in Figure 2. All of the treatments evaluated provided acceptable control, except for Acuron applied pre-emergence followed by Liberty + Status + Atrazine. Corn yields ranged from 88 to 111 bushels/acre with the greatest yields obtained in Verdict + atrazine pre-emergence followed by: Liberty + Atrazine, Roundup + Armezon Pro + atrazine, Liberty + Status + atrazine, or Roundup + Status + atrazine; Resicore + atrazine applied pre-emergence followed by Durango + atrazine; and Acuron applied pre-emergence followed by Roundup + atrazine. Pre-emergence programs based on Verdict plus atrazine could also be considered for fields going to grain sorghum.

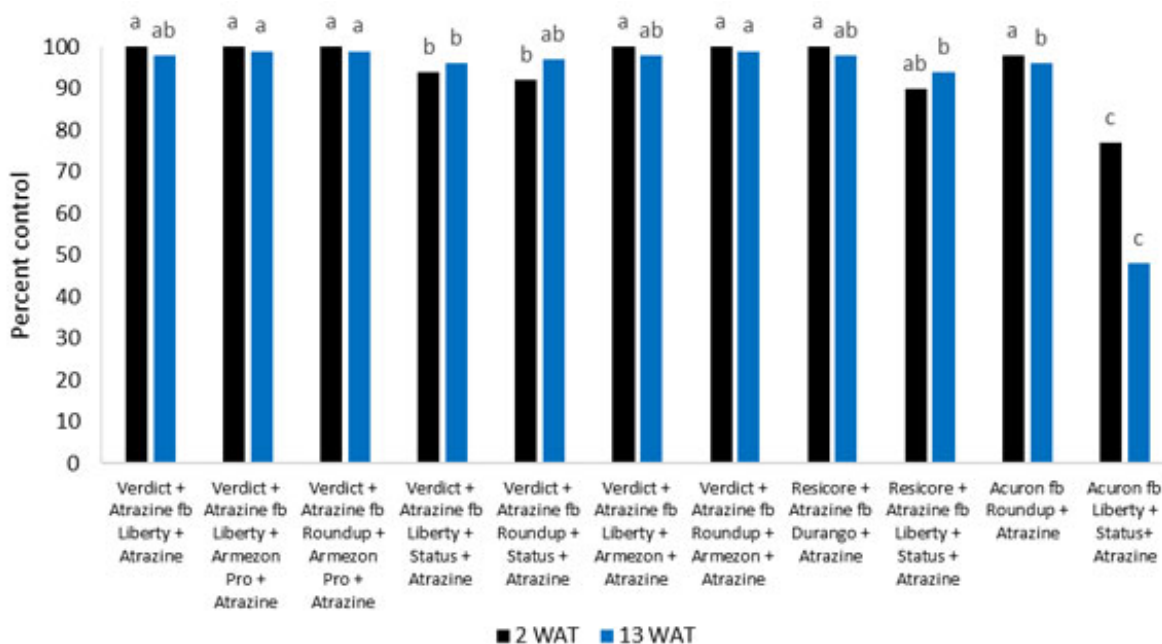


Figure 2. Kochia control in field studies conducted at Hays, KS. PRE, EPOST, and LPOST treatments were applied on April 23, June 11, and June 23, respectively. Similar letters indicate similar weed control.

Kochia control in fields going to sorghum

As sorghum planting in western Kansas generally resumes in mid-May, conserving soil moisture by controlling kochia and other weeds prior to sorghum planting is utmost important. Just like corn, kochia control in fields going to sorghum can be achieved with tank-mix application of dicamba (8 to 16 oz/a) with atrazine (1 to 2 pints/a) in early spring. If fields are infested with glyphosate- and/or dicamba-resistant kochia, Sharpen (2 oz/a) or Gramoxone (2 to 4 pints/a) can also be used to control resistant kochia biotypes. An application of PRE herbicides such as DegreeXtra (64 to 96 oz/a) or Lexar (96 oz/a) at planting can help controlling kochia in sorghum for 4-5 weeks.

Reference: Sbatella et al. 2019

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2. Cover crop termination considerations

Now is the time to begin considering how to terminate winter cover crops in preparation for summer crops. Some cover crop species, such as oilseed radish or fall-planted oats, are likely to be killed by freezing over the winter. But, many cover crops will need to be terminated by mechanical or chemical methods in the spring. Once the cover crop has been planted, there are two factors you can control in cover crop termination: method and timing, and choices related to these factors interact. It's also important to remember that NRCS guidelines for termination timing have implications for program compliance (Figure 1).

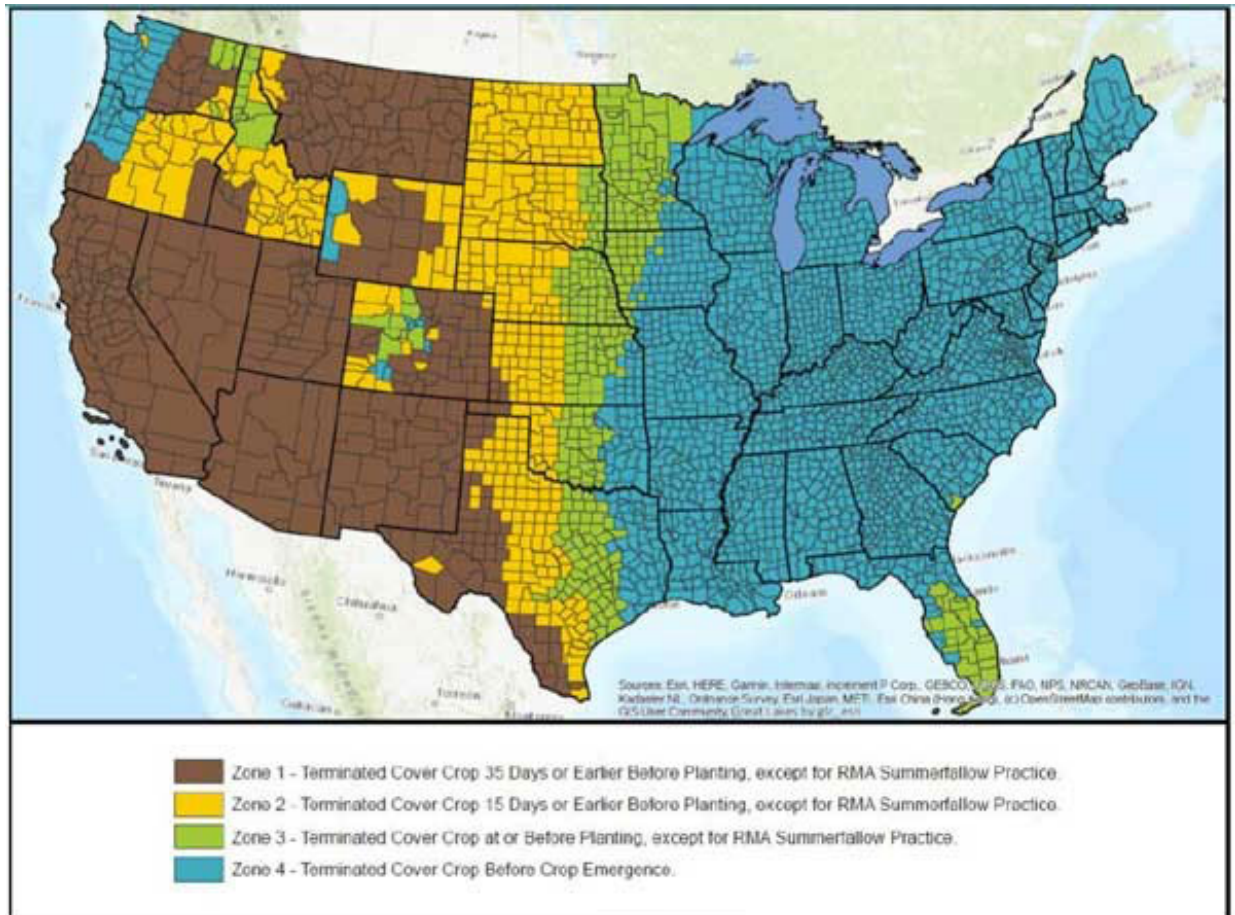


Figure 1. USDA's map depicting termination timing guidelines.

Mechanical cover crop termination methods, such as rolling or roller-crimping (Figure 2), tillage, and mowing have the potential advantage of reducing selection pressure on herbicide resistant weeds by deferring herbicide use to in-crop applications. Termination with a roller or roller-crimper may be more effective for monoculture plantings of a winter cereal grain, such a cereal rye. Cover crop growth stage is a key factor in achieving a successful kill. For example, cereal rye and other winter cereal grains are most consistently killed when a roller-crimper is used at milk or dough stage, while

legumes are best controlled at full bloom. Tillage is also a mechanical termination option in some cropping systems. Some species, especially clovers, may not be effectively killed by tillage. Multiple tillage passes may be required, which may cancel out soil health and conservation benefits of the practice. Mowing as a termination method is best suited to smaller acreages.



Figure 2. Roller crimper being used to terminate a sorghum-sudan grass summer cover crop. Photo by Peter Tomlinson, K-State Research and Extension.

Herbicides are an effective cover crop termination method that can be used in a variety of cropping systems. Selection of the most effective herbicide varies with cover crop species and growth stage. In general, more mature cover crops are more difficult to control with herbicides, especially once plants have begun reproductive development. Selective herbicides, such as Select (clethodim) for grasses or 2,4-D for broadleaves can be used to control single-species plantings, but non-selective herbicides such as glyphosate, glufosinate, or paraquat are recommended for control of mixed-species plantings. Combinations of glyphosate and 2,4-D can increase kill of broadleaf crops.

Residual herbicides such as Prefix or Authority Maxx can also be used in cover crop termination sprays. Research by Whalen et al. in Missouri suggests that including a residual herbicide controls waterhemp and protects soybean yields better than chemical termination without residual herbicides. In this research, the mid-season waterhemp control was greater when the cover crop was terminated 21 days before planting than when the cover crop was terminated 7 days before planting, but termination timing did not affect soybean yield. If you choose to include an herbicide

with residual activity, it is especially important to consider the potential for injury to the crop that will be planted afterward. When selecting an herbicide program to terminate your cover crop, it is important to consider the termination effectiveness and possible restrictions (Table 1).

Table 1. Herbicide considerations for chemical cover crop termination.

| Herbicide | Termination effectiveness ² | | Potential rotation restriction ³ |
|-----------------------------|--|---------------------|---|
| | Cereal rye | Austrian winter pea | |
| Roundup PowerMax | G/E | F/E | none |
| Roundup PowerMax + Aatrex | G | G/E | corn |
| Roundup PowerMax + Clarity | G/E | G/E | soybean |
| Roundup PowerMax + Canopy | F/G | G/E | corn |
| Roundup PowerMax + Sharpen | G/E | G | soybean |
| Roundup PowerMax + Lo-Vol 4 | G/E | G/E | soybean |
| Gramoxone Inteon | F/P | F/G | none |
| Gramoxone Inteon + Aatrex | F | E | corn |
| Gramoxone Inteon + Lo-Vol 4 | F/P | E | soybean |

¹Use of trade names does not indicate an endorsement of any product.

²E=excellent, G=good, F=fair, P=poor; Cover crop growth stage and environmental conditions will influence effectiveness. Based on Cornelius et al., 2017. Herbicide labels supersede this information.

³Rotation restrictions are influenced by application rate and herbicide resistance in crop. Herbicide labels supersede this information.

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3. 2020 Kansas Performance Tests with Corn Hybrids report now available

The *2020 Kansas Performance Tests with Corn Hybrids* report is now online and in print form. In this report, you will find a review of the 2020 corn crop, with a detailed discussion summarizing the statewide growing conditions and impacts from diseases and insects. More importantly, the results of the 2020 corn hybrid performance tests are also shown. Corn performance tests are conducted each year by the Kansas Agricultural Experiment Station. The results from these tests provide producers, extension agents, and industry professionals with unbiased agronomic information on many of the corn hybrids marketed in Kansas.

Producers and crop consultants can use this resource to help select corn hybrids for their operation by checking for varieties that show a consistently good performance in their region.

The online version of the corn hybrid performance test results can be found at: <https://bookstore.ksre.ksu.edu/pubs/SRP1159.pdf>. Paper copies can be ordered from the K-State Research and Extension Bookstore at www.bookstore.ksre.ksu.edu/

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4. Save the Date - Great Plains Cotton Conference, February 23 & 24

Following a very successful meeting in 2020, the 2021 Great Plains Cotton Conference is scheduled for **February 23 and 24, 2021**. Due to COVID restrictions, the meeting will be held virtually using the Zoom platform this year. Presentations will be focused on all things cotton, including stand establishment, early season management, pest and nutrient management, varieties, harvest-aids, post-harvest management, economics, and cotton industry updates related to the Great Plains. Nationally recognized speakers from OK, KS, TX, and TN will be presenting. Seed companies will be presenting on their latest varieties and traits as well. One KDA CEU credit will be offered. CCA credits have been requested but not confirmed.

Presentations will go from 7:30 am to 12:00 pm on February 23 **and** 7:30 am to 12:00 pm on February 24.

Interested individuals are asked to RSVP by February 19 to:

- email: Penny Adams at padams@ksu.edu Please provide your name, phone #, email address, address, and Pesticide Applicator Lic. # in the email.
- phone: Shelley Heinrich at 806-670-3250 or sheinrich@cottonboard.org

Registered attendees will receive a Zoom invitation on February 22.

5. New Crop Talk webinar series for northwest and north central Kansas



A new series of hour-long webinars began in early February. This series is focused on agronomic topics targeted for northwest and north central Kansas. Topics range from soil fertility, weed management, insect management, and dryland corn dynamics. Continuing education credits have been applied for and will vary based on the subject area of each webinar. Each webinar will begin at 10:30 am (CST) and last until 11:30 am, beginning with the first one on Tuesday, February 2.

Upon registration, participants will receive an email with instructions to attend via Zoom or YouTube. These webinars are open to all and there is no cost. Visit the K-State Northwest Research and Extension Center's website to register: <https://www.northwest.k-state.edu/events/crop-talk-series>.

Please contact any local KSRE extension office in north central or northwest Kansas for any questions.

A complete list of webinars, with dates, topics, and speakers is detailed below.

February 2 - **Soil Fertility Questions from Growers for the 2021 Season (focused for Northwest Kansas)**

Dorivar Ruiz Diaz, K-State Soil Fertility Specialist

(1 Soil Fertility CCA Credit)

February 3 - **Soil Fertility Questions from Growers for the 2021 Season (focused for North Central Kansas)**

Dorivar Ruiz Diaz, K-State Soil Fertility Specialist

(1 Soil Fertility CCA Credit)

February 9 - **Weed Management and that Pesky Palmer Amaranth (focused in Northwest Kansas)**

Sarah Lancaster, K-State Weed Scientist

Vipan Kumar, K-State Weed Scientist

(1 Integrated Pest Mgmt CCA Credit)

February 10 - **Weed Management and that Pesky Palmer Amaranth (focused in North Central**

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Kansas)

Sarah Lancaster, K-State Weed Scientist
Vipan Kumar, K-State Weed Scientist

(1 Integrated Pest Mgmt CCA Credit)

February 16 - **Corn Insect Resistance: Rootworm & Western Bean Cutworm**
Julie Peterson, UNL Entomologist

(1 Integrated Pest Mgmt CCA Credit)

February 23 - **Grain Sorghum Weed Control: Start Clean, Stay Clean**
Sarah Lancaster, K-State Weed Scientist

(1 Integrated Pest Mgmt CCA Credit)

February 24 - **Sorghum Insects: Aphids, Headworms and Chinch Bugs.. Oh My!**
J.P. Michaud, K-State Entomologist

(1 Integrated Pest Mgmt CCA Credit)

March 2 - **Alfalfa Management and Weevil Update**
Romulo Lollato - Wheat & Forage Specialist
Anthony Zukoff, K-State Extension Entomology Associate

(1 Crop Mgmt CCA Credit)

March 9 - **Dryland Corn Dynamics**
Lucas Haag, K-State NW Regional Agronomist

(1 Crop Mgmt CCA Credit)