Issue 1022

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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. Considerations when planting wheat into dry soil

Despite some recent rainfall events, the most recent Drought Monitor shows 96% of Kansas still experiencing abnormally dry or worse conditions. (Figure 1). Topsoil conditions are getting drier in many areas of Kansas, particularly in northwest and north central Kansas (Figure 2). Unfortunately, the precipitation outlook is not very favorable (Figure 3). For wheat yet to be planted in these areas, producers are left with a few options.

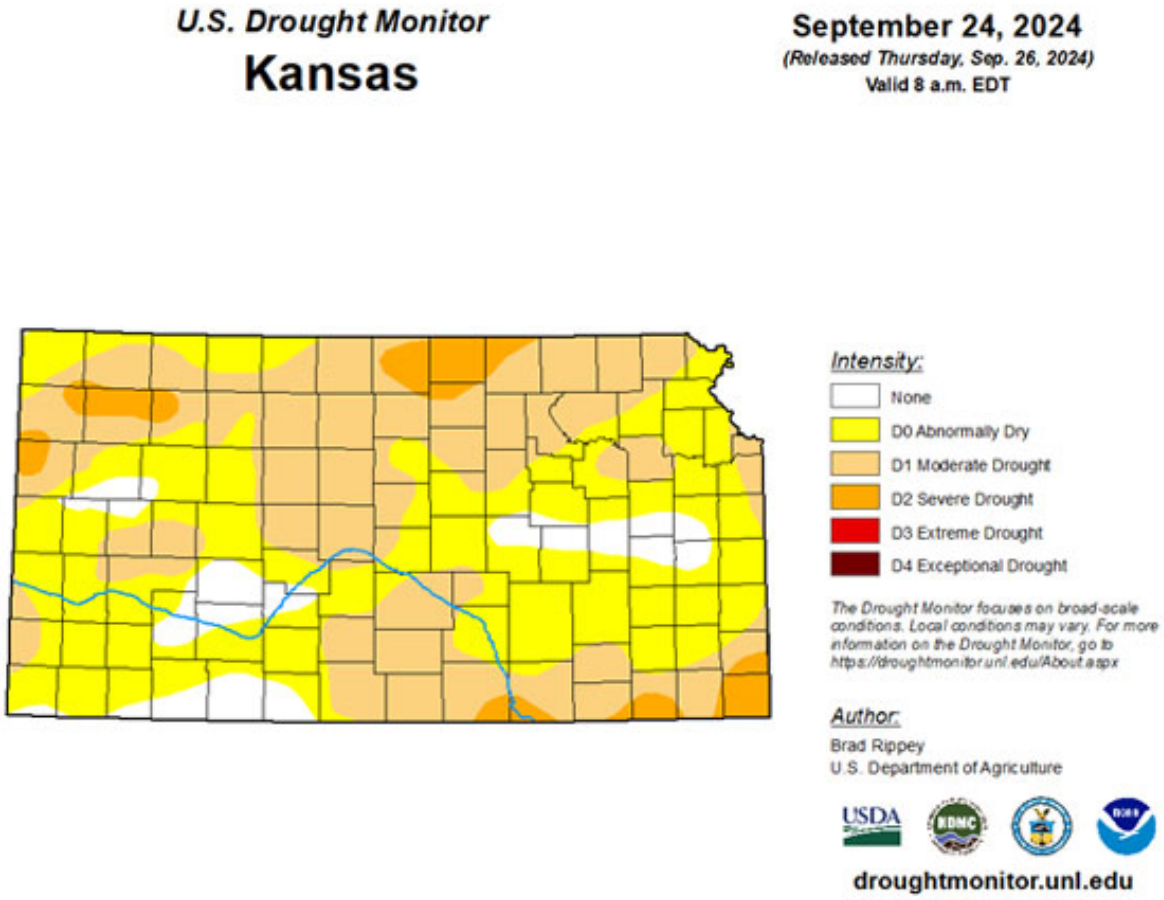

Figure 1. Current drought conditions for Kansas as of September 24, 2024. Map from droughtmonitor.unl.edu.

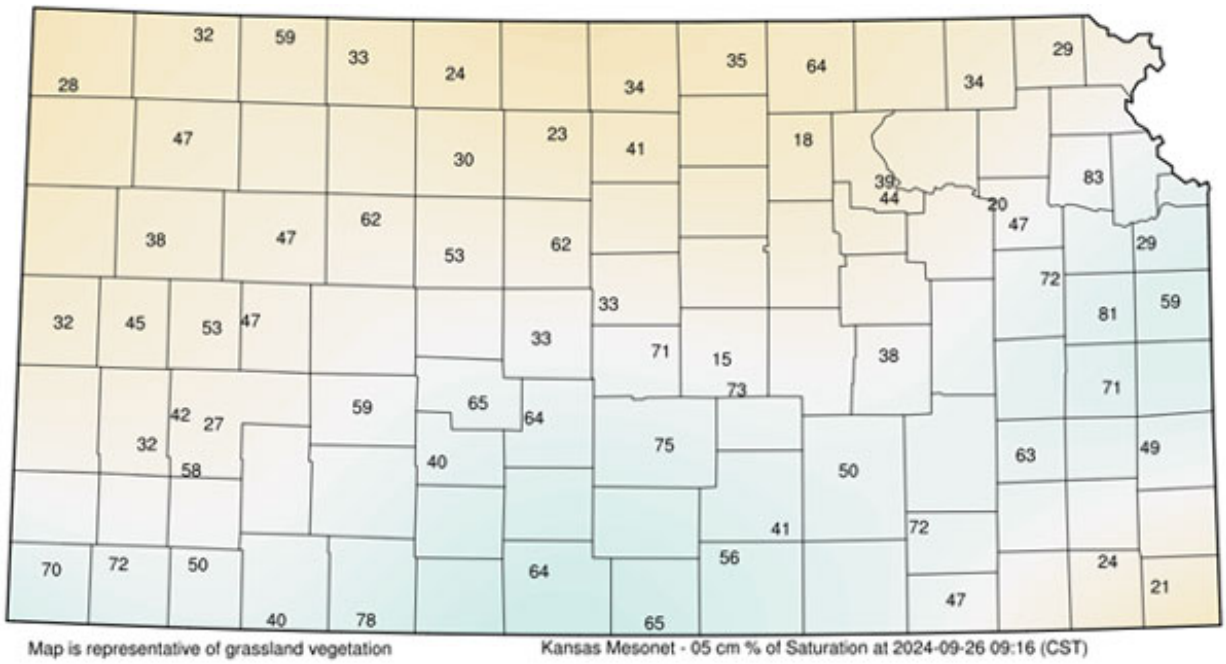

Figure 2. Topsoil moisture conditions at 2 inches (5 cm) reported as % saturation at the 5cm depth on September 26, 2024. Map by Kansas Mesonet: https://mesonet.ksu.edu/agriculture/soilmoist.

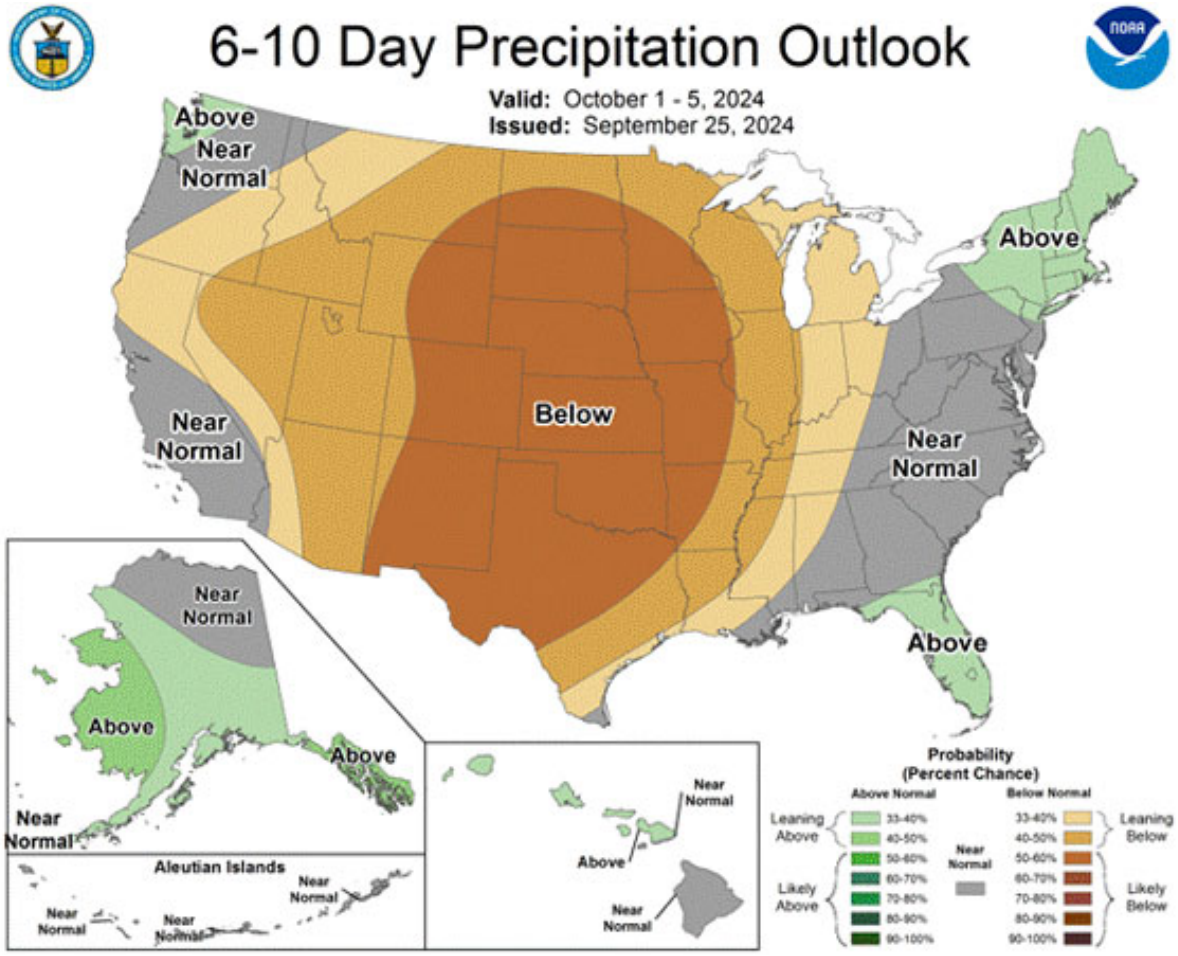

Figure 3. The precipitation outlook was issued on September 25, 2024, for the next 6-10 days (Oct. 1-5). Source: CPC.

Option 1: "Dust in" the wheat

Producers can choose to "dust in" the wheat at the normal seeding depth and the recommended planting date and hope for rain (Figure 4). Some farmers may consider planting it shallower than normal, but this could actually increase the potential for winterkill, freeze damage, and poor crown development. Planting the wheat crop at the normal depth and hoping for rain is probably the best option where soils are very dry. The seed will remain viable in the soil until it gets enough moisture for germination.

Figure 4. Wheat dusted in near Belleville in October 2015. Photo by Romulo Lollato, K-State Research and Extension.

Before planting, producers should examine the long-term forecast and estimate how long the dry conditions will persist. The current short-term precipitation outlook (6 to 10-day) is leaning significantly toward below-normal rainfall (Figure 3).

Precipitation amounts are predicted to remain below normal for October. Should this occur, producers should treat the fields as if they were planting later than the optimum time, as the emergence date will be delayed. Rather than cutting back on seeding rates and fertilizer to save money on a lost cause, producers should increase seeding rates, consider using a fungicide seed treatment, and use a starter phosphorus fertilizer to improve early season development. However, producers should be cautious with in-furrow nitrogen or potassium fertilizers as these are salts and can make it more difficult for the seed/seedling to absorb water needed for germination. The idea is to ensure the wheat gets off to a good start and will have enough heads to have good yield potential, assuming it will eventually rain and the crop will emerge late. Wheat that emerges in October may still hold full yield potential, but wheat that emerges in November almost always has fewer fall tillers and, therefore, can have decreased yield potential.

Probably the worst-case scenario for wheat planted into dry soils would be if a light rain occurs and the seed gets just enough moisture to germinate but not enough for the seedlings to emerge through the soil or to survive very long if dry conditions return. Once the coleoptile extends to the soil surface, the plant must have enough moisture to continue growth; otherwise, it will perish. This situation may worsen if producers plant wheat following a summer crop such as corn, soybean, or

sorghum, which depleted subsoil moisture through late summer. The wheat stand can be completely lost without subsoil moisture to sustain growth. If late October brings cooler temperatures, dusting wheat in becomes a more interesting option as soil moisture from a possible rainfall event could be stretched further.

Option 2: Plant deeper than usual into moisture

Planting deeper than usual can work if the variety to be planted has a long coleoptile and there is good soil moisture within reach. The advantage of this option is that the crop should come up and make a stand during the optimum time in the fall. If using a hoe drill, the ridges created could potentially keep the soil and emerging plants protected from wind erosion through the winter.

It's possible that the wheat would get planted so deep that it would germinate but never emerge at all, especially if the coleoptile length is too short for the planting depth (Figure 5). Generally, it's best to plant no deeper than 3 inches with most varieties in Kansas and the Great Plains. It is also important to remember that ridges formed by narrow press wheels can make the effective planting depth much deeper if the seed furrows fill in during a heavy rainfall event.

Figure 5. Deep-planted wheat can result in variable stands depending on if the coleoptile of the plants reaches the soil surface (plant on the left) or if it does not (plant on the right). In cases where the coleoptile does not reach the soil surface, chances are that the first true leaf will emerge below ground and perish with an accordion-like format. Photo by K-State Research and Extension.

Option 3. Wait for rain before planting

To overcome the risk of crusting or stand failure, producers may decide to wait until it has rained and soil moisture conditions are adequate before planting. Under the right conditions, this would result in good stands, assuming the producer uses a high seeding rate and a starter fertilizer, if appropriate. If it remains dry well past the optimum range of planting dates, the producer would then have the option of just keeping the wheat seed in the shed until next fall and planting spring crops next year instead.

The risk of this option is that the weather may turn rainy and stay wet later this fall, preventing the producer from planting the wheat, while those who dusted in their wheat could have a good stand. There is also the risk of leaving the soil unprotected from the wind through the winter until the spring crop is planted.

Crop insurance considerations and deadlines will play a role in these decisions. Another consideration is to delay the bulk of nitrogen application until topdress time in the spring, as wheat does not require much nitrogen in the fall. This would defer expenses until an acceptable wheat stand is assured.

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2. Control annual weeds with fall-applied herbicides ahead of corn and sorghum

With row crop harvest well underway, it is time to start planning fall herbicide applications. Herbicide applications in late October through November can improve control of difficult winter annual weeds. Fall weed control is associated with warmer soils and easier planting in the spring. However, it is important to remember that fall-applied herbicides may limit your crop options in the spring. Also, remember that herbicides should not be applied to frozen ground.

Some of the key herbicides to consider for fall herbicide applications include chlorimuron (Classic, others), flumioxazin (Valor, others), suflentrazone (Spartan, others), and Autumn Super for residual activity. Even though these herbicides provide activity, additional spring application of pre-emergence herbicides will be needed to extend the duration of residual weed control. One thing to remember about residual activity from fall herbicide applications is that weather conditions will influence the length of residual control and weed emergence patterns. Warm, wet winters are associated with shorter periods of weed control, while cool, dry winters are likely to allow for longer periods of weed control.

For burndown activity, glyphosate, 2,4-D, or dicamba are good options to consider. Alternatives for grass control include Group 1 herbicides like clethodim (Select, others) or quizalofop (Assure II, others). Alternatives for controlling broadleaf weeds include paraquat (Gramoxone, others) tiafenacil (Reviton), or saflufenacil (Sharpen).

Some key weeds to target with fall herbicide applications are marestail, henbit, dandelion, prickly lettuce, pepperweed, field pansy, evening primrose, mustard species, and recently-emerged cool-season grasses. When higher rates of herbicides are used, some suppression of early spring-germinating summer annual broadleaf weeds such as kochia, common lambsquarters, wild buckwheat, and Pennsylvania smartweed can be achieved. Recent data comparing kochia control with fall and spring applications are included in Figure 1.

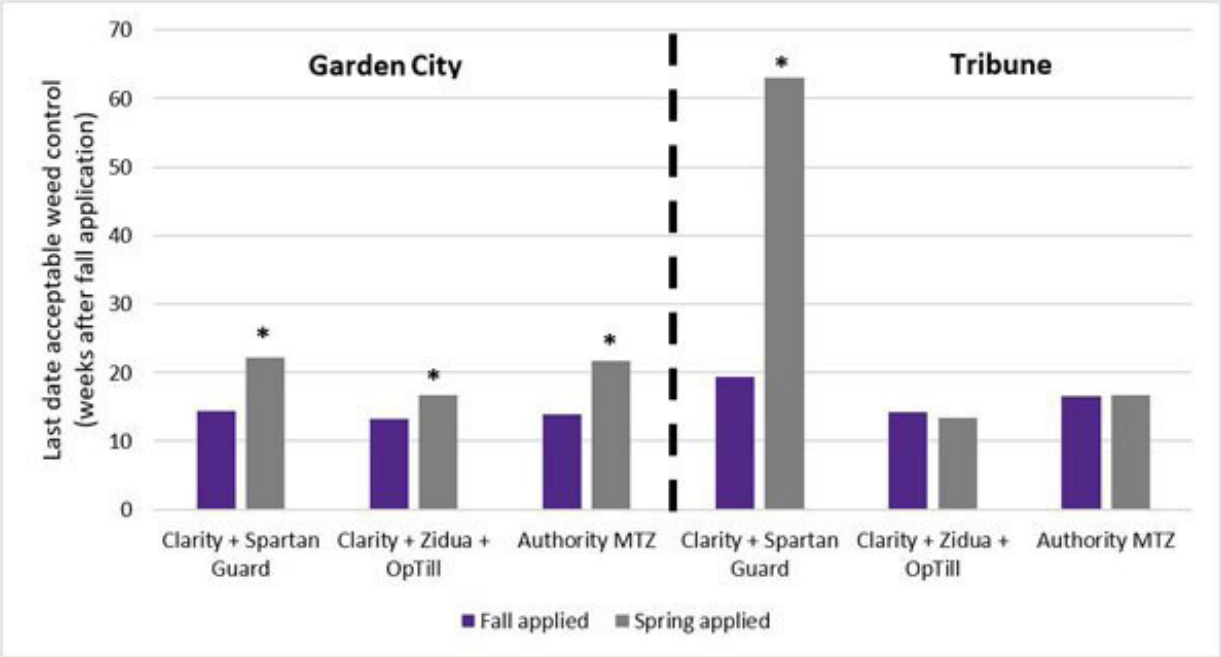

Figure 1. Estimated weeks of kochia control greater than 80% following fall (early December 2014) and spring (early February 2015) herbicide applications at Garden City and Tribune, KS. An asterisk (*) indicates that the spring application provided acceptable weed control at a later date than a fall application. Data from Kumar et al.,2019.

Marestail is a problem that merits special attention. It is much easier to control in fall or early spring while still in the rosette growth stage (Figure 2). A companion article in this eUpdate issue provides additional information about controlling marestail.

Figure 2. Marestail rosettes in a recently harvested soybean field. Photo from Dallas Peterson.

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.

For more information on controlling bindweed, see 2024 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland, K-State publication SRP-1183.

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3. Get control of fall-emerged marestail before next spring

Marestail or horseweed (*Erigeron canadensis*) is a challenging weed to manage in no-till or minimum-till soybeans systems. This weed is classified as a winter annual, but it germinates well into spring and summer, making it even more difficult to manage. In addition to an extended germination window, marestail can produce up to 200,000 seeds/plant, with approximately 80% of those seeds being able to germinate immediately after maturation. Kansas producers also face the added difficulty of trying to manage glyphosate-and ALS-resistant marestail. (Figure 1).

Figure 1. Fall-emerged marestail in the rosette stage in wheat stubble in Manhattan, KS. Photo by Tyler Meyeres, K-State Research and Extension.

Acceptable control of fall-emerged marestail with herbicide applications at planting will be unlikely because the marestail are generally too large, but control can be achieved with both fall and early spring herbicide applications. Other control options include tillage and cover crops.

Residual herbicides for marestail control include chlorimuron (Classic, others), flumioxazin (Valor, others), sulfentrazone (Spartan, others), and metribuzin products. Group 4 herbicides such as 2,4-D, dicamba, fluroxypyr (Starane Ultra), or haluxifen (Elevore) are good options to control emerged marestail, especially populations that are resistant to glyphosate or ALS-inhbiting herbicides. Control of marestail in the rosette stage (Figure 1) is similar among the Group 4 herbicides, but dicamba controls bolted marestail better than 2,4-D. Saflufenacil (Sharpen) or glufosinate (Liberty, others) can also control bolted marestail.

Fall and spring tillage has been shown to be effective in controlling marestail for a spring-planted crop. When tillage is not utilized in the fall, marestail will establish and be present in the spring. If implementing a minimum tillage system is the goal, research suggests that marestail can be controlled when a fall herbicide application is followed by shallow tillage in the spring or vice versa.

Cover Crops

Utilizing cover crops can result in fewer and smaller marestail plants in a field. Research in Kansas has shown control of marestail with a cereal rye cover crop paired with spring herbicide applications. The key to achieving effective suppression of marestail with cover crops is the accumulation of adequate cover crop biomass before marestail emerges, so timely cover crop planting is important for this strategy to succeed.

For additional information, see the "2024 Chemical Weed Control for Field Crops, Pastures, and Noncropland" (K-State publication SRP-1183) 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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4. Musk thistle control in the fall

Musk thistle (*Carduus nutans*) is one of 12 noxious weeds in Kansas, infesting over 420,000 acres. It has been reported in nearly every county in Kansas (Figure 1) and is found primarily in pastures, rangeland, hay meadows, alfalfa, fallow, roadsides, and waste areas. Under the new Noxious Weed Law (March 2021), musk thistle is considered a Category C weed. That means it is well established within the state and has an extensive population.

Control efforts should be aimed at reducing or eliminating new populations, and established stands should be managed with any accepted control method. Accepted control methods include mechanical, chemical, and biological approaches. Mechanical control involves removing the entire plant or just the reproductive parts to prevent the plants from producing flowers/seeds. Mowing, digging, and hoeing are common mechanical methods of controlling musk thistle. Several herbicides are labeled for musk thistle control and are discussed below. Biological control requires a permit and needs to be integrated with other methods. Head and crown weevils are found in the state but cannot be transported across state lines. A flower fly (*Cheilosia corydon*) is a new candidate species for biological control of musk thistle.

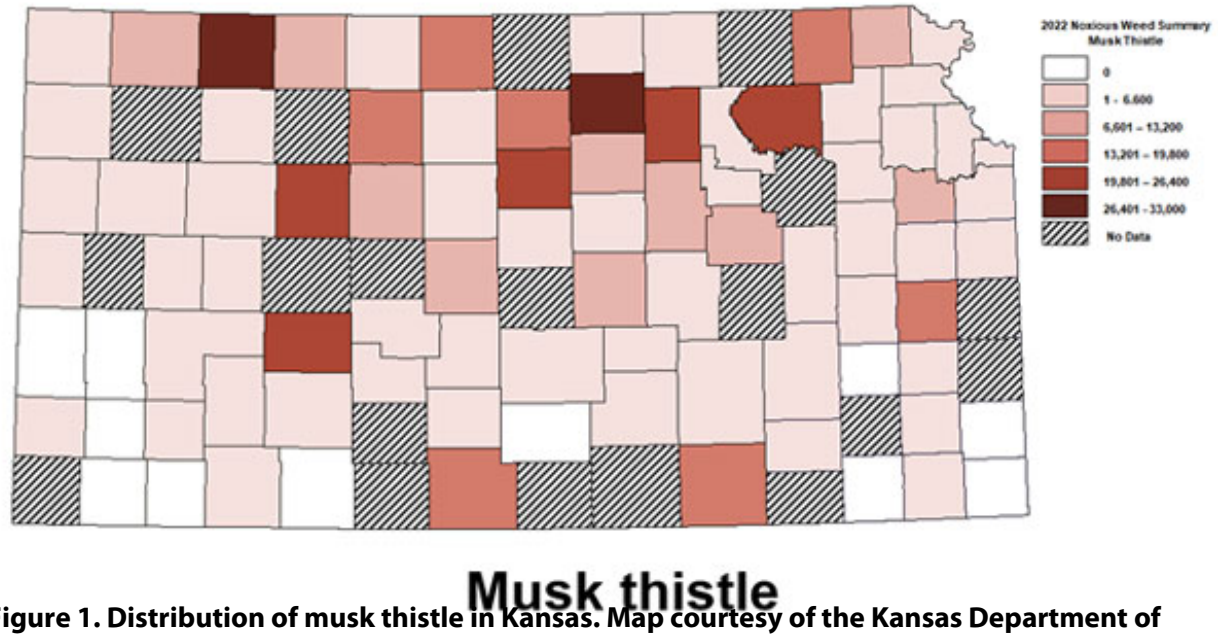

Figure 1. Distribution of musk thistle in Kansas. Map courtesy of the Kansas Department of Agriculture.

Musk thistle is primarily a biennial or winter annual species. Biennials take two growing seasons to complete their life cycle. Thistles germinating in the spring will spend the entire summer as a rosette, live through the winter, and bolt the next year in May and June. Winter annual plants will germinate with moisture and warm temperatures in the fall, live through the winter, and bolt the following year.

Most people recognize musk thistle during the early summer when the plants are actively blooming (Figure 2, top photo). However, musk thistle control is easiest as a rosette (Figure 2, bottom photo).

Figure 2. Musk thistle in flowering and rosette stages of growth. Photos courtesy of Walt Fick, K-State Research and Extension.

Fall is an excellent time to spray musk thistle as all are in the rosette growth stage. Another advantage of treatment in the fall is reduced risk of off-target drift. Waiting until most deciduous trees have lost their leaves and most crops are harvested will greatly reduce the likelihood of damage from herbicide drift. A wider window of opportunity for treating musk thistle also exists in the fall. The spraying window in the fall probably extends until the ground is frozen, and the musk thistle plants have shut down activity until warmer temperatures in the spring. Freezing temperatures will start to damage musk thistle plants, with some yellowing and curling of leaves. However, the plants are susceptible to herbicides as long as green tissue exists.

Dry conditions in the fall can reduce control of musk thistle with certain herbicides. Still, studies in Kansas indicated that a fall application of 2,4-D LVE at 2 lbs per acre was more effective (80% control) than a similar rate of 2,4-D amine (49% control). Dicamba + 2,4-D amine at 0.25 + 0.75 lbs per acre and picloram at 0.125 lbs per acre were also effective (>90% control) on musk thistle treated in the fall. Other herbicides that have proven effective include 3-5 fl oz/acre aminopyralid (Milestone) and aminopyralid + metsulfuron (Chaparral at 1.5 oz/acre). Products containing picloram and aminopyralid will not only control rosettes treated in the fall but will have enough carryover to control emerging seedlings the following spring.

If you need to treat musk thistle this fall, select the proper herbicide for the job. If possible, select a warm, sunny day to spray. Scattered rosettes can be mechanically removed by digging below the crown.

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5. Survey of integrated weed management practices used by Kansas producers

With the recent increase in early soybean planting, considerable research has been conducted on various weed management strategies. However, real-world farmer insights are limited. Therefore, we are conducting this survey to evaluate on-farm use of residual herbicides and other weed management practices. Our survey explores the practical aspects of early planting, chemical use, and row spacing. By gathering data on these practices, we hope to refine integrated weed management strategies and assist farmers in selecting effective and sustainable approaches.

Interested in sharing your experiences? Follow the link or scan the QR code to access the questionnaire.

https://kstate.qualtrics.com/jfe/form/SV_ermvM5eqgqYDU10

Thank you for your time and consideration. Contact us if you have any questions.

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