1. Control strategies for marestail in soybeans

Marestail continues to be one of the biggest problem weeds on many soybean fields in Kansas. Marestail is a little easier to control in corn since it is still susceptible to atrazine, dicamba, and other herbicides that can be used in corn.

Marestail has historically been considered a winter annual weed, but it can also germinate in the spring or summer and act as a summer annual. In fact, marestail appears to be shifting to more spring and summer germination in Kansas. Individual plants can produce an abundance of tiny seed that can be easily dispersed by wind. Seed can germinate soon after it is produced, but also can remain viable in the soil for several years, making it a hard weed to control with crop rotation. In addition to those problems, many populations of marestail in Kansas now appear to have some level of glyphosate resistance, while some populations may also be resistant to ALS-inhibiting herbicides.

Herbicide effectiveness on marestail depends largely on the stage of growth and size of the plants. Marestail generally is most susceptible to herbicides when it is small and still in the rosette stage of growth. Once marestail starts to bolt and exceed 4 to 6 inches tall, it becomes very difficult to kill with most herbicides. Since marestail can germinate throughout much of the year, a single herbicide application probably will not provide season-long control, particularly in no-till.

The most effective marestail control program should start with fall treatments, especially in fields with a history of marestail problems. A number of different herbicides can be applied in the fall for marestail control ahead of soybeans, such as 2,4-D, dicamba, Canopy EX, Autumn Super, or Valor XLT. The addition of glyphosate helps control grasses and other broadleaf weeds, and can even help on glyphosate-resistant marestail.

Fall applications can be effective even into December as long as applications are made to actively growing weeds during a stretch of mild temperatures. In fact, for fall applications, it may be better to wait until November to allow most of the fall-germinating winter annuals to emerge. A residual herbicide such as the Valor- or Classic-containing products (unless the marestail is ALS resistant) can be added to help control marestail through winter and early spring. But don’t expect a residual
herbicide applied in the fall to provide residual control of marestail and other weeds through the spring and summer of the next year. If a fall treatment isn’t made, early spring treatments in March to early April should be applied to help control fall-germinated marestail.

Dicamba or 2,4-D are generally combined with other herbicides to improve consistency of marestail control either in the fall or spring, but have preplant interval restrictions. A waiting period of 7 days is required after application of up to 1 pt/acre 2,4-D LV4; 15 days for up to 1 pt/acre 2,4-D amine; and 30 days between application and planting of soybeans for rates greater than 1 pt/acre for either ester or amine 2,4-D products.

Clarity herbicide has proven to be more effective than 2,4-D for control of marestail and can provide some residual control, but has even more restrictive preplant limitations. However, it may be a good alternative as a fall or very early spring treatment in some areas. Clarity use as a preplant herbicide treatment ahead of soybeans is prohibited in areas that average less than 25 inches of rain per year. In areas with greater than 25 inches of rain, a waiting interval of at least 14 days is required following accumulation of at least 1 inch of rain or irrigation after application of Clarity at rates up to 8 oz/acre.

Sharpen is a herbicide that generally has provided very good control of marestail. It can be applied anytime prior to soybean emergence and will provide a short period of residual control. Sharpen works best if applied with methylated seed oil and in combination with 2,4-D or glyphosate. Because Sharpen is a contact herbicide, using higher spray volumes (15-20 gal/acre) will help increase herbicide coverage on the plants. Sharpen works very fast and quickly desiccates marestail foliage, but marestail can sometimes regrow from axillary buds one to two weeks after treatment. Sharpen cannot be applied postemergence to soybeans. Sharpen is also available as a premix with Pursuit in the product OpTill, or with Outlook in the product Verdict.

In addition to a burndown application made in fall or early spring, most fields will benefit from use of residual herbicides that include a Valor, Classic, or FirstRate component in the spring, along with another dose of a burndown herbicide if needed. The use of a residual preplant or preemergence herbicide at planting time, tankmixed with a burndown herbicide, will help provide additional control of marestail, as well provide early-season weed control. This will also help manage or prevent the development of other glyphosate-resistant weeds such as waterhemp, ragweed, Palmer amaranth, or kochia.

If marestail are not controlled in fall or early spring and have started to bolt before they are treated, Ignite herbicide has proven to be one of the best treatments for control of larger bolted marestail. Ignite can be used as a burndown treatment prior to emergence of any type of soybeans, or as a postemergence treatment in Liberty Link soybeans. However, Ignite efficacy is often reduced under lower humidity.

Postemergence control of large marestail in soybeans can be very difficult, especially if the marestail is glyphosate resistant. FirstRate, Classic, and Synchrony herbicides are probably the best postemergence options, unless marestail is also ALS-resistant. The combination of these herbicides with glyphosate on Roundup Ready soybeans seems to work best, even on glyphosate-resistant marestail.

Glyphosate-resistant marestail and other glyphosate resistant weeds have developed due to over-reliance on glyphosate for weed control. Integration of other herbicides into the weed control
program and proper timing of herbicide applications is a key factor to help manage and prevent the development of glyphosate-resistant weeds.

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2. Late-season management decisions for alfalfa

Alfalfa growth may have resumed somewhat in areas that have had some rain in the past few weeks. This creates a dilemma for producers in need of forage, or for those who want to maximize profits from one last cutting. Should you cut it now or wait until just before the first killing freeze is forecast to get as much productivity as possible? The timing of the last cutting can have a long-lasting impact on the productivity of the stand.

The agronomics of the question are clear. At this stage of the growing season, alfalfa plants need to store enough carbohydrates to survive the winter. If root reserves are not replenished adequately before the first killing freeze (24 to 26 degrees) in the fall, the stand is more susceptible to winter damage than it would be normally. That could result in slower greenup and early growth next spring.

The last cutting, prior to fall dormancy, should be made so there are 8 to 12 inches of foliage, or 4 to 6 weeks of growth time, before the average killing freeze date. This should allow adequate time for replenishment of root reserves.

For northern areas of the state, particularly northwest, late September should be the target date for the last cutting before dormancy. The last week of September should be the cutoff date for southwest Kansas. The first week of October is the cutoff for southeast Kansas.

Making one last cutting in mid-October, if significant growth has occurred, could reduce root reserves during a critical time. About the worst thing that could happen to an alfalfa stand cut in mid-October would be for plants to regrow about 3 to 6 inches and get a killing frost. In that scenario, the root carbohydrate reserves would be at a low point and could hamper greenup next spring.

After a killing freeze, the remaining forage (if any) can be hayed safely. However, the producer should act quickly because the leaves will soon drop off.

Late fall is also a great time of the year to soil sample alfalfa ground. This timing allows for an accurate assessment of available soil nutrients and provides enough time to make nutrient management decisions before the crop starts growing in the spring. Soil tests of most interest include pH, phosphorus, and potassium, and to a lesser extent sulfur and boron. When sampling for immobile nutrients, sampling depth should be six inches, while mobile nutrients (sulfur) should be sampled to 24 inches.

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3. Wheat emergence and seedling development concerns

Over the next month or two, wheat stands will hopefully become established over most of the state. Ideally, the wheat will take on a solid green color, form a secondary root system, and develop one or two tillers in addition to the main tiller. But sometimes there are problems. The most common problems are discoloration, stunting, loss of leaves, or dying of emerged seedlings.

**Causes of chlorosis or poor growth**

If wheat is yellow or stunted and not growing this fall, what are the possible causes? Is it something producers can correct? Will it hurt yields? Some of the most common causes of yellowing and/or stunting in the fall are:

* **Nitrogen deficiency.** Nitrogen deficiency causes an overall yellowing of the plant with the lower leaves yellowing and dying from the leaf tips inward. Nitrogen deficiency also results in reduced tillering, top growth, and root growth in the fall. The primary causes of nitrogen deficiency are insufficient nitrogen fertilizer rates, leaching from heavy rains, early-season denitrification or volatilization, and the presence of heavy amounts of crop residue, which can immobilize nitrogen. Topdressing the field during the winter can solve the problem, provided there is enough moisture to move the fertilizer into the root zone (and the ground isn’t frozen at the time of application).

* **Poor root growth.** Chlorosis and stunting can also be due to poor root development, which can often result in nitrogen deficiency. If the plants have been emerged for several weeks or more, can be pulled up easily, and have only a couple primary roots visible, then the plants are yellow or stunted because the root systems are not extensive enough to provide enough nutrients. This may be due to dry soils, waterlogging, or poor seedbed conditions at planting time. If conditions improve, plants should develop secondary roots and the color should improve. If conditions do not improve and root growth remains stunted, the plants may winterkill more easily or may not be strong enough next spring to reach their full yield potential.
*Aluminum toxicity (low-pH soils).* Strongly acid soils may present several problems for wheat production. Aluminum toxicity is the most common problem associated with acid soils. Typical symptoms include thin stands and lack of vigor. High concentrations of aluminum will reduce development of the roots, giving them a short stubby appearance. The roots will often have a brownish color. In general terms aluminum toxicity will reduce yield potential when soil pH levels get below 5.5 and KCl-extractable (free) aluminum levels are greater than 25 parts per million. When soil pH levels are 5.0 or less, yields start dropping off rapidly in most cases. Selecting adequate varieties for low pH conditions is essential. In addition, liming to adequate pH levels following recommendations from a soil test can fix the problem long term.
*Leaf rust.* If leaf rust infects young seedlings in the fall, the plants may turn yellowish. Severe fall infections of leaf rust are not common in Kansas, but can occur. Producers will be able to see the small brown pustules on the leaves. Tan spot can also cause wheat to turn yellow in the fall. These seedling infections of tan spot are often associated with wheat sown into heavy wheat residue. Viral diseases, such as soil-borne mosaic, wheat streak mosaic, and barley yellow dwarf, can infect wheat in the fall. Some yellowing can occur in the fall but in most cases the severe yellowing symptoms do not show up until early spring. It rarely, if ever, pays to treat fields with fungicides in the fall for leaf rust or tan spot, even if those diseases do cause yellowing. Cold temperatures in the winter normally cure this problem.

*Cold temperatures.* When temperatures are quite cold at the time wheat emerges, it can result in yellow banding on the leaves. If this is the cause of the yellowing, symptoms should eventually fade away.

*Greenbugs or bird cherry oat aphids.* These insects most commonly infest wheat sometime after the first freeze and before Christmas. They can cause plants to turn yellow and be somewhat stunted. These symptoms can occur in the fall, but don’t usually show up until early spring. Often, greenbug and bird cherry oat aphid infestations occur in patches in a field, not uniformly distributed. Both infestations are usually initiated by one winged female landing on a susceptible wheat plant. That female starts to produce more females, which then produce more females, and so on. The resulting infestation often radiates out from the initial infested plant in a roughly circular pattern.
* Hessian fly. Seedlings infested by Hessian fly in the fall are typically not yellow, but are often stunted. Affected plants usually have an unusually large, broad greenish leaf for about a month in the fall. Stem elongation is typically much shorter than normal.

* Flea beetles. These tiny insects cause whitish streaks on the upper surfaces of leaves. If streaking is severe, plants may die.

**Causes of seedling death or loss of leaves**

If leaves are being lost, or the plants are sickly or have died, it is important to find out why before replanting. Some of the most common causes of seedling death, sickliness, or loss of leaves include:

* Seedling blight. This is one of the most common causes of post-emergence seedling death or sickliness. The root system or coleoptile region may be diseased or dead in infected plants. Several fungi cause seedling blight, and these diseases are often worse on early-planted wheat. Seedling blight may not kill the seedlings outright, but can lead to later problems with common root rot, crown rot, sharp eyespot, and dryland root rot (also known as dryland foot rot).

* Atrazine carryover. Wheat planted into soils with atrazine residue emerges then dies back from the tips of the oldest leaves first. Atrazine carryover is most likely to occur where there were high application rates, high soil pH, coarse-textured soils, and under dry conditions.

* Fall armyworms and army cutworms. Where fall armyworms infest the wheat, leaves start looking ragged from the “windowpaning” effect. As the worms grow, they will chew off entire leaves, tillers, or whole plants. Fall armyworms can move across a field in a wave, starting on one side of the field. Army cutworms may also damage wheat, much like fall armyworms. Army cutworms may successfully overwinter and continue feeding during mild spells throughout the winter and spring. Fall armyworms won't overwinter, thus they'll only be a problem until the advent of cold weather.

**Fall armyworm, and the windowpaning damage it causes to wheat in the fall. Photos by Jeff Whitworth, K-State Research and Extension.**

* Grasshoppers. Grasshoppers can be a problem along the edge of a field, where severe feeding can occur as other foliage turns brown. Three to four passes, as needed, from a sprayer with an insecticide along the edge of a field can usually minimize damage from this pest.

* False wireworms. These insects typically feed on seeds or seedling roots, and can cause death.

* White grubs. If young plants are dying, with no aboveground symptoms evident, white grubs may be the cause. Check to see if roots are pruned.
This is not a complete list of possible problems on early-season wheat by any means, just some of the most commonly found problems. For a complete discussion, see K-State’s publication S-84, “Diagnosing Wheat Production Problems” at: http://www.ksre.ksu.edu/library/crpsl2/s84.pdf/

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4. Comparative Vegetation Condition Report: September 4 – 17

K-State’s Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:
http://www.youtube.com/watch?v=CRP3Y5N1ggw
http://www.youtube.com/watch?v=tUdOK94efxc

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 21-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you’d like digital copies of the entire map series please contact Kevin Price at kprice@ksu.edu and we can place you on our email list to receive the entire dataset each week as they are produced. The maps are normally first available on Wednesday of each week, unless there is a delay in the posting of the data by EROS Data Center where we obtain the raw data used to make the maps. These maps are provided for free as a service of the Department of Agronomy and K-State Research and Extension.
The maps in this issue of the newsletter show the current vegetation conditions in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:

**Kansas Vegetation Condition**

Period 37: 09/04/2012 - 09/17/2012

Map 1. The Vegetation Condition Report for Kansas for September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that a moderate level of photosynthetic activity is visible in parts of northeast and eastern Kansas, where favorable rainfall occurred. In north central Kansas there is a particularly distinct contrast between eastern Mitchell and eastern Cloud counties. Aurora, in Cloud County, had twice as much rainfall from August 21 to September 4 as that recorded in Mitchell County.
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows a reversal of fortunes for west central and northern Kansas. Last year at this time, north central Kansas had received 90 percent of the year-to-date moisture. This year, north central Kansas is only at 70 percent of the year-to-date moisture.
Map 3. Compared to the 23-year average at this time for Kansas, this year’s Vegetation Condition Report for September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows a less intense decrease in biomass production from earlier time periods. As we move into the normal dormancy period, the visual contrast that illustrates drought stress on vegetation will become less noticeable. Some late-season response to the cooler conditions and the moisture received in late August/early September is visible in north central and southeast Kansas.
Map 4. The Vegetation Condition Report for the Corn Belt for September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that parts of southern Missouri and eastern Kentucky have benefited slightly from the recent rains. These rains were too late to be of much benefit to crops, however, as the end of the season is rapidly approaching. In Iowa, more than 80 percent of the corn crop has already reached maturity, in contrast to the 5-year average of 44 percent by this time.
Map 5. The comparison to last year in the Corn Belt for the period September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that, while Indiana and Kentucky have slightly more favorable vegetative conditions, the majority of the Corn Belt has experienced a steep decrease in biomass production. Currently, 67 percent of the Midwest is in moderate to exceptional drought. Last year at this time, less than 22 percent of the region was in drought status.
Map 6. Compared to the 23-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that parts of southern Missouri and Kentucky have slightly higher biomass production than average. This is the result of the slight response of drought-stressed plants to the recent rainfall.
Map 7. The Vegetation Condition Report for the U.S. for September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the areas of greatest photosynthetic activity are confined to the eastern portions of the country and along the Pacific Coast. Moderate photosynthetic activity in the Mountain West is an indication that the snowpack has not yet begun to accumulate.
Map 8. The U.S. comparison to last year at this time for the period September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the epicenter of the most intense drought conditions has reversed. Last year, almost 88 percent of Texas was in exceptional drought conditions, while this year less than 5 percent is in exceptional drought. In contrast, this year Nebraska has more than 70 percent of the state in exceptional drought, when last year that percentage was zero.
Map 9. The U.S. comparison to the 23-year average for the period September 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the northern Great Plains has the greatest decrease in biomass production. Meanwhile, the Southeast has the biggest increase over normal photosynthetic activity. Repeated tropical systems and favorable temperatures have enhanced vegetative production in the Southeast while intense heat and severe moisture deficits have limited production in the northern Great Plains and Midwest.

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update 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 Steve Watson, 785-532-7105 swatson@ksu.edu, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompson@ksu.edu.