k-state extension AGRONOMY e-Updates

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1. Red cedar control on grazinglands

Eastern red cedar infests more grazinglands in Kansas than any other brushy weed. It can be especially common on rangeland or pasture that has not been burned for several years. If left uncontrolled, eastern red cedar can completely take over a grazingland and greatly reduce forage production.

Eastern red cedar is a non-sprouting plant. It does not re-sprout from belowground plant parts like hedge or honey locust. This simplifies the control measures, in some ways. There are three principal methods of controlling eastern red cedar. In order of preference, the methods are:

* Prescribed burning
* Mechanical control
* Chemical control

Prescribed burning. Fire can kill or damage eastern red cedar if there is enough fuel on the grazingland. A normal fire will control red cedars that are less than three to four feet tall. Red cedar normally grows about a foot a year, so as long as grazingland managers burn every 3 to 4 years, that should keep most or all of the red cedars under control. Fire may not kill the entire plant, but if at least two-thirds or three-fourths of the needles are scorched, the plants will eventually die. If only half or less of the needles are scorched, the plants will probably survive. The most difficult situations are when there is a thick stand of red cedar, or many of the plants are more than four feet tall. Under these conditions, fire will probably not be acceptably effective.

Mechanical control. Red cedars can be killed outright if they are clipped off near ground level, below the first green branch. Where clipping or mowing hasn't been effective, it's because the plants were not cut low enough. Even clipping three inches off the ground may not be low enough in some cases. Managers should try to get as close to ground level as possible. Clipping may be the only way of controlling eastern red cedar that is more than four feet tall. Clipping is sometimes easier to do if the plants have first been burned – even if the plants survived the fire. If the fire was reasonably hot, it will almost always sear off many of the lower branches, which makes it easier to get to when operating a clipper, mower, or chainsaw. Eastern red cedar that is clipped off at ground level will not regrow or re-sprout. Red cedar can be controlled by clipping or mowing at any time of the year.

Chemical control. If the stand of red cedar is too thick to get a good burn, or the manager simply doesn't want to do a prescribed burn, and the plants aren't too big, then chemical control is another alternative. One chemical for eastern red cedar control is picloram, which is contained in Tordon 22K and Surmount. Tordon 22K can be applied as a liquid directly to the soil right at the base of the plant. The label calls for three to four milliliters (cc's), undiluted, per three feet of plant height. This should be applied in April/May or September/October, just prior to a rain if possible. It can also be applied as a foliar spray, in a one percent solution. Surmount is applied as a foliar spray to trees no more than three feet tall, at the rate of three to six pints per acre, in late spring or early summer. Tordon 22K and Surmount are restricted use pesticides.

Another chemical option for eastern red cedar is hexazinone. Velpar L is a liquid formulation, meant to be applied to the soil at the base of the tree at the rate of two to four milliliters per inch of stem diameter at breast height. Pronone Power Pellets are a dry formulation, applied on the soil at the base of the tree at the rate of one to two pellets per inch of stem diameter.

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2. Grain sorghum hybrid selection

There are many grain sorghum hybrids on the market. When selecting hybrids, producers should consider several factors, including yield potential, maturity, standability, and pest resistance.

* Yield potential. K-State conducts the annual Grain Sorghum Performance Tests at 14 locations throughout the state. This is a valuable source of objective information on the yield potential of many of the hybrids currently on the market. Test results from several years and locations should be examined before making selections. Small differences in yield may not be real. Still, it is not unusual for the best hybrid to out-yield the poorest

hybrid in a given trial by 40 bushels per acre or more. The test information can be found at http://kscroptests.agron.ksu.edu

* Maturity. A good full-season hybrid will out-yield a good early-season hybrid every time, other conditions being equal and favorable for sorghum growth. The stalks of full-season hybrids are usually larger and stand better than earlier hybrids. The rule of thumb is to plant the fullest-season hybrid available within the limitations of projected moisture availability, average length of growing season, and cropping sequence. Producers should select a hybrid that will reach physiological maturity a week or two before the average date of the first killing frost. Where soils tend to run out of moisture late in the growing season, this can be more damaging to late hybrids than frost. Earlier hybrids should be planted on those sites. By choosing hybrids that mature early enough to avoid severe moisture stress, lodging risk may be reduced.

* Standability. There is often considerable variation in lodging from year to year, even with the same hybrid. Soil moisture exhaustion plays a significant role in this variation. The timing of moisture exhaustion in relation to the plants' growth stage is important, not only in terms of yield but also in relation to invasion by diseases, such as charcoal rot, that cause lodging.

Planting two or more hybrids that differ slightly in maturity will help ensure that adverse environmental conditions will not affect total production. Early-season hybrids should be harvested as early as possible to minimize the potential for lodging. High-moisture grain storage or grain dryers may be needed, if economically feasible. Hybrids that consistently lodge worse than others should be avoided, especially on fields with a history of frequent lodging.

* Pest resistance. There are many insects and diseases that can affect grain sorghum in Kansas, and there are some differences among hybrids in resistance to these pest problems. Greenbug tolerance is one of the most common traits, but is also an example of how difficult it can be to maintain good pest resistance. Good greenbug-tolerant hybrids were available from 1976 to 1980. However, these hybrids had tolerance only to greenbug Biotype C. Soon, the predominant greenbug in Kansas became Biotype E. New hybrids were developed with resistance to this biotype. The most recent strains of greenbugs in Kansas are biotypes I and K, and few hybrids are available with resistance to these newer biotypes. Where greenbugs are often a problem, producers may want to look for hybrids with resistance to biotypes I and K.

Some hybrids appear to have more tolerance to chinch bugs than others, but true chinch bug resistance is not available.

Disease resistance may be another factor in hybrids selection. There are differences among hybrids in resistance to sorghum downy mildew, crazy top downy mildew, head smut, maize dwarf mosaic virus (MDMV-A), sooty stripe, charcoal rot, and fusarium

stalk rot. Seed companies are the best source of information about pest resistance of hybrids.

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3. Preplant considerations for cotton

A successful "First 40 Days" in the life of a cotton crop greatly increases the odds of making a profit. Setting up the "First 40" should begin well in advance of planting.

A weed-free seedbed in 2007 may look nothing like the weed-free seedbeds of past years, except that nothing green should be showing at planting time. The development of effective, reasonably priced herbicides has contributed greatly to the adoption of soil and water conserving weed control programs in cotton. An effective burndown program should kill all growing weeds and include residual weed control to last into the growing season.

In some south central Kansas cotton fields, marestail/horseweed has become increasingly difficult to control, and we suspect that glyphosate resistant populations have developed. Fairly inexpensive contact and/or residual herbicides by themselves, or in combination with glyphosate, as an early pre-plant burndown application should greatly reduce marestail competition. Even 2,4-D can be used in the burndown application, as long as it is applied at least 28 days prior to planting.

Producers can take measures to create a warmer seedbed. Strip-tillage is a practice that allows for clearing the seed row of residue and fertilizing while still maintaining residue cover in the row middles. Seed zone temperatures in the tilled strip average 3 to 5 degrees warmer than those under heavy residue in no-till conditions. On heavy soils, strip-tilled fields will be dry and ready to plant earlier than no-till fields. Being able to plant earlier, when temperatures are favorable for emergence and early-season growth, often add substantial pounds of lint at harvest.

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4. Winter damage to alfalfa stands

This could be a tough winter for alfalfa in Kansas, especially on newly seeded stands. The two main concerns for alfalfa are ice cover and heaving.

Ice cover. As with wheat, a solid coat of ice can suffocate alfalfa. In fact, alfalfa is somewhat more susceptible to suffocation from solid ice than wheat and other grasses. Alfalfa roots respire all winter long, and require oxygen. Smothering of alfalfa from solid ice may cause noticeable winter injury after one to three weeks. Death of plants can start occurring after two to six weeks of smothering ice. These are not hard and fast rules, however. Several factors play a role in determining whether alfalfa is damaged by ice. Probably the most important factor is the porosity of the ice layer at ground level. If there is a layer of snow or loosely packed sleet at ground level, more air exchange is possible and alfalfa can survive longer, even if there is a solid sheet of ice on top of the snow or sleet. If six to eight inches of stubble was left at the final cutting, the stems sticking up above the coating of ice can also provide holes through the ice surface and help the plants survive. Also, if the soil was wet when the ice formed, suffocation can occur more quickly than if the soil was dry and held more air. On the other hand, where ice or snow melts and immediately refreezes, there is likely to be a solid sheet of ice at ground level. Another factor is the condition of the plants. Where the stand was seeded in the fall, the plants will not be well developed and will be more susceptible to smothering. Very old stands may be in weakened condition, and therefore may also be less likely to survive.

Heaving. This winter could also result in a more common form of injury to alfalfa. As the soil freezes and thaws, alfalfa stands can be damaged by the heaving effect. This will be more likely to occur where soils are not under continuous snow or ice cover, and where temperatures have been in the single digits at night. This winter has been cold enough to freeze the soil where it is not under snow cover.

Producers can start to evaluate the health of their alfalfa stands in March or April, as soon as the soils thaws. They should look at the crowns and roots. Buds should be firm, and white or pink in color if they have survived with good vigor. The bark of roots should not peel away easily when scratched with a thumbnail. When cut, the interior of healthy roots will be white or cream in color.

If a newly seeded stands appears to have suffered significant injury, producers will probably want to re-seed this spring to thicken the stand. If an established stand was injured by ice or heaving, and large patches are dead, producers may want to temporarily thicken the bare areas by planting red clover. Red clover is not susceptible to the plant toxins released by alfalfa, and help provide good quality forage.

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5. Avoid applying nitrogen to frozen soils

Producers may be planning to topdress nitrogen (N) on wheat this winter while the ground is still firm and frozen, and before soils become too wet to accommodate fertilizer applicators. This should be avoided, however. Nitrogen should not be applied to frozen soils because of the potential for surface runoff.

When N is applied to frozen soils, it remains on the soil surface and on crop residue until the ground has thawed and precipitation moves the N into the soil. If precipitation falls while the soil is still frozen, a high percentage of it could move off the field in runoff water and into nearby surface waters. This causes N contamination of surface waters, one of the major water pollution concerns in Kansas and nationwide.

Agricultural lands are the source of much of the N entering surface waters. The N may be in inorganic forms, primarily ammonium and nitrate ions, and organic forms. Inorganic forms are most immediately available to aquatic vegetation, but much of the organic N becomes available over time.

Nitrogen transport to surface waters is largely determined by:

* The amount of runoff and erosion from the land. This is determined by the amount of precipitation and intensity of rainfall events, slope steepness and length, soil type, crops grown, and management practices.

* Distance to concentrated water flow or to surface waters. Most of the N that enters surface waters often comes from areas that are very near to concentrated water flow. Therefore, fertilizer or manure N applied within 50 ft of concentrated water flow is much more likely to enter surface waters than for N applied more than 100 ft away.

* Whether there are any management practices in place to trap sediments and nutrients carried by runoff and erosion before these enter surface waters. Vegetative filter strips and buffer zones along streams are effective in filtering sediments and nutrients from erosion and runoff to reduce the amounts entering surface waters. Much of the sediment bound N can be retained in sedimentation basins and wetlands preventing entry to surface waters.

In addition to avoiding N applications on frozen ground, several management options may be considered to minimize N runoff losses:

* Use tillage practices that minimize the potential for N loss in runoff and erosion.

* Use the right amount of N fertilizer. Credit needs to be given to N from previous

legume crops, manure applications, and irrigation water. Guidelines are available for each state for determining the N application rate.

* Avoid surface application of N in spring. There tend to be more intense storms in the spring than at other times of the year, and this is when there is the greatest risk for N loss to surface waters.

When surface waters are enriched with N or phosphorus, excessive growth of algae and other aquatic vegetation can occur. This vegetation growth depletes the oxygen concentration in the water. When the vegetative mass dies and decomposes, oxygen is further depleted and compounds toxic to other aquatic life may be released resulting in eutrophication. Nitrogen in surface waters moves easily in the flow of water in streams and rivers. Much of that in the Mississippi River watershed eventually reaches the Gulf of Mexico where it contributes to the 'dead zone' or the condition of hypoxia.

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These e-Updates are a regular weekly item from K-State Extension Agronomy. 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 Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader
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