Forage News
Mississippi State University Extension Service

Making Pasture Weed Control Decisions

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As we approach spring growth, weed control becomes an important part of the early preparation to having a healthy, weed-free pasture. Although there are several methods of controlling weeds in pastures, the best control starts with selecting forage species adapted to the physical characteristics of the landscape and managing the forages, so they stay vigorous and able to out-compete the weeds.

Weeds indicate a problem. If desirable legumes and grasses are not growing well, assess whether growing conditions or management practices are responsible for their poor growth. Corrections to pH, drainage, fertility, or grazing management can then be made to develop a thick, competitive pasture. Certain plant species, called indicator plants, grow in conditions that most other plants will not (for example, broom sedge indicates low pH or low fertility levels, especially phosphorus) and can be used to determine the severity of weed infestation.

General Pasture Management for Weed Control

Pasture management problems usually consist of over- or under-grazing. Over-grazing usually causes forage to have a slow recovery period and weeds with good root reserves grow faster and increasing their chances for colonization. Most of the effect of overgrazing happens in the mid-summer when pastures have been grazed several times and forage root reserves are low and growth is further slowed by hot, dry weather. This type of situation allows for perennial weeds with good root reserves to grow faster. On the other hand, under-grazing allows forage to become very mature and produce seed heads. As the forage flowers and set a seed head, the growth of the plants slow down significantly, allowing weed with good reserves to outgrow the forage and produce viable seeds. Maintaining 4-6 inches of dense forage growth with a good pasture rotation reduces or eliminates the opportunity for weeds to grow.

Identifying Weed Populations

It is important to begin by scouting pastures to identify all pre-existing problems and to determine the state of the desirable plants and the extent of the weed problem. Identify the weeds present in the pasture and know their growth habit. Understanding the way a plant grows allows controlling its growth and spread. There are three types of weeds can be found in a pasture: annual, biennial, and perennial weeds. Annual weeds germinated from seed, grow quickly in the spring, flower, and set seed during one growing season. Annual weeds could be cool-season or warm-season weeds. Cool-season weeds sprout any time from fall through spring and they will flower in late spring/early summer. Warm-season weeds tend to start growing in the spring and hang around throughout the whole growing season. Most annual weeds are a problem when establishing a pasture in a prepared seed bed.

Biennial and perennial weeds cause the major headaches in pastures. They usually grow when pasture are dormant or not very competitive. They usually become a major problem after

the first year when they have developed a good root system and accumulated a good nutrient reserve to survive (e.g. thistles and dandelions). Biennial weeds will normally reproduce by means of seed, but unlike annuals, they rarely flower and set seed in their first year. The first year's growth represents a vegetative phase during which the plant grows and accumulates food reserves followed by flowering and seed production in the second year. After the plant flowers and sets seed it normally dies. Perennial weeds are the most difficult to control or get rid of. Most perennial weeds reproduce both by seeds and by the spread of energy-storing vegetative parts, such as roots or tubers. If the entire root systems of a perennial weed is not killed, new plants could reproduce from every little root piece left behind.

Weed Control Methods for Pasture Management

An effective weed control plan for pasture involves several management practices. There are several methods of weed control that include chemical, mechanical, burning, and biological control. In pasture and forage crops, chemical control (herbicides) and mechanical (mowing) are the most common approaches. Chemical control involves selecting herbicides that will target one or several weed species depending on the mode of action. Herbicides control many annual, biennial, or perennial broadleaved weeds and woody plants in grass pasture. They are more effective than mowing to control perennial weeds. Remember, once the weed has begun to flower, herbicide applications are much less effective.

The best time to use herbicides for weed control in established pasture is during fall, early winter or early spring when weeds are actively growing. The approach will depend on the targeted weeds species and sometimes different applications throughout the year might be necessary. A producer should consider price, method of application (spot spraying vs. broadcast), rates, and time of application. One important aspect is applying herbicides when environmental conditions are appropriate for control. Watch wind speeds to avoid drift into adjacent row crops that could be very sensitive to products labeled for forage use. Often, early mornings are more still than later in the day. Apply these herbicides when air temperatures are between 65°F and 85°F. Adequate soil moisture is important for allowing translocation of some of the systemic herbicides into the root system and do not spray when precipitation is expected within 24 hours.

Herbicides that control more troublesome weeds also control many other broadleaf weeds. One thing to remember is that many herbicides can and do kill desirable legumes in the pasture. If broadleaf weeds are a problem, however, choosing a herbicide with low residual activity in the spring may allow to reintroduce legumes later in the fall. Restrictions on grazing or haying after application or removal of slaughter animals from treated areas are specified for each herbicide. Some herbicides affect palatability of certain plants, causing livestock to graze species that normally would be avoided. Unpalatable poisonous plants can become more palatable to livestock following an herbicide application. Remove livestock for at least 3 weeks after treatment if poisonous plants are present. Use herbicides that are labeled for the target weed and registered for use on pasture. Check the label or contact your local County Extension Office if in doubt about which herbicide to use.

Mowing or clipping temporarily removes weed top growth, but it also removes top growth from grass. This system stops seed production, but has different effects on the weeds. Using mowing as a control will depends on the cutting frequency and the height at which the weeds are cut. Frequent mowing or cutting can prevent weed seed production and reduce the amount of

energy stored in below-ground structures. Annual forbs can be controlled by cutting below the lowest leaf early in the growing season. Undesirable annual grasses should be mowed after the seed stalk has elongated, but prior to seed formation. Usually mowing perennial weeds one time reduces seed production; repeated mowing reduces vigor and slows spread. Some producers tend to mow when seed heads are present. This approach is not recommended because it increases the areas for seed dispersion making the area for weed control much larger.

Table 1. Economic comparison of mowing vs. spraying to control weeds in pastures.

	40-HP Tractor with	
Variables	**w/ 6-feet rotary mower**	**w/ 30-feet boom sprayer**
Labor Cost	**$10.00**	**$10.00**
Time Utilization		
Acres/hr	**2.73**	**14.18**
Cost/acre		
Fixed	**$ 5.58**	**$ 1.43**
Herbicide[1]	**$ 0.00**	**$ 8.10**
Labor	**$ 3.66**	**$ 0.71**
Operating	**$ 6.00**	**$ 1.33**
Total cost/acre[2]	**$15.24**	**$11.57**

[1]Herbicide used was 1 quart of Grazon Next. Cost may vary based on herbicide and rate applied.
[2]There may be a slight, incremental cost based on the price of application equipment and maintenance.
Source: Clary and Redmon. 2008. Texas AgriLife Extension Service.

Eliminating weed competition for nutrients and moisture in the spring is very critical because 50-60% of the summer's forage is produced from May through July. There are several producers that might debate between mowing or clipping and herbicide control. One of the disadvantages of mowing is that weeds need to reach certain height before start clipping and when this happens it will be too late in the season, greatly reducing the chances for optimum weed control. It has been shown that clipping in the spring does not stop weed completion and will not completely stop weed from reaching a reproductive stage and producing viable seeds. Mowing when weeds are at the same height of the forage will affect forage production because it is taking the top most nutritious portion of the plant, therefore, mowing does nothing to improve forage production. Cutting the grass in a pasture close to the ground and removing more of than 50% of the top growth will reduce the ability of the desirable forage plants to sustain themselves.

One advantage of using herbicides is that they control weeds when they are small and before they shade out grass. This could help to increase forage production. The reason for this is because reduces the competition for moisture and nutrients. Also, after spraying, weeds normally do not re-sprout if the correct herbicide was applied at the right time and rate. Since there is less labor involved on spraying than mowing, herbicide applications create less wear and tear on equipment and make it more economical. Spraying has also being considered faster than mowing. A cost analysis from Texas AgriLife Extension Service suggested that using a 40-HP tractor with a 6-feet rotary mower can mow 2.73 acres per hour while the same tractor with a 30-feet boom sprayer can spray 14.18 acres per hour. It was also indicated that by spraying (based on pricing of 1 quart of Grazon Next) a producer could save $3.67 per acre instead of mowing (**Table 1**). These savings might vary depending on how many times a producer might need to mow during the growing season and what herbicide is being used (**Table 2**).

Table 2. Estimated cost of mowing and selected herbicides used for forage weed control in Mississippi.

Common Name[2]	Trade Name[2]	Rate/ac	Cost[1]		
			Application Cost	Herbicide Cost[3]	Total Cost
			$/ac		
Mowing[4]	--	--	--	--	4.73
2,4-D	2,4-D Amine	1.5 pt	7.00	2.73	9.73
Chaparral	Aminopyralid + metsulfuron	2.0 oz	7.00	9.00	16.00
Cimarron Plus	Metsulfuron + chlorosulfuron	1.0 oz	7.00	15.00	22.00
Eraser	Glyphosate	2.0 pt	7.00	4.20	11.20
Grazon Next	Aminoyralid + 2,4-D	1.5 pt	7.00	5.62	12.62
Grazon P + D	2,4-D + picloram	3.0 pt	7.00	12.03	19.03
Journey	Imazapic + glyphosate	20.0 oz	7.00	17.18	24.18
Milestone	Amynopyralid	4.0 oz	7.00	9.66	16.66
Outrider	Sulfosulfuron	1.5 oz	7.00	22.80	29.80
PastureGard	Tricoplyr + fluroxypyr	4.0 pt	7.00	26.24	33.24
Remedy	Triclopyr	2.0 pt	7.00	25.12	32.12
Velpar	Hexazinone	3.0 pt	7.00	24.24	31.24
Weedmaster	2,4-D + dicamba	2.0 pt	7.00	6.60	13.60

[1]**Source of cost:** Mississippi State Budget Generator 2009.
[2]**Source:** **2010 Weed Control Guidelines for Mississippi. Publication 1532.**
[3]Cost of herbicide includes surfactant at 1 quart per 100 gallons of water when needed.
[4]Calcualtion for mowing is based on a 15-foot rotary mower and a 105 HP Tractor.
Note: The herbicide names or brands mentioned in this newsletter are used as guidelines for cost analysis purposes only. No direct endorsement of these products is intended by the Mississippi State University Extension Service. Other products providing similar weed control and approved for weed control in forage crops in Mississippi might be available. Contact your local County Extension Office for more information and pay close attention to application rates and livestock restrictions (hay and grazing).

Summary

An effective weed control program is essential to establishing and maintaining highly productive pastures and animal performance. We need to remember than "An ounce of prevention is worth a pound of cure." Select well-adapted grass and/or legume species that will grow and establish rapidly. This will minimize the length of time for weeds to invade easily. Lime and fertilize according to soil test recommendations. Proper pH and nutrient status will help insure that the forage will grow rapidly and be more competitive with weeds. Manage grazing properly. Overgrazing is a common cause of weed problems. Heavy grazing pressure may favor weed growth over grass. Identify weed problems and location and select which option or combination of options you plan to use for weed control (mechanical, chemical, or grazing management), but the most important is to put it in practice and evaluate the outcome.

To manage weeds successfully a combination of prevention, eradication, control strategies and practices need to be put in place. As a rule of thumb, a pound of grass replaces every pound of weed controlled with herbicides. If grass is the corner post of animal nutrition in a livestock operation, then weed control on pastures can make a major contribution to animal performance. Controlling weeds could increase forage production which means more energy and protein for grazing livestock. This will help cows meet their nutrient requirements plus those of their calves. At the same time, weed control will ensure pasture persistence and better quality forage.