Controlling Weeds in Horse and Cattle Pastures

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Weed control is one of the most talked about concerns of forage-animal systems. Producers will sometimes pay more attention to some pests than others and more so in some crops than others. For example, a producer may have a very low threshold for weed infestation in their corn, soybean or tobacco field but will have a very high tolerance for weeds in their pastures. This is usually because the "direct" dollar value of the forage is not seen while we can "see" how a reduction in soybean or corn yield will affect the bottom line of our operation. Vegetation manipulation is the only practical way to increase forage for livestock and to improve wildlife habitat on some grasslands (Holechek et al., 2004) especially when land prices prohibit the acquisition of more acreage.

Horses tend to graze plants closer to the ground than cattle and this can leave openings for weeds to establish themselves. Horses also tend to re-graze an area or spot graze more so than cattle so care must be taken to manage the grazing of horses versus cattle in a pasture. When forage production is limited and animals are hungry, they will eat plants that they would not otherwise eat. Some weeds are more palatable at certain growth stages (young), after herbicide application, or if animals have access to wilted leaves (Ball et al. 2002); nevertheless, weeds tend to reduce the palatability, quality, quantity, and stand life of desirable forage crops (Green and Martin, 1998). Differences in intake due to palatability is important because it can be the difference in milk or meat yield from animals and could also be because other less desirable plants (weeds) are mixed in with the forage. Weedy plants, generally, are not high yielding and are not usually desirable by livestock or have high quality. Forage quality of weeds rapidly declines with maturity and weeds become completely unacceptable to livestock, thus leaving a visible weedy look to your pasture. Weeds are "passive opportunists" that will fill the gap left by dead or overgrazed forage plants (Barnes et al. 2003) but some species can be very aggressive and choke out your desired forage. Therefore, it is important to consider implementing **appropriate** weed control strategies when needed.

It has been well documented that forage yield can be significantly affected in pasture and rangeland (Grekul and Bork, 2004; Gylling and Arnold, 1983; Reece and Wilson, 1983; Sheeley et al, 2000) if steps are not taken to manage the weeds. Grekul and Bork (2004) found that for every 1 pound of Canada thistle, there is a correlation of approximately 1 pound loss of forage production

and you could lose approximately 4 pounds of forage per acre for every Canada thistle plant in a 10 ft^2 area. Controlling certain weeds can lead to substantial increased in forage production as demonstrated by Reece and Wilson (1983) who found forage production increased 110 to 314% during a three year period by controlling mixed stands of musk and Canada thistle. In Montana, Sheley et al. (2000) found that controlling spotted knapweed increased perennial grass biomass 280-750% compared to the untreated areas up to 3 years after application. Herbicide-treated plots had greater biomass 3 years after treatment and that grass competition may help explain the long term control of spotted weed. In addition to reducing forage yield, weeds can also impact livestock access to forages. Bull and musk thistle reduced the amount of forage utilized, 42 and 72%, respectively, in beef cattle, and sheep grazed hill country pastures in New Zealand (Seefeldt et al, 2005).

Weed Management Strategies: It is prudent to use a variety of measures to be most successful. University of Kentucky Extension Publication AGR-172 (Weed Management in Grass Pasture, Hayfields, and other Farmstead Sites) is an excellent resource to get more detailed information. Some examples of herbicides labeled for use in permanent grass pastures and the approximate cost as well as the cost of mowing is presented in Table 1 which is from AGR-172.

Biological Methods: Biological control is more effective on some weeds than others. If you choose this option you should expect a delay in control as the control agent gets established and multiplies. Contact your local extension offices for more information on bio control agents that are available in your area.

Cultural Methods: This includes the crop management decisions and practices that are employed in the production system. Examples include:

- **Variety selection**: Select **certified**, vigorous, adapted varieties that will grow quickly in the early season to provide competition against weeds.

- **Crop rotation**: In forage production systems, yearly rotations do not normally occur but we may notice different weed problems if you go from a grass hayfield or pasture to an alfalfa hayfield or pasture and vice versa.

- **Use weed free seed**: Cheap seed may not be so cheap after all. Use certified seed that is free of noxious and other weeds. The seed label will provide information about the content of weed seed. You can visit http://invader.dbs.umt.edu/Noxious_Weeds/default.htm to find out what weeds are considered noxious weeds in your state.

- **Changing planting and harvesting date**: In some instances, crops will be able to germinate and grow earlier in the season than many weeds will. This early planting date will give crops an early start on the weeds. Keep in mind however, that some weeds like chickweed and henbit are winter annuals and will be actively growing early in the spring if that is when you plan to plant your crop or if you did a fall planting.

- **Field scouting**: This can be done in conjunction with other activities such as moving animals or fences, while putting out feed or minerals or while mowing. Once a weed problem is identified, whatever treatment option you choose, **DO NOT DELAY TREATMENT**. Delaying will only worsen the weed problem as the weed will likely get to a reproductive stage and reproduce.

Mowing or clipping: This is more effective when used in conjunction with other methods of control. Keep in mind that mowing is not selective and you will be mowing your desirable forage as well as the weeds. When weeds are mowed frequently it can reduce seed production and deplete food reserves in the root because they will not have enough time to replenish them before they are cut again. Low root reserves lead to slow growth and forage crops can then out-compete weeds. Some weeds can alter their growth habit if mowed frequently. For example, upright growing spiny amaranth or pigweed can change to a creeping growth habit if mowed frequently.

Chemical methods: If your pastures are pure stands of grass, it is very easy to use a selective herbicide to control broadleaf weeds. However, when the situation in question involves legume-grass mixtures, you will not successfully control broadleaf weeds without significantly injuring or killing your legumes. Legumes can usually be inter-seeded into a pasture up to a year after the herbicide application depending on what herbicide you used. Any decision to use herbicides should be prefaced by first determining which weeds are present in the area to be treated and the best time/stage to treat them. Using the right herbicide at the right time, right rate and with a properly calibrated sprayer can save you time and money. Herbicides are usually selective only within certain rates, environmental conditions, and methods of application. Foliar-active herbicides are applied directly to the leaves or stems of plants where they are absorbed and translocated in the plant. For control of established weeds, including perennial plants, herbicides that are translocated within the plant prevent regrowth. These herbicides may or may not remain active once moved into the soil. Soil-active herbicides can provide control of germinating seed and may also be absorbed by the roots or inhibit root growth of established plants.

Plant response to herbicide treatment is typically dependent on the growth characteristics of the target plant (Sosebee, 1983). *Annual plants are best*

treated with herbicide when actively growing and before changing from the vegetative to reproductive stage. *Biennials should be treated when* in the rosette stage of development. *Simple perennial plants and non-sprouting woody plants, perennial plants that reproduce solely by seed*, are best treated during the late vegetative through flowering stages of development, but before fruit set. *Creeping perennials*, plants that reproduce both by seed and vegetative means, should be treated after flowering and fruiting are complete or when carbohydrates within storage organs below-ground are being replenished. Herbicide effectiveness declines when vegetative growth ceases and reproduction begins. Sprouting woody plants, arguably the most difficult class of plants to control should be treated when energy reserves in the roots are being replenished and the herbicide can be translocated below-ground.

Six tips for cost –effective weed control

- Identify the weed problem – you need to know what it is before you can plan a control strategy
- Use a calibrated sprayer – this prevents the under- or over-application of a herbicide and can reduce cost
- Spray at the right time, at the right rate, with the right herbicide
- Recognize that drought stressed or mature weeds will be more difficult to control
- **Read and follow all label directions for proper use including handling, mixing and applying the herbicide**.

Table 1. Herbicides labeled for use in permanent grass and approximate costs.
Note these costs reflect costs at the time of preparing this article and are not current.

Herbicide	Rate	Estimated Cost/Acre*	Type of Weeds Controlled
Cimarron	0.1 to 0.4 oz/A	$2.30 - $9.20	Selected broadleaf weeds and certain woody plants. Temporary growth suppression of tall fescue or other pasture grasses may occur.
Cimarron MAX	Co-Pak	$7.50 - $15.00	Herbaceous broadleaf weeds. Temporary growth suppression of tall fescue or other pasture grasses may occur.
Crossbow	1 to 2 qt/A	$15.00 - $30.00	Woody brush and broadleaf weeds.
2,4-D Ester/Amine (3.8 lb ae/gal. formulations)	1 to 2 qt/A	$3.75 - $7.50	Herbaceous broadleaf weeds.
Dicamba (Banvel, Clarity, etc.)	0.5 to 2 pt/A	$5.50 - $22.00	Broadleaf weeds and woody brush.
ForeFront R&P	1.5 to 2.6 pt/A	$10.50 - $18.20	Herbaceous broadleaf weeds.
Milestone	3 to 7 fl. oz/A	$8.25 - $19.25	Herbaceous broadleaf weeds.
Overdrive	4 to 8 oz/A	$12.50 - $25.00	Herbaceous broadleaf weeds.
PastureGard	1.5 to 4 pt/A	$10.50 - $28.00	Woody brush and broadleaf weeds.
Redeem R&P	1.5 to 4 pt/A	$20.60 - $55.00	Herbaceous broadleaf weeds.
Weedmaster/Banvel + 2,4-D	2 to 4 pt/A	$7.00 - $14.00	Broadleaf weeds and woody brush.
MOWING		$12.00 - $18.00	Broadleaf weeds, weedy grasses, and small brush.
* The estimated cost ($/A) does not represent the use of spray additives or the cost for application.			

Source: AGR 172- University of Kentucky – Green et al. Weed Management in Grass Pasture, Hayfields, and other Farmstead Sites

Brush Management: Slowing the pace of brush encroachment into pastures is a challenge to land managers. A critical need is to determine what set of conditions or series of events are responsible for the invasion of pastures by woody species. Often the woody plant movement into pastures and subsequent expansion has been favored by overgrazing or neglect of a pasture. Overgrazing reduces vigor of forage species and decreases their ability to suppress encroaching woody species.

Before a brush management strategy can be developed it is important to **assess the means of regeneration or reproduction**. Woody species can be classified as those that reproduce only by seed and those that reproduce by seed and vegetative propagation from buds located on the root or crown of the parent plant. For example, when the main stem of honey locust is removed, buds located on the crown produce stems that enable the plant to persist. Thorny brush species like multiflora rose, honey locust, and blackberry can disrupt grazing patterns, and injure animals, landowners and workers as well as affect forage availability.

Brush Control Measures: As with herbaceous weeds, biological, mechanical, cultural, and chemical control measures are available to manage brush in pastures. Herbicides can be broadcast applied aerially, by ground equipment (tractors or ATV), or by backpack sprayer. Where the targeted brush stands are tall and/or dense aerial application may be most suitable. Use of application technology that reduces drift potential is important. Spray volumes should be no less than 5 gallons per acre. With ground spray equipment, keeping the spray

boom as low as possible without disrupting the desired spray pattern could reduce spray drift. Total spray delivery volume of 20 gallons per acre will also reduce drift potential and increase coverage of the targeted brush species.

Individual Plant Treatment (Spot Treatment) Techniques: Individual plant treatment can be an efficient, cost-effective alternative to broadcast applications to control brush, shrubs, or vines. Individual plant treatments include spot applied concentrate, high volume foliar, low volume basal, and cut-stump applications.

Summary

Integrating biological, cultural, mechanical, and chemical control methods in the proper sequence and combination will improve the efficiency and effectiveness of weed management. Your best weapon against weeds is a vigorous stand of productive forage. It is important to note that chemical weed control is a tool that should be used when the situation warrants and it is not as an answer for all situations. Whenever herbicides are used, ALWAYS read and follow all label directions for the product. Weaknesses in pasture management strategies must be identified before long-term improvements can be made following weed control. The cost of any potential treatment should be weighed against its potential success and effect on the forage system. While options like mowing may provide some control/suppression of weeds, the per acre cost compared to using chemicals is usually higher and total control is not as long-lasting.

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