

Weed and Brush Management in Texas

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PROBLEM DEFINED

A common pasture management problem faced by most Texas hay and/or livestock producers is weed and brush infestation. Weed species effectively compete with more desirable forage species for sunlight, moisture, and soil nutrients. Whether herbaceous or woody species, if enough weeds are present in the pasture, the carrying capacity of the management unit is decreased, the nutritive value of the forage base is reduced, and input costs of the production enterprise are increased. The result is that profitability is reduced or losses are increased.

Weed infestation generally occurs due to poor management or uncontrollable climatic conditions such as drought. Introduced forage pastures, such as bermudagrass, have been selected because of their ability to respond to fertilizer with significant increases in dry matter production. With proper fertility inputs, healthy forage stands usually can out-compete weed species. Under low fertility conditions, however, weed species generally have the competitive advantage.

Poor grazing management, usually overstocking, also contributes to weed infestation. **Overstocking** occurs when there are more animals per grazing unit relative to the unit's ability to provide forage. Desirable forages are continuously and heavily grazed without the opportunity to recover and are thus reduced in abundance and/or frequency. Increased weed infestation occurs at this point. Since most weed species are generally not as palatable to grazing animals, these species are generally ignored while more pressure is placed on the more desirable species. If this practice continues, a shift in plant species composition from desirable to less desirable species occurs. This change in plant composition is referred to as an **overgrazed** condition.

Thus, most weed problems are a direct result of past mismanagement. Most producers respond to weed problems by applying herbicides or mowing. If no change is made in the overall management of the operation, however, producers are only treating symptoms and not the direct cause of the problem. In fact, if there are no desirable species present to respond to a release from weed infestation, many times producers may be left with only bare soil following a herbicide application. Weeds can be beneficial in reducing the level of both soil and water that may leave a site as runoff. Thus, in certain situations, a complete renovation of the pasture may be warranted.

As noted above, most weed problems can be directly attributed to a lack of fertility coupled with an overstocked livestock herd. Exceptions occur because of drought. During dry years, reduced forage growth from desirable grasses offers weed species the opportunity to become established. If allowed to make seed, the year following a drought can witness a tremendous weed population. In this case, herbicides are usually required to manage the weed infestation. Drought conditions also encourage perennial weed infestations because their extensive root systems make them better able to survive these conditions.

WHY CONTROL WEEDS?

They Cost You Money: Research and demonstration trials throughout the state have shown that for every pound of weeds produced, it is possible to lose two to five pounds forage. Some weeds are more competitive and each pound of these weeds can reduce forage production by as much as ten pounds. Weeds compete heavily with forages for moisture, light, and nutrients. Chemical analyses on weeds indicate that most are as high or higher in nitrogen, phosphorus and potassium than forage grasses. This is evidence that the weeds are capturing much of the applied fertilizer.

Animal Health: Many of our common weeds such as bitter sneezeweed, Carolina horsenettle, and silverleaf nightshade are considered toxic to livestock. Fortunately, most are not palatable and are not readily grazed, unless animals are overstocked. However, if the weeds are harvested in hay, they can still retain some of their toxic properties and be harmful if they comprise a large portion of the forage. Adverse weather conditions such as drought, penned animals, or even rotational stocking may cause livestock to graze toxic plants. Some weeds, such as the buttercup, are only considered slightly toxic and may cause chronic problems such as reduced milk production, decreased weight gains, and lack of breeding efficiency that are seldom recognized.

Aesthetics: Most ranchers take great pride in their land and want it to reflect their pride of ownership. Nothing looks worse than a weedy pasture, but care must be taken to not use more herbicide than the amount that is actually required. This requires an understanding of the thresholds associated with various weed species and knowledge of when too many weeds are present, reducing forage production, and require herbicide control. Weed thresholds have not been well-documented for most individual species, however, you can gain some appreciation for potential losses by harvesting weeds over a measured, typical area, weigh them and calculate losses based on parameters discussed earlier.

WHEN SHOULD WEED CONTROL PRACTICES BE CONSIDERED?

- If you use fertilizer:** Your first pasture management dollar is best spent on weed control. If the threshold has been crossed and too many weeds are present, fertilizer alone will generally only produce more productive weeds, while doing little for forage production.
- If forage production is important to your enterprise:** If your production system relies heavily on forage production, weed and/or brush control can definitely be a wise investment.
- If you have toxic weeds:** Weed control is simply too inexpensive to allow either acute or chronic toxicity to reduce animal performance.

When is a “Weed” a “Weed”?

In monoculture grass pastures, such as bermudagrass, many producers consider any plant other than that, specific grass a weed. If hay is being produced for certain niche markets, such as the horse or dairy industry, relatively pure stands of grass, and thus, higher input costs, may be required. For most beef cattle operations, however, pure stands of grass may not be necessary or even desirable. Many plants that are routinely mowed or sprayed with herbicides have high nutritive value and are readily consumed by cattle, especially early in the season. The use of

good grazing management can encourage cattle to graze certain weed species and minimize either mowing or the use of herbicides.

One aspect of weed management often overlooked is whether or not the “weed” has an intrinsic value other than forage for beef cattle. Many weed species provide excellent food and cover for wildlife species. Wildlife species play an increasingly important role in providing revenue to ranch operations. If wildlife is to be a viable part of the ranch program, some thought should be given to the overall weed management program. Overgrown fence rows may appear unpleasing to the eye and require management, but in reality provide excellent habitat and food for both game (white-tailed deer, quail, rabbits,) and non-game species (songbirds, small mammals, etc.). Likewise, many broadleaf weed species, such as ragweed, have been identified as an important quail food and may actually be a desirable plant depending on the overall ranch goals and objectives. Many woody (brush) species also provide excellent browse for white-tailed deer. Careful consideration should be given to the “big picture” when considering weed management strategies.

MANAGEMENT OPTIONS

Usually the first indication of the need for a management strategy is the presence of weed flowers in the pasture. Unfortunately, by the time weeds become reproductive, it is usually too late to apply herbicide; the weed has effectively removed most of the moisture and nutrients required for that growing season. Some management options may be used to prevent ripening of seed; however, there is probably a large seed bank in the soil to begin with. A better strategy is to be proactive and scout pastures early in the growing season(s) to determine the level of infestation and whether or not management will be required.

Prevention: The best weed management program is actually one of prevention. As discussed previously, proper stocking rate and good fertility encourage vigorous stands of desirable forages able to compete with weed species in the pasture. The old adage “an ounce of prevention is worth a pound of cure” applies to weed management and is usually a more cost-effective management strategy. Even under the best of management schemes, however, some weed management will be necessary for most hay and/or livestock operations. The following is a discussion of weed management options.

Biological: Biological management does not necessarily mean using technologically-advanced bacterial agents or host-specific insects, although these strategies have been shown to be successful with certain weed species. More likely, biological management in Texas pastures would involve the use of grazing livestock to place pressure on weed species at key times in the season. Rotational stocking is necessary to encourage livestock to graze certain plants that would not normally be consumed. This grazing management practice can be quite effective on annual weed species in the early part of their growing season when root reserves are low. Continued defoliation can literally drain the plant of its store of energy before an adequate root system is developed and destroy the plant. Obviously, this is not a good management practice if toxic plants are the target species. Proper plant identification is critical for effective management of weed species, regardless of the management option used.

Prescribed fire: Prescribed fire is generally used to suppress woody species, and in many instances follows an appropriate herbicide treatment. The use of fire can extend the effective treatment life of the herbicide application. Continued use of prescribed fire, especially warm-

season fire, can open up wooded areas into savannas that provide better livestock and/or wildlife habitat. Many producers also find the savanna ecosystem more esthetically pleasing to the eye. Although prescribed fire is not used much in east Texas, its value as a weed management tool should not be overlooked.

Chemical: Chemical (herbicide) management of weed species can be both safe and cost-effective if used appropriately. There are two important steps in using herbicides. As mentioned previously, the first step is to correctly identify the problem plant. This is important because some herbicides are more effective on certain weed species than others. Correct identification of the target plant helps ensure the selection of the most effective herbicide.

The second step in appropriate herbicide use is to follow the label directions. Strict adherence to label directions is required by law. Paying close attention to label directions will also ensure safe, effective, and economical use. Chemical companies spend literally millions of dollars to develop their product labels. Herbicide labels contain directions for proper rate and timing of application, a list of susceptible species, and information regarding cleanup and disposal following use. Do not assume that if you have been successful in controlling weeds larger than the size recommended on the label, that this will always be the case. Label recommendations are the result of many field trials over variable sites and conditions and best reflect what will give you satisfactory results year in and year out. Even if you have used certain herbicides for many years, the product label should be checked each year to determine if any changes have been made regarding the application of the product. Also, new herbicides have been labeled in recent years that are very weed and forage specific, unlike herbicides commonly used in the past.

The question is often asked whether a limited amount of funds should be spent on herbicide or fertilizer. Data from College Station (Table 1) would indicated if the weed infestation is severe, it is more beneficial to control the weeds with herbicide rather than fertilize, although the combination of the two would be best. As can be seen from the data, whether in a dry or wet year, if there is still a forage base to work with, weed management with herbicides gives the best response. Also, shredding does not provide much forage response since competition with weeds occurs all the way up to when it is employed, robbing the forage of essential moisture and nutrients for too long. Again, if there is not a good forage base that will respond from the release of weed pressure, complete pasture renovation may be the best solution.

Table 1. Forage dry matter response to weed management during a dry and wet year. Texas A&M University trial, 1990-91 ¹				
Treatment	Forage Dry Matter (lbs/ac)			
	1990 (dry year)		1991 (wet year)	
	Forage	Weeds	With Fertilizer	Weeds
Early herbicide	2142	209	8323	0
Late herbicide	881	333	7610	1494
Shredding	577	1078	5089	2208
fertilizer only	645	1698	2587	7452
	Without fertilizer			
Early herbicide	1330	202	4987	0
Late herbicide	477	377	4898	1266
Shredding	341	761	4787	998
Control	377	1127	1385	4252

¹ Source: Paul Baumann and David Bade, Texas Agricultural Extension Service

There are several methods of applying herbicides including aerial, ground-applied using both boom and boomless (cluster nozzle) rigs, or by the use of individual plant treatment (IPT) for woody species.

Individual plant treatment (IPT) is a popular option for landowners that do not wish to purchase expensive spray rigs or pay someone else for herbicide application. Using IPT, landowners/managers can use simple, inexpensive applicators such as backpack sprayers or pump-up sprayers and a simple mixture of herbicide to treat as much or as little brush as they wish at times convenient to them. The following IPT treatment options provide excellent woody species control.

Stem Treatment: This treatment method uses a 15-25% mixture of triclopyr in diesel. Apply the mixture to the lower 12-18" of any smooth bark tree. The 25% mix should be used on rough, corky bark of more mature plants. This treatment may be made at any time of year unless there is frozen ground or standing water. For yucca control, apply the same triclopyr-diesel mixture directly into the whorl of yucca plant. No private pesticide applicators license is required to purchase the triclopyr herbicide. Due to the lack of residual soil activity, the use of triclopyr-diesel as a stem treatment is a highly selective method for controlling woody species and an extremely safe treatment for non-target species in the immediate vicinity. This treatment method is most useful when there is only one or two stems per plant or when plants are >8 feet in height.

High Volume Foliar Spray: This treatment method usually requires 1% (one gallon of herbicide in 100 gallons of spray solution) total concentration of a herbicide or combination of herbicides, depending on the target species and ¼% (one quart in 100 gallons) non-ionic surfactant containing at least 90% active ingredient combined in water. Herbicide is applied to all foliage to the point that leaves glisten, but not to the point that herbicide runs off. Timing of application is during the late spring/early summer when growing conditions are good and foliage has turned dark green. A private pesticide applicators license may be required depending on herbicide used. This treatment method is most useful when there are multiple stems per plant and when plants are <8 feet in height.

Cut Stump: This treatment is designed to reduce re-sprouting whenever woody species are cut. With this treatment method, cut the target species close to the ground to minimize interference with vehicle or walking traffic. Use the same herbicide treatment as described in the A. (Stem Treatment) above, but apply enough herbicide to thoroughly wet the surface, especially the edges of the stump. The herbicide should be applied to the cut surface as quickly as possible. The treatment may be applied at any time of the year as long as standing water or snow does not interfere with treatment to the ground level.

Mechanical: Last on the list is mechanical management. Mechanical methods can be effective in regions of the state where mesquite, huisache, blackbrush, and other woody species are problems (i.e., south Texas, north Texas). In regions of the state where introduced pastures are found, however, mechanical methods are generally less effective and more costly than options listed previously (Table 2).

Mechanical treatments, primarily mowing or shredding can actually make the management of some species like persimmon more difficult. The information contained in Table 2 may appear to indicate only a marginal advantage to the herbicide treatment. Usually, however, more than one mechanical treatment per season is required. When even two trips across the field with a bushhog are considered, the economical advantage of using herbicides becomes quickly apparent.

Table 2. Economic comparison: mechanical and chemical weed control¹

Item	40-hp tractor w/6' rotary mower	40-hp tractor w/30' boom sprayer
Labor cost/hour	\$10.00	\$10.00
Acres/hour	2.73	14.18
Costs		
Fixed cost/acre	\$5.58	\$1.43
Operating cost/acre	\$6.00	\$1.33
Labor cost/acre	\$3.66	\$0.71
Herbicide cost/acre	-0-	\$8.10
Total Cost/acre	\$15.24	\$11.57

Redmon, 2012.

SUMMARY

Weed infestation of pastures is a common discussion topic among landowners and managers. The most commonly perceived solution is to mow and/or apply herbicide. Weeds are generally a symptom of something gone wrong in the pasture. If weeds are a persistent problem, careful analysis of current management strategies may be necessary to determine the underlying causes for the dilemma. In most instances management strategies involving use of the appropriate stocking rate and a good soil fertility program will do much to alleviate the problem.

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