



Forages

Bermudagrass Decline

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THE PROBLEM

Many Texas forage and livestock producers have experienced a phenomenon known as bermudagrass decline. This situation is characterized by gradual thinning or outright loss of bermudagrass stands over time. The reasons for bermudagrass decline can be numerous, but are generally tied to management practices that lead to reduced vigor of bermudagrass. Any one of the reasons associated with bermudagrass decline can be problematic. Over the past several years, however, several problems have occurred during the same year, thus compounding the potential negative effects for bermudagrass. This publication discusses the causes for this wide spread problem and suggests management practices designed to improve the persistence of bermudagrass in Texas and the southern U.S.

THE CAUSES

Fertility

The lack of an appropriate fertility program may be the number one cause for bermudagrass decline. Bermudagrass is widely used across the southern US because of its adaptation to a variety of soil types and its demonstrated response to fertilizer by producing high quantities of forage. Bermudagrass, however, requires a high level of fertilizer input to maintain a competitive edge against other potential invading species such as bahiagrass or broadleaf weeds. The nutrient most associated with high production levels is nitrogen (N), but many times N is the only fertilizer input provided, if at all. Other nutrients, however, play an important role in maintaining bermudagrass stands. Potassium (K), for example, has been shown to be an important nutrient for forage, stolon, and rhizome production, but is also associated with improving bermudagrass tolerance to both winter kill and diseases such as *Helminthosporium* leaf spot. Potassium is also known to help improve water use, thus improving drought tolerance. Phosphorus (P), another important soil nutrient for

bermudagrass growth, is generally low in many of the acid soils where bermudagrass is grown and is seldom given the consideration it deserves. Coupled with already low soil P levels, an acid soil pH further decreases the level of plant available P. Therefore, many times the addition of limestone to increase soil pH to >6.0 can be an important aspect of improving plant available P for bermudagrass. Soil pH, however, is again often ignored assuming that bermudagrass can thrive at low soil pH levels. The only way to know for sure what levels of fertilizer nutrients are actually required, is by means of a soil test. To use a simple analogy, the soil test is the *dipstick* for the soil. Most people would not add oil to their crankcase without first determining what level of oil was needed by checking the dipstick. The soil test performs the same service and indicates what level of P, K, limestone, and other nutrients may be required to ensure optimum growth for bermudagrass at a given location. Soil testing remains one of the best investments one can make in a forage production system. Without a soil test, it is impossible to know exactly how much fertilizer should be applied to maintain a healthy, vigorous stand of forage.

Stocking Rate

Too heavy a stocking rate places excessive grazing pressure on forage resources. Heavy grazing pressure can reduce animal performance, but just as importantly, heavy grazing pressure can decrease plant vigor. Plant vigor is affected by decreasing photosynthesis due to a lack of sunlight-absorbing leaves. This robs the plant of its energy source for metabolic functions and reduces the amount of carbohydrates stored in the root system for winter. A reduction in plant vigor reduces plant frequency and abundance and can be a contributing factor in bermudagrass thinning or decline. As a result of overstocking and lack of adequate ground cover, the increased velocity of overland flow of water during precipitation events reduces infiltration rates into the soil for use by plants or for recharge of groundwater aquifers. Subsequently, much of the precipitation is lost from the site, thus reducing forage production potential. This can lead to further reduction in

infiltration rates and increases in overland flow. Finally, reduced ground cover associated with overstocking exposes the soil surface to raindrop impact. Raindrop impact dislodges surface soil particles, which can be removed and lost from the site in precipitation overland flow. Raindrop-dislodged soil particles can also fill pore spaces, thus sealing the surface soil layer forming a crust. The crust that forms has the effect of further reducing infiltration rates and increasing water loss from the site. Bare soil exposed to wind is also subject to dislodging and removal. Loss of topsoil either as a result of precipitation events or wind is known as erosion. Topsoil forms at extremely slow rates, often requiring thousands of years, thus the loss of topsoil due to erosion can affect site productivity for several generations. Besides loss of topsoil itself, important soil nutrients such as N, P, and K also are lost during the erosion process.

Overseeded Cool-Season Forages

In many instances, cool-season annual forages are over-seeded into bermudagrass fields and provide excellent nutrition for cattle during the fall and winter months. The use of cool-season annual forages can also reduce input costs associated with winter feeding compared with traditional hay-only programs. An important aspect of overseeding cool-season annual forages, however, is the timely removal of the forage in the spring prior to bermudagrass breaking dormancy. If the cool-season forage is not removed, the effects on bermudagrass can range from delayed initiation of growth to actual death of the bermudagrass plant. The reason for this effect is intense plant competition for sunlight, moisture, and nutrients. The canopy of annual ryegrass or clover should be removed via grazing or as a hay crop, thus reducing potential negative effects of the overseeded winter forage on the bermudagrass. While it is generally recommended that livestock producers utilize some form of cool-season annual forage to help improve animal performance and to reduce winter feeding costs, the timely removal of the cool-season forage is a critical factor in enhancing bermudagrass persistence. Do not plant more winter pasture than can be adequately managed. As a rule of thumb, $\frac{3}{4}$ to one acre of ryegrass per animal unit should provide adequate forage production for late winter and spring grazing. Excess ryegrass that **cannot** be controlled by grazing or harvested for hay should be sprayed during the warm-season perennial grass dormant season with glyphosate.

Drought

The impact of drought is obvious. Reduced moisture results in reduced forage production. While producers can do nothing about the incidence of drought, they can mitigate the negative effects by operating at a stocking rate that is less than the carrying capacity of the property based on long-term production records. During years of reduced forage, the reduced stocking rate may allow producers to go through the drought without the need for drastic stocking rate adjustments or the purchase of expensive hay and/or feed. During years of normal or excess

moisture and forage production, the excess forage may be utilized by additional stocker calves or may be harvested as hay. A recent look at long-term precipitation records in East Texas indicated that if an operation was stocked for the long-term average annual precipitation, in 6 of 10 years the operation would be overstocked due to drought. A sound management strategy might suggest that it is better to have a little extra forage in some years than not enough forage in others.

Pests

Invasive weeds can dominate pastures and reduce the productive capability of bermudagrass. The use of appropriate herbicides at the right time can do much to alleviate this problem. It is however, important, to properly identify the weed species so that the **right** herbicide can be used. Likewise, fall armyworm and grasshopper infestations can have a devastating effect on bermudagrass production in the summer and fall. In many ways, insect infestations mimic overstocking. This can rob the producer of valuable forage for grazing or hay and can reduce the bermudagrass plant's ability to store carbohydrates in the root system going into the fall season. Whether weed pests or insect pests, many times producers wait until too late in the season when the damage has already occurred before attempting to manage the problem. Scouting early in the season **in the field** (not from the vehicle) can indicate if and when a pest infestation is taking place and provide adequate time to treat the field before the damage is too extensive. Consult with your local County Extension Agent regarding appropriate pesticide choices and the best time to spray for optimum control.

THE CURES

As with most maladies, the best cure is prevention. In the case of bermudagrass decline, the following suggestions are made regarding production practices:

- ✓ Fertilize based on soil test recommendations. This can be most critical in a hay harvest situation where nutrients are being removed from the system.
- ✓ Understand what the appropriate stocking rate is for your operation. If you require help, seek the advice of a professional.
- ✓ When over-seeded cool-season annual forages are used as part of a winter feeding program, be sure these forages are removed in a timely manner before bermudagrass initiates growth in the spring.
- ✓ Scout early and often for pests such as weeds, grasshoppers, and fall armyworms and use appropriate control measures. If in doubt, talk to your local County Extension Agent.

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