

Forage Management Strategies for Drought Conditions

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DEALING WITH DROUGHT

During a drought, little can be done to increase forage growth in pastures or hay meadows. Proper management can minimize impacts of drought on your operation when drought occurs. Careful management early in a drought can minimize long-term forage stand damage and help maintain forage yields when rains do come. If pastures are managed properly during times of low moisture, the effects of drought will be less severe and pastures will rebound faster when precipitation is sufficient. Remember, management practices that minimize damage to pastures during drought are also the same for maintaining healthy pastures in a normal year.

Managing livestock

Reduce stocking rate if you believe forage supply will limit animal performance. First, cull cows that are old, open, in poor condition, or have poor disposition. A veterinarian can palpate cows for pregnancy and check for health problems that warrant elimination from the herd. Cows that are not pregnant are difficult to justify providing expensive hay or grazing. Moving cattle from stressed pastures to leased grazinglands where forage is available is an option without selling off a portion of the herd. Another option is early weaning and sale of calves. This reduces the grazing pressure and reduces the nutrient requirement of the cows (reducing forage intake by 20%) because the heavy nutrient demand of lactation is stopped. The longer that decisions to decrease livestock numbers are delayed, the sooner the forage supply will be exhausted. Delaying the decision to reduce stocking during a drought accelerates potential financial losses of the livestock production enterprise.

Grazing management

Lack of moisture suppresses plant growth and retards root development. Allow 6-8 inches of new growth before allowing livestock to graze. A healthy improved perennial grass pasture will have 3 to 4 inches of stubble. In severe drought, pastures may not reach this stubble height; thus, these pastures should be deferred until the time of dormancy (when nights are 55° F for warm-season perennial grass pastures) and then grazed to 3-4-inch stubble height. Those pastures with little or no green growth have severe reduction in leaf area, and this causes a substantial decline in root mass. Roots must be replaced or bare areas will increase and invader grasses/weeds will prevail. In addi-

tion, overgrazing of plants removes the buds needed for re-growth. If insufficient stubble and root remains, water capture and infiltration is reduced. Therefore, when rain fall occurs again, less water will enter the soil and be available for plant growth. Stocking rates must be reduced on all types of forage. Fertilizer inputs should be reduced or stopped during periods of prolonged reduced precipitation, and deferred grazing should be considered to increase harvest efficiency, forage utilization, and flexibility for herd management.

Weed management

Do not apply herbicides during a drought. Plant mechanisms in response to a drought will prevent adequate uptake of herbicides into plants and result in a high cost application with little control of the specific weed.

PREPARING FOR FUTURE DROUGHT

Some best management practices that can prepare pastures and hay meadows for a potential drought includes: forage management, grazing management, weed control, and utilization of warm-season annual forages.

Forage management

It is always important, drought or not, to pay attention to plant nutrient requirements. Soil test and apply the recommended ratios and levels of fertilizer and lime. Ensure soil pH is adequate to enhance fertilizer uptake efficiency. Applying nitrogen fertilizer just prior to times when conditions are likely to be optimum for forage growth, such as the beginning of the growing season, helps to maximize N utilization. In periods of limited soil moisture, delaying fertilizer application until moisture is present or imminent can also increase efficiency. When rain occurs, pastures should have adequate soil nutrients and be ready to grow. If not managed properly during drought recovery, invasive species will invade and once established will be difficult to control or eliminate.

Grazing management

Prolonged grazing during drought can severely stress plants. Even prior to a drought, prolonged grazing reduces the root mass and can make the plants less efficient for utilizing any nutrients and moisture in the soil. It may be necessary to remove livestock from pastures and feed stored feed for a few days or weeks. Producers without adequate facilities may have to establish a sacrifice paddock where feeding can take place. Using some method of deferment or rotation stocking management system allows flexibility for this practice. Using a sacrifice paddock will limit the damage to only one pasture as opposed to multiple areas. Animals could also be fed in alleyways and/or lanes. When feeding livestock in other locations, make sure water is always available. If destocking has occurred due to a drought, consider maintaining herd size at that reduced number. It is much more economical to harvest hay from excess forage during sufficient growth than it is to feed stored forage and supplement during a drought.

Weed control

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. Most weed problems can be directly attributed to a lack of fertility coupled with an overstocked livestock herd. Exceptions do 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 result in a tremendous weed population. In this case, herbicides are usually required to manage the weed infestation.

Warm-season annuals

Summer annual grasses should be considered as temporary solutions to summer forage needs. These forages can be expensive to produce, difficult to manage, and have a potential for prussic acid and/or nitrate poisoning of livestock. Some desirable characteristics include rapid growth, excellent drought tolerance, and good response to fertilizer and water. Summer annuals can be an excellent option in dry years if established early in the spring.

Summer annual grasses that can be grown in Texas include sudangrass (*Sorghum bicolor*), forage sorghum (*Sorghum bicolor*), sorghum × sudangrass hybrids, pearl millet (*Pennisetum americanum*), and crabgrass (*Digitaria* spp.). These forages can be valuable in the development of a pasture system. Each of these grasses have unique growth characteristics that require proper management and soil type location for optimum production.

Pearl millet is better adapted to sandy, acid soils than forage sorghums. Plantings can be made in the spring by simply broadcasting or drilling at a soil depth of ½ to 1 inch. The dwarf or semi dwarf types such as Tifleaf I, II, and III are leafier, with shorter internodes, fewer stems than the taller types, and therefore may be easier to manage under grazing. The taller types may produce more forage dry matter per acre than the dwarf types. Pearl millet will regrow after harvest if a 5-inch stubble height remains. Be careful not to graze or mow pearl millet too closely because it can be killed. About 4 to 6 weeks of regrowth may be necessary before it is ready for the next harvest. Grazing of Tifleaf cultivars can be continued until frost is expected. Most hybrid pearl millets are day length sensitive, and will flower and mature, and may not persist as long into the fall and cool conditions as sorghums. Pearl millet has two distinct advantages over sorghum, sudangrass, and sorghum × sudangrass hybrids; it DOES NOT produce prussic acid. However, pearl millet as well as sorghums can cause nitrate poisoning under certain conditions. The second advantage is that pearl millet is not affected by the sugarcane aphid.

Sorghums are a class of warm season annual grasses in which several forage types have been developed. Grain sorghums are short (3-5 ft) and are not normally considered for forage because of low dry matter yield. Forage sorghums can grow tall (8-13 ft), have bigger stems, and produce a substantial amount of dry matter tonnage. They are difficult to cure for hay because of their large stems. Sorghum-sudan hybrids are intermediate in height (4-7 ft), have smaller stems and dry faster. Forage sorghums are best adapted to fertile, well-drained soils that have good water holding capacity. Forage sorghums are best used in a single hay cutting when plants are in bloom or early dough stage. A mower-conditioner will be needed to crush the stems to promote faster and more even drying.

Sudangrass is a rapid growing warm-season annual that can produce good quality forage if managed appropriately. True sudangrass has fine stems and grows rapidly after grazing. They are usually lower yielding compared with sorghum-sudangrass hybrids. Sorghum-sudan hybrids have the highest yield potential of any of the summer annuals. Sorghum-sudans can be used for grazing or silage, but like other annual sorghums, their forage is very difficult to dry to moisture content suitable for hay production. If grazed, the sorghum-sudans should be allowed to regrow to a height of 24 inches before grazing. Sorghum family forages are susceptible to the sugarcane aphid which can cause moderate to significant damage. For forage growers using sorghum family forages consult sugar cane aphid (SCA) management and control strategies listed in “The sugarcane aphid: A new pest of grain and forage sorghum,” <http://lubbock.tamu.edu/files/2015/05/SCA-Management-Guide.pdf>

Be aware that both millet and sorghum-sudan plants can accumulate nitrates during drought; therefore, test hay before feeding and graze pastures cautiously. Nitrates will persist in forages cut for hay. If hay is suspected of having high nitrate levels, it should be sampled and tested. The local County Extension Office can provide information on hay sampling and advice on using hay with high nitrate levels. In addition to grazing, these crops can be harvested as green chop, silage, or hay. Feeding green chop requires the same precautions as grazing to prevent prussic acid and/or nitrate poisoning. Silage or hay is easiest to cure when the plants are in the boot stage (have not yet produced a seed head). However, yield and sugar for rapid fermentation of silage are greater at the soft dough stage (when the seed is soft). A mower-conditioner must be used to crush the stems to ensure quick drying for hay.

Crabgrass is commonly considered a weed; however, it possesses significant potential for supplying high quality summer forage. Crabgrass is best adapted to well-drained soils such as sand, sandy-loam, loamy-fine sand, loams and silt loams. It is best utilized in a rotational grazing system after prepared seedbed planting of small grain.

Summer annuals need a good supply of nutrients to make high yields. Lime, phosphorus and potassium should be applied according to soil test recommendations. Nitrogen is most important, and should be added at the rate of 60 to 100 pounds per acre at green up. If additional harvests are planned, 40 to 60 pounds of nitrogen per acre may be added after each harvest. Warm season annuals require annual land preparation, planting and fertilization. They may not be economical with high fuel, seed, fertilizer, and irrigation prices. Warm season annual forages fit well with prepared seedbed that can also be utilized for winter pasture in the winter. If summer precipitation limits or prevents hay production, winter annuals are the cattleman's next option.

Managing for drought is complex and must take place throughout the calendar year. Be sure to graze properly in the summer and plan ahead for fall, winter and spring forage production so that feeding of expensive hay or supplements is minimized.

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