



Pasture and Grazing Management under Drought Conditions

Volume 4, Issue 6

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June 2011

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Drought is a recurring fact of life in the southeast whether it occurs once every five years or five consecutive years. While little can be done during drought conditions to increase forage pasture growth in the short run, careful management could minimize long-term stand loss and help maintain forage yields until precipitation may become sufficient to increase forage production. Monitoring weather forecast that may lead to drought is an important tool to grazing management (**Fig. 1**). Early warning of possible low soil moisture levels and reduce precipitation can enable livestock producers to avoid overgrazing and reduce future economic losses. Drought management strategies involve different phases, but this article will discuss some key points and ways in which the impact of drought on pasture and grazing management can be minimized.

Apply Fertilizers only if Appropriate

Although pastures are more productive when fertilizers are applied in adequate amounts, fertilizer applications during drought conditions are not recommended. Avoid applying fertilizers without knowing what is needed. Perform a soil test first to identify what nutrients the pasture is lacking and apply those when soil moisture is adequate to maintain their availability in solution and increase root nutrient uptake. Hot and dry conditions increases nitrogen volatilization of products such as urea or urea ammonium nitrate solutions (UAN). Application of UAN to stressed plants can increase tissue burning and further delaying plant recovery. Under drought stress plants tend to increase nitrate accumulation which can increase nitrate poisoning in livestock. This is very common in plants such as Johnsongrass, sorghums, sorghum-sudangrass, pigweed, and lambsquarter. If the drought has been short-term (2-4 weeks), an application of 25 to 40 lbs/ac of actual nitrogen might be beneficial if there is anticipated precipitation in the forecast. If the drought has been long-term (more than 3 months), it might be better to withhold fertilization until moisture conditions improve. During drought, producers might want withhold lime, phosphorus and potassium applications until the following season when plants have recovered and might increase nutrient use efficiency.

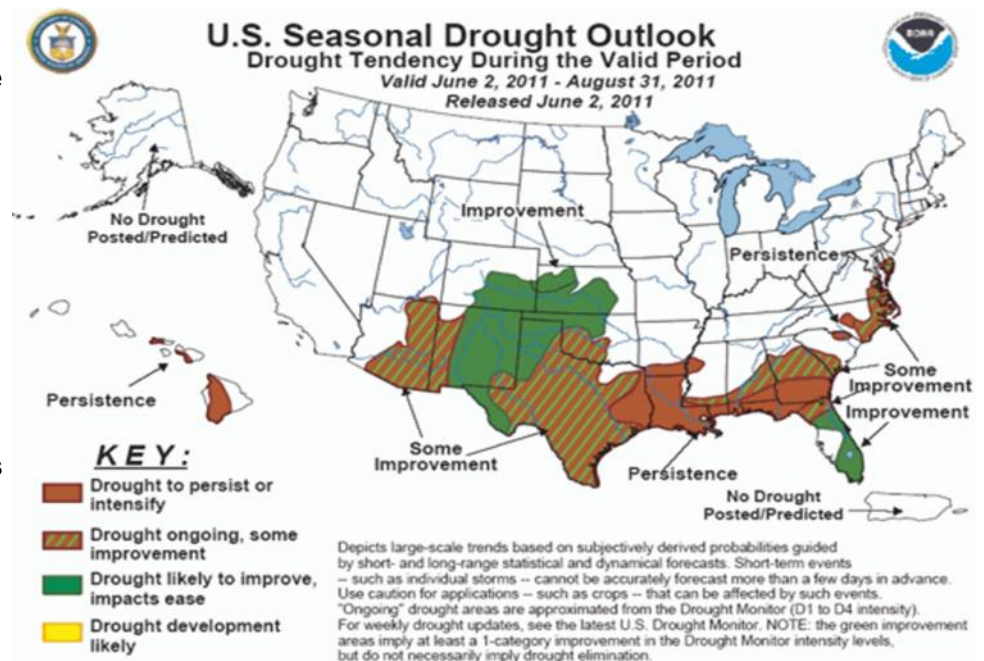


Figure 1. Summer drought assessment outlook for the southern U.S.

Source: [National Weather Center, Climate Prediction Center.](http://www.nws.noaa.gov/ClimatePredictionCenter/)



Stay on Top of Weeds

Weeds tend to thrive in drought conditions because most of them grow earlier in the season before soil moisture becomes a limiting factor. They compete with desirable pasture plants for sunlight, soil nutrients and water. It is important to control them early in the season. They have very little nutritional value (while they can be palatable when small) in a grazing system and some can be poisonous if grazed under stress conditions (milkweed, perilla mint, cocklebur, pigweed, sicklepod, jimsonweed, etc.). Poisonous plant infestations tend to thicken after serious drought, but toxicity problems can be more common after drought even when poisonous plants do not increase in density. They are eaten during times of drought because other forage is lacking or because the poisonous plants can become more palatable as they dry. It is not recommended to apply herbicides during drought. Low moisture in most cases prevents the entry and translocation of herbicides into the plant resulting in a high-cost of application. Depending on high herbicide use is usually an indication of poor grazing management practices and soil fertility management.

Grazing Management

Drought conditions further hamper pasture productivity. In order to deal with drought, forage and livestock producers must develop both short- and long-term strategies. That's why strategies and the ability to manage throughout drought is often decided based on weather forecast and drought survival should become a crucial component of a year to year operation.

Lack of moisture suppresses plant growth and retards root development. Without adequate root structure, plants are unable to extract moisture and nutrients from the soil, which further limits plant growth. Improper fertility, especially soil acidity restricts root growth which inhibits deeper soil water extraction and sugar storage capacity. A healthy root system is of paramount importance to forage growth since 50 to 80 percent of the plant growth occurs below the soil surface. Drought conditions force plant to utilize more of its stored sugar to grow replacement leaves, capture solar energy and proceed with photosynthetic processes to manufacture sugars. About 20 percent or more of the year's forage growth will occur using these stored reserves before the plant stops using reserves and maintains itself on mature leaves produced that season. Any sugars produced with the small amount in the root or crown reserves will be used to support basic plant functions instead of growth during drought, a reason why plants will have a higher forage quality. The extent to which forage production is reduced by drought depends on climate, soil type, forage species, fertility, and current and past grazing management practices.

Drought reduces forage growth in pastures. If pastures exit the drought in poor condition, the road to recovery is much longer. When drought comes and forage is in short supply, it is tempting to continue to graze until all the forage is gone. Pasture plants need a rest from grazing to restore their energy reserves. Reduced plant growth during drought means rest periods will be longer. This means that livestock should not return to the pasture until grass regrows to an 8 to 10 inches. Increasing grazing stubble height helps shading and cooling the soil; this helps to conserve moisture by reducing evaporation and making scarce moisture more effective. Also, by maintaining an adequate amount of stubble or residue will encourage root development below the soil surface. It is important to avoid the urge to start grazing as soon as additional moisture greens up the pasture. Grazing too soon on drought-weakened pastures can cause plants to further decline and prolong recovery time.

The purpose of a drought-management strategy is to use the recent precipitation amounts to trigger early and proactive adjustments in stocking rates. Allowing livestock unlimited access to pastures during drought can further weaken plants. Adjusting grazing management of the correct stocking rate is the most important of all grazing management decisions from the standpoint of vegetation cover and production, livestock management, and economic returns. Again, the use of rotational stocking can improve harvest efficiency, and thus, improve forage utilization during periods of limited precipitation. During a drought, producers cannot allow livestock to spot graze or trample and waste considerable amount of forage. Subdividing pastures into smaller units by using portable electric fences will be cost-effective.

During period of no precipitation, producers that have stocked at maximum carrying capacity might be forced to reduce the herd. It is important that stocking rates be reduced due to drought to a level that will provide acceptable animal performance (maintenance) under the worst circumstances. To avoid a stocking rate roller coaster during drought, produc-



ers in a cow-calf operation might want considering maintain livestock numbers to 75% of the long-term (>10 years) carrying capacity year-round. The amount of forage needed can be also reduced by culling heavily before the grazing season begins and the cattle market becomes saturated. Another approach is early weaning and reducing the number of replacements if possible. Mature cows might have the ability to survive better than young livestock that are still growing. Dry cows usually consume about 35-40% less forage than lactating cows and calves under 500 pounds consume about 33% as much as mature cows.

Summary

Remember that drought does not impact everyone to the same extent, and even pastures or portions of pastures within one farm might not be affected equally. The impact depends on how pastures have been treated in previous years to the drought. Turn animals onto pastures only for short periods of time and allow longer rest periods. Deny animals access to pasture when grass is less than 4 inches high and do not allow them access until grass grows to 8 to 10 inches. Under these conditions, confine the livestock to a pasture where hay can be fed if necessary or develop a strategic emergency rotational grazing plan. Changes must be made in a proactive, rather than reactive manner to minimize negative effects on forage and livestock production during prolonged periods of reduced precipitation. During drought, stocking rates must be reduced on all types of forage. Fertilizer inputs are generally reduced during periods of reduced precipitation, and rotational stocking should be considered to increase harvest efficiency and forage utilization.

Grazing management decisions after drought cannot be separated from the usual pasture management requirements. A grazing plan based on forage species, pasture condition and stocking rate requirements should be developed as part of the farm's management plan. The sooner the farm returns to a highly productive period, the more viable it will be into the incoming season. Early response permits opportunities to retain some high structure to exercise various livestock decisions, such as weaning times, culling practices, and marketing decisions and to retain plant vigor and health to accelerate post-drought recovery.

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