

# Pasture and Grazing Management Under Drought Conditions



Drought is a fact of life in the Southeast, whether it occurs once every 5 years or for 5 consecutive years. While little can be done during drought conditions to increase forage pasture growth in the short term, careful management could minimize long-term stand loss and help maintain forage yields until the drought ends. Monitoring weather forecasts is an important tool in

grazing management (Figure 1). If you know when to expect low soil moisture levels and rainfall, you can avoid overgrazing and reduce future economic losses. Drought management strategies are complex, but this publication will discuss some key points and how to minimize the impact of drought on pasture growth.

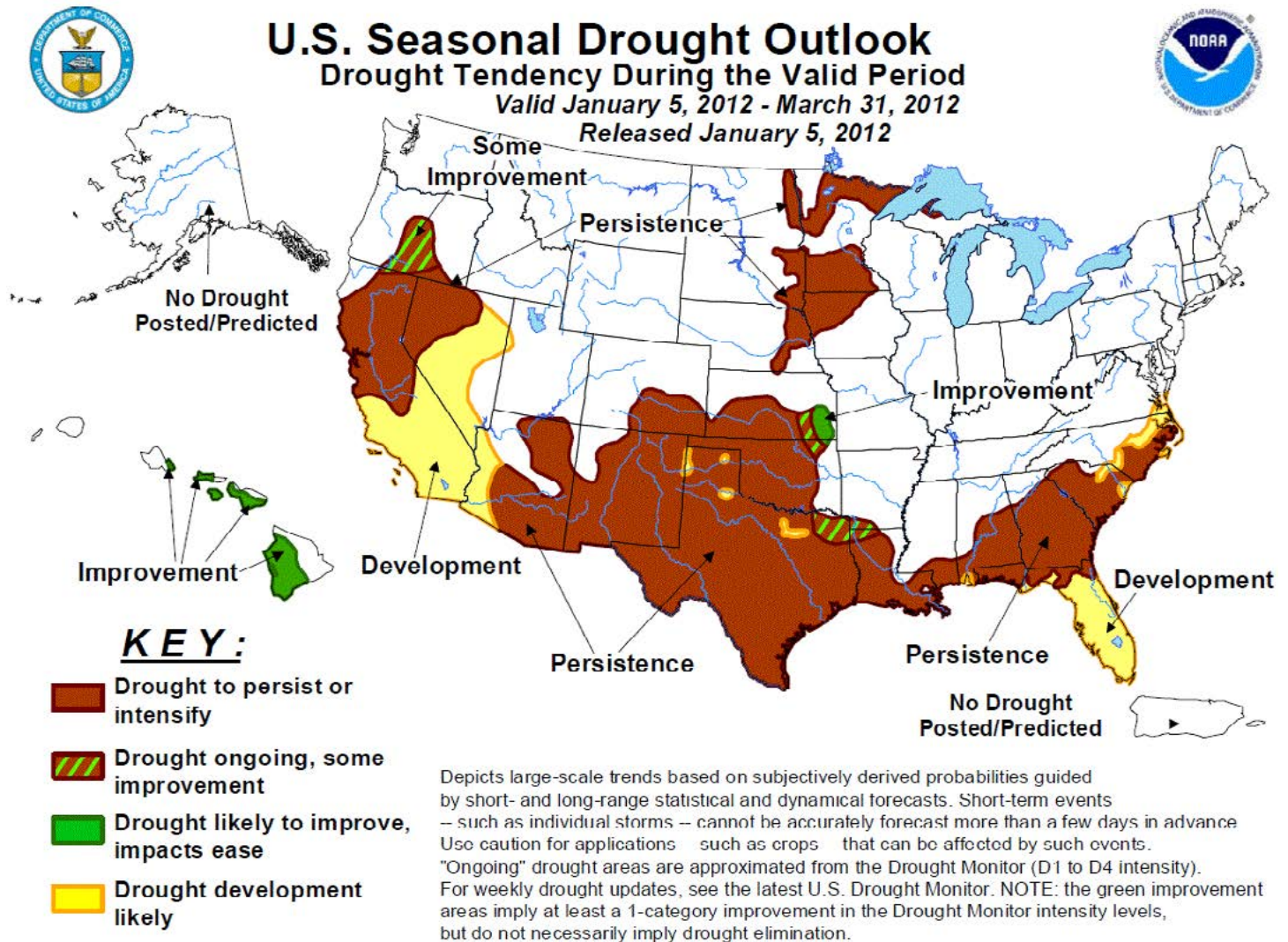


Figure 1. Drought assessment outlook for the southern United States. Source: National Weather Center, Climate Prediction Center: [http://www.cpc.ncep.noaa.gov/products/expert\\_assessment/season\\_drought.gif](http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif)

## Apply Fertilizers When Appropriate

Although pastures are more productive when fertilizers are applied in adequate amounts, fertilizer applications during drought conditions are not recommended. Find out what the soil needs before applying fertilizers. Perform a soil test to identify what nutrients the pasture is lacking and apply fertilizers ONLY when soil moisture is adequate to maintain their availability in solution and increase root nutrient uptake. If the soil is saturated, there is a chance for nitrate leaching and nitrogen loss.

Hot, dry conditions increase nitrogen volatilization of certain products, such as urea or urea ammonium nitrate solutions (UAN). Applying UAN to stressed plants can burn tissue and delay plant recovery. Under drought stress, plants tend to accumulate nitrate, which can increase the likelihood of 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 to 4 weeks), an application of nitrogen at a rate of 25 to 40 pounds per acre might be beneficial when rain is 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, consider withholding lime, phosphorus, and potassium until the following season when plants have recovered and can use nutrients more efficiently.

## Stay on Top of Weeds

Weeds tend to thrive in drought conditions because most of them grow early 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. Though they can be palatable when small, weeds have very little nutritional value in a grazing system. Some, such as milkweed, perilla mint, cocklebur, pigweed, sicklepod, jimsonweed, and others, can be poisonous if grazed under stress conditions. Poisonous plant infestations tend to thicken after serious drought. Toxicity problems can be more common after drought because other forage is lacking or because the poisonous plants can become more palatable as they dry.

Do not apply herbicides during drought. In most cases, low moisture prevents the movement of herbicides into and within the plant, resulting in high cost and low success. Over-dependence on herbicides is often caused by poor grazing management practices and poor soil fertility management.

## Grazing Management

Drought conditions also make pastures less productive. Forage and livestock producers must develop both short- and long-term strategies for dealing with drought. Decisions about managing during drought are often based on weather forecasts. Drought survival should become a major part of year-to-year operations.

Lack of moisture suppresses plant growth and root development. Without adequate roots, plants cannot pull moisture and nutrients from the soil, which further limits plant growth. Improper fertility, especially acidic soil, restricts root growth, which prevents plants from being able to reach water deep in the soil and reduces their sugar storage capacity. A healthy root system is very important because 50 to 80 percent of the plant growth occurs below the soil surface.

Drought conditions force plants to use their 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. During drought, any sugars produced with the root or crown reserves will be used to support basic plant functions instead of growth, so plants will have a higher forage quality; little growth and higher nutrient concentration minimize the nutrient dilution effect. The amount of damage drought causes depends on climate, soil type, forage species, fertility, and current and past grazing management practices.

Drought reduces forage growth in pastures. When drought comes and forage is in short supply, it is tempting to continue to graze until all the forage is gone. But if pastures exit the drought in poor condition, the road to recovery is much longer. Pasture plants need a rest from grazing to restore their energy reserves. Reduced plant growth during drought means rest periods must be longer. In other words, livestock should not return to the pasture until grass regrows to about 8 to 10 inches. Increasing grazing stubble height helps shade and cool the soil, which reduces evaporation and conserves moisture. Also, 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 harm plants 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. Using the correct stocking rate is the best way to protect your pasture, your animals, and your wallet. Again, rotational stocking can improve harvest efficiency and forages during drought. (Refer to Publications 2459 and 2629 at <http://extension.msstate.edu>). During a drought, you cannot allow livestock to spot graze or trample and waste forage. Subdividing pastures with portable electric fences is cost effective.

During a drought, producers who have stocked at maximum carrying capacity might be forced to reduce the herd. It is important to reduce stocking rates to a level that will provide acceptable animal maintenance under the worst circumstances. To avoid a stocking rate roller coaster during drought, producers in a cow-calf operation might want to consider maintaining livestock numbers at 75 percent of the long-term (more than 10 years) carrying capacity year-round. The amount of forage needed can also be 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 should be able to survive better than young livestock. Additionally, by removing the calf, the nutrient requirements of the cow will drop dramatically. Dry cows usually consume about 35 to 40 percent less forage than lactating cows. Calves under 500 pounds consume about 33 percent as much as mature cows.

It is important that the pasture quality be assessed. Crude protein levels below 8 percent can severely impact the nitrogen available for rumen microbes to function, thereby harming forage digestibility and livestock performance. If you are managing animals with a higher nutrient requirement than dry cows, such as dairy cattle or stocker cattle, forage assessment is especially important. If you know the quality of the forage, you can design a supplement program to make up for the deficiencies in the grass. A supplement high in degradable intake protein, such as corn gluten feed or urea-free protein tubs, may help the animal during these periods because they will provide a source of nitrogen to the rumen microbes. Also consider long-term plans when determining a supplementation program. If you will retain ownership of the yearlings, a minimal input program may be best. This would result in a lower rate of gain at the farm or ranch but allow for compensatory gain at the feedlot, where feed would be cheaper.

One final consideration is the use of high-quality minerals during periods of drought. Microminerals, such as zinc and manganese, can have an effect on forage digestibility. During periods when we are trying to maximize what little forage is available, we do not want to

shortchange the animal. Vitamin A is an important vitamin for beef cattle production. It is stored as beta carotene and is usually available in lush, green forage. Vitamin A is stored in the liver for later use, but deficiency may occur after long periods of hay feeding or grazing of dormant pastures. Deficiency symptoms may include decreased reproductive performance or, in severe cases, night blindness. Deficiencies can be overcome by feeding vitamin A. Most good-quality beef minerals include vitamins A, D, and E, but always check the guarantee analysis on the mineral bags to ensure that the mineral used has all the microminerals and a good supply of vitamins.

## 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 the years before 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 tall, 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. Make changes proactively to minimize negative effects on forage and livestock production during prolonged periods of drought. 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. Other factors, such as pasture quality and feed and mineral supplement considerations, need to be addressed, as well. Management decisions should maximize productivity and minimize future problems. The sooner the farm returns to a highly productive period, the better off it will be in the next season. Early response offers you more management options, such as weaning times, culling practices, and marketing decisions. It also keeps plants healthier, allowing for faster post-drought recovery.

For more information related to drought conditions, see Publication 2426 *Mississippi Beef Cattle Producer Guide to Coping with Drought Conditions* at <http://extension.msstate.edu/publications/publications/mississippi-beef-cattle-producer-guide-coping-drought-conditions>.

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