

## IT'S ALL ABOUT THE LEAVES

*Dr. Gary Bates, Director  
UT Beef and Forage Center*

It won't be long before pastures across the state will begin to grow and be extremely productive. We know that the warmer temperatures have a lot to do with this growth. But we also need to realize that our management can have a huge impact on the yield of a pasture. The amount of fertilizer applied is one big factor. Another factor we often don't pay attention to is the amount of leaf area in the pasture.

One of the most important factors influencing forage growth is the amount of light that is absorbed by the plant. Because plants need sunlight to carry on photosynthesis, growth depends on sunlight, as long as the other nutrients are available (water, fertilizer, etc.). Because of this, the management of a plant's leaf area will influence yield. Look at the graph. Early as the plant begins to grow, there is not much leaf area available to capture sunlight. Most of the light is falling on the soil around the plant. Because of this, the growth rate during phase 1 is slow.

Since the plant can't produce the energy it needs to grow, its growth is dependent on stored energy from the roots. As the leaves begin to develop, more sunlight is captured, more energy from photosynthesis is produced, and less root carbohydrates are needed. This cycle begins to build on itself. More energy means more leaf growth, which captures more sunlight, which means more energy, producing more growth, and so on. Phase 2 is characterized by a very rapid growth rate. As the plant moves into phase 3, the leaves produced during phase 2 get older, are less efficient at photosynthesis, and growth rate slows. The amount of forage accumulated comes to a halt.

### **Overgrazing vs undergrazing**

This is basis for the benefit of rotational grazing. In phase 1, the forage quality is high, but quantity is low. The plant is depending on stored energy for its growth. If a plant is forced, through overgrazing to stay in phase 1, forage quality may be high, but eventually the plant may run out of energy in the roots, and will die. Some species are more sensitive to overgrazing than others. It is easy to kill alfalfa and orchardgrass by overgrazing, while bermudagrass and tall fescue are harder to kill.

If we let the plants go into phase 3 before grazing, we are ensuring that the plants are able to keep high levels of root carbohydrates, but we are letting a lot of forage get mature before we harvest, so forage is wasted. The best management is to let the plants get into phase 2, then graze them and force them back into phase 1. Then after they grow back into phase 2, graze them into phase 1 again. How do we do this? By splitting pastures and rotating cattle among the pastures.

As difficult as we would like to think rotational grazing is, it boils down to this simple point. Rotational grazing is used to manage the forage growth curve.

