

Fall 2002: What's Happened To The Small Grains Pastures?

Robert Morgan and Dewey Lee

Extension Agronomists

The University of Georgia

The Problem:

“My pastures are turning yellow and purple and are not growing!” While this is not a quote from a single person, it is a paraphrase of many calls received by county agents and forage agronomists this fall. This notice is to try and explain what is happening with small grain pastures and what producers can do about them.

The Cause:

First, all of the changes occurring in small grain pastures this fall are almost exclusively due to environmental conditions and not to disease. Four different environmental factors have come together this fall to shut down growth. The first was the above average rainfall received in October. Most agents reported rainfall amounts between 5 to 12 inches within a two-week period. This led to long-term saturation (greater than one week) of the soil. The second factor was that all of this rainfall was the result of cloudy days. Many days since October have been cloudy as well which also slows plant growth. The third factor is the loss of available fertilizer for the plants. This is the result of the excessive rainfall leaching fertilizer out of the root zone. In most cases, pastures would have recovered from these stresses by now if it were not for the fourth factor, the cold weather. Cold temperatures, particularly night-time lows below 45E F, cause small grain plants to grow slowly. These four factors have combined to leave pastures looking very poor.



The Plant:

To understand why small grain plants look the way they do, you must understand how the plants respond to these stresses. The first response is that plants grow shallow root systems due to saturated soils and low soil oxygen conditions. Examination of small grains root systems in many fields in south Georgia reveal a root system no deeper than three to four inches. A second response is the yellowing and browning of the older leaves. Lack of nitrogen is the cause and results from leached and saturated soils. Because of these shallow root systems and the high rainfall levels, much of the nitrogen applied at planting was carried below the root zone making it unavailable to plants. Saturated soils quickly become an anaerobic environment and denitrification occurred rapidly, which rendered remaining nitrogen unavailable to plants. In addition, small grain roots die in low soil oxygen conditions. This also hinders nitrogen uptake due to the lack of active root cells. As plants lose their ability to take nitrogen from the soil, they mobilize nitrogen from older leaves to younger leaves causing older leaves to yellow and die. New green growth and older yellow growth is a key characteristic used to identify nitrogen deficiency.

Why, then, have the pastures not responded to additional nitrogen or remain striped? The answer is simple: continued cold weather. In order for a pasture to “green up”, the new growth must cover over the older leaves that have yellowed and died. The cold weather of November and December have limited growth. The striping effect is caused in most cases by differences in residual nitrogen left from the previous crop or lay of the land.



The red or purple coloration seen on many leaves is a general response by plants to many stresses. When plants cannot make chlorophyll for some reason, the plant will make a purple pigment called anthocyanin. Several factors including saturated soils, lack of nitrogen, extended cloudy weather, and freezes will cause small grain plants to produce the anthocyanin.

The Recommendation:

Producers should graze the small grain pastures if the plants are 6 to 8 inches tall or have tillered well and apply 40 to 60 pounds of nitrogen. With a week or two of sunshine, warmer temperatures, and a little moisture, the small grain pastures should green back up and become productive again.