

## BREATHING THROUGH MY MOUTH

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A few weeks ago I got a head cold. My nose got all stopped up and I could only breathe through my mouth. It seemed like I had to constantly drink water, because my mouth was always dry. Having to keep my mouth open to breathe caused me to lose a lot of water.

This is very similar to what happens to tall fescue as it tries to grow. In order to photosynthesize, the plant needs carbon dioxide (CO<sub>2</sub>). The plant has specialized pores in the leaves called stomates. These open to allow CO<sub>2</sub> to enter in the leaf. The problem is that, while CO<sub>2</sub> goes in, water moves out. The loss of water through the stomates is called transpiration. During the spring it generally isn't a problem. Temperatures are cooler so the plants don't lose as much water, plus soil moisture is plentiful so plants can continue to take up water through the roots to replace the transpiration loss. During the summer, it is another matter. Soil moisture is reduced, plus higher temperatures cause higher water loss rates. Plants conserve water by leaving their stomates open for less time. This, however, means less CO<sub>2</sub> enters the leaves. Less CO<sub>2</sub> equals less photosynthesis which equals less growth.

Cool-season plants such as tall fescue, orchardgrass, and clover struggle with this problem during the summer time. They need high levels of CO<sub>2</sub> in the plant to grow, but they lose lots of water trying to keep their stomates open. These plants grow best when temperatures are in the 60-70 degree temperature range. Summertime temperatures in the 80-90 degree range cause cool-season plants to drop in the photosynthetic rate and growth.

In order to get better summer forage production, it is better to use warm-season grasses like bermudagrass, crabgrass, sorghum x sudangrass, etc. These grasses have an additional photosynthetic pathway that makes them more efficient with CO<sub>2</sub>. They do not need as high of a CO<sub>2</sub> level, so they don't have to leave their stomates open as long. This results in less water loss through transpiration. These plants grow best in 80-90 degree temperatures. All of this adds up to plants that are much better producers during the summer.

Why is this plant physiology lesson important? I would suggest several reasons. First, it helps you understand why some grasses grow during the summer and tall fescue during the spring and fall. Second, if you know a plant is either cool-season or warm-season, it helps you know when to expect production. Third, and most important, it helps you in forage management decisions on your farm. If you need help with forage production during the summer and periods of drought, it would be better to plant a few acres of a warm-season grass rather than to irrigate your tall fescue pastures. No matter how much water you apply, you can't change the fact that tall fescue growth is limited when temperatures get into the 80's and above.

If your tall fescue pastures are overgrazed, crunchy and brown, think about planting a warm-season grass next spring. This will help you make it through the hot, dry conditions of the summer.