

Grazing Impacts on Pasture Composition
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Much attention has been placed on the potential negative environmental impacts of grazing; however, grazing can be a powerful tool for improving pasture health and productivity. This has been realized for many years. In fact, Aldo Leopold listed the ax, plow, cow, fire and seeding as potential renovation tools in the early 1900s. These tools have changed little over the years and are as effective today as they were in the early 20th century. Grazing can diminish the competitive ability of plants like broomsedge and johnsongrass and improve the competitiveness of bermudagrass, bahiagrass and even clovers. Improper grazing, on the other hand, can decrease the competitiveness of desirable species like orchardgrass or switchgrass and encourage undesirable weedy species.

Why does grazing alter plant composition?

Defoliation can be an effective herbicide. An obvious example of defoliation is mowing or “bush hogging”. Mowing is nonselective since all plants are clipped to the same height. Taking advantage of animal’s *selective* grazing greatly increases the effectiveness of defoliation by “mowing” only certain plants. Repeated removal of top growth of preferred “weeds” like johnsongrass (or even briars and honeysuckle with goats) makes grazing a more effective and selective herbicide than mowing.

Why does uniform grazing discourage growth of some plant species and encourage growth of others? Another way to phrase this question is: Why are some plants more tolerant of grazing than others? The answer to this question depends on plant species and is not easy to answer. Possible reasons include (1) differential root storage of carbohydrates, (2) altered rooting depth (3) improved light penetration or growth habit differences.

Root carbohydrate storage

Carbohydrates stored in roots are the “savings account” of many forage plants. They are energy stores used for winter survival and for regrowth after defoliation. Plants species differ in root storage characteristics. For example, bahiagrass has large rhizomes that store adequate root carbohydrates for regrowth. These stores are replenished quickly because of the low growth habit of bahiagrass. Johnsongrass also has large rhizomes to store carbohydrates, but must use most of this energy to produce large upright leaves. Under continuous grazing, cattle typically select johnsongrass over bermudagrass and remove regrowth constantly. This frequent defoliation does not allow johnsongrass root reserves to replenish. With continuous “withdrawals” from the carbohydrate bank account to produce new leaves and no “deposits” the plant eventually runs out of energy and dies. Why doesn’t haying or mowing kill johnsongrass? The reason is simple- plants have ample time to replenish root carbohydrates in the period between hay cuttings.

Rooting depth

Overgrazing also affects root depth and in turn decreases competitiveness for water. Plants that are grazed preferentially and continuously for long periods of time will likely have shallower root systems than ungrazed plants. This gives ungrazed plants an advantage in rooting depth and water status and may, over time, alter the composition of plant species in a pasture.

For example, consider a typical “understocked and overgrazed” scenario observed in bermudagrass pastures. “Spot grazing” of bermudagrass in understocked continuously grazed bahiagrass/bermudagrass pastures can shift the balance of plant species toward bahiagrass or other competitive but less palatable species. This is because the areas of heavily grazed bermudagrass are at a competitive disadvantage. Nongrazed areas of bermudagrass and bahiagrass are busy converting sunlight to plant carbohydrates and thrive and expand. Intensive grazing management can help bermudagrass compete on a more “level playing field” by forcing cattle to graze all species present in the pasture equally.

Shading

Most people think of trees when effects of shading are mentioned; however, shading also occurs in undergrazed pastures. Light is the energy that fuels the plant factory. Light availability is critical to the survival and competitiveness of many forage species. I have previously written that white clover can be sensitive to shading in undergrazed tall fescue and bermudagrass. There are several other instances where grazing, mowing, or burning can “release” light to lower portions of the canopy and improve plant performance and persistence.

One practical example of shading occurs in overseeded bermudagrass or bahiagrass pastures. Rye, wheat, oats, ryegrass arrowleaf clover and crimson clover are all sensitive to low light levels. Grazing bermudagrass or bahiagrass residue to a 1-2” height before planting winter annuals increases the light available to seedlings and improves fall and early spring forage production.

Light relationships can be altered by other management practices. Burning bermudagrass hayfields in early spring removes thatch, exposes soil to light, and hastens greenup. Thatch removal also exposes stolons to light and encourages bermudagrass fields to thicken. Harvesting tall fescue for hay at the proper maturity (boot to soft dough stage) exposes lower portions of the plant to light and encourages tillering and regrowth. Results of harvesting hay on time are (1) higher quality hay (2) improved summer regrowth and (3) a potential August/September cutting if summer rains materialize.

While the above tips seem simple, keep in mind that balance must be achieved between light, forage quality and root carbohydrate reserves to improve the plant and animal performance from various forage species. There is no simple “one size fits all” solution for all farms.

As you can see, the cow can be an effective and economical pasture renovator. Simply through altering fertility and grazing practices, species like johnsongrass and broomsedge can be reduced in pastures without chemicals or plows. Altering grazing frequency and intensity can be used to improve the persistence of desirable species as well. Begin to think of pastures from the plant's perspective the next time you turn animals out to graze.