While Maintaining White Clover

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As winter draws to a close and hints of spring emerge, the new flush of green will undoubtedly contain a mix of both good and undesirable vegetation. Weed management decisions made during this period will determine whether cattle are receiving maximum yield and nutrition and how well our summer forage will recover from dormancy. As managers, we are also faced with the difficulty of controlling broadleaf weeds while still maintaining our clover population, understanding the benefits of this legume. Research conducted in permanent pastures across the region has evaluated the resiliency of established, perennial white clover and observed its tolerance to commonly-used broadleaf herbicides.

White clover (*Trifolium repens*) consists of three subtypes, which include Dutch, ladino, and intermediate. This cool-season perennial species performs well in pasturelands across the Southeastern U.S. in fine loam to clay soils that retain adequate moisture. It has a short-statured growth habit and spreads along the ground by lateral stems (stolons). These stems are capable of rooting where the nodes come into contact with the ground, helping the spread and establishment. White clover can be identified by trifoliate leaves, which consists of three round leaflets, often with a distinctive, white, crescent-shaped band on each. The characteristic white blooms usually appear mid- to late spring and continue into summer.

Figure 1. Typical mixture of spring grass forage and established white clover found in grazing pastures.

White clover is a tough species that can withstand abuse ranging from livestock trampling and grazing to mechanical disking and herbicide spraying. In addition, clovers belong to the legume family and are able to fix their own nitrogen, turning atmospheric nitrogen into a plant-available form. As a forage, white clover is highly palatable and often high in crude protein. When it comes to chemical weed control, it is not surprising that producers often hesitate to treat their pastures.

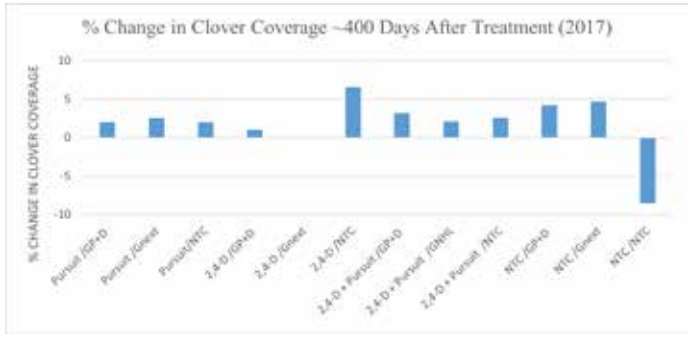

Table 1. Change in clover density from March 2016 to April 2017. Line 0 is the baseline measurement of clover coverage the previous year.
**NTC = non-treated check (no herbicide)*

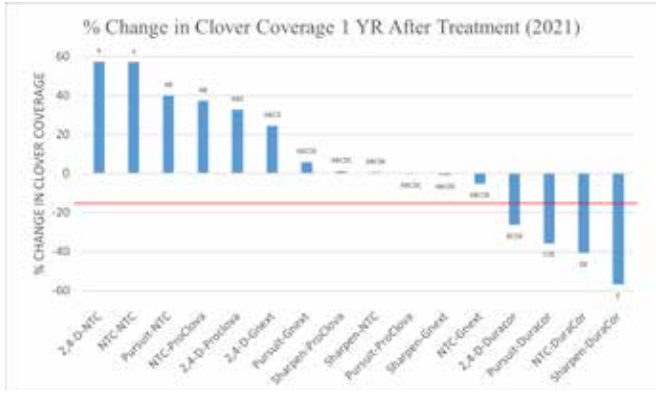

Table 2. Change in clover density from March 2020 to March 2021. Line 0 is the baseline measurement of clover coverage the previous year.

In at least three separate field trials, perennial white clover tolerance was measured in response to both spring and summer-applied herbicides typically used for broadleaf weed control. 2,4-D, Pursuit (imazethapyr), and Sharpen (saflufenacil) were spring-applied, followed by a June application of GrazonNext HL (aminopyralid + 2,4-D), Grazon P+D (picloram

+ 2,4-D), ProClova (florpyrauxifen + 2,4-D), or DuraCor (florpyrauxifen + aminopyralid). In the first study, surprisingly, white clover recovered from every herbicide application by 13 months after treatment. The only decline in clover occurred in areas not treated at all (Table 1). There are a few potential explanations for this, including (1) the herbicide application likely reduced broadleaf weed competition and stimulated clover growth, (2) the March applications were mild enough for clover survival, (3) the clover was already semi-dormant and was not as responsive to the June application, or (4) over time, the herbicide degraded or moved below the soil rooting zone enough for the white clover to recover.

A summary of two additional trials indicated that all spring/summer herbicide combinations, with the exception of summer-applied DuraCor, resulted in clover recovery equal to spring-applied 2,4-D or nothing at all (Table 2). Basically, these results suggest that established white clover can be difficult to kill.

In order to clean up spring pastures, at a time when target weeds are species such as buttercup (*Ranunculus spp.*), dandelion (T*araxacum officianale*), curly dock (*Rumex crispus*), plantain *(Plantago spp.*), and thistle (*Carduus and Cirsium spp.*), etc., an early application of 2,4-D is one of the best and most affordable options. Established white clover (Dutch) has consistently tolerated up to 1.5 pints of 2,4-D amine (3.8 lb/gal formulation) per acre with only temporary loss of blooms (Fig. 1). This rate will successfully control most of the broadleaf weeds previously mentioned when applied between March to early April at an early vegetative stage.

If herbicide applications of 2,4-D are made early to mid-spring, white clover often has at least two to three months of active growth remaining to recover if adequate rainfall and mild temperatures persist. This should provide time for plants to produce seed and to release small amounts of fixed nitrogen for the benefit of emerging summer forage grasses. By June, products containing aminopyralid (GrazonNext, Gunslinger AMP, or DuraCor) or picloram (Grazon P+D or Gunslinger P+D) become more viable options when targeting species like horsenettle (*Solanum carolinense*), dogfennel (*Eupatorium capillifolium*), ragweed (*Ambrosia spp.*), and pigweed (*Amaranthus spp.*), etc. because of their soil residual activity. These products are usually more harsh on desirable clover species, but applications at this point in the summer often allow clover to complete their life cycle. By the following spring, herbicides have usually broken down or moved downward through the soil profile, below the rooting zone.

As a reminder, this research focuses on established, perennial, white clover and is not a recommendation for practice in systems where annual clover is desired. Annual clover species usually have much lower tolerances to herbicides. There is a recommended one-year plant-back restriction of alfalfa and clover following applications of Grazon P+D, a four-month restriction following Pursuit, and a bioassay is required following the use of GrazonNext HL. Pursuit requires a 30-day grazing restriction while other herbicides previously mentioned do not have restrictions for grazing meat animals. It is important to always read and follow any pesticide label recommendations.

Disclaimer: Reference to specific products is not intended to be an endorsement of these products to the exclusion of others that may have similar uses.

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