

**White clover of the future is here!**  
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In past articles new grazing persistent white clover varieties that are “on the horizon” have been mentioned. Seed of these varieties are available this fall and should be seriously considered for addition to grazed pastures. Many beef producers already realize the benefits of including clover in pastures. Improved forage distribution, increased nutrient content, greatly improved animal performance (particularly on toxic tall fescue), and eliminated nitrogen requirements can all be achieved with a healthy stand of white clover. Yet few producers have actually gone to the extra effort to include clover in their pastures. Many feel that the short life of white clover (typically 1 ½ to 2 years) does not justify the investment. In this article I’ll discuss Durana and Patriot, two new highly persistent white clovers recently developed by Dr. Joe Bouton at The University of Georgia in collaboration with Drs. Derek Woodfield and John Caradus, AgResearch, New Zealand. Marketing and production rights for both Durana and Patriot were assigned to Pennington Seed, Madison GA and their partner Agricom, Ashburton, New Zealand.

**Durana and Patriot development**

To improve grazing tolerance of white clovers, Dr. Bouton collected plants that had survived several natural hot, dry summers from several locations in Georgia. These plants, called native ecotypes, were dug from pastures where clover had not been planted for many years. After transplanting offspring of these ecotypes into the harsh environment of the Central Branch Research and Education Center near Eatonton, plants were subjected to heavy continuous grazing with grass competition. Productive survivors were crossed and a promising entry (ultimately named Durana) was increased for further development. Durana has smaller leaves than ladino clovers, but produces many more “runners” or stolons, which allow aggressive spreading and excellent grazing tolerance. Durana flowers profusely for long periods, which may make it a more dependable reseed. Parent material that gave rise to Durana was also crossed with a virus-resistant ladino clover. The product of this cross, named Patriot, is also commercially available.

Small-plot testing of Durana indicates that it is highly persistent but slightly lower yielding than ladino-type white clovers during the establishment year (Tables 1 and 2). Even though Durana yields are lower than ladino varieties during establishment, Durana’s persistence overcomes these yield reductions after two to three years when ladino stands ultimately fail. Yield of Patriot is more like the ladino type (Table 1), but its persistence is superior to ladinos (Table 2). It is important to note that clipping trials likely overestimate the persistence of Regal ladino clover. Patriot’s increased yields make it an ideal choice for producers practicing rotational grazing who can effectively harvest this forage.

**Table 1. Clipped dry forage yields of white clover varieties near Athens, GA. Established Oct. 29, 1999. (Hoveland and Durham, unpublished data)**

<b>Entry</b>	<b>Establishment year 2000 yield (lb/A)</b>	<b>2000-2002 average (lb/A)</b>
Regal	4172	3969
Durana	3218	3834
Patriot	3816	4180

Grazing persistence is a far better predictor of clover performance than yield clipping trials because grazed clovers are frequently defoliated and treaded upon. Table 2 is derived from a study conducted by Dr. Carl Hoveland and Greg Durham at the Northwest Georgia Branch Station. In this study Durana, Patriot and Regal clovers were fall planted in bermudagrass sod and continuously grazed. Ground coverage of all clover entries was equal at the beginning of the study. After one year of grazing, basal coverage of Regal clover was significantly less than that of Durana or Patriot. This is important because basal coverage provides energy storage and growing points for good regrowth and survival of Durana and Patriot.

**Table 2. Percent basal coverage within row of white clover entries continuously grazed in bermudagrass sod. Planted October 1, 1999 at the Northwest Georgia Branch Station.**

<b>Entry</b>	<b>Percent basal cover March 31, 2000</b>	<b>Percent basal cover January 31, 2002</b>
Regal	77	6
Durana	90	65
Patriot	85	75

Performance of stocker steers grazing four year old pastures near Eatonton also demonstrates the benefits of Durana white clover persistence (Table 3). In this study, steers grazing toxic tall fescue and Durana gained almost 300% more per day and over 100 pounds more per acre than nitrogen fertilized toxic tall fescue. Regal white clover had essentially failed as indicated by low average daily gains (no tall fescue toxin dilution) and low gain per acre (low nitrogen fixation). We have continued grazing the excellent Durana pastures this year (Figure 1) while Regal stands had to be reseeded. Tall fescue stands overseeded with Patriot at the Northwest Georgia Station have also persisted well and improved performance of animals grazing toxic tall fescue.

**Table 3. Beef steer performance on tall fescue pastures with Durana white vs Regal ladino clover in central Georgia, fourth year after establishment, March 28-June 14, 2002. (Bouton, Andrae and Hoveland, 2003).**

<b>Pasture</b>	<b>Average daily gain (lb/d)</b>	<b>Lbs Gain per acre</b>
Toxic tall fescue + N	0.60	187
Toxic tall fescue + Durana	1.79	296
Toxic tall fescue + Regal	0.89	136

**Figure 1. Toxic tall fescue overseeded with Durana. Five year old stand at the Central Georgia Station near Eatonton Georgia. Approximately 45% white clover and 55% tall fescue on dry matter basis.**



**When and where should these new clovers be utilized?**

Durana and Patriot can be planted in areas where white clovers have been utilized in the past. Based on the animal performance responses observed near Eatonton, every properly grazed tall fescue pasture in Middle and North Georgia that contains adequate pH, P and K should be overseeded with either Durana or Patriot white clover. The 100+ pounds of nitrogen fixed annually by Durana and Patriot will more than cover seed costs. Consider the improved animal performance a nice bonus for your bank account.

The persistent nature and aggressive stolons of Durana and Patriot could also expand the area and forage species in which white clover can be dependably utilized. Durana has been successfully maintained in bermudagrass near Calhoun for two years under grazing. We are currently testing persistence of these new white clovers in warm season grass pastures of South Georgia. Studies are underway in Eatonton and Tifton to examine if Durana or Patriot can be utilized in bermudagrass. Through the hard work of excellent county agents and enthusiastic producers, several demonstration plots have also been established. Durana and Patriot demonstration plots are in place across the state from Franklin County to Brooks County and from Carroll County to Screven County. These plots are seeded in a variety of perennial sods (bahiagrass, bermudagrass and tall fescue) and will provide valuable “real world” persistence information. Durana and Patriot have persisted well in demonstration plots established in Fall 2001 with many

Regal and Osceola ladino clover stands already beginning to decline. Plantings from last fall are well established and will be continue to be grazed and monitored over the next few years.

### **Which should I plant - Durana or Patriot?**

Durana is the more persistent of the two varieties and should probably be the variety of choice for average producers in Middle Georgia. This variety is somewhat more tolerant of heavy grazing and drought conditions than Patriot. Cattlemen practicing rotational grazing or farmers located north of Gainesville would probably benefit more from Patriot. Proper rotational grazing allows increased Patriot yields to be utilized and likely temper the slightly decreased persistence (relative to Durana) of Patriot.

The marked improvement in persistence of these new varieties really makes Durana or Patriot the white clover of choice. I can see no reason not to pay the additional \$3-6 dollars per acre seed cost unless you are simply looking for a shorter lived ladino white clover.

### **Before you plant...**

The advantages of these new white clovers greatly offset any risk of failure during establishment. Establishment risks are reduced by following some simple practices in the months surrounding planting.

Test your soil to determine if lime or nutrients are needed for healthy clover stands. Most legumes are sensitive to soil pH, P and K levels. Lime should be applied to raise soil pH to 6.0. Potassium is mandatory for persistent and productive clover stands. A soil test is a cheap insurance policy for effective clover establishment.

Make sure residual activities of prior broadleaf herbicide applications have expired. 2,4-D has a short residual activity (2-3 weeks) and should not pose many problems for most clover seedings, but dicamba (Banvel or Weedmaster) has 120 days labeled residual activity and picloram (Grazon P+D) has residual activity for up to one year after spraying. Avoid planting clover on areas where herbicide activity will injure seedlings.

Plant at the proper time and depth. Clovers can be planted (3 pounds of coated seed per acre) with a no-till drill in early October. Seeds are small and should not be planted over ¼" deep. Insects (particularly pygmy crickets) can severely damage young seedlings in early autumn, so new plantings should be scouted closely. Half-moon "bites" in seedling leaves indicate insect feeding. Insecticide can be applied if insect feeding is severe. In late winter or early spring seed can be broadcast and trampled in with temporary heavy stocking rates. Broadcast applications are most effective from early-February through mid-March. Increase seeding rate by 25% to offset poor seed-soil contact if broadcast seeding.

Minimize grass competition immediately before planting and throughout the establishment period. *Grass is the enemy of seedling clover!* Grass competes with tiny clover seedlings for valuable light, nutrients and water. Graze pastures closely before planting and use flash grazing after emergence to provide light to clover. Light applications of paraquat are extremely helpful to suppress tight tall fescue sods. Do not apply nitrogen as this encourages grass competition and penalizes clover seedlings. Once clover is well established, it should fix over 100 pounds of nitrogen per acre annually.

Consider long-term needs for the pasture. These clovers are persistent and should remain in the pasture for many years. Do not establish Durana or Patriot white clover in pastures intended for hay harvest or stockpiling as clover will likely be lost to shading. Once white clover is established it will tolerate heavy grazing, but can easily be shaded out if pastures are improperly grazed or deferred in the spring or fall.

I encourage Middle and North Georgia beef cattle producers to try one of these new clovers, particularly in tall fescue pastures. I think you'll be impressed with their persistence and benefit economically from improved animal performance and decreased fertilizer needs.