

WINTER ANNUAL LEGUMES
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During this time of year and with the dry year that we have had, it really makes sense to think about incorporating some annual legumes into our winter pastures. This is a strategy that will work fairly well in most of Georgia. Unlike the use of winter annual grasses and small grains, winter annual legumes are much more complementary than competitive. This is especially true for our tall fescue-based pastures. Ryegrass, for example, hits its peak in April/May about the same time that our fescue will, but using an early-maturing legume like crimson clover will offer little competition. Of course, each farm operation will be slightly different because of the location, soil types, soil fertility, and grazing strategy. To help you determine which winter annual clover is best for your operation, a summary of the characteristics of the most common winter annual legumes is provided below.

Most Common Winter Annual Legumes in Georgia

Arrowleaf clover is best adapted to well-drained, sandy soils of the Coastal Plain that have a soil pH ≥ 6.0 . It is high in tannins which prevent bloat (and make it undesirable to horses). Some arrowleaf varieties can provide forage growth well into June, if weather permits. 'Yuchi' is a common variety that has performed well, but an improved variety from Texas called 'Apache' has superior resistance to virus problems. Arrowleaf also has a very hard seed coat (90% hard seed), which makes it ideal for natural reseeding when managed appropriately.

Berseem clover is more tolerant of the poorly-drained clay and loamy clay soils of Georgia, but also requires a soil pH ≥ 6.0 . However, it is generally not as cold-hardy as other annual clovers. Berseem can sometimes produce grazing in November/December, but it makes most of its growth from March – May. 'Bigbee' is the most common variety and it has performed well in yield trials throughout Georgia. However, it will occasionally winter kill in north Georgia.

Crimson clover has the best seedling vigor of these most common species and will tolerate soil pH values as low as 5.8, however it is not adapted to poorly drained soils. Crimson allows for earlier grazing (November – March) than the other annual legumes and matures earlier. There are several recommended varieties available including 'AU Sunrise', 'AU Robin', and 'Tibbee' that will consistently out-yield the old standby, 'Dixie.' Be careful to get good seed, however. Last year, a fair amount of crimson clover seed was sold in Georgia that had originated in other countries. Much of this seed was decimated by disease in early 2007.

Minimize Risk by Choosing Winter Annual Legumes

Certainly, there's nothing new about the risks in farming. Growing a winter annual crop is no different. The productivity of winter annual legumes is highly weather-dependent. Table 1 provides some historical data that illustrates this variability. Looking at the 3-year average, one would miss the fact that some species/varieties are very risky.

Table 1. Total annual forage yield of selected winter annual clovers at the Plant Science Farm near Athens, GA.

Clover Species	Variety	Year			3 yr. Average (1983-85)
		1983	1984*	1985*	
Arrowleaf	'Yuchi'	4920	910	5610	3810
Berseem	'Bigbee'	6900	0	3250	3380
Crimson	'Tibbee'	6040	2210	3060	3770

* There was a severe winter freeze in 1983-84 and in 1984-85 that caused substantial loss in both years.

Of course, the yield contribution of these winter annual legumes is not the only value of these legumes. In fact, some would argue that the forage productivity of these species takes a backseat to the value of the nitrogen that they provide to the system. Back when nitrogen fertilizer had been non-existent or at least hard to come by, producers knew just how valuable winter annual legumes could be to them. In the 1980's and 90's, legume nitrogen was more hassle than it was worth because nitrogen fertilizer prices were so low. As you are probably painfully aware, that's no longer the case. Fertilizer prices have essentially doubled since 2002. Growing winter annual legumes can help you hedge your bets on your nitrogen fertilizer bill by growing your own fertilizer. Table 2 shows data that illustrate how valuable biological nitrogen fixation can be to bermudagrass hay production.

Table 2. Total annual forage yield of 'Coastal' bermudagrass that had been overseeded with either crimson or arrowleaf clovers near Starkville, MS.*

Treatment	1965	1966	1967	1968
	----- dry lbs/acre -----			
Crimson + 200 lbs N/Acre	22500	22300	17500	24500
Arrowleaf + 200 lbs N/Acre	24000	21600	16500	27100
No Clover + 200 lbs N/Acre	17100	19800	15400	21600

* Source: Knight, W.E. 1970. Agron. J. 62:773-775.

On average, growing an annual legume in dormant bermudagrass sod added about 3500 lbs/acre when compared to fertilizing the bermuda with only 200 lbs of N per acre. From other studies, we know that the producer would have to add another 100-150 lbs of N per acre to get an additional 3500 lbs/acre with only N fertilizer. That equates to a fertilizer bill that will be \$40-75/acre higher. So that leads to this month's homework assignment. Would it be more profitable to grow the annual legumes or just buy in more nitrogen fertilizer? Which would be riskier, year-in and year-out: growing annual legumes or buying in more nitrogen fertilizer? Here's a hint: if your ciperin' shows that it is cheaper and less risky to buy the additional fertilizer rather than to grow an annual legume, you've probably done your math wrong.

To learn more about the benefits of growing winter annual legumes, visit our website at www.georgiaforages.com or contact your local University of Georgia Cooperative Extension office.