

## COOL SEASON FORAGE SYSTEMS FOR REPLACEMENT HEIFERS

September 2012 Georgia Cattleman  
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As the dog days of summer set in, we begin to yearn for those cool mornings that are just a few weeks away. In fact, now is a good time to begin giving some thought to our use of that cool season. It is at that time of year when we have the greatest opportunity to put cheap weight on our calves. With the current cattle cycle, some Georgia's cattlemen may be focusing on using these high quality great cool season forage options as they produce replacement heifers. In this month's article, we examine the cool season forage options that can provide the lowest cost.

### Our Competitive Advantage

The ability to produce high quality cool season forages in the fall, winter, and early spring gives our beef producers a competitive advantage. This is particularly true when raising replacement heifers. When raising replacement heifers, the goal is to keep the calves growing at a rate of 1.5 – 1.8 lbs per head per day to ensure the heifers are at the right size at the right time so as to be bred and put into the brood herd. Gains on cool season pastures can easily hit these benchmarks for gain. Other regions of the U.S. have a much shorter grazing season and their cattlemen rely more heavily on concentrate-based rations.

### Begin With the End in Mind

This is a case where it is important to focus on the goal and work backwards from there. The goal in developing replacement heifers is to ensure that they calve at 22 to 24 months of age. To do this, the heifer needs to have reached puberty at 12 to 14 months of age. However, puberty is a function of both age and weight, and weight is usually the limiting factor. As a rule of thumb, the heifer should be at 65% of her mature body weight before she is bred. Table 1 provides the target weight at breeding for different mature weights (and frame score).

**Table 1.** The influence of frame score and mature body weight on the target weight at breeding.

	Frame Score				
	3	4	5	6	7
Estimated Mature Weight, lbs	900	1000	1100	1200	1300
Target Weight for Breeding, lbs	585	650	715	780	845

The keys to successful replacement heifer development are to ensure that the heifer weighs 500+ lbs when weaned at 7 to 8 months of age and that the calf gains at a rate that ensures that she reaches puberty at the right age. By working backwards, one can determine the amount and rate of gain that the heifer needs in order to hit the benchmarks at the right time. Examples of breeds with medium and large frame scores are provided in Table 2. Note that the average daily gains (ADG) that are required for replacement heifers are relatively low. Gains above 2 lbs per head per day are usually unnecessary and can lead to breeding problems.

**Table 2.** Two examples of how to track the development of replacement heifers.

	Example 1	Example 2
Estimated Mature Weight, lbs	1100	1300
Target Weight for Breeding, lbs	715	845
Target Breeding Date	1-Mar	1-Mar
Weaning Weight, lbs	500	600
Weaning Date	1-Oct	1-Oct
Gain Required to Meet Target, lbs	715 - 500 = 215	845 - 600 = 245
Days from Weaning to Breeding	1-Mar. - 1-Oct. = 151	1-Mar. - 1-Oct. = 151
Avg. Daily Gain Needed, lbs	215/151 = 1.42	245/151 = 1.62

### Cool Season Forage Options

There are two major types of cool season forages for Georgia cattle producers: cool season annual forages (statewide) and tall fescue (North Georgia). Since cool season annuals can be used across all of Georgia, let us begin with those options.

**Cool Season Annuals:** In general, cool season annuals are high in crude protein and very digestible (Table 1). Research suggests that heifers could gain an average of 1.8 to 2.3 lbs per head per day on productive, well-managed cool season annual pastures with little or no supplementation. It is generally useful to combine a small grain (usually rye) with annual ryegrass, either with the individual species in separate paddocks or as mixtures within a paddock. Since rye produces more forage early and ryegrass tends to produce more forage later, using both species (either in a mixture or in different areas) provides better distribution of forage production. However, animal performance depends on the species/combination and the time of the year. Table 3 provides results from a study of various small grain combinations with annual ryegrass at the Univ. of Arkansas. Though this study was conducted with steers, one can get a sense as to the gains one might expect from replacement heifers in such systems, as well.

**Table 3.** The effect of cool season annual mixture on steer gains in SW Arkansas.

	ORG <sup>†</sup>	RG	RRG	TRG	WRG
ADG (lbs/hd/d) <sup>‡</sup>					
Winter	1.2	0.7	1.4	1.1	1.2
Spring	2.5	2.6	2.4	2.1	2.4
Stocking rate (head/acre)	1.5	1.5	1.5	1.5	1.5
Gain (lb/acre)	253	239	281	219	256

<sup>†</sup> ORG = oats + ryegrass; RG = ryegrass; RRG = rye + ryegrass; TRG = triticale + ryegrass; WRG = wheat + ryegrass.

<sup>‡</sup> Grazing began in early winter (early January) and continued through early May in each system.

Legumes are generally higher in protein and more digestible than cool season annual grasses, and can also be used in these winter annual mixtures. However, care should be taken to avoid excessive gains. High percentages of some legumes can also lead to bloat or high phytoestrogen levels.

**Tall Fescue:** For cattlemen in north Georgia, tall fescue is still a great option as a base forage. When adequate moisture is available, tall fescue will provide excellent grazing in spring, fair to good grazing from June through early July, and good grazing in the fall. However, tall fescue productivity in the fall is highly dependent on rainfall. Much of the tall fescue in Georgia owes its durability to an endophytic fungus (*Neotyphodium coenophialum*) that grows within the plant. Unfortunately, this fungus also produces toxic alkaloids which causes several metabolic problems (collectively termed “fescue toxicosis”) in animals consuming endophyte infected varieties. These problems often lead calves to have ADGs of less than 1.0 lbs/head/day.

**Table 4.** The effect of tall fescue endophyte status and the use of white clover in the pasture on stocker performance.

	ADG (lbs/hd/d)	Gain (lb/acre)
Toxic Endophyte	1.1	126
Novel Endophyte	1.8	186
Toxic + White Clover	1.6	150
NE + White Clover	2.6	252

For replacement heifer development systems, it is recommended that cattlemen use novel-endophyte tall fescue pastures or at least incorporate white clover into their endophyte-infected tall fescue (Table 4). Endophyte-free varieties are available but generally last for less than 2 years and are not recommended. More information about novel endophyte-infected tall fescue is available in the Extension bulletin entitled “Novel Endophyte-Infected Tall Fescue” (<http://pubs.caes.uga.edu/caespubs/pubcd/C861/C861.htm>).

The addition of legumes to tall fescue pastures has only a minimal impact on total forage yield. However, including a legume increases the quality of the pasture and results in the addition of biologically-fixed nitrogen. The effect of these two factors result in increased ADG and gain/acre and a substantial decrease in the total cost of the forage system. Research in Alabama has shown that tall fescue-based pastures where legumes were used provided the lowest cost of gain of any forage system. A number of cool season legumes are used in Georgia. However, there are two forage legumes that fit best with tall fescue: white clover and red clover. In general, the best clover for replacement heifer development is white clover.

### More Information

More detailed information on the various forage systems that are suitable for replacement heifer production can be found on our website, [www.georgiaforages.com](http://www.georgiaforages.com). If you have additional forage management questions, visit our website or contact your local University of Georgia Cooperative Extension office by dialing 1-800-ASK-UGA1.

### got questions?

Have a question or topic that you want Dr. Hancock to address? Email him at: [questions@georgiaforages.com](mailto:questions@georgiaforages.com).