

Southern Belle and Cherokee Red Clover in Florida ¹

K. H. Quesenberry and A. R. Blount²

Red clover (*Trifolium pratense* L.) is a high-quality forage legume that can be grazed in late winter and early spring or used as a hay crop. It can be grown throughout Florida when planted on the proper soil type. Prior to the development and release of Cherokee in 1994 and Southern Belle in 2004, the only red clover cultivars available to Florida producers had been bred and developed in the central and upper Midwest. These Midwestern cultivars tended to have a high degree of winter dormancy and were slow to begin growth in the spring. Cherokee and Southern Belle were bred and developed in north-central Florida, and were specifically selected for earlier spring production. Figure 1 shows a comparison of first flowering dates which are indicative of when early spring growth begins of these clovers. Note that when Southern Belle and Cherokee are compared with Kenstar (developed in Kentucky), Cinnamon (developed in Indiana), and Marathon and Scarlet (developed in Wisconsin), Southern Belle and Cherokee reach full flowering (approximately April 15 in North Florida) before other cultivars have begun spring growth and flowering. First harvest date and total seasonal yields (Table 1) in spring/summer 2005 at the Agronomy Forage Research Unit near Gainesville of Southern

Belle and Cherokee compared to Freedom! (developed in Kentucky) and Marathon (developed in Wisconsin), reflect this earlier forage production. Table 2 shows similar data from plots grown at the North Florida Research and Education Center at Quincy, FL in 1999 and at the North Florida Research and Education Center at Marianna, FL in 2005 (Table 3). Note that first harvest yields of the Florida-bred cultivars are more than double that of more northern-developed cultivars. Although total seasonal yields of some other cultivars approach Southern Belle and Cherokee in some years, the most crucial period of forage deficit in Florida is late winter/early spring when Southern Belle and Cherokee show maximum yields. These two Florida-developed cultivars are the only semi-nondormant red clover cultivars currently available to producers.

Cherokee was the first red clover cultivar to exhibit any level of root-knot nematode (RKN) resistance. Cherokee has been tested throughout Florida, as well as many areas of the southeastern U.S. It has superior resistance to RKN when compared to cultivars developed in more northern states, and will be equal to these cultivars in total

1. This document is SS-AGR-40, one of a series of the Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Revised October 2006. Please visit the EDIS Web site at <http://edis.ifas.ufl.edu>.

2. K. H. Quesenberry, professor, Agronomy Department; A. R. Blount, associate professor, North Florida Research and Education Center--Marianna, FL; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. U.S. Department of Agriculture, Cooperative Extension Service, University of Florida, IFAS, Florida A. & M. University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Larry Arrington, Dean

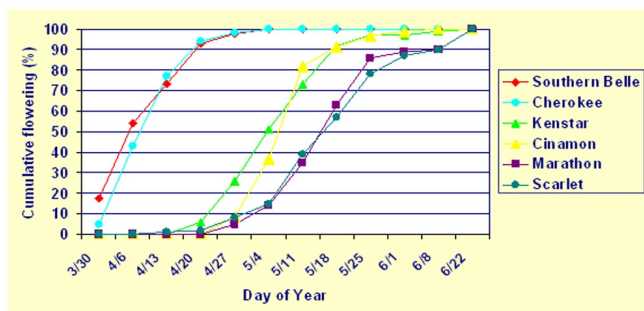


Figure 1. Percentage of plants of six red clover cultivars flowering on a given date in spring at the Agronomy Forage Research Unit near Gainesville, Florida in 1998.

seasonal yield at least as far north as middle Tennessee. Southern Belle was developed by additional selection for RKN resistance in Cherokee. It is similar to Cherokee in early spring production and total yield, but has superior levels of RKN resistance. This trait should be beneficial to producers desiring to plant red clover in rotation with vegetables, peanuts, or on other sites known to be infected with RKN.

PLANT DESCRIPTION

In northern states, red clover is a short-lived perennial legume that grows from 1 to 3 years. In Florida, it is grown primarily as a winter annual. With proper late spring/summer management, good reseeding of Southern Belle and Cherokee can be obtained. In northwest Florida some plants may persist through the summer and even into a second season (Figure 2). Red clover is an erect-growing bunch-type plant with no rhizomes or stolons, having numerous leafy stems arising from a thick crown. It has a taproot system with many secondary branches. It can be utilized as both a grazing or hay crop and can make excellent hay during the typically low rainfall months of April and May in Florida.

SITE SELECTION

Cherokee or Southern Belle red clover should be planted on sites that do not flood but are moist, and on soil types that are higher than average in organic matter or clay content. They can also be successfully grown on sands underlain by clay. Planting on deep, droughty sands is not recommended.



Figure 2. Red clover growing in August in a bahiagrass pasture.

LIMING AND FERTILIZATION

Red clover will grow best on soils with a pH near 6 to 6.5. Soils should be tested, then limed and fertilized according to soil-test results. Lime should be applied 6 months in advance of seeding in order to neutralize the soil acidity. If soil testing is not performed, a seasonal application of 60 lb P_2O_5 and 160 lb K_2O per acre will usually be sufficient to support good growth. The K_2O should be applied in two applications, 80 lb at seeding or soon after and 80 lb after the first grazing or harvest.

SEEDING

In Florida, red clover should be planted from October 1 to November 25. In north Florida, if possible, plant during the first half of the above planting period and in south Florida plant during the last half of the planting period. Use 12 to 15 lb of seed per acre. Lower seeding rates of 8 to 10 lb/A may be used if high quality seed is planted into a clean, tilled seedbed and irrigated at seeding time. Seeding rate may be reduced one-third if planted with a cool-season annual such as rye, ryegrass or crimson clover.

Red clover can be seeded on clean-cultivated land or overseeded in a perennial grass pasture. On clean cultivated land, the seedbed should be firmed before seeding. The clover seed may be planted with a grain drill that has a small seed attachment, a corrugated roller seeder, or a cyclone-type seeder. If a cyclone-type seeder is used, the seedbed should be

rolled before and after seeding. This helps to ensure proper planting depth and prevents freshly worked soil from drying out too quickly. The proper planting depth for red clover is 1/4 to 1/2 inch deep.

When red clover is overseeded in a perennial grass pasture, the pasture should be grazed closely or the excess forage removed as hay. This allows the germinating clover seedlings to receive sunlight. Go over the pasture with a lightweight disk or chopper, plant, then roll or cultipack. Disking is needed to turn up enough soil for good soil-seed contact. Using a roller helps to cover and firm soil around the seed allowing satisfactory germination and nodulation. Sod seeding with a pasture drill also works effectively if excess forage has been removed. It may be easier to obtain good stands of clover in new grass sods (planted the previous summer) or in bermudagrass than in well-established bahiagrass sods. In a warm fall, the planting dates for overseeding should be delayed until the growth of the perennial grass has slowed by cool temperatures and early frosts (3 to 4 weeks). Do not apply and N fertilizer to grass sods in which red clover is being established.

The clover seed should be inoculated with nitrogen-fixing bacteria just before planting. Moisten the seed with a sticker solution, and then mix red clover type inoculant with seed. Always keep the inoculant and the inoculated seed in a cool place out of direct sunlight. Try to seed only in moist soil because hot, dry conditions reduce effectiveness of the bacteria. Southern Belle and Cherokee seed may be sold pelleted and pre-inoculated with the appropriate bacteria.

USE

Red clover may be rotationally grazed, harvested as green chop, or made into hay. Red clover grown in pure stands or in combination with a small grain or ryegrass has been used to provide high quality grazing for stocker cattle, replacement and first calf heifers, or as a supplement for mature cows. When grazing a pure stand, a bloat control product should be used. It is usually ready for grazing by March 1. When grazed, red clover will retain a higher quality and be more productive if grazed rotationally. It may

be grazed continuously if stocked at a medium rate, but stocking should not be so light that plants are allowed to mature. Since the feed value of leaves is greater than that of the stems, the objective of either rotational or continuous grazing is to maintain a canopy of primarily leaves and developing stems with few to no mature stems. Red clover should not be grazed as close as white clover.

Red clover may be the best hay plant of any of the cool-season legumes found in Florida. It should be cut for hay at 1/4 bloom stage, or when blooms first appear. It recovers quickly after cutting even when cut at an advanced bloom stage. If rainfall is evenly distributed or if moisture is provided by irrigation, red clover may be cut every 32 to 40 days after the first harvest for a total of 3 to 4 harvests. Using the crop for both grazing and hay may be useful to some producers. For both grazing and haying, a combination of ryegrass and red clover could be grazed until mid-April when the cattle would be removed to allow the crop growth to accumulate for a hay harvest. Dairymen have used chopped red clover hay successfully in their rations.

SUMMARY OF MANAGEMENT RECOMMENDATION

1. Plant Southern Belle and Cherokee red clover on land that is fertile and well-drained. Use irrigation if available to ensure good stands and high yields.
2. Test your soil. Lime soils to a pH of 6 to 6.5.
3. Determine phosphorus and potash needs from a soil test. Apply phosphorus and potash at seeding or when clover seedlings emerge. Apply additional potash after the first cutting is made.
4. Make sure the seed are properly inoculated with the correct type of inoculant. Do not plant in hot, dry sand. Wait until soils are moist.
5. Prepare a firm, compact seedbed and plant at proper depth, usually 1/4 to 1/2 inch deep. Use 8 to 15 pounds of seed per acre. Use the lower rates when seed are planted with a drill or other precision type planters. Use higher rates when seed are broadcast.

6. When overseeding perennial grass pastures, reduce top growth of grass as much as possible. For broadcast plantings, lightly disturb the soil surface so that red clover seed will be covered with soil.
7. Do not apply N to grass sods in which red clover is being established or grown, since N fertilization increases grass competition and reduces efficiency of nitrogen fixation by the red clover plants. If red clover is planted on a clean, tilled seedbed with rye, oats, or ryegrass, a small amount of nitrogen may be included in the fertilizer applied at planting time in order to allow the cool-season annual grasses to establish.
8. Provide irrigation during drought periods.
9. The forage portion of red clover is composed of approximately 50% leaves and 50% stems. The feed value of the leaves is greater than that of the stems. Leaf loss can be minimized by harvesting as green chop or haylage. Higher leaf loss occurs with baling or grazing. Care should be taken when tedding the hay to minimize leaf loss during curing.

Table 1. Cherokee and Southern Belle red clover dry matter yields (lbs/A) compared to two northern adapted red clover cultivars grown at the IFAS Forage Research Unit near Hague, FL – 2005.

Red Clover Cultivars	Harvest Dates			
	April 4	May 10	July 12	Total
Cherokee	2060 a*	1800 a	1690 a	5550 a
Southern Belle	1700 a	1730 a	1430 a	4860 ab
Freedom	720 b	1330 b	1100 b	3150 c
Marathon	870 b	1740 a	1920 a	4530 b

* Means followed by the same letter are not significantly different ($P > 0.05$).

Table 2. Red clover dry matter yields (lbs/A), relative maturity and mildew ratings, North Florida Forage Trials, NFREC-Quincy – 1999.

Cultivar	Harvest Dates						Maturity** 1-5	Mildew [†] 1-5
	March 3	April 4	June 6	Aug. 8	Sept. 9	Total		
Cherokee	426 a*	3257 a	2531 cd	1197 bc	166 bc	7576 a	5	3
Southern Belle	260 b	2750 bc	2246 de	1143 bc	255 bc	6654 ab	4	2
Kenland	161 cd	1888 d	2566 c	2037 a	493 a	7145 ab	5	4
Cinnamon	40 e	1142 e	3376 a	1586 ab	126 bc	6270 bc	1	4
Marathon	58 e	1113 e	2998 b	1311 bc	58 c	5538 c	5	3
Redland III	90 de	1387 e	3231 ab	1492 b	103 bc	6303 bc	5	3

* Means followed by the same letter are not significantly different ($P > 0.05$).

**Maturity rating based on a relative 1-5 comparison of cultivars and experimental lines where 1=early maturing to 5=late maturing.

[†]Mildew rating based on a relative 1-5 comparison of cultivars and experimental lines where 1=no apparent mildew to 5=leaves dead from mildew.

Table 3. Red and Arrowleaf clover dry matter yields (lbs/A), North Florida Forage Trials, NFREC-Marianna – 2005.

Cultivar	Harvest Dates		Total
	April 14	May 26	
Cherokee	2213 bc*	2510 a	4722 abc
Southern Belle	2873 ab	1500 bcd	4373 abcd
Marathon	898 e	1069 d	1968 e
Freedom!	2027 bcd	1931 abc	3958 bcd
Kenland	1455 cde	1737 bcd	3193 cde
Yuchi Arrowleaf	1032 de	1188 cd	2220 e
Apachi Arrowleaf	1789 cde	1322 cd	3111 e

* Means followed by the same letter are not significantly different ($P > 0.05$).