



Red Clover Variety Trials 2008-2009

Greg Durham, Forage Research Technician, UGA-Athens
 Dr. Dennis Hancock, Forage Extension Specialist, UGA-Athens

Table of Contents

Introduction to Red Clover	1
Description of the Variety Trials	2
Red Clover Yield Trial Summary	2
Stand Assessments (Grazing Trial) – Eatonton	3
Yield by Harvest Date – Athens	3
Weather during Trials	4

Introduction to Red Clover

Adaptation: Entire state. Survives 2 years in north GA, is an annual south GA. Fairly drought tolerant. Tolerates more soil acidity and poorer soil drainage than alfalfa.

Establishment: Plant seed at 6 - 8 lb/A in drill rows or 12 - 15 lb/A broadcast on prepared land during September-October. Excellent for overseeding closely grazed grass sods during December-January in south GA or February-March in north GA.

Recommended Varieties: North GA – Bulldog Red, Cimarron Plus, Kenland, and Redland Max
 South GA –Cherokee and Southern Belle (both are nematode resistant and non-dormant).

Red clover is a short-lived perennial legume that is adapted to a fairly wide range of soils. It is deep-rooted and, like alfalfa, does best on well-drained sites. It is more tolerant of lower fertility and soil acidity than alfalfa, but it does best and persists better under good fertility. Red clover stands generally start to thin in the second year. Some stands in Georgia have persisted for several years (most likely a result of reseeding). Red clover is best adapted to heavy, fertile soils in north Georgia and can be seeded into tall fescue or orchardgrass stands along with white clover. However, red clover does not tolerate close grazing and will not produce or survive well in continuously stocked pastures. Diseases also may limit stand life during cool, moist springs.

In some areas of south Georgia, red clover is used as an annual to overseed pastures or mix with a small grain or ryegrass. Some varieties are available that are resistant to root-knot nematodes and well-adapted to sandy loam and loamy soils in the Coastal Plain. These varieties are usually less winter dormant and produce more spring and autumn forage than other varieties. Though these more winter-active varieties are well suited to south Georgia, they may be less winter hardy than other varieties and not well suited for north Georgia. Regardless, red clover should not be planted on droughty soils such as deep sands.



Red Clover (*Trifolium pratense*)

Description of the Variety Trials

Red clover variety entries were solicited from the companies who sell them. These companies were charged an entry fee for each variety they entered and for each location in which the variety was tested. This entry fee helped to cover some of the costs of the variety trial.

The tests were planted at Georgia Agriculture Experiment Station (GAES) facilities and maintained by experienced research technicians and other GAES staff under the supervision of the State Forage Extension Specialist. The red clover trials were established and managed using standard practices as recommended by UGA Specialists. Unless otherwise indicated, the trials were established by drilling the red clover seed into a well-prepared seedbed at the rate of 8 lbs of pure live seed (PLS) per acre. Specific planting dates for individual locations are described in the Yield by Harvest Date sections. Soil fertility was maintained in accordance with soil fertility recommendations.

Two types of variety trials were conducted. The first type is the yield trial. Yield-type variety trials simulate forage productivity under a well-managed rotational grazing regimen. Red clover tests generally continue for only two years. Tests are only ended before two years when the stands of the majority of the entries deteriorate below 60% basal area coverage (60% stand). If the variety trial failed to maintain this threshold for the two years because of stand deterioration, a footnote is added to describe when and why the study was terminated.

The second type of variety trial is the grazing persistence trial. In this trial type, red clover varieties were planted and managed similar to the yield trials. Once the stand was well-established (i.e., stands exhibited stoloniferous spread), however, the plots were subjected to continuous grazing pressure by mature beef cows during the growing season of the three years of the trial. The result of this grazing pressure was a simulation of severe over-grazing. Stands were assessed using a quantitative measure of the plot area that is covered by living red clover plants after harvest (basal area coverage). This stand assessment usually was made during the dormant season (winter).

Statistical analyses were performed on all data to determine if the numerical differences were truly the result of varietal differences or just random differences. To determine if two varieties are truly different, compare the difference between them and the LSD (Least Significant Difference) at the bottom of the column. If the difference is equal to or greater than the LSD, the varieties are truly different when grown under the conditions at the given locations. The comparison is aided by the fact that the values in bold font are not significantly different from the best variety at that time and location. In addition, values sharing the same letter are not different. NS indicates no significant differences were observed. The Coefficient of Variation (CV) is a measure of the variability of the data and is included for each column of means when differences exist. Low variability is desirable (generally, a CV less than 15%).

Red Clover Yield Trial Summary

Table 1. Forage yield of red clover varieties averaged over the 2008-2009 growing seasons in Athens, GA.[†]

Variety	Athens 2-yr Average (2008-09) (dry lbs/acre)
FL4X [§]	8876 a[‡]
FLMD [§]	8531 ab
Redland Max	8308 ab
Freedom	7865 bc
PG 606 [§]	7468 c
GAC1RC [§]	7445 c
CV %	9
LSD _{α=0.05}	693

[†] Planted on October 7, 2007. Note: stand assessments were not conducted on this test.

[‡] Values within a column that are labeled with the same letter were not significantly different ($\alpha=0.05$) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

[§] Experimental variety (not available).

Stand Assessments (Grazing Trial) – Eatonton

Table 2. Percent basal cover of red clover varieties in the grazing persistence trial at Eatonton, GA. 2007-2009. †

Variety	Percent basal cover within row		
	July 14, 2007	Jan. 4, 2008	Dec. 4, 2008
RedlandMax	80 a	35	3
Southern Belle	53 b	25	2
GA 100 PVP§	56 b*	37	3
CV %	21	-	-
LSD $\alpha=0.05$	19.3	NS	NS

† Planted: November 1, 2006.

* Values within a column that are labeled with the same letter were not significantly different ($\alpha=0.05$) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

§ Experimental variety (not available).

Yield by Harvest Date – Athens

Table 3. Forage yield of red clover varieties at Athens, GA. 2008-2009. †

Year	Variety	Dry Matter Yield					Total
		dry lbs/acre					
		Harvest Date					
2008		April 18	June 3	July 9	Aug. 28	Nov.13	
		lbs/acre					
	FL4X§	2536 a†	3697 a	823 a	1066 a	1699 a	9821 a
	FLMD§	1933 b	3539 a	676 ab	843 b	1424 a	8415 b
	Redland Max	1346 cd	3211 ab	858 a	1120 a	1641 a	8176 b
	GAC1RC§	1725 bc	3724 a	429 c	742 b	1087 b	7707 b
	PG 606	1295 cd	3156 ab	537 bc	696 b	936 b	6620 c
	Freedom	1053 d	2813 b	759 a	805 b	1012 b	6442 c
	CV %	25	14	22	19	17	9
	LSD $\alpha=0.05$	541	626	193	222	290	981
2009		Apr. 22	May 26	July 8	Aug.14	Oct.2	Total
	Freedom	2910	2151 ab	1550 a	577 a	2100	9288 a
	FLMD§	2855	2083 ab	1589 a	327 bc	1793	8647 ab
	Redland Max	2819	2123 ab	1058 b	465 ab	1974	8439 ab
	PG 606	2365	2267 a	1288 ab	479 ab	1917	8316 abc
	FL4X§	2731	1880 b*	1025 bc	277 c	2017	7930 bc
	GAC1RC§	2823	1551 c	692 c	323 bc	1793	7182 c
	CV %		13	22	29		11
	LSD $\alpha=0.05$	NS	328	355	157	NS	1167

† Planted on October 7, 2007. Note: stand assessments were not conducted on this test.

* Values within a column that are labeled with the same letter were not significantly different ($\alpha=0.05$) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

§ Experimental variety (not available).

Weather Data during Trials:

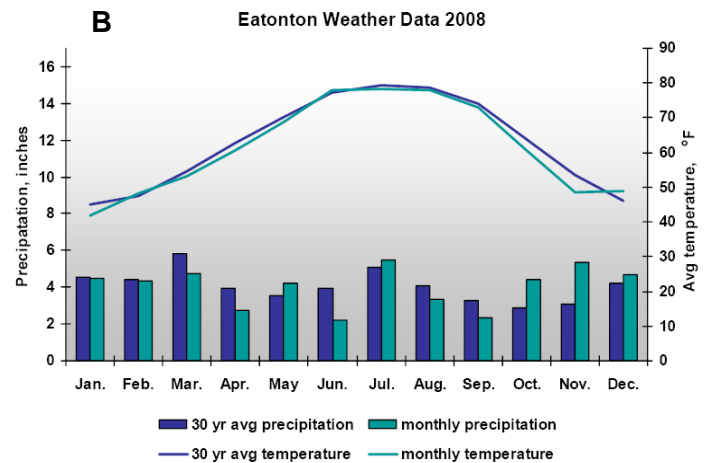
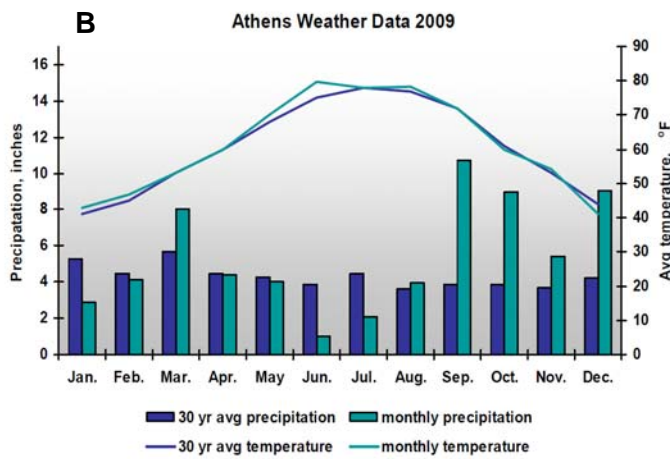
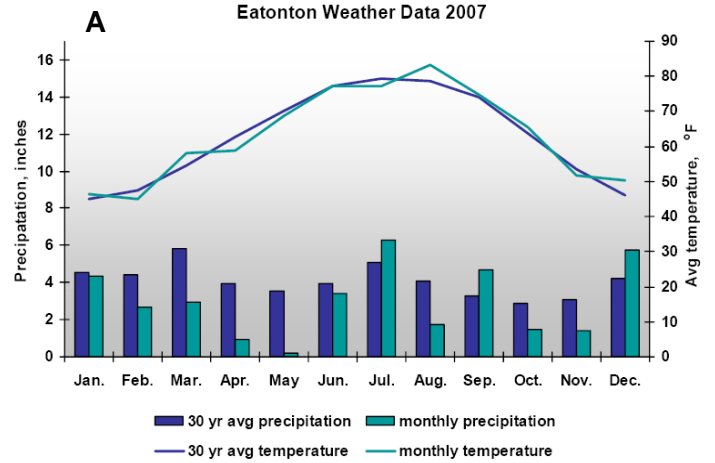
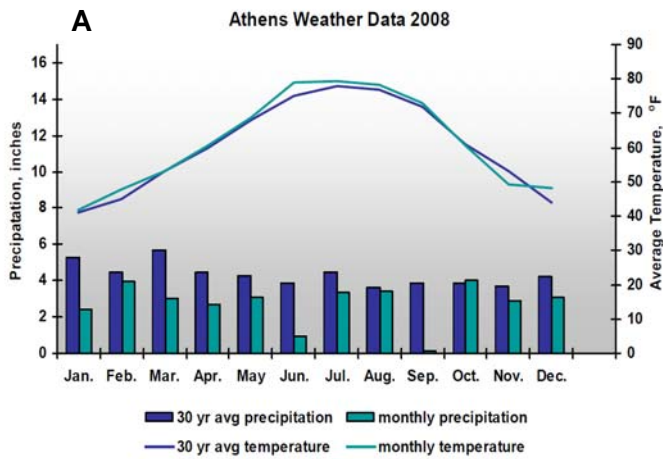


Figure 1. Weather data during the 2008 (A) and 2009 (B) growing seasons in Athens, GA.

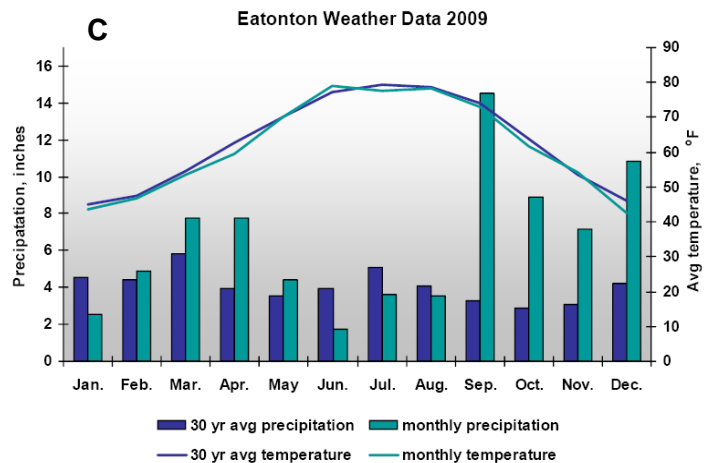


Figure 2. Weather data during the 2007 (A), 2008 (B), and 2009(C) growing seasons in Eatonton.

Learning *for* Life

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. Cooperative Extension, the University of Georgia College of Agricultural and Environmental Sciences, offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, gender or disability.

An Equal Opportunity Employer/Affirmative Action Organization Committed to a Diverse Work Force

CSS-F047

March 2010

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, The University of Georgia College of Agricultural and Environmental Sciences and the U.S. Department of Agriculture cooperating.

J. Scott Angle, Dean and Director