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Performance of

R I D

C L O V E R

VARIETIES IN ALABAMA

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PERFORMANCE OF RED CLOVER VARIETIES IN ALABAMA

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Red clover is a short-lived but productive perennial forage legume that is more tolerant of soil acidity than alfalfa. It remains productive for 2 years in northern Alabama but may persist only 1 year on sandy soils in southern Alabama where nematodes are a serious problem. Red clover, unlike crimson or arrowleaf, is not a dependable natural reseeder. Diseases such as southern anthracnose and powdery mildew can be serious problems, and improved disease resistance is needed in new varieties.

Red clover is an excellent plant for overseeding tall fescue sod as it provides high quality grazing well into midsummer and often into autumn. It can also be planted on prepared land either in a pure stand for hay production or in mixtures with small grains and ryegrass where a long grazing season is desired.

Five red clover variety trials were conducted in Alabama during the years 1977-80. Red clover entries were planted in rows 6 inches apart using plots 4 x 20 feet with 4 replications. The tests were planted in late September or early October and harvested with a flail-type harvester 2 to 4 times each year. A sample of green forage was collected from each plot at each harvest and was oven dried for dry matter determination.

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Red clover entries in the trials were as follows:

- Kenland - Developed by the Kentucky Agricultural Experiment Station and USDA. This persistent variety, highly resistant to southern anthracnose, was released in 1947.
- Kenstar - Released by the Kentucky Agricultural Experimental Station and USDA in 1973. This somewhat later maturing variety has greater persistence and more resistance to virus diseases than Kenland.
- Redland - This southern anthracnose-resistant variety with tolerance to powdery mildew and northern anthracnose was developed at the University of Illinois and is marketed by North American Plant Breeders, Ames, Iowa.
- Redman - This variety was selected for improved persistence by Farmers Forage Research in Indiana.
- Redmor - A variety selected for resistance to southern anthracnose and powdery mildew. Marketed by Huffman Seed Co., in Pennsylvania.
- Tristan - Selected for persistence. Resistant to northern but not southern anthracnose. Marketed by Stanford Seed Co., Buffalo, New York.
- Florie - Good resistance to powdery mildew, northern and southern anthracnose. Late maturing. Adapted for use in southeastern United States. Northrup King Co., Minneapolis, Minnesota.
- Mega - Resistant to northern and southern anthracnose, good resistance to powdery mildew. Northrup King Co., Minneapolis, Minnesota.
- K8-110, K8-112, and K4-183 - Unreleased experimental red clovers developed by Northrup King Co., Minneapolis, Minnesota.
- RHA-1 - Local ecotype of red clover that has reseeded for many years on the Richard H. Arrington farm near Montgomery, Alabama.

RESULTS

Red clover is well adapted to northern Alabama. At the Tennessee Valley Substation the top yielding red clover varieties the first year were K4-183, K8-110, and Redland, table 1. Florie, Tristan, Kenstar, and Redmor also performed well. During the second year, the highest producing entries were K4-183, Kenland, Kenstar, Florie, Mega, and K8-110, table 2. RHA-1 was the lowest yielding entry both years, table 1. There was considerable difference among entries in spring production.

Forage yields were especially high the first year at the Sand Mountain Substation in northeast Alabama, ranging from 3 to 5 tons per acre, table 3. Although numerical differences among entries were large, there were few significant differences. Yields declined the second year, a result of severe drought, table 4. Again, there were few differences among varieties.

At the Upper Coastal Plain Substation in northwestern Alabama, first-year yields were somewhat lower than at other northern Alabama locations, table 5. Some varieties, particularly Redman and Redmor, made especially early growth. Total yields were similar for most varieties. Second-year yields showed Kenland and Kenstar as top producers, table 6.

Red clover yields were somewhat lower and stand persistence was reduced at locations further south in Alabama. Forage yields at the Plant Breeding Unit in central Alabama on a sandy loam soil were about 2 to 2½ tons per acre, tables 7 and 8. Kenstar was the top producer both years. Second-year production was only about one-half that of the top yielders. Good second-year production is an indication that a particular variety may be more disease and/or nematode resistant.

Second-year yields at the Black Belt Substation in west central Alabama were sharply reduced on many varieties, tables 9 and 10. K8-110, Redland,

and Florie were the most productive entries the second season. The poor persistence of RHA-1 was evident the second year. Its yield was less than half that of the first year. Powdery mildew was severe on this entry. Two-year average forage yields at all locations show that the top entries were K8-110, Kenstar, K4-183, and Florie, table 11. The differences among entries become more pronounced when average yields for only the second year are considered. Varieties having the highest second-year production were Kenstar, K8-110, K4-183, Florie, and Kenland.

SUMMARY

Red clover variety trials were conducted for 2 years at five locations in northern and central Alabama.

Forage yields were generally higher in northern than central Alabama.

Most varieties gave acceptable forage yields during the first year.

Red clover entries having the highest second-year forage yields were Kenstar, K8-110, K4-183, Florie, and Kenland.

Table 1. First-year forage yield of red clover varieties at Tennessee Valley Substation, Belle Mina, Alabama, 1978

Variety	Dry forage per acre				
	April 27 Lb.	June 9 Lb.	July 6 Lb.	August 23 Lb.	Total Lb.
K4-183.....	1,935 ab*	1,879 a	2,201 a	942 bc	6,957 a
K4-110.....	2,184 a	1,837 ab	2,009 a	868 bc	6,888 a
Kenland.....	1,840 ab	1,652 bc	1,927 abc	967 bc	6,386 ab
Florie.....	1,323 cd	1,720 ab	2,007 ab	1,096 b	6,216 bc
Tristan.....	1,668 bc	1,731 ab	2,034 abc	720 c	6,153 bc
Kenstar.....	1,455 cd	1,695 ab	2,075 ab	904 bc	6,129 bc
Redmor.....	1,864 ab	1,511 cd	1,850 abc	831 bc	6,056 bc
Redman.....	1,363 cd	1,495 cd	1,858 abc	877 bc	5,593 cd
K4-112.....	1,395 cd	1,484 cd	1,696 cd	1,000 bc	5,575 cd
Mega.....	1,238 d	1,272 e	1,822 bc	988 bc	5,320 d
Kenland.....	777 e	1,133 e	1,435 de	1,355 a	4,700 e
RHA-1.....	860 e	1,455 d	1,319 de	995 bc	4,629 e
C.V., percent....	16	8	11	18	7

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 14, 1977.

Table 2. Second-year forage yield of red clover varieties at Tennessee Valley Substation, Belle Mina, Alabama 1979

Variety	Dry forage per acre				
	May 11 Lb.	June 18 Lb.	July 18 Lb.	August 10 Lb.	Total Lb.
K4-183.....	3,360 a*	2,675 ab	827 a	601 abc	7,463 a
Kenland.....	2,976 abc	2,806 a	717 abc	566 abc	7,065 ab
Kenstar.....	2,873 abcd	2,735 a	790 ab	652 ab	7,050 ab
Florie.....	3,063 ab	2,692 ab	674 bc	569 abc	6,998 ab
Mega.....	2,857 abcd	2,550 abc	698 abc	686 a	6,791 abc
K8-110.....	2,634 bcd	2,526 abc	717 abc	637 abc	6,514 abcd
Redman.....	2,704 abcd	2,214 bc	584 c	531 abc	6,033 bcd
K8-112.....	2,427 bcd	2,077 c	692 abc	581 abc	5,777 cde
Redland.....	2,469 bcd	2,166 bc	667 bc	453 c	5,755 cde
Tristan.....	2,322 cd	2,065 c	617 c	580 abc	5,584 de
Redmor.....	2,220 d	2,101 c	641 c	563 abc	5,525 de
RHA-1.....	2,492 bcd	1,245 d	463 d	475 bc	4,675 e
C.V., percent	16	13	12	19	12

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 14, 1977.

Table 3. First-year forage yield of red clover varieties at Sand Mountain Substation, Crossville, Alabama 1979

Variety	Dry forage per acre				
	April 27	June 26	August 8	September 12	Total
	Lb.	Lb.	Lb.	Lb.	Lb.
K8-112	2,765 a*	4,714 a	1,713 a	927 a	10,110 a
Mega	2,545 a	4,449 a	1,508 a	752 ab	9,254 ab
K8-110	2,373 a	4,408 a	1,570 a	874 ab	9,225 ab
Florie	2,595 a	4,507 a	1,338 a	710 ab	9,150 ab
Kenstar	2,659 a	4,279 a	1,316 a	788 ab	9,042 ab
K4-183	2,202 a	4,354 a	1,490 a	686 ab	8,732 ab
Redmor	1,805 a	4,102 a	1,477 a	824 ab	8,208 ab
Redman	2,191 a	3,973 a	1,276 a	708 ab	8,148 ab
Tristan	1,728 a	3,983 a	1,392 a		7,872 ab
RHA-1	2,400 a	3,606 a	1,089 ab	591 abc	7,686 ab
Redland	2,081 a	3,732 a	1,124 ab	533 bc	7,470 ab
Kenland	1,807 a	3,350 a	495 b	351 c	6,003 b
C.V., percent..	39	26	35	39	27

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: October 8, 1978.

Table 4. Second-year forage yield of red clover varieties at Sand Mountain Substation, Crossville, Alabama, 1980

Variety	Dry forage per acre			
	May 7	June 19	August 8	Total
	Lb.	Lb.	Lb.	Lb.
K8-110	3,541 a*	2,405 a	243 a	6,189 a
Kenstar	3,362 a	2,186 ab	235 a	5,783 a
Redmor	3,248 a	2,247 a	272 a	5,767 a
K8-112	3,001 ab	2,250 a	246 a	5,497 a
Tristan	3,087 ab	2,139 ab	186 ab	5,412 ab
Redman	3,026 ab	2,059 ab	231 a	5,316 ab
Florie	2,876 ab	2,248 a	192 ab	5,316 ab
Mega	2,855 ab	2,165 ab	186 ab	5,206 ab
K4-183	2,964 ab	1,993 ab	234 a	5,191 ab
RHA-1	2,967 ab	1,993 ab	194 ab	5,094 ab
Redland	2,724 ab	1,938 ab	174 ab	4,836 ab
Kenland	2,118 b	1,606 b	83 b	3,807 b
C.V., percent..	22	18	36	19

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: October 8, 1978.

Table 5. First-year forage yield of red clover varieties at Upper Coastal Plain Substation, Winfield, Alabama, 1979

Variety	Dry forage per acre				
	April 14	May 25	June 23	August 11	Total
	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>
K8-110.....	1,140 abc*	1,616 a	2,089 a	239 abcde	5,084 a
Redland	1,170 ab	1,591 a	1,936 ab	286 abc	4,983 ab
Redman	1,346 a	1,510 a	1,782 ab	219 bcde	4,857 ab
K4-183	1,117 abc	1,574 a	1,861 ab	237 bcde	4,789 ab
Florie	1,035 abc	1,541 a	1,954 ab	256 abcd	4,786 ab
Kenstar.....	897 bc	1,394 a	2,120 a	292 abc	4,703 abc
Redmor.....	1,233 ab	1,317 a	1,806 ab	148 ef	4,504 abc
Tristan	914 abc	1,531 a	1,967 ab	80 f	4,492 abc
Mega	833 bc	1,411 a	1,788 ab	312 ab	4,384 abc
K8-112	930 bc	1,400 a	1,808 ab	198 cde	4,336 abc
RHA-1	971 bc	1,400 a	1,605 b	169 def	4,145 bc
Kenland.....	796 c	1,174 a	1,630 b	346 a	3,946 c
C.V., percent	21	20	12	28	11

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 13, 1977.

Table 6. Second-year forage yield of red clover varieties at Upper Coastal Plain Substation, Winfield, Alabama, 1980

Variety	Dry forage per acre				
	April 11	May 5	June 21	August 16	Total
	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>
Kenland.....	563 a*	613 c	2,558 abc	2,474 a	6,208 a
Kenstar	604 a	893 b	2,906 a	1,783 b	6,186 a
K4-183	653 a	837 bc	2,597 abc	1,731 b	5,818 ab
K8-110	556 a	803 bc	2,813 ab	1,588 b	5,760 ab
Florie	338 bcde	1,112 a	2,472 abc	1,742 b	5,664 abc
Redland	439 abcd	813 bc	2,499 abc	1,795 b	5,546 abc
Mega	452 abcd	912 b	2,342 abc	1,802 b	5,508 abc
Redmor	465 abc	687 bc	2,760 abc	1,559 b	5,471 abc
Redman	524 ab	665 c	2,342 abc	1,688 b	5,219 abc
RHA-1	231 dc	742 bc	2,352 abc	1,573 b	4,898 bc
K8-112	290 cde	807 bc	2,132 abc	1,450 b	4,679 bc
Tristan.....	224 e	808 bc	2,069 abc	1,337 b	4,430 c
C.V., percent.	30	17	17	30	14

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 13, 1977.

Table 7. First-year forage yield of red clover varieties at Plant Breeding Unit, Tallassee, Alabama, 1978

Variety	Dry forage per acre			
	May 5	June 12	August 22	Total
	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>
Kenstar.....	1,868 abc*	1,658 ab	1,389 abc	4,915 a
Redman	1,952 ab	1,602 abc	1,308 bcd	4,862 a
Redland	1,798 abc	1,729 a	1,157 bcde	4,684 ab
K4-183	1,779 bc	1,428 abc	1,436 ab	4,643 ab
Florie	1,709 bc	1,623 abc	1,093 cde	4,425 abc
K8-110	1,668 bc	1,546 abc	1,190 bcd	4,404 abc
Redmor	2,029 ab	1,268 c	1,057 de	4,354 abc
Mega	1,665 bc	1,332 bc	1,060 de	4,057 bc
K8-112	1,586 c	1,333 bc	873 e	3,792 c
C.V., percent..	12	15	16	12

*Means in a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 27, 1977.

Table 8. Second-year forage yield of red clover varieties at Plant Breeding Unit, Tallassee, Alabama, 1979

Variety	Dry forage yield per acre		
	May 8	June 15	Total
	<u>Lb.</u>	<u>Lb.</u>	<u>Lb.</u>
Kenstar	2,897 a*	2,032 ab	4,929 a
K8-110	2,682 a	2,030 ab	4,712 ab
K4-183	2,135 ab	2,200 a	4,335 ab
Redland	2,039 ab	1,792 abc	3,831 ab
Florie	1,520 b	1,708 abc	3,228 bc
Redman	1,809 ab	1,297 c	3,106 bc
Mega	1,394 b	1,392 bc	2,786 c
Redmor	1,503 b	1,221 c	2,724 c
K8-112	1,125 b	1,357 bc	2,482 c
C.V., percent	46	26	40

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 27, 1977.

Table 9. First-year forage yield of red clover varieties at Black Belt Substation, Marion Junction, Alabama, 1978

Variety	Dry forage per acre			
	May 17	June 23	July 20	Total
	Lb.	Lb.	Lb.	Lb.
K-110	3,092 a*	2,108 ab	678 a	5,878 a
K4-183	2,747 a	2,199 a	745 a	5,691 ab
Kenstar	2,904 a	2,057 abc	591 ab	5,552 ab
RHA-1	3,150 a	1,938 abc	416 b	5,504 ab
Redland	2,864 a	1,819 bcd	638 a	5,321 ab
Florie	2,801 a	1,730 cd	670 a	5,201 ab
Kenland	2,891 a	1,572 d	582 ab	5,045 ab
Redmor	2,862 a	1,551 d	577 ab	4,990 b
Redman	2,530 a	1,783 bcd	666 a	4,979 b
Mega	2,697 a	1,563 d	680 a	4,940 b
K8-112	2,807 a	1,493 d	627 a	4,927 b
Tristan	2,697 a	1,525 d	605 a	4,827 b
C.V., percent..	14	12	19	10

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 15, 1977.

Table 10. Second-year forage yield of red clover varieties at Black Belt Substation, Marion Junction, Alabama, 1979

Variety	Dry forage per acre			
	May 11	June 14	July 13	Total
	Lb.	Lb.	Lb.	Lb.
K8-110	2,186 a*	1,323 ab	594 ab	4,103 a
Redland	2,083 a	1,533 a	482 abc	4,098 a
Florie	2,162 a	1,223 ab	628 ab	4,013 a
K4-183	1,841 a	1,171 ab	679 a	3,691 ab
Mega	1,690 a	1,188 ab	658 a	3,536 ab
Kenstar	1,907 a	998 bc	552 abc	3,457 ab
Redman	2,154 a	849 bc	421 bc	3,424 ab
Tristan	1,787 a	963 bc	548 abc	3,298 ab
K8-112	1,752 a	988 bc	549 abc	3,289 ab
Redmor	1,924 a	525 c	548 abc	2,997 ab
Kenland	1,497 a	913 bc	582 ab	2,992 ab
RHA-1	1,414 a	570 c	367 c	2,351 b
C.V., percent...				

*Means within a column followed by the same letter are not significantly different at the 5 percent level.

Planted: September 15, 1977.

Table 11. Two-year average forage yield and second-year average forage yield of red clover varieties at five locations in Alabama

Dry forage yield per acre							
Variety	Upper Coastal Plain Sub.	Tenn Valley Sub.	Sand Mountain Sub.	Plant Breeding Unit	Black Belt Sub.	Two-year average, all locations	Second year average, all locations
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
K8-110 ...	5,420	6,700	7,710	4,560	4,990	5,880	5,460
Kenstar...	5,440	6,560	7,410	4,920	4,500	5,770	5,480
K4-183 ...	5,300	7,210	6,960	4,490	4,690	5,730	5,300
Florie ...	5,220	6,630	7,240	3,830	4,610	5,510	5,040
Redland ..	5,260	6,070	6,150	4,260	4,710	5,290	4,810
Redmor ...	4,990	5,790	6,980	4,354	3,990	5,220	4,500
Mega	4,950	6,050	7,230	3,420	4,240	5,180	4,760
Redman ...	5,040	5,810	6,730	3,980	4,200	5,150	4,590
K8-112 ...	4,510	5,680	7,810	3,140	4,110	5,050	4,340
Tristan ..	4,460	5,870	6,640		4,060	5,260*	4,680*
Kenland ..	5,080	5,880	4,910		4,020	4,970*	5,020*
RHA-1 ...	4,520	4,630	6,390		3,920	4,870*	4,250*

*Average of four locations.

Information contained herein is available to all
regardless of race, color, sex, or national origin