

## 1991 Kentucky Red Clover Variety Trials

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### Introduction

Red clover is a high quality, short-lived perennial legume that is used in mixed or pure stands for pasture, hay, silage, green chop, and soil improvement. This species is adapted to a wide range of climatic and soil conditions and therefore is very versatile as a forage crop. Stands are generally productive for two or three years with the highest yields occurring in the year following establishment. Red clover is used primarily as a renovation legume for grass pastures. It is a dominant legume in Kentucky because it is relatively easy to establish and has high forage quality, yield, and animal acceptance.

Yield and persistence of red clover varieties are dependent on environment and pressure from diseases and insects. The most common red clover diseases in Kentucky are southern anthracnose, powdery mildew, sclerotinia crown rot and root rots. High yields and persistence (as measured by ground cover) are two indications that a red clover variety is resistant to or tolerant of these diseases when grown in Kentucky.

The objective of these studies, sown at Lexington in 1990 and Lexington and Princeton in 1991, was to compare dry matter yields and persistence of red clover varieties. The varieties tested, their source and Kentucky distributor are listed in Table 1.

### Description of the tests

The 1990 study was planted with a corrugated roller in 3' x 13' plots arranged in a randomized complete block design with four replications using 14 lb. of seed per acre. The seedbed was a lightly disked small grain cover crop that had been planted the previous fall. Harvests were taken at the 25% bloom stage using a flail type forage plot harvester with the whole plot collected and oven dried at 65° C. Percent stand data were collected prior to harvesting as a visual observation.

The 1991 seedings were made at the rate of 16 lb. seed per acre into a prepared seedbed with a disk drill. Plots were 4' x 15' and were arranged in a randomized complete block design with four replications. Harvests were taken at full flower using a sickle-type forage plot harvester. Fresh weights were measured in the field and occasional subsamples weighed and oven dried at 65° C. The soils at both locations were well-drained silt loams (Maury at Lexington and Crider at Princeton) well suited to red clover production. Management of all tests was according to current recommendations.

### Results

Yield data for three harvests and a spring rating of percent stand was collected from the 1990 seeding in Lexington (Table 2). Percent stand, an estimate of ground cover, reflects the variety's seedling vigor, ability to compete with weeds, and stand persistence. In general, the highest yielding varieties were the most persistent as determined by percent stand.

Four yield harvests were taken from the 1991 seeding at Lexington and while only two harvests were made at Princeton (Table 3). Princeton was 6.54 inches of rain below the long term average through the end of October while Lexington had surplus rainfall of 2.69 inches for the same period. (Table 4). Due to the lack of moisture at Princeton, no measurable yields were attained after August 14.

Four common red clovers, each from different distributors, were included in this trial to study the potential difference in yield resulting from seeding common red clover compared to certified varieties. Common red clover, generally sold as "medium red clover variety unknown", is uncertified red clover with an unknown performance record. There is no assurance that a common red clover will perform the same year after year or that it is even adapted to Kentucky conditions. Consequently, the use of these varieties is not generally recommended. Altaswede is a mammoth type or single-cut red clover that was developed in Canada and is not well adapted to Kentucky conditions.

Statistical analyses were performed on all red clover yield and stand data to determine if the apparent differences are truly due to variety or just due to chance. The top variety in each column is marked with two asterisks (\*\*) and those varieties not significantly different from the top variety are marked with one asterisk (\*). To determine if two varieties are truly different, compare the difference between the two varieties to 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 a given location.

When selecting a red clover variety, choose a certified, high yielding variety adapted to Kentucky. Also, be sure to read the seed label, whose test date should be within the last 9 months. Buy seed with high germination and relatively few crop and weed seeds. Proper management, beginning with land preparation and continuing throughout the life of the stand, is necessary for even the the highest yielding, most pest resistant variety to be productive. Other College of Agriculture publications related to the establishment, management, and harvesting of red clover are available from your local county extension office (Table 5).

**Table 1. Red clover sources and distributors.**

Variety	Proprietor/Developer	Kentucky Distributor
4x - 2x Tetraploid	KY Agric. Exp. Sta.	Experimental
2x - 4x Tetraploid	KY Agric. Exp. Sta.	Experimental
Acclaim	Allied Seed Coop.	Scott Seed
Altaswede	Farmer ecotype, Canada	Public
Arlington	W Agric. Exp. Sta.	Public
Atlas	Northrup King	Northrup King
Cherokee	Florida Agric. Exp. Sta.	Public
Cinnamon	FFR	Southern States
Common A	Farmer ecotype, Canada	Public
Common B	Farmer ecotype, Minnesota	Public
Common C	Farmer ecotype, Canada	Public
Common D	Farmer ecotype, Canada	Public
Flare	ABI	ABI
Kenland	KY Agric. Exp. Sta.	Public
Kenstar	KY Agric. Exp. Sta.	Public
Kenstar II Syn I	KY Agric. Exp. Sta.	Experimental
Kenstar II Syn II	KY Agric. Exp. Sta.	Experimental
Marathon	W Agric. Exp. Sta.	Public
N <sub>2</sub> O Tetraploid	KY Agric. Exp. Sta.	Experimental
Persist	Northrup King	Northrup King
Reddy	FFR	Southern States
Redland II	ABI	ABI
Redland III	ABI	ABI
Redman	FFR	Southern States
Renegade	International Seeds	Green Seed
Root Rot Selection	KY Agric. Exp. Sta.	Experimental
Starglo	Beachley-Hardey	out of production
SX8402	FFR	Experimental
Unreduced Gamete Tetraploid	KY Agric. Exp. Sta.	Experimental
Virus Resistant Selection	KY Agric. Exp. Sta.	Experimental
VS638	Scott Seed	Experimental
WPB-RC-L	Olsen-Fennell Seeds	Experimental
WPB-RC-T	Willamette Valley	Experimental

**Table 2. Dry matter yields (tons/acre) and percent stand ratings of red clover varieties sown on March 13, 1990, at Lexington, Kentucky.**

Variety	% Stand Jun27	1991 Harvests			1991 Total
		May23	Jun27	Aug15	
2x - 4x Tetraploid	27.50	1.73*	0.95	0.68	3.36
4x - 2x Tetraploid	25.00	1.77*	0.99	0.73	3.49
Arlington	43.75*	1.70	1.16*	0.86*	3.71
Atlas	48.75*	1.99*	1.18*	0.78	3.95*
Flare	45.00*	1.91*	1.11*	0.82*	3.84*
ISI 84-KM	28.75	1.81*	1.06	0.83*	3.70
Kenland	53.75*	2.14*	1.10*	0.71	3.94*
Kenstar	62.50*	2.01*	1.12*	0.68	3.81*
Kenstar II Syn I	62.50*	2.17*	1.37**	0.99**	4.53**
Kenstar II Syn II	48.75*	2.01*	1.19*	0.87*	4.07*
Marathon	13.75	1.52	1.14*	0.87*	3.53
N <sub>2</sub> O Tetraploid	29.25	1.94*	1.10*	0.66	3.70
Persist	63.75*	1.99*	1.27*	0.72	3.97*
Reddy	50.00*	1.99*	1.09*	0.67	3.75
Redland II	77.50**	1.90*	1.37*	0.96*	4.22*
Redan	58.75*	1.93*	1.27*	0.72	3.92*
Root Rot Selection	51.25*	1.69	1.22*	0.84*	3.75
Starglo	71.25*	1.95*	1.34*	0.76	4.05*
Unred. Gam Tetra.	71.25*	2.19**	1.31*	0.79*	4.29*
Virus Resistant Sel.	42.50	1.72*	1.02	0.67	3.41
Mean	47.90	1.90	1.17	0.78	3.85
CV, %	50.16	18.05	17.95	18.66	14.24
LSD, 0.05	34.02	0.49	0.30	0.21	0.78

\*\*Highest numerical value in the column.

\*Not significantly different from the highest numerical value in the column based on the 5% LSD.

**Table 3. Dry matter yields (tons/acre) of red clover varieties sown on April 11, 1991, at Lexington, Kentucky and on April 23, 1991, at Princeton, Kentucky.**

Variety	Lexington					Princeton		
	1991 Harvests				1991 Total	1991 Harvests		1991 Total
	Jun27	Jul31	Sep03	Oct31		Jul10	Aug14	
Acclaim	1.03	0.91	0.27	0.28	2.49	1.41*	0.13	1.53
Altaswede	0.79	0.74	0.44**	0.11	2.08	0.46	0.05	0.52
Arlington	1.18*	1.09*	0.41*	0.26	2.94*	1.09	0.16	1.25
Common A	0.55	0.72	0.34*	0.19	1.81	0.91	0.16	1.07
Common B	1.03	0.87	0.34*	0.26	2.50	1.40*	0.15	1.55
Common C	0.94	0.83	0.32*	0.27	2.37	1.06	0.22	1.28
Common D	1.24*	1.11*	0.33*	0.24	2.92*	0.76	0.11	0.87
Kenland	1.12	0.94	0.37*	0.28	2.92*	0.76	0.11	0.87
Kenstar	1.43*	1.20**	0.40*	0.37	3.40*	1.60*	0.24	1.85*
Kenstar II Syn 1	1.13	1.00*	0.32*	0.29	2.74	1.58*	0.20	1.78*
Marathon	1.24*	1.10*	0.42*	0.31	3.07*	1.28*	0.15	1.43
Redland III	1.36*	1.07*	0.35*	0.31	3.09*	1.77*	0.21	1.98*
Renegade	1.38*	1.16*	0.41*	0.58**	3.52**	1.83**	0.34**	2.17**
SX8402	1.36*	1.05*	0.31*	0.25	2.97*	1.47*	0.19	1.66*
VS 638	1.51**	1.03*	0.35*	0.39	3.28*	1.45*	0.25*	1.70*
WPB-90-RC-L						1.38*	0.22	1.61*
WPB-90-RC-T						1.80*	0.28*	2.08*
Mean	1.15	0.99	0.36	0.29	2.79	1.30	0.19	1.49
CV, %	22.00	18.69	27.97	24.93	18.60	32.31	38.41	29.49
LSD, 0.05	0.36	0.26	0.14	0.10	0.74	0.60	0.10	0.62

\*\*Highest numerical value in the column.

\*Not significantly different from the highest numerical value in the column based on the 5% LSD.

**TABLE 4. TEMPERATURE AND RAINFALL IN LEXINGTON  
AND PRINCETON DURING 1991.**

<u>MONTH</u>	<u>LEXINGTON</u>				<u>PRINCETON</u>			
	<u>TEMPERATURE</u>		<u>RAINFALL</u>		<u>TEMPERATURE</u>		<u>RAINFALL</u>	
	<u>F</u>	<u>DEP.</u>	<u>INCHES</u>	<u>DEP.</u>	<u>F</u>	<u>DEP.</u>	<u>INCHES</u>	<u>DEP.</u>
JAN	36	4.5	3.53	-0.04	35	0.6	3.52	-1.01
FEB	41	5.9	4.33	1.07	43	4.7	5.44	1.53
MAR	49	5.1	5.62	0.79	50	2.8	5.27	0.22
APR	60	4.5	3.09	-0.92	62	2.9	3.75	-0.86
MAY	71	6.3	6.43	2.20	72	5.5	4.93	0.68
JUN	74	1.3	2.64	-1.61	77	2.5	1.49	-1.89
JUL	77	0.6	15.84	0.89	81	2.9	1.23	-2.67
AUG	74	-0.9	3.54	-0.42	79	2.1	1.61	-1.99
SEP	68	-0.7	3.19	-0.09	72	1.5	2.50	-0.80
OCT	59	2.2	3.08	0.82	61	1.5	2.70	0.25

TEMPERATURES ARE IN DEGREES FAHRENHEIT.

DEP. IS DEPARTURE FROM THE 30-YEAR AVERAGE FOR THAT LOCATION.

**Table 7. University of Kentucky agricultural extension  
publications related to red clover management**

<b>Publication</b>	<b>Title</b>
AGR-33	Growing red clover in Kentucky
AGR-2	Producing red clover seed in Kentucky
AGR-24	Kenstar red clover
AGR-64	Establishing forage crops
-----	Seed tags: What they reveal
AGR-26	Renovating hay and pasture fields
AGR-90	Inoculation of forage legumes
AGR-18	Grain and forage crop guide for Kentucky
AGR-1	Lime and fertilizer recommendations
AGR-148	Weed control strategies for alfalfa and other forage legume crops
ENT-17	Insect management recommendations for field crops and livestock
PPA-10d	Kentucky plant disease management guide for forage legumes

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