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1990 Kentucky Red Clover Variety Test

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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 the dominant legume in Kentucky because it is high in seedling vigor, 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, and fusarium and sclerotinia crown and root rots. An indication that a red clover variety is resistant to or tolerant of these diseases is persistence and the production of an acceptable yield when grown in Kentucky.

Description of the test

The objective of this study was to compare dry matter yields and persistence of 20 varieties of red clover. Table 1 lists the varieties tested and gives the source and the Kentucky distributor. These varieties were planted at Lexington, Kentucky on March 17, 1989, using 14 lbs of seed per acre. The seeding was made into a lightly disked small grain cover crop that had been planted the previous fall. Plots were 3' x 15' in a randomized complete block design with four replications. Harvests were taken using a flail type forage plot harvester with the whole plot collected and dried at 65°C. Percent stand data were collected prior to harvesting as a visual observation.

The weather in Lexington is temperate with an average annual temperature of 55°F and total precipitation of about 46 inches per year. Temperatures during 1990 deviated somewhat from normal; January through March was warmer, while spring and

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summer were cooler than the long term average. Total precipitation was near normal but unevenly distributed among months (Table 2).

Results

Yield data were collected for four harvests in 1990. Varieties are listed in order of total yield from highest to lowest in Table 3. The LSD (Least Significant Difference) is a statistic that is used to determine whether the difference between any two varieties is real or due to chance. The majority of the varieties had total seasonal yields that did not differ. Only "Kenland", with 4.20 tons/acre, was significantly different in total yield from the lowest yielding variety. Percent stand information, in order from highest to lowest final percent stand (9/18), is given in Table 4. Percent stand is an estimate of ground cover, which reflects the variety's seedling vigor, ability to compete with weeds, and most importantly in the case of red clover, stand persistence. The highest yielding varieties are also the most persistent as determined by percent stand. This persistence throughout the growing season resulted in higher yields in subsequent cuttings.

Proper management, beginning with land preparation and continuing throughout the life of the stand, is necessary for even the highest yielding, most pest-resistant variety to be productive. Table 5 is a listing of other College of Agriculture publications related to the establishment, management, and harvesting of red clover. These resources, which are available through the county extension agent's office, should be consulted to maximize the productivity and persistence of the stand of red clover.

Table 1. Red clover variety sources and distributors.

Variety	Source	KY Distributor
AP86-R-01	AgriPro	Experimental
AP86-R-04	AgriPro	Experimental
AP87-R-01	AgriPro	Experimental
Arlington	WI Agric. Exp. Sta.	Public
Atlas	Northrup King	Northrup King
F1-6-EF	FL Agric. Exp. Sta.	Experimental
FL-MTC	FL Agric. Exp. Sta.	Experimental
HK	Int'l Seeds	Int'l Seeds
Kenland	KY Agric. Exp. Sta.	Public
Kenstar	KY Agric. Exp. Sta.	Public
KY Exp. Syn. I	KY Agric. Exp. Sta.	Experimental
KY Exp. Syn. II	KY Agric. Exp. Sta.	Experimental
Marathon	WI Agric. Exp. Sta.	Public
Persist	Northrup King	Northrup King
Reddy	FFR	Southern States
Redland II	AgriPro	AgriPro
Redman	FFR	Southern States
Starglo	Beachley-Hardy	out of production
Virus Resistant Syn.	KY Agric. Exp. Sta.	Experimental
W 115	Northrup King	Northrup King

Table 2. Temperature and rainfall at Lexington, Kentucky during the 1990 red clover growing season.

	Temperature		Rainfall	
Month	°F	Dep.[1]	Inches	Dep.[1]
Jan.	41.3	9.9	4.48	0.91
Feb.	43.1	8.5	3.73	0.47
Mar.	47.9	4.0	2.18	-2.65
Apr.	52.3	-2.7	2.46	-1.55
May	60.9	-3.3	6.52	2.29
June	72.4	0.2	4.63	0.38
July	75.0	-1.0	4.84	-0.11
Aug.	75.0	-0.2	5.21	1.25
Sept.	70.2	1.5	2.16	-1.12

[1] Departure from normal.

Table 3. 1990 Dry matter yields of 20 red clover varieties seeded at Lexington, Kentucky on March 17, 1989.

	1990				
Variety	5/29	7/2	8/7	9/18	Total
	Ton/ac				
Kenland	2.08^{ab} [1]	0.81^{a}	0.76^{a}	0.55^{ab}	4.20^{a}
AP86-R-04	2.40^{ab}	0.55^{bc}	0.65^{a-e} [2]	0.40^{b-d}	3.99^{ab}
Persist	2.45^{a}	0.31^{e-g}	0.63^{a-e}	0.49^{a-c}	3.89^{ab}
Redman	2.22^{ab}	0.45^{b-e}	0.68^{ab}	0.51^{a-c}	3.86^{ab}
Reddy	2.17^{ab}	0.42^{c-e}	0.68^{ab}	0.46^{a-d}	3.73^{ab}
KY Exp. Syn. I	1.88^{ab}	0.63^{ab}	0.64^{a-e}	0.48^{a-d}	3.63^{ab}
Starglo	1.85^{ab}	0.62^{b}	0.67^{a-c}	0.49^{a-c}	3.63^{ab}
KY Exp. Syn. II	2.18^{ab}	0.39^{c-f}	0.54^{c-e}	0.52^{a-c}	3.62^{ab}
Marathon	2.28^{ab}	0.36^{c-g}	0.53^{de}	0.43^{a-d}	3.59^{ab}
HK	2.14^{ab}	0.45^{b-e}	0.67^{a-c}	0.31^{d}	3.57^{ab}
Arlington	2.14^{ab}	0.38^{c-f}	0.64^{a-e}	0.41^{a-d}	3.56^{ab}
F1-6-EF	2.31^{ab}	0.07^{h}	0.59^{b-e}	0.57^{a}	3.54^{ab}
Kenstar	2.04^{ab}	0.48^{b-e}	0.59^{b-e}	0.39^{b-d}	3.51^{ab}
Redland II	1.87^{ab}	0.50^{b-e}	0.65^{a-e}	0.45^{a-d}	3.47^{ab}
AP87-R-01	1.75^{b}	0.54^{b-d}	0.64^{a-e}	0.47^{a-d}	3.40^{ab}
Vir. Resistant Syn.	1.86^{ab}	0.51^{b-d}	0.66^{a-d}	0.35^{cd}	3.39^{ab}
AP86-R-01	2.07^{ab}	0.35^{d-g}	0.53^{de}	0.38^{cd}	3.34^{ab}
Atlas	2.02^{ab}	0.37^{c-f}	0.52^{e}	0.39^{b-d}	3.30^{b}
FL-MTC	2.11^{ab}	0.17^{gh}	0.52^{e}	0.45^{a-d}	3.25^{b}
W 115	1.99^{ab}	0.22^{f-h}	0.52^{e}	0.46^{a-d}	3.19^{b}
Mean	2.09	0.43	0.62	0.45	3.58
C.V., %	23.73	31.65	15.75	26.98	17.57
LSD, 0.05	0.70	0.19	0.14	0.17	0.89

[1] Means within the any column with the same letter(s) are not significantly different based on the 5% LSD.
[2] Includes a, b, c, d, and e.

Table 4. 1990 Percent stand of 20 red clover varieties seeded at Lexington, Kentucky on March 17, 1989 (Exp 333).

Variety	-1989--	----------1990----------			
	7/3	5/29	6/18	8/7	9/18
	----------	----------	%----------	----------	----------
Kenland	85[a] [1]	71[a]	74[a]	74[a]	69[a]
KY Exp. Syn. I	85[a]	53[a-d]	53[b-d]	54[a-c]	48[ab]
AP87-R-01	78[a-c]	73[a]	64[ab]	59[ab]	43[bc]
Starglo	71[a-c]	60[a-c]	58[a-c]	50[a-d]	36[b-e]
Redland II	73[a-c]	70[a]	60[a-c]	43[b-e]	36[b-e]
AP86-R-04	74[a-c]	71[a]	54[a-c]	49[b-d]	35[b-e]
Marathon	71[a-c]	60[a-c]	46[b-f]	43[b-e]	34[b-e]
Redman	80[a-c]	45[a-e]	41[c-g]	39[b-e]	29[b-e]
Reddy	85[a]	66[ab]	46[b-f]	50[a-d]	29[b-e]
Arlington	83[ab]	65[ab]	41[c-g]	48[b-d]	29[b-e]
Virus Resistant Syn.	63[bc]	49[a-e]	45[b-f]	31[c-f]	28[b-e]
KY Exp. Syn. II	66[a-c]	61[a-c]	46[b-f]	38[b-e]	25[b-e]
HK	68[a-c]	61[a-c]	49[b-e]	30[c-f]	21[b-f]
AP86-R-01	71[a-c]	40[b-f]	31[e-g]	29[d-g]	20[c-g]
Kenstar	66[a-c]	31[d-f]	43[c-g]	35[b-e]	18[c-g]
Persist	83[ab]	66[ab]	33[d-g]	31[c-f]	18[d-g]
W 115	61[c]	50[a-e]	23[gh]	23[e-g]	14[d-g]
Atlas	69[a-c]	36[c-f]	28[f-h]	36[b-e]	13[e-g]
FL-MTC	66[a-c]	23[ef]	9[h]	8[fg]	3[fg]
F1-6-FE	80[a-c]	14[f]	9[h]	5[g]	1[g]
Mean	72	53	43	39	27
C.V., %	20	38	35	44	60
LSD, 0.05	21	29	21	24	23

[1] Means within any column with the same letter(s) are not significantly different based on the 5% LSD.
[2] Includes a, b, c, and d.

Table 5. University of Kentucky agricultural extension publications related to red clover management.

Publication	Title
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-119	Alternatives for fungus infected tall fescue
AGR-90	Inoculation of forage legumes
AGR-18	Grain and forage crop guide for Kentucky
AGR-1	Lime and fertilizer recommendations
AGR-57	Soil testing: What it is and what it does
AGR-16	Taking soil test samples
AGR-19	Liming acid soils
AGR-92	Sampling plant tissue for nutrient analysis
AGR-6	Chemical control of weeds in Kentucky farm crops
ENT-17	Insecticide recommendations for alfalfa and clover - 1990
PPA-9	Collecting plant specimens for disease diagnosis
AGR-62	Quality hay production
AGR-45	The effects of weather on hay production
ID-46	Hay preservatives
AGR-61	Hay feeding systems
ASC-50	Grazing systems
AGR-85	Efficient pasture systems
ID-74	Planning fencing systems for intensive grazing management
ID-5	A beef forage system
ID-76	Creep grazing for beef calves
ASC-56	Producing slaughter beef with grain on pasture
ASC-34	Nutritional requirements for dairy animals and composition of feedstuffs
ASC-57	Forage-related cattle disorders
ASC-120	Forages for horses
AGR-81	Horse pasture

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