

2023 Alfalfa, Red Clover, and White Clover Grazing Tolerance Report

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Introduction

Alfalfa (*Medicago sativa*) is the highest-yielding, highest-quality forage legume grown in Kentucky. It forms the basis of Kentucky's cash hay enterprise and is an important component in dairy, horse, beef, and sheep diets. Recent emphasis on its use as a grazing crop and the release of grazing-tolerant varieties have raised the following question: Do varieties differ in tolerance to grazing? To answer this question, we have chosen to use the standard tolerance test recommended by the North American Alfalfa Improvement Conference. This test uses continuous heavy grazing to sort out differences in grazing tolerance in a relatively short period of time.

Red clover (*Trifolium pratense* L.) is a high-quality, short-lived perennial legume that is used in mixed or pure stands for pasture, hay, silage, soil improvement, and wildlife habitat. This species is adapted to a wide range of climatic and soil conditions. Stands of improved varieties are generally productive for two and a half to 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 forage legume in Kentucky because it is relatively easy to establish and has high forage quality, high yield, and animal acceptance.

White clover (*Trifolium repens* L.) is a low-growing, perennial pasture legume with white flowers. It differs from red clover in that the stems (stolons) grow along the surface of the soil and can form adventitious roots that may lead to the development of new plants. Three types of white clover grow in Kentucky: Dutch, intermediate, and ladino. Dutch white clover, sometimes called common, naturally occurs in many Kentucky pastures and even lawns. It is generally long lived and reseeds readily, but its small leaves and low growth habit result in low forage yield. The intermediate type is a cross between ladino and Dutch white clover and has been developed to give higher yields than the Dutch type and to persist better than the ladino type under pasture or frequent grazing conditions. Ladino white clover has larger leaves and taller growth than the intermediate and Dutch types and is the highest yielding of the three white clover types.

This report summarizes research on the grazing tolerance of alfalfa and clover varieties when subjected to continuous heavy grazing pressure during the grazing season. A summary of all alfalfa varieties tested in Kentucky during the last 20 years and information about distributors, fall dormancy ratings, and disease resistance is included at the end of this report. The UK Forage Extension website (<https://forages.ca.uky.edu>) contains past versions of all forage variety testing reports from Kentucky and surrounding states and a large number of other forage publications.

Important Selection Considerations

Local adaptation and seasonal yield. The variety should be adapted to Kentucky as indicated by good winter survival and good performance across years and locations in replicated yield and grazing trials, such as those presented in this publication. Choose high-yielding, persistent varieties and varieties that are productive during the desired season of use. Refer to the 2023 Alfalfa Report (PR-837) and the 2023 Red and White Clover Report (PR-836), (or previous years if needed) for yield data on specific varieties of interest.

Seed quality. Buy premium-quality seed that is high in germination, high in purity, and free from weed seed. Buy certified seed or proprietary seed of an improved variety. An improved variety is one that has performed well in independent trials. Other information on the label will include the test date (which must be within the previous nine months), the level of germination, and percentage of other crop and weed seed. Order seed well in advance of planting time to assure that it will be available when needed. For pre-inoculated seed, make sure to plant by the expiration date for the rhizobia inoculum on the seed tag.

Description of the Tests

Variety tests for grazing tolerance were established in Lexington in the fall of 2020, 2021 and 2022. The soils at this location are well-drained silt loams and are well-suited to alfalfa and clover. Plots were 5 feet by 20 feet in a randomized complete block design, with each variety replicated six times. In these tests, alfalfa (20 pounds per acre), red clover (12 pounds per acre) and white clover (3 pounds per acre) were planted into a prepared seedbed using a disk drill. All alfalfa seed lots were treated with metalaxyl fungicide and inoculated if not supplied pre-treated with these treatments. The clover seed was also inoculated prior to planting. With coated seed, the seeding rate was adjusted to account for the weight of any seed coating. Plots were grazed continuously beginning the first spring after seeding. Grazing pressure was maintained to keep plant height to less than three inches. In general, plots were grazed from mid-May until mid-September. Supplemental hay was fed during periods of slowest growth. Visual ratings of percent stand were made in the fall several weeks after the cattle were removed to check stand survival after the grazing season. Ratings were made in the spring prior to grazing to check on winter survival and spring growth. Since trials were seeded in rows, persistence ratings were based on density within a row and not total ground cover. Pests (weeds and insects) were controlled so they would not limit yield or persistence. Fertilizers (lime, P, K, and boron) were applied based on University of Kentucky soil test recommendations. In each alfalfa trial, Alfagraze was the grazing-tolerant check variety.

Results and Discussion

Weather data for Lexington is presented in Table 1.

Data on percent stand are presented in tables 2-10. Statistical analyses were performed on all alfalfa yield data (including experimentals) to determine whether the apparent differences are due to variety or simply to chance. To determine whether two varieties are truly different, compare the difference between the two varieties to the least significant difference (LSD) 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. The coefficient of variation (CV), which is a measure of the variability of the data, is included for each column of means. Low variability is desirable, and increased variability within a study results in higher CVs and larger LSDs.

Table 11, 12, and 13 summarizes information about distributors, fall dormancy ratings, and disease resistance information for all varieties included in current tests. You can find more detailed disease and insect resistance ratings for alfalfa at www.alfalfa.org/pdf/2023_Alfalfa_Variety_Leaflet.pdf.

How to Interpret the Summary Table

Table 14 is a summary of stand persistence data of commercial varieties of alfalfa that have been entered in the Kentucky trials from 2001 to 2023. The data for each trial are listed as a percentage of the grazing-tolerant variety Alfagraze. In other words, in each trial the rating for Alfagraze is set to 100—varieties with table values over 100 persisted better than Alfagraze and varieties with values less than 100 persisted less than Alfagraze. Tables 15 and 16 are summaries of stand persistence data from 2002 to 2023 of commercial red and white clover varieties that have been entered in the Kentucky trials. Table 15 shows information only for one or two years. The data are listed as a percentage of the mean of the commercial varieties entered in each specific trial. In other words, the mean value for each trial is set at 100 percent—varieties with percentages over 100 persisted better than average, and varieties with percentages less than 100 persisted less than average. Direct statistical comparisons of varieties cannot be made using the summary tables 14, 15, and 16, but these comparisons do help to identify varieties for further consideration. Varieties that have performed better than average over many years and at several locations have stable performance, while others may have performed well in wet years or on particular soil types. These details may influence variety choice, and more information can be found in past yearly reports. See footnote in tables 14, 15, and 16 to identify specific yearly reports which contain more detailed persistence information.

Summary

Measurements taken after multiple years of grazing in these trials indicate that alfalfa varieties have been developed that exhibit improved tolerance to heavy grazing pressure compared to standard hay-type varieties. The grazing management imposed in these trials included continuous stocking from the initiation of grazing in spring until mid-September, when grazing was terminated for the season to allow stands to acclimate to winter. Heavy grazing pressure was used purposely in these trials to better differentiate among varieties for relative grazing tolerance. Research has shown that abusive grazing tests are a good way to sort out differences in grazing tolerance between varieties in a relatively short period of time. Recommended rotational grazing management would improve alfalfa forage productivity and stand persistence.

The information in this report should be used in conjunction with other yield, pest resistance, and adaptation information to select the best alfalfa and clover varieties for each situation. Bloat prevention practices are recommended when grazing alfalfa, especially pure stands.

Good management for maximum life from grazing alfalfa and clover would include:

- Allowing alfalfa and clover to become completely established before grazing
- Using rotational grazing where animals harvest available forage in seven days or less, followed by resting for 28 days before regrazing; less rest time is required for white clover
- Adding needed fertilizer and lime
- Removing grazing livestock from alfalfa and red clover fields from mid-September until November 1 to replenish root reserves for winter survival

For further information about grazing alfalfa management, refer to the following College of Agriculture publications, available at the local county Extension office or in the publications section of the UK Forage website (<https://forages.ca.uky.edu>).

- Grazing Alfalfa (<https://www.alfalfa.org/pdf/GrazingAlfalfa-Final.pdf>)
- Managing Legume Induced Bloat in Cattle (ID-186)
- Frost Seeding Clover: A Recipe for Success (AGR-271)
- Extending Grazing and Reducing Stored Feed Needs (AGR-199)
- Renovating Hay and Pastures Fields (AGR-26)
- Weed Control Strategies for Alfalfa and Other Forage Legume Crops (AGR-148)
- Rotational Grazing (ID-143)
- Grazing Red Clover in Kentucky (AGR-33)
- Grazing White Clover in Kentucky (AGR-195)

Authors

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Table 1. Temperature and rainfall at Lexington, Kentucky, in 2021, 2022, and 2023.

	2021				2022				2023 ²			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	34	+3	4.51	+1.65	29	-2	4.93	+2.07	44	+13	6.28	+3.42
FEB	31	-4	4.60	+1.39	38	+3	7.69	+4.48	47	+12	3.73	+0.52
MAR	50	+6	5.12	+0.72	49	+5	4.27	-0.13	48	+4	4.45	+0.05
APR	54	-1	2.72	-1.16	55	0	3.71	-0.17	58	+3	2.36	-1.52
MAY	62	-2	4.34	-0.13	69	+5	3.84	-0.63	65	+1	2.53	-1.94
JUN	73	+1	6.26	+2.60	76	+4	2.10	-1.56	72	0	6.75	+3.09
JUL	75	-1	5.90	+0.90	80	+4	6.46	+1.46	78	+2	5.32	+0.32
AUG	76	+1	6.16	+2.23	77	+2	4.27	+0.34	76	+1	2.40	-1.53
SEP	69	+1	3.03	-0.17	70	+2	1.50	-1.70	71	+3	0.99	-2.21
OCT	62	+5	4.64	+2.10	57	0	0.96	-1.61	61	+4	2.30	-0.27
NOV	43	-2	2.13	-1.26	49	+4	2.1	-1.29				
DEC	47	+11	4.41	+0.43	40	+4	3.46	-0.52				
Total			53.85	+9.30			45.29	+0.74			37.11	-0.07

¹ DEP is departure from the long-term average.

² 2023 data is for ten months through October.

Table 2. Stand persistence of alfalfa varieties sown September 8, 2020, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 2, 2020	Percent Stand						
		2020	2021		2022		2023	
		Oct 2	Jul 2	Oct 7	Mar 24	Fall ²	Apr 10	Oct 17
Commercial Varieties-Available for Farm Use								
Amerstand 403TPlus	4.8	100	85	60	28	—	9	11*
Alfagraze	4.2	100	73	52	25	—	13	11*
Alfabar	4.3	100	87	53	28	—	6	4
Saranac AR (certified)	4.8	100	76	48	23	—	7	4
Experimental Varieties								
AFX164047	4.8	100	76	62	33	—	9	5*
Mean	4.6	100	79	55	27	—	9	7
CV, %	7.0	0	14	27	35	—	37	74
LSD,0.05	0.4	0	13	18	12	—	4	6

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

² Due to heavy grazing and lack of fall rainfall, there was not enough green growth to get a fall stand rating.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 3. Seedling vigor and stand persistence of alfalfa varieties sown September 8, 2021, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 5, 2021	Percent Stand				
		2021	2022		2023	
		Oct 5	Mar 24	Oct 24	Mar 21	Oct 17
Commercial Varieties-Available for Farm Use						
Rugged	4.8	100	100	100	99	80*
Ameristand 403TPlus	4.6	100	100	100	93	75*
Rugged II	4.5	100	100	100	99	75*
Alfagraze	4.3	100	100	99	99	74*
GA409	4.8	100	100	100	99	61*
AFX469	4.4	100	100	99	97	42
Mean	4.5	100	100	100	98	68
CV,%	7.7	0	0	1	7	23
LSD,0.05	0.4	0	0	2	8	19

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 4. Seedling vigor and stand persistence of alfalfa varieties sown September 2, 2022, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Sep 28, 2022	Percent Stand		
		2022	2023	
		Sep 28	Mar 21	Oct 17
Commercial Varieties-Available for Farm Use				
Rugged II	5.0	100	100	94*
Ameristand 403TPlus	5.0	100	100	93*
Alfagraze	5.0	100	100	87*
AFX469	5.0	100	100	65
Mean	5.0	100	100	85
CV,%	0.0	0	0	10
LSD,0.05	0.0	0	0	11

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 5. Seedling vigor and stand persistence of red clover varieties sown September 8, 2020, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 2, 2020	Percent Stand					
		2020 Oct 2	2021		2022		2023
			Jul 6	Oct 7	Mar 24	Fall ²	Apr 10 ³
Commercial Varieties-Available for Farm Use							
SS0303RCG	4.4	100	28	33	28*	–	–
Freedom!	4.6	100	39	34	27*	–	–
Kenland (certified)	4.3	100	33	32	24*	–	–
GA9908	4.1	100	10	13	11	–	–
Barduro	4.9	100	10	7	6	–	–
Experimental Varieties							
20-LA-RC-1	4.6	100	32	32	21*	–	–
20-LA-RC-2	4.6	100	26	28	20*	–	–
BARTP9	4.5	100	16	17	19*	–	–
BARTP11	4.5	100	23	22	16*	–	–
20-AB-RC-3	3.8	100	18	19	14	–	–
CW30091	3.3	94	9	7	6	–	–
Mean	4.3	99	22	22	17	–	–
CV,% ⁴	8.6	1	50	49	64	–	–
LSD,0.05	0.4	1	13	13	13	–	–

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
² Due to heavy grazing and lack of fall rainfall, there was not enough green growth to get a fall stand rating.
³ Stands were 1% or less for all plots spring of 2023, therefore data is not shown and test was terminated.
⁴ High CVs during the later years of this test reflect increasing variability between plots as the stands thin.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 6. Seedling vigor and stand persistence of red clover varieties sown September 8, 2021, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 5, 2021	Percent Stand				
		2021 Oct 5	2022		2023	
			Mar 24	Oct 24	Apr 10	Oct 17
Commercial Varieties-Available for Farm Use						
Gallant	3.6	100	100	87	49	33*
Freedom!	4.3	100	100	76	45	30*
Blaze	3.8	100	99	85	57	29*
SS0303RCG	4.3	100	100	84	55	25*
GA9908	3.8	100	100	53	20	23*
Kenland (certified)	4.6	100	100	53	31	23*
Barduro	4.0	100	100	41	13	15
Experimental Varieties						
20-LA-RC-2	4.5	100	100	79	41	25*
BARTSRWR	3.8	100	100	70	55	23*
20AB-RC-3	3.8	100	100	78	42	22*
CW30091	3.0	96	98	74	32	20
20-LA-RC-1	3.9	100	100	76	28	18
PSTCLVR981211	3.0	94	95	42	13	18
PSTCLVR20825	3.3	91	91	47	18	13
Mean	3.8	99	99	67	35	23
CV,%	11.9	4	4	21	37	46
LSD,0.05	0.5	5	5	16	15	12

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 7. Seedling vigor and stand persistence of red clover varieties sown September 2, 2022, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Sep 28, 2022	Percent Stand		
		2022 Sep 28, 2022	2023	
			Mar 21	Oct 18
Commercial Varieties-Available for Farm Use				
SS0303RCG	5.0	100	100	72*
Blaze	5.0	100	100	69*
Freedom!	5.0	100	100	68*
Gallant	4.8	100	100	67*
Kenland (certified)	5.0	100	100	63*
Experimental Varieties				
20-LARC-1	4.9	100	100	68*
Mean	5.0	100	100	68
CV,%	2.5	0	0	19
LSD,0.05	0.1	0	0	15

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 8. Seedling vigor and stand persistence of white clover varieties sown September 8, 2020, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 2, 2020	Percent Stand							
		2020		2021		2022		2023	
		Oct 2	Jul 6	Oct 7	Mar 24	Fall ²	Apr 10	Oct 18	
Commercial Varieties-Available for Farm Use									
Dusi	4.3	100	93	97	96	–	29	26*	
Durana	3.9	97	83	96	93	–	29	25*	
Patriot	3.6	95	91	96	95	–	43	25*	
Will	4.7	100	98	99	98	–	27	25*	
Kakariki	4.5	99	86	93	91	–	22	22*	
RegalGraze	4.2	100	95	95	93	–	18	21*	
Cresendo	4.3	100	93	94	89	–	16	20*	
Neches	4.4	100	83	94	90	–	20	18*	
Alice	4.2	100	92	97	93	–	12	12	
Experimental Varieties									
CW9501	3.6	84	91	95	91	–	19	22*	
Mean	4.2	97	91	96	93	–	23	21	
CV,%	10.2	7	7	4	5	–	33	36	
LSD,0.05	0.5	8	8	4	6	–	9	9	

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

² Due to heavy grazing and lack of fall rainfall, there was not enough green growth to get a fall stand rating.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 9. Seedling vigor and stand persistence of white clover varieties sown September 8, 2021, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 5, 2021	Percent Stand					
		2021		2022		2023	
		Oct 5	Mar 24	Oct 24	Apr 10	Oct 18	
Commercial Varieties-Available for Farm Use							
Will	3.7	99	100	99	92	79*	
Kakariki	3.1	99	99	95	80	78*	
RegalGraze	4.1	100	100	96	85	75*	
Stamina	3.1	99	100	96	89	75*	
Patriot	3.0	97	99	98	93	68*	
Durana	3.1	98	99	99	96	64*	
Alice	3.4	100	100	96	82	60	
Experimental Varieties							
CW9501	3.3	97	98	96	76	62	
BARTSRWR	4.9	100	100	97	83	61	
GATR21024D	2.9	99	99	99	91	48	
Mean	3.5	99	99	97	87	67	
CV,%	10.4	2	1	2	10	20	
LSD,0.05	0.4	2	1	3	10	16	

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 10. Seedling vigor and stand persistence of white clover varieties sown September 2, 2022, in a cattle-grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Sep 28, 2022	Percent Stand			
		2022		2023	
		Sep 28	Mar 21	Oct 17	
Commercial Varieties-Available for Farm Use					
Durana	4.6	98	98	98*	
Will	4.7	99	99	96*	
Alice	4.8	98	98	96*	
Patriot	4.5	98	97	95*	
RegalGraze	4.9	100	100	94*	
Stamina	4.6	97	97	92	
Experimental Varieties					
C26532	4.7	99	99	97*	
GATR21024D	4.6	98	98	88	
Mean	4.7	98	98	94	
CV,%	8.1	2	3	5	
LSD,0.05	0.4	2	3	5	

¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 11. Characterization and proprietors of alfalfa varieties in current grazing trials in Kentucky.

Variety	Proprietor/ KY Distributor	Variety Characteristics ¹							
		FD ³	Disease Resistance ²					APH1	APH2
			BW	FW	AN	PRR			
Commercial Varieties-Available for Farm Use									
AFX 469	Alforex Seeds	4	HR	HR	HR	HR	HR	R	
Alfabar	Barenbrug USA	3	HR	HR	HR	HR	HR/R	–	
Alfagraze	America's Alfalfa	2	MR	R	MR	LR	-	–	
Ameristand 403T Plus	America's Alfalfa	4	HR	HR	HR	HR	HR	R	
GA409	Preferred Alfalfa Genetics	4	HR	HR	HR	HR	HR	HR	
Rugged	Alforex Seeds	3	HR	HR	HR	HR	HR	MR	
Rugged II	Alforex Seeds	3	HR	HR	HR	HR	HR	R	
Saranac AR (certified)	Public	4	MR	R	HR	LR	–	–	
Experimental Varieties⁴									
AFX164047	Alforex Seeds	4	HR	HR	HR	HR	HR	–	

¹ Variety Characteristics: FD=Fall Dormancy, BW=Bacterial Wilt, FW=Fusarium Wilt, AN=Anthracnose, PRR=Phytophthora Root Rot, APH=Aphanomyces Root Rot Race 1 and Race 2.

² Disease Resistance: S=Susceptible, LR=Low Resistance, MR=Medium Resistance, R=Resistance, HR=High Resistance. (more detailed disease and insect resistance ratings at www.alfalfa.org/pdf/2023_Alfalfa_Variety_Leaflet.pdf).

³ Fall dormancy: 2=Vernal, 3=Ranger, 4=Saranac, 5=DuPuits.

⁴ Experimental varieties are not available commercially, but provide an indication of the progress being made by forage breeding companies.

Table 12. Proprietors of red clover varieties in current grazing trials in Kentucky.

Variety	Proprietor/KY Distributor
Commercial Varieties-Available for Farm Use	
Barduro	Barenbrug USA
Blaze	Mountain View Seeds
Freedom!	Barenbrug USA
Gallant	Turner Seed
GA9908	Smith Seed Services
Kenland (certified)	Public
SS-0303RCG	Southern States
Experimental Varieties¹	
BARTP9	Barenbrug USA
BARTP11	Barenbrug USA
BARTSRWR	Barenbrug USA
CW30091	Barenbrug USA
PSTCLVR20825	Caldbeck Consulting
PSTCLVR981211	Caldbeck Consulting
20-AB-RC-3	Ampac Seed
20-LA-RC-1	Ampac Seed
20-LA-RC-2	Ampac Seed

¹ Experimental varieties are not available commercially, but provide an indication of the progress being made by forage breeding companies.

Table 13. Proprietors and type of white clover varieties in current grazing trials in Kentucky.

Variety	Type	Proprietor/KY Distributor
Commercial Varieties-Available for Farm Use		
Alice	Intermediate	Barenbrug USA
Cresendo	Ladino	Barenbrug USA
Durana	Intermediate	Pennington Seed
Dusi	Ladino	Barenbrug USA
Kakariki	Ladino	Luisetti Seeds
Patriot	Intermediate	Pennington Seed
Neches	Intermediate	Barenbrug USA
Regal Graze	Ladino	Cal/West Seeds
Renovation	Intermediate	Smith Seed
Stamina	Intermediate	Mountain View Seeds
Will	Ladino	Allied Seed
Experimental Varieties¹		
BARTSRWR	red/white blend	Barenbrug USA
CW9501	Ladino	Barenbrug USA
C26532	–	Univ. of GA
GATR21024D	–	Univ. of GA

¹ Experimental varieties are not available commercially, but provide an indication of the progress being made by forage breeding companies.

Table 15. Summary of 2002-2023 Kentucky red clover grazing tolerance trials in Lexington (stand persistence shown as a percent of the mean of the commercial varieties in the test).

Variety	Proprietor	02 ^{1,2}	05	06	07	08	10	11	12	13	14	15	16	17	18	19	20	21	Mean ³ (#trials)	
		1yr ⁴	2yr	1yr	1yr	1yr	1yr	2yr	2yr	2yr	3yr	2yr	2yr	1yr	1yr	2yr	1yr	2yr		
AA117ER	ABI Alfalfa		150																–	
Blaze	Mountain View Seeds																	114	–	
Barduro	Barenbrug USA														90	70	29	59	62(4)	
Cinnamon Plus	Southern States	185		115	106	111	112	108	122	81									118(8)	
Common	Public	31	6	82	106	91	88	54	44		88				57				65(10)	
CW9901	Barenbrug USA														104				–	
Freedom!	Barenbrug USA		155	93		104	107	95	56	94	111	73	128	81	142	134	142	118	109(15)	
Freedom! MR	Barenbrug USA		117												118				118(2)	
Gallant	Turner Seed										131			85	132	83		130	112(5)	
GA9908	Smith Seed Services									69		102	80				115	55	90	85(6)
Juliet	Caudill Seed				80	90													85(2)	
Kenland(cert)	KY Ag Exp Sta	108	127	108	106	104	93	122	133	113	95	92	104	117	109	83	134	90	108(17)	
Kenton	KY Ag Exp Sta		111																–	
Kenway	KY Ag Exp Sta		61																–	
LS9703	Lewis Seed							122	100	131	82								109(4)	
SS0303RCG	Southern States								144	113	92	133	88	117	47	115	139	98	109(10)	
Starfire	Cal/West & Ampac	77																	–	
Triple Trust 350	ABI Alfalfa		72																–	
Vesna	DLF																		–	

¹ Year trial was established.

² Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific test. For example, the trial planted in the fall of 2019 was grazed for two years so the final persistence report would be “2021 Red and White Clover Grazing Tolerance Report” archived in the UK Forage website (<https://forages.ca.uky.edu>).

³ Mean only presented when respective variety was included in two or more trials.

⁴ Number of years of data.

Table 16. Summary of 2002-2023 Kentucky white clover grazing tolerance trials in Lexington (stand persistence shown as a percent of the mean of the commercial varieties in the test).

Variety	Type	Proprietor	02 ^{1,2}	4	06 ³	6	08 ⁴	08	09	10	11	12	13	14	15	16	17	18	19	20	Mean ⁵ (#trials)
			2yr ⁶	4yr	2yr	2yr	3yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	3yr	4yr	4yr	4yr	4yr	3yr	
Alice	Intermediate	Barenbrug USA		59	98									93	71	79	97	95	91	56	82(9)
Barblanca	Intermediate	Barenbrug USA		118	91	151															120(3)
Canterbury	Dutch	Allied Seed											51	93							72(2)
Colt	Intermediate	Seed Research of OR		114	134	122															123(3)
Crescendo	Ladino	Cal/West	84			72														93	83(3)
Dusi	Ladino	Barenbrug USA																		121	–
Durana	Intermediate	Pennington		83	105	103		115	102	107	126	86	81	113	152	86	102	77	104	116	104(16)
GWC-AS10	NA ⁷	Ampac Seed								77											–
Insight	Ladino	Allied Seed				77															–
Ivory	Intermediate	DLF Pickseed	132	142																	137(2)
Ivory II	Intermediate	DLF Pickseed					102														–
Kakariki	Ladino	Luisetti Seeds															97			102	100(2)
Kopu II	Intermediate	Ampac Seed			77	122	96		93	113	112	86	106	93	87	107		95	106		99(13)
KY Select	Intermediate	KY Agr Ex. Sta.						105		83											94(2)
Neches	NA ⁷	Barenbrug USA												104					83	84	90(3)
Patriot	Intermediate	Pennington		110	137	122		100	111	110	123	102	132	109	123	107	111	107	118	116	115(16)
Pinnacle	Ladino	Allied Seed									87										–
Rampart	NA ⁷	Oregro Seeds						90													–
Regal	Ladino	Public	92		57	54		93		103											80(5)
Regal Graze	Ladino	Cal/West			84	87	105	90	87	93	72	94	81	102	87	107	87	95	85	97	91(16)
Renovation	Intermediate	Smith Seed											102	100	55		97		97		90(5)
Resolute	Intermediate	Southern States			101	106					65										91(3)
Seminole	Ladino	Saddle Butte Ag. Inc.		75		97	91						89	85							97(5)
Tillman II	Ladino	Caudill Seed	92																		–
WBDX	Dutch	Saddle Butte Ag. Inc.								70											–
Will	Ladino	Allied Seed			117	87	107	105	108	143	115	133	157	111	120	114	108	131	116	116	118(16)

¹ Year trial was established.

² Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific test. For example, the trial planted in the fall of 2016 was grazed for four years so the final persistence report would be “2020 Red and White Clover Grazing Tolerance Report” archived in the UK Forage website (<https://forages.ca.uky.edu>).

³ This trial was planted in the spring of 2006 due to poor establishment of the fall 2005 planting.

⁴ This trial was planted in the spring of 2008 due to poor establishment of the fall 2007 planting.

⁵ Mean only presented when respective variety was included in two or more trials.

⁶ Number of years of data.

⁷ Type was not provided by the company.

2023 Alfalfa, Red Clover, and White Clover Grazing Tolerance Report



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