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Agricultural Experiment Station

2025 Cool-season Grass Grazing Tolerance Report

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Introduction

Cool-season forages such as tall fescue, orchardgrass, and Kentucky bluegrass are the primary pasture grasses in Kentucky. Other species such as perennial ryegrass and festulolium can also be used in pasture systems. Little is known about the effect of variety on the grazing tolerance of these cool-season grass species.

The purpose of this report is to summarize current research on the grazing tolerance of varieties of tall fescue, orchardgrass, perennial ryegrass, and other species when they are subjected to continuous, heavy grazing pressure by cattle within the growing season. Overgrazing is not a recommended practice but is done in these studies to determine how different varieties perform under conditions that are worse than occur during the life of a typical pasture. Varieties are primarily rated for percent survival but data on seedling vigor and grazing preference are also presented. Consult the UK Forage Extension website (https://forages.ca.uky.edu) to access all forage variety testing reports from Kentucky and surrounding states as well as from a large number of other forage publications.

Important Selection Considerations

Local adaptation and seasonal yield. Select a variety that is adapted to Kentucky as indicated by superior performance across years and locations in replicated trials, such as those reported in this publication. Grazing persistence data should be used in combination with yield data to select the best variety for pasture use. Refer to the appropriate yield trial reports for yield data on specific varieties of interest.

Seed quality. Buy premium-quality seed that is high in germination and 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), level of germination, and percentage of other crop and weed seed. Order seed well in advance of planting time to ensure that it will be available when needed.

Description of the Tests

Grass variety tests for grazing tolerance were established in Lexington in the fall of 2021, 2022, 2023, and 2024. The soil at Lexington (Maury) is a well-drained silt loam and is well-suited to tall fescue, orchardgrass, and perennial ryegrass production. Plots were 5 feet by 15 feet in a randomized complete block design, with each variety replicated six times. Plots were seeded at the recommended seeding rate per acre and were sown into a prepared seedbed using a disk drill. Grazing began in April and was continuous until late September. Plots were grazed down to below 4 inches quickly by steers or heifers and kept at 2 to 4 inches for the remainder of the grazing season. The trials were rated for grazing preference 10 to 20 days after cattle were allowed to start grazing. A rating of 1 indicates no forage removed, and a rating of 9 indicates all forage was grazed. Individual trials occasionally were clipped to remove seedheads or weed growth not controlled by herbicides. Each day the cattle were given about 2 pounds/head of grain (soyhulls/cracked corn) to facilitate monitoring the cattle for our IACUC protocol. Supplemental hay was fed during periods of slowest growth. Animals were removed from plots after all fall growth had been removed and when little regrowth was expected. Visual ratings of percent stand were made in the fall several weeks after the cattle were removed and in the spring prior to resuming grazing to assess 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. Grass plots were fertilized with 30 pounds of actual N per acre in March, 30 pounds of actual N in May, and 40 pounds of actual N in November. Other fertilizers (lime, P, and K) were applied as needed according to the University of Kentucky soil test recommendations.

Results and Discussion

Weather data for Lexington are presented in Table 1. Data on percent stand are presented in tables 2 through 13. Statistical analyses were performed on all entries (including experimentals) to determine if the apparent differences are truly due to variety. To determine if 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.

Kentucky 31 tall fescue with the endophyte (KY31+) is considered to be the most grazing-tolerant variety and was the grazing-tolerant check entry in all tall fescue trials. The central questions regarding grazing tolerance among tall fescues are: Can endophyte-free varieties persist as well as KY31+, and will novel endophyte varieties persist as well as other grazing tolerant varieties? Several fescue varieties were comparable to KY31+ in regard to grazing tolerance even after three or four seasons (tables 2, 3, and 17).

Tables 14 (tall fescue), 15 (orchardgrass), and 16 (perennial ryegrass and festulolium) show information about proprietors/distributors for all varieties in these tests.

How to Interpret the Summary Tables

Tables 17, 18, and 19 are summaries of stand persistence data from 2000 to 2025 of commercial tall fescue, orchardgrass, and perennial ryegrass varieties that have been entered in the Kentucky trials. In Table 17 the data is listed as a percentage of KY31+. In other words, the stand survival ratings of all varieties is expressed as a percent of KY31+, with KY31+ set to 100. Varieties with percentages over 100 persisted better than KY31+, and those with percentages less than 100 persisted less well than KY31+. In tables 18 and 19 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 well than average. Direct, statistical comparisons of varieties cannot be made using the summary tables 17, 18, and 19, but these comparisons can help identify varieties for further consideration. Varieties that have performed better than average over many years have very stable performance; others may have performed very well in wet years or on particular soil types. These details may influence variety choice, and more information can be found in the yearly reports. See the footnotes in tables 17, 18, and 19 to determine which yearly report should be referenced.

Summary

These studies indicate that there are varieties of cool-season grasses that can tolerate overgrazing for multiple seasons and still maintain reasonable stands. Some varieties of endophyte-free as well as novel endophyte tall fescue have been able to maintain equivalent stands to endophyte-infected KY31. There is no KY31+ equivalent in orchardgrass; that is, no variety has historically been proven to be tolerant of overgrazing. However, some varieties have exhibited good tolerance to grazing abuse even after three and four seasons.

This information should be used along with yield and other information (for example, relative maturity in spring) in selecting the best grass variety for each individual use. Overgrazing tall fescue or orchardgrass is not recommended. Although several varieties expressed tolerance to the level of grazing pressure used in these trials, overgrazing greatly reduces yield, persistence and therefore profitability of these varieties. This information should be an indication of those varieties that will better withstand occasional overgrazing that sometimes becomes necessary in livestock operations. Good management for maximum life from any grass would be to allow it to become completely established before grazing and to avoid overgrazing it during times of extreme stress, such as drought.

For further information about grazing management, refer to the College of Agriculture publications, available at the local Extension office or in the publications section of the UK Forage Extension website at www.forages.ca.uky.edu.

- Rotational Grazing (ID-143)
- Tall Fescue (AGR-59)
- Fescue Toxicosis (ID-221)
- Producers Guide to Pasture-Based Finishing (ID-224)
- Broadleaf Weeds of Kentucky Pastures (AGR-207)
- Weed Management in Grass Pastures, Hayfields and Other Farmstead Sites (AGR-172)
- Extending Grazing and Reducing Stored Feed Needs (AGR-199)

About the Authors

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We wish to thank Kirk Vanzant (research specialist) for assisting with the procurement and management of the cattle.

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2022, 2023, 2024, and 2025.

	2022				2023				2024				2025[2]			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP[1]	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	29	-2	4.93	+2.07	44	+13	6.28	+3.42	32	+1	5.50	+2.60	27	-4	2.80	-0.06
FEB	38	+3	7.69	+4.48	47	+12	3.73	+0.52	44	+9	3.90	+0.70	37	+2	6.10	+2.89
MAR	49	+5	4.27	-0.13	48	+4	4.45	+0.05	49	+5	3.50	-0.90	49	+5	3.90	-0.50
APR	55	0	3.71	-0.17	58	+3	2.36	-1.52	58	+3	3.90	0.00	57	+7	10.80	+6.92
MAY	69	+5	3.84	-0.63	65	+1	2.53	-1.94	67	+3	4.60	+0.10	62	-2	7.30	+2.83
JUN	76	+4	2.10	-1.56	72	0	6.75	+3.09	74	+2	2.40	-1.30	75	+3	8.20	+4.54
JUL	80	+4	6.46	+1.46	78	+2	5.32	+0.32	77	+1	2.50	-2.50	79	+3	3.90	-1.10
AUG	77	+2	4.27	+0.34	76	+1	2.40	-1.53	75	0	3.30	-0.60	73	+2	1.80	-2.13
SEP	70	+2	1.50	-1.70	71	+3	0.99	-2.21	70	+2	6.20	+3.00	70	+2	2.70	-0.50
OCT	57	0	0.96	-1.61	61	+4	2.30	-0.27	58	+1	0.30	-2.30	58	+1	8.10	+6.13
NOV	49	+4	2.1	-1.29	49	+4	1.7	-1.69	50	+5	3.80	-0.41				
DEC	40	+4	3.46	-0.52	44	+8	2.41	-1.57	40	+4	3.9	-0.08				
Total			45.29	+0.74			41.22	-3.33			43.80	-0.75			55.60	+18.4

[1] DEP is departure from the long-term average.
[2] 2025 data is for ten months through October.

Table 2. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown September 8, 2021, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Endophyte Status[1]	Seedling Vigor[2] Oct 5, 2021	Grazing Preference[3]			Percent Stand								
			2022	2023	2025	2021	2022		2023		2024		2025	
			May 6	May 4	May 29	Oct 5	Mar 24	Oct 24	Mar 21	Oct 18	Mar 22	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use														
BarOptima PLUS E34	novel	4.5	2.5	2.5	1.3	100	100	100	100	100	100	100	100	100*
Cajun II	free	4.7	1.0	1.2	1.5	100	100	100	100	100	100	100	100	100*
Estancia Arkshield	novel	4.7	1.2	1.0	1.3	100	100	100	100	100	100	100	100	100*
Jesup MaxQ II	novel	4.3	1.0	1.2	1.2	100	100	100	100	100	100	100	100	100*
KY31+	toxic	4.6	1.2	2.0	1.3	100	100	100	100	100	100	100	100	100*
Lacefield MaxQ II	novel	4.9	1.3	1.2	1.2	100	100	100	100	100	100	100	100	100*
Ranchero	free	4.4	1.7	1.2	1.3	100	100	100	100	100	100	100	100	100*
SS0705TFSL	free	4.9	1.7	1.2	1.5	100	100	100	100	100	100	100	100	100*
Texoma MaxQ II	novel	4.3	1.0	1.0	1.3	100	100	100	100	100	100	100	100	100*
Experimental Varieties														
KY31-	free	4.8	1.5	1.2	1.2	100	100	100	100	100	100	100	100	100*
KYFA9611	free	4.2	3.0	2.3	1.3	100	100	100	100	100	100	100	100	100*
RAD-GAN208	free	4.6	1.8	1.5	1.3	100	100	100	100	100	100	100	100	100*
SETFN97	free	4.5	1.0	1.2	1.7	100	100	100	100	100	100	100	100	100*
SETFPC-5BK	free	4.4	1.0	1.0	1.2	100	100	100	100	100	100	100	100	100*
Mean		4.6	1.5	1.4	1.3	100	100	100	100	100	100	100	100	100
CV,%		5.2	25.8	32.2	32.7	0	0	0	0	0	0	0	0	0
LSD,0.05		0.3	0.4	0.5	0.5	0	0	0	0	0	0	0	0	0

[1] Free-varieties that do not contain an endophyte. Toxic-KY31+ contains a toxic endophyte. Novel-varieties that contain an endophyte that aids persistence but is not toxic to cattle.
[2] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[3] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2022-16 days, 2023-15 days, 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 3. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown September 9, 2022, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Endophyte Status[1]	Seedling Vigor[2] Sep 28, 2022	Grazing Preference[3]		Percent Stand						
			2023	2025	2022	2023		2024		2025	
			May 4	May 29	Sep 28	Mar 21	Oct 18	Mar 25	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use											
BarOptima PLUS E34	novel	4.8	3.0	1.5	100	100	100	100	100	100	100*
Cajun II	free	5.0	3.2	1.8	100	100	100	100	100	100	100*
Estancia Arkshield	novel	4.8	2.5	1.2	100	100	100	100	100	100	100*
Jesup MaxQII	novel	4.7	2.7	1.5	100	100	100	100	100	100	100*
KY31+	toxic	4.8	2.7	1.7	100	100	100	100	100	100	100*
Lacefield MaxQII	novel	5.0	2.7	1.8	100	100	100	100	100	100	100*
SS0705TFSL	free	5.0	2.5	1.8	100	100	100	100	100	100	100*
Texoma MaxQII	novel	4.8	2.8	1.5	100	100	100	100	100	100	100*
Experimental Varieties											
GTC16076/T10941	free	4.8	3.3	2.0	100	100	100	100	100	100	100*
GTC16077/T10942	free	4.9	3.0	1.8	100	100	100	100	100	100	100*
GTC16078/T10943	free	4.8	3.0	1.5	100	100	100	100	100	100	100*
GTC16079/T10944	free	5.0	2.7	1.5	100	100	100	100	100	100	100*
GTC16081/T11044	free	4.8	3.0	1.5	100	100	100	100	100	100	100*
KY31-	free	4.9	2.8	1.3	100	100	100	100	100	100	100*
KYFA9732/AR584	novel	5.0	3.7	1.5	100	100	100	100	100	100	100*
RAD-TF119	free	4.8	2.8	1.7	100	100	100	100	100	100	100*
Mean		4.9	2.9	1.6	100	100	100	100	100	100	100
CV,%		4.8	22.9	39.6	0	0	0	0	0	0	0
LSD,0.05		0.3	0.8	0.7	0	0	0	0	0	0	0

[1] Free-varieties that do not contain an endophyte. Toxic-KY31+ contains a toxic endophyte. Novel-varieties that contain an endophyte that aids persistence but is not toxic to cattle.
[2] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[3] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2023-15 days, 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 4. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown August 31, 2023, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Endophyte Status[1]	Seedling Vigor[2] Oct 14, 2023	Grazing Preference[3] May 29, 2025	Percent Stand				
				2023	2024		2025	
				Oct 14	Mar 14	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use								
SS0705TFSL	free	3.1	1.3	92	95	96	96	96*
BarOptima PLUS E34	novel	3.4	1.8	96	96	96	96	96*
Cajun II	free	3.4	1.0	94	95	96	96	96*
Iliade	free	3.7	2.8	96	95	95	95	95*
Lacefield MaxQII	novel	2.9	1.0	95	94	95	95	95*
Fawn	free	3.5	1.0	93	93	93	93	94*
Jesup MaxQII	novel	2.8	1.0	88	93	93	94	94*
Texoma MaxQII	novel	2.6	1.5	88	93	94	94	94*
KY31+	toxic	3.2	1.0	91	91	93	93	93
Estancia Arkshield	novel	2.9	1.0	86	89	93	93	93
Palatine	free	2.8	1.3	90	91	91	92	92
Ranchero	free	3.0	1.0	89	91	90	90	91
Experimental Varieties								
KY31-	free	3.5	1.0	96	95	95	95	96*
KYFA9732/AR584	novel	3.4	1.0	92	92	94	95	94*
KYFA9611	free	2.8	1.0	94	93	92	91	91
KYFA1014	free	2.9	1.0	78	80	90	90	90
Mean		3.1	1.2	91	92	93	93	93
CV,%		22.9	36.6	9	6	3	3	3
LSD,0.05		0.8	0.5	10	6	3	3	3

[1] Free-varieties that do not contain an endophyte. Toxic-KY31+ contains a toxic endophyte. Novel-varieties that contain an endophyte that aids persistence but is not toxic to cattle.
[2] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[3] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 5. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown September 6, 2024, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Endophyte Status[1]	Seedling Vigor[2] Oct 2, 2024	Grazing Preference[3] May 14, 2025	Percent Stand		
				2024	2025	
				Oct 2	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use						
Estancia Arkshield	novel	4.1	1.8	100	100	100*
KY31+	toxic	4.5	1.8	99	99	98*
Triumphant Protek	novel	4.1	1.5	98	98	98*
Tower Protek	novel	4.3	2.0	96	99	98*
Matin2 Protek	novel	3.9	1.0	96	99	97*
BigSky	free	4.3	2.2	99	98	96*
SS0705TFSL	free	4.2	2.0	94	95	95*
Malma	free	4.1	2.2	90	92	93*
BarOptima PLUS E34	novel	4.3	2.7	99	100	90*
Palatine	free	4.6	2.5	100	100	88*
Cajun II	free	4.0	1.7	92	96	83*
Experimental Varieties						
KY31-	free	4.5	1.7	97	98	98*
KYFA9611GT	free	4.1	2.3	94	94	98*
KYFA0502	free	3.2	1.5	77	80	80
GEN-FCOV	free	4.2	2.7	95	95	79
KYFA1014	free	3.3	2.0	74	78	78
Mean		4.1	2.0	94	95	92
CV,%		16.5	34.1	11	10	18
LSD,0.05		0.8	0.8	12	11	19

[1] Free-varieties that do not contain an endophyte. Toxic-KY31+ contains a toxic endophyte. Novel-varieties that contain an endophyte that aids persistence but is not toxic to cattle.
[2] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[3] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2025-35 days.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

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

Variety	Seedling Vigor[1] Oct 5, 2021	Grazing Preference[2]			Percent Stand								
		2022	2023	2025	2021	2022		2023		2024		2025	
		May 6	May 4	May 29	Oct 5	Mar 24	Oct 24	Mar 21	Oct 17	Mar 22	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use													
Profit	4.6	2.3	3.5	2.0	100	100	100	98	88	89	94	94	94*
Persist II	4.4	2.0	2.5	1.0	100	100	100	99	96	97	97	97	93*
Persist	4.8	1.8	2.3	1.5	100	100	100	98	94	94	94	94	93*
Prodigy	4.7	2.0	3.8	1.3	100	100	100	96	91	91	91	91	93*
SS0708OGDT	4.3	2.0	3.3	1.8	100	100	100	97	92	93	93	93	93*
Devour	4.4	2.8	4.7	4.2	100	100	100	97	94	94	95	95	92*
Potomac	4.5	2.2	2.5	2.0	100	100	100	98	94	93	93	93	90*
Prairie	4.3	2.0	3.0	2.2	100	100	100	99	91	92	92	92	90*
Intensiv	4.9	2.5	5.7	3.8	100	100	100	95	68	76	84	87	87
Barlegro	3.3	2.5	5.5	4.0	100	100	100	97	72	71	82	82	80
Experimental Varieties													
BARDgLF99	4.1	2.5	6.0	2.5	100	100	100	96	91	92	93	93	93*
BARDgLF98	4.4	2.2	4.3	2.0	100	100	100	99	86	90	93	93	90*
BarDgLF84	3.9	2.0	4.3	2.8	100	100	100	96	77	68	78	78	84
BarDgLF85	4.7	1.7	4.5	2.3	100	100	100	96	83	83	86	88	83
Mean	4.4	2.2	4.0	2.4	100	100	100	97	87	87	90	91	90
CV,%	8.8	17.8	18.5	18.1	0	0	0	2	11	9	5	5	5
LSD,0.05	0.4	0.4	0.9	0.8	0	0	0	2	11	9	5	5	6

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2022-16 days, 2023-15 days, 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 7. Seedling vigor, grazing preference, and stand persistence of orchardgrass varieties sown September 9, 2022, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Sep 28, 2022	Grazing Preference[2]		Percent Stand						
		2023	2025	2022	2023		2024		2025	
		May 4	May 29	Sep 28	Mar 21	Nov 9	Mar 25	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use										
Profit	5.0	3.5	2.2	100	100	99	95	96	96	96*
Persist II	4.9	3.7	2.0	100	100	97	96	96	96	95*
Prairie	4.9	3.3	2.0	100	100	96	96	96	96	94*
Devour	5.0	3.5	2.8	100	100	100	96	95	96	94*
Persist	4.9	3.5	2.0	100	100	98	94	93	93	93*
Prodigy	4.9	3.2	2.0	100	100	97	95	95	94	93*
SS0708OGDT	5.0	3.7	1.7	100	100	97	94	94	94	93*
Potomac	5.0	3.2	2.0	100	100	98	98	97	97	93*
Mean	5.0	3.4	2.1	100	100	98	96	95	95	94
CV,%	2.6	17.2	35.9	0	0	2	3	3	3	3
LSD,0.05	0.2	0.7	0.9	0	0	3	4	4	4	3

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2023-15 days, 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 8. Seedling vigor, grazing preference, and stand persistence of orchardgrass varieties sown August 31, 2023, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 19, 2023	Grazing Preference[2] May 29, 2025	Percent Stand				
			2023	2024		2025	
			Oct 19	Mar 14	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use							
Persist II	3.4	1.0	94	95	96	96	94*
Persist	4.4	1.2	98	96	96	96	93*
SS0708OGDT	3.8	2.0	95	94	93	93	93*
Prodigy	3.8	1.7	97	95	95	95	92*
Devour	3.7	3.5	96	94	94	94	89
Intensiv	4.7	3.2	99	97	94	94	88
Mean	4.0	2.1	96	95	95	95	91
CV,%	18.6	21.3	3	4	3	3	4
LSD,0.05	0.9	0.5	4	4	3	3	5

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 9. Seedling vigor, grazing preference, and stand persistence of orchardgrass varieties sown September 6, 2024, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 2, 2024	Grazing Preference[2] May 29, 2025	Percent Stand		
			2024	2025	
			Oct 2	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use					
Devour	4.3	3.2	100	100	100*
Intensiv	4.6	3.7	100	100	100*
SS0708OGDT	4.8	1.2	100	100	100*
Persist	4.7	1.5	100	99	99*
Persist II	4.5	1.8	100	99	99*
Experimental Varieties					
GEN-POCV	4.7	3.3	100	93	92
Mean	4.6	2.4	100	99	98
CV,%	7.5	27.3	0	5	7
LSD,0.05	0.4	0.8	0	6	8

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2025-35 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 10. Seedling vigor, grazing preference, and stand persistence of perennial ryegrass varieties sown September 8, 2021, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 5, 2021	Grazing Preference[2]			Percent Stand								
		2022	2023	2025	2021	2022		2023		2024		2025	
		May 6	May 4	May 6	Oct 5	Mar 24	Oct 24	Mar 21	Oct 17	Mar 22	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use													
Remington PLUS NEA2[3]	4.3	5.0	5.7	4.3	100	100	100	100	100	100	98	98	93*
Remington	4.6	4.8	5.7	5.8	100	100	100	99	99	99	98	98	88*
PayDay	4.7	5.0	6.2	2.3	100	100	100	97	94	94	89	89	72*
Linn	4.9	4.8	3.7	2.2	100	98	96	94	88	91	87	87	67
Power	4.6	5.3	5.7	3.8	100	100	100	98	93	93	88	88	60
TetraMag	5.0	6.5	7.3	4.0	100	99	95	89	32	33	33	28	30
Experimental Varieties													
GPT14021 AR1[3]	4.0	6.2	5.5	2.2	100	97	93	90	80	81	80	89	79*
Mean	4.6	5.4	5.7	3.5	100	99	98	95	84	84	82	83	70
CV,%	7.4	13.9	15.1	42.4	0	2	5	7	13	13	14	9	28
LSD,0.05	0.4	0.9	1.0	1.8	0	2	6	8	13	13	14	8	23

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2022-16 days, 2023-15 days, 2025-12 days.
[3] Remington PLUS NEA2 and GPT1402 AR1 contain a non-toxic (novel) endophyte.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 11. Seedling vigor, grazing preference, and stand persistence of perennial ryegrass and festulolium (FL) varieties sown September 9, 2022, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Sep 28, 2022	Grazing Preference[2]		Percent Stand						
		2023	2025	2022	2023		2024		2025	
		May 4	May 6	Sep 28	Mar 21	Nov 9	Mar 25	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use										
PayDay	4.8	4.2	6.5	100	100	100	100	100	100	92*
TetraSweet	4.9	4.0	6.8	100	100	100	100	100	100	90*
TetraMag	5.0	4.0	7.2	100	100	100	100	100	99	90*
Sugarcrest (FL)	4.9	4.3	6.5	100	100	100	100	100	98	88*
Power	4.8	4.0	5.3	100	100	100	100	100	100	87*
SpringGreen (FL)	4.9	4.2	7.2	100	100	100	100	100	100	86*
Linn	4.9	3.7	5.8	100	100	100	100	100	99	84
Experimental Varieties										
PST-2BUL19	4.8	4.2	5.2	100	100	100	100	100	97	88*
Mean	4.9	4.1	6.3	100	100	100	100	100	99	88
CV,%	3.1	14.7	23.9	0	0	0	0	0	2	7
LSD,0.05	0.2	0.7	1.8	0	0	0	0	0	3	7

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2023-15 days, 2025-12 days.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 12. Seedling vigor, grazing preference, and stand persistence of perennial ryegrass and festulolium (FL) varieties sown August 31, 2023, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 19, 2023	Grazing Preference[2] May 6, 2025	Percent Stand				
			2023	2024		2025	
			Oct 19	Mar 14	Sep 30	Mar 19	Oct 10
Commercial Varieties-Available for Farm Use							
Remington	3.7	5.7	100	99	97	91	89*
Remington PLUS NEA2[3]	3.3	6.0	98	98	98	94	89*
TetraSweet	4.1	5.2	99	99	98	91	86*
PayDay	3.6	6.7	98	97	97	92	78*
Power	4.0	6.2	99	99	98	90	77*
SpringGreen (FL)	4.2	6.0	98	99	96	90	67
Delika	3.9	6.2	100	100	98	22	65
Linn	4.7	3.7	100	99	96	90	64
Sugarcrest (FL)	3.9	5.8	98	98	96	90	58
TetraMag	4.2	5.7	99	99	98	83	56
Mean	3.9	5.7	99	99	97	83	73
CV,%	14.6	25.7	2	2	2	7	15
LSD,0.05	0.7	1.7	2	2	2	7	13

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2025-12 days.
[3] Remington PLUS NEA2 contains a non-toxic (novel) endophyte.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 13. Seedling vigor, grazing preference, and stand persistence of perennial ryegrass varieties sown September 6, 2024, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 2, 2024	Grazing Preference[2] May 14, 2025	Percent Stand		
			2024	2025	
			Oct 2	Mar 19	Oct 21
Commercial Varieties-Available for Farm Use					
Remington PLUS NEA2[3]	3.8	6.0	100	100	98*
PayDay	4.8	5.8	100	100	83*
TetraSweet	4.8	5.8	100	100	82*
Delika	4.8	6.0	100	100	81*
Power	5.0	6.0	100	100	66
TetraMag	4.8	5.5	100	100	58
Mean	4.7	5.9	100	100	78
CV,%	6.8	8.8	0	0	19
LSD,0.05	0.4	0.6	0	0	18

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Preference score based on a scale of 1 to 9 with 9 indicating all forage was grazed. Grazing time before rating: 2025-12 days.
[3] Remington PLUS NEA2 contains a non-toxic (novel) endophyte.
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 14. Proprietors of tall fescue varieties in current grazing trials in Lexington, Kentucky.

Variety	Endophyte Status[1]	Proprietor/KY distributor
Commercial Varieties-Available for Farm Use		
BarOptima PLUS E34	novel	Barenbrug USA
BigSky	free	Columbia Seeds
Cajun II	free	Smith Seed Services
Estancia Arkshield	novel	Mountain View Seeds
Fawn	free	Smith Seed Services
Goliath	free	Ampac Seed
Iliade	free	Columbia Seeds
Jesup MaxQII	novel	Pennington Seed
KY 31+	toxic	KY Agric. Exp. Station
Lacefield MaxQ II	novel	Pennington Seed
Malma	free	Gentos SA
Martin2 Protek	novel	DLF Pickseed
Palatine	free	Mountain View Seeds
Ranchero	free	Smith Seed Services
SS-0705TFSL	free	Southern States
STF43	free	Barenbrug USA
Texoma MaxQII	novel	Pennington Seed
Triumphant Protek	novel	DLF Pickseed
Experimental Varieties[2]		
BARFA6BTR179	novel	Barenbrug USA
GEN-FCOV	free	Gentos SA
GTC16076/T10941	free	Univ. of GA
GTC16077/T10942	free	Univ. of GA
GTC16078/T10943	free	Univ. of GA
GTC16079/T10944	free	Univ. of GA
GTC16081/T11044	novel	Univ. of GA
KY 31-	free	KY Agric. Exp. Station
KYFA0502	free	KY Agric. Exp. Station
KYFA1014	free	KY Agric. Exp. Station
KYFA9611	free	KY Agric. Exp. Station
KYFA9732/AR584	novel	KY Agric. Exp. Station
RAD-GAN208	free	Radix Research
RAD-TF119	free	Radix Research
SETFN97	free	Smith Seed Services
SETFPC-5BK	free	Smith Seed Services

[1] Free-varieties that do not contain an endophyte.Toxic-KY31+ contains a toxic endophyte. Novel-varieties that contain an endophyte that aids persistence but is not toxic to cattle.
[2] Experimental varieties are not available commercially, but provide an indication of the progress being made by forage breeding companies.

Table 15. Proprietors of orchardgrass varieties in current grazing trials in Lexington, Kentucky.

Variety	Proprietor/KY distributor
Commercial Varieties-Available for Farm Use	
Barlegro	Barenbrug USA
Devour	Mountain View Seeds
Intensiv	Barenbrug USA
Persist	Smith Seed Services
Persist II	Smith Seed Services
Potomac	Public
Prairie	Turner Seed
Prodigy	Caudill Seed
Profit	Ampac Seed
SS-0708OGDT	Southern States
Experimental Varieties[1]	
BARDgLF84	Barenbrug USA
BARDgLF85	Barenbrug USA
BARDgLF98	Barenbrug USA
BARDgLF99	Barenbrug USA
GEN-POCV	Gentos SA

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

Table 16. Proprietors of perennial ryegrass and festulolium (FL) varieties in current grazing trials in Lexington, Kentucky.

Variety	Proprietor/KY Distributor
Commercial Varieties-Available for Farm Use	
Delika	Columbia Seeds
Linn (certified)	Public
PayDay	Mountain View Seeds
Power	Ampac Seed Co.
Remington	Barenbrug USA
Remington PLUS NEA2[1]	Barenbrug USA
Spring Green (FL)	Turf Seed
Sugarcrest (FL)	Mountain View Seeds
TetraMag	Mountain View Seeds
TetraSweet	Mountain View Seeds
Experimental Varieties[2]	
GPT14021 AR1[1]	Mountain View Seeds
PST-2BUL19	Pure Seed Testing

[1] Remington PLUS NEA2 and GPT14021 AR1 contain a non-toxic (novel) endophyte.
[2] Experimental varieties are not available commercially, but provide an indication of the progress being made by forage breeding companies.

Table 17. Summary of 2002-2025 Kentucky tall fescue grazing tolerance trials in Lexington (stand persistence shown as a percent of the stand rating of KY 31+).

Variety	Endophyte Status[1]	Proprietor	2002[2,3]	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Mean[4] (#trials)
			4yr[5]	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	3-yr	
Advance MaxQ	novel	Pennington Seed					94																	–
Armory	free	Barenbrug USA																		99	100			100(2)
Baguala	free	Allied Seed														99								–
Bariane	free	Barenbrug USA		89		75	47	29																60(4)
BarElite	free	Barenbrug USA						96																–
Barolex	free	Barenbrug USA				78	101	86																88(3)
BarOptima PLUS E34	novel	Barenbrug USA				100		97			98	100	98	100	100	100	100	96	91	100	100	100	100	99(15)
Bronson	free	Ampac Seed								98	98						100							99(3)
Bull	free	Caudill Seed												96			100	98	91					96(4)
Cajun II	free	Smith Seed Services									98				97	100	100	99	96	99	100	100	100	99(10)
Cowgirl	free	Rose Agri-Seed			99								99											99(2)
Dominate	free	Allied Seed														99								–
Drover	free	Barenbrug USA														99								–
Estancia Arkshield	novel	Mountain View Seeds																		100	100	100	100	100(4)
Evergraze	free	Bailey Seed & Grain																			100			–
Festival	free	Pickseed West	101																					–
FSG 402TF	free	Farm Service Genetics														99								–
Flourish	free	Allied Seed											98											–
Goliath	free	Ampac Seed									98						100				100			99(3)
HyMark	free	Fraser Seeds							95			100												98(2)
Jesup MaxQ	novel	Pennington Seed	103	97		68	102	97	97	99	98	100	99	99	99	100	100	100	99		100			97(17)
Jesup MaxQII	novel	Pennington Seed																		100		100	100	100(3)
KY31+	toxic	KY Agri. Exp Sta.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100(21)
KY31-	free	KY Agri. Exp Sta.	103	98	100	83	101	100	98	99	99	100	100	99	100	100	100	99	96	100	100	100	100	99(21)
Lacefield MaxQ II	novel	Pennington Seed				82	102	99	98	98	97			100	99	100	100	99	100	100	100	100	100	98(16)
Ranchero	free	Smith Seed Services																98		96	100	100		99(4)
Select	free	Southern States	100	100		67	100	93	95	97	100	100	99	99	99	101								96(13)
SS0705TFSL	free	Southern States													100	100	100	99	96	100	100	100	100	99(9)
STF43	free	Barenbrug USA																		97	100			99(2)
Stockman	free	Seed Res. of OR			102																			–
Texoma MaxQ II	novel	Pennington Seed				88	100	98												95		100	100	97(6)
Tuscany II	free	Seed Res. of OR					101																	–
Verdant	free	Am.Grass Seed					97																	–

[1] Free-varieties that do not contain an endophyte. Toxic-KY31+ contains a toxic endophyte. Novel-varieties that contain an endophyte that aids persistence but is not toxic to cattle.
[2] Year trial was established.
[3] 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 trial. For example, the Lexington trial planted in the fall of 2016 was grazed four years so the final report would be "2020 Cool-Season Grass Grazing Tolerance Report" archived in the UK Forage website (https://forages.ca.uky.edu).
[4] Mean only presented when respective variety was included in two or more trials.
[5] Number of years of data.

Table 18. Summary of 2000-2025 Kentucky orchardgrass grazing tolerance trials in Lexington (stand persistence shown as a percent of the mean of the commercial varieties in the trial).

Variety	Proprietor	2000[1,2]	2001	2002	2003	2004	2005[3]	2007	2009	2010	2011	2012	2013[3]	2014	2015	2016	2017	2018	2019	2020	2021	2022	Mean[4]
		4yr[5]	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	3yr	(#trials)
Abertop	Pennington Seed			38																			–
Albert	Univ. of Wisconsin		115																				–
Amba	DLF-Jenks		71																				–
Ambrosia	Pennington Seed							94															–
Athos	DLF-Jenks		93				60																–
Barlegro	Barenbrug USA																				88		–
Benchmark	Southern States	118	123	114																			118(3)
Benchmark Plus	Southern States			120			152	135	106	106	108	115	146	154									120(7)
Boone	Public	102																					–
Command	Seed Research of OR					81																	–
Crown Royale	Donley Seed		100																				–
Crown Royale Plus	Donley Seed			124																			–
Devour	Mountain View Seeds															145				107	102	100	114(4)
Elise	Pure Seed											97				62							80(2)
Hallmark	James VanLeeuwen		115		113																		114(2)
Harvestar	Columbia Seeds							75		89	94		51	34		60							70(5)
Haymate	Southern States	53	115	100	118																		97(4)
HLR	Barenbrug USA																		90	99			95(2)
Intensiv	Barenbrug USA				51															96	96		94(2)
Mammoth	DLF-Jenks		115																				–
Megabite	Turf Seed		77																				–
Niva	DLF-Jenks			76																			–
Persist	Smith Seed Services						138	107	103	100	96	115	102	123	104	131	116	132	140	107	103	99	114(15)
Persist II	Smith Seed Services																		117	108	103	101	107(4)
Potomac (certified)	Public			116		119									109	82	109				99	99	105(7)
Prairie	Turner Seed	127	121								94		131	90	97	107	60	105	90	106	99	100	100(12)
Prodigy	Caudill Seed												109	119		94	109	97	87		103	99	101(7)
Profile	Scott Seed			116																			–
Profit	Ampac Seed								95	99	102	94	95	90	82					105	104	102	97(9)
Swante	Smith Seed Services																			73			–
Tekapo	Ampac Seed		55	74	118		50	103	95	105	106	80	66	63	77								84(11)
Takena	Smith Seed Services		99																				–
Seco	Southern States							85															–
SS0708OGDT	Southern States													128	131	118	106	109	87		103	99	110(8)
Swante	Smith Seed Services																	57					–

[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 trial. For example, the Lexington trial planted in the fall of 2016 was grazed four years so the final report would be "2020 Cool-Season Grass Grazing Tolerance Report" archived in the UK Forage website (https://forages.ca.uky.edu).

[3] Due to high variation during 2005 and 2013 trials these values are not included in the overall mean.

[4] Mean only presented when respective variety was included in two or more trials.

[5] Number of years of data.
Stand thinning may have been greater for preferred varieties due to closer grazing. See individual trial tables for preference ratings.

Table 19. Summary of 2001-2025 Kentucky perennial ryegrass and festulolium (FL) grazing tolerance trials in Lexington (stand persistence shown as a percent of the mean of the commercial varieties in the trial).

Variety	Type	Proprietor	2001[1,2]	2003	2007	2008	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Mean[3]
			3yr[4]	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	3yr	(#trials)
AGRLP103	–	AgResearch USA		86																–
Albion	tetraploid	Grassland Oregon										112								–
Aries	diploid	Ampac Seed	128																	–
Barfest (FL)	MF x PR[6]	Barenbrug USA					116	112												–
BG-34	diploid	Barenbrug USA										78								–
Boost	tetraploid	Allied Seed				101	83	95	92											93(4)
Calibra	tetraploid	DLF International							106		88	90	98		94					95(5)
Citadel	tetraploid	Donley Seed																		–
Duo (FL)	MF x PR[6]	Ampac Seed				95	72	90	102			65	65							82(6)
Lasso	diploid	DLF-Jenks	120																	–
Linn (certified)	diploid	Public	118	63		95	108	95	91	96	80	69	88	79	99	96	52	98	95	89(16)
Melpetra	tetraploid	Hood River Seed											90							–
PayDay	tetraploid	Mountain View Seeds								101	85			99	90	73	93	105	104	94(8)
Polly II	tetraploid	FS Growmark	63																	–
Power	tetraploid	Ampac Seed			158		107	112	96	89	79	78					89	88	99	100(10)
Quartet	tetraploid	Ampac Seed	70		59															68(2)
Remington	tetraploid	Barenbrug USA		151							138	168	169	124	116	147	133	129		142(9)
Remington PLUS NEA2[5]	tetraploid	Barenbrug USA									145	159			122	151	134	136		141(6)
Spring Green (FL)	MF x PR[6]	Rose Agri-Seed				109	115	115	106			81	88						98	102(7)
Sugarcrest (FL)	MF x PR[6]	Mountain View Seeds																		–
TetraGain	tetraploid	Pure Seed							102					90						96(2)
TetraMag	tetraploid	Mountain View Seeds													89	55		44	102	73(4)
TetraSweet	tetraploid	Mountain View Seeds													89	82			102	91(3)
Victorian	diploid	Caudill Seed								114				109						112(2)

[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 trial. For example, the Lexington trial planted in the fall of 2016 was grazed four years so the final report would be "2020 Cool-Season Grass Grazing Tolerance Report" archived in the UK Forage website (htpps://forages.ca.uky.edu).
[3] Mean only presented when respective variety was included in two or more trials.
[4] Number of years of data.
[5] Remington PLUS NEA2 contains a non-toxic (novel) endophyte.
[6] MF=meadow fescue, PR=perennial ryegrass, IR=Italian ryegrass.

2025 Cool-season Grass Grazing Tolerance Report

Martin-Gatton
College of Agriculture,
Food and Environment

12-2025