AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT, LEXINGTON, KY, 40546

PR-702

UNIVERSITY OF KENTUCKY
College of Agriculture, Food and Environment

2015 Cool-Season Grass Grazing Tolerance Report

G.L. Olson, S.R. Smith, and T.D. Phillips, Plant and Soil Sciences, and J.D. Clark, Animal and Food Sciences

Introduction

Cool-season grasses such as tall fescue, orchardgrass, and Kentucky bluegrass are the primary pasture grasses in Kentucky. Other species such as perennial ryegrass, festulolium, and the brome grasses can 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 grazing season. The main focus will be on plant stand survival. Tables 17, 18, and 19 show the summaries of all tall fescue, orchardgrass, and perennial ryegrass varieties tested in Kentucky during the past 15 years. The UK Forage Extension website, at www.uky.edu/Ag/Forage, contains electronic versions of all forage variety testing reports from Kentucky and surrounding states and from 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 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 assure 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 2011, 2012, 2013, and 2014. 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. Supplemental hay or soybean hulls were 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 to check stand survival after the grazing season and in the spring prior to grazing to check on winter survival and spring growth. Since

Table 1. Temperature and rainfall at Lexington, Kentucky in 2012, 2013, 2014, and 2015.

	2012				2013				2014				2015[2]			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP[1]	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	38	+7	4.80	+1.94	38	+7	4.50	+1.64	25	-6	2.28	-.58	32	+1	2.17	-0.69
FEB	40	+5	5.39	+2.18	36	+1	1.78	-1.43	30	-5	5.47	+2.26	26	14	3.08	-0.13
MAR	56	+12	5.64	+1.24	39	-5	5.47	+1.07	39	-5	3.08	-1.32	45	+1	7.34	+2.94
APR	56	+1	3.26	-0.62	55	0	4.46	+0.58	58	+3	5.27	-1.89	57	+2	13.19	+9.31
MAY	69	+5	4.02	-0.45	65	+1	5.23	+.076	66	+2	5.72	+1.25	69	+5	3.02	-1.45
JUN	73	+1	2.42	-1.24	72	0	7.32	+3.66	75	+3	2.93	-0.73	75	+3	8.20	+4.54
JUL	81	+5	2.50	-2.50	72	-4	9.33	+4.33	74	-2	3.18	-1.82	77	+1	10.22	+5.22
AUG	75	0	1.68	-2.25	72	-3	3.68	-0.25	76	+1	6.53	+2.60	74	-1	3.49	-0.44
SEP	67	-1	6.40	+3.20	67	-1	2.21	-0.99	69	+1	3.63	+.43	72	+4	3.49	+0.29
OCT	55	-2	2.00	-0.57	55	-2	7.02	+4.45	57	0	5.55	+2.98	59	+2	2.78	+0.21
NOV	43	-2	1.81	-0.65	41	-4	3.06	-0.33	41	-4	2.79	-0.60				
DEC	42	+6	9.57	+4.94	36	0	4.19	+0.21	40	+4	2.47	-1.51				
Total			49.49	+4.94			58.25	+13.70			49.4	+4.85			56.98	+19.80

[1] DEP is departure from the long-term average.
[2] 2015 data is for the ten months through October.

Table 2. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown September 13, 2011, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling	Grazing Preference[2]				Percent Stand								
	Vigor[1]	2012	2013	2014	2015	2011	2012		2013		2014		2015	
Variety	Oct 11, 2011	May 2	May 20	May 15	May 1	Oct 11	Mar 23	Oct 10	Mar 21	Oct 14	Apr 3	Nov 3	Apr 6	Oct 21
Commercial Varieties-Available for Farm Use														
BarOptima PLUS E34[3]	4.4	3.3	3.5	2.8	2.8	100	100	100	100	100	100	100	100	100*
HyMark	4.8	1.5	1.3	1.0	1.0	100	100	100	100	100	100	100	100	100*
Jesup EF	4.9	2.2	1.3	1.0	1.0	100	100	100	100	100	100	100	100	100*
Jesup MaxQ[3]	4.5	2.6	1.0	1.0	1.0	100	100	100	100	100	100	100	100	100*
KY31+[3]	4.7	4.3	1.7	1.3	1.3	100	100	100	100	100	100	100	100	100*
Select	4.4	2.0	1.2	1.0	1.0	100	100	100	100	100	100	100	100	100*
Experimental Varieties														
AGRFA148	4.7	2.8	1.0	1.0	1.0	100	100	100	100	100	100	100	100	100*
KY31-[3]	4.7	4.7	1.3	1.3	1.0	100	100	100	100	100	100	100	100	100*
KYFA0804	4.9	1.0	1.2	1.0	1.0	100	100	100	100	100	100	100	100	100*
KYFA0902	4.8	3.0	2.8	1.2	1.2	100	100	100	100	100	100	100	100	100*
KYFA0905	4.8	4.3	3.0	1.3	2.3	100	100	100	100	100	100	100	100	100*
NFTF 1411	4.8	2.7	1.0	1.0	1.0	100	100	100	100	100	100	100	100	100*
Mean	4.7	2.9	1.7	1.3	1.3	100	100	100	100	100	100	100	100	100
CV,%	5.8	28.3	52.5	28.2	54.5	0	0	0	0	0	0	0	0	0
LSD,0.05	0.3	0.9	1.0	0.4	0.8	0	0	0	0	0	0	0	0	0

[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; 2012-29 days, 2013-28 days, 2014-23 days, 2015-10 days.
[3] KY 31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte. Jesup MaxQ contains a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. The other fescue varieties in this test do not contain an endophyte.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

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. Varieties not significantly different from the highest numerical value in a column are marked with one asterisk (*). 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

Table 3. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown August 30, 2012, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling	Grazing Preference[2]			Percent Stand						
	Vigor[1]	2013	2014	2015	2012	2013		2014		2015	
Variety	Oct 8. 2012	May 8	May 15	May 4	Oct 8	Mar 21	Oct 14	Apr 3	Nov 3	Apr 6	Oct 21
Commercial Varieties-Available for Farm Use											
KY31+[3]	3.1	2.3	1.7	1.2	97	100	100	100	100	100	100*
Cowgirl	4.0	2.8	1.3	1.0	99	100	100	100	100	100	100*
Jesup EF	2.7	1.0	1.0	1.0	98	100	100	99	99	99	99*
BarOptima PLUS E34[3]	3.9	3.5	2.3	2.2	100	99	100	99	99	99	99*
Jesup MaxQ[3]	3.2	1.2	1.0	1.0	99	99	100	99	99	99	99*
Select	3.3	1.2	1.2	1.0	98	99	99	99	100	99	99*
Flourish	3.6	4.5	1.2	1.8	98	98	99	99	99	99	98
Experimental Varieties											
KYFA0905	3.3	3.3	1.5	1.7	99	99	99	100	100	100	100*
KYFA0906	3.0	2.5	1.3	1.5	98	99	99	99	100	100	100*
KY31-[3]	3.7	2.0	1.2	1.2	100	100	100	100	100	99	99*
KYFA0901	3.3	2.8	1.2	1.0	98	99	100	100	100	99	99*
PPG-FTF104	2.9	2.3	1.7	1.8	98	99	99	99	99	99	98
Mean	3.3	2.5	1.4	1.4	99	99	99	99	100	99	99
CV,%	33.8	42.5	37.2	38.7	2	2	1	1	1	1	1
LSD,0.05	1.3	1.2	0.6	0.6	3	2	1	1	1	1	1

[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; 2013-16 days, 2014-23 days, 2015-13 days.
[3] KY 31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte. Jesup MaxQ contains a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. The other fescue varieties in this test do not contain an endophyte.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

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 in grazing tolerance among tall fescues are: Can endophyte-free varieties persist as well as KY31+? and Will the new novel, or "friendly," endophyte materials persist as well as other tolerant varieties? After three and four seasons, several fescue varieties were comparable to KY31+ in regard to grazing tolerance (Tables 2 and 3).

Table 14 (fescue), Table 15 (orchardgrass), and Table 16 (perennial ryegrass and festulolium) summarize information about distributors and persistence across years for all varieties in these tests. Varieties are listed in alphabetical order, with experimental varieties listed at the bottom. An open block indicates that the variety was not in that particular test (labeled at the top of the column); an "x" in the block indicates that the variety was in the test but plant survival was significantly less than the most persistent variety. A single asterisk (*) means that the variety was not significantly different from the most persistent variety in that study based on the 0.05 LSD. It is best to choose a variety that has performed well over several years.

Tables 17, 18, and 19 are summaries of stand persistence data from 2000 to 2015 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, in the tall fescue trials KY31+ is 100 percent. Varieties with percentages over 100 persisted better than KY31+, and varieties with percentages less than 100 persisted less 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 for each trial is 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

Table 4. Seedling vigor, grazing preference, and stand persistence of tall fescue varieties sown September 6, 2013, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling Vigor[1]	Grazing Preference[2]		Percent Stand				
		2014	2015	2013	2014		2015	
Variety	Oct 14, 2013	May 1	May 1	Oct 14	Apr 2	Oct 6	Apr 6	Oct 21
Commercial Varieties-Available for Farm Use								
BarOptima Plus E34[3]	3.3	5.3	2.5	78	81	89	90	94*
KY31+[3]	3.8	5.7	2.0	85	89	92	93	94*
Select	3.3	4.8	1.0	83	85	89	93	93*
Lacefield MaxQ II[3]	3.9	4.7	1.8	89	89	92	93	92*
Bull	2.8	3.5	1.2	71	75	87	89	91*
Jesup MaxQ[3]	3.1	4.0	1.7	73	82	89	92	88*
Cajun II	2.8	6.3	1.3	43	47	57	64	63
Experimental Varieties								
KYFA0701	3.9	5.3	1.8	87	88	90	94	94*
KYFA9732/AR584[3]	3.9	6.0	3.3	89	87	92	92	92*
GT213/AR584[3]	4.3	5.0	2.3	90	88	89	91	91*
KYFA9821/AR584[3]	3.1	5.7	1.3	54	74	86	91	91*
HTWC4	3.0	5.5	2.0	69	78	87	90	90*
KY31-[3]	2.7	5.8	1.7	72	73	86	89	90*
AGRFA-200/AR584[3]	4.3	5.5	4.8	92	91	93	94	89*
AGRFA-179/AR584[3]	3.3	6.3	4.2	75	74	83	88	86*
AGRFA-201/AR605[3]	2.8	5.0	1.3	52	61	77	83	80
BARFAF13131	2.0	6.3	2.2	23	35	42	47	53
Mean	3.4	5.3	2.1	72.0	76	83	86	86
CV,%	24.2	21.1	34.3	21.0	14	12	11	12
LSD,0.05	1.0	1.3	0.8	18.0	12	11	11	12

[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; 2014-9 days, 2015-10 days.
[3] KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ and Lacefield MaxQ II contain a non toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 and AR605 are non-toxic endophytes inserted into the experimental tall fescue varieties. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.
*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 9, 2014, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling Vigor[1]	Grazing Preference[2]	Percent Stand		
			2014	2015	
Variety	Oct 9, 2014	May 1, 2015	Oct 9	Apr 6	Oct 21
Commercial Varieties-Available for Farm Use					
Cajun II	4.8	1.5	100	100	100*
Jesup MaxQ[3]	4.8	2.0	100	100	100*
KY31+[3]	4.8	2.7	100	100	100*
Lacefield MaxQ II[3]	4.8	2.3	100	100	100*
SS-0705TFSL	4.8	2.3	100	100	100*
Select	4.6	1.2	99	99	100*
BarOptima PLUS E34[3]	4.1	3.0	98	98	100*
Experimental Varieties					
KY31-[3]	4.8	2.3	100	100	100*
KYFA1114/ AR584[3]	4.8	2.8	99	100	100*
KYFA1115/AR584[3]	4.4	3.0	99	99	100*
NFTF 1044	4.3	2.0	99	100	100*
NFTF 1051	4.6	1.5	100	100	100*
NFTF 1370	4.7	1.8	100	100	100*
KYFA1113/AR584[3]	4.7	2.2	99	100	100*
Mean	4.6	2.2	99	100	100
CV,%	10.3	39.3	1	1	0
LSD,0.05	0.6	1.0	1	1	0

[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; 2014-9 days, 2015-10 days.
[3] KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ and Lacefield MaxQ II contain a non toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 is a non-toxic endophyte inserted into the experimental tall fescue varieties. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.
*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 13, 2011, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling Vigor[1]	Grazing Preference[2]				Percent Stand								
		2012	2013	2014	2015	2011	2012		2013		2014		2015	
Variety	Oct 11, 2011	May 2	May 8	May 1	May 1	Oct 11	Mar 23	Oct 10	Mar 21	Oct 14	Apr 3	Nov 3	Apr 6	Nov 10
Commercial Varieties-Available for Farm Use														
Benchmark Plus	5.0	1.2	1.2	3.8	3.5	100	100	100	100	99	99	99	99	88*
Tekapo	4.9	1.8	4.8	6.2	5.8	100	100	100	100	99	97	98	97	86*
Profit	5.0	1.3	3.3	5.0	4.5	100	100	100	100	98	94	93	94	83*
Persist	4.9	1.8	1.2	4.2	3.2	100	100	100	100	98	99	98	98	78
Harvestar	4.8	1.5	6.2	6.0	6.5	100	100	100	100	97	97	96	95	77
Prairie	4.8	1.5	1.8	4.5	5.0	100	100	100	100	99	97	97	97	77
Mean	4.9	1.5	3.1	4.9	4.8	100	100	100	100	98	97	97	97	82
CV,%	3.5	48.4	35.5	27.4	25.0	0	0	0	0	2	5	5	4	9
LSD,0.05	0.2	0.9	1.3	1.6	1.4	0	0	0	0	2	6	6	5	9

[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; 2012-29 days, 2013-16 days, 2014-9 days, 2015-10 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 August 30, 2012, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling Vigor[1]	Grazing Preference[2]			Percent Stand						
		2013	2014	2015	2012	2013		2014		2015	
Variety	Oct 8, 2012	May 8	May 1	May 1	Oct 8	Mar 21	Oct 14	Apr 3	Nov 3	Apr 6	Nov 10
Commercial Varieties-Available for Farm Use											
Benchmark Plus	4.5	2.0	3.5	2.3	99	99	99	99	98	99	82*
Elise	3.4	3.7	5.5	4.5	99	100	100	100	99	98	74*
Profit	4.3	1.8	5.3	4.7	100	100	99	98	97	97	72*
Tekapo	3.3	4.0	4.8	6.5	100	100	99	99	98	96	68
Persist	3.8	1.8	4.0	2.8	99	99	99	99	96	97	68
Experimental Varieties											
PPG-OG106	2.7	4.2	5.8	4.7	98	99	99	99	98	98	73*
Mean	3.7	2.9	4.8	4.3	99	99	99	99	98	97	73
CV,%	14.4	19.7	18.8	31.3	1	1	1	1	2	2	12
LSD,0.05	0.6	0.7	1.1	1.6	2	1	1	1	2	2	11

[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; 2013-16 days, 2014-9 days, 2015-10 days.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

of varieties cannot be made using the summary Tables 17, 18, and 19, but these comparisons do 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 the information can be found in the yearly reports. See footnotes in Tables 17, 18, and 19 to determine to which yearly report to refer.

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, or "friendly," 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. It is not recommended that tall fescue or orchardgrass be continuously overgrazed as was done in these trials. Although several varieties expressed tolerance to the level of grazing pressure used in these trials, overgrazing greatly reduces yield and therefore profitability of these varieties. This information should be an indication of those varieties that will better withstand the 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 avoid overgrazing it during times of extreme stress, such as drought.

About the Authors

G.L. Olson is a research specialist and S.R. Smith is an Extension professor of Forages. T.D. Phillips is an associate professor of Tall Fescue Breeding, and J.D. Clark is research facility manager of the UK Dairy.

Table 8. Seedling vigor, grazing preference, and stand persistence of orchardgrass varieties sown September 6, 2013, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 14, 2013	Grazing Preference[2] 2014 May 1	Grazing Preference[2] 2015 May 1	Percent Stand 2013 Oct 14	Percent Stand 2014 Apr 2	Percent Stand 2014 Oct 6	Percent Stand 2015 Apr 6	Percent Stand 2015 Nov 10
Commercial Varieties-Available for Farm Use								
Persist	3.3	7.6	2.2	70	31	51	55	44*
Prairie	4.2	6.8	3.0	78	34	48	53	43*
Benchmark Plus	3.7	7.8	2.7	77	33	49	53	43*
Prodigy	4.1	7.0	3.7	83	51	63	69	40*
Profit	3.7	7.8	4.0	71	31	39	43	34*
Harvestar	3.4	7.8	3.5	63	18	29	27	22
Tekapo	4.5	8.3	4.2	88	12	23	22	18
Experimental Varieties								
B-SIG 613	3.0	7.3	2.7	45	23	38	46	45*
Mean	3.8	7.5	3.2	72	29	42	46	36
CV,%	17.7	9.3	21.6	21	43	49	40	36
LSD,0.05	0.8	0.9	0.8	18	15	24	21	15

[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; 2014-9 days, 2015-10 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 9, 2014, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 9, 2014	Grazing Preference[2] May 1, 2015	Percent Stand 2014 Oct 9	Percent Stand 2015 Apr 6	Percent Stand 2015 Oct 21
Commercial Varieties-Available for Farm Use					
SS-0708OGDT	4.6	2.6	99	99	98*
Benchmark Plus	4.8	2.5	98	98	98*
Persist	3.7	2.7	98	99	98*
Prodigy	4.8	2.6	99	99	97*
Prairie	4.3	2.8	98	98	97*
Profit	4.8	3.5	99	98	97*
Harvestar	4.2	6.5	98	95	93
Tekapo	4.3	8.8	99	81	81
Experimental Varieties					
2014.90.16	4.3	2.2	98	98	99*
B-SIG613	4.5	2.0	98	99	98*
Mean	4.4	3.6	98	96	96
CV,%	10.6	24.3	2	4	3
LSD,0.05	0.5	1.0	3	4	4

[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; 2015-10 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 and festulolium (FL) varieties sown September 13, 2011, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling Vigor[1]	Grazing Preference[2]				Percent Stand								
		2012	2013	2014	2015	2011	2012		2013		2014		2015	
Variety	Oct 11, 2011	May 2	May 8	May 1	May 1	Oct 11	Mar 23	Oct 10	Mar 21	Oct 14	Apr 3	Nov 3	Apr 6	Nov 10
Commercial Varieties-Available for Farm Use														
BG34	4.0	1.3	3.7	4.8	2.0	100	100	98	99	98	98	98	98	93*
SpringGreen (FL)	4.1	2.7	4.3	5.7	3.2	100	100	98	99	97	93	93	93	68
Barfest (FL)	4.0	3.3	4.5	5.2	3.8	100	100	98	99	97	93	93	92	66
Power	4.1	2.7	4.0	5.3	4.0	100	100	99	100	97	93	93	93	66
Boost	4.1	3.2	3.7	5.2	4.0	100	100	98	98	96	89	87	88	56
Linn (certified)	3.8	1.3	1.8	5.2	1.8	100	100	99	99	98	94	93	93	56
Duo (FL)	5.0	3.2	3.5	4.3	4.2	100	100	91	92	85	66	67	74	53
Grand Daddy	3.9	2.3	3.3	5.0	2.8	100	100	98	99	96	90	90	89	48
Experimental Varieties														
KYFA1016 (FL)	4.2	2.8	3.7	5.2	3.5	100	100	98	98	97	94	94	95	80
KYFA1015 (FL)	3.9	3.7	4.5	5.8	4.2	100	100	99	99	97	90	91	91	59
Mean	4.1	2.7	3.7	5.2	3.4	100	100	98	98	96	90	90	90	65
CV,%	5.1	30.9	28.4	21.9	36.6	0	0	2	2	3	7	5	5	16
LSD,0.05	0.2	1.0	1.2	1.3	1.4	0	0	2	2	4	7	6	5	12

[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; 2012-29 days, 2013-16 days, 2014-9 days, 2015-10 days.
*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 August 30, 2012, in a cattle grazing tolerance study at Lexington, Kentucky.

	Seedling Vigor[1]	Grazing Preference[2]			Percent Stand						
		2013	2014	2015	2012	2013		2014		2015	
Variety	Oct 8, 2012	Apr 30	May 1	May 1	Oct 8	Mar 21	Oct 14	Apr 3	Nov 3	Apr 6	Nov 10
Commercial Varieties-Available for Farm Use											
BG34	3.8	4.0	5.3	3.2	99	100	99	99	98	98	96*
Calibra	4.5	3.7	3.8	3.2	100	100	99	99	97	97	95*
Spring Green (FL)	4.1	4.3	4.7	3.5	100	100	99	99	97	98	94*
Duo (FL)	4.5	4.7	4.0	3.0	100	100	99	99	96	97	92*
TetraGain	3.4	5.0	4.7	3.2	98	99	98	98	97	97	91*
Power	4.3	4.3	3.7	3.2	100	100	98	98	96	97	91*
Boost	4.4	3.8	4.8	3.2	100	100	98	98	96	96	90*
Linn (certified)	4.2	3.2	3.8	1.8	99	100	100	99	90	90	87
Grand Daddy	4.1	4.3	4.3	3.0	100	100	99	99	95	95	87
Meadow Green (FL)	5.0	6.7	–	–	100	85	2	0	0	5	8
Mean	4.2	4.4	4.4	3.0	100	98	89	90	86	90	83
CV,%	13.2	26.9	26.5	27.0	1	3	2	1	3	3	8
LSD,0.05	0.6	1.4	1.3	1.2	1	3	2	1	3	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; 2013-16 days, 2014-9 days, 2015-10 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 varieties sown September 6, 2013, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 14, 2013	Grazing Preference[2] 2014 May 1	Grazing Preference[2] 2015 May 1	Percent Stand 2013 Oct 14	Percent Stand 2014 Apr 2	Percent Stand 2014 Oct 6	Percent Stand 2015 Apr 6	Percent Stand 2015 Oct 21
Commercial Varieties-Available for Farm Use								
PayDay	3.6	5.8	4.3	92	93	94	95	92*
Grand Daddy	3.6	6.2	3.8	95	94	94	93	92*
Victorian	4.6	4.7	1.8	98	93	94	96	91*
Linn (certified)	3.6	4.8	3.0	95	95	96	97	91*
Power	3.7	6.0	4.3	94	95	94	96	91*
Experimental Varieties								
B-13.0205	3.8	5.8	3.8	95	95	93	94	92*
Mean	3.8	5.6	3.5	95	94	94	95	91
CV,%	15.7	14.3	25.4	3	4	3	3	4
LSD,0.05	0.7	0.9	1.0	3	4	4	3	4

[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; 2014-9 days, 2015-10 days.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 13. Seedling vigor, grazing preference, winter injury, and stand persistence of perennial ryegrass varieties sown September 9, 2014, in a cattle grazing tolerance study at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 9, 2014	Grazing Preference[2] May 1, 2015	Winter Injury[3] Jan 29, 2015	Percent Stand 2014 Oct 9	Percent Stand 2015 Apr 6	Percent Stand 2015 Oct 21
Commercial Varieties-Available for Farm Use						
LPTNEAROM	4.8	5.0	2.5	100	100	100*
PayDay	4.4	4.3	4.5	97	98	99*
Remington	4.4	4.3	2.3	97	99	99*
BG34	4.9	3.2	2.8	100	100	99*
Linn (certified)	4.5	2.8	7.0	99	100	99*
Calibra	4.6	3.3	3.8	97	99	98
Grand Daddy	3.9	3.5	2.7	96	98	97
Power	4.2	4.5	4.7	95	98	97
Experimental Varieties						
AGRLP157-AR1	4.8	3.5	3.3	100	100	100*
AGRLP156-AR1	5.0	3.2	4.3	100	100	99*
Mean	4.5	3.8	3.8	98	99	99.0
CV,5	9.7	21.8	26.4	3	1	1.0
LSD,0.05	0.5	1.0	1.2	3	2	2.0

[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; 2015-10 days.
[3] Winter injury score based on a scale of 1 to 9 with 9 being the greatest amount of injury.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 14. Summary of persistence of tall fescue varieties under heavy grazing pressure across years at Lexington, Kentucky.[1]

Variety	Proprietor/ KY distributor	2011[2]								2012						2013				2014	
		Mar	Oct	Mar	Oct	Apr	Nov	Apr	Oct	Mar	Oct	Apr	Nov	Apr	Oct	Apr	Nov	Apr	Oct	Apr	Oct
		2012[3]		2013		2014		2015		2013		2014		2015		2014		2015		2015	
Commercial Varieties-Available for Farm Use																					
BarOptima PLUS E34[4]	Barenbrug USA	*	*	*	*	*	*	*	*	*	*	*	x[5]			*	*			x	*
Bull	Caudill Seed															x	*				
Cajun II	Smith Seed Services															x	x	x	x	*	*
Cowgirl	Pure Seed									*	*	*	*								
Flourish	Allied Seed									*	x	*	x		x						
HyMark	Fraser Seeds	*	*	*	*	*	*	*	*												
Jesup EF	Pennington Seed	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
Jesup Max Q[4]	Pennington Seed	*	*	*	*	*	*	*	*	*	*	*	x	*	*	*	*			*	*
KY 31+[4]	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
Lacefield MaxQ II[4]	Pennington Seed															*	*	*	*	*	*
Select	FFR/Southern States	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SS-0705TFSL	FFR/Southern States																			*	*
Experimental Varieties																					
AGRFA 148	AgResearch (USA)	*	*	*	*	*	*	*	*												
AGRFA-179/AR584[4]	AgResearch (USA)															x	*	*	*		
AGRFA-200/AR584[4]	AgResearch (USA)															*	*	*	*		
AGRFA-201/AR584[4]	AgResearch (USA)															x	x	x	x		
BARFAF13131	Barenbrug USA															x	x	x	x		
GT213/AR584[4]	AgResearch (USA)															x	*	*	*		
HTWC4	KY Agric. Exp. Station															x	*	*	*		
KY 31-[4]	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*	*	*	*	*	x	*	*	*	*	*
KYFA0601	KY Agric. Exp. Station																				
KYFA0701	KY Agric. Exp. Station															*	*	*	*		
KYFA0804	KY Agric. Exp. Station	*	*	*	*	*	*	*	*												
KYFA0901	KY Agric. Exp. Station									*	*	*	*	*	*						
KYFA0902	KY Agric. Exp. Station	*	*	*	*	*	*	*	*												
KYFA0905	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
KYFA0906	KY Agric. Exp. Station									*	*	*	*	*	*						
KYFA1113/AR584[4]	KY Agric. Exp. Station																			*	*
KYFA1114/AR584[4]	KY Agric. Exp. Station																			*	*
KYFa1115/AR584[4]	KY Agric. Exp. Station																			*	*
KYFA9732/AR584[4]	KY Agric. Exp. Station															*	*	*	*		
KYFA9821/AR584[4]	KY Agric. Exp. Station															x	*	*	*		
NFTF 1044	Noble Foundation																			*	*
NFTF 1051	Noble Foundation																			*	*
NFTF 1370	Noble Foundation																			*	*
NFTF 1411	Noble Foundation	*	*	*	*	*	*	*	*												
PPG-FTF 104	Mountain View Seeds									*	x	*	x	*	x						

[1] For detailed stand ratings over years, see individual trial tables.
[2] Establishment year.
[3] Date of rating of percent stand.
[4] KY 31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte. Jesup MaxQ and Lacefield MaxQ II contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 is a non-toxic endophyte inserted into experimental tall fescue varieties. The other fescue varieties in this table do not contain an endophyte.
[5] "x" in the block indicates the variety was in the test but plant survival was significantly less than the most persistent variety. An open block indicates the variety was not in the test.
*Not significantly different from the most persistent variety in the test.

Table 15. Summary of persistence of orchardgrass varieties under heavy grazing pressure across years at Lexington, Kentucky.

Variety	Proprietor/KY Distributor	2011[1]								2012						2013				2014	
		Mar	Oct	Mar	Oct	Apr	Nov	Apr	Nov	Mar	Oct	Apr	Nov	Apr	Nov	Apr	Oct	Apr	Nov	Apr	Oct
		2012[2]		2013		2014		2015		2013		2014		2015		2014		2015		2015	
Commercial Varieties-Available for Farm Use																					
Benchmark Plus	FFR/Southern States	*	*	*	*	*	*	*	*	*	*	*	*	*	*	x[3]	*	*	*	*	*
Elise	Pure Seed									*	*	*	*	*	*						
Harvestar	Columbia Seeds	*	*	*	x	*	x	*	x							x	x	x	x	*	x
Persist	Smith Seed Services	*	*	*	*	*	*	*	x	*	*	*	x	*	x	x	*	*	*	*	*
Prairie	Turner Seed	*	*	*	*	*	*	*	x							x	*	*	*	*	*
Prodigy	Caudill Seed															*	*	*	*	*	*
Profit	Ampac Seed Co.	*	*	*	*	*	*	*	*	*	*	x	*	*	*	x	*	x	*	*	*
SS-0708OGDT	FFR/Southern States																				
Tekapo	Ampac Seed Co.	*	*	*	*	*	*	*	*	*	*	*	*	x	x	x	x	x	x	x	x
Experimental Varieties																					
2014.90.16	KY Agric. Exp. Station																			*	*
B-SIG 613	Blue Moon Farms															x	*	x	*	*	*
PPG-OG 106	Mountain View Seeds									*	*	*	*	*	*						

[1] Establishment year.
[2] Date of visual rating of percent stand.
[3] "x" in the block indicate the variety was in the test but stand survival was significantly less than the most persistent variety. Open blocks indicate the variety was not in the test.
*Not significantly different from the most persistent variety.

Table 16. Summary of persistence of perennial ryegrass and festulolium (FL) varieties under heavy grazing pressure across years at Lexington, Kentucky.

Variety	Proprietor/KY Distributor	2011[1]								2012						2013				2014	
		Mar	Oct	Mar	Oct	Apr	Nov	Apr	Nov	Mar	Oct	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Oct	Apr	Oct
		2012[2]		2013		2014		2015		2013		2014		2015		2014		2015		2015	
Commercial Varieties-Available for Farm Use																					
Barfest (FL)	Barenbrug USA	*	*	*	*	*	*	*	x[3]												
BG34	Barenbrug USA	*	*	*	*	*	*	*	*	*	*	*	*	*	*					*	*
Boost	Allied Seed	*	*	*	*	x	x	x	x	*	*	*	*	*	*						
Calibra	DLF International									*	*	*	*	*	*					*	x
Duo (FL)	Ampac Seed Co.	*	*	x	x	x	x	x	x	*	*	*	*	*	*						
Grand Daddy	Smith Seed	*	*	*	*	x	x	x	x	*	*	*	x	*	x	*	*	x	*	*	x
Linn (certified)	Public	*	x	*	*	*	*	*	x	*	*	*	x	x	x	*	*	*	*	*	*
LPTNEAROM	Barenbrug USA																			*	*
Meadow Green (FL)	Pure Seed									x	x	x	x	x	x						
PayDay	Mountain View Seeds															*	*	*	*	*	*
Power	Ampac Seed Co.	*	*	*	*	*	*	*	x	*	*	*	*	*	*	*	*	*	*	*	x
Remington	Barenbrug USA																			*	*
SpringGreen (FL)	Rose Agri-Seed	*	*	*	*	*	*	*	x	*	*	*	*	*	*						
Tetra Gain	Pure Seed									*	*	*	*	*	*						
Victorian	Caudill Seed															*	*	*	*		
Experimental Varieties																					
AGRLP156-AR1	Ag. Research																			*	*
AGRLP157-AR1	Ag. Research																			*	*
B-13.0205	Blue Moon Farms															*	*	*	*		
KYFA1015 (FL)	KY Agric.Exp. Station	*	*	*	*	x	x	x	x												
KYFA1016 (FL)	KY Agric.Exp. Station	*	*	*	*	*	*	*	x												

[1] Establishment year.
[2] Date of visual rating of percent stand.
[3] "x" in the block indicates the variety was in the test but plant survival was significantly less than the most persistent variety. An open block indicates the variety was not in the test.
*Not significantly different from the most persistent variety.

Table 17. Summary of 2000-2015 Kentucky tall fescue grazing tolerance trials (stand persistence shown as a percent of the stand rating of KY 31+).

		Lexington													Princeton	
		2000[1,2]	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2002	Mean[3]
Variety	Proprietor	4yr[4]	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	3yr	4yr	(#trials)
Advance MaxQ[5]	Pennington Seed							94								–
Bariane	Barenbrug USA				89		75	47	29							60(4)
BarElite	Barenbrug USA								96							–
Barolex	Barenbrug USA						78	101	86							88(3)
BarOptima PLUS E34[5]	Barenbrug USA						100		97			98	100	99		99(5)
Bronson	Ampac Seed										98	98				98(2)
Cajun II	Smith Seed Services											98				–
Cattle Club	Green Seed	93	91													92(2)
Carmine	DLF-Jenks		90													–
Cowgirl	Rose Agri-Seed					99								100		100(2)
Festival	Pickseed West		100	101											89	97(3)
Festorina	Advanta Seeds															80(3)
Flourish	Allied Seed													98		–
Goliath	Ampac Seed											98				–
Hoedown	DLF-Jenks	88														–
HyMark	Fraser Seeds									95			100			98(2)
Jesup EF	Pennington Seed				99							99	100	99		99(4)
Jesup MaxQ[5]	Pennington Seed			103	97		68	102	97	97	99	98	100	99	105	97(11)
Johnstone	Proseeds		92													–
KY31+[5]	KY Agri. Exp Sta.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100(14)
KY31-[5]	KY Agri. Exp Sta.		98	103	98	100	82	100	100	98	99	99	100	99	105	99(13)
Kokanee	Ampac Seed	43														–
Maximize	Rose Agri-Seed		99													–
Nanryo	Japanese Grassland For.Seed								100							–
Orygun	–			99												–
Resolute	Ampac Seed		23													–
Select	FFR/Sou. St.	107	101	100	100		67	100	93	95	97	99	100	99	98	97(13)
Stargrazer	FFR/Sou. St.	86	89													79(4)
Stockman	Seed Res. of OR					102										–
Texoma MaxQ[5]	Pennington Seed						88	100	98							95(3)
Tuscany II	Seed Res. of OR							100								–
Verdant	Am.Grass Seed							97								–

[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 in 2010 was grazed four years so the final report would be "2014 Cool-Season Grass Grazing Tolerance Report" archived in the KY Forage website at www.uky.edu/Ag/Forage.

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

[4] Number of years of data.

[5] KY 31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte. Jesup MaxQ, Texoma MaxQ and Advance MaxQ contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. The other fescue varieties in this table do not contain an endophyte.

Table 18. Summary of 2000-2015 Kentucky orchardgrass grazing tolerance trials (stand persistence shown as a percent of the mean of the commercial varieties in the trial).

		Lexington											Princeton	
		2000[1,2]	2001	2002	2003	2004	2005[3]	2007	2009	2010	2011	2012	2002	Mean[4]
Variety	Proprietor	4yr[5]	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	4yr	3yr	4yr	(#trials)
Abertop	Pennington Seed			38										–
Albert	Univ. of Wisconsin		115											–
Amba	DLF-Jenks		71											–
Ambrosia	Pennington Seed							94						–
Athos	DLF-Jenks		93				60							–
Benchmark	FFR/Sou. States	118	123	114									133	122(4)
Benchmark Plus	FFR/Sou. States			120			152	135	106	106	108	113	133	117(7)
Boone	Public	102												–
Command	Seed Research of OR					81								–
Crown Royale	Donley Seed		100											–
Crown Royale Plus	Donley Seed			124									83	104(2)
Elise	Pure Seed											102		–
Hallmark	James VanLeeuwen		115		113								83	104(3)
Harvestar	Columbia Seeds							75		89	94			86(3)
Haymate	FFR/Sou. States	53	115	100	118								83	94(5)
Intensiv	Barenbrug USA				51									–
Mammoth	DLF-Jenks		115											–
Megabite	Turf Seed		77											–
Niva	DLF-Jenks			76									83	80(2)
Persist	Smith Seed						138	107	103	100	96	93		100(5)
Potomac	Public			116		119							117	117(3)
Prairie	Turner Seed	127	121								94		83	106(4)
Profile	Scott Seed			116										–
Profit	Ampac Seed								95	99	102	99		99(4)
Tekapo	Ampac Seed		55	74	118		50	103	95	105	106	93	100	94(9)
Takena	Smith Seed		99											–
Seco	FFR/Sou. States							85						–

[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 2010 was grazed four years so the final report would be "2014 Cool-Season Grass Grazing Tolerance Report" archived in the KY Forage website at www.uky.edu/Ag/Forage.
[3] Due to high variation during 2005 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 2000-2015 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	Proprietor	2000[1,2] 4yr[4]	2001 3yr	2003 4yr	2005 3-yr	2007 4yr	2008 4yr	2010 4yr	2011 4yr	2012 3yr	Mean[3] (#trials)
AGRLP103	AgResearch USA	128		86							107(2)
Aries	Ampac Seed		139								–
Barfest (FL)	Barenbrug USA							111	104		108(2)
BG 34	Barenbrug USA				176[5]	145[5]		129	147	116	142(5)
Boost	Allied Seed						101	79	89	108	94(4)
Calibra	DLF International									114	–
Citadel	Donley Seed	107									–
Duo (FL)	Ampac Seed	116					95	68	84	111	95(5)
Grand Daddy	Smith Seed Services		121			70		95	76	105	93(5)
Lasso	DLF-Jenks		130								–
Linn (certified)	Public	112	129	63			95	103	89	105	99(7)
Maverick	Ampac Seed		36								–
Meadow Green (FL)	Pure Seed									10	–
Polly II	FFR/Southern States	36	68								52(2)
Power	Ampac Seed					134		102	104	110	113(4)
Quartet	Ampac Seed		77		63	50					60(3)
Remington	Barenbrug USA			151[5]							–
Spring Green (FL)	Rose Agri-Seed	101					109	109	108	113	108(5)
TetraGain	Pure Seed									110	–
Tonga	Ampac Seed				61						–

[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 2010 was grazed four years so the final report would be "2014 Cool-Season Grass Grazing Tolerance Report" archived in the KY Forage website at www.uky.edu/Ag/Forage.
[3] Mean only presented when respective variety was included in two or more trials.
[4] Number of years of data.
[5] Grazing tolerance values for these entries may have been elevated due to the low survival of the other commercial varieties in the trials for these years.

12-2015