



2016 Orchardgrass Report

G.L. Olson, S.R. Smith, and T.D. Phillips, Plant and Soil Sciences

Introduction

Orchardgrass (*Dactylus glomerata*) is a high-quality, productive, cool-season grass that is well-adapted to Kentucky conditions. This grass is used for pasture, hay, green chop, and silage, but it requires better management than tall fescue for greater yields, higher quality, and longer stand life. It produces an open, bunch-type sod, making it compatible with alfalfa or red clover as a pasture and hay crop or as habitat for wildlife.

This report provides current yield data on orchardgrass varieties included in yield trials in Kentucky as well as guidelines for selecting orchardgrass varieties. Table 11 shows a summary of all orchardgrass varieties tested in Kentucky for the last 12 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

Maturity. Orchardgrass varieties will range in maturity from early to late, based on the date of heading. In this report, early-maturing varieties will in general have higher first-cutting yields than later-maturing varieties because they are more mature at the date of first cutting. Orchardgrass typically matures earlier in the spring than red clover or alfalfa. Later-maturing varieties are preferred for use with red clover or alfalfa because they are at a more optimal stage of maturity when the legume is ready for cutting.

Local adaptation and seasonal yield. Choose a variety adapted to Kentucky, as indicated by good performance across years and locations in replicated yield trials such as those presented in this publication. Also, look for varieties that are productive in the desired season of use.

Seed quality. Buy premium-quality seed 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 past nine months), the level of germination, and the

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2013, 2014, 2015, and 2016.

	2013				2014				2015				2016 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	4.50	+1.64	25	-6	2.28	-5.8	32	+1	2.17	-0.69	32	+1	0.80	-2.06
FEB	36	+1	1.78	-1.43	30	-5	5.47	+2.26	26	14	3.08	-0.13	38	+3	6.09	+2.88
MAR	39	-5	5.47	+1.07	39	-5	3.08	-1.32	45	+1	7.34	+2.94	52	+8	4.07	-0.33
APR	55	0	4.46	+0.58	58	+3	5.27	-1.89	57	+2	13.19	+9.31	57	+2	3.97	+0.09
MAY	65	+1	5.23	+0.76	66	+2	5.72	+1.25	69	+5	3.02	-1.45	64	0	9.17	+4.70
JUN	72	0	7.32	+3.66	75	+3	2.93	-0.73	75	+3	8.20	+4.54	76	+4	5.09	+1.43
JUL	72	-4	9.33	+4.33	74	-2	3.18	-1.82	77	+1	10.22	+5.22	79	+3	7.43	+2.43
AUG	72	-3	3.68	-0.25	76	+1	6.53	+2.60	74	-1	3.49	-0.44	79	+4	4.37	+0.44
SEP	67	-1	2.21	-0.99	69	+1	3.63	+4.3	72	+4	3.49	+0.29	74	+6	2.18	-1.02
OCT	55	-2	7.02	+4.45	57	0	5.55	+2.98	59	+2	2.78	+0.21	64	+7	0.37	-2.20
NOV	41	-4	3.06	-0.33	41	-4	2.79	-0.60	51	+6	3.72	+0.33				
DEC	36	0	4.19	+0.21	40	+4	2.47	-1.51	49	+13	8.42	+4.44				
Total							49.4	+4.85			69.12	+24.57			46.54	+6.36

¹ DEP is departure from the long-term average.

² 2016 data is for ten months through October.

Table 2. Temperature and rainfall at Princeton, Kentucky, in 2015 and 2016.

	2015				2016 ²			
	Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP
JAN	34	0	1.51	-2.29	35	+1	1.37	-2.43
FEB	28	-10	4.16	-0.27	40	+2	4.23	-0.20
MAR	46	-1	6.83	+1.89	53	+6	7.3	+2.36
APR	60	+1	7.38	+2.58	59	0	4.41	-0.39
MAY	68	+1	3.52	-1.44	64	-3	6.21	+1.25
JUN	76	+1	2.85	-1.00	77	+2	2.18	-1.67
JUL	79	+1	8.83	+4.54	80	+2	12.72	+8.43
AUG	73	-4	2.90	-1.11	78	+2	5.37	+1.36
SEP	71	0	0.82	-2.51	73	+2	1.33	-2.00
OCT	60	+1	4.15	+1.10	65	+6	0.25	-2.80
NOV	53	+6	5.95	+1.32				
DEC	49	+10	6.37	+1.33				
Total			55.27	+4.14			45.37	+3.91

¹ DEP is departure from the long-term average.

² 2016 data is for the ten months through October.

Table 3. Temperature and rainfall at Quicksand, Kentucky in 2014, 2015, and 2016.

	2014				2015				2016 ²			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	29	-2	2.66	-0.63	33	+2	1.89	-1.40	32	+1	2.76	-0.53
FEB	36	+3	4.52	+0.92	27	-6	3.67	+0.07	40	+7	6.06	+2.46
MAR	43	+2	5.68	+1.34	46	+5	6.51	+2.17	51	+10	2.16	-2.18
APR	58	+5	5.12	+1.02	57	+4	9.51	+5.41	57	+4	3.53	-0.57
MAY	65	+3	2.71	-1.77	67	+5	2.54	-1.94	63	+1	8.04	+3.56
JUN	75	+5	1.81	-2.01	74	+4	3.06	-0.76	73	+3	5.51	+1.69
JUL	72	-2	7.14	+1.89	76	+2	7.91	+2.66	78	+4	6.52	+1.27
AUG	74	+1	7.94	+3.93	73	0	3.48	-0.53	78	+5	5.59	+1.58
SEP	69	+3	1.93	-1.59	70	+4	2.05	-1.47	72	+6	1.05	-2.47
OCT	57	+3	6.36	+3.45	57	+3	2.51	-0.40	62	+8	1.01	-1.90
NOV	41	-1	3.10	-0.78	50	+8	2.25	-1.63				
DEC	41	+8	2.41	-1.73	49	+16	4.72	+0.58				
Total			51.38	+4.04			50.10	+2.76			42.23	+2.91

¹ DEP is departure from the long-term average.

² 2016 data is for the ten months through October.

percentage of other crop and weed seed. Order seed well in advance of planting time to assure it will be available when needed.

Description of the Tests

Data from five studies are reported. Orchardgrass varieties were sown at Lexington (2013, 2014, and 2015), Princeton (2015), and Quicksand (2013). The soils at Lexington (Maury), Princeton (Crider), and Quicksand (Nolin) are well-drained silt loams and are well-suited to orchardgrass production. Seedlings were made at the rate of 20 pounds per acre into a prepared seedbed with a disk drill. Plots were 5 feet by 20 feet in a randomized complete block design with four replications with a harvest plot area of 5 feet by 15 feet. Nitrogen was top-dressed at 60 pounds per acre of actual nitrogen in March, after the first cutting, and again in late summer, for a total of 180 pounds per acre per season. The tests were harvested using a sickle-type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile management system. Fresh weight samples were taken at each harvest to calculate percent dry matter production. Management practices for establishment, fertility (P, K, and lime based on regular soil tests), weed control, and harvest timing were in accordance with University of Kentucky recommendations.

Results and Discussion

Weather data for Lexington, Princeton, and Quicksand are presented in tables 1, 2, and 3.

Ratings for maturity (see Table 4 for maturity scale), stand persistence, and dry matter yields (tons per acre) are reported in Tables 5 through 9. Yields are given by cutting date for 2016 and as total annual production. Stated yields are adjusted for percent weeds; therefore, tonnage given is for crop only. Varieties are listed by descending total yield. Experimental varieties, listed separately at the bottom of the tables, are not available commercially.

Statistical analyses were performed on all data (including experimentals) to determine if the apparent differences are truly due to varietal differences or just to chance. In the tables, the variet-

Table 4. Descriptive scheme for the stages of development in perennial forage grasses.

Code	Description	Remarks
Leaf development		
11	First leaf unfolded	Applicable to regrowth of established (plants) and to primary growth of seedlings.
12	2 leaves unfolded	Further subdivision by means of leaf development index (see text).
13	3 leaves unfolded	
•	•••••	
19	9 or more leaves unfolded	
Sheath elongation		
20	No elongated sheath	Denotes first phase of new spring growth after overwintering. This character is used instead of tillering which is difficult to record in established stands.
21	1 elongated sheath	
22	2 elongated sheaths	
23	3 elongated sheaths	
•	•••••	
29	9 or more elongated sheaths	
Tillering (alternative to sheath elongation)		
21	Main shoot only	Applicable to primary growth of seedlings or to single tiller transplants.
22	Main shoot and 1 tiller	
23	Main shoot and 2 tillers	
24	Main shoot and 3 tillers	
•	•••••	
29	Main shoot and 9 or more tillers	
Stem elongation		
31	First node palpable	More precisely an accumulation of nodes. Fertile and sterile tillers distinguishable.
32	Second node palpable	
33	Third node palpable	
34	Fourth node palpable	
35	Fifth node palpable	
37	Flag leaf just visible	
39	Flag leaf ligule/collar just visible	
Booting		
45	Boot swollen	
Inflorescence emergence		
50	Upper 1 to 2 cm of inflorescence visible	
52	¼ of inflorescence emerged	
54	½ of inflorescence emerged	
56	¾ of inflorescence emerged	
58	Base of inflorescence just visible	
Anthesis		
60	Preanthesis	Inflorescence-bearing internode is visible. No anthers are visible.
62	Beginning of anthesis	First anthers appear.
64	Maximum anthesis	Maximum pollen shedding.
66	End of anthesis	No more pollen shedding.
Seed ripening		
75	Endosperm milky	Inflorescence green
85	Endosperm soft doughy	No seeds loosening when inflorescence is hit on palm.
87	Endosperm hard doughy	Inflorescence losing chlorophyll; a few seeds loosening when inflorescence hit on palm
91	Endosperm hard	Inflorescence-bearing internode losing chlorophyll; seeds loosening in quantity when inflorescence hit on palm.
93	Endosperm hard and dry	Final stage of seed development; most seeds shed.

Source: J. Allan Smith and Virgil W. Hayes. 14th International Grasslands Conference Proc. p. 416-418. June 14-24, 1981, Lexington, Kentucky.

ies not significantly different from the top variety in that column are marked with one asterisk (*). To determine if two varieties are truly different, compare the difference between them 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 the given locations. 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 10 summarizes information about distributors and yield performance

across locations for all varieties currently included in tests discussed in this publication. Varieties are listed in alphabetical order, with the experimental varieties at the bottom. Remember that experimental varieties are not available for farm use; commercial varieties can be purchased through distributors. In Table 10, 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 means that the variety was in the test but yielded significantly less than the top-yielding variety. A single asterisk (*) means that the variety was not significantly different from the top-yielding variety in that study, based on the 0.05 LSD. It is best to choose a variety that has performed well over several years and locations. Remember to consider the distribution of yield across the growing season when evaluating productivity of orchardgrass varieties (tables 5 through 9).

Table 11 is a summary of yield data from 2002 to 2016 of commercial varieties that have been entered in the Kentucky trials. The data is 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 yielded better than average, and varieties with percentages less than 100 yielded lower than average. Direct, statistical comparisons of varieties cannot be made using the summary Table 11, 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; others may have performed 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 the footnote in Table 11 to determine to which yearly report to refer.

Summary

Selecting a good orchardgrass variety is an important first step in establishing a productive stand of grass. Proper management, beginning with seedbed preparation and continuing throughout the life of the stand, is necessary for even the highest-yielding variety to produce to its genetic potential.

Table 5. Dry matter yields, seedling vigor, maturity, disease rating, and stand persistence of orchardgrass varieties sown September 5, 2013, at Lexington, Kentucky.

Variety	Seedling Vigor ¹		Maturity ²				Disease ³				Percent Stand						Yield (tons/acre)						3-year Total										
	Oct 14, 2013		2004	2015	2016	2014	2016	2015	2016	2014	2016	2015	2016	2014	2016	2015	2016	2014	2016	2015	2016	2014		2016	2015	2016	2014	2016	2015	2016			
	May 7	May 12	May 7	May 12	May 11	Jun 16	Oct 14	Oct 14	Apr 2	Oct 30	Apr 6	Oct 29	Mar 23	Oct 17	2016	2016	2015	2016	2014	2016	2015	2016		2014	2016	2015	2016	2014	2016	2015	2016		
Commercial Varieties-Available for Farm Use																																	
Prairie	3.5		52.0	56.5	56.5	6.8	99	99	94	97	96	95	95	91	91	4.33	3.45	1.45	0.80	0.44												2.69	10.48*
Benchmark Plus	3.3		53.0	56.0	57.0	7.8	100	100	91	96	95	95	95	93	93	4.03	2.38	1.36	1.08	0.46												2.90	9.31
Potomac	4.3		51.8	56.5	56.5	7.0	99	99	97	97	95	95	95	92	92	3.65	2.70	1.24	0.66	0.51											2.42	8.77	
Persist	3.4		52.0	57.0	58.0	6.8	100	100	95	98	98	98	98	96	96	3.60	2.70	1.31	0.55	0.39											2.26	8.55	
Prodigy	5.0		50.5	53.5	54.5	7.5	100	100	98	99	97	97	97	94	94	3.83	2.31	1.10	0.76	0.29											2.14	8.28	
Profit	3.9		50.0	50.3	54.5	6.3	100	100	96	100	97	97	97	89	89	3.57	2.28	1.32	0.72	0.31											2.35	8.20	
Harvestar	3.4		36.8	50.0	50.5	5.5	100	100	75	95	79	90	87	84	84	3.63	2.16	1.05	0.77	0.44										2.26	8.04		
Tekapo	3.4		36.5	57.0	55.0	4.3	100	100	36	64	38	38	40	35	35	2.95	2.11	0.86	0.27	0.28										1.41	6.47		
Experimental Varieties																																	
OG62	3.6		49.8	49.0	52.5	5.5	99	99	75	94	90	91	87	88	88	3.69	1.90	1.21	1.37	0.36											2.93	8.52	
OG61M2	3.0		37.0	47.8	50.3	4.8	99	99	73	90	70	74	74	70	70	3.62	1.99	0.96	0.54	0.46											1.96	7.57	
Mean	3.7		46.9	53.4	54.5	6.2	100	100	83	93	85	87	86	83	83	3.69	2.40	1.19	0.75	0.39											2.33	8.42	
CV%	14.4		10.8	6.0	4.4	15.0	1	1	16	9	7	8	9	12	12	9.13	17.61	33.58	37.97	40.91										22.24	9.08		
LSD,0.05	0.8		7.4	4.6	3.5	1.3	2	2	20	12	9	10	11	14	14	0.49	0.61	0.58	0.41	0.23										0.75	1.11		

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

² Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 4 for complete scale.

³ Disease score based on a scale of 1 to 9 with 9 being almost all leaves affected.

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

Table 6. Dry matter yields, seedling vigor, maturity, and stand persistence of orchardgrass varieties sown September 4, 2014, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 9, 2014	Maturity ²		Percent Stand					Yield (tons/acre)					2-year Total
		2015	2016	2014	2015		2016		2015	2016				
		May 12	May 11	Oct 9	Apr 2	Oct 29	Mar 21	Oct 17	Total	May 12	Jun 17	Aug 24	Total	
Commercial Varieties-Available for Farm Use														
Potomac	4.8	54.0	60.0	100	100	100	100	99	4.56	2.33	0.98	1.26	4.57	9.13*
Persist	4.1	57.0	59.5	100	100	100	99	98	4.10	2.11	1.00	0.95	4.07	8.16*
Prairie	3.5	55.5	57.5	100	100	100	100	98	3.95	2.10	1.20	0.88	4.17	8.13*
Benchmark Plus	4.3	55.5	59.5	100	100	100	100	98	3.89	2.14	0.83	1.09	4.05	7.94*
Profit	4.0	46.8	51.5	100	100	100	100	100	3.93	1.73	1.21	0.70	3.65	7.57*
SS0708OGDT	4.4	49.3	57.5	100	100	100	100	98	3.31	1.65	0.97	1.03	3.65	6.96
Tekapo	3.3	51.8	53.5	100	97	98	94	89	2.24	1.99	1.23	0.82	4.05	6.29
Experimental Varieties														
B-14.0515	2.6	52.3	47.3	100	98	99	98	98	3.68	2.52	1.12	1.53	5.16	8.84*
B-14.0519	3.3	54.5	47.5	98	99	99	98	96	4.00	1.71	1.36	1.08	4.15	8.14*
B-14.0521	3.3	55.0	58.5	98	99	99	99	97	4.05	1.73	1.28	0.97	3.97	8.02*
GO-OG131E	4.0	50.3	57.0	100	98	100	99	97	3.37	1.80	0.98	1.15	3.94	7.31
GO-BXCR	4.0	44.8	46.3	100	100	100	100	97	3.25	1.78	0.98	0.97	3.72	6.98
GO-MOSO	3.8	51.5	53.5	98	98	99	98	96	3.15	1.92	1.19	0.71	3.82	6.96
BAR DGLF47	3.0	43.5	45.0	100	95	97	97	93	3.17	1.67	0.96	1.08	3.71	6.88
Mean	3.7	51.5	53.9	99	99	99	99	97	3.62	1.94	1.09	1.01	4.05	7.67
CV,%	13.5	7.1	3.5	1	2	1	2	3	16.66	22.31	36.11	33.66	19.20	16.40
LSD,0.05	0.7	5.2	2.7	2	3	2	3	5	0.86	0.62	0.49	0.49	1.11	1.80

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

² Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 4 for complete scale.

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

The following is a list of University of Kentucky Cooperative Extension publications related to orchardgrass management. They are available from your county Extension office and are listed in the "Publications" section of the UK Forage website, www.uky.edu/Ag/Forage:

- Lime and Fertilizer Recommendations (AGR-1)
- Grain and Forage Crop Guide for Kentucky (AGR-18)
- Renovating Hay and Pasture Fields (AGR-26)
- Orchardgrass (AGR-58)
- Establishing Forage Crops (AGR-64)
- Forage Identification and Use Guide (AGR-175)
- Rotational Grazing (ID-143)
- Rating Scale for Brown Stripe of Orchardgrass (PPFS-AG-F-07)

About the Authors

G.L. Olson is a research specialist and S.R. Smith is an Extension professor in Forages, T.D. Phillips is an associate professor in Tall Fescue Breeding.

Table 7. Dry matter yields, seedling vigor, maturity, and stand persistence of orchardgrass varieties sown September 4, 2015, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 15, 2015	Maturity ² 2016 May 11	Percent Stand			Yield (tons/acre)			
			2015	2016		2016			
			Oct 15	Mar 18	Oct 17	May 12	Jun 20	Aug 24	Total
Commercial Varieties-Available for Farm Use									
SS-0708OGDT	4.9	54.5	100	100	100	1.67	1.47	1.24	4.38*
Persist	4.4	50.3	100	100	100	1.44	1.48	1.39	4.31*
Olathe	4.4	52.0	100	100	100	1.73	1.32	1.22	4.27*
Inavale	4.4	47.5	100	100	100	1.65	1.07	1.41	4.14*
Potomac	4.9	51.8	100	100	100	1.53	1.47	1.11	4.10*
Prairie	4.5	53.5	100	100	100	1.63	1.15	1.29	4.07*
Lyra	4.9	45.0	100	100	100	1.41	1.34	1.22	3.97*
Treposno	5.0	46.3	100	100	94	1.78	1.02	0.99	3.79*
Profit	4.8	45.0	100	100	100	1.64	1.15	0.95	3.74*
Experimental Varieties									
DLFPS-OG-79	4.6	45.0	100	100	100	1.81	1.19	1.41	4.40*
RAD-ECF44	4.6	52.5	100	100	100	1.82	1.28	1.10	4.20*
OG-0707	4.9	48.0	100	100	100	1.68	1.31	1.19	4.17*
KYDG1001	4.1	48.8	100	100	99	1.61	1.24	1.23	4.07*
DLFPS-OG-80	4.6	45.0	100	97	99	1.46	1.25	1.21	3.92*
Dg82Ro1	4.0	47.5	100	100	100	1.37	1.15	1.16	3.69*
PPG-OG-114	4.3	45.0	100	100	100	1.31	1.06	1.18	3.54*
KYDG1002	4.4	46.8	100	100	99	1.23	0.77	1.05	3.04
Mean	4.6	48.5	100	100	99	1.57	1.22	1.20	3.99
CV,%	8.4	5.2	0	1	2	26.16	28.96	35.49	20.53
LSD,0.05	0.5	3.6	0	1	3	0.59	0.50	0.60	1.16

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

² Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 4 for complete scale.

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

Table 8. Dry matter yields, seedling vigor, maturity, and stand persistence of orchardgrass varieties sown August 25, 2015, at Princeton, Kentucky.

Variety	Seedling Vigor ¹ Oct 23, 2015	Maturity ² 2016 May 4	Percent Stand			Yield (tons/acre)			
			2015		2016	2016			
			Oct 23	Mar 22	Nov 2	May 4	Jun 7	Aug 23	Total
Commercial Varieties-Available for Farm Use									
Olathe	1.3	55.0	84	92	86	2.61	1.44	1.70	5.75*
Treposno	3.3	48.0	99	97	40	3.02	1.49	1.24	5.75*
Potomac	3.1	55.5	99	99	88	2.81	1.33	1.19	5.33*
Lyra	3.1	45.0	99	98	84	2.24	1.65	1.35	5.23*
Persist	3.0	55.5	100	100	93	2.70	1.34	1.08	5.13*
SS0708OGDT	2.4	55.5	98	99	91	2.73	1.26	1.13	5.11*
Prairie	2.8	55.5	96	98	84	2.63	1.33	1.00	4.95*
Inavale	1.9	51.0	95	95	84	2.30	1.46	1.13	4.89*
Profit	2.8	51.3	99	98	86	2.50	1.26	0.99	4.75*
Experimental Varieties									
OG0707	3.1	52.3	99	100	95	3.10	1.45	1.30	5.84*
KYDG1001	3.0	52.8	99	99	69	3.07	1.33	1.28	5.68*
RAD-ECF44	2.4	56.5	98	97	88	2.70	1.43	1.41	5.53*
DLFPS-OG-79	2.0	46.3	91	94	90	2.43	1.70	1.06	5.19*
KYDG1002	2.8	51.8	99	99	82	2.60	1.30	1.10	5.01*
DLFPS-OG-80	2.3	47.3	93	88	79	2.09	1.40	1.41	4.91*
Dg82Ro1	1.1	50.8	84	84	78	2.12	1.27	1.26	4.66*
Mean	2.5	51.9	96	96	82	2.60	1.40	1.23	5.23
CV,%	36.6	6.7	5	4	11	32.27	14.09	28.69	21.14
LSD,0.05	1.3	4.9	7	6	13	1.20	0.28	0.50	1.58

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

² Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 4 for complete scale.

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

Table 9. Dry matter yields, seedling vigor, and stand persistence of orchardgrass varieties sown August 29, 2013, at Quicksand, Kentucky.

Variety	Seedling Vigor ¹ Oct 3, 2013	Percent Stand							Yield (tons/acre)						3-year Total	
		2013		2014		2015		2016		2014		2015		2016		
		Oct 3	Mar 27	Nov 3	Apr 8	Oct 29	Mar 23	Nov 3	Total	Total	May 4	Jun 29	Sep 19	Total		
Commercial Varieties-Available for Farm Use																
Potomac	4.5	100	100	100	100	100	100	97	5.24	3.95	0.96	0.61	0.79	2.35	11.54*	
Persist	1.8	100	98	98	98	98	99	84	4.13	3.71	1.28	0.74	0.83	2.85	10.69	
Benchmark Plus	4.5	100	100	99	99	99	99	91	4.66	3.53	1.15	0.61	0.70	2.46	10.65	
Prairie	3.9	100	100	100	100	100	100	80	4.87	3.43	0.97	0.68	0.69	2.34	10.65	
Harvestar	2.3	99	97	97	98	97	96	80	4.70	3.10	0.84	0.98	0.96	2.78	10.58	
Profit	4.0	100	100	100	100	99	99	85	4.51	3.45	0.70	0.68	0.63	2.01	9.97	
Prodigy	3.5	100	100	100	100	99	99	68	4.24	3.29	0.94	0.69	0.67	2.31	9.84	
Tekapo	3.4	100	99	98	98	98	97	68	3.92	3.13	1.01	0.68	0.56	2.25	9.31	
Experimental Varieties																
OG62	3.5	100	98	98	98	98	98	81	6.14	3.99	1.05	0.86	0.70	2.62	12.74*	
OG61M2	2.5	98	96	97	95	95	95	73	4.73	3.49	0.93	0.76	0.66	2.35	10.57	
Mean	3.4	100	99	99	98	98	98	81	4.72	3.51	0.98	0.73	0.72	2.43	10.65	
CV,%	28.2	1	2	2	2	2	2	16	18.57	14.90	29.38	16.57	24.80	11.53	13.06	
LSD,0.05	1.4	1	3	3	3	3	3	19	1.27	0.76	0.42	0.18	0.26	0.41	2.02	

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. Performance of orchardgrass varieties across years and locations in Kentucky.

Variety	Proprietor/KY distributor	Lexington						Princeton	Quicksand			
		2013 ¹			2014		2015	2015	2013			
		14 ²	15	16	15	16	16	16	14	15	16	
Commercial Varieties-Available for Farm Use												
Benchmark Plus	Southern States	*	x ³	*	*	*				X	*	*
Harvestar	Columbia Seeds	X	X	*						X	X	*
Inavale	DLF International						*	*				
Lyra	Hood River Seed						*	*				
Olathe	DLF International						*	*				
Persist	Smith Seed Services	X	X	*	*	*	*	*		X	*	*
Potomac	Public	X	X	*	*	*	*	*		*	*	X
Prairie	Turner Seed Company	*	*	*	*	*	*	*		*	*	X
Prodigy	Caudill Seed	X	X	X						X	*	X
Profit	Ampac Seed Company	X	X	*	*	X	*	*		X	*	X
SS-0708OGDT	Southern States				X	X	*	*				
Tekapo	Ampac Seed Company	X	X	X	X	*				X	X	X
Treposno	Hood River Seed						*	*				
Experimental Varieties												
B-14.0515	Blue Moon Farms				X	*						
B-14.0519	Blue Moon Farms				*	*						
B-14.0521	Blue Moon Farms				*	X						
BAR DGLF47	Barenbrug				X	X						
Dg82Ro1	Barenbrug						*	*				
DLFPS-OG-79	DLF International						*	*				
DLFPS-OG-80	DLF International						*	*				
GO-BXCR	Grassland Oregon				X	X						
GO-MOSO	Grassland Oregon				X	X						
GO-OG131E	Grassland Oregon				X	X						
KYDG1001	Ky. Agri. Exp. Sta.						*	*				
KYDG1002	Ky. Agri. Exp. Sta.						X	*				
OG-0707	Allied Seed						*	*				
OG62	DLF International	X	X	*						*	*	*
OG61M2	DLF International	X	X	X						X	*	X
PPG-OG-114	Smith Seed Services						*					
RAD-ECF44	Radix Research						*	*				

¹ Establishment year.

² Harvest year.

³ "x" in the box indicates the variety was in the test but yielded significantly less than the top ranked variety in the test. Open box indicates the variety was not in the test.

*Not significantly different from the highest yielding variety in the test.

Table 11. Summary of Kentucky orchardgrass yield trials 2002-2016 (yield shown as a percentage of the mean of the commercial varieties in the trial).

Variety	Proprietor	Lexington												Princeton												Mean ³ (#trials)
		2003 ^{1,2} 3-yr ⁴	2006 4-yr	2007 3-yr	2009 3-yr	2011 3-yr	2012 3-yr	2013 3-yr	2014 2-yr	2014 3-yr	2002 3-yr	2004 3-yr	2006 3-yr	2008 3-yr	2010 3-yr	2012 3-yr	2003 3-yr	2005 4-yr	2010 3-yr	2013 3-yr						
Abertop	Pennington																									
Ambassador	DLF International Seeds																									
Ambrosia	American Grass Seed Prod.																									
Benchmark	Southern States																									
Benchmark Plus	Southern States		100	108	105	106	97	109	103	107																
Bounty	Allied Seed		101																							
Century	Seed Research of Oregon		98																							
Checkmate	Seed Research of Oregon			102			117																			
Christoss	Proseeds Marketing			92																						
Command	Seed Research of Oregon																									
Crown	Donley Seed				97							101														
Crown Royale Plus	Donley Seed											108														
Elise	Rose-AgriSeed						86																			
Endurance	DLF International Seeds																									
Extend	Allied Seed					107																				
Hallmark	James VanLeeuwen		102																							
Harvestar	Columbia Seeds		91	97				94																		
Haymaster	Southern States		94			102																				
Haymate	Southern States																									
Icon	Seed Research of Oregon		105																							
Intensiv	Barenbrug		102																							
Lazuly	Proseeds Marketing																									
LG-31	DLF International Seeds																									
Megabite	Turf-Seed																									
Niva	DLF International Seeds																									
Paiute	DLF International Seeds			108																						
Persist	Smith Seed		123	105	106	107	112	100	105																	
Potomac	Public																									
Prairie	Turner Seed		107	101	109	106	113	123	105	104																
Prodigy	Caudill Seed																									
Profit	Ampac Seed			107	96	98	103	96	98																	
RAD-LCF 25	Radix Research																									
Shawnee	Rose-AgriSeed																									
Shiloh II	Proseeds Marketing																									
SS07080GDT	Southern States								90																	
Takana	Smith Seed									100																
Tekena II	Smith Seed		110	102																						
Tekapo	Ampac Seed		91	81	81	82	78	82	76	81																
Tucker	Oregro Seeds						96																			
Udder	Improved Forages		100	107																						
Vaillant	Proseeds Marketing																									
Vision	Cropmark Seeds		63																							

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 forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2012 was harvested three years, so the final report would be "2015 Orchardgrass 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.

Mention or display of a trademark, proprietary product, or firm in text or figures does not constitute an endorsement and does not imply approval to the exclusion of other suitable products or firms.