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University of Kentucky
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2018 Orchardgrass Report

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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 15 years. The UK Forage Extension website, at forages.ca.uky.edu, 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

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2016, 2017, and 2018.

	2016				2017				2018[2]			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP[1]	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	32	+1	0.80	-2.06	40	+9	6.81	+3.95	31	0	2.01	-0.85
FEB	38	+3	6.09	+2.88	47	+12	4.46	+1.25	45	+10	9.77	+6.56
MAR	52	+8	4.07	-0.33	48	+4	3.34	-1.06	42	-2.	5.16	+0.76
APR	57	+2	3.97	+0.09	62	+7	4.17	+0.29	50	-5	5.52	+1.64
MAY	64	0	9.17	+4.70	66	+2	7.74	+3.27	73	+9	8.39	+3.92
JUN	76	+4	5.09	+1.43	73	+1	7.68	+4.02	76	+4	6.42	+2.76
JUL	79	+3	7.43	+2.43	76	0	4.49	-0.51	77	+1	6.15	+1.15
AUG	79	+4	4.37	+0.44	74	-1	6.66	+2.73	77	+2	6.45	+2.52
SEP	74	+6	2.18	-1.02	69	+1	4.72	+1.52	74	+6	12.88	+9.68
OCT	64	+7	0.37	-2.20	60	+3	6.06	+3.49	59	+2	6.54	+3.97
NOV	51	+6	1.94	-1.45	47	+2	3.09	-0.30				
DEC	37	+1	9.4	+5.42	35	-1	2.66	-1.32				
Total			54.88	+10.33			61.88	+17.33			69.29	+32.11

[1] DEP is departure from the long-term average.
[2] 2018 data is for ten months through October.

Table 2. Temperature and rainfall at Princeton, Kentucky, in 2016, 2017, and 2018.

	2016				2017				2018[2]			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP[1]	IN	DEP	°F	DEP[1]	IN	DEP	°F	DEP[1]	IN	DEP
JAN	35	+1	1.37	-2.43	43	+9	3.18	-0.62	32	-2	4.28	+0.48
FEB	40	+2	4.23	-0.20	49	+11	1.78	-2.65	45	+7	9.50	+5.07
MAR	53	+6	7.30	+2.36	50	+3	4.09	-0.85	47	0	9.53	-1.41
APR	59	0	4.41	-0.39	63	+4	4.28	-0.52	53	-6	4.90	+0.10
MAY	64	-3	6.21	+1.25	67	0	4.43	-0.53	74	+7	4.69	-0.27
JUN	77	+2	2.18	-1.67	74	-1	5.39	+1.54	78	+3	7.80	+3.95
JUL	80	+2	12.72	+8.43	78	0	2.23	-2.06	78	0	2.58	-1.71
AUG	78	+2	5.37	+1.36	75	-2	1.39	-2.62	77	0	2.68	-1.33
SEP	73	+2	1.33	-2.00	71	0	3.93	+0.60	74	+4	5.61	+2.28
OCT	65	+6	0.25	-2.80	61	+2	6.65	+3.60	61	+2	2.96	-0.09
NOV	52	+5	2.86	-1.77	50	+2	2.96	-1.67				
DEC	38	-1	6.51	+1.47	37	-2	3.01	-2.03				
Total			54.74	+3.61			43.32	-7.81			48.53	+7.07

[1] DEP is departure from the long-term average.
[2] 2018 data is for the ten months through October.

Table 3. Temperature and rainfall at Quicksand, Kentucky, in 2017 and 2018.

	2017				2018[2]			
	Temp		Rainfall		Temp		Rainfall	
	°F	DEP[1]	IN	DEP	°F	DEP[1]	IN	DEP
JAN	43	+12	4.61	+1.32	31	0	1.71	-1.58
FEB	46	+13	2.27	-1.33	48	+15	7.56	+3.96
MAR	48	+7	4.13	-0.21	44	+3	5.90	+1.56
APR	62	+9	4.23	+0.13	52	-1	4.07	-0.03
MAY	65	+3	6.33	+1.85	71	+9	5.28	+0.80
JUN	71	+1	5.82	+2.00	75	+5	5.47	+1.65
JUL	76	+2	5.76	+0.51	76	+2	5.39	+0.14
AUG	73	0	6.59	+2.58	75	+2	3.23	-0.78
SEP	68	+2	2.57	-0.95	74	+8	8.70	+5.18
OCT	59	+5	5.56	+2.65	59	+5	4.54	+1.63
NOV	47	+5	1.33	-2.55				
DEC	37	+4	3.28	-0.86				
Total			52.48	+5.14			51.85	+12.53

[1] DEP is departure from the long-term average.
[2] 2018 data is for the ten months through October.

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 seedlingsor 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 quantitywhen 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.

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 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 (2015, 2016, and 2017), Princeton (2015), and Quicksand (2016). The soils at Lexington (Maury), Princeton (Crider), and Quicksand (Nolin) are well-drained silt loams and are well-suited to orchardgrass production. Seedings 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 2018 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 varieties 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. Experimental varieties are not available for farm use; commercial varieties can be purchased through the distributors listed in Tables 10 and 11. 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

Table 5. 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	Maturity[2] 2017	Maturity[2] 2018	Percent Stand 2015	Percent Stand 2016		Percent Stand 2017		Percent Stand 2018		Yield (tons/acre) 2016	Yield (tons/acre) 2017	Yield (tons/acre) 2018					3-year Total
		May 11	May 10	May 18	Oct 15	Mar 18	Oct 17	Mar 23	Oct 23	Mar 20	Oct 24	Total	Total	May 18	Jun 20	Aug 6	Oct 17	Total	
Commercial Varieties-Available for Farm Use																			
Olathe	4.4	52.0	55.5	59.0	100	100	100	100	100	98	97	4.27	4.23	1.60	0.61	0.69	0.67	3.57	12.07*
Persist	4.4	50.3	59.0	62.0	100	100	100	100	100	100	98	4.31	4.39	1.60	0.50	0.61	0.64	3.36	12.06*
SS-0708OGDT	4.9	54.5	56.5	59.0	100	100	100	100	100	100	96	4.38	4.10	1.43	0.38	0.49	0.61	2.90	11.38*
Prairie	4.5	53.5	56.5	61.5	100	100	100	100	100	99	97	4.07	3.99	1.38	0.45	0.60	0.64	3.07	11.13*
Potomac	4.9	51.8	59.0	61.5	100	100	100	99	100	99	97	4.10	3.94	1.33	0.44	0.56	0.54	2.87	10.90*
Inavale	4.4	47.5	49.8	56.0	100	100	100	95	97	95	89	4.14	3.61	1.20	0.44	0.64	0.72	3.00	10.75*
Treposno	5.0	46.3	48.5	56.5	100	100	94	86	91	88	86	3.79	3.52	1.19	0.47	0.51	0.47	2.65	9.96*
Lyra	4.9	45.0	49.3	53.5	100	100	100	97	97	95	93	3.97	3.19	1.10	0.38	0.55	0.53	2.55	9.72*
Profit	4.8	45.0	55.3	58.0	100	100	100	98	98	97	95	3.74	3.19	1.04	0.36	0.71	0.65	2.76	9.70*
Experimental Varieties																			
OG-0707	4.9	48.0	56.5	59.0	100	100	100	100	100	100	96	4.17	4.47	1.30	0.47	0.69	0.70	3.16	11.80*
RAD-ECF44	4.6	52.5	56.5	60.0	100	100	100	99	98	97	95	4.20	4.01	1.42	0.38	0.55	0.58	2.93	11.14*
DLFPS-OG-80	4.6	45.0	50.3	56.0	100	97	99	93	92	91	86	3.92	3.85	1.29	0.49	0.70	0.61	3.10	10.87*
KYDG1001	4.1	48.8	56.0	57.5	100	100	99	99	99	99	97	4.07	3.45	1.32	0.38	0.49	0.72	2.92	10.43*
DLFPS-OG-79	4.6	45.0	49.3	56.0	100	100	100	100	100	97	95	4.40	3.48	1.07	0.35	0.51	0.53	2.46	10.35*
PPG-OG-114	4.3	45.0	45.0	55.0	100	100	100	100	98	96	92	3.54	3.92	0.96	0.54	0.53	0.74	2.77	10.24*
KYDG1002	4.4	46.8	52.0	56.5	100	100	99	94	93	93	92	3.04	3.80	1.22	0.32	0.67	0.57	2.79	9.64*
Dg82Ro1	4.0	47.5	50.3	56.0	100	100	100	99	98	97	89	3.69	2.70	0.89	0.38	0.38	0.37	2.02	8.41
Mean	4.6	48.5	53.2	57.8	100	100	99	97	98	96	94	3.99	3.76	1.26	0.43	0.58	0.61	2.88	10.62
CV,%	8.5	5.2	4.7	3.3	0	1	2	6	4	4	4	20.53	22.57	25.26	34.17	30.96	32.76	22.53	16.88
LSD,0.05	0.5	3.6	3.6	2.7	0	1	3	8	6	6	6	0.16	1.21	0.45	0.21	0.26	0.28	0.92	2.55

[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.

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. It is important 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 2018 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 the yearly report that should be referenced.

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.

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, forages.ca.uky.edu:

- 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

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Table 6. Dry matter yields, seedling vigor, maturity, and stand persistence of orchardgrass varieties swon September 7, 2016, at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 5, 2016	Maturity[2] 2017 May 10	Maturity[2] 2018 May 17	Percent Stand 2016 Oct 15	Percent Stand 2017 Mar 14	Percent Stand 2017 Oct 23	Percent Stand 2018 Mar 20	Percent Stand 2018 Oct 19	Yield (tons/acre) 2017 Total	Yield (tons/acre) 2018 May 17	Yield (tons/acre) 2018 Jun 19	Yield (tons/acre) 2018 Aug 14	Yield (tons/acre) 2018 Oct 19	Yield (tons/acre) 2018 Total	2-year Total
Commercial Varieties-Available for Farm Use															
Prairie	3.3	56.5	58.0	100	100	100	100	98	6.02	1.55	0.72	0.42	0.27	2.97	8.98*
Alpine II	3.6	46.3	48.5	100	100	100	86	96	6.33	1.03	0.69	0.30	0.34	2.36	8.69*
Olathe	2.8	56.0	54.5	100	100	100	96	98	5.73	1.33	0.74	0.35	0.42	2.84	8.58*
Endurance	3.3	55.5	54.3	99	100	100	99	99	5.78	1.16	0.75	0.23	0.28	2.42	8.20*
SS0708OGDT	4.8	56.5	58.0	100	100	100	98	98	5.59	1.19	0.60	0.38	0.35	2.52	8.11*
Albert	3.0	53.5	55.0	100	100	100	100	99	5.71	1.07	0.57	0.42	0.29	2.36	8.07*
Rushmore II	3.5	54.5	58.5	100	100	100	99	99	5.84	1.14	0.55	0.23	0.25	2.17	8.01*
Persist	3.3	58.0	60.0	100	100	100	100	96	5.67	1.27	0.50	0.30	0.27	2.34	8.01*
Prodigy	4.3	55.0	57.0	100	100	100	99	98	5.74	1.15	0.58	0.28	0.16	2.16	7.90*
Echelon	2.9	45.0	45.0	100	100	100	93	95	5.98	0.66	0.70	0.27	0.26	1.88	7.86*
Devour	3.8	49.3	48.8	100	100	100	81	96	5.81	0.88	0.66	0.27	0.21	2.01	7.83*
Inavale	3.1	46.3	48.5	100	100	100	91	96	5.61	0.85	0.70	0.23	0.20	1.97	7.59
Potomac	4.3	57.0	43.2	100	100	100	100	99	5.37	0.96	0.49	0.32	0.35	2.12	7.49
Experimental Varieties															
RAD-ECF44	3.3	57.5	58.5	100	100	100	92	96	6.34	1.14	0.62	0.40	0.33	2.50	8.84*
GADG1305	3.8	62.0	60.5	100	100	100	98	98	6.01	1.33	0.57	0.35	0.31	2.56	8.57*
GADG1303	3.1	62.0	59.0	100	100	100	100	100	5.93	1.52	0.52	0.25	0.30	2.60	8.53*
IS-OG62	3.3	53.5	56.5	100	100	100	96	97	5.71	1.16	0.59	0.49	0.36	2.61	8.32*
GSDG1314	3.5	62.0	61.0	99	100	100	100	100	5.74	1.47	0.36	0.34	0.26	2.42	8.16*
PPG-OG-102	4.0	52.0	52.3	100	100	100	96	95	5.95	1.03	0.53	0.33	0.25	2.14	8.09*
KYDG1002	3.6	55.5	56.5	100	100	100	98	92	5.66	1.27	0.64	0.32	0.19	2.42	8.08*
GADG1304	3.4	62.0	60.5	100	100	100	100	100	5.31	1.23	0.67	0.35	0.31	2.56	7.87*
RAD-ECF39	3.4	56.0	56.5	100	100	100	96	95	5.56	1.11	0.59	0.25	0.17	2.13	7.69
GADG1313	3.4	62.0	60.0	100	100	100	98	97	5.40	1.22	0.51	0.30	0.23	2.26	7.66
KYDG1001	3.1	52.5	56.0	100	100	100	99	99	4.97	1.39	0.62	0.42	0.21	2.66	7.62
GADG1401	2.9	62.0	59.5	100	100	100	100	99	5.09	1.40	0.41	0.20	0.26	2.28	7.37
GADG1315	3.5	62.0	60.5	100	100	100	100	99	5.12	1.17	0.44	0.24	0.25	2.11	7.23
Mean	3.5	55.8	55.6	100	100	100	97	97	5.69	1.18	0.59	0.32	0.27	2.36	8.05
CV,%	12.3	4.0	11.4	1	0	0	6	4	12.13	21.68	34.89	46.91	44.18	16.77	10.47
LSD,0.05	0.6	3.2	8.9	1	0	0	8	5	0.97	0.36	0.29	0.21	0.17	0.56	1.19

[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 7. Dry matter yields, seedling vigor, maturity, and stand persistence of orchardgrass varieties sown September 8, 2017, at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 12, 2017	Maturity[2] 2018 May 8	Percent Stand 2017 Oct 12	Percent Stand 2018 Mar 14	Percent Stand 2018 Oct 19	Yield (tons/acre) 2018 May 8	Yield (tons/acre) 2018 Jun 15	Yield (tons/acre) 2018 Aug 9	Yield (tons/acre) 2018 Oct 23	Yield (tons/acre) 2018 Total
Commercial Varieties-Available for Farm Use										
Rushmore II	3.9	46.3	100	100	100	1.30	1.39	0.98	0.58	4.25*
Aldebaran	2.9	45.0	100	100	100	1.22	1.40	1.04	0.49	4.14*
Prairie	3.3	49.8	100	100	100	1.33	1.16	0.96	0.70	4.14*
Persist	2.9	48.8	100	99	100	1.48	1.33	0.68	0.65	4.14*
SS0708OGDT	3.0	50.5	99	99	100	1.25	1.08	0.94	0.67	3.94*
Treposno	5.0	45.0	100	100	100	1.10	1.39	0.64	0.57	3.70*
Potomac	3.1	50.3	100	100	100	1.24	1.15	0.66	0.50	3.55*
Berta	2.6	45.0	100	98	100	0.76	1.22	0.82	0.68	3.48*
Lyra	2.9	45.0	100	95	100	0.64	1.26	0.58	0.63	3.11
Experimental Varieties										
SOG-1614	3.1	46.3	100	97	100	1.00	1.39	0.68	0.74	3.81*
Mean	3.3	47.2	100	99	100	1.13	1.28	0.80	0.62	3.83
CV,%	16.7	4.5	1	2	0	32.05.	21.65	30.68	25.10	19.07
LSD,0.05	0.8	3.1	1	3	0	1	0.40	0.35	0.23	1.06

[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 15, 2015	Maturity[2] 2016 May 4	Maturity[2] 2017 May 9	Percent Stand 2015 Oct 23	Percent Stand 2016 Mar 22	Percent Stand 2016 Nov 2	Percent Stand 2017 Mar 16	Percent Stand 2017 Oct 25	Percent Stand 2018 Apr 5	Percent Stand 2018 Oct 11	Yield (tons/acre) 2016 Total	Yield (tons/acre) 2017 Total	Yield (tons/acre) 2-year Total
Commercial Varieties-Available for Farm Use													
Olathe	1.3	55.0	57.5	84	92	86	87	87	88	68	5.75	4.17	9.92*
Potomac	3.1	55.5	58.5	99	99	88	90	90	89	58	5.33	3.65	8.98*
Persist	3.0	55.5	59.0	100	100	93	94	91	93	78	5.13	3.81	8.93*
SS0708OGD	2.4	55.5	57.0	98	99	91	93	93	94	87	5.11	3.75	8.86*
Treposno	3.3	48.0	55.3	99	97	40	40	45	50	20	5.75	2.96	8.71*
Lyra	3.1	45.0	51.5	99	98	84	77	83	81	69	5.23	3.35	8.59*
Inavale	1.9	51.0	53.5	95	95	84	84	84	84	54	4.89	3.66	8.55*
Prairie	2.8	55.5	58.0	96	98	84	86	88	91	69	4.95	3.56	8.52*
Profit	2.8	51.3	55.0	99	98	86	86	88	91	53	4.75	3.70	8.45*
Experimental Varieties													
RAD-ECF44	2.4	56.5	58.5	98	97	88	88	86	86	46	5.53	3.91	9.44*
KYDG1001	3.0	52.8	58.0	99	99	69	80	85	83	55	5.68	3.59	9.27*
OG0707	3.1	52.3	56.5	99	100	95	93	93	93	80	5.84	3.43	9.27*
DLFPS-OG-79	2.0	46.3	51.5	91	94	90	92	93	89	86	5.19	4.02	9.21*
DLFPS-OG-80	2.3	47.3	53.0	93	88	79	82	80	75	66	4.91	3.49	8.40*
KYDG1002	2.8	51.8	57.0	99	99	82	82	86	84	61	5.01	3.33	8.34*
Dg82Ro1	1.1	50.8	53.0	84	84	78	81	80	76	40	4.66	3.11	7.77*
Mean	2.2	51.9	55.8	96	96	82	83	84	84	62	5.23	3.59	9
CV,%	36.6	6.7	3.6	5	4	11	10	8	8	37	21.14	17.88	18
LSD,0.05	1.3	4.9	2.9	7	6	11	11	10	10	33	1.58	0.91	2

[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.
Footnote: Due to harvester issues, 2018 yields are not reported, but Oct 11, 2018 percent stand ratings provide an indication of variety stand persistence after 3 years.

Table 9. Dry matter yields, seedling vigor, and stand persistence of orchardgrass varieties sown September 2, 2016, at Quicksand, Kentucky.

Variety	Seedling Vigor[1] Nov 3, 2016	Percent Stand 2016 Nov 3	Percent Stand 2017 Mar 24	Percent Stand 2017 Nov 8	Percent Stand 2018 Apr 4	Percent Stand 2018 Oct 5	Yield (tons/acre) 2017 Total	Yield (tons/acre) 2018 May 4	Yield (tons/acre) 2018 Jul 10	Yield (tons/acre) 2018 Aug 31	Yield (tons/acre) 2018 Nov 8	Yield (tons/acre) 2018 Total	Yield (tons/acre) 2-year Total
Commercial Varieties-Available for Farm Use													
Eschelon	2.6	97	81	83	83	83	5.04	0.57	0.82	0.32	0.38	2.10	7.14*
Inavale	4.0	96	92	96	96	97	5.19	0.42	0.68	0.29	0.38	1.76	6.95*
Persist	4.4	99	100	100	100	100	4.65	0.71	0.70	0.44	0.42	2.27	6.91*
Prairie	3.0	95	82	95	95	95	4.77	0.45	0.78	0.39	0.29	1.91	6.68*
SS0705OGDT	4.3	98	98	98	98	98	4.81	0.41	0.61	0.40	0.38	1.80	6.61*
Rushmore II	3.6	98	94	97	97	97	4.59	0.62	0.81	0.29	0.23	1.94	6.53*
Potomac	3.4	95	94	96	96	96	4.64	0.44	0.68	0.41	0.26	1.78	6.43*
Albert	3.3	93	76	83	85	84	4.66	0.41	0.71	0.41	0.16	1.68	6.34
Olathe	2.8	91	83	89	89	89	4.20	0.55	0.59	0.32	0.14	1.59	5.79
Endurance	2.8	87	82	89	92	90	3.83	0.37	0.80	0.37	0.11	1.65	5.48
Experimental Varieties													
KYDG1002	4.5	100	99	100	99	99	4.96	0.48	0.78	0.35	0.30	1.92	6.88*
KYDG1001	3.1	95	86	95	93	95	4.89	0.47	0.74	0.31	0.18	1.70	6.59*
Mean	3.5	96	89	93	93	94	4.69	0.49	0.73	0.36	0.27	1.84	6.33
CV,%	29.5	8	16	11	9	9	17.07	34.37	26.56	35.60	69.18	22.83	15.82
LSD,0.05	1.5	10	21	14	13	12	1.15	0.24	0.28	0.18	0.27	0.60	1.49

[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 Distibutor	Lexington						Quicksand	
		2015[1]			2016		2017	2016	
		16[2]	17	18	17	18	18	17	18
Commercial Varieties-Available for Farm Use									
Albert	Oregro Seeds				*	x[3]		*	*
Aldebaran	DLF Pickseed						*		
Alpine II	Mountain View Seeds				*	x			
Berta	Mountain View Seeds						*		
Echelon	DLF Pickseed				*	x		*	*
Endurance	DLF Pickseed				*	*		x	x
Devour	Mountain View Seeds				*	x			
Inavale	DLF Pickseed	*	*	*	*	x		*	*
Lyra	Hood River Seed	*	x	x			x		
Olathe	DLF Pickseed	*	*	*	*	*		*	x
Persist	Smith Seed Services	*	*	*	*	x	*	*	*
Potomac	Public	*	*	*	*	x	*	*	*
Prairie	Turner Seed Company	*	*	*	*	*	*	*	*
Prodigy	Caudill Seed				*	x			
Profit	Ampac Seed Company	*	x	*					
Rushmore II	Mountain View Seeds				*	x	*	*	*
SS-0708OGDT	Southern States	*	*	*	*	*	*	*	*
Tekapo	Ampac Seed Company								
Treposno	Hood River Seed	*	*	*			*		
Experimental Varieties									
Dg82Ro1	Barenbrug	*	x	x					
DLFPS-OG-79	DLF Pickseed	*	*	x					
DLFPS-OG-80	DLF Pickseed	*	*	*					
GADG1303	Univ. of Georgia				*	*			
GADG1304	Univ. of Georgia				*	*			
GADG1305	Univ. of Georgia				*	*			
GADG1313	Univ. of Georgia				*	x			
GADG1314	Univ. of Georgia				*	*			
GADG1315	Univ. of Georgia				x	x			
GADG1401	Univ. of Georgia				x	x			
IS-OG62	DLF Pickseed				*	*			
KYDG1001	Ky. Agri. Exp. Sta.	*	*	*	x	*		*	*
KYDG1002	Ky. Agri. Exp. Sta.	x	*	*	*	*		*	*
OG-0707	Allied Seed	*	*	*					
PPG-OG-102	Mountain View Seeds				*	x			
PPG-OG-114	Smith Seed Services	*	*	*					
RAD-ECF39	Radix Research				*	x			
RAD-ECF44	Radix Research	*	*	*	*	*			
SOG-1614	Smith Seed Services						*		

[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 2002-2018 (yield shown as a percentage of the mean of the commercial varieties in the trial).

		Lexington										Princeton							Quicksand					
		2003[1,2]	2006	2007	2009	2011	2012	2013	2014	2015	2016	2002	2004	2006	2008	2010	2012	2015	2003	2005	2010	2013	2016	
Variety	**Proprietor**	**3-yr[4]**	**4-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**2-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**3-yr**	**2-yr**	**3-yr**	**4-yr**	**3-yr**	**3-yr**	**2-yr**	**Mean[3] (#trials)**
Abertop	Pennington											71												–
Albert	Oregro Seeds										100												98	99(2)
Alpine II	Mountain View Seeds										107													–
Ambassador	DLF Pickseed												95											–
Ambrosia	American Grass Seed Prod.													90										–
Benchmark	Southern States											113												–
Benchmark Plus	Southern States		100	108	105	106	97	109	104			107		107	104	102	107		107	102	94	102		104(16)
Bounty	Allied Seed		101																	98				100(2)
Century	Seed Research of Oregon		98																	104				101(2)
Checkmate	Seed Research of Oregon			102			117										106							108(3)
Christoss	Proseeds Marketing			92																				–
Command	Seed Research of Oregon												87											–
Crown	Donley Seed				97							101			105									101(3)
Crown Royale Plus	Donley Seed											108							97					103(2)
Devour	Mountain View Seeds										97													–
Echelon	DLF Pickseed										97												110	104(2)
Elise	Rose-AgriSeed						86								98		98							94(3)
Endurance	DLF Pickseed										101			104									84	96(3)
Extend	Allied Seed					107							100			105					108			105(4)
Hallmark	James VanLeeuwen	102										103	98						96					100(4)
Harvestar	Columbia Seeds		91	97				94						106						100		102		100(6)
Haymaster	Southern States		94			102														97				98(3)
Haymate	Southern States											106							103					105(2)
Icon	Seed Research of Oregon		105																	98				102(2)
Inavale	DLF Pickseed									99	94							97					107	99(4)
Intensiv	Barenbrug	102																						–
Lazuly	Proseeds Marketing														97									–
LG-31	DLF Pickseed												92											–
Lyra	Hood River Seed									90								97						94(2)
Megabite	Turf-Seed														106									–
Niva	DLF Pickseed											81												–
Olathe	DLF Pickseed									111	106							112					89	105(4)
Paiute	DLF Pickseed			108																				–
Persist	Smith Seed	123	105	106	107	112	106	100	103	111	99		101			105	102	101	108	101	102	103	107	105(19)
Potomac	Public				103	96	97	103	116	100	92	98			108	101	98	102			94	111	99	101(15)
Prairie	Turner Seed		107	101	109	106	113	123	108	103	111	104		100	104	99	104	96	105	107	120	102	103	106(20)
Prodigy	Caudill Seed				101		99	97			98				103		101					95		99(7)
Profit	Ampac Seed			107	96	98	103	96	97	89					103	102	102	96			115	96		100(13)
RAD-LCF 25	Radix Research															99					102			101(2)
Rushmore II	Mountain View seeds										99												101	100(2)
Shawnee	Rose-AgriSeed														86									–
Shiloh II	Proseeds Marketing												117											–
SS0708OGDT	Southern States								91	105	100							100					102	100(5)
Takena	Smith Seed											100												–
Tekena II	Smith Seed	110	102										109						106	104				106(5)
Tekapo	Ampac Seed		91	81	82	78	82	76	80					98	86	92	82		105	91	81	89		86(15)
Treposno	Hood River Seed									92								99						96(2)
Tucker	Oregro Seeds					96								96	102	96					85			95(5)
Udder	Improved Forages	100	107									102							106	99				103(5)
Vailliant	Proseeds Marketing			96																				–
Vision	Cropmark Seeds	63																	67					65(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 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 3 years, so the final report would be "2015 Orchardgrass Report" archived in the KY Forage website at <forages.ca.uky.edu>.
[3] Mean only presented when respective variety was included in two or more trials.
[4] Number of years of data.

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