

2005 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 higher yields, quality, and long stand life. It produces an open, bunch-type sod, making it very 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. Go to the UK Forage Extension Web site at www.uky.edu/AG/FORAGE to obtain electronic versions of all forage variety testing reports as well as 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 that is 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 high-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 past nine months) and the level of germination and 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

Data from four studies are reported. Orchardgrass varieties were sown at Lexington (2003), Quicksand (2003), and Princeton (2002 and 2004). The soils at Lexington (Maury), Quicksand (Nolin), and Princeton (Crider) are well-drained silt loams and are well suited to orchardgrass production. Seedings were made at the rate of 20 lb/A into a prepared seedbed with a disk drill. Plots were 5 by 15 ft in a randomized complete block design, with four replications. Nitrogen was topdressed at 60 lb/A of

actual N in March, after the first cutting and again in late summer, for a total of 180 lb/A 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, weed control, and harvest timing were in accordance with University of Kentucky recommendations.

Results and Discussion

Weather data for Quicksand, Lexington, and Princeton are presented in Tables 1 through 3.

Ratings for maturity and stand and dry matter yields (tons/acre) are reported in Tables 4 through 7. Yields are given by cutting date and as total annual production. Stated yields are adjusted for percent weeds; therefore, value listed 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 LSD (Least Significant Difference) 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 8 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, while commercial varieties can be purchased through distributors. In Table 8, an open block indicates that the variety was not in that particular test (labeled at the top of the column), while 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. 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 4 through 7).

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.

- AGR-1 Lime and Fertilizer Recommendations
- AGR-18 Grain and Forage Crop Guide for Kentucky
- AGR-26 Renovating Hay and Pasture Fields
- AGR-58 Orchardgrass
- AGR-64 Establishing Forage Crops

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Table 1. Temperature and rainfall at Princeton, Kentucky in 2003, 2004 and 2005.

	2003				2004				2005			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	31	-3	2.19	-1.61	36	+2	4.12	+0.32	41	+7	5.30	+1.50
FEB	35	-3	7.45	+3.02	39	+1	2.44	-1.99	43	+5	2.30	-2.13
MAR	50	+3	2.46	-2.48	53	+6	4.28	-0.66	47	0	4.11	-0.83
APR	60	+1	6.99	+2.19	59	0	5.32	+0.52	60	+1	4.61	-0.19
MAY	67	0	4.81	-0.15	72	+5	7.34	+2.38	65	-2	1.54	-3.42
JUN	71	-4	5.05	+1.20	74	-1	3.40	-0.45	76	+1	3.09	-0.76
JUL	79	+1	4.75	+0.46	75	-3	4.87	+0.58	79	+1	2.39	-1.90
AUG	79	+2	2.05	-1.96	73	-4	3.02	-0.99	80	+3	11.54	+7.53
SEP	69	-2	6.17	+2.84	71	0	0.20	-3.13	74	+2	2.17	-1.16
OCT	60	+1	3.73	+0.68	64	+5	4.03	+0.98	60	+1	0.19	-2.86
NOV	53	+6	5.85	+1.22	53	+6	6.94	+2.31	50	+3	2.48	-2.15
DEC	40	+1	2.39	-2.65	37	-1	4.29	-0.75				
Total		.	53.89	+2.76			50.25	-0.88			39.72	-6.37

DEP is departure from the long-term average.

Table 2. Temperature and rainfall at Lexington, Kentucky in 2004 and 2005.

	2004				2005			
	Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	30	-1	3.14	+0.28	37	+6	4.35	+1.49
FEB	36	+1	1.32	-1.89	39	+4	1.68	-1.53
MAR	47	+3	3.43	-0.97	41	-3	2.79	-1.61
APR	55	0	3.06	-0.82	56	+1	3.30	-0.58
MAY	68	+4	9.79	+5.32	61	-3	1.78	-2.69
JUN	72	0	3.13	-0.53	75	+3	1.33	-2.33
JUL	73	-3	7.65	+2.65	77	+1	3.30	-1.70
AUG	71	-4	2.91	-1.02	78	+3	3.34	-0.59
SEP	68	0	2.61	-0.59	72	+4	0.59	-2.21
OCT	58	+1	5.65	+3.08	58	+1	0.92	-1.65
NOV	49	+4	6.29	+2.90	47	+2	1.54	-1.85
DEC	36	0	3.20	-0.78				
Total			52.18	+7.63			25.32	-15.25

DEP is departure from the long-term average.

Table 3. Temperature and rainfall at Quicksand, Kentucky in 2004 and 2005.

	2004				2005			
	Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	34	+3	4.48	+1.19	40	+9	4.45	+1.16
FEB	39	+6	3.45	-0.15	42	+9	3.01	-0.59
MAR	49	+8	3.84	-0.5	44	+3	2.86	-1.48
APR	51	+4	4.84	+0.74	58	+5	6.63	+2.53
MAY	68	+6	11.22	+6.74	63	+1	2.05	-2.43
JUN	71	+1	6.19	+2.37	75	+5	2.39	-1.43
JUL	75	+1	2.3	-2.95	78	+4	2.58	-2.67
AUG	72	-1	1.37	-2.64	79	+6	3.51	-0.50
SEP	69	+3	6.8	+3.28	72	+6	0.27	-3.25
OCT	61	+7	4.19	+1.29	59	+5	0.68	-2.23
NOV	51	+9	3.56	-0.32	49	+7	1.30	-2.58
DEC	37	+4	3.59	-0.55				
Total			55.83	+8.49			29.73	-13.47

DEP is departure from the long-term average for that location.

Table 4. Dry matter yields (tons/acre), maturity and stand rating of orchardgrass varieties sown September 25, 2002 at Princeton, Kentucky.

Variety	Maturity ¹ May 10, 2004	Maturity May 10, 2005	2005 Percent Stand		Yield (tons/acre)							3-yr Total
			Apr 15	Nov 3	2003 Total	2004 Total	2005					
							May 10	Jun 13	Jul 29	Oct 6	Total	
Commercial Varieties—Available for Farm Use												
Benchmark	59.5	56.5	81	89	4.46	4.21	1.82	0.80	0.26	0.69	3.57	12.24*
Crown Royale Plus	56.0	54.0	75	65	4.54	4.22	1.63	0.65	0.24	0.41	2.93	11.69*
Benchmark Plus	60.0	56.0	74	67	4.41	4.43	1.65	0.50	0.26	0.33	2.74	11.58*
Haymate	52.5	45.0	78	92	4.23	3.70	1.32	0.94	0.26	0.47	3.33	11.46*
Uncertified Potomac	57.0	54.7	80	84	4.14	4.16	1.40	0.67	0.35	0.42	2.84	11.30*
Prairie	57.5	56.0	73	70	4.25	4.33	1.49	0.60	0.24	0.37	2.69	11.27*
Hallmark	59.5	56.5	73	93	4.36	3.81	1.42	0.68	0.28	0.42	2.93	11.11*
Udder	57.5	50.0	75	65	4.05	3.84	1.47	0.56	0.31	0.34	2.69	11.01*
Crown	57.5	52.7	80	80	3.77	4.46	1.41	0.51	0.32	0.34	2.59	10.93*
Takena	48.5	47.3	75	80	4.64	3.76	0.92	0.77	0.30	0.45	2.44	10.84
Certified Potomac	56.5	56.0	78	83	4.05	3.90	1.71	0.67	0.21	0.49	2.97	10.59
Niva	49.5	39.0	46	43	3.47	3.59	0.66	0.56	0.20	0.23	1.65	8.71
Abertop	58.0	57.0	23	10	3.82	3.02	0.37	0.28	0.15	0.08	0.87	7.68
Experimental Varieties												
OG 9701	60.0	55.5	70	73	4.18	4.22	1.56	0.56	0.30	0.39	2.80	11.21*
OG-1	60.0	56.7	50	43	4.28	4.04	1.67	0.38	0.22	0.21	2.47	10.91*
Mean	56.6	53.0	69.9	70.5	4.18	4.01	1.39	0.63	0.26	0.39	2.68	10.93
CV,%	4.5	5.0	20.4	24.9	7.43	14.12	32.10	40.51	31.94	45.52	23.88	7.68
LSD,0.05	3.9	4.2	22.7	30.6	0.44	0.88	0.70	0.40	0.13	0.29	1.04	1.36

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

¹ 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.

Table 5. Dry matter yields (tons/acre), seedling vigor, maturity and stand rating of orchardgrass varieties sown September 16, 2003 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 31, 2003	Maturity ²		2005 Percent Stand		Yield (tons/acre)					2-yr Total	
		May 13 2004	May 12 2005	Apr 8	Oct 28	2004 Total	2005					
							May 12	Jun 14	Aug 18	Oct 18		Total
Commercial Varieties—Available for Farm Use												
Persist	4.0	54.5	58.0	78	93	5.34	2.51	0.68	0.33	0.49	4.01	9.34*
Takena II	4.5	41.0	54.5	86	98	4.69	1.99	0.99	0.44	0.46	3.88	8.57*
Hallmark	2.0	59.5	57.5	95	70	4.43	2.49	0.77	0.36	0.35	3.97	8.40*
Intensiv	5.0	38.0	51.5	85	95	5.14	1.66	0.92	0.27	0.36	3.20	8.34
Udder	2.0	51.0	55.5	91	90	4.76	1.77	1.04	0.34	0.41	3.56	8.32
Vision	3.5	52.0	56.0	33	28	3.89	0.68	0.42	0.33	0.22	1.65	5.53
Experimental Varieties												
KYDG 9801	5.0	50.5	58.0	93	100	5.43	2.38	0.88	0.45	0.41	4.12	9.55*
KYDG 9701	3.0	57.0	55.5	95	98	5.15	2.74	0.82	0.36	0.34	4.25	9.40*
CIS-OG 4	4.8	44.5	56.0	90	98	5.28	2.30	0.74	0.47	0.57	4.08	9.35*
ECF 30	4.5	53.5	58.0	94	98	5.13	2.47	0.87	0.24	0.45	4.03	9.16*
KYDG 9303	4.5	43.0	57.5	90	98	4.89	2.46	0.87	0.41	0.39	4.14	9.03*
DP65-4928	3.5	39.8	56.0	54	71	5.04	1.30	0.92	0.27	0.43	2.93	7.97
Mean	3.9	48.7	56.2	81.9	86.2	4.93	2.06	0.83	0.36	0.41	3.65	8.58
CV,%	9.1	11.1	1.8	27	18.5	9.24	20.96	18.45	27.93	24.07	14.57	9.29
LSD,0.05	0.5	7.8	1.4	31.8	23	0.66	0.62	0.22	0.14	0.14	0.77	1.15

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

¹ Vigor score based on 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.

Table 6. Dry matter yields(tons/acre), maturity and stand rating of orchardgrass varieties sown October 9, 2003 at Quicksand, Kentucky.

Variety	Maturity ¹ May 11, 2005	2005 Percent Stand		Yield(tons/acre)					2-yr Total
		Apr 14	Nov 28	2004 Total	2005				
					May 11	Jun 29	Aug 22	Total	
Commercial Varieties—Available for Farm Use									
Persist	62.0	90	90	5.96	2.53	1.37	1.02	4.92	10.89*
Benchmark Plus	62.0	84	88	5.93	2.64	1.25	0.82	4.71	10.63*
Udder	62.0	88	65	5.52	2.65	1.44	0.91	4.99	10.51*
Prairie	62.0	93	91	5.55	2.53	1.52	0.79	4.84	10.39*
Takena II	61.5	94	83	5.45	2.48	1.51	0.89	4.88	10.33*
Tekapo	62.0	90	80	5.65	2.22	1.37	0.82	4.41	10.06*
Haymate	61.3	85	76	4.84	2.71	1.41	0.78	4.90	9.74
Crown Royale Plus	62.0	93	83	5.45	2.34	1.15	0.65	4.14	9.58
Hallmark	62.0	96	88	4.62	2.68	1.21	0.93	4.82	9.44
Vision	62.0	15	5	5.77	1.22	0.26	0.38	1.87	7.64
Experimental Varieties									
ECF 30	62.0	91	85	5.16	2.74	1.16	0.89	4.80	9.96*
KYDG 9701	61.5	91	79	5.10	2.53	1.34	0.87	4.74	9.84*
Mean	61.9	82.8	75.5	5.41	2.44	1.25	0.81	4.50	9.92
CV,%	0.4	9.3	8.7	9.22	14.94	14.79	16.02	17.5	7.44
LSD,0.05	0.4	11.0	9.5	0.72	0.52	0.27	0.19	0.81	1.06

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

¹ 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.

Table 7. Dry matter yields(tons/acre), seedling vigor, maturity and stand rating of orchardgrass varieties sown September 1, 2004 at Princeton, Kentucky.

Variety	Seedling Vigor ¹ Dec 21, 2004	Maturity ² May 10, 2005	2005 Percent Stand		2005 Yield(tons/acre)				
			Apr 15	Nov 3	May 10	Jun 13	Jul 29	Oct 5	Total
Commercial Varieties—Available for Farm Use									
Shiloh II	3.5	47.8	96	98	1.81	0.96	0.90	1.17	4.84*
Persist	4.3	50.8	100	99	1.44	0.90	0.86	1.22	4.42*
Takena	4.0	46.5	96	98	1.52	1.11	0.70	1.04	4.37*
Extend	3.3	46.5	81	96	1.65	0.88	0.75	1.04	4.32*
Hallmark	3.3	50.8	100	99	1.06	0.92	0.74	1.27	3.99*
Ambassador	3.8	51.0	99	99	1.15	0.85	0.78	1.13	3.90*
LG-31	3.3	36.5	80	96	0.75	0.73	0.73	1.00	3.21
Command	3.0	40.0	81	99	0.47	0.75	0.95	0.99	3.16
Experimental Varieties									
ECF27	3.8	52.5	98	100	1.85	1.08	0.66	1.06	4.65*
KYDG9801	4.5	53.0	100	100	1.50	1.07	0.79	1.27	4.64*
KYDG0101	3.5	45.0	91	99	1.61	0.88	0.86	1.23	4.58*
KYDG9303	5.0	47.5	100	100	1.30	1.04	0.65	0.95	3.94*
94-100	4.0	42.5	91	99	1.13	0.89	0.82	0.96	3.81*
Mean	3.8	46.9	93.4	98.5	1.33	0.93	0.78	1.10	4.14
CV,%	10.4	9.8	5.7	2.1	59.80	20.54	12.58	18.79	20.73
LSD,0.05	0.6	6.6	7.6	3.0	1.14	0.27	0.14	0.28	1.23

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

¹ Vigor score based on 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.

Table 8. Performance of orchardgrass varieties across years and locations.

Variety	Proprietor/KY distributor	Princeton				Lexington		Quicksand	
		2002 ¹			2004	2003		2003	
		03 ²	04	05	05	04	05	04	05
Commercial Varieties—Available for Farm Use									
Abertop	Pennington Seed, Inc.	x	x	x					
Ambassador	DLF International Seeds				*				
Benchmark Plus	FFR/Southern States	*	*	*				*	*
Benchmark	FFR/Southern States	*	*	*					
Command	Seed Research of Oregon				x				
Crown	Donley Seed	x	*	*					
Crown Royale Plus	Donley Seed	*	*	*				*	*
Extend	Allied Seed				*				
Hallmark	James VanLeeuwen	*	*	*	*	x	*	x	*
Haymate	FFR/Southern States	*	*	*				x	*
Intensiv	Barenbrug USA					*	x		
LG-31	DLF International Seeds				x				
Niva	DLF-Jenks	x	*	x					
Persist	Smith Seed Services				*	*	*	*	*
Potomac, certified	public	*	*	*					
Potomac, uncertified	public	*	*	*					
Prairie	Turner Seed Company	*	*	*				*	*
Shiloh II	Proseeds Marketing				*				
Takena	Smith Seed Services	*	*	x					
Takena II	Smith Seed Services				*	x	*	*	*
Tekapo	Ampac Seed Company							*	*
Udder	Improved Forages, Inc	*	*	*		x	*	*	*
Vision	Cropmark Seeds LTD					x	x	*	x
Experimental Varieties									
CIS OG-4	Cebeco International Seeds					*	*		
DP65-4928	DLF International Seeds					*	x		
ECF27	Radix Research, Inc				*				
ECF30	Radix Research, Inc					*	*	*	*
GA OG-1	Pennington Seed, Inc.	*	*	x					
KYDG0101	KY Agric. Exp. Station				*				
KYDG9303	KY Agric. Exp. Station				*	*	*		
KYDG9701	KY Agric. Exp. Station					*	*	*	*
KYDG9801	KY Agric. Exp. Station				*	*	*		
OG 9701	Allied Seed	*	*	*					
94-100	Agri-Food of Canada				*				

¹ Establishment year.

² Harvest year.

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

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.



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