

The 1996 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 the higher yields and quality. 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.

Important Considerations in Selecting an Orchardgrass Variety

Maturity. Orchardgrass typically matures earlier in the spring than its legume companion crop. Much breeding work has been done and continues to be done to develop varieties whose maturity coincides more with alfalfa and improvements have been made. Therefore, if it is to be grown in association with alfalfa or red clover, a later maturing variety of orchardgrass should be selected.

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 either certified or Plant Variety Protected (PVP) seed, which will guarantee that the genetics and performance you are paying for are in the bag. Look for the blue tag, which must be attached to all bags of certified seed or look for Plant Variety Protection labelling, which is the proprietor's guarantee. Other information on the label will include the test date, which must be within the previous 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 will be reported. Orchardgrass varieties were sown in and in 1994 at Princeton, Quicksand, at a surface mine near Quicksand, and in 1995 at Lexington as part of The Forage Variety Testing Program. The soils at Quicksand (Pope), Lexington (Maury) and Princeton (Cridler) were well-drained silt loams. All are well-suited to orchardgrass

production. The planting medium at the surface mine is material composed primarily of gray shale and sandstone. These materials are almost always very low in organic matter and frequently low in Phosphorus and Potassium. This medium can be well drained to the point of being droughty or poorly drained to the point of remaining flooded, depending on the particle size of the material below and degree of compaction. Seedings were made at the rate of 20 lb/A into a prepared seedbed with a disk drill. Plots were 4' x 15' in a randomized complete block design with four replications. Nitrogen was topdressed at 60 lb/A of actual N in March, May, and August. The tests were harvested using a sickle type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile management system. The first cutting was harvested at each location when spring growth of alfalfa was at the bud/first flower stage and all orchardgrass varieties had reached at least the boot stage. Fresh weights were measured in the field and converted to dry matter production using long-term averages for percent dry matter of orchardgrass. Management of all tests for establishment, fertility, weed control, and harvest management was according to University of Kentucky Cooperative Extension Service recommendations.

Results and Discussion

Weather data for Quicksand, Lexington, and Princeton are presented in Table 1. Temperatures across the state were warmer in the winter and late spring with March and April somewhat cooler. July and August were near normal at all locations except Lexington where July was cooler. September was also cooler except at Quicksand, which was near normal. Temperatures in October were near normal everywhere except Quicksand, which was much warmer. All locations measured a surplus of >3 inches of precipitation for the growing season. Generally, January, April, May, and September were wetter than normal, while February, March, and August were drier. June and October were wetter at Quicksand and Princeton but dry at Lexington. July was dry everywhere but Princeton. Precipitation was not only unevenly distributed across the season at all locations but also within months. There were numerous rainfall events of greater than 1 inch and several instances in which the total rainfall for the month fell in a matter of 2-3 days.

Ratings for percent stand and maturity and dry matter yields (tons/acre) are reported in Tables 2-5. Yields are given by cutting date and as total annual production. Varieties are listed by descending maturity rating, if taken, otherwise they are listed

by descending total yield. Experimental varieties are listed separately at the bottom of the tables and 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 random chance. In the tables, the variety with the highest numerical value in each column is marked with two asterisks (**) and those varieties not significantly different from that variety 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 CV's and larger LSD's.

This was an interesting year for cool season grass production across the state. Varieties at Quicksand were at a later stage of maturity than varieties at Princeton at harvest-time (Tables 2 & 5). This would be expected since they were harvested a week later. Second year yields at Quicksand were slightly above 1995 production. This phenomenon, which also occurred in the tall fescue test at Quicksand, has not been previously observed in any cool season grass test in the Variety Testing Program. The cutting taken at the post-mine site was about half the first harvest of 1995, but the 1995 harvest was delayed by one month (Table 3). First cutting yields from the test at Lexington were extremely low, especially for the first production year. This may have been due to a bitter cold spell 2-5 February, during which daily high temperatures averaged only 14 F and lows averaged -3 F. This cold snap occurred in the middle of a two-month period which had a daily average temperature 3 degrees above normal. Several varieties experienced a great amount of winter-kill from this episode as indicated by the percent stand ratings. These varieties are of Euro-

pean origin and may not as well adapted to Kentucky conditions. Most varieties yielded better than expected in subsequent cuttings but the total yields were still considerably less than expected for the first year. The 1994 test at Princeton had second year yields that were 0.75 tons/acre higher than those of a test planted in 1992 at Princeton (1994 Kentucky Orchardgrass Variety Test Report, KY Agr. Exp. Sta. Progress Report 368).

Table 6 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 dealerships. In table 6, shaded areas indicate that the variety was not in that particular test (labelled at the top of the column) while clear blocks mean that the variety was in the test. A double asterisk (**) indicates that the variety was the highest yielding variety in the test for that year. A single asterisk (*) means that the variety was not significantly different from the highest yielding variety. 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 2-5).

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. Other College of Agriculture publications related to the establishment, management, and utilization of orchardgrass are listed on the back page and are available from your local county Extension office.

	Quicksand				Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
MON	F	DEP	IN	DEP	F	DEP	IN	DEP	F	DEP	IN	DEP
JAN	34	+3	5.02	+1.73	31	+0	4.38	+1.52	36	+2	4.94	+1.14
FEB	38	+5	2.17	-1.43	36	+1	1.50	-1.71	40	+2	1.74	-2.69
MAR	39	-2	4.04	-0.30	39	-5	4.44	+0.04	43	-4	4.38	-0.56
APR	52	-1	4.59	+0.49	51	-4	5.15	+1.27	56	-3	5.98	+1.18
MAY	66	+4	5.65	+1.17	66	+2	8.23	+3.76	70	+3	5.19	+0.23
JUN	72	+2	5.17	+1.35	72	+0	3.45	-0.21	75	+0	4.13	+0.28
JUL	73	-1	4.75	-0.50	73	-3	4.80	-0.20	77	-1	7.04	+2.75
AUG	74	+1	2.79	-1.22	74	-1	3.13	-0.80	78	+1	0.82	-3.19
SEP	66	+0	4.86	+1.34	66	-2	5.11	+1.91	69	-2	6.52	+3.19
OCT	58	+4	3.44	+0.53	57	-0	1.39	-1.18	61	+2	6.21	+3.16

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

Table 2. Dry Matter Yields (Tons/acre) and Maturity Ratings of Orchardgrass Varieties Sown 24 August 1994, at Quicksand, Kentucky.

Variety	Maturity May 15	1995 Total	1996 Harvests				1996 Total	2-yr Total
			May 15	Jun 14	Aug 16	Oct 29		
Commercial Varieties - Available for Farm Use								
BENCHMARK	11.00**	5.28*	2.33*	0.92	1.06*	0.66	4.97*	10.25*
OG8703	11.00**	5.19*	2.08	1.11	1.45*	0.89*	5.53*	10.72*
POTOMAC	10.50*	4.64*	1.90	1.23	0.83	0.68	4.63	9.28*
SHILOH	10.50*	5.08*	2.08	1.08	1.54**	1.01**	5.71**	10.79**
HALLMARK	10.00*	5.48**	2.15	1.06	1.08*	0.78	5.05*	10.53*
PROFILE	10.00*	4.71*	2.18*	1.05	0.98*	0.68	4.89*	9.60*
PRO-GRESS	9.50	4.50	2.10	1.11	1.31*	0.63	5.15*	9.65*
HAYMATE	9.00	5.03*	2.00	1.45**	1.25*	0.77	5.47*	10.50*
TEKAPO	9.00	4.14	1.46	0.99	1.11*	0.74	4.29	8.43
89-19	8.50	4.67*	1.89	1.14	1.37*	0.77	5.16*	9.84*
ORION	8.50	4.85*	1.99	1.29*	1.23*	0.62	5.13*	9.98*
SC89-19	7.50	4.58*	1.54	1.36*	1.37*	0.66	4.92*	9.50*
Experimental Varieties - Not Available for Farm Use								
GA-OG1	11.00**	4.55*	2.61**	0.76	0.99*	0.51	4.87*	9.42*
ISI8511	9.50	4.65*	2.01	1.05	1.35*	0.86*	5.27*	9.92*
MEAN	9.68	4.81	2.02	1.11	1.21	0.73	5.07	9.89
CV, %	7.95	14.08	15.73	15.84	37.30	21.01	13.73	11.35
LSD, 0.05	1.10	0.97	0.45	0.25	0.64	0.22	1.00	1.60
<p>1995 total includes 4 harvests dated May 01, Jun 15, Aug 11, and Oct 31. Maturity rating scale: 1=vegetative 3=early boot 5=mid boot 7=late boot 9=early head 11=full head 13=early bloom 15=full bloom 17=seed (dough) 19=mature seed **Highest numerical value in the column. *Not significantly different from the highest numerical value in the column based on the 5% LSD.</p>								

Table 3. Dry Matter Yields (Tons/acre) of Orchardgrass Varieties Sown 24 August 1994 on a Post-mine Site Near Quicksand, Kentucky.

Variety	1995 Total	1996		2-yr Total
		May 15	Total	
Commercial Varieties - Available for Farm Use				
OG8703	1.00*	0.42*	0.42*	1.42*
BENCHMARK	0.96*	0.32*	0.32*	1.28*
HALLMARK	0.93*	0.34*	0.34*	1.27*
POTOMAC	1.00*	0.26	0.26	1.26*
PROFILE	0.90*	0.27	0.27	1.18
HAYMATE	0.76	0.33*	0.33*	1.10
TEKAPO	0.80	0.28	0.28	1.08
PRO-GRESS	0.79	0.28	0.28	1.07
ORION	0.77	0.26	0.26	1.04
SHILOH	0.70	0.27	0.27	0.98
89-19	0.77	0.19	0.19	0.96
SC89-19	0.59	0.26	0.26	0.85
Experimental Varieties - Not Available for Farm Use				
GA-OG1	1.11**	0.47**	0.47**	1.58**
ISI8511	0.95*	0.27	0.27	1.22*
MEAN	0.86	0.30	0.30	1.16
CV, %	25.32	42.57	42.57	23.21
LSD, 0.05	0.31	0.18	0.18	0.39
<p>1995 total includes 2 harvest dated Jun 15 and Oct 31. **Highest numerical value in the column. *Not significantly different from the highest numerical value in the column based on the 5% LSD.</p>				

Variety	% Stand Apr 16	1996 Harvests				1996 Total
		May 13	Jun 14	Aug 09	Oct 28	
Commercial Varieties - Available for Farm Use						
TAKENA	83.75*	0.11	1.66*	0.89*	2.07**	4.72*
BRONC	83.75*	0.25*	1.71*	0.97*	1.71*	4.65*
SHILOH	91.25**	0.26*	1.66*	0.75	1.94*	4.61*
POTOMAC	85.00*	0.18	1.61*	0.60	1.91*	4.30*
BAR051	65.00	0.11	1.16	0.84*	2.06*	4.16*
PIZZA	68.75	0.06	1.19	0.82*	1.70*	3.78
LUPRE	3.75	0.00	0.03	0.06	0.05	0.14
Experimental Varieties - Not Available for Farm Use						
OG1A	78.75*	0.19	1.66*	1.03**	1.98*	4.85**
OG1	87.50*	0.21	1.77**	0.94*	1.93*	4.85**
B23	90.00*	0.31**	1.54*	0.67	1.70*	4.23*
BAR5USF	57.50	0.06	1.10	0.91*	1.76*	3.83
BAR4871	15.00	0.04	0.10	0.19	0.21	0.52
MEAN	67.50	0.15	1.26	0.72	1.58	3.72
CV, %	17.92	42.10	21.63	21.57	23.82	16.05
LSD, 0.05	17.40	0.09	0.39	0.22	0.54	0.86
**Highest numerical value in the column.						
*Not significantly different from the highest numerical value in the column based on the 5% LSD.						

Variety	Maturity May 09	1995 Total	1996 Harvests				1996 Total	2-yr Total
			May 09	Jun 13	Aug 15	Oct 31		
Commercial Varieties - Available for Farm Use								
HALLMARK	10.50**	6.62*	1.49	0.55*	0.60*	1.00*	3.65	10.27*
BENCHMARK	10.00*	7.04**	1.55	0.58**	0.53*	1.05*	3.71	10.74*
OG8703	10.00*	6.01	1.43	0.46*	0.49	1.12**	3.49	9.50
POTOMAC	9.50	6.44*	1.48	0.48*	0.46	1.00*	3.43	9.87*
PRO-GRESS	9.50	6.53*	1.62	0.51*	0.55*	0.99*	3.67	10.20*
SHILOH	9.50	6.48*	1.59	0.50*	0.51	0.68	3.27	9.75
PROFILE	9.00	6.44*	1.56	0.48*	0.61*	0.84	3.49	9.93*
TEKAPO	9.00	5.36	0.75	0.49*	0.48	0.79	2.51	7.87
HAYMATE	8.50	6.16*	1.39	0.52*	0.50	0.80	3.21	9.38
ORION	8.00	6.05	1.70	0.53*	0.69**	0.70	3.63	9.68
SC89-19	7.50	5.97	1.57	0.52*	0.59*	0.59	3.28	9.25
89-19	7.00	5.93	1.31	0.51*	0.60*	0.66	3.08	9.01
Experimental Varieties - Not Available for Farm Use								
GA-OG1	10.50**	6.76*	2.09**	0.46*	0.59*	1.04*	4.17**	10.93**
ISI8511	9.00	6.74*	1.68	0.55*	0.49	1.04*	3.76	10.51*
MEAN	9.11	6.32	1.51	0.51	0.55	0.88	3.45	9.78
CV, %	10.75	10.59	12.04	20.57	21.27	15.80	7.66	7.90
LSD, 0.05	1.40	0.96	0.26	0.15	0.17	0.20	0.38	1.10
1995 total includes 4 harvests dated May 03, Jun 06, Aug 10, and Nov 02.								
Maturity rating scale: 1=vegetative 3=early boot 5=mid boot 7=late boot 9=early head 11=full head 13=early bloom 15=full bloom 17=seed (dough) 19=mature seed								
**Highest numerical value in the column.								
*Not significantly different from the highest numerical value in the column based on the 5% LSD.								

Table 6. Performance of Orchardgrass Varieties Across Years and Locations.								
		Quicksand		Post-mine		Lexington	Princeton	
		1994 ¹		1994		1995	1994	
Variety	Source/KY Distributor	95 ²	96	95	96	95	95	96
Commercial Varieties - Available For Farm Use								
89-19	Smith Seed Services/J & M Seed	*	*					
BAR H DGL 051	Barenbrug USA					*		
Benchmark	FFR/Southern States	*	*	*	*		**	
Bronc	ABT, Grasslands West/Scott Seed					*		
Hallmark	James VanLeeuwen	**	*	*	*		*	
Haymate	FFR/Southern States	*	*		*		*	
Lupre	Barenbrug USA							
OG8073	Fine Lawn Research/Geo.W. Hill	*	*	*	*			
Orion	Van Dyke Seed/to be determined	*	*					
Pizza	Advanta Seeds West							
Potomac	USDA/Public	*		*		*	*	
Pro-file	J.W. Jenks Seed/Scott Seed	*	*	*			*	
Pro-gress	J.W. Jenks Seed/Scott Seed		*					
SC89-19	The Seed Connection	*	*					
Shiloh	Green Seed	*	**			*	*	
Takena	Smith Seed Services					*		
Tekapo	Modern Forage Systems/Oldfields Seed							
Experimental Varieties - Not Available For Farm Use								
B-23	Willamette Valley Plant Breeders							
BAR-4871	Barenbrug Research							
BAR-5USF	Barenbrug Research							
GA-OG1	GA Agric Exp Sta	*	*	**	**		*	**
ISI8511	International Seeds	*	*	*			*	
OG1	Pure Seed Testing							
OG1A	Pure Seed Testing							
¹ Establishment year ² Harvest year Indicates that the variety was not in the test. **Highest yielding variety in the test for that year. *Not significantly different from the highest yielding variety in the test.								

The following is a list of University of Kentucky Agricultural Extension publications related to orchardgrass management.

- 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
- AGR-103 Fertilization of Cool-Season Grasses
- ASC-16 Beef: Grass Tetany in Beef Cattle
Seed tags: What They Reveal

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