

1994 Kentucky Orchardgrass Variety Test Report

J.C. Henning, L.M. Lauriault, T.D. Phillips, G.D. Lacefield, and T.G. Gray

Introduction

Orchardgrass 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.

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 three studies will be reported. Orchardgrass varieties were sown in Lexington and Princeton in the late summer of 1992 and again in Lexington in the late summer of 1993 as part of the Kentucky Forage Variety Testing Program. The objective of these studies was to compare dry matter yields of orchardgrass varieties under simulated grazing and hay management schemes in different environments.

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 50 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 when spring growth of alfalfa was at the bud/first flower stage at each location. Fresh weights were measured in the field and converted to dry matter production using long-term averages for dry matter percents of orchardgrass.

Soils at both locations are well-drained silt loams (Maury at Lexington and Crider at Princeton). All tests were managed according to University of Kentucky Cooperative Extension Service recommendations.

Results and Discussion

Weather data for Lexington and Princeton are presented in Table 1. With the exception of May, which was exceptionally cool at both locations, the spring was warmer than average at both locations. The summer and fall were much cooler than normal at Lexington, while Princeton had a near normal summer and fall. Precipitation was above average through May at Lexington, while it was near normal through April at Princeton. The remainder of the growing season was well below average at both locations.

Maturity ratings and dry matter yields (tons/acre) are reported in Tables 2, 3, and 4. Yields are given by

cutting date and as total annual production. In these tables, varieties are listed by descending maturity rating with the experimental varieties, which are not available for purchase, listed separately at the bottom. All varieties matured earlier at Princeton compared to Lexington. Some varieties were past the optimum stage of harvest for orchardgrass, which is late boot/early flowering (maturity rating = 6.5-9.5). Maturity differences between the two locations were related to harvest date.

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 (C.V.), 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 C.V.'s and larger L.S.D.'s.

Yields of 1992 seedings at both locations were somewhat lower in 1994 than in 1993. This reduction, occurring mainly in the first and second cuttings, was also observed in variety trials for other cool-season grasses of the same age in Kentucky. Similarly, 1994 yields of the test sown in 1993 at Lexington compare well to the 1993 yields of the tests sown in 1992.

Table 5 lists all the varieties included in the Kentucky Orchardgrass Variety Tests as well as information about distributors and yield performance across locations in 1993 for all varieties currently included in the Kentucky Orchardgrass Variety Tests. 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 this table, 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. However, data from only one year is available at this time so give consideration to varieties that yielded well at both locations. Remember to consider the distribution of yield across the growing season when evaluating productivity of orchardgrass varieties (Tables 2-4).

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 in Table 6 and are available from your local county extension office.

TABLE 1. TEMPERATURE AND RAINFALL IN LEXINGTON AND PRINCETON IN 1994.

MONTH	LEXINGTON				PRINCETON			
	TEMPERATURE		RAINFALL		TEMPERATURE		RAINFALL	
	F	DEP.	INCHES	DEP.	F	DEP.	INCHES	DEP.
JAN	25	-6	3.60	+0.03	30	-4	4.26	+0.40
FEB	36	+1	3.41	+0.15	41	+2	3.73	-0.71
MAR	43	-1	5.95	+1.12	49	+1	5.13	+0.69
APR	58	+3	6.02	+2.01	60	+1	5.48	+0.60
MAY	60	-4	4.05	-0.18	63	-6	0.84	-4.84
JUN	74	+2	2.01	-2.24	77	+2	4.19	+0.32
JUL	76	0	2.62	-2.33	78	0	3.89	-0.41
AUG	72	-3	5.86	+1.90	75	-1	1.69	-2.37
SEP	65	-3	1.43	-1.85	68	-1	2.28	-1.06
OCT	57	0	1.71	-0.55	61	+1	2.65	-0.67

TEMPERATURES ARE IN DEGREES FAHRENHEIT.

DEP. IS DEPARTURE FROM THE LONG-TERM AVERAGE FOR THAT LOCATION.

TABLE 2. DRY MATTER YIELDS (TONS/ACRE) OF ORCHARDGRASS VARIETIES
SOWN 15 SEP 1992 AT LEXINGTON, KENTUCKY.

VARIETY	MATURIT 1993		1994 HARVESTS			1994	2-YR
	MAY09	TOTAL	MAY10	JUN03	OCT24	TOTAL	TOTAL
COMMERCIAL VARIETIES - Available for farm use							
BOONE	10.00**	3.60	1.30	0.47*	0.76	2.53	6.13
BENCHMARK	9.75*	4.74**	1.50*	0.49*	0.94	2.93*	7.67*
POTOMAC	9.75*	4.29*	1.39	0.47*	0.87	2.73	7.01*
SHILOH	9.75*	4.38*	1.39	0.46*	0.91	2.75	7.14*
PAIUTE	9.50*	4.18	1.37	0.47*	0.86	2.70	6.88
LATAR	9.25*	4.29*	1.20	0.46*	0.89	2.55	6.84
ELSIE	8.75	3.90	1.29	0.36	0.84	2.50	6.39
SHAWNEE	8.50	3.74	1.15	0.55*	0.97	2.67	6.41
WARRIOR	8.50	4.45*	1.25	0.50*	0.94	2.69	7.15*
CONDOR	8.33	4.61*	1.32	0.53*	0.93	2.78*	7.39*
D58	7.75	3.80	1.07	0.56*	0.89	2.52	6.31
89-103	7.67	4.53*	1.31	0.51*	1.05*	2.86*	7.40*
DAWN	7.50	3.89	1.27	0.52*	0.84	2.63	6.51
EXPERIMENTAL VARIETIES - Not available for farm use							
CIS-EG1	10.00**	3.84	1.61**	0.50*	0.90	3.01*	6.85
CIS-28	10.00**	3.67	1.29	0.30	0.83	2.41	6.08
KYEXP3	9.75*	4.37*	1.58*	0.59*	1.00	3.17*	7.54*
TN-OG-SYN-2	9.67*	4.65*	1.55*	0.48*	1.18**	3.21**	7.86**
HHR-2	9.25*	4.22	1.46*	0.45*	0.83	2.74	6.96
CIS-LG4	9.00*	3.48	1.13	0.27	0.92	2.32	5.79
KYEXP1	9.00*	4.35*	1.39	0.57*	0.86	2.81*	7.16*
KYEXP2	9.00*	4.63*	1.39	0.60**	0.91	2.90*	7.53*
OG90132	9.00*	4.40*	1.33	0.50*	0.99	2.83*	7.23*
MEAN	9.08	4.17	1.35	0.48	0.91	2.75	6.91
CV, %	9.27	8.22	14.19	20.22	11.47	11.75	8.86
LSD, 0.05	1.19	0.49	0.19	0.14	0.15	0.45	0.87

MATURITY RATING SCALE: 1=VEGETATIVE 11=FULL HEAD
 3=EARLY BOOT 13=EARLY BLOOM
 5=MID BOOT 15=FULL BLOOM
 7=LATE BOOT 17=SEED
 9=EARLY HEAD 19=MATURE SEED

1993 TOTAL INCLUDES 4 HARVESTS DATED MAY06, JUN07, JUL13, AND

**HIGHEST NUMERICAL VALUE IN THE COLUMN.

*NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST NUMERICAL VALUE
IN THE

COLUMN BASED ON THE 5% LSD.

TABLE 3. DRY MATTER YIELDS (TONS/ACRE) AND MATURITY RATINGS OF ORCHARDGRASS VARIETIES SOWN 7 SEP 1993 AT LEXINGTON, KENTUCKY.

VARIETY	MATURIT		1994 HARVESTS				TOTAL
	MAY09	MAY10	JUN03	JUL15	AUG11	OCT24	
COMMERCIAL VARIETIES - Available for farm use							
BENCHMARK	10.25**	2.02*	1.43	0.30*	0.29		5.27*
BOONE	10.00*	1.54	1.30	0.25*	0.34*	1.11*	4.54
CROWN	10.00*	2.10**	1.67**	0.23*	0.31*	1.15*	5.46**
OG91134	10.00*	1.94*	1.47*	0.22	0.31*	1.04*	4.98*
POTOMAC	10.00*	1.64	1.40	0.17	0.29	1.04*	4.54
SHILOH	10.00*	1.96*	1.55*	0.23*	0.25	1.11*	5.09*
PAIUTE	9.75*	1.72	1.34	0.18	0.36*	0.92	4.53
PS-RR	9.75*	1.46	1.11	0.28*	0.27	0.90	4.02
AXIOM	8.25	1.57	1.31	0.24*	0.27	1.10*	4.48
HAYMATE	8.00	1.34	1.30	0.20	0.25	0.90	4.00
8702	7.50	1.81	1.44*	0.21	0.33*		5.01*
PIZZA	6.50	1.84*	1.29	0.19	0.30	1.05*	4.67
EXPERIMENTAL VARIETIES - Not available for farm use							
KYEXP2	10.25**	1.86*	1.54*	0.30*	0.39**	1.20*	5.28*
KYEXP3	10.00*	1.53	1.15	0.18	0.34*	1.14*	4.34
OG9001	10.00*	2.08*	1.38	0.27*	0.37*	1.08*	5.18*
SCS9007238	10.00*	1.67	1.40	0.25*	0.36*	1.17*	4.86
KYEXP1	9.75*	1.73	1.43	0.17	0.26	1.08*	4.67
PL-OG-DR1-SYN-	9.50*	1.72	1.32	0.16	0.23	0.99	4.43
TALL-OATGRASS	9.00*	2.03*	0.99	0.45++	0.19	0.70	4.36
WX9-400	8.00	1.78	1.30	0.19	0.30	1.05*	4.67
OFI-C9	7.75	1.55	1.17	0.31**	0.26	1.16*	4.46
OFI-T8	7.50	1.68	1.53*	0.22	0.26		4.91*
WX0-421-6	7.00	1.50	1.32	0.22	0.26	0.94	4.23
WX0-422-5	7.00	1.63	1.08	0.23*	0.18	0.73	3.86
PL-OG-DR1-SYN-	6.50	1.51	1.29	0.18	0.25	0.93	4.16
PL-OG-DR1-SYN-	6.50	1.51	1.23	0.18	0.25	0.95	4.12
MEAN	8.76	1.72	1.34	0.23	0.28	1.05	4.62
CV, %	10.59	11.85	12.56	26.62	23.25	13.61	8.87
LSD, 0.05	1.31	0.29	0.24	0.09	0.09	0.20	0.58

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**HIGHEST NUMERICAL VALUE IN THE COLUMN.

*NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST NUMERICAL VALUE IN THE

COLUMN BASED ON THE 5% LSD.

++TALL OATGRASS WAS THE HIGHEST NUMERICAL VALUE IN THIS COLUMN WITH ALL

ORCHARDGRASS VARIETIES SIGNIFICANTLY DIFFERENT, THUS '**' AND '*'

APPLY TO ORCHARDGRASS VARIETIES ONLY IN THIS COLUMN.

TABLE 4. DRY MATTER YIELDS (TONS/ACRE) AND MATURITY RATINGS OF ORCHARDGRASS VARIETIES SOWN 16 SEP 1992 AT PRINCETON, KENTUCKY.

VARIETY	MATURIT 1993		1994 HARVESTS					1994	2-YR
	MAY02	TOTAL	MAY02	JUN02	JUN30	AUG03	OCT27	TOTAL	TOTAL
COMMERCIAL VARIETIES - Available for farm use									
BENCHMARK	10.00**	3.50*	1.65*	0.59	0.20*	0.15*	0.42	3.03*	6.52*
SHILOH	9.50*	3.29*	1.45*	0.73*	0.18*	0.19**	0.47	3.02*	6.31*
BOONE	9.00*	3.09*	1.45*	0.71*	0.19*	0.12*	0.43	2.90*	6.00*
PAIUTE	8.75*	2.95	1.35	0.50	0.14	0.07	0.25	2.32	5.27
POTOMAC	8.25*	3.05	1.36	0.68*	0.16*	0.16*	0.44	2.81*	5.86*
LATAR	8.00*	3.69*	1.21	0.69*	0.20*	0.12*	0.36	2.59	6.28*
CONDOR	5.50	3.42*	1.21	0.66	0.17*	0.14*	0.41	2.60	6.01*
DAWN	5.50	3.44*	1.14	0.74*	0.20*	0.15*	0.40	2.62	6.07*
ELSIE	5.50	3.44*	1.13	0.67*	0.17*	0.17*	0.45	2.60	6.04*
WARRIOR	5.50	3.79**	1.05	0.64	0.15	0.12*	0.43	2.39	6.19*
D58	4.00	2.74	1.07	0.79**	0.13	0.15*	0.41	2.56	5.30
SHAWNEE	4.00	3.34*	0.86	0.72*	0.14	0.16*	0.28	2.16	5.50*
89-103	3.50	3.31*	1.01	0.79**	0.16*	0.08	0.37	2.41	5.72*
EXPERIMENTAL VARIETIES - Not available for farm use									
TN-OG-SYN-2	9.25*	3.52*	1.67**	0.59	0.21*	0.16*	0.62**	3.26**	6.78**
CIS-28	9.00*	2.70	0.90	0.50	0.21*	0.17*	0.45	2.23	4.93
KYEXP3	8.50*	3.61*	1.52*	0.68*	0.19*	0.13*	0.58*	3.11*	6.72*
CIS-EG1	8.25*	2.97	1.38	0.69*	0.21*	0.17*	0.38	2.83*	5.79*
HHR-2	7.50	3.38*	1.34	0.64	0.19*	0.15*	0.35	2.67	6.05*
KYEXP2	7.50	3.69*	1.42*	0.73*	0.20*	0.17*	0.54*	3.06*	6.75*
CIS-LG4	5.50	3.04	0.93	0.58	0.15	0.15*	0.39	2.20	5.23
KYEXP1	5.00	3.54*	1.23	0.77*	0.18*	0.12*	0.59*	2.89*	6.43*
OG90132	5.00	3.51*	1.16	0.77*	0.23**	0.18*	0.43	2.76	6.28*
MEAN	6.93	3.32	1.25	0.68	0.18	0.14	0.43	2.68	6.00
CV, %	22.57	15.12	15.37	13.69	29.93	41.64	23.52	12.16	11.61
LSD, 0.05	2.21	0.71	0.27	0.13	0.08	0.09	0.14	0.46	0.98

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**HIGHEST NUMERICAL VALUE IN THE COLUMN.

*NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST NUMERICAL VALUE IN THE COLUMN BASED ON THE 5% LSD.

Table 5. Characterization of orchardgrass varieties and their performance across years and locations. 1994 Kentucky Orchardgrass Variety Tests L.M. Lauriault, J.C. Henning, G.D. Lacefield, and T.G. Gray		Lexington			Princeton	
		1992 ¹		1993	1992	
		93 ²	94	94	93	94
Variety	Source/KY Distributor					
COMMERCIAL VARIETIES - Available for farm use						
8702	Genesis Turf and Forage/Green Seed			*		
89-103	Green Seed	*	*		*	
Axiom	American Seed Producers					
Benchmark	FFR/Southern States	**	*	*	*	*
Boone	KY Agric. Exp. Sta./Public				*	*
Condor	Olsen-Fennell Seed	*	*		*	
Crown	Willamette Seed/Dobbs, Sphar, Lewis,			**		
D58	Research Seeds, Inc.					
Dawn	Research Seeds, Inc.				*	
Elsie	Turf Seed/Geo. W. Hill, Bunton Seed				*	
Haymate	FFR/Southern States					
Latar	Oregon Orchardgrass Commission/Public	*			*	
OG91134	International Seeds/Green Seed			*		
Paiute	Oregon Orchardgrass Commission/Public					
Pizza	Advanta Seeds West					
Potomac	USDA/Public	*				*
PS-RR	ProSeeds Marketing/Dobson-Hicks Co.					
Shawnee	Turf Seed/Geo. W. Hill, Bunton Seed				*	
Shiloh	Green Seed	*		*	*	*
Warrior	Olsen-Fennell Seed	*			**	
EXPERIMENTAL VARIETIES - Not available for farm use						
CIS-28	Cascade International Seeds/Experimental					
CIS-EG1	Cascade International Seeds/Experimental	*	*			*
CIS-LG4	Cascade International Seeds/Experimental					
HHR-2	International Seeds/Experimental				*	
KYEXP1	KY Agric. Exp. Sta./Experimental	*	*		*	*
KYEXP2	KY Agric. Exp. Sta./Experimental	*		*	*	*
KYEXP3	KY Agric. Exp. Sta./Experimental	*			*	*
OFI-C4	Olsen-Fennell Seeds/Experimental					
OFI-C9	Olsen-Fennell Seeds/Experimental					
OFI-T8	Olsen-Fennell Seeds/Experimental			*		
OG9001	FFR/Experimental			*		
OG90132	International Seeds/Experimental	*	*		*	
PL-OG-DR1-SYN 1	U.S. N. Atlantic Regional Pasture					
PL-OG-DR1-SYN 2	U.S. N. Atlantic Regional Pasture					
PL-OG-DR1-SYN 3	U.S. N. Atlantic Regional Pasture					
SCS9007238	Soil Conservation Service/Experimental					
Tall Oatgrass	Soil Conservation Service/Experimental					
TN-OG-SYN-2	TN Agric. Exp. Sta./Experimental	*	**		*	**
WX0-421-6	Willamette Seed/Experimental					

WX0-422-5	Willamette Seed/Experimental					
WX9-400	Willamette Seed/Experimental					
¹ Establishment year		Indicates that the variety was not in the test.				
² Harvest year		<ul style="list-style-type: none"> * Highest yielding variety in the test for that year. * Not significantly different from the highest yielding variety in the test. 				

Table 6. University of Kentucky agricultural extension

publications related to orchardgrass management.

<u>Publication</u>	<u>Title</u>
AGR-58	Orchardgrass
AGR-64	Establishing forage crops Seed tags: What they reveal
AGR-26	Renovating hay and pasture fields
AGR-18	Grain and forage crop guide for Kentucky
AGR-1	Lime and fertilizer recommendations
AGR-103	Fertilization of cool-season grasses
<u>ASC-16</u>	<u>Beef: Grass tetany in beef cattle</u>
