1993 Kentucky Orchardgrass Variety Test Report

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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 high quality, certified seed that has high germination and few other crop and weed seed. This information is shown on the label. The test date, which indicates when the germination was last tested, must be within the previous nine months. The use of certified seed assures 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. Order seed well in advance of planting time to assure that it will be available when needed.

Description of the Tests

Data from two studies will be reported. Orchardgrass varieties were sown in Lexington and Princeton in the late summer of 1992 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 occasional subsamples were taken and weighed and dried and reweighed to determine percent dry matter on an oven dry basis.

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 the 1993 growing season in Lexington and Princeton are presented in Table 1. At both locations, spring and fall were slightly cooler than normal, while July and August were warmer. Precipitation was below average for most of the growing season. In months with a surplus, rain tended to come in events of greater than 1". Therefore, yields are somewhat lower than what these levels of rainfall would support under more ideal conditions.

Maturity ratings and dry matter yields (tons/acre) are reported in Tables 2 and 3. Yields are given by cutting date and as total annual production. In these tables, varieties are listed by descending maturity rating. All varieties matured earlier at Princeton compared to Lexington. Some varieties were past the optimum stage of harvest for the orchardgrass, which is late boot/early flowering (maturity rating = 6.5-9.5).

Statistical analyses were performed on all data to determine if the apparent differences are truly due to varietal differences or just to random chance. In the tables, the highest yielding variety in each column is marked with two asterisks (**) and those varieties not significantly different from the highest yielding 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.

Although first cutting yields at Princeton were 0.83 tons/acre higher than the same cutting at Lexington, yields of subsequent harvests were all greater at Lexington leading to a 1993 total production that was 0.75 tons/acre higher at that location. This was apparently caused by hotter, dryer summer conditions at Princeton.

Table 4 lists all the varieties included in the Kentucky Orchardgrass Variety Tests as well as information about distributors and performance across locations in 1993. All of the varieties were sown in both tests. 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 and 3).

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 5 and are available from your local county extension office.

TABLE 1. TEMPERATURE AND RAINFALL IN LEXINGTON AND PRINCETON DURING 1993.

	LEXINGTON				PRINCETON			
	TEMPERATURE		RAINFALL		TEMPERATURE		RAINFALL	
MONTH	F	DEP.	INCHES	DEP.	F	DEP.	INCHES	DEP.
JAN	38	7	2.95	-0.62	39	5	4.75	0.22
FEB	33	-2	4.04	0.78	37	-1	3.75	-0.16
MAR	41	-3	4.15	-0.68	46	-1	4.35	-0.70
APR	53	-2	3.26	-0.75	57	-2	4.66	0.05
MAY	65	1	2.48	-1.75	66	-1	5.09	0.84
JUN	72	0	6.48	2.23	75	0	4.54	1.16
JUL	79	3	3.17	-1.78	83	5	2.22	-1.68
AUG	76	1	4.65	0.69	80	3	1.71	-1.89
SEP	66	-2	3.72	0.44	69	-2	4.53	1.23
OCT	54	-2	4.08	1.82	58	-2	3.72	0.40

TEMPERATURES ARE IN DEGREES FAHRENHEIT.

DEP. IS DEPARTURE FROM THE 30-YEAR AVERAGE FOR THAT LOCATION.

TABLE 2. DRY MATTER YIELDS (TONS/ACRE) AND MATURITY RATINGS[1] OF ORCHARDGRASS VARIETIES SOWN ON 15 SEP 1992 AT LEXINGTON, KENTUCKY.

VARIETY	MAY05 93 MATURITY	1993 HARVESTS MAY06	JUN07	JUL13	OCT28	1993 TOTAL
BENCHMARK	9.00**	1.54**	1.32*	0.58	1.30	4.74**
BOONE	9.00**	0.81	1.08	0.52	1.18	3.60
CIS-28	9.00**	0.78	1.07	0.53	1.28	3.67
SHILOH	9.00**	1.17	1.29*	0.60	1.32	4.38*
TN-OG-SYN-1	9.00**	1.20	1.20	0.72**	1.52**	4.65*
CIS-EG1	8.50*	0.92	1.15	0.50	1.27	3.84*
PAIUTE	8.50*	1.06	1.30*	0.52	1.30	4.18
HHR-2	8.00*	1.22	1.30*	0.56	1.15	4.22
KYEXP2	7.50*	1.19	1.45**	0.61	1.37	4.63*
KYEXP3	7.50*	1.27	1.26	0.58	1.26	4.37*
POTOMAC	7.50*	1.24	1.28	0.48	1.30	4.29*
LATAR	7.00*	1.12	1.34*	0.53	1.31	4.29*
90132	6.50	1.02	1.42*	0.55	1.42*	4.40*
CIS-LG4	6.00	0.73	1.11	0.45	1.19	3.48
KYEXP1	6.00	1.14	1.32*	0.57	1.32	4.35*
WARRIOR	6.00	1.08	1.42*	0.56	1.38	4.45*
CONDOR	5.67	1.16	1.37	0.56	1.51*	4.61*
89103	5.67	1.01	1.45**	0.64*	1.43*	4.53*
DAWN	5.50	0.77	1.30	0.56	1.25	3.89
ELSIE	5.00	0.82	1.30	0.54	1.24	3.90
SHAWNEE	5.00	0.63	1.33	0.50	1.27	3.74
D58	4.50	0.69	1.42*	0.54	1.15	3.80
MEAN	7.05	1.03	1.30	0.55	1.30	4.17
C.V., %	24.00	17.20	9.14	13.17	8.20	8.22
L.S.D., 0.05	2.39	0.25	0.17	0.10	0.15	0.49

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

**HIGHEST NUMERICAL YIELD IN THE COLUMN.
*NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST NUMERICAL YIELD IN THE COLUMN BASED ON THE L.S.D.

TABLE 3. DRY MATTER YIELDS (TONS/ACRE) AND MATURITY RATINGS[1] OF ORCHARDGRASS VARIETIES SOWN ON 16 SEP 1992 AT PRINCETON, KENTUCKY.

VARIETY	MAY12 MATURITY	1993 HARVESTS MAY12	JUN10	JUL15	OCT26	1993 TOTAL
BENCHMARK	12.00**	1.93*	0.91*	0.42*	0.23*	3.50*
BOONE	12.00**	1.65	0.77	0.43*	0.24*	3.09*
KYEXP3	12.00**	1.87*	0.93*	0.52**	0.29**	3.61*
SHILOH	12.00**	1.88*	0.91*	0.32	0.18	3.29*
TN-OG-SYN-2	12.00**	1.95*	0.79	0.50*	0.28*	3.52*
CIS-EG1	11.50*	1.61	0.70	0.42*	0.23*	2.97
HHR-2	11.50*	1.92*	0.90*	0.36	0.20	3.38*
POTOMAC	11.50*	1.81*	0.77	0.30	0.17	3.05
CIS-28	11.00*	1.52	0.65	0.34	0.19	2.70
KYEXP1	11.00*	2.00*	0.89	0.41*	0.23*	3.54*
KYEXP2	11.00*	1.84*	1.08**	0.49*	0.27*	3.69*
WARRIOR	11.00*	2.07*	1.04*	0.44*	0.24*	3.79**
CIS-LG4	10.50*	1.77*	0.71	0.36	0.20	3.04
89103	10.50*	1.81*	0.81	0.44*	0.25*	3.31*
90132	10.50*	1.96*	0.91*	0.41*	0.23*	3.51*
PAIUTE	10.00*	1.57	0.85	0.34	0.19	2.95
CONDOR	9.50*	1.96*	0.91*	0.35	0.20	3.42*
DAWN	9.50*	2.06*	0.82	0.36	0.20	3.44*
ELSIE	9.50*	1.92*	0.87	0.42*	0.23*	3.44*
LATAR	9.50*	2.19**	0.88	0.40	0.22	3.69*
SHAWNEE	8.50	1.89*	0.85	0.39	0.22	3.34*
D58	7.00	1.64	0.71	0.25	0.14	2.74
MEAN	10.61	1.86	0.85	0.40	0.22	3.32
C.V., %	18.45	19.53	16.07	21.58	21.58	15.12
L.S.D., 0.05	2.77	0.51	0.19	0.12	0.07	0.71

[1]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 (DOUGH)
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Table 4. Characterization of orchardgrass varieties and their performance across years and locations.
1993 Kentucky Orchardgrass Variety Tests
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Variety	Source/KY Distributor	Lexington 1992[1] 93[2]	Princeton 1992 93
89-103	Green Seed	*	*
90132	International Seeds/Experimental	*	*
Benchmark	FFR/Southern States	**	*
Boone	KY Agric. Exp. Sta./Public		*
CIS-28	Cascade International Seeds/Experimental		
CIS-EG1	Cascade International Seeds/Experimental	*	
CIS-LG4	Cascade International Seeds/Experimental		
Condor	Olsen-Fennell Seed	*	*
D58	Research Seeds, Inc.		
Dawn	Research Seeds, Inc.		*
Elsie	Turf Seed/Geo. W. Hill, Bunton Seed		*
HHR-2	International Seeds/Experimental		*
KYEXP1	KY Agric. Exp. Sta./Experimental	*	*
KYEXP2	KY Agric. Exp. Sta./Experimental	*	*
KYEXP3	KY Agric. Exp. Sta./Experimental	*	*
Latar	Oregon Orchardgrass Commission/Public	*	*
Paiute	Oregon Orchardgrass Commission/Public		
Potomac	USDA/Public	*	
Shawnee	Turf Seed/Geo. W. Hill, Bunton Seed		*
Shiloh	Green Seed	*	*
TN-OG-SYN-2	TN Agric. Exp. Sta./Experimental	*	*
Warrior	Olsen-Fennell Seed	*	**

[1] Establishment year

[2] Harvest year

**Highest numerical yield in the test for that year.

*Not significantly different from the highest numerical yield in the test for that year.

Table 5. University of Kentucky agricultural extension publications related to orchardgrass management

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