



2001 Annual and Perennial Ryegrass Report

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Introduction

Annual ryegrass (*Lolium multiflorum*) and perennial ryegrass (*Lolium perenne*) are high-quality, productive cool-season grasses used in Kentucky. Both have exceptionally high seedling vigor and are highly palatable to livestock.

Annual ryegrasses are increasing in use across Kentucky as more winter-hardy varieties are released and promoted. Annual ryegrass is used primarily for extra fall, winter, and early spring pasture. Winter growth occurs only during mild winters.

Perennial ryegrass can be used as a short-lived hay or pasture plant and has growth characteristics similar to tall fescue.

This report provides current yield data on annual and perennial ryegrass varieties in trials in Kentucky as well as guidelines for selecting varieties.

Important Considerations in Selecting a Ryegrass Variety

Local Adaptation and Seasonal Yield. The variety should be adapted to Kentucky as indicated by good winter survival and good performance across years and locations in replicated yield trials such as those presented in this publication. Choose high-yielding varieties, but choose varieties that are productive during the desired season of use.

Annual ryegrass, also called Italian ryegrass, is planted in the fall and makes most of its growth from late February through June. In years when fall temperatures remain mild and ryegrass is planted in early September, there can also be substantial forage in October and November. Varieties differ in winter hardiness, but this trait is undefined for many of the varieties in this trial. The winter of 1999-2000 was mild, and no varieties in this trial suffered winterkill. These results are no guarantee of future winter productivity or survival.

Perennial ryegrass is more winter-hardy and persistent than annual ryegrass (two- to three-year stand life) but less so than other cool-season grasses like tall fescue or orchardgrass. Hot, dry summers stress perennial ryegrass more than cold winters.

Seed Quality. Buy high-quality seed that is high in germination and purity and free from weed seed. Buy certified seed or proprietary varieties of 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 previous nine months, the level of germination, and a listing of other crop and weed seed. Order seed well in advance of planting time to assure that it will be available when needed.

Important: When seeding perennial ryegrasses for horse pasture (of any kind), insist on an endophyte-free variety of perennial ryegrass. Most forage types of perennial ryegrass are endophyte free, and most new turf types are infected. This endophyte is similar to the endophyte of tall fescue (which affects pregnant mares) but is different in its effect on horses. All horses grazing endophyte-infected perennial ryegrass may develop a neurological condition known as *ryegrass staggers*.

Description of the Tests

Data from six studies are reported. An annual and a perennial ryegrass study were sown at Lexington in 1999. In the fall of 2000 an annual and perennial ryegrass test was established at both Bowling Green and Princeton. The soils at Lexington, Bowling Green, and Princeton are well-drained silt loams (Maury, Pembroke, and Crider, respectively) and are well suited for ryegrass production.

Seedings were made at the rate of 20 lb/A into a prepared seedbed with a disk drill. Plots were 5 ft x 15 ft in a randomized complete block design with four replications. Nitrogen was topdressed at 60 lb/A of actual N in March and after each additional cutting. The tests were harvested using a sickle-type forage plot harvester. The first cutting was harvested at each location when all ryegrass varieties had reached at least the boot stage. Fresh weight samples were taken at each harvest to calculate dry matter production. Management practices for these tests regarding establishment, fertility, weed control, and harvest timing were in accordance with University of Kentucky recommendations.

Results and Discussion

Weather data for Lexington, Bowling Green, and Princeton are presented in Table 1. In general, temperature and moisture in 2001 were closer to normal than in recent years.

Ratings for maturity and dry matter yields (tons/acre) are reported in Tables 2 through 7. Yields are given by cutting date and as total annual production. Varieties are listed by total yield in descending order. Experimental varieties are listed separately at the bottom of the tables and are not available commercially.

Annual ryegrass varieties were extremely productive during the spring and summer of 2000. In most years, annual ryegrass can be expected to die or become unproductive after mid-June. Some varieties in the 1999 Lexington test of annual ryegrass continued to grow into 2001 (Table 2). It is uncertain how frequently this will occur.

The perennial ryegrass test contained two festuloliums (Spring Green and Duo) that are hybrids of tall fescue and ryegrass, having some of the characteristics of both. Unlike annual ryegrasses, perennials should be productive under Kentucky conditions for two or more growing seasons. Perennial ryegrass stands declined significantly in late summer of 2001 for the 1999 and 2000 seedings (Tables 5, 6, and 7). The exact cause is unknown.

Statistical analyses were performed on all data (including experimentals) to determine if the apparent differences are truly

due to varietal differences or just due to chance. In the tables, varieties not significantly different from the top variety in the column for that characteristic 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) is a measure of the variability of the data and is included for each column of means. Low variability is desirable, and increased variability within a study results in higher CVs and larger LSDs.

Tables 8 and 9 summarize information about distributors and yield performance for all varieties currently included in tests discussed in this report. Varieties are listed in alphabetical order by species, with the experimental varieties at the bottom. Remember that experimental varieties are not available for farm use, while commercial varieties can be purchased from agricultural distributors. In Tables 8 and 9, a single asterisk (*) means that the variety was not significantly different from the top variety. It is best to choose a variety that has performed well over several years and locations. Remember to consider the relative spring maturity and the distribution of yield across the growing season when evaluating productivity of ryegrass varieties (Tables 2 through 7).

Table 1. Temperature and rainfall at Bowling Green, Lexington, and Princeton, Kentucky in 2001.

	Bowling Green				Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
MON	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	33	-1	1.8	-2.1	31	0	0.9	-1.9	35	+1	1.6	-2.3
FEB	43	+5	4.4	+0.3	40	+5	3.2	0	44	+6	5.0	+0.5
MAR	43	-3	2.9	-2.2	40	-4	2.7	-1.7	44	-3	2.8	-2.1
APR	62	+5	2.3	-2.1	59	+4	1.7	-2.2	64	+5	2.2	-2.6
MAY	69	+3	4.3	-0.6	66	+2	4.9	+0.4	69	+2	2.5	-2.5
JUN	73	-2	4.4	+0.3	71	-1	2.0	-1.6	74	-1	4.8	+1.0
JUL	79	+1	3.7	-1.1	75	-1	5.6	+0.6	80	+2	5.5	+1.2
AUG	77	0	6.0	+2.5	76	+1	4.8	+0.8	79	+2	4.0	-0.1
SEP	68	-2	2.1	-1.7	65	-3	3.0	-0.2	69	-2	3.5	+0.2
OCT	57	-1	4.3	+1.3	56	-1	3.6	+1.1	61	+2	7.5	+4.4

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

Table 2. Dry matter yields (tons/acre) and maturity ratings for annual ryegrass varieties sown 28 September 1999 at Lexington, Kentucky.

Variety	Maturity ¹ May 22, 2000	Total ² 2000	Total ³ 2001	2-yr Total
Commercial varieties – available for farm use				
Zorro	57.3	6.38	0.96	7.33*
Hercules	57.3	6.43	0.55	6.98*
Avance	55.3	6.26	0.51	6.77
Andy	58.0	5.94	0.30	6.24
Marshall	56.0	5.45	0.43	5.88
Rio	62.5	5.48	0.34	5.82
Big Daddy	60.3	5.43	0.26	5.69
Fantastic	64.5	5.31	0.37	5.68
Spark	59.0		0.21	5.58
Experimental varieties – not available for farm use				
BAR-GS	60.0	5.99	0.86	6.86*
Floralina	62.8	5.44	0.37	5.81
Mean	59.3	5.77	0.47	6.24
CV, %	1.79	6.65	29	5.53
LSD, 0.05	1.53	0.55	0.2	0.5

* 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 shedding.
² Includes one harvest from Fall 1999.
³ Total yield in 2001 was from one harvest taken May 2.

Summary

Selecting a good variety of annual or perennial ryegrass 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.

Table 3. Dry matter yields (tons/acre) and maturity ratings for annual ryegrass varieties sown 22 September 2000 at Bowling Green, Kentucky.

Variety	2001 Harvests				Total 2001
	Apr 6	Apr 27	Jun 11	Jul 24	
Commercial varieties – available for farm use					
Zorro	1.18	1.46	0.82	0.41	3.46*
Marshall	1.32	1.46	0.56	0.05	3.34*
Big Daddy	1.19	1.29	0.58	0.04	3.05
Rio	1.21	1.33	0.45	0.06	3.00
Fantastic	1.35	1.07	0.42	0.03	2.85
Common	1.15	1.20	0.44	0.02	2.79
Gulf	1.10	1.01	0.43	0.03	2.53
Spark	1.01	0.90	0.52	0.10	2.43
Experimental varieties – not available for farm use					
Floralina	1.27	1.35	0.43	0.04	3.05
CIS Florida 4N	1.07	1.26	0.57	0.07	2.89
Mean	1.18	1.23	0.52	0.09	3.02
CV, %	13.4	7.37	21.9	67.22	8.95
LSD, 0.05	0.23	0.13	0.17	0.08	0.39

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

Table 4. Dry matter yields (tons/acre) and maturity ratings for annual ryegrass varieties sown 21 September 2000 at Princeton, Kentucky.

Variety	2001 Harvests				2001 Total
	Apr 5	Apr 26	Jun 12	Jul 17	
Commercial varieties – available for farm use					
Zorro	1.34	1.81	1.03	0.49	4.66*
Hercules	1.05	1.51	0.81	0.42	3.80
Avance	1.03	1.50	0.83	0.40	3.76
Marshall	1.15	1.84	0.48	0.04	3.52
Rio	1.29	1.63	0.51	0.02	3.45
Andy	0.88	1.37	0.84	0.33	3.42
Big Daddy	0.93	1.54	0.60	0.03	3.10
Fantastic	1.31	1.36	0.38	0.05	3.09
Common	1.07	1.41	0.42	0.03	2.93
Gulf	0.91	1.44	0.42	0.01	2.79
Experimental varieties – not available for farm use					
CIS Florida	0.66	1.53	0.58	0.05	2.82
Mean	1.06	1.54	0.63	0.17	3.39
CV, %	10.47	7.38	13.5	37.94	6.83
LSD, 0.05	0.16	0.16	0.12	0.09	0.33

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

Table 5. Dry matter yields (tons/acre) and maturity ratings of perennial ryegrass and festulolium (FL) varieties sown on 28 September 1999 at Lexington, Kentucky.

Variety	2001 Harvests						Percent Stand Nov 13, 2001	Total 2001
	May 1	May 23	Jun 21	Jul 31	Aug 4	Oct 18		
Commercial varieties – available for farm use								
Springgreen (FL)	1.49	0.97	1.51	0.36	0.98	0.38	74	5.68*
Boxer	0.85	1.54	1.35	0.47	0.87	0.49	68	5.57*
Citadel	0.92	0.92	1.65	0.25	0.74	0.29	63	4.77
Anaconda	0.98	0.79	1.33	0.36	0.80	0.43	76	4.68
Amazon	0.88	0.83	1.45	0.26	0.59	0.42	83	4.43
Polly II	0.22	1.16	1.13	0.47	0.24	0.20	8	3.42
Linn	1.65	0.29	0.73	0.18	0.39	0.12	9	3.36
Yatsyn	0.14	0.86	0.72	0.26	0.59	0.43	51	2.99
Sampson	0.13	0.58	0.69	0.27	0.61	0.30	35	2.58
Experimental varieties – not available for farm use								
BAR TP	0.84	0.76	1.61	0.29	0.70	0.34	69	4.54
BAR 934	0.63	0.77	1.65	0.20	0.49	0.33	55	4.07
BAR 914	1.11	0.43	1.20	0.15	0.35	0.42	55	3.67
ITP 94	0.61	1.21	0.92	0.00	0.00	0.00	0	2.75
Mean	0.8	0.85	1.23	0.27	0.57	0.32	50	4.04
CV, %	17.19	18.39	12.16	26.08	28.31	34.62	23	12.15
LSD, 0.05	0.2	0.23	0.21	0.1	0.23	0.16	16	0.70

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

Table 6. Dry matter yields (tons/acre) and maturity ratings of perennial ryegrass and festulolium (FL) varieties sown on 22 September 2000 at Bowling Green, Kentucky.							
Variety	2001 Harvests					Percent stand Nov 13, 2001	Total 2001
	Apr 6	Apr 27	Jun 11	Jul 24	Aug 23		
Commercial varieties – available for farm use							
Polly II	1.28	1.46	1.46	0.64	0.57	45	5.41*
Bestfor	1.16	1.49	1.34	0.58	0.49	28	5.05*
Duo (FL)	0.70	1.72	1.46	0.16	0.85	73	4.88*
Bandit	0.90	1.53	1.32	0.20	0.86	55	4.82*
Anaconda	0.82	1.40	1.04	0.32	0.91	80	4.49*
Springgreen (FL)	0.66	1.42	1.41	0.32	0.66	43	4.47*
Citadel	0.63	1.41	1.41	0.17	0.76	60	4.39*
Mara	0.56	1.27	0.95	0.11	0.48	49	3.38
Linn	0.58	1.42	0.56	0.09	0.22	59	2.87
Derby	0.51	1.04	0.90	0.09	0.28	73	2.81
Mean	0.78	1.42	1.19	0.27	0.61	56	4.26
CV, %	19.36	10.28	31.48	34.94	42.49	42	16.78
LSD, 0.05	0.22	0.21	0.54	0.14	0.37	34	1.04
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.							

Table 7. Dry matter yields (tons/acre) and maturity ratings of perennial ryegrass and festulolium (FL) varieties sown on 21 September 2000 at Princeton, Kentucky.								
Variety	2001 Harvests						Percent stand Oct 30, 2001	2001 Total
	May 5	May 26	Jun 12	Jul 17	Aug 22	Oct 22		
Commercial varieties – available for farm use								
Bestfor	1.74	2.46	1.96	0.33	0.24	0.10	5	6.83 *
Polly II	1.63	2.40	1.88	0.31	0.25	0.06	4	6.53 *
Boxer	1.50	2.30	1.91	0.09	0.24	0.21	45	6.25 *
Duo (FL)	1.39	2.53	1.80	0.09	0.21	0.22	54	6.25 *
Springgreen (FL)	1.34	2.46	1.86	0.13	0.22	0.18	39	6.18 *
Anaconda	1.22	2.51	1.64	0.09	0.27	0.40	88	6.12
Bandit	1.38	2.52	1.70	0.11	0.23	0.17	45	6.12
Citadel	1.26	2.22	1.79	0.07	0.23	0.24	51	5.82
Yatsyn	1.51	2.30	1.14	0.08	0.13	0.27	73	5.42
Linn	1.31	2.55	0.99	0.08	0.13	0.14	41	5.20
Mean	1.43	2.42	1.67	0.14	0.22	0.20	44	6.07
CV, %	10.68	11.18	11.81	35.67	24.87	37.69	53	7.48
LSD, 0.05	0.22	0.39	0.29	0.07	0.08	0.11	34	0.66
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.								

		Lexington		Bowling Green	Princeton
		1999 ¹		2000	2000
Variety	Proprietor/KY Distributor	2000 ²	2001	2001	2001
Commercial varieties – available for farm use					
Andy	DLF-Trifolium				
Avance	DLF-Trifolium				
Big Daddy	FFR/Southern States Cooperative				
Common	Public				
Fantastic	Ampac Seed Company/Bunton Seed				
Gulf					
Hercules	Barenbrug USA		*		
Marshall	public			*	
Rio					
Spark	DLF-Trifolium				
Zorro	DLF-Trifolium	*	*	*	*
Experimental varieties – not available for farm use					
BAR-GS	Barenbrug USA		*		
CIS Florida 4N	Cebeco International Seeds				
Florlina	Proseeds Marketing, Inc.				
* Highest yielding variety in the test. ¹ Establishment year. ² Harvest year.					

		Lexington		Bowling Green	Princeton
		1999 ¹		2000	2000
Variety	Proprietor/KY Distributor	2000 ²	2001	2001	2001
Commercial varieties – available for farm use					
Amazon	AgriBioTech	*			
Anaconda	Landmark Seed Co./Caudill Seed	*		*	
Bandit	Grassland West Company			*	
Bestfor	Improved Forages			*	*
Boxer	AgriBioTech	*	*		*
Citadel	Ag Canada			*	
Derby	Public				
Duo (FL)	Ampac Seed Company			*	*
Linn	Public				
Mara					
Polly II	FFR/Southern States Cooperative	*		*	*
Sampson	International Seeds, Inc./Caudill Seed				
Spring Green (FL)	Turf-Seed, Inc./Bunton Seed Co.	*	*	*	*
Yatsyn	Barenbrug USA				
Experimental varieties – not available for farm use					
BAR TP	Barenbrug USA				
BAR 914	Barenbrug USA				
BAR 934	Barenbrug USA				
ITP 94	Landmark Seed Co.				
* Not significantly different from the highest yielding variety in the test. ¹ Establishment year. ² Harvest year.					

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