

2002 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 2001-2002 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 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. The endophyte level will be stated on a green tag on every bag of seed. 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*. In addition, infected perennial ryegrass may also produce ergot-type alkaloids like those in infected tall fescue.

Description of the Tests

Data from five studies are reported. In the fall of 2000 and 2001, an annual ryegrass test was established at Bowling Green and Lexington, respectively. A perennial ryegrass test was established in the fall of 2000 (Bowling Green and Princeton) and in the fall of 2001 (Lexington). 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 2002 in Lexington, Bowling Green, and Princeton are presented in Table 1. After a wet spring, Kentucky experienced the fourth hottest and driest summer on record.

Ratings for maturity and dry matter yields (tons/acre) are reported in Tables 2 through 6. Yields are given by cutting date and as total annual production. Varieties are listed by total yield in descending order. Experimental varieties, listed separately at the bottom of the tables, are not available commercially.

Some annual ryegrass varieties planted in 2000 at Bowling Green continued to grow into 2002 (Table 2). They were rated for percent stand but not harvested for yield since weeds had invaded the weak stands. In most years, annual ryegrasses can

be expected to die or become unproductive after mid-June in their first summer.

Several varieties in the new planting of annual ryegrass (Lexington) were extremely productive during the wet spring of 2002.

The perennial ryegrass tests contained several festuloliums that are hybrids of meadow fescue and perennial ryegrass, having some of the characteristics of both. Unlike annual ryegrasses, perennials should be productive under Kentucky conditions for two or more growing seasons.

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 7 and 8 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 7 and 8, 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 6).

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 1. Temperature and rainfall at Bowling Green, Lexington, and Princeton, Kentucky, in 2002.

	Bowling Green				Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	40	+6	3.70	-0.12	38	+7	2.12	-0.74	41	+7	3.79	-0.01
FEB	39	+1	0.91	-3.22	38	+3	1.28	-1.93	42	+4	2.40	-2.03
MAR	47	+1	7.60	+2.50	45	+1	7.93	+3.53	49	+2	8.18	+3.24
APR	60	+3	7.30	+2.98	58	+3	4.19	+0.31	63	+4	5.72	+0.92
MAY	64	-2	5.56	+0.62	61	-3	4.36	-0.11	66	-1	9.04	+4.08
JUN	76	+1	1.20	-2.97	74	+2	2.45	-1.21	77	+2	1.88	-1.97
JUL	80	+2	3.57	-1.17	78	+2	1.10	-3.90	81	+3	2.13	-2.16
AUG	80	+3	5.10	+1.59	77	+2	0.95	-2.98	80	+3	2.06	-1.95
SEP	75	+5	9.46	+5.74	72	+4	4.90	+1.70	74	+3	5.90	+2.57
OCT	62	+4	5.24	+2.22	55	-2	5.61	+3.04	59	0	6.12	+3.07
NOV	48	+2	5.00	+0.57	43	-2	3.76	+0.37	47	0	2.49	-2.14
AVG	61	+2.3	4.97	+0.80	58.1	+1.6	3.51	-0.18	61.7	+2.5	4.52	+0.33

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 September 22, 2000, at Bowling Green, Kentucky.

Variety	Type	2001 Harvests				Total 2001	% Stand May 27, 2002
		Apr 6	Apr 27	Jun 11	Jul 24		
Commercial Varieties — Available for Farm Use							
Zorro	tetraploid	1.18	1.46	0.82	0.41	3.46*	59*
Marshall	tetraploid	1.32	1.46	0.56	0.05	3.34*	38
Big Daddy	tetraploid	1.19	1.29	0.58	0.04	3.05	10
Rio	tetraploid	1.21	1.33	0.45	0.06	3.00	13
Fantastic	diploid	1.35	1.07	0.42	0.03	2.85	6
Common	diploid	1.15	1.20	0.44	0.02	2.79	4
Gulf	diploid	1.10	1.01	0.43	0.03	2.53	2
Spark	tetraploid	1.01	0.90	0.52	0.10	2.43	20
Experimental Varieties — Not Available for Farm Use							
Florlina	diploid	1.27	1.35	0.43	0.04	3.05	5
CIS Florida 4N	tetraploid	1.07	1.26	0.57	0.07	2.89	13
Mean		1.18	1.23	0.52	0.09	3.02	17
CV, %		13.4	7.37	21.9	67.22	8.95	57.13
LSD, 0.05		0.23	0.13	0.17	0.08	0.39	13.95

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

Table 3. Dry matter yields (tons/acre) of annual ryegrass varieties planted September 7, 2001, at Lexington, Kentucky.

Variety	Type	Seedling Vigor ¹ Nov 2, 2001	Harvest Nov 23, 2001	Maturity ² May 1, 2002	2002 Harvests			Total 2002	2-Yr Total
					May 1	Jun 4	Jul 17		
Commercial Varieties — Available for Farm Use									
Zorro	tetraploid	4	0.95	47	2.29	2.42	0.77	5.48	6.43*
Jeanne	tetraploid	5	1.10	47	2.17	2.31	0.70	5.19	6.29*
Aurelia	tetraploid	5	1.16	43	1.86	2.32	0.72	4.90	6.06*
Andy	tetraploid	4	1.11	44	1.72	2.03	0.44	4.19	5.30
Feast II	tetraploid	4	1.13	42	1.38	1.79	0.68	3.85	4.98
King	diploid	4	0.97	55	1.83	1.69	0.17	3.69	4.66
Feast	tetraploid	4	0.73	44	1.37	1.92	0.54	3.83	4.56
Winterstar	tetraploid	4	0.87	48	1.25	1.78	0.50	3.54	4.41
Big Daddy	tetraploid	4	1.17	55	1.35	1.63	0.19	3.17	4.35
Gulf	diploid	3	0.65	55	1.44	1.48	0.08	3.01	3.65
Experimental Varieties — Not Available for Farm Use									
Monarque	tetraploid	4	1.02	45	1.87	2.00	0.53	4.40	5.43
Mean		4	0.99	48	1.69	1.94	0.49	4.11	5.10
CV, %		23.53	48.99	8.93	12.42	8.27	21.05	6.01	9.84
LSD, 0.05		1.31	0.7	6.14	0.3	0.23	0.15	0.36	0.73

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

¹ Based on 0 to 5 scale with 5 being the most vigorous.

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 shedding.

Table 4. Dry matter yield (tons/acre) and maturity ratings of perennial ryegrass and festulolium (FL) varieties sown on September 22, 2000, at Bowling Green, Kentucky.

Variety	Type	Total 2001	Maturity ¹ May 27, 2002	2002 Harvests		Total 2002	2-Yr Total
				May 27	Jun 21		
Commercial Varieties — Available for Farm Use							
Polly II	tetraploid	5.41	65	2.66	0.31	2.97	8.39*
Bestfor	tetraploid	5.05	66	2.67	0.33	3.00	8.06*
Duo (FL)	tetraploid	4.88	63	2.78	0.12	2.9	7.78*
Bandit	tetraploid	4.82	62	2.77	0.09	2.86	7.69*
Spring Green (FL)		4.47	62	2.72	0.19	2.91	7.38*
Anaconda	tetraploid	4.49	66	2.31	0.13	2.43	6.92*
Citadel	tetraploid	4.39	57	2.38	0.13	2.51	6.91
Mara	diploid	3.38	55	2.22	0.16	2.38	5.75
Linn	diploid	2.87	65	2.14	0.14	2.28	5.15
Derby	diploid	2.81	64	2.07	0.07	2.13	4.95
Mean		4.26	62	2.47	0.17	2.64	6.9
CV, %		16.78	3.06	14.86	25.11	13.5	14.8
LSD, 0.05		1.04	2.76	0.53	0.06	0.52	1.48

* 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.

Table 5. Dry matter yields (tons/acre) and maturity ratings of perennial ryegrass and festulolium (FL) varieties sown on September 21, 2000, at Princeton, Kentucky.

Variety	Type	Total 2001	Maturity ¹ May 30, 2002	2002 Harvest		Total 2002	2-Yr Total
				May 30	Jul 8		
Commercial Varieties — Available for Farm Use							
Bestfor	tetraploid	6.83	70	2.87	0.89	3.76	10.59*
Polly II	tetraploid	6.53	68	2.97	0.78	3.76	10.29*
Boxer	tetraploid	6.25	69	3.33	0.33	3.67	9.92*
Bandit	tetraploid	6.12	67	3.39	0.38	3.77	9.89*
Spring Green (FL)		6.18	67	3.17	0.40	3.57	9.75*
Duo (FL)	tetraploid	6.25	68	3.23	0.22	3.45	9.70*
Anaconda	tetraploid	6.12	74	2.42	0.30	2.72	8.84
Citadel	tetraploid	5.82	66	2.70	0.24	2.95	8.77
Yatsyn	diploid	5.42	70	2.61	0.27	2.88	8.30
Linn	diploid	5.20	68	2.60	0.29	2.89	8.09
Mean		6.07	69	2.93	0.41	3.34	9.41
CV, %		7.48	3.42	12.04	37.36	13.24	6.78
LSD, 0.05		0.66	3.40	0.51	0.22	0.64	0.93

* Not significantly different from the highest 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.

Table 6. Dry matter yields (tons/acre) of perennial ryegrass and festulolium (FL) varieties sown September 7, 2001, at Lexington, Kentucky.

Variety	Type	Seedling Vigor ¹ Nov 2, 2001	2002 Harvests				Total 2002
			Apr 26	Jun 4	Jul 17	Nov 8	
Commercial Varieties — Available for Farm Use							
Barfest (FL)		3	2.18	2.73	0.67	1.04	5.57*
Grand Daddy	tetraploid	3	1.80	2.53	0.83	1.02	5.17*
Lasso	diploid	2	0.96	2.49	0.69	0.84	4.14
CAS-MP 64	diploid	4	1.50	1.94	0.64	0.76	4.08
Linn	diploid	4	1.74	1.78	0.55	0.82	4.07
Quartet	tetraploid	3	0.92	2.23	0.82	0.90	3.97
Aries	diploid	4	1.18	2.12	0.65	0.69	3.95
Maverick Gold	diploid	5	0.81	2.10	0.46	0.11	3.37
Experimental Varieties — Not Available for Farm Use							
CAS-EP66	diploid	3	1.84	1.75	0.60	0.90	4.20
PP 11	blend	5	0.79	2.28	0.64	0.40	3.71
Mean		4	1.37	2.20	0.66	0.75	4.22
CV,%		15.21	24.19	11.36	23.12	12.51	10.91
LSD, 0.05		0.80	0.48	0.36	0.22	0.14	0.67

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

¹ Based on 0 to 5 scale with 5 being the most vigorous.

Table 7. Performance of annual ryegrass varieties across years and locations.

Variety	Proprietor/KY Distributor	Bowling Green		Lexington
		2000 ¹		2001
		2001 ²	2002	2002
Commercial Varieties — Available for Farm Use				
Andy	DLF-Jenks			
Aurelia	Forage Genetics International			*
Big Daddy	Smith Seed Services/FFR/Southern States Cooperative			
Common	Public			
Fantastic	Ampac Seed Company/Bunton Seed			
Feast	Ampac Seed Company			
Feast II	Ampac Seed Company			
Gulf	public			
Jeanne	DLF-Jenks			*
King	Lewis Seed Company			
Marshall	The Wax Company	*		
Rio				
Spark	DLF-Jenks			
Winterstar	Ampac Seed Company			
Zorro	DLF-Jenks	*	* ³	*
Experimental Varieties — Not Available for Farm Use				
CIS Florida 4N	Cebeco International Seeds			
Florlina	Proseeds Marketing, Inc.			
Monarque	Forage Genetics International			

* Highest yielding variety in the test.

¹ Establishment year.

² Harvest year.

³ Represents top variety in percent stand. No harvests were taken in 2002 due to weed invasion.

Table 8. Performance of perennial ryegrass and festulolium (FL) varieties across years and locations.

Variety	Proprietor/KY Distributor	Bowling Green		Princeton		Lexington
		2000 ¹		2000		2001
		2001 ²	2002	2001	2002	2002
Commercial Varieties — Available for Farm Use						
Anaconda	Landmark Seed Co./Caudill Seed	*	*			
Aries	Ampac Seed Company					
Bandit	Grassland West Company	*	*		*	
Barfest (FL)	Barenbrug USA					*
Bestfor	Improved Forages	*	*	*	*	
Boxer	AgriBioTech			*	*	
CAS-MP64	Cascade International Seed					
Citadel	Ag Canada	*				
Derby	Public					
Duo (FL)	Ampac Seed Company	*	*	*	*	
Grand Daddy	Smith Seed Services					*
Lasso	DLF-Jenks					
Linn	Public					
Mara	Barenbrug USA					
Maverick Gold	Ampac Seed Company					
Polly II	FFR/Southern States Cooperative	*	*	*	*	
Quartet	Ampac Seed Company					
Spring Green (FL)	Turf-Seed, Inc./Bunton Seed Co.	*	*	*	*	
Yatsyn	Barenbrug USA					
Experimental Varieties — Not Available for Farm Use						
CAS-EP66	Lewis Seed Company					
PP 11	Ampac Seed Company					

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

1 Establishment year.

2 Harvest year.

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