

# 2003 Annual and Perennial Ryegrass Report

R.F. Spitaleri, M. Collins, G.D. Lacefield, and P.B. Burris

## 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.

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 such as tall fescue and 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 af-

fects 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 such as those in infected tall fescue.

## Description of the Tests

Data from three studies are reported. In the fall of 2002, an annual ryegrass test was established at Princeton. A perennial ryegrass test was established in the fall of 2001 at Lexington and in 2002 at Princeton. The soils at Lexington and Princeton are well-drained silt loams (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 by 15 feet 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 2003 in Lexington and Princeton are presented in Table 1.

Ratings for maturity and dry matter yields (tons/acre) are reported in Tables 2 through 4. 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.

In most years, annual ryegrasses can be expected to die or become unproductive after mid-June in their first summer.

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 5 and 6 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 agri-

cultural distributors. In Tables 5 and 6, 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 4).

## 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.

	Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	26	-5	0.96	-1.90	31	-3	2.19	-1.61
FEB	32	-3	3.59	+0.38	35	-3	7.45	+3.02
MAR	47	+3	2.09	-2.31	50	+3	2.46	-2.48
APR	57	+2	3.14	-0.74	60	+1	6.99	+2.19
MAY	63	-1	6.68	+2.21	67	0	4.81	-0.15
JUN	69	-3	4.85	+1.19	71	-4	5.05	+1.20
JUL	74	-2	2.68	-2.32	79	+1	4.75	+0.46
AUG	75	0	5.26	+1.33	79	+2	2.05	-1.96
SEP	65	-3	4.22	+1.02	69	-2	6.17	+2.84
OCT	56	-1	1.61	-0.96	60	+1	3.73	+0.68
NOV	50	+5	4.63	+1.24	53	+6	5.85	+1.22
<b>Total</b>			<b>39.71</b>	<b>-0.86</b>			<b>51.50</b>	<b>+5.41</b>

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

**Table 2. Dry matter yields (tons/acre) of annual ryegrass varieties sown September 25, 2002, at Princeton, Kentucky.**

Variety	Seedling Vigor <sup>1</sup>	April 14, 2003	Maturity <sup>2</sup> May 16, 2003	May 16, 2003	Maturity Jun 18, 2003	June 18, 2003	July 30, 2003	Total 2003
<b>Commercial Varieties—Available for Farm Use</b>								
Zorro	5	1.88	53	2.12	62	2.28	0.41	6.70*
Feast II	5	1.56	51	2.30	55	2.10	0.39	6.35*
Domino	5	1.61	54	2.05	62	2.14	0.42	6.23*
Barextra	5	1.52	54	1.99	63	2.13	0.41	6.05
Passerel Plus	5	1.74	60	2.07	62	1.26	0.09	5.16
Marshall	5	1.94	58	1.81	62	1.19	0.07	5.01
Rio	5	1.89	60	1.95	63	1.06	0.07	4.98
Winter Star	5	1.43	58	1.84	63	1.42	0.26	4.94
Jackson	5	1.86	60	1.72	65	0.88	0.04	4.50
Tam 90	4	1.74	62	1.75	65	0.85	0.05	4.39
Big Daddy	5	1.68	63	1.91	65	0.72	0.07	4.38
Common	5	1.60	58	1.61	63	1.09	0.06	4.37
Gulf	5	1.74	64	1.57	66	0.60	0.03	3.95
<b>Experimental Varieties</b>								
NEX2002(2000)(NEW2)	4	1.89	60	1.92	63	0.98	0.06	4.84
WMN 97	4	2.01	59	1.81	63	0.92	0.07	4.81
ME-94	5	2.07	60	1.75	63	0.91	0.03	4.76
LM9929D	4	1.52	51	1.66	57	1.39	0.19	4.76
FLORLINA	4	1.81	59	1.88	64	0.80	0.08	4.56
FLX2001(NEW1)4XLR	5	1.78	57	1.81	64	0.88	0.08	4.55
FLX2002(LA3)LRCT	4	1.90	60	1.65	64	0.91	0.07	4.53
LM2000E	2	1.42	53	1.70	35	1.11	0.26	4.50
FL/NEX2002(NEW2)LR	4	1.84	59	1.69	64	0.86	0.06	4.45
FLX2002(DRU)LRCT	4	1.85	59	1.69	64	0.81	0.03	4.39
KYLM 9801	5	1.67	63	1.56	65	0.61	0.05	3.89
Mean	4.39	1.75	58	1.83	62	1.16	0.14	4.88
CV, %	9.89	9.75	4	10.22	2	16.41	23.43	7.33
LSD, 0.05	0.61	0.24	3	0.26	1	0.27	0.05	0.50

\* Not significantly different from the highest number in the column, based on the 0.05 LSD.

<sup>1</sup> Seedling vigor score is based on a scale of 1 to 5 with 5 being the most vigorous growth.

<sup>2</sup> Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence, 58=complete emergence of inflorescence, 62=beginning of pollen shed.

<b>Table 3. Dry matter yields (tons/acre) of perennial ryegrass and festulolium (FL) varieties sown September 7, 2001, at Lexington, Kentucky.</b>								
Variety	Type	Total 2002	April 22, 2003	Maturity <sup>1</sup> Jun 6, 2003	June 6, 2003	September 15, 2003	Total 2003	2-yr Total
<b>Commercial Varieties—Available for Farm Use</b>								
Barfest (FL)	festulolium	5.57	1.89	60	2.08	1.01	4.97	10.54*
Grand Daddy	tetraploid	5.17	1.79	59	1.79	0.75	4.34	9.5
Lasso	diploid	4.14	1.57	53	1.65	0.59	3.81	7.95
Linn	diploid	4.07	2.28	56	1.2	0.39	3.87	7.94
Quartet	tetraploid	3.97	1.17	53	1.84	0.85	3.85	7.82
Maverick Gold	diploid	3.37	1.83	59	1.94	0.67	4.44	7.82
'CAS-MP64'	diploid	4.08	2.01	51	1.14	0.57	3.73	7.81
Aries	diploid	3.95	1.55	58	1.67	0.51	3.73	7.68
<b>Experimental Varieties</b>								
PP 11	blend	3.71	1.62	58	2.08	0.89	4.6	8.31
'CAS-EP66'	diploid	4.2	2.12	54	1.14	0.38	3.64	7.83
Mean		4.22	1.78	56.05	1.65	0.66	4.10	8.32
CV, %		10.91	13.76	4.65	11.95	23.56	9.21	7.32
LSD, 0.05		0.67	0.36	3.78	0.29	0.23	0.55	0.88
* Not significantly different from the highest value in the column, based on the 0.05 LSD.								
<sup>1</sup> Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence, 58=complete emergence of inflorescence, 62=beginning of pollen shed.								

<b>Table 4. Dry matter yields (tons/acre) of perennial ryegrass, festulolium (FL), and Kentucky bluegrass (KB) varieties sown September 25, 2002, at Princeton, Kentucky.</b>								
Variety	April 14, 2003	Maturity <sup>1</sup> May 16, 2003	May 16, 2003	Maturity Jun 18, 2003	June 18, 2003	July 30, 2003	September 24, 2003	Total 2003
<b>Commercial Varieties—Available for Farm Use</b>								
Quartet	1.50	30.00	2.02	40.25	1.71	0.61	2.83	8.66*
Grand Daddy	1.48	56.25	2.69	37.00	1.11	0.47	2.10	7.84*
Calibra	1.53	47.75	2.47	36.75	1.38	0.51	1.70	7.60*
Citadel	1.77	63.25	1.98	38.75	1.25	0.44	2.08	7.52
Bestfor	2.43	52.50	2.59	61.75	1.70	0.36	0.23	7.30
Amazon	2.24	52.75	2.31	62.25	1.69	0.47	0.25	6.96
Aires HD	1.35	59.75	2.28	36.00	1.12	0.41	1.28	6.43
Duo	1.54	54.00	2.27	50.00	1.32	0.43	0.68	6.23
Manhattan	0.99	58.75	2.27	28.50	0.83	0.28	1.38	5.74
Linn	1.52	58.50	1.79	33.25	0.97	0.32	0.75	5.36
Maverick Gold	1.77	49.50	1.63	51.75	1.26	0.41	0.03	5.10
<b>Experimental Varieties</b>								
EC 410	1.59	58.25	1.87	32.00	0.95	0.43	1.70	6.54
KYLP 9801	1.77	58.50	1.86	45.75	0.75	0.34	1.33	6.05
S-22	0.28	24.50	0.93	27.50	0.97	0.29	3.25	5.72
BARBERIA	1.87	63.75	1.02	40.00	1.19	0.49	0.58	5.15
VB 5649	0.34	25.50	1.07	27.50	1.00	0.26	1.63	4.30
Mean	1.50	51	1.94	41	1.20	0.41	1.36	6.41
CV, %	14.60	5	12.18	8	11.65	27.96	46.56	11.85
LSD, 0.05	0.31	3	0.34	5	0.20	0.16	0.90	1.08
* Not significantly different from the highest value in the column, based on the 0.05 LSD.								
<sup>1</sup> Maturity rating scale; 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed.								

<b>Table 5. Performance of annual ryegrass varieties across years and locations.</b>		
		<b>Princeton</b>
		<b>2002 <sup>1</sup></b>
<b>Variety</b>	<b>Proprietor/KY Distributor</b>	<b>2003 <sup>2</sup></b>
<b>Commercial Varieties—Available for Farm Use</b>		
Barextra	Barenbrug USA	
Big Daddy	Smith Seed Services/FFR/Southern States Cooperative	
Common	Public	
Domino	DLF—Jenks	*
Feast II	Ampac Seed Company	*
Gulf	public	
Jackson	The Wax Company	
Marshall	The Wax Company	
Passerel Plus	Pennington Seed, Inc.	
Rio		
Tam 90		
WinterStar	Ampac Seed Company	
Zorro	DLF—Jenks	*
<b>Experimental Varieties</b>		
Florlina	Proseeds Marketing, Inc.	
FLX2001(NEW1)4XLR	Pennington Seed, Inc.	
FLX2002(LA3)LRCT	Univ of Florida	
FL/NEX2002(NEW2)LR	Univ of Florida	
FLX2002(DRU)LRCT	Univ of Florida	
KYLM9801	Univ of Kentucky	
LM2000E	Pennington Seed, Inc.	
LM9929D	Pennington Seed, Inc.	
ME-94	The Wax Company	
NEX2002[2000(NEW2)	Univ of Florida	
WMN 97	The Wax Company	
* Highest yielding variety in the test.		
<sup>1</sup> Establishment year.		
<sup>2</sup> Harvest year.		

<b>Table 6. Performance of perennial ryegrass, festulolium (FL), and Kentucky bluegrass (KB) varieties across years and locations.</b>				
		<b>Lexington</b>		<b>Princeton</b>
		<b>2001 <sup>1</sup></b>		<b>2002</b>
<b>Variety</b>	<b>Proprietor/KY Distributor</b>	<b>2002 <sup>2</sup></b>	<b>2003</b>	<b>2003</b>
<b>Commercial Varieties—Available for Farm Use</b>				
Amazon				
Aries HD	Ampac Seed Company			
Barfest (FL)	Barenbrug USA	*	*	
Bestfor	Improved Forages			
'CAS-MP64'	Cascade International Seed			
Calibra	DLF-Jenks			
Citadel	Ag Canada			
Duo (FL)	Ampac Seed Company			
Grand Daddy	Smith Seed Services	*		
Lasso	DLF-Jenks			
Linn	Public			
Mara	Barenbrug USA			
Manhattan				
Maverick Gold	Ampac Seed Company		*	
Polly II	FFR/Southern States Cooperative			
Quartet	Ampac Seed Company			*
<b>Experimental Varieties</b>				
Barberia	Barenbrug USA			
'CAS-EP66'	Lewis Seed Company			
EC 410	Emerald Commodities, Inc.			
KYLP 9801	Univ of Kentucky			
PP 11	Ampac Seed Company		*	
S-22 (KB)	Barenbrug USA			
VB 5649 (KB)	Barenbrug USA			
* Not significantly different from the highest yielding variety in the test.				
<sup>1</sup> Establishment year.				
<sup>2</sup> Harvest year.				

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