

2006 Timothy and Kentucky Bluegrass Report

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Introduction

Timothy (*Phleum pratense*) is the fourth most widely sown cool-season perennial grass used in Kentucky for forage after tall fescue, orchardgrass, and Kentucky bluegrass. It is a late-maturing bunchgrass that can be used for grazing or wildlife habitat. Timothy is primarily harvested as hay, particularly for horses.

Management is similar to that for other cool-season grasses. Harvesting at the mid- to late-boot stage is needed to assure good yields and high-forage quality. The quality of timothy declines more rapidly after heading than other cool-season grasses. In Kentucky, timothy behaves like a short-lived perennial, with stands lasting two to four years.

Kentucky bluegrass (*Poa pratensis*) is a high-quality, highly palatable, long-lived pasture plant with limited use for hay. It tolerates close frequent grazing better than most grasses. It has low yields and low summer production and becomes dormant and brown during hot, dry summers. Kentucky bluegrass is slow to establish.

This report provides current maturity and yield data on timothy varieties included in yield trials in Kentucky as well as guidelines for selecting timothy varieties. New for 2006, Tables 8 and 9 show summaries of all timothy and Kentucky bluegrass varieties tested in Kentucky for the last six years. Go to the UK Forage Extension Web site at <www.uky.edu/Ag/Forage> to obtain electronic versions of all forage variety testing reports from Kentucky and surrounding states and from a large number of other forage publications.

Considerations in Selection

Local Adaptation and Seasonal Yield. Choose a variety that is adapted to Kentucky, as indicated by good performance across 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, whether for hay or grazing. Later maturity is desirable when timothy alone is to be grown for hay, while early maturity would help timothy grown in mixtures with legumes.

Seed Quality. Buy premium-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 such as those reported in this publication or others like it.

Description of the Test

Data from three studies are reported. Timothy varieties were sown at Lexington (2002) and Princeton (2004) and Kentucky bluegrass varieties were sown at Lexington (2004) as part of the University of Kentucky Forage Variety Testing Program. The soil at Lexington (Maury) and Princeton (Crider) are well-drained silt loams and are well suited for timothy and bluegrass production. Seedings were made at the rate of 6 lb/A for timothy and 15 lb/A for Kentucky bluegrass into a prepared seedbed with a disk drill. Plots were 5 by 15 feet, arranged in a randomized complete block design with four replications. Nitrogen was topdressed at 60 lb/A of actual N in March, May, and August. The test was harvested using a sickle-type forage plot harvester leaving a 3-inch stubble to simulate a hay management system. The first cutting was harvested when spring growth of most varieties had reached the mid- to late-boot stage. Subsequent harvests were taken when forage growth was adequate for harvest. Fresh weight samples were taken at each harvest to calculate dry matter production. Establishment, fertility, weed control, and harvest were managed according to University of Kentucky Cooperative Extension Service recommendations.

Results and Discussion

Weather data for Lexington and Princeton are presented in Tables 1 and 2.

Maturity ratings and dry matter yields are reported in Tables 3 through 5. Yields are given by harvest date and as total annual production. Stated yields are adjusted for percent weeds; therefore, value listed is for crop only. Varieties are listed by descending total production. Experimental varieties, listed separately at the bottom of the tables, are not available commercially.

Statistical analyses were performed on all data to determine if the apparent differences are truly due to varietal differences. Varieties not significantly different from the top variety in the column are marked with one asterisk (*). To determine if two varieties are significantly different, compare the difference between them to the Least Significant Difference (LSD) at the bottom of that column. If the difference is equal to or greater than the LSD, the varieties are significantly different when grown under those conditions. 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.

	2003				2004				2005				2006			
	Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	26	-5	0.96	-1.90	30	-1	3.14	+0.28	37	+6	4.35	+1.49	42	+11	4.77	+1.91
FEB	32	-3	3.59	+0.38	36	+1	1.32	-1.89	39	+4	1.68	-1.53	36	+1	2.13	-1.08
MAR	47	+3	2.09	-2.31	47	+3	3.43	-0.97	41	-3	2.79	-1.61	44	0	3.05	-1.35
APR	57	+2	3.14	-0.74	55	0	3.06	-0.82	56	+1	3.30	-0.58	59	+4	3.52	-0.36
MAY	63	-1	6.68	+2.21	68	+4	9.79	+5.32	61	-3	1.78	-2.69	62	-2	2.99	-1.48
JUN	69	-3	4.85	+1.19	72	0	3.13	-0.53	75	+3	1.33	-2.33	70	-2	1.82	-1.84
JUL	74	-2	2.68	-2.32	73	-3	7.65	+2.65	77	+1	3.30	-1.70	76	0	5.13	+0.13
AUG	75	0	5.26	+1.33	71	-4	2.91	-1.02	78	+3	3.34	-0.59	76	+1	3.23	-0.70
SEP	65	-3	4.22	+1.02	68	0	2.61	-0.59	72	+4	0.59	-2.21	64	-4	9.27	+6.07
OCT	56	-1	1.61	-0.96	58	+1	5.65	+3.08	58	+1	0.92	-1.65	54	-3	4.88	+2.31
NOV	50	+5	4.63	+1.24	49	+4	6.29	+2.90	47	+2	1.54	-1.85	47	+2	1.78	-1.61
DEC	36	0	3.26	-0.72	36	0	3.20	-0.78	32	-4	2.19	-1.79				
Total			42.97	-1.58			52.18	+7.63			27.51	-17.04			42.57	+2.00

DEP is departure from the long-term average.

Tables 6 and 7 summarize information about distributors and yield performance across locations for timothy and Kentucky bluegrass varieties currently included in tests in this report. Varieties are listed in alphabetical order, with the experimental varieties at the bottom. Remember that experimental varieties are not available for farm use. In Tables 6 and 7, an open block indicates that the variety was not in that particular test (labeled at the top of the column), while an (x) in the block means that the variety was in the test but yielded significantly less than the top-yielding variety. 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.

Tables 8 and 9 are summaries of yield data from 2000-2006 of commercial varieties that have been entered in the Kentucky trials. The data is listed as a percentage of the mean of the commercial varieties entered in each specific trial. In other words, the mean for each trial is 100%—varieties with percentages over 100 yielded better than average and varieties with percentages

less than 100 yielded lower than average. Direct, statistical comparisons of varieties cannot be made using the summary Tables 8 and 9, but these comparisons do help to identify varieties for further consideration. Varieties that have performed better than average over many years and at several locations have very stable performance, while others may have performed very well in wet years or on particular soil types. These details may influence variety choice and the information can be found in the yearly reports. See footnote in Tables 8 and 9 to determine which yearly report to refer to.

Summary

Selecting a good timothy or Kentucky bluegrass 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.

	2004				2005				2006			
	Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	36	+2	4.12	+0.32	41	+7	5.30	+1.50	46	+12	5.38	+1.58
FEB	39	+1	2.44	-1.99	43	+5	2.30	-2.13	38	0	2.66	-1.77
MAR	53	+6	4.28	-0.66	47	0	4.11	-0.83	51	+4	4.22	-0.72
APR	59	0	5.32	+0.52	60	+1	4.61	-0.19	63	+4	4.02	-0.78
MAY	72	+5	7.34	+2.38	65	-2	1.54	-3.42	66	-1	5.42	+0.46
JUN	74	-1	3.40	-0.45	76	+1	3.09	-0.76	75	0	3.39	-0.46
JUL	75	-3	4.87	+0.58	79	+1	2.39	-1.90	79	+1	3.79	-0.50
AUG	73	-4	3.02	-0.99	80	+3	11.54	+7.53	80	+3	2.58	-1.43
SEP	71	0	0.20	-3.13	74	+2	2.17	-1.16	67	-4	9.80	+6.47
OCT	64	+5	4.03	+0.98	60	+1	0.19	-2.86	57	-2	4.5	+1.45
NOV	53	+6	6.94	+2.31	50	+3	2.48	-2.15	49	+2	4.31	-0.32
DEC	37	-1	4.29	-0.75	35	-4	1.92	-3.12				
Total			50.25	-0.88			42.55	-8.58			50.07	+3.98

DEP is departure from the long-term average.

The following is a list of University of Kentucky Cooperative Extension publications related to timothy and Kentucky bluegrass management. They are available from your county Extension office.

- AGR-1 *Lime and Fertilizer Recommendations*
- AGR-18 *Grain and Forage Crop Guide for Kentucky*
- AGR-64 *Establishing Forage Crops*
- AGR-84 *Timothy*
- AGR-134 *Kentucky Bluegrass as a Forage Crop*

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Table 3. Dry matter yields, maturity, and stand persistence of timothy varieties sown Sept. 18, 2002, at Lexington, Kentucky.

Variety	Maturity ¹		Percent Stand			Yields (tons/acre)				
	May 23 2005	May 12 2006	2005		2006 Apr 17	2003 Total	2004 Total	2005 Total	2006 May 12	4-yr Total
			Apr 8	Oct 18						
Commercial Varieties—Available for Farm Use										
Clair	56.0	56.5	73	70	70	4.23	3.98	3.91	2.29	14.39*
Summit	55.5	56.8	71	68	69	4.20	3.73	4.35	1.98	14.27*
Colt	54.0	50.0	70	63	60	3.93	3.70	3.25	1.78	12.66
Express	55.5	58.0	60	35	43	3.65	2.88	4.06	1.52	12.11
Dolina	53.5	55.3	75	60	63	3.80	3.22	2.91	1.48	11.41
Tuukka	55.5	59.0	55	38	38	3.66	2.44	3.47	1.65	11.22
Classic	51.5	55.8	58	70	63	3.52	3.03	3.54	0.86	10.95
Experimental Varieties										
KYPP 9301	55.5	60.0	73	83	65	4.27	3.93	4.24	2.37	14.82*
KY Early	55.5	60.0	73	78	78	4.40	3.62	4.25	2.39	14.66*
Mean	54.8	56.8	68	63	61.5	3.98	3.43	3.83	1.83	13.08
CV,%	2.9	6.9	16	16	21.2	9.78	13.21	22.20	26.17	10.63
LSD,0.05	2.2	5.5	16	15	18.3	0.55	0.64	1.20	0.68	1.96

*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 shed.

Table 4. Dry matter yields, seedling vigor, and stand persistence of timothy varieties sown Sept. 1, 2004, at Princeton, Kentucky.

Variety	Seedling Vigor ¹ Dec 21, 2004	Maturity ² May 24 2005	Percent Stand				Yield (tons/acre)		
			2005		2006		2005 Total	2006 May 25	2-yr Total
			Apr 15	Nov 3	Apr 5	Jun 26			
Commercial Varieties—Available for Farm Use									
Derby	4.3	55.5	100	78	75	33	3.71	3.17	6.89*
Clair	3.8	56.0	99	85	75	26	3.75	3.03	6.78*
Colt	4.5	46.3	100	58	55	11	3.37	2.15	5.52
Joliet	4.8	45.0	98	55	45	8	3.47	1.56	5.03
Jonaton	4.5	45.0	95	45	38	4	3.47	1.21	4.68
Alma	4.3	47.5	95	53	48	1	3.15	1.36	4.51
Mean	4.3	49.2	98	62	56	14	3.49	2.08	5.57
CV,%	14.6	3.5	2	26	28	78	7.93	24.50	11.98
LSD,0.05	1.0	2.6	3	24	23	16	0.42	0.77	1.00

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
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 shed.

Table 5. Dry matter yields, seedling vigor, maturity, and stand persistence of Kentucky bluegrass varieties sown Sept. 13, 2004, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Nov 8, 2004	Maturity ²		Percent Stand		Yield (tons/acre)						2-yr Total
		May 13	Apr 24			2005 Total	2006					
		2005	2006				Apr 24	Jun 1	Jul 20	Oct 5	Total	
Commercial Varieties—Available for Farm Use												
Adam 1	5.0	63.0	58.0	100	100	2.80	1.38	0.59	0.86	1.43	4.25	7.05*
Kenblue	4.3	66.5	56.0	100	100	3.07	1.35	0.65	0.75	1.20	3.95	7.02*
Experimental Varieties												
KYPP9901	3.0	66.5	55.5	100	100	2.69	1.43	0.63	0.84	1.24	4.13	6.82*
2RAD-28A	3.3	66.5	38.0	100	100	2.64	0.63	0.60	0.64	1.18	3.05	5.69
Mean	3.9	65.6	51.9	100.0	100.0	2.80	1.20	0.62	0.77	1.26	3.85	6.65
CV,%	7.5	3.8	2.2	0.0	0.0	9.86	11.46	21.58	17.87	8.29	8.69	8.71
LSD,0.05	0.5	4.0	1.9	0.0	0.0	0.44	0.22	0.21	0.22	0.17	0.53	0.93

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
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 shed.

Table 6. Performance of timothy varieties at Lexington and Princeton.

Variety/Proprietor		Lexington 2002 ¹				Princeton 2004	
		03 ²	04	05	06	05	06
Commercial Varieties—Available for Farm Use							
Alma	Newfield Seeds Co/Caudill Seed Co.					X	X
Clair	Ky Agric. Exp. Station	*	*	*	*	*	*
Classic	Cebeco International Seeds	X	X	X	X		
Colt	FFR Cooperative	*	*	*	*	*	X
Derby	FFR Cooperative					*	*
Dolina	DLF-Trifolium	X	X	X	X		
Express	Seed Research of Oregon	X	X	X	X		
Joliet	Newfield Seeds Co/Caudill Seed Co.					*	X
Jonaton	Newfield Seeds Co/Caudill Seed Co.					*	X
Summit	Allied Seed, L.L.C.	*	*	*	*		
Tuukka	Ampac Seed Company	X		X	*		
Experimental Varieties							
KYPP9301	Ky Agric. Exp. Station	*	*	*	*		
KY Early	Ky Agric. Exp. Station	*	*	*	*		

¹ Establishment year.
² Harvest year.
*Not significantly different from the highest yielding variety in the test.
Open block indicates the variety was not in the test.

Table 7. Performance of Kentucky bluegrass varieties at Lexington.

Variety/Proprietor		Lexington 2004 ¹	
		05 ²	06
Commercial Varieties—Available for Farm Use			
Adam 1	Radix Research	*	*
Kenblue	Public	*	*
Experimental Varieties			
2RAD-28A	Radix Research	*	x
KYPP9901	Ky Agric. Exp. Station	*	*
¹ Establishment year. ² Harvest year. *Not significantly different from the highest yielding variety in the test. "x" in the block indicates the variety was in the test but yielded significantly less than the top-yielding variety in the test.			

Table 8. Summary of Kentucky Timothy Yield Trials, 1999-2006 (yield shown as a percentage of the mean of the commercial varieties in the trial).

Variety/Proprietor		Lexington			Quicksand		Princeton		Mean ³ (# trials)
		00 ^{1,2} 2yr ⁴	01 3yr	02 4yr	99 2yr	01 2yr	00 3yr	04 2yr	
Commercial Varieties—Available for Farm Use									
Alma	Newfield Seeds Co/Caudill Seed Co.							81	-
Auroro	General Feed and Grain	100			98				99(2)
Clair	Ky Agric. Exp. Station		109	115		108		122	114(4)
Classic	Cebeco International Seeds	100		88	87				92(3)
Colt	FFR Cooperative	105		101	112			99	104(4)
Common	Public		96						-
Derby	FFR Cooperative						124		-
Dolina	DLF-Trifolium	100		91					96(2)
Express	Seed Research of Oregon			97					-
Hokuei	Snow Brand Seed	103							-
Hokusei	Snow Brand Seed	97			99				98(2)
Joliet	Newfield Seeds Co/Caudill Seed Co.							90	-
Jonaton	Newfield Seeds Co/Caudill Seed Co.							84	-
Outlaw	Grassland West Company						107		-
Richmond	Pickseed Canada Inc.	100			103				102(2)
Summit	Allied Seed, L.L.C.			114					-
Tundra	DLF-Trifolium	95							-
Tuukka	Ampac Seed Company		95	90		92	93		93(4)

¹ Year trial was established.

² Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2000 was harvested two years, so the final report would be "2002 Timothy Report" archived in the Kentucky Forage Web site at <www.uky.edu/Ag/Forage>.

³ Mean only presented when respective variety was included in two or more trials.

⁴ Number of years of data.

Table 9. Summary of Kentucky Bluegrass Yield Trials, 1996-2006 (yield shown as a percentage of the mean of commercial varieties in the trial).

Variety/Proprietor		Lexington			Princeton	Mean ³ (# trials)
		96 ^{1,2} 3yr ⁴	03 2yr	04 2yr	02 3yr	
Adam 1	Radix Research			100		-
Barderby	Barenbrug				114	-
Ginger	Proceeds Marketing		89	100		95(2)
Kenblue	Public	90				-
Lato	Turf Seed Inc.	110				-
Slezanka	DLF International Seeds		111			-

¹ Year trial was established.

² Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2004 was harvested two years, so the final report would be "2006 Timothy and Kentucky Bluegrass Report" archived in the Kentucky Forage Web site at <www.uky.edu/Ag/Forage>. The 1996 and 2003 Lexington and 2002 Princeton results are in the appropriate Tall Fescue Reports.

³ Mean only presented when respective variety was included in two or more trials.

⁴ Number of years of data.



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