

2008 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. Tables 9 and 10 show summaries of all timothy and Kentucky bluegrass varieties tested in Kentucky for the last six years. The UK Forage Extension Web site at <www.uky.edu/Ag/Forage> contains 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; 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 and others like it.

Description of the Test

Data from five studies are reported. Timothy varieties were sown at Lexington in 2006 and 2007, and Kentucky bluegrass varieties were sown at Lexington in 2004, 2006 and 2007 as part of the University of Kentucky Forage Variety Testing Program. The soil at Lexington (Maury) is a well-drained silt loam and is 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 20 feet in a randomized complete block design with four replications with a harvested plot area of 5 by 15 feet. 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 are presented in Table 1.

Maturity ratings and dry matter yields are reported in Tables 2 through 6. 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.

Tables 7 and 8 summarize information about distributors and yield performance for Kentucky bluegrass and timothy varieties currently included in tests in this report. Varieties are listed in alphabetical

Table 1. Temperature and rainfall at Lexington, Kentucky in 2005, 2006, 2007 and 2008.

	2005				2006				2007				2008 ²			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	37	+6	4.35	+1.49	42	+11	4.77	+1.91	37	+6	2.93	+0.07	33	+2	4.60	+1.74
FEB	39	+4	1.68	-1.53	36	+1	2.13	-1.08	27	-8	1.83	-1.38	36	+1	5.37	+2.16
MAR	41	-3	2.79	-1.61	44	0	3.05	-1.35	52	+8	1.97	-2.43	45	+1	6.28	+1.88
APR	56	+1	3.30	-0.58	59	+4	3.52	-0.36	53	-2	3.87	-0.01	55	0	5.72	+1.84
MAY	61	-3	1.78	-2.69	62	-2	2.99	-1.48	68	+4	1.45	-3.02	62	-2	4.88	+0.41
JUN	75	+3	1.33	-2.33	70	-2	1.82	-1.84	74	+2	1.77	-1.89	74	+2	3.30	-0.36
JUL	77	+1	3.30	-1.70	76	0	5.13	+0.13	74	-2	6.90	+1.90	76	0	2.54	-2.46
AUG	78	+3	3.34	-0.59	76	+1	3.23	-0.70	80	+5	2.56	-1.37	75	0	1.08	-2.85
SEP	72	+4	0.59	-2.21	64	-4	9.27	+6.07	72	+4	1.15	-2.05	72	+4	1.21	-1.99
OCT	58	+1	0.92	-1.65	54	-3	4.88	+2.31	63	+6	5.28	+2.71	57	0	1.35	-1.22
NOV	47	+2	1.54	-1.85	47	+2	1.78	-1.61	46	+1	2.86	-0.53	43	-2	2.28	-1.11
DEC	32	-4	2.19	-1.79	42	+6	2.45	-1.53	40	+4	5.29	+1.31				
Total			27.51	-17.04			45.02	+0.47			37.86	-6.69			38.61	-1.96

¹ DEP is departure from the long-term average.
² 2008 data is for eleven months through November.

order, with the experimental varieties at the bottom. Remember that experimental varieties are not available for farm use. In Table 7 and 8, an open block indicates that the variety was not in that particular test (labeled at the top of the column); 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 9 and 10 are summaries of yield data of commercial varieties for Kentucky bluegrass (1996-2008) and timothy (2000-2008) 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 9 and 10, 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; others may have performed very well in wet years or on particular soil types. These details may influence vari-

ety choice, and the information can be found in the yearly reports. See footnotes in Tables 9 and 10 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.

Table 2. Dry matter yields, seedling vigor, maturity and stand persistence of Kentucky bluegrass varieties sown September 12, 2004 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Nov 8, 2004	Maturity ²				Percent Stand						Yield (tons/acre)						4-year Total
		2005		2006		2007		2008		2006		2007		2008		2008		
		May 13	Apr 24	May 9	May 6	Apr 14	Oct 17	Mar 26	Oct 11	Mar 27	Aug 12	Total	Total	Total	May 6	Jun 23	Total	
Commercial Varieties-Available for Farm Use																		
Adam1	5.0	63.0	58.0	60.0	60.0	100	100	100	100	100	93	2.80	4.25	2.00	0.88	0.46	1.33	10.38*
Kenblue	4.3	66.5	56.0	60.0	60.0	100	100	100	100	100	95	3.07	3.95	2.50	0.50	0.46	0.96	9.94*
Experimental Varieties																		
KYPP9901	3.0	66.5	55.5	59.5	58.5	100	100	100	100	100	90	2.69	4.13	2.22	0.64	0.41	1.05	10.08*
2RAD-28A	3.3	66.5	38.0	56.5	60	100	100	100	100	100	90	2.64	3.05	1.72	0.28	0.47	0.74	8.02
Mean	3.9	65.6	51.9	59.0	59.8	100	100	100	100	100	92	2.80	3.85	2.11	0.62	0.45	1.07	9.82
CV,%	7.5	3.8	2.2	2.3	0.9	0	0	0	0	0	11	9.86	8.69	5.74	35.02	32.19	27.81	6.29
LSD,0.05	0.5	4.0	1.9	2.1	1.0	0	0	0	0	0	18	0.44	0.53	0.19	0.42	0.25	0.59	1.23

¹ Vigor score based on 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.
 *Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 3. Dry matter yields, seedling vigor, maturity and stand persistence of Kentucky bluegrass varieties sown September 6, 2006 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 25, 2006	Maturity ²		Percent Stand					Yield (tons/acre)				2-year Total
		2007	2008	2006	2007		2008		2007	2008			
		May 15	May 6	Oct 25	Mar 26	Oct 11	Apr 3	Oct 21	Total	May 6	Jun 23	Total	
Commercial Varieties-Available for Farm Use													
Kenblue	4.0	60.0	57.5	100	99	100	100	100	1.62	1.78	0.30	2.08	3.70*
Ginger	3.3	52.3	59.5	100	97	97	98	96	1.47	1.64	0.42	2.06	3.53*
RAD-643	2.5	45.0	57.5	98	98	98	98	94	1.53	1.19	0.27	1.46	2.99
RAD-339	3.5	60.0	54.5	99	98	99	99	99	1.08	1.29	0.30	1.60	2.68
RAD-5	1.0	60.0	55.5	94	97	95	99	98	1.06	1.04	0.34	1.38	2.44
RAD-762	2.5	52.3	52.5	100	98	97	75	99	1.22	0.83	0.30	1.13	2.35
RAD-731zx	1.8	52.3	55.0	97	95	95	80	90	1.12	0.73	0.41	1.13	2.25
Common	3.0	29.0	51.5	98	97	97	91	96	0.70	0.40	0.39	0.78	1.48
Experimental Varieties													
B-50815	4.0	60.0	53.0	100	99	100	100	100	1.72	1.30	0.34	1.64	3.36*
HTBF-1000	3.8	60.0	50.0	100	99	98	98	100	1.54	0.70	0.44	1.14	2.68
HTBF-2000	3.5	60.0	50.5	99	98	100	100	99	1.27	0.86	0.37	1.22	2.49
B-50336	3.3	52.3	54.0	100	98	97	97	98	0.81	0.98	0.36	1.34	2.15
H01-847	4.5	52.8	54.5	100	100	99	85	90	0.88	0.80	0.28	1.08	1.96
Mean	3.1	53.5	53.3	98.8	97.7	97.7	93.8	96.7	1.23	1.04	0.35	1.39	2.62
CV,%	24.2	20.6	3.3	2.0	2.7	3.6	16.6	6.6	18.47	40.39	29.54	34.03	18.50
LSD,0.05	1.1	15.8	2.6	2.9	3.8	5.1	22.3	9.1	0.33	0.60	0.15	0.68	0.70

¹Vigor score based on scale of 1 to 5 with 5 being the most vigorous seedling growth.

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

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

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 or can be found at www.uky.edu/Ag/Forage.

- 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
- ID-147—Establishing and Managing Horse Pastures

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Table 4. Dry matter yields, seedling vigor, maturity and stand persistence of Kentucky bluegrass varieties sown September 6, 2007 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Nov 5, 2007	Maturity ²	Percent Stand			Yield (tons/acre)		
		2008	2007	2008		2008		
		May 6	Nov 5	Mar 26	Oct 21	May 6	Jun 23	Total
Commercial Varieties-Available for Farm Use								
Lato	3.8	51.5	98	98	99	0.50	0.80	1.30*
Ginger	1.8	57.0	97	97	99	0.32	0.62	0.93
Barberby	5.0	57.0	100	100	100	0.39	0.49	0.88
Common	2.5	29.0	98	100	100	0.01	0.18	0.19
Mean	3.3	48.6	98.1	98.6	99.4	0.30	0.52	0.82
CV,%	26.1	2.8	1.8	1.8	0.8	42.15	16.46	8.83
LSD,0.05	1.4	2.1	2.9	2.8	1.3	0.20	0.14	0.12

¹Vigor score based on scale of 1 to 5 with 5 being the most vigorous seedling growth.

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

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

Table 5. Dry matter yields, seedling vigor, maturity and stand persistence of timothy varieties sown September 8, 2006 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 25, 2006	Maturity ²		Percent Stand					Yield (tons/acre)				2-year Total
		2007	2008	2006	2007		2008		2007	2008			
		May 10	May 13	Oct 25	Mar 26	Nov 30	Apr 3	Oct 21	Total	May 13	Jul 1	Total	
Commercial Varieties-Available for Farm Use													
Talon	4.5	46.0	46.3	99	100	80	84	76	2.70	1.81	0.36	2.17	4.86*
Derby	3.8	50.0	46.3	100	100	88	84	73	2.77	1.63	0.34	1.98	4.75*
Clair	3.5	46.0	48.8	100	100	83	83	83	2.50	1.68	0.40	2.09	4.59*
Treasure	4.0	48.8	47.5	100	100	72	71	70	2.87	1.39	0.33	1.72	4.58*
Colt	3.8	34.0	45.0	100	100	80	75	71	2.16	1.34	0.30	1.63	3.79
Climax	2.8	43.3	48.8	100	100	85	70	68	2.04	1.09	0.28	1.37	3.41
RAD-EMR74	1.8	37.8	45.0	98	99	72	59	50	1.81	0.76	0.29	1.05	2.85
Experimental Varieties													
PF7PPT-1	3.5	37.3	45.0	100	100	74	73	69	2.31	1.15	0.33	1.48	3.79
Mean	3.4	42.9	46.6	99.3	99.8	79.1	74.7	69.8	2.39	1.36	0.33	1.69	4.08
CV,%	24.1	11.8	4.0	1.5	1.0	13.0	19.6	19.0	8.54	17.32	27.74	16.73	9.59
LSD,0.05	1.2	7.4	2.7	2.2	1.4	16.6	21.5	19.5	0.30	0.35	0.13	0.41	0.58

¹ Vigor score based on 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.

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

Table 6. Dry matter yields, seedling vigor, maturity and stand persistence of timothy and tall oatgrass (TOG) varieties sown September 6, 2007 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 25, 2007	Maturity ²		Percent stand			Yield (tons/acre)		
		2008	2007	2008		2008			
		May 22	Oct 25	Mar 26	Oct 21	May 22	Jun 30	Total	
Commercial Varieties-Available for Farm Use									
Derby	2.3	56.0	92	94	95	2.72	0.32	3.04*	
Treasure	3.3	54.0	95	96	93	2.70	0.25	2.95*	
Talon	3.0	54.5	88	68	91	2.44	0.35	2.79*	
Express	3.3	46.3	97	98	92	2.43	0.24	2.67	
Climax	2.3	57.0	90	93	93	2.29	0.38	2.67	
Barpenta	3.0	42.0	90	93	83	1.86	0.27	2.12	
Clair	1.0	56.5	50	55	71	1.69	0.40	2.09	
Barfleo3	-	34.5	-	84	84	0.47	0.61	1.09	
Experimental Varieties									
TOG564692 (TOG)	3.0	59.5	74	71	73	2.43	0.49	2.91*	
KYPP 9301	2.8	57.0	93	95	93	2.47	0.31	2.78*	
TM9701	2.8	56.0	91	93	90	2.42	0.31	2.72	
RAD-EMR74	1.3	47.5	69	61	43	1.24	0.27	1.52	
Mean	2.5	51.7	84.3	83.5	83.1	2.10	0.35	2.45	
CV,%	38.6	6.2	10.3	18.5	12.5	10.53	22.39	8.96	
LSD,0.05	1.4	4.6	12.6	22.2	15.0	0.32	0.11	0.32	

¹ Vigor score based on 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.

³ Replanted with new seed on Nov. 12, 2007.

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

Variety	Proprietor/KY Distributor	2004 ¹				2006		2007
		05 ²	06	07	08	07	08	08
Commercial Varieties-Available for Farm Use								
Adam 1	Radix Research	*	*	x ³	*			
Barderby	Barenbrug							x
Common	Public					x	x	x
Ginger	ProSeeds Marketing					*	*	x
Kenblue	Public	*	*	*	*	*	*	
Lato	Allied Seed							*
RAD-339	Radix Research					x	*	
RAD-5	Radix Research					x	x	
RAD-643	Radix Research					*	*	
RAD-731zx	Radix Research					x	x	
RAD-762	Radix Research					x	x	
Experimental Varieties								
2RAD-28A	Radix Research	*	x	x	x			
B-50336	Blue Moon Farms					x	x	
B-50815	Blue Moon Farms					*	*	
H01-847	ProSeeds Marketing					x	x	
HTBF-1000	FFR					*	x	
HTBF-2000	FFR					x	x	
KYPP9901	Ky Agric. Exp. Station	*	*	x	*			

¹ Establishment year.
² Harvest year.
³ x in the block indicates the variety was in the test but yielded significantly less than the top yielding variety in the test.
Open boxes indicate the variety was not in the test.
*Not significantly different from the highest yielding variety in the test.

Variety	Proprietor/KY Distributor	2006 ¹		2007
		07 ²	08	08
Commercial Varieties-Available for Farm Use				
Barfleo	Barenbrug			x ³
Barpenta	Barenbrug			x
Clair	Ky Agric. Exp. Station	*	*	x
Climax	Canada Agr. Res. Station	x	x	x
Colt	FFR Cooperative	x	x	
Derby	FFR Cooperative	*	*	*
Express	Seed Research of Oregon			x
RAD-EMR74	Radix Research	x	x	x
Talon	Seed Research of Oregon	*	*	*
Treasure	Seed Research of Oregon	*	x	*
Experimental Varieties				
KYPP9301	Ky Agric. Exp. Station			*
PF7PPT-1	ProSeeds Marketing	x	x	
TM9701	Allied Seed			x

¹ Establishment year.
² Harvest year.
³ x in the block indicates the variety was in the test but yielded significantly less than the top yielding variety in the test.
Open boxes indicate the variety was not in the test.
*Not significantly different from the highest yielding variety in the test.

Variety	Proprietor/KY Distributor	Lexington				Princeton	Mean ³ (#trials)
		96 ^{1,2}	03	04	06	02	
		3yr ⁴	2yr	3yr	2-yr	3yr	
Adam 1	Radix Research			98		-	
Barderby	Barenbrug				114	-	
Common	Public				55	-	
Ginger	ProSeeds Marketing		89		132	111(2)	
Kenblue	Public	90		102	138	110(3)	
Lato	Turf Seed Inc.	110				-	
RAD-339	Radix Research				100	-	
RAD-5	Radix Research				91	-	
RAD-643	Radix Research				112	-	
RAD-731zx	Radix Research				84	-	
RAD-762	Radix Research				88	-	
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 2 years, so the final report would be "2006 Timothy and Kentucky Bluegrass Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>. The 96 and 03 Lexington and 02 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.

Table 10. Summary of Kentucky Timothy Yield Trials 2000-2008 (yield shown as a percentage of the mean of the commercial varieties in the trial.)

Variety	Proprietor/KY Distributor	Lexington				Quicksand		Princeton		Mean ³ (#trials)
		00 ^{1,2}	01	02	06	99	01	00	04	
		2yr ⁴	3yr	4yr	2-yr	2yr	2yr	3yr	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	111		108		122	113(5)
Classic	Cebeco International Seeds	100		88		87				92(3)
Climax	Canada Agr. Res. Station				83					-
Colt	FFR Cooperative	105		101	92	112			99	102(5)
Common	Public		96							-
Derby	FFR Cooperative				115				124	120(2)
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		-
RAD-EMR74	Radix Research				69					-
Richmond	Pickseed Canada Inc.	100				103				102(2)
Summit	Allied Seed, L.L.C.			114						-
Talon	Seed Research of Oregon				118					-
Treasure	Seed Research of Oregon				111					-
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 2 years, so the final report would be "2002 Timothy Report" archived in the KY Forage website 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.



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