Progress Report 393

The 1996 Timothy Report

The Forage Variety Testing Program
Serving Kentucky's Farmers With Pride From East to West

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Introduction

Timothy (*Phleum pratense*) is the fourth most widely sown cool-season perennial grass used in Kentucky for forage, behind tall fescue, orchardgrass, and Kentucky bluegrass. It is a late-maturing bunchgrass that can be used for grazing or wildlife habitat, but is mainly harvested as hay, particularly for horses. For hay production, timothy can be sown with alfalfa or red clover, while white clover or birdsfoot trefoil make good mixtures with timothy for grazing. 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. Quality of timothy declines more rapidly than other cool-season grasses as it over-matures. In Kentucky, timothy behaves like a short-lived perennial with stands lasting for 2-3 years.

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.

Considerations in Selecting a Timothy Variety

Local Adaptation and Seasonal Yield. Choose a variety that is adapted to Kentucky as indicated by good performance across locations and years in replicated yield trials, such as is presented in this publication. Also, look for varieties that are productive in the desired season of use, whether for hay or grazing.

Seed Quality. Buy either certified or Plant Variety Protected (PVP) seed, which will ensure that the genetics and performance you are paying for are in the bag. Look for the blue tag, which must be attached to all bags of certified seed or look for Plant Variety Protection labelling, which is the proprietor's guarantee. Other information on the label will include the test date, which must be within the previous nine months, and the level of germination and other crop and weed seed. Order seed well in advance of seeding time to assure that it will be available when needed.

Description of the Test

Timothy varieties were sown in Lexington in the late summer of 1994 and at Quicksand in 1995 as part of the University of Kentucky Grass Breeding Program. The objective of this study was to compare dry matter yields and maturities of three experimental lines under development at the University of Kentucky ('94TIMPC', 'Ky-Early', and 'Ky-Leafy') with a common timothy and selected improved varieties ('Clair', 'Climax', 'Colt', 'Mohawk', and 'Timfor'). 'Ky-Early' and 'Ky-Leafy' are selections out of 'Clair' and '94TIMPC' is a selection out of 'Ky-Early' and 'Ky-Leafy'. 'Ky-Early,Syn-1' and 'Ky-Leafy,Syn-1' are in a class of seed that is three generations prior to certified seed. 'Clair-Brdr' and 'Ky-Early,Syn-2' are in a class of seed that is two generations prior to certified seed. The two entries of 'Ky-Early,Syn-2' in the 1995 test represent seed harvests from two consecutive years from the same field, as indicated. As an earlier generation, 'Clair,Brdr' would be expected to perform better than 'Clair,Cert' and so it is placed in the trial for experimental purposes and is not available for sale. All the improved varieties were from certified seed and 'Common' is from uncertified seed.

Cultivars were sown at the rate of 6 lb/A into a prepared seedbed with a disk drill. Plots were 4' x 15' arranged in a randomized complete block design with four replications. The soil at Lexington was a well-drained Maury silt loam and the soil at Quicksand was a Pope silt loam . 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 2" stubble to simulate a hay management system with fall stockpiling. The first cutting was harvested when spring growth of most varieties had reached the mid- to late-boot stage. Fresh weights were measured in the field and converted to dry matter production using long-term averages for percent dry matter of timothy. Management for establishment, fertility, and weed control and harvest management was according to University of Kentucky Cooperative Extension Service recommendations.

Results and Discussion

Weather data for Lexington and Quicksand are presented in Table 1. Temperatures across the state were warmer in the winter and late spring with March and April somewhat cooler. July through September was near normal at Quicksand but October was much warmer. At Lexington July and September were cool while August and October were near normal. Both locations measured a surplus of >3 inches of precipitation for the growing season. Generally, January, April, May, and September were wetter than normal, while February, March, July, and August were drier. June and October were wetter at Quicksand but dry at Lexington. Precipitation was not only unevenly distributed across the season at all locations but also within months. There were numerous rainfall events of greater than

1 inch and several instances in which the total rainfall for the month fell in a matter of 2-3 days.

Maturity ratings and dry matter yields are reported in Tables 2 & 3. Yields are given by harvest date and as total annual production. Varieties are listed by descending total production for the 1994 test and by maturity for the 1995 test. Experimental varieties are listed separately at the bottom of the tables and they are not available for purchase commercially. Some varieties had not yet reached the optimum stage of harvest for timothy, which is mid- to late-boot (5-7), but they all were in a reproductive stage. Statistical analyses were performed on all data to test the significance of varietal differences. In the tables, the variety with the highest numerical value in each column is marked with two asterisks (**) and those varieties that are not significantly different from that variety are marked with one asterisk (*). To determine if two varieties are significantly different, compare the difference between them to the LSD (Least Significant Difference) 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), which is a measure of the variability of the data, is included for each column of means. Low variability is desirable and increased variability within a study results in higher CV's and larger LSD's.

First production year dry matter yields of timothy sown at Quicksand (Table 3) were higher than yields measured in 1995 at Lexington (Table 2) as well as first year yields measured at Lexington in 1993 (1994 Kentucky Timothy Variety Test Report, Agronomy Notes, Vol. 27, No. 9, 1994). In other tests of cool season grasses, first year yields have been higher than that of subsequent years and this was the case for the 1994 test at Lexington. Some varieties in that test had second year yields that were comparable to previous tests; however, most were at least 1 ton/acre less. This difference was observed in the first cutting and may have been due to the cooler spring at Lexington.

The three experimentals, 94TIMPC, 'Ky-Early', and 'Ky-Leafy', all under development by the Grass Breeding Program at the University of Kentucky, appear to be promising as new timothy varieties for Kentucky. Of the three, 'Ky-Early' may be released for seed increase before summer 1997 and could be available as certified seed as early as the summer of 1998.

Table 4 lists the varieties included in the tests and gives information about developers and distributors, characteristics, and yield performance across locations for all varieties currently included in tests discussed 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, while commercial varieties can be purchased from dealerships. In table 4, shaded areas indicate that the variety was not in that particular test (labelled at the top of the column) while clear blocks mean that the variety was in the test. A double asterisk (**) indicates that the variety was the highest yielding variety in the test for that year. 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. Remember to consider the distribution of yield across the growing season when evaluating productivity of timothy varieties (Tables 2 & 3).

Summary

Selecting a good timothy 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. Page 4 lists other College of Agriculture publications related to the establishment, management, and utilization of timothy that are available from your local county Extension office.

Table 1. Temperature and Rainfall at Quicksand and Lexington in 1996.

	Quicksand				Lexington			
	Temp		Rainfall		Temp		Rainfall	
MON	F	DEP	IN	DEP	F	DEP	IN	DEP
JAN	34	+3	5.02	+1.73	31	+0	4.38	+1.52
FEB	38	+5	2.17	-1.43	36	+1	1.50	-1.71
MAR	39	-2	4.04	-0.30	39	-5	4.44	+0.04
APR	52	-1	4.59	+0.49	51	-4	5.15	+1.27
MAY	66	+4	5.65	+1.17	66	+2	8.23	+3.76
JUN	72	+2	5.17	+1.35	72	+0	3.45	-0.21
JUL	73	-1	4.75	-0.50	73	-3	4.80	-0.20
AUG	74	+1	2.79	-1.22	74	-1	3.13	-0.80
SEP	66	+0	4.86	+1.34	66	-2	5.11	+1.91
OCT	58	+4	3.44	+0.53	57	-0	1.39	-1.18

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

Table 2. Dry Matter Yields (Tons/acre) of Timothy Varieties Sown 19 September 1994, at Lexington, Kentucky as Part of The Grass Breeding Program.

Variety	1995 Total	1996 Harvests			1996 Total	2-yr Total
		May 21	Aug 08	Oct 28		
Commercial Varieties - Available For Farm Use						
CLAIR,CERT	4.97*	0.80*	1.02	1.00	2.81	7.79
MOHAWK	4.58	0.70	1.42*	0.67	2.80	7.38
COLT	4.30	0.80*	1.19*	0.83	2.83	7.13
COMMON	3.39	0.85*	1.30*	0.96	3.11*	6.50
CLIMAX	3.47	0.74*	1.20*	1.02*	2.96*	6.44
TIMFOR	3.30	0.78*	1.12*	0.78	2.68	5.98
Experimental Varieties - Not Available For Farm Use						
94TIMPC,BRDR	5.94**	0.85*	1.47*	1.17*	3.49*	9.43**
KYEARLY,SYN-1	5.45*	0.99**	1.70**	1.11*	3.80**	9.24*
CLAIR,BRDR	5.02*	0.98*	0.97	1.38**	3.33*	8.35*
KYLEAFY,SYN-1	5.08*	0.96*	1.04*	0.98	2.98*	8.06*
MEAN	4.55	0.85	1.24	0.99	3.08	7.63
CV, %	15.80	22.11	33.58	26.37	20.61	13.68
LSD, 0.05	1.04	0.27	0.61	0.38	0.92	1.51

1995 total includes 3 harvests dated May 12, Jul 03, and Oct 26.
***Highest numerical value in the column.*
**Not significantly different from the highest numerical value in the column based on the 5% LSD.*

Table 3. Dry Matter Yields (Tons/acre) And Maturity Ratings of Timothy Varieties Sown 15 September 1995, at Quicksand, Kentucky as Part of The Grass Breeding Program

Variety	Maturity May 27	1996 Harvests			1996 Total
		May 27	Aug 08	Oct 29	
Commercial Varieties - Available For Farm Use					
COLT	6.00	4.20*	0.80*	2.38	7.39*
CLAIR,CERT	6.00	3.44*	0.90**	2.73*	7.08*
CLIMAX	4.50	4.27**	0.51	2.09	6.87*
COMMON	4.75	4.15*	0.77*	1.94	6.86*
Experimental Varieties - Not Available For Farm Use					
KYEARLY,SYN-2 (1995 SEED)	7.75**	4.21*	0.88*	2.92**	8.01**
94TIMPC	7.75**	3.73*	0.80*	2.90*	7.43*
KYEARLY,SYN-2 (1994 SEED)	7.00*	3.90*	0.68*	2.65*	7.23*
KYLEAFY,SYN-2	7.50*	2.96	0.76*	2.69*	6.41
MEAN	6.40	3.86	0.76	2.54	7.16
CV, %	17.34	19.24	23.09	13.54	12.38
LSD, 0.05	1.63	1.09	0.26	0.51	1.30

Maturity rating scale: 1=vegetative 3=early boot 5=mid boot 7=late boot 9=early head 11=full head 13=early bloom 15=full bloom 17=seed (dough) 19=mature seed
***Highest numerical value in the column.*
**Not significantly different from the highest numerical value in the column based on the 5% LSD.*

Table 4. Characterization of Timothy Varieties and Their Performance Across Years and Locations.

				1994[1]		1995
Variety	**Developer**	**Ky Distributor**	**Characteristics**	**95[2]**	**96**	**96**
Commercial Varieties - Available for Farm Use						
CLAIR,CERT	KY. AGRIC. EXP. STA.	PUBLIC	EARLY MATURING, VIGOROUS GROWTH, AFTERMATH PRODUCTION	*		*
CLIMAX	CANADA AGR. RES. STA.	CAN. SEED ASSOC.	LEAFY, AFTERMATH PRODUCTION, DISEASE RESISTANCE		*	*
COMMON	FARMER ECOTYPE	PUBLIC	UNIMPROVED		*	*
COLT	FFR	SOUTHERN STATES	EARLY-MEDIUM MATURITY, AFTERMATH PRODUCTION			*
MOHAWK	FFR	SOUTHERN STATES	MEDIUM-LATE MATURING, LATER THAN CLAIR			
TIMFOR	NORTHRUP KING	NORTHRUP KING	MEDIUM MATURING, FAST RECOVERY, DISEASE RESISTANCE			
Experimental Varieties - Not Available for Farm Use						
94TIMPC	KY. AGRIC. EXP. STA.	EXPERIMENTAL	EARLY MATURING, LEAFINESS, AFTERMATH PRODUCTION	**	*	*
CLAIR,BRDR	KY. AGRIC. EXP. STA.	PUBLIC	EARLY MATURING, VIGOROUS GROWTH, AFTERMATH PRODUCTION	*	*	
KY-EARLY,SYN-1	KY. AGRIC. EXP. STA.	EXPERIMENTAL	EARLIER THAN CLAIR, WIDE LEAVES	*	**	
KY-EARLY,SYN-2 (94 SEED)	KY. AGRIC. EXP. STA.	EXPERIMENTAL	EARLIER THAN CLAIR, WIDE LEAVES			*
KY-EARLY,SYN-2 (95 SEED)	KY. AGRIC. EXP. STA.	EXPERIMENTAL	EARLIER THAN CLAIR, WIDE LEAVES			**
KY-LEAFY,SYN-1	KY. AGRIC. EXP. STA.	EXPERIMENTAL	EARLIER THAN CLAIR, MORE BASAL LEAF PRODUCTION	*	*	

[1] *Establishment year*
[2] *Harvest year*
Shaded boxes indicate that the variety was not in the test
***Highest yielding variety in the test fot that year*
**Not significantly different from the highest yielding variety in the test for that year*

The following is a list of University of Kentucky Agricultural Extension publications related to timothy management.

AGR-1 Lime and Fertilizer Recommendations
ASC-16 Beef: Grass Tetany in Beef Cattle
AGR-18 Grain and Forage Crop Guide for Kentucky
AGR-26 Renovating Hay and Pasture Fields
AGR-64 Establishing Forage Crops
AGR-103 Fertilization of Cool-season Grasses
Seed Tags: What They Reveal

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