

1993 Kentucky Tall Fescue Variety Test Report

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Introduction

Tall fescue is a soil conserving, productive, well-adapted, persistent, cool season grass that is grown on approximately 5.5 million acres in Kentucky. This grass is used for both hay and pasture and is the forage base of most of Kentucky's livestock enterprises, particularly beef cattle.

Much of the tall fescue in Kentucky is infected with an internal fungus (endophyte) that results in decreased weight gains in growing ruminants and lower pregnancy rates in breeding stock, especially in hot weather. Varieties are now available that are free of this fungal endophyte.

This publication will summarize data on the yield of many newer varieties and give guidelines for selecting a variety.

Important Considerations in Selecting a Tall Fescue Variety

Local Adaptation and Seasonal Yield. The variety should be adapted to Kentucky as indicated by 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.

Tall fescues are often classified as either "Mediterranean" or "European" types according to the area from which the parental material for the variety came. In general, the Mediterranean types (Cajun, for example) are more productive in the fall and winter than the European types such as Kentucky 31. While they mature earlier in the spring, the Mediterranean types become very dormant and non-productive during the summer in Kentucky and are more susceptible than European varieties to some leaf diseases, such as *Helminthosporium* and *Rhizoctonia*. Therefore, Mediterranean varieties are less preferred for use in Kentucky than European types. Because Mediterranean varieties mature earlier in the spring, first cutting yields are generally higher for these varieties when the two types are harvested at the same time. However, the European types produce more in the summer, allowing for extended grazing.

Endophyte Level. Make sure the seed has been tested for endophyte content. Seed with infection levels of less than 5% are regarded as being endophyte-free. This information will be prominently displayed on a green tag attached to the seed bag. If no tag is present, assume the seed is infected with the endophyte. Several varieties, both with and without the endophyte, are adapted for use in Kentucky as determined by the tests in this report.

Seed Quality. Buy high quality, certified seed that has high germination and few other crop and weed seed. This information is shown on the label. The test date, which indicates when the germination was last tested, must be within the previous nine months. The use of certified seed assures 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. Order seed well in advance of planting time to assure that it is available when needed.

Description of the Tests

Data from two studies will be reported. Plots of tall fescue varieties were sown in Lexington and

Princeton in the late summer of 1992 as part of the Kentucky Forage Variety Testing Program. The objective of these studies was to compare dry matter yields of tall fescue varieties under simulated grazing and hay management schemes in different environments.

Seedlings were made at the rate of 20 lb/A into a prepared seedbed with a disk drill. To aid establishment 25 lb/A of nitrogen was applied and incorporated prior to planting. Plots were 4' x 15' in a randomized complete block design with four replications. Nitrogen was topdressed at 50 lb/A of actual N in March, May, and August. The tests were harvested using a sickle type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile management system. Fresh weights were measured in the field and occasional subsamples were taken and weighed and dried and reweighed to determine percent dry matter on an oven dry basis.

Soils at both locations are well-drained silt loams (Maury at Lexington and Crider at Princeton). All tests were managed according to University of Kentucky Cooperative Extension Service recommendations.

Results and Discussion

Weather data for the 1993 growing season in Lexington and Princeton are presented in Table 1. At both locations spring and fall were slightly cooler than normal, while July and August were warmer. Precipitation was below average for most of the growing season. In months with a surplus, rain tended to come in events of greater than 1". Therefore, yields are somewhat lower than what these levels of rainfall would support under more ideal conditions.

Maturity ratings and dry matter yields (tons/acre) are reported in Tables 2 and 3. Yields are given by cutting date and as total annual production. In these tables, varieties are listed by descending maturity rating. Statistical analyses were performed on all data to determine if the apparent differences are truly due to varietal differences or just to random chance. In the tables, the highest yielding variety in each column is marked with two asterisks (**) and those varieties not significantly different from the highest yielding variety 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 (C.V.), 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 C.V.'s and larger L.S.D.'s.

In spite of the erratic distribution of precipitation, tall fescue yields across the state were higher in 1993 than in previous years. Dry matter production at Lexington was higher than Princeton for every harvest accounting for a total difference between the two locations of about one ton/acre. Most of the difference occurred during the summer months when temperatures were higher and rainfall was more limiting at Princeton. Variety performance was consistent at both locations.

Some of the endophyte-free varieties have been observed to have low seedling vigor, which has been blamed for some stand failures in some cases. While differences seedling vigor have been noted between endophyte-free and endophyte-infected varieties, other work at the University of Kentucky indicates that seedling vigor differs from year to year in the same variety. The reason for this variation is not clear, but can be related to soil and environmental conditions at seeding, as well as age, size, and production environment of the seed. Stand establishment of endophyte-free varieties was not a problem in the variety tests sown in 1992.

It is recommended that late summer seeded low-endophyte tall fescues be harvested as hay the

following spring to give the plants an opportunity to become established. After this cutting, follow recommendations about pasture fertilization and grazing rotation. Take care not to overgraze low endophyte tall fescue, especially during periods of extreme drought stress.

Two perennial ryegrass varieties have been included in the studies and were treated the same as the tall fescue varieties. They are listed at the bottom of the table, again in order of descending maturity. Bison had the highest yield, by far, of all varieties in the tests. However, perennial ryegrass is a short-lived perennial in Kentucky, disappearing from pastures and hay fields in a few years due to winter kill and summer drought stress. It is therefore likely that ryegrass fields will have to be reseeded in a few years.

Table 4 lists all the varieties included in the Kentucky Tall Fescue Variety Tests as well as information about distributors, endophyte infection, and performance across locations in 1993. 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. However, data from only one year is available at this time so give consideration to varieties that yielded highly at both locations. Remember to consider the distribution of yield across the growing season when evaluating productivity of tall fescue varieties (Tables 2 and 3).

Summary

Selecting a good endophyte-free variety of tall fescue 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. Other College of Agriculture publications related to the establishment, management, and utilization of tall fescue are listed in Table 5 and are available from your local county extension office.

TABLE 1. TEMPERATURE AND RAINFALL IN
 LEXINGTON
 AND PRINCETON DURING 1993.

MONTH	LEXINGTON				PRINCETON	
	TEMPERATURE		RAINFALL		TEMPERATURE	
	F	DEP.	INCHES	DEP.	F	DEP.
JAN	38	7	2.95	-0.62	39	5
	4.75	0.22				
FEB	33	-2	4.04	0.78	37	-1
	3.75	-0.16				
MAR	41	-3	4.15	-0.68	46	-1
	4.35	-0.70				
APR	53	-2	3.26	-0.75	57	-2
	4.66	0.05				
MAY	65	1	2.48	-1.75	66	-1
	5.09	0.84				
JUN	72	0	6.48	2.23	75	0
	4.54	1.16				
JUL	79	3	3.17	-1.78	83	5
	2.22	-1.68				
AUG	76	1	4.65	0.69	80	3
	1.71	-1.89				
SEP	66	-2	3.72	0.44	69	-2
	4.53	1.23				
OCT	54	-2	4.08	1.82	58	-2
	3.72	0.40				

TEMPERATURES ARE IN DEGREES FAHRENHEIT.

DEP. IS DEPARTURE FROM THE 30-YEAR AVERAGE FOR THAT LOCATION.

TABLE 2. DRY MATTER YIELDS (TONS/ACRE) AND MATURITY RATINGS¹
 OF TALL FESCUE VARIETIES AND SOME PERENNIAL RYEGRASS
 VARIETIES
 SOWN ON 15 SEP 1992 AT LEXINGTON, KENTUCKY.

VARIETY	MAY05	1993 HARVESTS				1993
	93	MAY06	JUN07	JUL13	OCT28	TOTAL
	MATURIT Y					
CAJUN	10.50**	2.57*	1.08	1.05*	1.57**	6.25**
GA87E	10.00*	2.23	0.77	0.65	1.27	4.91
MARTIN	10.00*	2.22	0.89	0.80	1.29	5.20
MOZARK	9.00*	2.51*	0.95	0.90	1.24	5.59*
OFI88B1	9.00*	2.29	0.93	0.68	1.30	5.21
GA120L	8.00	2.39*	0.83	0.75	1.41*	5.38
KY31CL	6.50	2.54*	1.08	0.83	1.29	5.73*
PHYTER	6.50	2.43*	1.30**	0.78	1.31	5.82*
KENHY	6.00	2.34*	1.08	1.14**	1.40*	5.96*
OFI88B15	6.00	2.08	0.99	0.79	1.24	5.11
CATTLE-CLUB	5.50	2.41*	1.16*	0.87	1.45*	5.89*
TF8805	5.50	2.68**	0.90	0.91*	1.35*	5.84*
JOHNSTONE	5.00	2.23	1.02	0.79	1.16	5.20
KY31IN	5.00	2.08	0.96	0.79	1.48*	5.32
MAXIMIZE	5.00	2.22	0.89	0.97*	1.46*	5.54
STARGRAZER	5.00	2.67*	1.28*	0.82	1.41*	6.18*
TN-F-SYN-1	5.00	2.15	0.83	0.65	1.24	4.87
FTF8976	4.50	2.20	0.87	0.71	1.45*	5.23
JACKAROO, RYEGRASS	6.50++	2.77	0.98	0.32	1.13++	5.20
BISON, RYEGRASS	4.50	3.70++	2.50++	1.04++	1.00+	8.25++
MEAN	6.65	2.44	1.06	0.81	1.32	5.63
C.V., %	19.58	11.04	11.51	20.60	13.81	8.88
L.S.D., 0.05	1.84	0.38	0.17	0.24	0.26	0.71

¹ MATURITY RATING SCALE: 1=VEGETATIVE 11=FULL HEAD
 3=EARLY BOOT 13=EARLY BLOOM
 5=MID BOOT 15=FULL BLOOM
 7=LATE BOOT 17=SEED

(DOUGH)

9=EARLY HEAD 19=MATURE SEED

**HIGHEST NUMERICAL YIELD OF TALL FESCUE IN THE COLUMN.

*NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST NUMERICAL
 YIELD OF TALL

FESCUE IN THE COLUMN BASED ON THE L.S.D.

++HIGHEST NUMERICAL YIELD OF PERENNIAL RYEGRASS IN THE
 COLUMN.

+NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST NUMERICAL
 YIELD OF

PERENNIAL RYEGRASS IN THE COLUMN BASED ON THE L.S.D.

TABLE 3. DRY MATTER YIELDS (TONS/ACRE) AND MATURITY RATINGS
OF TALL
FESCUE VARIETIES AND SOME PERENNIAL RYEGRASS VARIETIES
SOWN ON 16 SEP 1992 AT PRINCETON, KENTUCKY.

VARIETY	MAY12	1993 HARVESTS				1993
	MATURIT Y	MAY12	JUN10	JUL15	OCT26	TOTAL
GA87E	14.50**	1.98	0.88	0.59**	1.03*	4.48*
MOZARK	14.50**	2.45*	0.81	0.56*	0.98*	4.80*
CAJUN	14.00*	2.13	0.94	0.52*	0.98*	4.58*
OFI88B1	14.00*	2.14	0.93	0.51*	1.02*	4.60*
GA120L	13.50*	2.61**	0.74	0.52*	1.02*	4.89**
MARTIN	13.00*	1.94	0.79	0.48	0.95	4.16
CATTLE-CLUB	12.50	2.43*	0.68	0.48	1.02*	4.60*
MAXIMIZE	12.50	2.31*	0.81	0.50*	1.05*	4.67*
PHYTER	12.50	2.24*	1.15**	0.45	0.94	4.79*
KY31CL	12.00	2.43*	0.86	0.48	1.04*	4.82*
OFI88B15	12.00	2.10	0.76	0.46	0.99*	4.30
TF8805	12.00	2.47*	0.79	0.51*	0.92	4.70*
JOHNSTONE	11.50	2.29*	0.66	0.45	0.93	4.33
KENHY	11.50	2.09	0.69	0.52*	0.98*	4.28
KY31IN	11.50	2.35*	0.72	0.52*	0.97*	4.56*
FTF8976	11.00	1.93	0.54	0.31	0.91	3.70
STARGRAZER	11.00	2.09	0.98	0.59**	1.08**	4.73*
TN-F-SYN-1	11.00	2.07	0.64	0.50*	0.99*	4.20
JACKAROO, RYEGRASS	13.00++	2.84	0.66	0.14	0.65	4.29
BISON, RYEGRASS	12.50+	3.70++	1.96++	0.69++	0.91++	7.27++
MEAN	12.50	2.33	0.85	0.49	0.97	4.64
C.V., %	8.66	12.49	11.41	16.10	8.47	7.38
L.S.D., 0.05	1.53	0.41	0.14	0.11	0.12	0.48

**HIGHEST YIELDING TALL FESCUE VARIETY IN THE COLUMN.

*NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST YIELDING TALL FESCUE

VARIETY IN THE COLUMN BASED ON THE L.S.D.

++HIGHEST YIELDING PERENNIAL RYEGRASS VARIETY IN THE COLUMN.

+NOT SIGNIFICANTLY DIFFERENT FROM THE HIGHEST YIELDING PERENNIAL

RYEGRASS VARIETY IN THE COLUMN BASED ON THE L.S.D.

Table 4. Characterization of tall fescue and perennial ryegrass varieties and their performance across years and locations. 1993 Kentucky Tall Fescue Variety Tests L.M. Lauriault, J.C. Henning, and G.D. Lacefield			Lexington	Princeton
			1992 ¹	1992
Variety	Source/KY Distributor	EI ²	93 ³	93
Cajun	International Seeds/Green Seed	low	**	*
Cattle Club	Green Seed	free	*	*
GA-87-E	GA Agric. Exp. Sta./Experimental	free		*
GA-120-L	GA Agric. Exp. Sta./Experimental	free		**
ISI 8976	International Seeds/Green Seed	low		
Johnstone	KY Agric. Exp. Sta./Public	free		
Kenhy	KY Agric. Exp. Sta./unavailable	free	*	
KY 31, endophyte-free	KY Agric. Exp. Sta./Experimental	free	*	*
KY 31, endophyte-	KY Agric. Exp. Sta./Public	high		*
Martin	MO Agric. Exp. Sta./International	low		
Maximize	Turf Seed, Inc./Geo. W. Hill,	low		*
Mozark	MO Agric. Exp. Sta./International	free	*	*
OFI-88-B1	Olsen-Fennell Seeds	free		*
OFI-88-B15	Olsen-Fennell Seeds	free		
Phyter	FFR/Southern States	low	*	*
Stargrazer	FFR/Southern States	low	*	*
TF8805	FFR/Experimental	free ⁴	*	*
TN-TF-SYN-1	TN Agric. Exp. Sta./Experimental	free		
Bison perennial		low	**	**
Jackaroo perennial	Wright Stephenson Seeds	high		

¹ Establishment year	**Highest yielding variety within species in the test for that
² Endophyte Infection Level	*Not significantly different from the highest yielding variety within
³ Harvest year	⁴ Plots sown with seed containing dead endophyte, stand is

Table 5. University of Kentucky Extension Service publications related to tall fescue management.

Publication	Title
AGR-59	Tall fescue
AGR-108	Tall fescue in Kentucky
AGR-64	Establishing forage crops
-----	Seed tags: What they reveal
AGR-26	Renovating hay and pasture fields
PPA-30	Sampling for the tall fescue endophyte in pasture and hay fields
AGR-119	Alternatives for fungus infected tall fescue
AGR-126	Replacement of an endophyte infested stand
AGR-18	Grain and forage crop guide for Kentucky
AGR-1	Lime and fertilizer recommendations
AGR-103	Fertilization of cool season grasses
AGR-44	Season of the year affects nutritional value of tall fescue
PPA-9	Collecting plant specimens for disease diagnosis
ASC-16	Beef: Grass tetany in beef cattle