

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2020

INTRODUCTION

Varieties of several forage-crop species are evaluated every year in the Mississippi Agricultural and Forestry Experiment Station's (MAFES) small-plot forage trials. Entries are provided by seed companies and forage and breeding programs at state universities. Experimental and commercially available varieties are tested at one or more locations across Mississippi. All entries from privately owned companies are tested on a fee basis. Some varieties may be added by MAFES forage variety testing program as a reference for comparison purposes. In addition, varieties of interest may also be added when applicable. Testing during 2019-2020 was conducted at the following locations: Prairie Research Unit (Prairie), Leveck Animal Research Center Forage Unit (Mississippi

State campus), Coastal Plain Branch Experiment Station (Newton), and White Sands Research Unit (Poplarville). However, due to flooding and overall plot failure, only the Starkville location was analyzed.

Data presented in Tables 2–4 was used to evaluate the performance of each forage crop within its respective trial. Mean and harvest comparisons were statistically evaluated by using the least significant difference (LSD) test at the probability level of $\alpha = 0.05$. The LSD value represents the minimum amount of dry matter yield (pounds of dry matter per acre) that must be observed between any two varieties to determine if the difference was due to variety performance alone. Sources of seed are presented in Table 5.

PROTOCOL

Annual ryegrass, small grains, and clover trials across the state were established from October to November 2019. At all locations, soil samples were taken and analyzed by the Mississippi State University Soil Testing Laboratory. Trial areas were amended with lime and fertilized with phosphorus (P_2O_5) and potassium (K_2O) according to the soil test recommendations for individual species. Grass trials were additionally fertilized with 50 pounds of nitrogen per acre at planting and after each harvest using urea ammonium sulfate (33-0-0/11S). Plots were 6 feet by 10 feet and planted using a precision cone seeder on a prepared seedbed. Trial design was a randomized complete block replicated four times. The seeding rates are presented in Table 1. Individual trials were harvested when 75% of the plots

Table 1. Recommended seeding rates for cool-season forage crops.

Type/Species	Seed rate
	<i>lb/A</i>
Annual Grasses	
Rye	100
Oat	100
Triticale	100
Ryegrass	30
Annual Clovers	
Arrowleaf	10
Berseem	25
Balansa	4
Ball	3
Crimson	30
Persian	8

achieved 15 inches of growth. All plots were harvested to a 3-inch stubble height. Plots were harvested using a Winterstieger Cibus F equipped with a forage plot harvester reel type header that collected a 4.8-foot by 10-foot swath to calculate total yield. A subsample was

collected and dried at 130°F until constant weight was achieved to calculate DM concentration. Data were analyzed using the General Linear Model (PROC GLM) of SAS and mean separation was conducted using LSD at $\alpha = 0.05$.

ANNUAL RYEGRASS

Introduction

Annual ryegrass is the most relevant and versatile cool-season annual grass for livestock producers in Mississippi. In pasture and hay systems, annual ryegrass is a popular forage because of its ease of establishment, high nutritive value, high yielding potential, good reseeding ability, and adaptability to a wide range of soil types. Annual ryegrass can be established in pure stands or mixed with small grains and/or clovers for cool-season forage production. For these reasons, annual ryegrass is a staple for many cool-season grazing programs in Mississippi. Recommended planting dates vary by location but usually fall between September to mid-October for prepared seedbed or late October if overseeded on a warm-season perennial grass pasture. Seeding rates are 30 pounds per acre for pure stands and 20 pounds per acre for mixtures with small grains and/or clovers. Annual ryegrass is very responsive to nitrogen fertilizer, and its use should be split into two

applications for grazing systems. Reasonable productivity can be expected from November to May in the southern part of Mississippi and February to May in the northern part of Mississippi. Annual ryegrass should normally be allowed to reach an initial height of at least 10 inches before grazing begins.

Results

Data in Table 2 present the yield performance of ryegrass varieties in Starkville. The mean yield of the first harvest was 1,279 pounds per acre. Among replications, variety performance was highly variable leading to minimal statistical differences between varieties. In the second harvest, the mean yield was 3,259 pounds per acre, the greatest among individual harvest. The mean yield of the third was 1,135 pounds per acre, less than the first and second harvests. The total seasonal mean was 5,635 pounds per acre with yield ranging from 4,062 to 6,922 pounds per acre among varieties.