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Ryegrass Establishment in East Texas

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Summary

Annual ryegrass (*Lolium multiflorum* Lam.) is used to overseed warm-season perennial grass pastures to extend the grazing season by providing high-quality forage in late winter and spring. A study was conducted to investigate the influence of planting methods and seeding rates on ryegrass seedling density and yield when 'TAM 90' ryegrass was overseeded on 'Coastal' bermudagrass [*Cynodon dactylon* (L.) Pers.]. Ryegrass seedling density increased with seeding rate regardless of planting method. First harvest yields also increased with seeding rate and were significantly higher when the bermudagrass sod was disked lightly before planting. Broadcasting ryegrass seed resulted in higher first harvest yields than did drilling seed as seeding rate increased above 25 lb/A. The influence of planting method on total yield varied with seeding rate, but disking before drilling or broadcasting ryegrass seed was always the most productive.

Introduction

Annual ryegrass is used extensively throughout the eastern half of Texas for winter pasture, lawns, and soil stabilization along roadsides. Its primary attributes are adaptation to a wide range of soil types, ease of establishment, and high forage quality. Annual ryegrass is also responsive to nitrogen (N) fertilizer, tolerant of close grazing, and higher yielding than small grains in East Texas (Nelson et al., 1991; Ward et al., 1991). Ryegrass is easy to establish because good stands can be obtained by broadcasting the seed on the soil surface. Higher seeding rates are suggested when seed are broadcast instead of drilled because a lower percentage of the broadcast seed is assumed to germinate in the less favorable microclimate for seedling establishment. Ryegrass planting methods and seeding rates were compared on a Coastal bermudagrass hay meadow at the Overton Research and Extension Center.

Procedure

The test site was on a fine sandy loam soil (Keithville Sawtown). Soil analysis indicated a pH of 6.9 with 51, 18, and 88 ppm of available N, phosphorus (P_2O_5), and potassium (K_2O), respectively. Experimental design was a split plot with four replications and a plot size of 8 x 15 ft. Main plots underwent establishment methods of (1) light disking and drilling seed, (2) light disking and broadcasting seed, (3) drilling seed in sod, and (4) broadcasting seed on sod. Subplots underwent seeding rates of 15, 25, 35, and 45 lb/A of TAM 90 ryegrass. The Coastal sod was mowed to a 1-in. stubble height with a flail mower before planting. The light disking treatment involved going over the area twice, disking about 2 in. deep with only a slight tilt on the disk blades. The drill was set to plant seed in 7-in. rows. On October 7, 1991, the study was planted and fertilized with 84 lb P_2O_5, 84 lb K_2O, 1 lb boron, and 10 lb magnesium per acre. A drag harrow was pulled over all plots to help shake the seed to the soil surface in the sod treatments and cover the seed in the disk treatments. The first frost that terminated bermudagrass growth was November 4, 1991.

Ryegrass seedling counts were taken in two random 12- x 14-in. quadrants in each plot on November 18, 1991. Nitrogen fertilizer rates and dates were 60 lb/A on November 21 and January 14 and 50 lb/A on February 28 and April 9 for a total of 220 lb/A. A 5-ft strip was harvested from the center of each plot on February 27, March 26, April 21, and May 20. A 12- x 14-in. subsample was taken from each plot at the last harvest to determine ryegrass and Coastal bermudagrass percentages.

Results and Discussion

A linear relationship existed between seeding rate and seedling density for each planting method (Fig. 1). The disk and broadcast planting method had significantly more seedlings than the other methods at the higher seeding rates. Competition between ryegrass seedlings was delayed in the broadcast seeding because of more even distribution of seed than in the drill seeding when disked. Bermudagrass competition suppressed seedling density in the nondisked treatments.

There was about a 250- to 300-lb/A advantage to the disked treatment in the first harvest (Fig. 2). Bermudagrass competed less with the ryegrass seedlings on the disked treatments. First harvest yields increased as seeding rate increased but did so at a faster rate when the seed were broadcast. As

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stated previously, this was probably due to more even distribution of the seed, which resulted in less competition between ryegrass seedlings in the early part of the growing season.

The relationship between total yield for the season and seeding rate varied with establishment method (Fig. 3). At the low seeding rate of 15 lb/A, disking and drilling had a slight advantage. There were no significant differences between planting methods at 25 lb/A. Disking at the highest seeding rate produced a 600-lb/A advantage.

Ryegrass stands can be increased by increasing seeding rates. Early forage production was directly related to seedling density and seeding rate. But once a solid ryegrass canopy was formed, there was little advantage to seeding rates in excess of 25 lb/A. Reducing bermudagrass competition by disking enhanced early ryegrass production. In this study, ryegrass was harvested when it reached approximately an 8-in. height. If ryegrass is kept below a 4-in. height under continuous grazing, seeding rates as much as 45 lb/A would be advantageous.

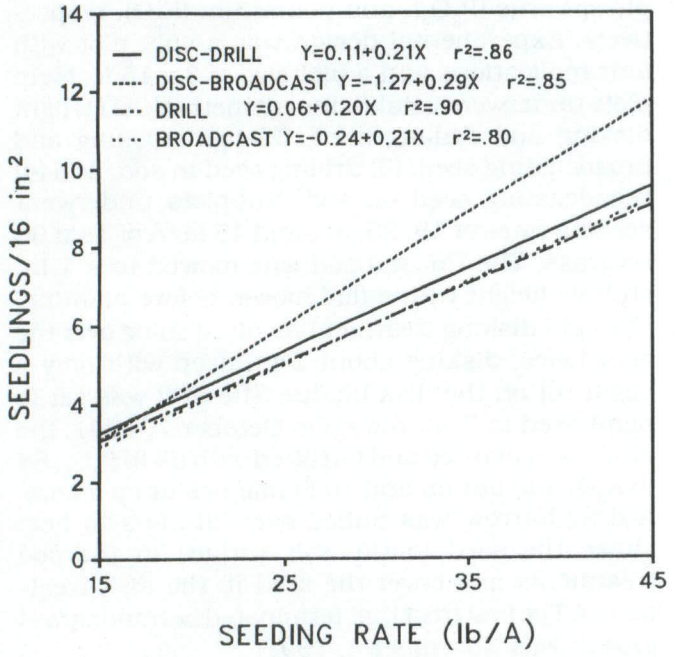

Figure 1. Relationship of seeding rate and planting method on annual ryegrass seedling density 6 weeks after planting.

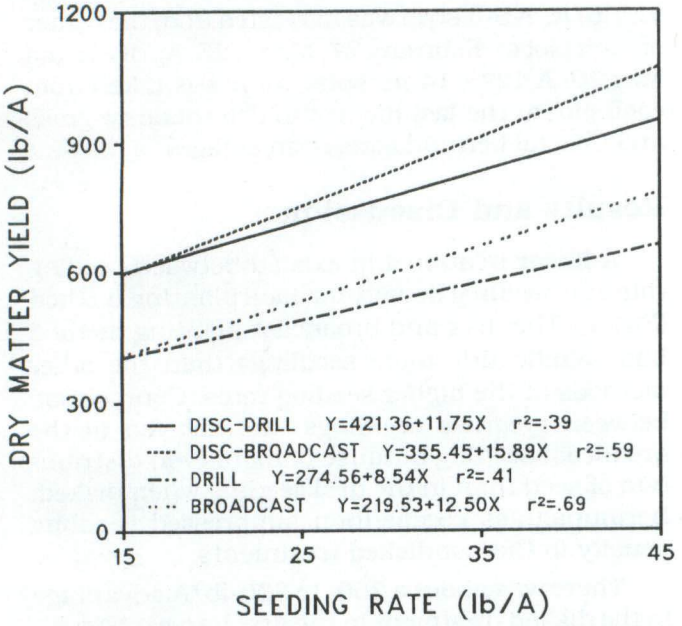

Figure 2. Influence of seeding rate and planting method on first harvest yields of annual ryegrass.

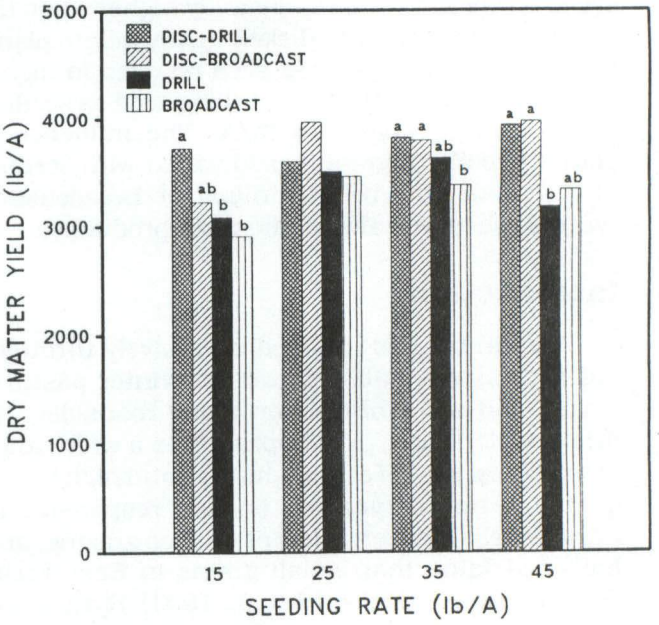

Figure 3. Influence of seeding rate and planting method on total forage production of annual ryegrass. (Yields within a seeding rate with the same letter are not significantly different at the 0.05 level, Waller-Duncan Multiple Range Test.)

Literature Cited

Ward, S., J. Crowder, and L. R. Nelson. 1991. Oat, rye, wheat, and triticale forage variety tests at Overton in 1988-89. *In* Forage Research in Texas, 1989. Tex. Agric. Exp. Stn. CPR-4731, p. 50-53.

Nelson, L. R., S. Ward, J. Crowder, and G. W. Evers. 1991. Annual ryegrass forage variety tests at Overton and Angleton for 1987-1988. *In* Forage Research in Texas, 1989. Tex. Agric. Exp. Stn. CPR-4731, p. 54-56.