

FIELD DAY REPORT - 1993

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NITROGEN FERTILIZATION OF ARROWLEAF CLOVER-RYEGRASS PASTURES

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Background. Clover-ryegrass mixtures are overseeded on warm-season perennial grasses such as bermudagrass and bahiagrass to provide grazing when the summer grass is dormant. Ryegrass provides early growth if fertilized with nitrogen (N) and helps reduce the bloat potential of grazing a legume. Clover provides a high quality forage during the spring months and can obtain N from the air through N_2 -fixation. Nitrogen fertilizer is a necessary input for early ryegrass production. However, applying too much N at critical periods can reduce the clover stand with a corresponding decrease in spring growth and N_2 -fixation.

A study examining N rate and time of application on an arrowleaf-ryegrass mixture was conducted at the Texas A&M University Agricultural Research and Extension Center at Overton. 'Yuchi' arrowleaf clover and 'TAM 90' ryegrass were overseeded on a short 'Coastal' bermudagrass sod on October 22, 1991. Nitrogen was applied at 0, 30, 60, and 90 lb/ac at planting or a month later when arrowleaf clover seedlings had one true leaf. These initial N treatments were followed with an additional 0 or 60 lb N/ac on January 20 and after the first harvest on March 13. Pure stands of arrowleaf clover and ryegrass without N and ryegrass with 180 lb N/ac in three equal applications were additional treatments. Phosphorus and potash were applied at planting according to soil test.

Research Findings. Early N fertilization treatments had little effect on clover yields at the first harvest (Mar. 12) because arrowleaf clover produces little growth during autumn and winter (Figure 1). Early clover production was maximized where no N was applied until January 20. Delaying N fertilization restrained ryegrass competition and the N applied in January enhanced clover growth as can be seen when compared to the no N treatment. Comparison of treatments with and without January N demonstrates the necessity of winter N fertilizer for ryegrass production. Applying N a month after planting instead of at planting improved ryegrass yields. Total clover production for the year was best where no N had been applied (Figure 2). There were no major differences in arrowleaf yield among the N fertilizer treatments. Applying 60 lb N/ac one month after planting and in January to an arrowleaf-ryegrass mixture provided the same amount of forage as a pure ryegrass stand fertilized with 180 lb N/ac.

Application. If winter grazing is not needed, N should not be applied to a arrowleaf-ryegrass mixture. Winter production can be obtained by applying 50-60 lb N/ac a month after

planting and 6- to 8-weeks later.

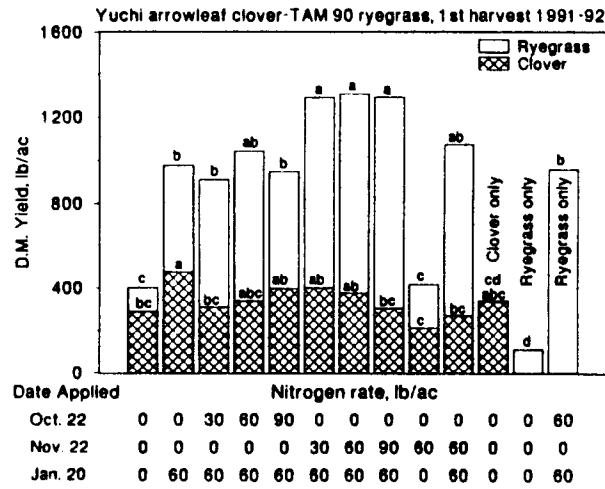


Figure 1. Influence of nitrogen fertilizer on arrowleaf clover-ryegrass production by March 12. Clover and total yields followed by the same letter are not significantly different (0.05 level, Waller-Duncan MRT).

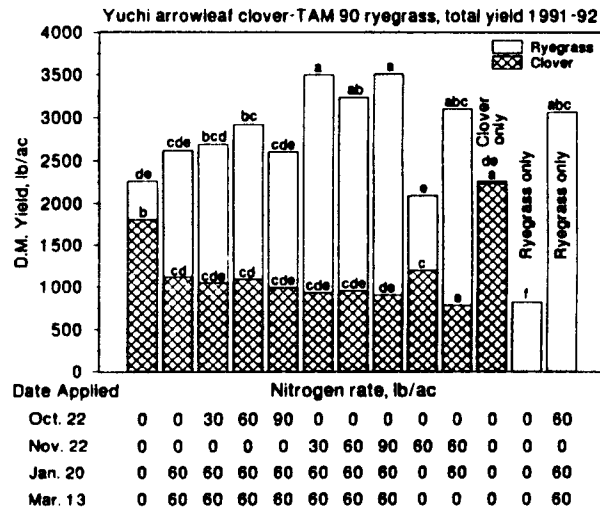


Figure 2. Influence of nitrogen and application time on total yield of arrowleaf-ryegrass mixtures.