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NITROGEN FERTILIZATION OF CRIMSON 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 crimson clover-ryegrass mixture was conducted at the Texas A&M University Agricultural Research and Extension Center at Overton. 'Dixie' crimson 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 crimson 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 6. Pure stands of crimson 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. Crimson clover has good seedling vigor and the genetic potential to produce late autumn and winter forage. Crimson clover was most productive when N was withheld until January 20 (Figure 1). Early crimson clover growth was reduced by ryegrass when N was applied at planting and even more when N was applied a month after planting. Nitrogen applied at 60 lb/ac in January was the major factor influencing winter ryegrass production. The most efficient N treatment for crimson clover-ryegrass was 60 lb N/ac in January, after withholding earlier N treatments. The pure ryegrass plots were harvested about a week after the clover-ryegrass mixtures. This is the reason for the higher ryegrass yields with N.

Crimson clover production was significantly reduced for the year when N was applied to the mixture (Figure 2). Applying N increased total yield only 500 to 900 lb/ac more than the clover-ryegrass mixture with no N. The pure stand of ryegrass with 180 lb N/ac produced only 350 lb/ac more than the mixture with no N. Differences in total yield reflected winter ryegrass production which was dependent on the N application in January. Applying N in March did not

improve yield if N was applied a month after planting and in January.

Application. Production of crimson clover-ryegrass without N is good but is limited to the spring. The most effective N application time for increasing ryegrass and earlier forage production is early winter.

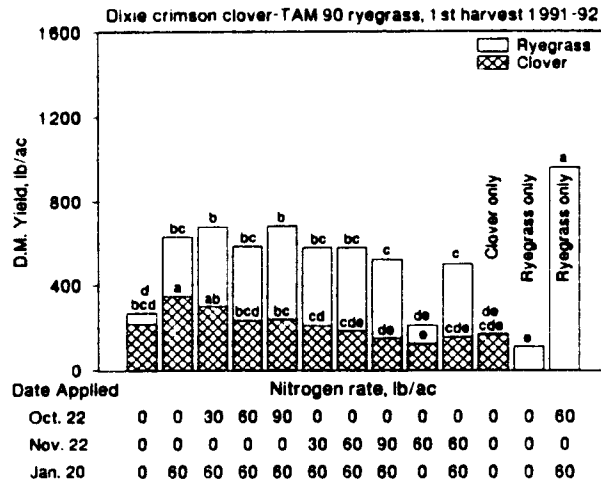


Figure 1. Influence of nitrogen fertilizer on crimson clover-ryegrass production by March 6. Clover and total yields followed by the same letter are not significantly different (0.05 level, Waller-Duncan MRT).

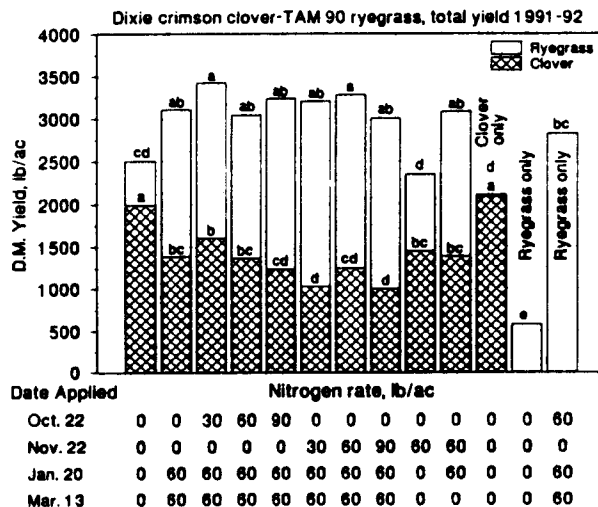


Figure 2. Influence of nitrogen fertilizer on total production of crimson clover-ryegrass mixtures. Clover and total yields followed by the same letter are not significantly different (0.05 level, Waller-Duncan MRT).