NEWS & VIEWS

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Manage Ryegrass Fertility for Maximum Profit and Yield

THERE ARE several reasons why annual ryegrass is a popular cool season forage crop in the southern U.S. It is easily established, it provides high quality forage, produces relatively high yields, has good reseeding ability, and it can be grown in a wide range of soil and climatic conditions.

The primary area of annual ryegrass production in the U.S. is from central Texas and Oklahoma eastward to the Atlantic coast and north to the transition zone of warm and cool season grasses. It performs well in soils with pH values ranging from 5.5 to 8.0, and, in addition to excellent growth on sandy soils, is adapted to wet clayey soils due to its ability to produce adventitious roots at or near the soil surface.

One of the primary reasons that annual ryegrass is grown so extensively is the excellent diet that it provides ruminants at a time when grazing from warm season forages is very low in quality or not available. Ryegrass shares this attribute with small grain species, but is often preferred for its more uniform growth pattern, sward stability under wet conditions, and other favorable characteristics. Dry matter digestibility may be near 80 percent early in the season and remains as high as 65 percent throughout the season. Protein content ranges from 15 to 20 percent with no nitrogen (N) fertilizer and may be as high as 26 to 28 percent with N fertilization. Leaf tips may contain more than 30 percent protein.

In Texas, annual ryegrass grows well from the deep, sandy, acid soils of east Texas to the poorly drained clay soils of the Texas Rice Belt. Of the nearly one million acres of ryegrass in Texas, most is in the eastern half of the state. However, it is becoming established as a major species for grazing stocker cattle in southwest Texas, especially along the southern edge of the Edwards Aquifer. Furthermore, the pressures from the urban centers of this region on agriculture to reduce groundwater consumption will likely result in further increases in ryegrass acres. Since ryegrass yield response data from this area were not available, a study supported by PPI/FAR was recently initiated near Uvlade, Texas to investigate the effect of N and phosphorus (P) fertilization on annual ryegrass forage production under center pivot irrigation.

The study began in the fall of 1995 and was conducted on a soil that tested low in N, medium in P, and very high in potassium (K). Rates of N were 0, 120, 240, 360, and 480 lb/A, and were split into three applications, except for the 480 lb/A rate which was applied in four applications. Phosphorus was applied preplant and incorporated at 0, 20, 40, and 80 lb P_2O_5/A rates. The effect of fertilization and the interactions between nutrients on ryegrass forage production in the 1995-1996 season are illustrated in **Figure 1**. Response to both N and

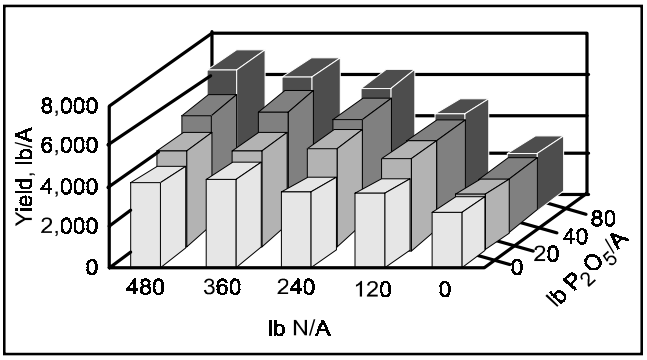

Figure 1. Effect of fertilization on ryegrass forage yield during the 1995-1996 season. (Lippke)

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P fertilization was excellent, and as P rate increased, response to N and N use efficiency were improved.

An economic analysis based on estimated steer gain per acre was prepared from the yield data and is illustrated in **Figure 2**. The greatest estimated profit per acre was where N was applied at 360 lb/A and P was applied at the highest rate of 80 lb P_2O_5 /A.

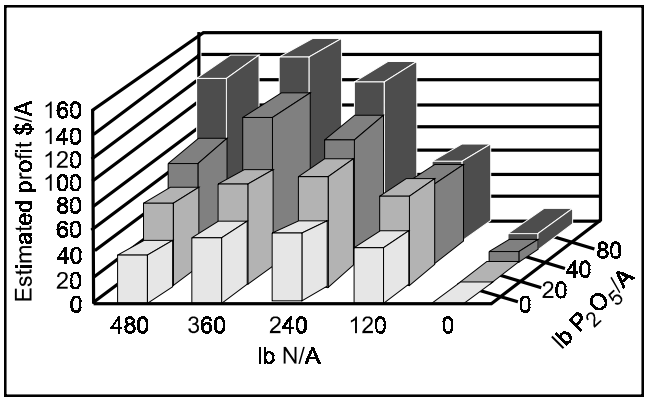

Figure 2. Effect of fertilization on estimated profit from stocker gain during the 1995-1996 season (Lippke).

In the second year of the study, the P fertilization rate was adjusted upward since maximum response was not determined in the first year. In the 1996-1997 season, N fertilization remained the same as the previous year, but P rates were 0, 40, 80, 120, and 160 lb P_2O_5/A. Fertilization practices were consistent with the 1995-1996 season. Response to N and P fertilization is illustrated in **Figure 3**. Nitrogen application beyond 240 lb/A did not significantly increase production. Also, P application above the 80 lb P_2O_5/A rate did not increase forage production. In the second year, added N was ineffective for increasing ryegrass yeilds unless P was also applied. This study is ongoing, and future data will provide an even clearer picture of the optimum fertilization practices for ryegrass in this region of Texas.

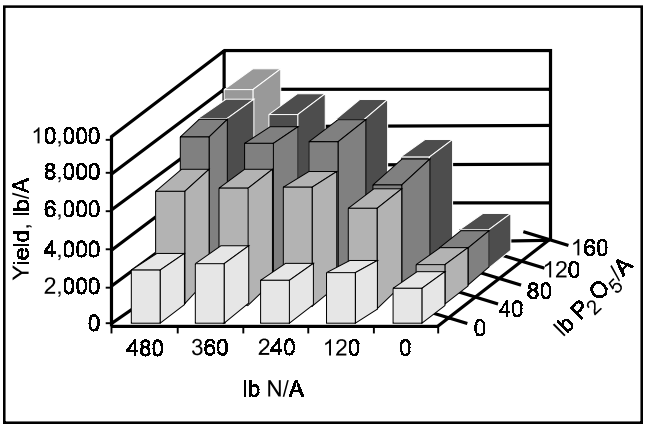

Figure 3. Effect of fertilization on ryegrass forage yield during the 1996-1997 season. (Lippke).

Ryegrass is an extensively used forage crop in Texas and the southeastern U.S. It can be grown in a variety of soil conditions and has excellent potential for both yield and forage quality. Proper fertilization based on soil tests and nutrient removal is crucial in attaining optimum ryegrass forage quality and yield. Balanced fertility management is also important in maximizing nutrient use efficiency and, consequently, reducing risks to the environment from nutrient leaching or runoff. ■

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