Environmental Impact of Fertilizing Cool-Season Forage Grasses at Economically Optimum Nitrogen Rates. (C06-hall131914-Poster)

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Abstract:

The objectives were to determine the N application rate to four cool-season grasses species that optimizes economic return while minimizing NO3-N remaining in the soil. Four N rates were applied to established stands of orchardgrass (Dactylis glamerata L.), tall fescue (Festuca arundinacea L.) and timothy (Phleum pratense L.) for three years. The grasses were harvested three and four times per year. Economical optimum N rates (ENR) were 225, 294 and 228 kg N ha-1 or 23, 28, and 28 kg N Mg-1 forage harvested for orchardgrass, tall fescue and timothy, respectively. At ENR, NO3-N concentration exceeded 1000 ppm in forage from early-season harvests when four harvested per year were taken but not when three harvests per year were taken. Apparent nitrogen recovery ranged from 34 to 80% and was greatest at or near ENR. Soil NO3-N concentration was generally not elevated above background levels at ENR. Our results indicate that the ENR for the cool-season grasses we evaluated is approximately 5 to 7 kg N Mg-1 forage greater than existing recommendations in the northeastern United States and that soil NO3-N is not elevated at this level of N application.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 928

Keywords:
Cool-season grasses, Nitrogen fertilization