

Management and Livestock Performance of Alfalfa-Tall Fescue Mixed Stands

Pepper Monique Raines

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Master of Science
in
Crop and Soil Environmental Sciences

Dr. S. Ray Smith, Jr., Chair
Dr. Joseph P. Fontenot
Dr. A. Ozzie Abaye

April 26, 2004
Blacksburg, Virginia

Keywords: alfalfa, tall fescue, alfalfa-tall fescue, rotational stocking, forage quality

Copyright 2004, Pepper M. Raines

Management and Livestock Performance of Alfalfa-Tall Fescue Mixed Stands

Pepper M. Raines

Abstract

Tall fescue (*Festuca arundinacea* Schreb.) and alfalfa (*Medicago sativa* L.) have many desirable forage attributes, are grown extensively throughout the USA, and combined form a productive pasture mixture. The objective of this research was to develop recommended management practices for alfalfa-tall fescue mixtures and compare livestock performance, forage quality, and productivity of this mixture to N-fertilized endophyte-free tall fescue. Forty-eight Angus or Angus crossbred steers were rotationally stocked on a four-replicate alfalfa-tall fescue and N-fertilized tall fescue pasture system during 2002 and 2003. Livestock gain, forage quality, and forage production were monitored throughout the seasons. Management treatments conducted within wire exclosures included defoliation height, rest period, exclosure movement, and month and were evaluated using detailed botanical composition and persistence measurements. Defoliation height, rest period, and month all affected alfalfa-tall fescue competition. Alfalfa was generally more competitive with longer rest periods and shorter heights, although results were not consistent. Alfalfa composition and persistence declined dramatically over the 2003 season due to climate, grazing management, and cultivar. Cool, high moisture conditions stimulated tall fescue growth and reduced alfalfa vigor and survival. Livestock gains were higher for pure tall fescue at one date in 2002, but higher overall for alfalfa-tall fescue during 2003. Forage quality (CP, NDF and ADF) was consistently higher for alfalfa-tall fescue during both seasons. In conclusion, both

alfalfa-tall fescue and N-fertilized endophyte-free tall fescue produce productive pastures and high ADG in beef steers in Virginia, but continued management research is required to maintain the alfalfa component of this mixture.