

NUTRIENT COMPOSITION, HERBAGE PRODUCTION, AND GROWTH
PATTERNS OF SELECTED WARM-SEASON GRASSES

A Thesis
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Donovan Jay Craig

In Partial Fulfillment of the Requirements
for the Degree of
MASTER OF SCIENCE

Major Program:
Natural Resources Management

Major Department:
Animal and Range Sciences

March 2002

Fargo, North Dakota

ABSTRACT

Craig, Donovan Jay, M.S., Program of Natural Resources Management, Department of Animal and Range Sciences, College of Agriculture, North Dakota State University, March 2002. Nutrient Composition, Herbage Production, and Growth Patterns of Selected Warm-Season Grasses. Major Professor: Dr. Kevin K. Sedivec.

The nutrient composition, herbage production, and growth patterns were determined for 16 selected varieties of warm-season grasses established in experimental plantings near Hettinger, ND, and Pierre, SD. Grass varieties were established at each location using a randomized complete block design (RCBD) replicated three times. Samples were hand clipped from 0.5m² frames at 3-week intervals during the growing seasons of 1999 and 2000. Dry matter production curves were developed for all varieties that were successfully established. 'Dacotah' switchgrass, blue grama, and sideoats grama varieties developed seed heads earlier than other warm-season grasses in this trial. Grass varieties of North Dakota origin typically developed earliest. 'Forestburg' switchgrass produced the highest peak herbage production at both sites in 1999 and 2000. Tall grass species produced the greatest amount of standing biomass at Pierre; however, short-stature species like sideoats grama produced greater amounts at Hettinger. Crude protein (CP) and in vitro dry matter digestibility (IVDMD) declined with time and maturity for all grass varieties with year, variety, and location effects occurring ($p < 0.05$). Blue grama varieties maintained higher CP late into the growing season relative to other species. In addition, varieties that maintained a vegetative condition longer were higher in quality than those that developed seed heads early. Southern varieties of big bluestem and Indiangrass, along with varieties of sand bluestem, were highly digestible throughout the season. These grasses were also typically lowest in acid detergent fiber (ADF) and neutral detergent fiber (NDF). These fiber fractions tended to increase with time and maturity; however, they did experience year, variety, and location effects ($p < 0.05$).