

# Forage Crop Research: Evaluating Forage Species in Iowa for Productivity during Drought Conditions—Yield

M. H. Wiedenhoft, associate professor  
R. L. Hintz, assistant scientist  
P. Patrick, research associate  
Department of Agronomy

## Introduction

Drought often results in greater agricultural damage in southern, western, and northeastern Iowa than in the rest of the state. Slight to steep slopes are prone to erosion, and soils high in clay content are slow to drain excess moisture during wet periods; they have low amounts of available moisture during periods of drought. This land is predominantly used for livestock production because of the factors that limit the level of productivity in row crop production. Sorghum, sudangrass, and sorghum-sudangrass hybrids are adapted to environments with limited rainfall and high temperatures. New varieties have not been tested for Iowa conditions.

The objective of this research was to evaluate forage species for their seasonal productivity differences and their ability to withstand droughty environmental conditions in Iowa.

## Materials and Methods

Small plots of pure stands of various forage species were seeded at a rate of 20 lb/acre, with a 30-in. row spacing in a completely randomized block design with six replications at Nashua on May 17, 2001, May 15, 2002, and May 22, 2003. The plots were fertilized according to the previous crop and the current soil test. Plant materials used were forage sorghum, GX-BMR (Wolf River); sudangrass, True Hybrid (Cenex) and Trudan 10 (NK); and sorghum-sudangrass hybrid, Nutri+Plus BMR (Wolf River), Sweet Sioux (Cargill), and STE6 (Dekalb). The forage plots were harvested at a vegetative (July 10, 2001, July 9, 2002, and July 9, 2003), boot (July 24, 2001, July 19, 2002, and July 21, 2003),

dough (August 21, 2001, August 21, 2002, and August 12, 2003), and grain or silage growth stage (September 11, 2001, September 18, 2002, and September 3, 2003). Regrowth was harvested from the plots that had been harvested at the vegetative and boot stages (September 8, 2002, and September 3, 2003). Forage yields were determined by collecting and weighing a harvested area of 50 ft<sup>2</sup>. The dry matter was determined by taking a representative subsample, which was weighed, dried, and reweighed.

## Results and Discussion

Sudangrasses have smaller, finer stems than sorghum-sudangrass hybrids, which have finer stems than forage sorghums. Consequently, sudangrasses and sorghum-sudangrass hybrids are more easily cured for hay than forage sorghums. The sorghum-sudangrass hybrids, Nutri+Plus BMR, Sweet Sioux, and STE6, tended to outyield the sorghum and sudangrass varieties for all three growing seasons. In general, the dry matter yields were higher when the plants were harvested at the silage stage of growth, regardless of the year. Yields in general were lower than the expected yield from corn silage with good environmental conditions. However, in a year with poor environmental conditions the sorghum-sudangrass hybrids could easily produce more dry matter per acre compared with corn silage.

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