

A Nutritional Calendar for Forage Kochia

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Introduction

In the northern Great Basin, annual feed costs represent a major obstacle to beef producers and threaten the future of beef production. Feed costs can range from \$100 to \$200 per cow each year. In addition, much of the range in the northern Great Basin is becoming infested with cheatgrass due to past overgrazing and/or recurring wildfires. Forage kochia (*Kochia prostrata*) (Fig. 1) may be a complementary forage that can decrease winter supplementation costs while aiding in fire prevention. However, very little research has explored the nutritional quality of forage kochia for grazing ruminants.

Forage kochia is a half-shrub native to the arid and semiarid regions of central Eurasia. Because of its natural ability to survive in arid climates and on saline soils, many scientists and rangeland managers consider forage kochia a prime candidate for use in western range rehabilitation and fire prevention efforts. It tends to slow the spread of wildfires when used as a greenstrip; however, it will burn if surrounded by sufficient fuel. Following burning, it will sprout and regrow and is used extensively for seeding after fires on cheatgrass-dominated rangelands to help prevent future wildfires. No research has yet determined whether forage kochia seeds consumed by ruminants have the ability to germinate after passage through the digestive tract, thereby spreading to other range sites.

This experiment was conducted to develop a nutritional calendar for forage kochia and to determine whether forage kochia seeds are viable and germinate following passage through the gastrointestinal tract of ruminants.

Experimental Protocol

In 1986 and 1987, forage kochia was established on plots 1.25 miles north of Mud Lake in the Harney Basin of southeastern Oregon. These plots were fenced and excluded from cattle grazing but were accessible to wildlife. Plants were clipped on the 15th of July 2001, October 2001, January 2002, and April 2002. Samples were analyzed for nutritional content. Also, five ruminally cannulated steers were used

to determine the viability of forage kochia seeds following ruminal incubation.

Results and Discussion

Forage kochia crude protein (CP) concentrations were higher in July through January than normally found in native grasses within the northern Great Basin (Fig. 2). During periods when native cool-season grasses were actively growing, forage kochia CP concentration was lower than native grasses. Also, ruminal digestibility of dry matter and CP from forage kochia decreased linearly from July 2001 through April 2002. However, these levels would increase the ruminally digestible dry matter and CP normally available to ruminants



Figure 1. Forage kochia (*Kochia prostrata*) growing in the Catlow Valley of southeast Oregon.

grazing dormant native range.

These results suggest that forage kochia may function as a complementary forage source to grazing animals during periods when native grasses are dormant by supplying needed protein for both wildlife and domestic livestock.

Following ruminal incubation, no germination of forage kochia seeds occurred, compared with 95 percent for nonincubated seeds. These results are encouraging because they demonstrate the inability of forage kochia to become an invasive, noxious weed via ruminant dispersal.

Management Implications

Forage kochia can function as a complementary forage for domesticated livestock and wildlife grazing dormant cool-season forage in the northern Great Basin, without increasing potential stand spread through dispersal of viable seeds following grazing. During periods of native grass dormancy, forage kochia may improve the dietary CP of wildlife and domesticated livestock grazing rangelands inter-seeded with forage kochia. Furthermore, forage kochia has the potential to be a sustainable management alternative by which livestock producers in the northern Great Basin can decrease winter supplementation costs, help stabilize erodible soils, and aid in suppressing wildfires.

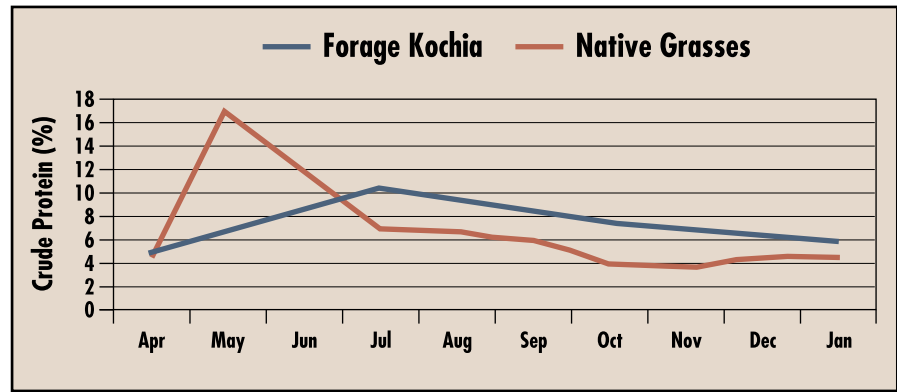


Figure 2. The effect of calendar date on crude protein concentration of forage kochia and native grasses.