



USDA-ARS Northern Great Plains Research Laboratory

Mandan, ND

Northern
Great
Plains
Research
Laboratory

Alfalfa Varieties for Grazing in the Northern Great Plains

Alfalfa can provide a valuable grazing resource for producers in the Northern Great Plains by increasing the quantity and quality of the forage resource. Alfalfa can be incorporated into existing grasslands or grazed in pure stands. Recently, several new cultivars have been released specifically for grazing. However, many of these cultivars have not been developed to withstand the climatic conditions of the Northern Great Plains.

The Northern Great Plains Research Laboratory recently completed two studies to evaluate the survival of alfalfa under grazing. One study included 16 cultivars and experimental strains of alfalfa planted into an existing grassland and heavily grazed from 1997 to 2000. The other study evaluated survival of 23 alfalfa entries in a pure stand and a grass-alfalfa mixture.

In the first study, 10 of the 16 cultivars and experimental strains had survival rates over 50% (Figure 1). Generally, those entries from colder areas such as SC MF 3713 (developed at Swift Current), Alaska Syn A (Alaska), and Anik (northern Alberta), had the highest survival. Mandan 3851, developed at NGPRL, and Travois (South Dakota) also had over 70% survival. Of all cultivars and strains, Mandan 3851 had the highest vigor rating at the end of the experiment.

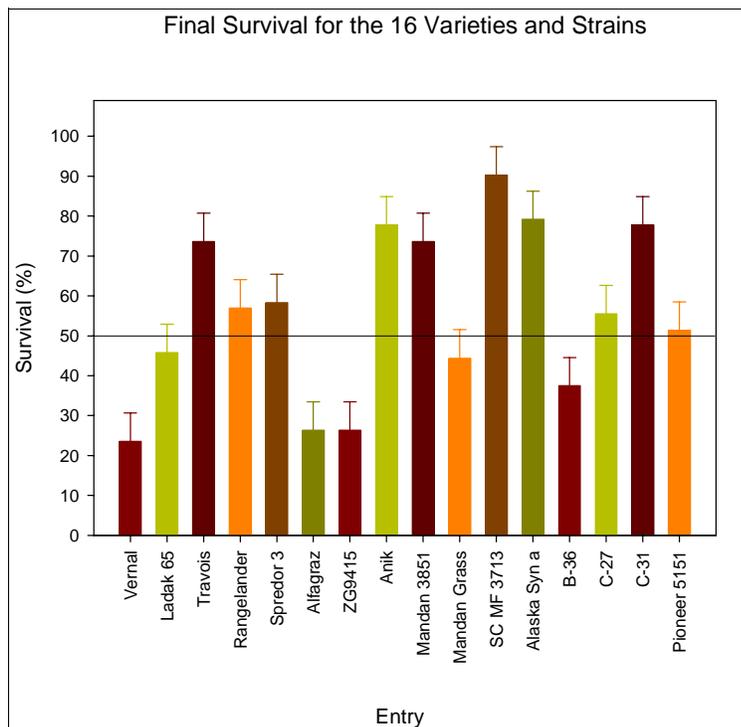
The second study was heavily grazed from 1998 to 2000, and high levels of cold-induced dormancy also were associated with high levels of survival in this study. Pasture-type alfalfas developed in northern climates (Rambler, Rangelander, Spredor2, and

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Our Vision:

An economically sustainable and environmentally sound agriculture.

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Percent survival of 16 cultivars and experimental strains of alfalfa planted into an existing grassland.

Improving Forage Quality with Palatable Shrubs

In the Northern Great Plains, livestock weight gains are typically lower in late summer than in spring and early summer. This depression in gains is largely the result of lower levels of available protein and energy in forage.

Plants become less nutritious as they mature, although regrowth has higher nutritional value. Pastures dominated by cool-season grasses possess relatively low levels of protein and energy by early August. Conversely, pastures dominated by warm-season grasses will likely have higher levels of protein and energy in early August in comparison to the cool-season grasses, but decline in quality very quickly after they reach their seed development phase.

Fortunately, not all plants grown in the Northern Great Plains are as low in protein in late summer as are grasses. The leaves of shrubs and trees typically have relatively high levels of crude protein in late summer, and cattle will often eat more leaves from these plants if available. Unfortunately, the abundance of palatable shrubs and trees is often very low on pastures of the Northern Great Plains.

New research at NGPRL seeks to rectify this situation. There are a variety of palatable shrubs that can be established in pastures in the Northern Great Plains. Examples include lead-plant (a warm-season native legume for late summer grazing) and two evergreen native shrubs called four-wing saltbush and winterfat (for fall and winter use). Crude protein levels of dried lead-plant, four-wing saltbush, and



Winterfat in late October.

winterfat from a screening trial at NGPRL in August were 16, 14, and 18%, respectively. By October, crude protein levels in dried four-wing saltbush and winterfat were 15 and 17%, respectively – more than adequate levels for good livestock productivity.

Furthermore, common shelterbelt trees like caragana may be useful as a late summer source of protein. Leaf and small stem samples of caragana collected and dried in August and September at NGPRL were very high in crude protein levels (about 20%). This small tree has been used for livestock feed in Siberia, and has been readily utilized by cattle in eastern Montana.

In short, the introduction of more palatable shrubs into pastures via interseeding or re-seeding offers great promise to improve the diet quality and productivity of animals grazing these pastures in late summer as well as fall and winter. Research on these shrubs is ongoing at NGPRL.

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NGPRL Scientists Present Dynamic Cropping Systems Research in Charlotte, NC

Scientists from NGPRL recently presented research results on dynamic cropping systems at the annual meetings of the American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America in Charlotte, NC on October 21-25.

Eight posters on dynamic cropping systems were presented as a group at the meeting. Poster topics included an overview of dynamic cropping systems, plus component posters on crop production, plant diseases, soil water use, weed populations, and soil condition. Dave Archer (USDA-ARS, Morris, MN) presented a poster on economics and crop sequencing, while Jeff Fehmi (former NGPRL Postdoctoral Research Associate; now an Ecologist with the Army Corps of Engineers) rounded out



John Hendrickson discusses weed population results with a meeting participant.

the group with a poster and computer demonstration of the Crop Sequence Calculator.

There was substantial interest in the poster session from meeting participants, which was held on Tuesday, October 23rd. A continuous flow of people visited the posters throughout the morning, with traffic increasing substantially after 10:30 a.m. Jon Hanson, Research Leader at NGPRL,

commented that the poster session was one of the busiest he's been involved in during his 22-year career. Dr. Hanson also mentioned the group presentation highlighted the 'teamwork' approach necessary to effectively address problems in natural resource management.

The theme for the 2001 meeting in Charlotte was 'Sustaining Earth and its People: Translating Science into Practice'. Highlights of the meeting included plenary sessions on the important role of soil, land, and biological resources in sustaining society to assure adequate agricultural productivity and environmental quality for future generations. Approximately 2,900 papers were presented at the meeting.

NGPRL Update

Retirement

Ron Ries, a Rangeland Scientist at NGPRL, retired from federal service in June of this year. In his 27 years at NGPRL, Dr. Ries conducted research on mine-land revegetation, grass seedling morphology, and weed ecology and management.

Prior to his retirement, Dr. Ries generously donated a new gas grill to the NGPRL Employees Organization for employee cookouts. Dr. Ries and his wife, Ann, plan to settle near Cody, WY.

Visiting Scientist

Randy Anderson, a Research Agronomist with the USDA-ARS Northern Grain Insects Research Laboratory in Brookings, SD, is serving a six-month detail to contribute weed science exper-

tise toward completed and ongoing cropping system studies at NGPRL.

Since arriving in September, Randy has been working to enhance the weed management component of the 'Crop Sequence Calculator'. Specifically, Randy is supplying information on principles that guide weed management programs and integration of weed management with crop sequencing. He is working with John Hendrickson and Ron Ries to evaluate weed data from the crop by crop-residue matrix experiment from which the Calculator is based. Together, their goal is to identify crop sequences that reduce weed density in future crops.

During his stay, Randy will also be assessing changes in the weed community in the '65-acre' long-term rotation study. Results from this work will be

presented at the National Sunflower Association Workshop in Fargo, January 17-18. Other presentations during his stay include a review of principles for designing rotations in semiarid regions at the Kansas No-Till Alliance Conference in Salina, KS, January 21-22, a talk on guidelines for devising rotations with herbicide-resistant crops at the Manitoba-North Dakota Zero Tillage Farmers Association meeting in Minot, January 29-30, and a review of weed management principles at the Northern Plains Sustainable Agriculture Society meeting in Mandan, February 1-3.

Randy has conducted research in alternative cropping systems and weed ecology during his career, with most of his research applying to the semiarid Great Plains.

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To be added to our mailing list, request a copy through our website or contact Audrey Myers by phone (701 667-3001), fax (701 667-3054), or e-mail (myersa@mandan.ars.usda.gov).

Alfalfa Varieties; cont'd

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SC MF 3713) averaged approximately 80% survival after three seasons of heavy grazing. The cultivars Alfagraze and Cut'N'Graze, developed in more southern climates for grazing, had 30 to 40% survival in our test.

Results from this research show the importance of considering the origin of the alfalfa when selecting cultivars for use in grazing.

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***** Upcoming Events *****

- ◆ National Sunflower Association Meeting
January 17-18, 2002
Ramada Plaza Suites and Convention Center
Fargo, ND
- ◆ Area IV SCD/NSA Research Results Workshop
January 22, 2002
Seven Seas Hotel and Conference Center
Mandan, ND
- ◆ Manitoba/North Dakota Zero Tillage Meeting
January 29-30, 2002
Holiday Inn Riverside
Minot, ND
- ◆ Northern Plains Sustainable Agriculture Society Meeting
February 1-3, 2002
Seven Seas Hotel and Conference Center
Mandan, ND

