Virginia Cooperative Extension

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# 'Matua' Prairie Grass

## *Bromus wildenowii*

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## Description, Cultural Practices, Use and Management

**Common names: Matua prairiegrass, Rescuegrass and Schraders bromegrass.**

## Introduction

Early spring, mid summer, and late fall are periods in Virginia where there is frequently low forage productivity. A forage crop that could stretch the grazing season by providing additional high quality feed in early spring, mid summer, and late fall when the productivity of typical cool-season forages is low would provide livestock producers with lower feed costs and increased animal performance. The ability of Matua prairiegrass (Matua) to grow at cool temperatures makes it an ideal forage for early spring and late fall grazing.

## Description:

A cool-season, short-lived perennial, bunch grass. Erect-growing, typically 2 to 3 feet tall (80-100 cm), including the inflorescence. Somewhat similar appearance to orchardgrass except that basal leaf sheaths of Matua are densely covered with fine hairs and the ligule is shorter. Leaves are light green to green rolled in the bud. Matua has no auricles, the ligule is long (8 mm), membranous, and fringed. The inflorescence is an open, drooping panicle with flat spikelets, each containing 6 to 12 florets. Seed heads are produced throughout the growing season unlike most cool-season grasses.

## Adaptation:

Adapted to well drained, high fertility soils, with a pH of 6.0-7.0. Generally, soils which support good alfalfa stands are good choices for Matua prairiegrass. Produces in warm summer conditions with adequate moisture. It grows well in sandy, drier soils that often limit other grass species. Responds well to nitrogen (N) fertility. Fairly winter-hardy with good early spring and fall production; some growth during mild winters in SE Virginia. Prolific re-seeding results in perennial stands.

## Virginia Field and Animal Trials

## Matua's Yield Potential

Figures 1 and 2 show yield from grass variety trials conducted at three locations in Virginia. The grass varieties were established in September of 1997. Depending on location, nitrogen fertilization ranged from 225 to 300 lbs/acre/year applied in split applications. The annual forage yield of Matua was higher than KY 31 tall fescue at the Northern Piedmont and Blacksburg locations (Figure 1). Additionally, a slightly better seasonal forage distribution from Matua prairiegrass was observed at these locations (Table 1). At the Southern Piedmont location, however, KY 31 tall fescue out yielded Matua both in 1998 and 1999 (Figures 1 and 2). The yield advantage of Matua compared to tall fescue at the Orange and Blacksburg locations can be attributed to slightly cooler temperatures and more precipitation at these locations. Generally, Matua's main advantage over most cool-season grass is its yield potential in summer and fall where the productivity of most cool season grass is in decline.

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**Figure 1.** Forage variety yield (ton/acre) grown at different locations in Virginia: 1998

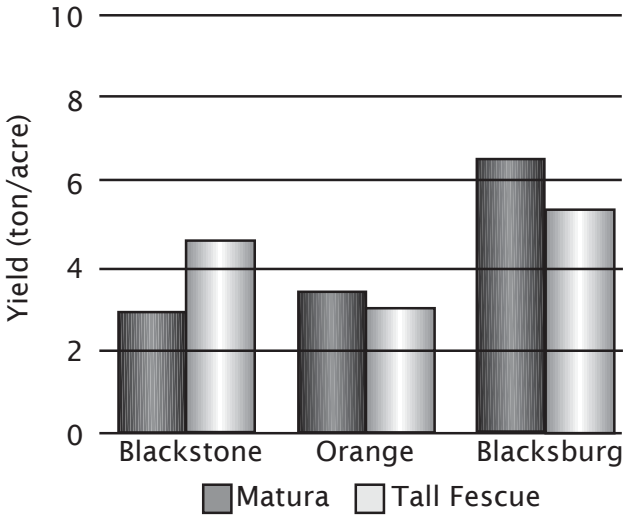


**Figure 2.** Forage variety yield (ton/acre) grown at different locations in Virginia: 1999

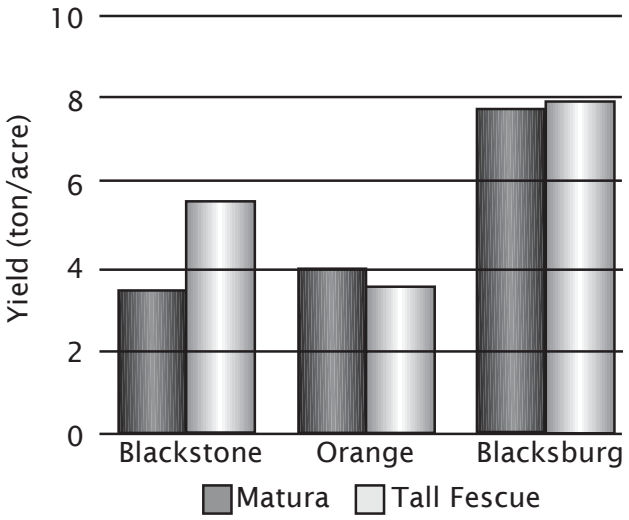


**Table 1.** Seasonal distribution of Matua prairiegrass grown at different locations in Virginia. 1998-1999. Yield ton/acre.

| Location | May | | June | | August | | Oct. | | Nov. | | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 |
| Southern Piedmont AREC | 2.43 | 2.13 | 1.29 | 1.70 | | | | | | | 0.20 | 0.39 |
| Northern Piedmont AREC | 1.62 | 2.21 | 0.89 | | 0.61 | | | | | 1.81 | 0.21 | |
| Kentland Farm, Blacksburg | 2.21 | 3.55 | 2.28 | July | 0.98<br>1.04 | 1.30 | 1.00 | | | 1.94 | | |

**Table 2.** Seasonal distribution of KY-31 tall fescue grown at different locations in Virginia. 1998-1999. Yield ton/acre.

| Location | May | | June | | August | | Oct. | | Nov. | | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 | 1999 |
| Southern Piedmont AREC | 2.11 | 2.25 | 1.53 | 1.64 | | | | | | | 1.09 | 1.49 |
| Northern Piedmont AREC | 1.40 | 1.76 | 0.97 | | 0.41 | | | | | 2.01 | 0.15 | |
| Kentland Farm, Blacksburg | 1.27 | 3.51 | 2.01 | July<br>1.36 | 0.77 | 1.35 | 1.27 | | | 1.72 | | |

## N Fertilization of Matua

Field and greenhouse experiments were conducted in Texas using five nitrogen rates (0, 20, 45, 90 and 180 lbs/acre each rate applied twice). The result of the field trial showed a linear yield response to increasing nitrogen application. However, according to the same experiment, nitrogen recovery by matua reached its maximum (>80%) only when nitrogen was applied at a rate equivalent to 45 lb/acre at each application.

## Compatibility of Matua with Legumes

A field trial was initiated in May 1998 at Blacksburg, Virginia, to investigate: 1) the compatibility of Matua prairiegrass with various legumes and 2) quality and yield performance of Matua in pure stands vs. mixed with legumes. The legume treatments: alfalfa (*Medicago sativa*), red clover (*Trifolium pratense*), ladino clover (*Trifolium repens*), and annual lespedeza (*Lespedeza stipulacea*) were drilled into an existing Matua stand (established in 1994) with or without 75 lb N/A applied in September. The seeding rate for the legumes were: 2, 5, 10, and 15 lbs/acre, for ladino clover, red clover, alfalfa and annual lespedeza, respectively. During establishment, plots were mowed frequently to suppress Matua competitiveness with legume seedlings. Yield, quality, and species composition were determined in 1998 and 1999.

In June of the establishment year (1998), red clover was the only legume that had established. By July, considerable amounts of ladino clover, red clover, alfalfa, and annual lespedeza were observed. By November, legume percentage in the Matua stand increased to 36%, 28%, and 10% for ladino clover, red clover, and alfalfa, respectively. There was no measurable annual lespedeza in November. Matua percentage was very low when grown with ladino clover. A possible incompatibility between matua and ladino clover is indicated if ladino clover in the mixture exceeds a certain percentage (>25%).

Matua yield was higher where it was grown with alfalfa, annual lespedeza, or grown alone, compared to ladino clover and red clover. This yield increase could be due to both the lower proportions of these legumes in the mixture and nitrogen contributing to the grass growth. Generally, percent NDF was higher where a higher proportion of Matua was present. Percent NDF was lower where red clover was interseeded with Matua compared with the other legumes or Matua grown alone.

## Metabolism Trial

In the spring of 1999, Matua and a mixture of alfalfa and Matua were established for use in the metabolism trial. For the pure stand of Matua, a total of 200 lb N/acre (in a split application) was used. Hay was harvested from the two plots during the 2000 growing season. At harvest, Matua was 80% headed while alfalfa was at 1/10 bloom.. In order to provide enough feed for the 14 weather lambs for a six-week feeding trial, the May, June and July harvests of each forage were combined . Prior to the beginning of the trial, all of the hay was ground in a hammermill to pass a 1.5 inch mesh screen. The lambs were fed 0.5 lb of the diet and 5 g of trace mineral salt during a two-hour feeding period, every 12 hours. Feed and feces were analyzed for DM, NDF, ADF and CP.

The crude protein contents of Matua and the mixture with alfalfa harvested at an advanced stage of maturity were similar to orchardgrass harvested at a vegetative stage in Virginia, and coastal bermudagrass harvested at early reproductive stages in Texas (Table 3). However, Matua that was harvested at early reproductive stages in Texas was higher in overall quality than any one of the forages with the exception of alfalfa (Table 3A).

The apparent dry matter digestibility of Matua and the mixture with alfalfa was similar to Caucasian bluestem, orchardgrass, and Matua fed to yearling horses, but considerably higher than for coastal bermudagrass. As expected, apparent digestibility of alfalfa was higher than all forages used (Table 3B).

## Summary of Field and Metabolism Trials

Alfalfa was the most compatible and least competitive legume with Matua.

Ladino or red clover were not compatible with Matua at the seeding rates used in our experiment.

Yields of Matua-legume mixtures were highest when the legume percentage was the highest.

Ladino and red clover treatments tended to increase the nutritive quality of grass/legume mixtures the most by: reducing % NDF, % ADF, and increasing % CP.

According to the metabolism trial conducted at Virginia Tech and Texas Tech, Matua is an acceptable forage for sheep and yearling horses. In general, the quality of Matua was second only to alfalfa.

## Management

Matua is palatable at all stages of growth, and, unlike many grasses, exhibits less decline of feed value as the plant matures.

Matua can be grown with legumes such as ladino clover or red clover if legumes are used at very low seeding rates. However, due to its less competitive nature, the stand density of Matua will decline rapidly if the stand is managed by the growth stage of legumes instead of the Matua.

Matua is sensitive to intensive grazing that utilizes frequent and/or close (below 3 inches) grazing. When soil moisture is not limiting growth, about 30-40 days of regrowth is needed before harvest.

Matua production and persistence are maximized with a 40- to 50-day rest period between harvests. It will not withstand overgrazing, especially when it is under stress of excessively wet or dry conditions.

Matua survived rates of N greater than 1000 lbs/acre; however, the N recovery efficiencies were unacceptable when annual N applications were above 250 to 400 lbs/acre (Texas Tech greenhouse research).

**Table 3.** Chemical composition (A) and apparent digestibility (B) of Matua bromegrass, Matua bromegrass + alfalfa, Caucasian bluestem, Orchardgrass, alfalfa, and Coastal bermudagass

| **A** | **Virginia Metabolism[a] Trial, 2001** | | **Virginia Metabolism[b] Trial, 1999** | | **Texas Tech metabolism [c] Trial, 1996** | | |
|---|---|---|---|---|---|---|---|
| Item | [1]Matua prairiegrass | [1]Matua prairiegrass + Alflalfa | [2]Orchards grass | [3]Caucasain bluestem | Alfalfa | [3]Matua prairiegrass | [3]Coastal bermudagrass |
| Crude | 11 | 12 | 12 | 7 | 20 | 14 | 11 |
| Protein | | | | | | | |
| NDF[d] | 73 | 70 | 63 | 79 | 37 | 62 | 78 |
| ADF[e] | 41 | 41 | 37 | 51 | 30 | 36 | 40 |

[a] Metabolism trial conducted in 2001 ( Abaye et al.)
[b] Munday, 1999, M.S. Thesis.
[c] LaCasha,, et al. 1999. J. Anim. Sci. 77:2766-2773.
[d] Neutral Detergent Fiber.
[e] Acid Detergent Fiber.
[1] Matua and matua + alfalfa harvested at 80% seedhead, and 1/10 bloom, respectively.
[2] Orchardgrass harvested at vegetative stage
[3] Caucasian Bluestem, Matua and Coastal bermudagrass harvested at early reproductive stage

| **B** | **Virginia Metabolism[a] Trial, 2001** | | **Virginia Metabolism[b] Trial, 1999** | | **Texas Tech etabolism Trial, 1996[c]** | | |
|---|---|---|---|---|---|---|---|
| Apparent Digestibility | Matua | Matua + Alflalfa | Bluestem | Orchard-grass | Alfalfa | Matua | Coastal bermudagrass |
| Dry Matter | 56 | 58 | 54 | 58 | 63 | 51 | 46 |
| Crude | 40 | 55 | 48 | 61 | 88 | 74 | 64 |
| Protein | | | | | | | |
| NDF | 64 | 67 | 61 | 65 | 24 | 47 | 52 |
| ADF | 55 | 58 | 54 | 56 | 21 | 20 | 26 |

[a] Metabolism trial conducted in 2001 ( Abaye et al.)
[b] Munday, 1999, M.S. Thesis.
[c] LaCasha, et al. 1999. J. Anim. Sci. 77:2766-2773.

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