Herbage Accumulation, Nutritive Value and Persistence of Mulato II in Florida

Joao M. B. Vendramini
University of Florida

Lynn E. Sollenberger
University of Florida

Graham C. Lamb
University of Florida

Maria L. Silveira
University of Florida

Follow this and additional works at: https://uknowledge.uky.edu/igc

Part of the Plant Sciences Commons, and the Soil Science Commons

This document is available at https://uknowledge.uky.edu/igc/22/1-2/13

The XXII International Grassland Congress (Revitalising Grasslands to Sustain Our Communities) took place in Sydney, Australia from September 15 through September 19, 2013. Proceedings Editors: David L. Michalk, Geoffrey D. Millar, Warwick B. Badgery, and Kim M. Broadfoot

Publisher: New South Wales Department of Primary Industry, Kite St., Orange New South Wales, Australia

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.
Herbage accumulation, nutritive value and persistence of Mulato II in Florida

Joao M B Vendramini\textsuperscript{A}, Lynn E Sollenberger\textsuperscript{B}, Graham C Lamb\textsuperscript{C} and Maria L Silveira\textsuperscript{A}

\textsuperscript{A} UF/IFAS Range Cattle Research and Education Center, Ona, FL, USA
\textsuperscript{B} UF/IFAS Agronomy Department, Gainesville, FL, USA
\textsuperscript{C} UF/IFAS North Florida Research and Education Center, FL, USA

Contact email: jv@ufl.edu

Keywords: Mulato II, grazing management, stubble height.

Introduction
Grasses in the \textit{Brachiaria} genus are the most widely grown forages in tropical America, occupying over 80 Mha (Bod-ney \textit{et al} 2004). Mulato II is apomictic and a vigorous, semi-erect cultivar resulting from 3 generations of crosses including original crosses between ruzigrass and signalgrass (cv. Basilisk, apomictic tetraploid). According to Peters \textit{et al} (2003), Mulato produced 25\% more herbage mass than palisadegrass (\textit{Brachiaria brizantha}) and koroni-viagrass (\textit{Brachiaria humidicola}) under similar management practices. Although Mulato II shows promise as a forage in tropical regions, herbage accumulation and persistence in subtropical areas is unknown. This publication summarises results of the research with Mulato II conducted in Florida in the last 5 years.

Methods
South Florida
This experiment was conducted on Mulato II in Ona, FL (27°26’ N, 82°55’ W) between August and November in 2007 and 2008. Treatments were the factorial combinations of 3 stubble heights (2.5, 7.5 and 12.5 cm) and 2 harvest frequencies (2 and 4 weeks) in a randomised complete block design with 4 replicates. Plot size was 3 x 2 m with a 1-m alley between plots. Samples were analysed for \textit{in vitro} digestible organic matter (IVDOM) and crude protein (CP) concentrations.

Central Florida
The study was conducted in Gainesville, FL (29°44’N, 82°16’W) from June 2008 to June 2010. Treatments were Mulato II treated as an annual (planted in 2008 and 2009), Mulato II treated as a perennial (planted in 2008 only), Tif-ton 85 (\textit{Cynodon} hybrid) (planted in 2008), and Tifleaf 3 pearl millet (\textit{Pennisetum glaucum}) and Hayday sorghum-sudangrass (\textit{Sorghum bicolor}) (both planted in 2008 and 2009), arranged in a randomised complete block design with 4 replicates. The annual treatment for Mulato II was included to compare the use of this grass with the annual species pearl millet and sorghum-sudangrass, while the perennial Mulato II treatment was included to compare persistence and productivity over time with Tifton 85 bermudagrass. Plots were 5 x 5 m with a 1-m alley between plots. Seeded grass was planted on June 2008 and 2009. Tifton 85 was planted vegetatively using 100 plugs per plot. In general, perennials were harvested every 5-6 weeks throughout the summer, with slightly longer intervals during cool autumn weather. An area of 2.88 m\textsuperscript{2} was harvested with a sickle-bar mower from the centre of the plot to a 10-cm stubble height. Herbage accumulation, IVDOM, and CP were determined.

North Florida
The study was conducted in Marianna, FL (30°52’ N, 85°11’ W). Treatments were 3 forage species, Tifleaf 3 pearl millet, Hayday sorghum-sudangrass and Mulato II arranged in a completely randomised design with 3 replicates. Pastures (0.6-ha experimental units) were established on June 2008 and June 2009 in a prepared seedbed. Pastures were stocked continuously using a variable stocking rate. Two heifers (Angus crossbred) were assigned as testers to each experimental unit. Additional heifers of comparable age and weight to the testers were introduced or removed to maintain similar forage stubble height (≈ 30 cm) across experimental units. Herbage mass, nutritive value, stocking rate and average daily gains per head and per ha were evaluated.

Results
In south Florida, there was a quadratic decrease in herbage accumulation from 2.0 to 1.6 t/ha with decreasing stubble height. Conversely, herbage CP increased linearly with decreasing stubble height (from 14 to 17 \%), while IVDOM was virtually unaffected (66 vs 67 \%). Mulato II ground cover increased linearly from 74 to 87\% as stubble height increased from 2.5 to 12.5 cm.

In central Florida, Hayday and Tifleaf 3 established more rapidly than Mulato II; however, Mulato II had greater herbage accumulation later in the fall. The perennial treatments (Mulato II and Tifton 85) had greater herbage accumulation overall than the annual treatments and Tifton 85 had greater ground cover than Mulato II in 2009 (73 vs 36\%) and 2010 (73 vs 12\%).

In north Florida, in year 1, there were no differences in herbage allowance (0.9 kg DM/kg body weight), average daily gain (0.5 kg/d) and gain/ha (168 kg) among treatments. However, in year 2, Mulato II had greater herbage allowance (2.0 vs 0.7 kg DM/kg BW) and ADG (0.78 vs 0.41 kg/d) than Tifleaf 3 and Hayday but similar gain/ha (302 kg).

Conclusions
In central and north Florida, Mulato II may behave as an
annual or biennial forage and its greater herbage accumula-
tion and nutritive value make it a suitable alternative to
Tifton 85 and warm-season annual forages. In contrast, in
south Florida, Mulato II behaves as a perennial forage and
displays superior nutritive value to the other species. How-
ever, forage production is reduced if it is cut frequently to
short stubble heights. These management strategies should
be avoided.

References

Boddey RM, Macedo R, Tarré RM, Ferreira E, de Oliveira OC,
Rezende CP, Cantarutti RB, Pereira JM, Alves BJR,
Urquiaga S (2004) Nutrient cycling of Brachiaria pastures:
the key to understanding the process of pasture decline.

Agriculture, Ecosystems and Environment 103, 389-403.

Inyang U, Vendramini JMB, Sollenberger LE, Silveira MLA,
frequency and stubble height affects herbage accumulation,
nutritive value, and persistence of ‘Mulato II’ brachiaria-
grass. Forage and Grazinglands doi:10.1094/FG-2010-
0923-01-RS.

pose forage species: Options for producers in Central
America. CIAT Publication # 333. (International Center for
Tropical Agriculture, CIAT: Cali, Colombia)

Vendramini JMB, Sollenberger LE, Lamb GC, Foster JL, Liu K,
Maddox M (2012) Forage accumulation, nutritive value, and
persistence of ‘Mulato II’ brachiariagrass in northern Florida.
Crop Science 52, 914-922.