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**379-7 Modeling the Regrowth of Forage Grasses: Simulating Growth, Partitioning, and Carbon and Nitrogen Metabolism.**

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**Leonardo S. B. Moreno**, Agronomy Department, University of Florida, Gainesville, FL and **Kenneth J. Boote**, Agronomy Dept., 3105 McCarty Hall, University of Florida, Gainesville, FL

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**Abstract:**

Reserves play an important role in plants undergoing stress. Plants adapted to defoliation use reserve compounds to regrow leaf area. Modeling grass regrowth should account for these processes. A field experiment was conducted in Gainesville, FL, to study herbage production, partitioning and mobilization of reserve compounds of two tropical grasses (Jiggs bermudagrass and Mulato-2 brachiaria grass), under the combination of two light levels – 56% and 100% solar radiation, and two N rates – 30 and 120 kg N ha<sup>-1</sup> after each harvest. Herbage mass was quantified at harvest every 28 days. During two consecutive regrowth cycles, at days 0, 4, 9, 18 and 28 after harvest, plant tissue was collected to determine biomass allocation, and C and N concentration. Natural abundance of C and N stable isotopes was used to track remobilization. Field data was used to evaluate the CROPGRO model. Both species were evaluated in 2014, but Mulato-2 did not survive the winter of 2014-15. Seasonal herbage harvested was greater for Mulato-2 (8000 kg DM ha<sup>-1</sup>) than Jiggs (5000 kg DM ha<sup>-1</sup>) ( $p < 0.001$ ). High N treatments produced more forage (6000 kg DM ha<sup>-1</sup>) than low N treatments (5000 kg DM ha<sup>-1</sup>) ( $p = 0.004$ ). More forage was harvested from full sun plots (7300 kg DM ha<sup>-1</sup>) than from shaded plots (5700 kg DM ha<sup>-1</sup>) ( $p < 0.001$ ). No significant interactions were observed. An overall N effect was observed ( $p = 0.04$ ) on Jiggs herbage mass in the two consecutive growth seasons. A significant interaction between light level and year was detected ( $p < 0.001$ ), and the contrast analysis showed a carryover effect of shade; herbage harvested from shaded plots was lower in 2015 compared to 2014. The combination of modeling and experimentation proved to be effective. The model provided a framework and experimentation was delineated relative to model routines. The experiment was designed to challenge the model to simulate contrasting environmental and management situations.

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