UNIVERSIDAD DE COSTA RICA

Dos Pinos CEBS Comité de Educación y Bienestar Social

Rotational Grazing Systems Using Phenological Stage in Kikuyu Grass (*Kikuyuocloa clandestina*)

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C I N A

Introduction

- Rotational grazing systems should ensure that pastures have high nutritive value to meet the requirements of livestock and reduce the use of supplements.
- Water soluble carbohydrates are the primary source of energy that allow pasture regrowth after harvest.
- When pastures mature beyond an ideal phenological stage, young leaves continue to grow and the oldest leaves senesce, reducing the nutritive value of the forage (Fig. 1).

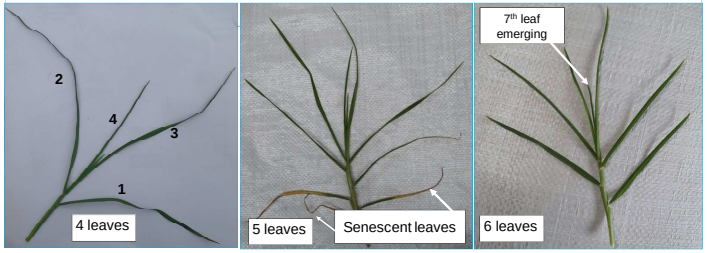


Fig. 1. Kikuyu grass with 4, 5, and 6 green leaves per tiller.

Objective

To evaluate the yield and nutritional value of Kikuyu grass with a phenological stage of 4 green leaves per tiller in a dairy farm in the highlands of Costa Rica.

Materials and Methods

- Location: Alajuela (1900 masl), Costa Rica, from July 2016-January 2017
- Treatments: pastures with 10, 15, 20, 25, and 30 d of regrowth, turning cows into paddocks with 4 leaves/tiller
- Response variables: dry matter yield (DMY), crude protein (CP), neutral detergent fiber (αNDF), *in-vitro* dry matter digestibility (IVDMD), and fiber digestibility (NDFD)
- First two months (transition stage) adjusting from previous grazing management (30 d of regrowth), aimed at reducing senescent material (Fig. 2).
- Next five months (experimental stage) grazing pastures at an average of 25 d of regrowth.



Fig. 2. Senescent material in Kikuyu pastures during the transition stage

Results

- Days of regrowth and # of green leaves are correlated (Fig. 3).
  - Pearson correlation coefficients: dry season (0.77; p=0.0014) and rainy season (0.48; p≤0.0001)
- During the experimental stage, biomass was lower (p=0.0610), whereas # of green leaves was higher (p=0.1076) (Fig. 4).

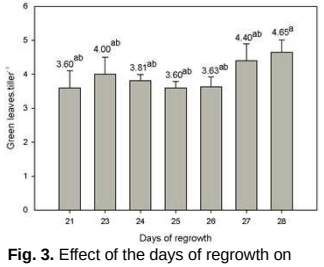


Fig. 3. Effect of the days of regrowth on the phenology of Kikuyu grass.

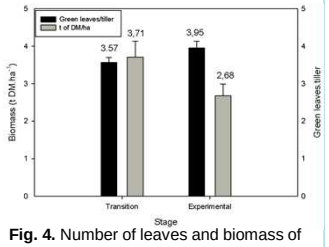


Fig. 4. Number of leaves and biomass of Kikuyu grass during the transition and experimental stages.

- Protein content was greater (p=0.0056) during the experimental stage, but fiber content did not differ between stages (p=0.1422) (Fig. 5).
- Dry matter (p=0.0569) and fiber (p=0.0689) digestibilities tended to be greater during the experimental stage (Fig. 6).

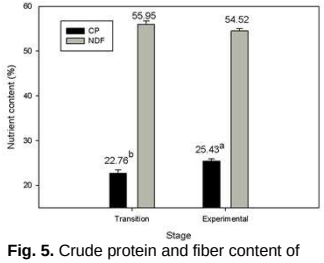


Fig. 5. Crude protein and fiber content of Kikuyu grass during the transition and experimental stages

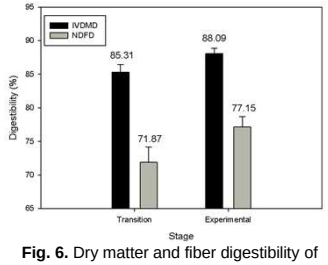


Fig. 6. Dry matter and fiber digestibility of Kikuyu grass during the transition and experimental stages

Implications

- We recommend reducing senescent material to foster greater utilization in pastures prior to use of phenological stage criteria.
- Kikuyu grazed at 4 leaves/tiller in the rainy season generates a forage surplus that can be preserved (as silage or haylage) for the dry season, if grazing by number of leaves is not applicable.
- Kikuyu grass exhibited lower yields during the experimental stage, but its exceptional nutritive value may still reduce the use of supplements in dairy cattle operations.

Acknowledgements

The authors would like to thank the Cooperative Dos Pinos R.L. for funding this research as well as the owner of the farm, Anthony Harrington, and the technician, Luis Noguera, for their valuable input during this study.