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

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**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).

**Materials and Methods**

- **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.

- **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 (aNDF), 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.

**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).

- 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).

**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.
- 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.

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