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# Yield Development and Quality Changes of High Yielding Grasses During the Rainy Season in the "Natural Reserve Area Chacocente" on the Nicaraguan Pacific Coast

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**Abstract**

The "Natural Reserve Area Chacocente" on Nicaragua's pacific coast needs to find alternatives in livestock production to increase rural incomes and - at the same time - protect natural resources. This study examines the potential of sugarcane (*Saccharum officinarum* L.) and two types of elephant grass - Taiwan (*Pennisetum purpureum* Schumach. Cv. Taiwan A-144) and King Grass (*Pennisetum purpureum* Schumach. × *Pennisetum americanum* L.) - for fodder production. The study describes the development of yield and nutritive value during maturation of grasses as baseline knowledge to develop possible preservation strategies (hay, silage) for excess fodder grown during the rainy season. A field experiment with the three grasses was established on a "Eutric Cambisol" under semiarid conditions (900 mm annual precipitation) in May 2006. The randomised block design comprised three factors: grass genotype, N fertiliser (N1: 0 kg ha$^{-1}$; $N_2$: 100 kg ha$^{-1}$) and sampling date (total of 10 dates). Samples were collected from mid June to mid September in ten day intervals. At each sampling, dry matter, plant height, leaf/steam-ratio, dry matter content and tiller density was measured. Contents of crude protein and metabolisable energy were determined using NIRS calibrations developed from the material of this study. Effects of genotype, N fertilisation and cutting date were analysed using multivariate statistics. The dynamics of yield and quality development over time was described using the growth function of Boguslawski. The highest yields were measured in King Grass. At the last sampling (114 days after planting), dry matter yields of 27.7 t ha$^{-1}$ for King Grass, 22.1 t ha$^{-1}$ for Taiwan and 10.9 t ha$^{-1}$ for sugarcane were measured. The crude protein content ranged from 22.0 % (Taiwan, fertilised, 47 days) to 3.5 % (King Grass, unfertilised, 114 days), while metabolisable energy had values from 9.7 MJ kg$^{-1}$ DM$^{-1}$ (Taiwan, unfertilised, 37 days) to 6.0 MJ kg$^{-1}$ DM$^{-1}$ (Taiwan, fertilised, 114 days). Sugarcane seems to be less suitable because of a late growth whereas elephant grass may require the addition of protein-rich legumes during preservation. However, such investments seem to be profitable only for dairy producers and only as part of a package combining fodder production, animal health care, milk marketing, and training.

**Keywords:** Dry season feeding, livestock production, tropical grasses

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