

Summary

The present study was carried out at CATIE's Animal Production Research Station in Turrialba, Costa Rica (9° 53' N; 83° 38' W; 639 m.a.s.l; 22.3 °C; rainfall 2636 mm/year, but only 1 month with a negative hydric balance), in order to evaluate the effects of *Arachis pintoii* CIAT 17434 and *Desmodium ovalifolium* CIAT 350 on pasture dynamics, selectivity, herbage quality and milk production, when those legumes were oversown in African stargrass (*Cynodon nlemfuensis*) degraded pastures. The pasture treatments (grass alone and the two grass/legume mixtures) were randomly distributed in two blocks, with two paddocks of each pasture per block. The pastures were rotationally grazed, with 3 or 5 days of occupation depending on paddock size (937 and 1406 m², respectively), but the whole grazing cycle lasted 26 days.

The experimental design used was a Change Over Latin Square with seven, two, and one replicates over time, when milk yield and composition, selectivity, and intake were measured. Each replicate (phase) involved three pairs of Criollo x Jersey crossbred milking cows (or oesophageal fistulated steers) and three periods of 16 days. In all periods, the cows were allowed to adjust to the new pastures for 6 days; this was followed by a 10-day measurement period, and the 26-days cycle was completed by grazing African-stargrass in monoculture. The stocking rates used were 2.9 AU/ha for the first three phases (January-September 1990), and 2.4 AU/ha for the last four phases (May-October 1991/ January-July 1992).

In all grazing cycles the changes in total, green and senescent forage biomass availability were monitored, as well as their nutritive value (CP content and IVDMD) before and after grazing, botanical composition of the pastures before grazing, and milk yield and composition. Diet composition and quality were determined during the minimum and maximum rainfall periods (February and June) of 1992, and pasture intake was measured only in June 1992. On the other hand, the blood urea concentration was determined during the first three phases of this study, whereas the concentration of urea in milk was determined only in the last two phases.

The results obtained in this study showed not only the comparative advantages of *Arachis pinto* over *Desmodium ovalifolium* in terms of nutritive value and palatability, but also its beneficial effects on the availability and quality of the forage on offer. The voluntary intake, CP content, and IVDMD of the diet selected by cows grazing the African stargrass/*A. pinto* mixture were 28.1, 33.6, and 13.0% higher than those obtained for the African stargrass pastures, but only a 14.2% (1.3 kg/day) increase in milk yield, suggesting that energy supply is the limiting factor for a greater response to *A. pinto*. In contrast, *D. ovalifolium* did not affect the above mentioned parameters, although its contribution to the total biomass was equivalent to that estimated for *A. pinto*.

Arachis pinto CIAT 17434 appears as a good alternative to reclaim African stargrass degraded pastures, and to improve milk production in the humid tropics. However, to prevent degradation of the newly formed grass/legume mixture, the stocking rate to be applied must be carefully defined. In this experiment, the highest milk yield (25.9 kg of milk/ha per day) was obtained when African stargrass/*A. pinto* mixtures were grazed with 2.4 AU/ha, whereas lower milk production and deterioration of the pasture occurred with a stocking rate of 2.9 AU/ha.