

Summary

Three seeding systems were studied in a 7-year old "purma" or fallow land grazed by cattle, in the Ucayali region of Pucallpa, Peru: rice in monoculture, *Brachiaria dictyoneura* in association with *Stylosanthes guianensis*, and rice and grass in association. Two planting modalities (in line and broadcasted) and three weed control methods (both pre- and post-emergence herbicides and traditional weeding) were also assessed. Objectives were to (a) determine the most appropriate seeding system and time for weeding in rice-grass associations; (b) assess the trees in the system; and (c) quantify the income generated by the sale of rice and its relation to pasture establishment costs.

Measurements were made of tree height and diameter, rice yields (t/ha), botanical composition (%) of the pasture, forage yields (t/ha) after rice harvest, and cost-benefit ratios. A randomized complete block design was used with three replications, arranged in split-split plots. The census of "purma" flora revealed 52 species, of which 17 were arboreal, with an average diameter of 7.17 cm and an average height of 3.97 m. Weed incidence was high ($P < 0.01$) in the pasture (89%), followed by the rice crop (80%), and the rice-grass association (43%). Seeding in lines resulted in 62% weeds, which was significantly lower than broadcasted sowing (79%). Weed control with pre- and post-emergence herbicides was similar: 79% and 62%, respectively. Rice yields averaged 1.42 t/ha, with no significant differences among the treatments studied. Forage yield after rice harvest was identical regardless of seeding system or modality, averaging 0.40 t/ha. However, highly significant differences ($P < 0.01$) were found when pre- and post-emergence herbicides were used compared with traditional weeding: 0.45 t/ha vs. 0.25 t/ha. Pasture establishment costs were US\$430, and the income generated by the sale of rice was

US\$326. Rice production in association with improved pastures is therefore considered feasible, whether sown in lines or broadcasted, with the application of pre- or post-emergence herbicides. Furthermore, the pasture is established after the rice harvest, and the sale of the rice covers 76% of the costs of pasture establishment.