

# CROP PRODUCTIVITY USING FORAGE LEGUMES AND GRASSES AS CONTOUR HEDGEROW SPECIES IN AN ACID UPLAND SOIL<sup>1</sup>

Agustin R. Mercado, Jr.<sup>2\*</sup>, Nestor Sanchez<sup>2</sup> and Dennis P. Garrity<sup>3</sup>

## Abstract

Contour hedgerow systems have been viewed as an important technology to sustain crop production in the sloping uplands by reducing soil erosion and provide organic fertilizer for crop production. A collaborative study between the International Centre for Research in Agroforestry (ICRAF) and Misamis Oriental State College of Agriculture and Technology (MOSCAT) compared several forage legumes and grasses as contour hedgerow species. The trial focused on how the species compared in reducing soil erosion, influencing annual crop yields, and their relative competition with the associated crops. A 5 x 3 factorial experiment was laid out in a strip-plot design in randomized complete blocks. The five hedgerow species of *Flemingia congesta*, *Stylosantes scabra*, *Panicum maximum* and *Vetiveria zizanioides*, and an open-field control were the vertical factor. The three pruning management practices of prunings removed, uniform application, and skewed application across the alleyway (2/3, 1/3, 0, and 0 on the four inter-alley zones from highest to lowest elevation) were the horizontal factors. The annual double-crop system was upland rice followed by maize in the alleyways. The hedgerow systems reduced soil erosion between 67 and 95%, with the grass species tending to be most superior alternatives for soil conservation. *F. mycrophylla* provided the highest annual pruning biomass (7.22 t/ha). Grain yields and total dry matter of upland rice and maize in the hedgerow systems did not differ consistently from those observed in the open field control. *P. maximum* reduced yields significantly, due to severe competitiveness. The hedgerow species rankings from lowest to highest in competitiveness were *S. scabra*, *V. zizanioides*, *F. congesta*, and *P. maximum*. Skewed application of pruning biomass and crop residues to the upper alleyways to ameliorate upper-alley scouring showed no superiority compared with a uniform application.

<sup>1</sup>Paper presented during the Roving Workshop on Conservation Farming on Sloping Lands on November 1-9, 1998 at Southwinds Hotel, Cagayan de Oro City.

<sup>2</sup> Associate Research Officer and Field Assistant, respectively, International Centre for Research in Agroforestry, Claveria Research Site, MOSCAT Campus, Claveria, Misamis Oriental 9004, Philippines.

<sup>3</sup>Systems Agronomist and Coordinator, Southeast Asian Regional Research Programme, ICRAF, P.O. Box 161, Bogor 16001, Indonesia.