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## Cassava-Based Intercropping Systems on Sumatra Island in Indonesia: Productivity, Soil Erosion, and Rooting Zone

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**Abstract:** In Gunung Batin, the southern end of Sumatra Island, Indonesia, cassava is widely cultivated on gently sloping areas for starch materials. The monoculture system and/or the intercropping system without legume plants commonly adopted in this region may tend to accelerate soil degradation. The objective of this study is to compare the productivity among several cassava cropping patterns to propose the most beneficial one in this region. A field experiment of five cropping patterns {cassava (*Manihot esculenta* Crantz) single-cropping, three cassava-based intercropping patterns, and a crop rotation} was conducted for three years. The cropping pattern that recorded the highest net income varied with the year. In 1997, the driest year of the past several decades, cassava single-cropping was the highest in income. The proposed intercropping system {cassava/(maize—soybean—cowpea)} was the highest in 1998, a year with moderate rainfall. In 1999, when severe insect damage occurred to legume crops, the farmers' conventional intercropping was the highest. In an average of the three years, the proposed intercropping pattern was same as cassava single-cropping, although cowpea cultivation as the dry season cropping was not possible in this region. The amount of soil erosion was relatively high in cassava monoculture in comparison with the other intercropping and crop-rotation systems. Cassava roots penetrated to only 0.5 m deep and extended 1 to 2 m in a horizontal direction depending on the planting density. These results lead to the conclusion that the proposed

cassava cropping system would be the most beneficial in terms of economy and control of soil erosion.

**Keywords:** [Cassava](#), [Crop rotation](#), [Intercropping](#), [Manihot esculenta Crantz](#), [Mulching](#), [Rooting depth](#), [Red acid soil](#), [Soil erosion](#)

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