

Modification of Cassava Intercropping System in East Nusa Tenggara - Indonesia

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ABSTRACT INTRODUCTION

Cassava (*Manihot esculenta* Crantz.) is one of the sources for food crops in the East Nusa Tenggara Province of Indonesia. Unfortunately, the average production of cassava in East Nusa Tenggara was still below the average national production level (10 t.ha⁻¹ and 16 t.ha⁻¹, respectively). The main reason for the low cassava productivity is the local cassava farming system in East Nusa Tenggara only considered cassava as the secondary food crops that planted in wider planting space (1 m x 4 m). Moreover, farmers only apply fertilizer to the main crops (maize, coconut or cacao) but there was no fertilizer application for the cassava. Farmers in the East Nusa Tenggara Province, especially in the Sikka Regency suggested that planting cassava with closer planting space will obstruct the growth of the main crops. Hence, they are reluctant to planting more cassava in each growing season. The main objective of this research is to create varieties of cassava based intercropping system that suitable for farmers in the Sikka regency. This research will introduced several cassava based intercropping system that will give farmers securities in term of crop yield and income.

MATERIALS AND METHODS

The field experiment was arranged in a Fully Randomized Block Design with 3 replications. The treatments are: (1) Cassava and Maize monoculture (C0); (2) Intercropping cassava + maize local system (TS1); (3) Intercropping cassava + maize introduced system (TS2); (4) Intercropping cassava + peanut (TS3); (5) Intercropping cassava + mung bean (TS4); and (6) Intercropping cassava + soybean (TS5). All treatments received basic fertilizer of Urea 300 kg.ha⁻¹ (given in three separates fertilization), 150 kg.ha⁻¹ SP36, and 100 kg.ha⁻¹ KCl. The data collected from this experiment include crops growth and yield, harvest index and farmers income.

RESULTS AND DISCUSSION

The results from this experiment showed that the growth and yield of maize planted in the introduced intercropping system (TS2) was higher than that of grown in local intercropping system (TS1), although the difference was not significant ($p > 0.05$). This result showed that by planting cassava more, it did not reduce the maize yield as farmers expected. The total yield of cassava in TS2 was significantly higher ($p < 0.05$) than TS1 as expected. The cassava in the TS2 was actually benefited from the fertilization given to the maize. When comparing the harvest index of all treatment, the TS2 treatment showed the highest index (0.55) compared to the other treatments (0.42 – 0.50). Given the higher harvest index, the TS2 treatment also had the highest Land Equivalent Ratio compared to the other treatments. Using the current prize of crops used in this experiment, the highest revenue was from Intercropping cassava + peanut (TS3) followed by the TS2. The results from this experiment further generate options of cassava based intercropping system for farmers in the Sikka Regency.

CONCLUSIONS

In this study, the higher crop yield in the introduced cassava+maize intercropping system was strongly related to higher cassava yield observed in this experiment. By planting cassava in tighter planting space, the cassava was benefited from maize fertilization, but did not obstruct the maize growth. This result was able to show that cassava did not obstruct maize growth as long as the planting time was carefully planned. The results from this experiment were able to change farmer's point of view regarding planting cassava as main crops in the Sikka Regency. Further action plan on farmer's participation and cassava post-harvest technologies are appropriate to support farmers in the Sikka Regency.

KEYWORDS

Cassava intercropping, farmer's income, revenue, harvest index, land equivalent ratio