

Participatory variety selection increases adoption of modern varieties by subsistence farmers in East Timor

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Abstract

The adoption of modern maize varieties East Timor has met with little success over the last 24 years. Although some high yield maize varieties were available to farmers for more than 20 years, less than 5% of farmers now adopt the modern varieties. A new variety evaluation program "Seeds of Life" (SoL) has been established in East Timor since 2000, with the aim to increase on farm yields by the use of suitable high-yielding varieties.

Adoption rate of the recently released varieties of maize, rice, peanuts and sweet potatoes was evaluated in the 2006/07 wet season. Farmers (595) were first introduced to the new varieties of maize, peanuts, rice and sweet potato through on farm trials during the 2005/06 wet season. Overall the level of adoption of one modern variety the following year was 73% (396/544). High levels of adoption were obtained for new rice, peanut and maize varieties (81, 74 and 81% respectively). Sweet potatoes had a lower adoption rate (50%). The high rate of adoption of the newly released varieties shows the participatory system of variety evaluation of Seeds of Life is appropriate to Timorese subsistence farmers.

Key Words

East Timor, Participatory breeding, Variety evaluation, maize, peanuts, rice, sweet potato

Introduction

Timor-Leste is primarily an agricultural economy, where 80% of the population resides in the countryside, relying primarily on subsistence agriculture for their livelihoods. Maize is the dominant cereal (grown by more than 80% of farmers) and is supplemented by cassava, rice and sweet potato. Maize yields in East Timor have stagnated at 1.5 t/ha over the last 30 years, despite the release and promotion of higher yielding OPV maize varieties in the 1980s by the then Indonesian government. Adoption rates of the Indonesian varieties are approximately 5% (Guterres and Williams 2006)

The SoL Program has been testing and introducing new varieties of the staple field crops; maize, cassava, sweet potato, rice and peanut since 2000. These have been supplied by CGIAR Crop Centres, namely CIMMYT, CIAT, CIP, IIRR and ICRISAT (Piggin and Palmer 2003).

SOL test new varieties in two phases, replicated research station trials and unreplicated on farm trials. Farmers are included at both phases of the selection process (Williams et al. 2006). As a result of this testing, seven new varieties of the major food crops were released for general production in 2006. This included 2 maize, 3 sweet potatoes, one rice and one peanut variety. All are reproducible by farmers using their current seed production methods. This paper presents the first follow up survey of the recently released varieties.

Methods

In the 2005/06 growing season, more than 600 on farm experiments of new varieties of maize, rice, sweet potato and peanut were conducted with farmers. To determine adoption rates of the new varieties, all participating farmers involved in on farm testing during the 2005/06 season were surveyed. The questionnaire covered all species of improved varieties of maize, peanuts, rice, and sweet potato used in

the SoL research program. Surveys were conducted in January and February 2007. Analyses of the results were conducted using MS Excel and Minitab.

Results

Overall adoption level

Overall adoption for at least one new tested variety was very high (73%, 396/544) across all four species. There was no difference in adoption levels between men and women headed households (73 and 72% respectively).

The three cereals tested all have high adoption rates, above 75% (Table 1). This demonstrates the suitability of these varieties to subsistence farmers. They all have consistent yield advantage over local check varieties, and have acceptable taste properties. The main cause of non-adoption of the maize varieties was weevil damage of the stored seed. Among some farmers Sele was desired because of the sweet taste as a fresh corn.

The large seeded peanut variety (Utumua) was well adopted (48%), more so than the smaller seed variety, with a lower yield advantage GN11. Sweet potatoes have a lower adoption rate than the other species, mainly due to the difficulty in keeping planting material over the long dry season, especially on the north coast.

Table 1. Adoption of all tested varieties across all districts in 2006/07.

Species	Variety	Yield advantage over local (%)	Adoption level No. (%)	Seed passed on to other farmers (%)
Maize	Sele	40	79	14
	Sewan 5	55	76	
Peanuts	Utumua	48	69	2
	GN11	24	58	
Sweet Potato	Hohare 1	128	57	9
	Hohare 2	138	35	
	Hohare 3	138	69	
Rice	Nakroma	15	81	23

For all species, some seed of the new varieties were passed from the original farmer to family members. The lowest level of sharing the new varieties was for peanuts, and the greatest exchange was for rice (Table 1). The extent of seed distribution to others is related to the amount of seed that was produced from the on farm testing. Peanuts produced the least amount of seed from an on farm trial, and rice produced the largest amount. Maize was between these two species for the amount of seed produced and distribution of seed.

Conclusion

The rates of adoption in the Seeds of Life program in the first season are much higher than those achieved by previous maize breeding programs in East Timor. The high adoption rate, demonstrates the usefulness of including farmers in the variety evaluation process. All the recommended varieties had been chosen by farmers at field days and using characteristics required by subsistence farmers in East Timor.

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