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Conservation of Tropical Root Crop Agrobiodiversity: On-farm True Seeds Production and Use as a Mean for Geographic Distribution of Allelic Diversity

LABEYRIE VANESSE, LEBOT VINCENT

*Vanuatu Agricultural Research and Training Centre (VARTC), French Agricultural Research Centre for
International Development (CIRAD), Vanuatu*

Abstract

The tropical root and tuber crops (cassava, sweet potato, taro and yam) are cultivated throughout the tropics where they play a major role for food security. In Vanuatu, an archipelago of 81 islands situated in the South West Pacific, traditional food gardens are at the basis of self-sufficiency with tuber and root crops as the main source of carbohydrates for smallholders. Emerging environmental changes such as climatic ones, the introduction of new plant diseases and/or changing diets are now endangering the local agrobiodiversity and the country's food security. As several molecular genetic studies have shown, the local tuber and root crops diversity of Vanuatu is narrow and in the course of genetic erosion, its resilience to changes is thus quite limited. To enlarge this genetic pool, introduction of exotic varieties has been conducted through *in vitro* genotypes but excessive distribution costs and the limited success of the operation, mainly due to the high fragmentation of the country, pointed up the need for other means of allelic dispersion. True botanical seeds production and use seems to be a promising way since it is easier to distribute and because it enables efficient protection of local allelic pool by crossing it with introduced one. However, the adoption of this innovative practice by traditional smallholders raises numerous problems since they are practicing exclusively clonal propagation and are not aware of tuber and root crops sexual reproduction. Our project aims at evaluating the potential for on-farm true seeds production and use through participatory methods. This study will focus on main environmental, economical, social and cultural constraints to the development of this practice in on-farm conditions. Since the sexual reproduction of these plants is poorly documented, this study will also assess the efficiency of this method through the characterization of reproductive biology and estimation of the percentage of new cultivars created during a cycle. We will finally evaluate the possible practical improvements by building on farmer's own experiments and analysis of their difficulties. As most of the work on tropical tuber and root crops true seed of has been limited to scientific research stations, it is of interest to develop this technique for on-farm activities.

Keywords: Food safety, genetic diversity, geographic distribution of allelic diversity, on-farm conservation, root crops

Contact Address: Labeyrie Vanesse, Vanuatu Agricultural Research and Training Centre (VARTC), French Agricultural Research Centre for International Development (CIRAD), P.O. Box 946 , Port-Vila, Vanuatu, e-mail: vanesse.labeyrie@supagro.inra.fr