

Local multiplication to ensure timely planting

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As sweet potato is a major cash crop in Central Luzon, the Philippines, demand for planting material is always high. In the lowland plains of the Tarlac province, however, most fields become flooded during the rainy season, which, after the harvest of the sweet potato roots, kills all plants. This makes it impossible for farmers to use vines from these plants as planting material for the next season. Differences in the agro-climatic conditions in Central Luzon have resulted in different yet complementary growing seasons. Sweet potato is grown from May to July in the uplands of Bataan province, and from September to December in the vast lowlands of the Tarlac province. This means that the harvest time in Bataan happens at just about the time that farmers from Tarlac are in need of planting material. This has given rise to a flow of sweet potato planting materials across Central Luzon.

Accessing planting material

A hectare of land planted with sweet potato requires about 50 000 vine cuttings. If a farmer from Tarlac has to buy all this planting material it would cost approximately 11 500 Philippine pesos (US\$ 230). Over recent decades, farmers from both provinces have developed a practice which substantially reduces the cost of the planting material needed for the entire production area. Individual farmers obtain only a small portion of the entire planting material required, from the Bataan region. They then multiply these cuttings over a period of two to three months, in small field plots known locally as *palakay*, until they have enough planting material for their needs.

The following scenario is typical: sweet potato farmers in Tarlac purchase vine cuttings from Bataan for planting on a *palakay* field (12 500 cuttings for a quarter of a hectare at a cost of about US\$ 58). A *palakay* area is selected which is close to a water source but not prone to floods. The vines obtained from Bataan are planted in the *palakay*. Vegetative planting material is collected from this field only after the sweet potato plants have started root formation, or about 30 days later. This also allows the farmers, at a later stage, to harvest sweet potato roots from the *palakay*. Depending on the total size of a farmer's sweet potato production area, cuttings from the *palakay* are collected at intervals of 15 days, until all the fields meant for sweet potato production are planted. Meanwhile, farmers can harvest sweet potato roots from the *palakay* 75 to 90 days after planting. During this time, the price of fresh roots is relatively high.



Farmers from Tarlac select only the best planting material from sweet potato producers in the Bataan region.

Maintaining seed quality

A very important aspect of this exchange system for sweet potato planting material between two different regions is that there is opportunity to maintain quality through appropriate selection. First, the commercial sweet potato producers in Tarlac travel to the fields in Bataan to select and harvest the cuttings themselves. They select the best plants in the best fields as mother plants. No vine cuttings are collected from farms with plants showing symptoms of virus infection. In collecting the planting materials, these experienced farmers also have specific selection criteria, such as the size or diameter of the stem or vine, greenness of foliage, spread and appearance of leaves, texture of vines and distance of internodes. They also have their own typical collection practices where, for instance, they only take cuttings from the primary vines of a plant and avoid vines with hairy structures.

After multiplying the selected vines from Bataan in the *palakay*, a second stage of selecting cuttings is done prior to planting in the root production fields. Poor quality plants are discarded and most of the selection criteria already mentioned are applied again. For planting in the main fields, farmers also prefer vines of at least 30 centimetres long; they think that shorter vines have softer stems and therefore have low tolerance to drought and heat, conditions commonly experienced in Central Luzon. Moreover, farmers prefer collecting cuttings from the *palakay* not later than 75 days after planting since they believe that older mother plants are more susceptible to diseases and often even carriers of pests and disease. This practice has allowed farmers to eliminate possible sources of disease and abnormality, despite the continuous use of vegetative planting materials from the same source for over 50 years.

Continuing challenges

The International Potato Center (CIP), through its Users' Perspectives with Agricultural Research and Development (UPWARD) programme, has learned from such sustainable practices developed by small farmers in Central Luzon and now works with local partners to enhance farmers' management of varietal diversity and production of planting materials. The Tarlac College of Agriculture, the regional Department of Agriculture and the University of the Philippines Los Baños are leading inter-institutional efforts to address specific needs and opportunities. These include providing a virus-free source of planting materials through tissue-cultured mother plants, and large-scale production of planting materials to meet increased demand for sweet potato roots from commercial companies. Sweet potato has become a major ingredient in commercial animal feed products, leading to rapid expansion in the crop's cultivation. A major commercial company is now engaged in a contract-growing arrangement with sweet potato farmers. To meet increased demand for planting materials, the company has also contracted local farmers' co-operatives and groups to produce adequate volumes of planting materials derived from tissue-cultured mother plants.

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