Improving seedling preparation in Mali with locally available and affordable materials

Mali is a landlocked country in West Africa with four major agro-climatic zones, with rainfall ranging from less than 250 mm to more than 800 mm annually. Agriculture is the primary contributor to Mali’s economy, accounting for about 45% of the GDP. Compared to the major staple crops (sorghum, millet, rice and maize), vegetable production tends to be predominant in the irrigated and peri-urban systems because it provides cash to growers and sellers, jobs to young rural men and women, and a diversity of nutrients to urban consumers.

However, the success of vegetable production greatly depends on good quality seedlings being produced in the nursery at high quantity. Conventionally seedlings are simply grown on the ground without soil sterilization and pest control. This practice often produces poor quality seedlings with low survivability after transplanting to the field.

To increase the quality and quantity of vegetable seedlings, AVRDC-The World Vegetable Center’s subregional office for West and Central Africa in Mali has developed an improved...
Low-cost soil sterilizers

seedling preparation method by using locally available rectangular flat seedling containers, soil sterilizers, wooden mats and nylon nets to increase the seedling vigor, survival rate and the overall output in the field. This method has been introduced to the young rural and peri-urban Malians recently.

The rectangular flat seedling container has wooden planks on all four sides and a corrugated galvanized steel sheet at the bottom with holes for draining excess water. These containers are placed on bricks as elevated supports for easy operation and to avoid direct contact with potential pests on the ground. They come in different sizes and can be designed by local woodworkers.

Soil is first hydrated and heat sterilized in covered soil sterilizers which are available in most local markets at relatively low cost. This system depends on burning firewood for 6-12 hours. For better environmental protection, an improved sterilizing system has been designed and is expected to replace the current system.

After sowing, the whole container is covered with a wooden mat to maintain warm and humid conditions for better germination. This wooden mat is made of local materials (such as split bamboo sticks) by local businessmen in most villages. The mat needs to be removed after emergence during the daytime to avoid excessive growth which may result in thin, tall and weak seedlings and lower survivability after transplanting. At night, the wooden mat can be used to cover the seedling container again to protect young seedlings from reptiles, frogs, and rodents.

After emergence, young seedlings are protected with nylon nets, which are also available in local markets. This nursery technique is very suitable for tomato, pepper, eggplant, cabbage and amaranth seedling preparation in Mali.
On 12 January 2010, a massive 7.0-magnitude earthquake struck Haiti, the poorest country in the Western Hemisphere. The epicenter of the quake was near the densely populated capital, Port-au-Prince. Widespread damage resulted from the quake and the capital city was devastated. The destruction of roads, bridges, fishing ports and irrigation infrastructure all have had a serious effect on food production. About 230,000 people were killed, 196,595 injured and 1,200,000 displaced. Most of the survivors moved to the center, north and south of Haiti where quake intensity was moderate to light. Those people immediately faced the challenge to survive and it is therefore crucial to boost agricultural production in the areas that accommodated most of the population movement to sustain the food supply and settle the victims.

A total of 8,000 ha among 22,000 ha of Savane Diane plateau has been developed so far, and 300 ha is allocated for an agricultural rehabilitation project which is facilitated by TaiwanICDF.

Taiwan International Cooperation and Development Fund (TaiwanICDF) implements an agricultural rehabilitation project which carries out in conjunction with a New Hope Village reconstruction project for the quake survivors. The project site is located in Savane Diane plateau in the Center Department of Haiti. This plateau is surrounded by mountains, 22,000 ha in size, 300-400 m in altitude and safer from natural disasters. Haitian Agricultural Department plans to develop this area as the second granary in Haiti (the first one is the Artibonite Plain) and hopes this development can be hastened by a joint effort of rehabilitation to keep the quake survivors settled in this area.

The village reconstruction is facilitated by Taiwan Red Cross and each household will be established on a 1.6 ha plot, with 1.5 ha allocated for planting food grains and 0.1 ha set aside for a house and vegetable production. The house construction will be finished in late 2010 and TaiwanICDF estimates that 200 households (about 1000 people, 5 people per household on average) will benefit from the effort.
Forty hectares of maize were planted in May 2010 in Savane Diane plateau to evaluate the growth and pest infestation among different varieties.

An estimated 53% of Haiti's population live in rural areas and 47% in urban areas. Although the earthquake hit western and southern of Haiti, the catastrophe is nationwide. Through the agricultural rehabilitation project, TaiwanICDF intends to set up the agricultural production system to sustain the food supply for the survivors to settle in Central Haiti, to reduce hunger and malnutrition in rural areas and to relieve the high levels of post-earthquake unemployment.

On 27 August 2010, TaiwanICDF agronomist Kun-chong Huang and Haitian Agricultural Department staff explained to the quake survivors about the land allocation of the rehabilitation project and the planting schedule for the first food grain production (Photo: Kung-chong Huang).

AVRDC-the World Vegetable Center provided 120.9 kg of seeds with French and Creole planting instructions to TaiwanICDF for the agricultural rehabilitation project in Central Haiti (Photo: Ming-che Chen, Communications and Information, AVRDC-The World Vegetable Center).

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Source and photos:
Ming-hong Yen, site coordinator for agricultural rehabilitation project in Haiti, TaiwanICDF
New vegetables with matching management practices and cooking recipes for Tuvaluans

Tuvalu, one of the smallest (26,000 km²) and least populated (around 12,000) countries in the world, is composed of four reef islands and five atolls, all low-lying. Its highest elevation is only 4.5 m above sea level, the second lowest country elevation in the world. It is one of the most at-risk countries to future sea level rise resulting from climate change. It has sandy soil with lots of coral debris which makes it difficult to support agricultural activities. Thus, Tuvalu depends on imported foods.

The Taiwan Technical Mission (TTM) in Tuvalu works closely with the Department of Agriculture, Ministry of Natural Resources and Environment to increase vegetable production and consumption, and thus reduce dependence on imported vegetables and improve household nutrition in Tuvalu. TTM has a 3,500-m² Demonstration Farm at Funafuti where the Tuvaluans are introduced to new vegetable crops such as yard-long bean, pepper, pak-choi, pumpkin, Chinese cabbage, okra, spring onion and more. Vegetables produced there are sold in TTM’s Friday Morning Market in the Demonstration Farm with 50-60 Tuvaluans buying heaps of mixed vegetables at low cost and being shown how to cook the new vegetables.

It is a big challenge for the TTM to demonstrate how to produce vegetables in the infertile soil. Coral debris has to be removed and composts from plant residues are incorporated into the sandy soil to improve its nutrient and water holding capacity. Vegetable production technologies are promoted through field days, radio broadcasts, and two-month trainings, and by distributing free seedlings.

Tuvalu land is sandy with plenty of coral debris (left); compost mixed with sandy soil free of coral debris greatly improves soil quality (center); and vegetable seedlings are grown in pits with sand and compost mixture, covered with coconut leaves for protection from the sun (right).
Vegetables are produced in home gardens, either in small plots or in pots and other containers. Home garden competition is held regularly with garden implements and farm inputs as prizes.

In general, pests are not a big problem in Tuvalu. Drought is a major concern because the soil is sandy. Also, salinity is common around January/February when the sea water level rises and sea water intrusion occurs.

**Giant swamp taro or “pulaka” (Cyrtosperma chamissonis)** (left back), taro (introduction from Fiji) (left front), slippery cabbage (right), banana and breadfruit are traditional foods in Tuvalu.

**Various vegetables grown in Taiwan Technical Mission Demonstration Farm in Tuvalu**

**Source and photos:**
Edwin Javier, Global Technology Dissemination, AVRDC-The World Vegetable Center