

FEEDBACK

from the field

This bulletin provides information about application of AVRDC's technologies in the field and other topics of interest regarding vegetable production and consumption constraints around the world. It is issued quarterly. We welcome everyone to share any interesting news about vegetables – please send a short article with photos to tech_dissemination@worldveg.org. Thank you!

Application and adoption of Starter Solution Technology (SST) by Farmer Field School participants in Indonesia

In Kediri and Blitar districts of East Java and Bangli and Tabanan districts of Bali, the soil in general is very sandy and low in organic matter, but high in available potassium. However, overuse of inorganic fertilizers and inappropriate timing of fertilizer applications result in poor vegetable production in these areas. Therefore, under the USAID-funded project, *Mobilizing vegetable genetic resources and technologies to enhance household nutrition, income and livelihoods in Indonesia*, AVRDC has introduced Starter Solution Technology (SST) to 1680 farmers through Farmer Field Schools (FFS) for improving the current fertilization management for vegetable production.

Starter Solution Technology (SST) was developed by AVRDC and has been disseminated in Thailand, Indonesia, China, India and Taiwan. SST involves applying small amounts of very highly concentrated inorganic fertilizer solutions to soils in the root vicinity immediately after transplanting. This is to provide young plants with readily available nutrients before their root systems are well-established, which greatly enhances the plants' initial growth.

A preliminary test was carried out by FFS participants two days before the planned transplanting date. Farmers used local fertilizer (Phonska, PA) to prepare six different concentrations of starter solutions and applied 50 ml of each solution to six uniform seedlings immediately after transplanting. Farmers observed the plants one day after



Different concentrations of starter solution for preliminary test: PA-1 is water only and PA-6 is the highest concentration (from left to right)

application. If a plant is wilting or dying, it indicates that the concentration of starter solution is too high. Farmers selected the concentration that elicited the best response in growth by the plants.



Farmer Field School (FFS) participants tested different starter solution concentrations in the field before applying to the crops



Farmers practiced starter solution application when the soil was dry and applied it to inner sides of plant holes in Bali





Farmers observed chili growth after applying Starter Solution Technology (SST), East Java (**right**); Ms. Ni Made Sekartani, a woman farmer from Tabanan district of Bali shared her observations about applying SST during a field day (**left**)

After selecting the most appropriate concentration, farmers applied it to tomato and chili in their FFS and observed the leaf color, plant height and number of fruit set every 1-2 weeks. They compared the crops with SST application with crops that were applied with large amounts of fertilizers (the usual practice). Ms. Ni Made Sekartani, a woman farmer from Tabanan district of Bali said during a field day: "Applying SST can reduce excessive use of inorganic fertilizers and this significantly reduces production costs. Although the yield is slightly lower, I still receive higher net revenue than from applying the usual practice".

Mr. Iswanto and Ms. Suyatni, farmers from Blitar and Kediri districts of East Java, observed the effect of SST in their FFS. Mr. Iswanto said the effect appeared three days after application-the chili leaves were greener and the plants were stronger after applying SST. Ms. Suyatni applied SST in her own chili farm after observing its effects in the FFS.

AVRDC's research has shown that applying starter solution can substitute for 30-50% of inorganic fertilizer and 50% of organic fertilizer used during the cropping season for several vegetable crops. Starter solution can also be used as a sidedressing in later crop growth stages. SST is an innovative technology for reducing fertilizer inputs while increasing

fertilizer use efficiency and crop productivity. It is a low-input and soil-based approach, and it is applicable to the common problem of farmers using excessive fertilizer applications. Fields with low fertility may get a better effect from SST. This technology is applicable, accessible and affordable by smallholder farmers in developing countries. Starter Solution Technology is easy to apply and can be modified for applying to different types of soils and vegetables.

The introduction of SST has corrected two erroneous beliefs which are common in Indonesia: (1) that high amounts of inorganic fertilizers are necessary for good vegetable production; (2) that highly concentrated fertilizer solutions will kill plants. SST has also provided information on optimal timing for fertilizer applications. Due to the benefits from SST, it has good potential to be adopted by Indonesian farmers in the near future.

Source:

Joko Mariyono, Site Coordinator, Vegetables for Indonesia project; Chin-hua Ma, Bacteriology, AVRDC-The World Vegetable Center

Photos:

Joko Mariyono; Chin-hua Ma; Willie Chen, Greg Luther, Global Technology Dissemination, AVRDC-The World Vegetable Center



Effects of Starter Solution Technology (SST) on plant height and growth at 45 days after transplanting:

Left: Farmer's practice, plant height is 68 cm

Right: SST practice, plant height is 85 cm

Elephant foot yam - a new cash crop in Bangladesh



Corms of elephant foot yam (**left**) and sale in the market (**right**)

Elephant foot yam (*Amorphophallus paeoniifolius*) is a tropical tuber crop which originated in India, Sri Lanka or Southeast Asia. In Bangladesh, it is commonly known as 'Olkochu' and is a very popular but still underutilized tuber vegetable crop. It is easy to cultivate with minimal inputs. The tubers, stems and leaves are used as vegetables in various Bengali cuisines.

In Bangladesh, 250-300 g elephant foot yam cormels are used as propagules for cultivation. Cormels are planted in holes which are filled with cow dung during March to April. Young and vigorous shoots of the yam emerge within a few days after planting and can be grown into a full-grown plant within a couple of months. Elephant foot yam grows normally throughout the monsoon season and the tubers are harvested during the months of November and December. The high yielding varieties of elephant foot yam are very productive and yield from 40-50 t/ha. It is also commonly grown in the homestead areas without much care in Bangladesh.

When the leaves are yellowing and drying up, it's time to dig out the corms. Uninjured harvested corms can be preserved for a few months and farmers can consume them for a longer period. Elephant foot yam is a nutritious tuber crop which is rich in minerals (calcium, phosphorus and iron) and vitamins (vitamin A, thiamine, niacin and riboflavin). The common way to consume the elephant foot yam is simply boiling it and mashing it with mustard paste or preparing it with curry, fish,

meat and potato. Recently, the corms are used to prepare various value-added products such as pickles of elephant foot yam, which are becoming very popular in Bangladesh. The pickles are prepared through an easy process by adding the paste of boiled olive with the elephant foot yam mash and mixing powders of mustard, fennel seed, fenugreek, hot pepper along with mustard oil, turmeric, garlic, salt and a pinch of sugar. These pickles are very delicious and mouthwatering. In addition, homemade elephant foot yam chips are crispy and savory.

Demand for elephant foot yam is growing because of its popularity as a vegetable, its suitability in agroforestry farming systems and its place as a major component of several indigenous medicinal preparations. Many farmers in Meherpur, Chuadanga, Kushtia, Natore, Rajshahi, Dinajpur, Rangpur, Khulna and Jessore districts have started to cultivate elephant foot yam commercially as a cash crop in recent years.



Source and photos:

Sitesh Chandra Biswas, BRAC Agricultural Research & Development Centre (BARDC), Bangladesh



Above: A full-grown plant of elephant foot yam

Left: Yam corm slice and pickles of elephant foot yam

Right: Homemade elephant foot yam chips

Tomato supply severely constrained by various diseases and postharvest handling in Mindanao, Philippines



The entire tomato farm was infected by tomato late blight disease in highland Mindanao (**left**); severe symptoms of tomato yellow leaf curl disease (**right**)

In Mindanao of the Philippines, tomato production is severely constrained by various diseases, which cause very low yields, around 3-5 t/ha. The tomato yellow leaf curl disease (TYLCD), late blight and bacterial wilt are prevalent in tomato fields, especially TYLCD. It is caused by begomoviruses and is spread throughout the country, and diverse viruses have been identified from different regions. The TYLCD incidence is high and causes high yield loss. In addition, highland tomato production is greatly affected by late blight infestation.

Farmers in Mindanao simply pack the harvested tomatoes in wooden boxes in the fields and transport them to the

markets without grading and adequate protection. Up to 38% tomato yield loss is caused by poor postharvest handling in the Philippines.

TYLCD is transmitted by the whitefly, *Bemisia tabaci*. Raising tomato seedlings in an insect-proof nethouse (50-mesh size or finer) or in a greenhouse is highly recommended to prevent early infection of seedlings by whitefly infestations. Under this condition with complex disease problems, developing tomato cultivars with multiple disease resistance (TYLCD, late blight and bacterial wilt) will have a great positive impact on tomato production in Mindanao.



Tomatoes are simply packed in wooden boxes and kept by the roadside after harvesting (**left**) and then transported to markets without grading and proper protection (**right**)

Source and photos:

Wen-shi Tsai, Virology, AVRDC-The World Vegetable Center

AVRDC - The World Vegetable Center

Global Technology Dissemination
P.O. Box 42, Shanhua, Tainan 74199
Taiwan

T +886 6 5837801

F +886 6 5830009

E tech_dissemination@worldveg.org

I www.avrdc.org

Facebook: <http://www.facebook.com/pages/Feedback-from-the-Field/169530259752510>

Editors: Mandy Lin and Greg Luther, Global Technology Dissemination

Layout: Vanna Liu, Communications & Information