

# 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](mailto:tech_dissemination@worldveg.org). Thank you!

## Simple innovations successfully applied to grow summer gourds in winter for higher prices in Jharkhand, India



Farmers sold the harvested bottle gourds in March and April for five times the price of the peak season

In Kaora village near the city of Khunti in Jharkhand, India, summer rains are often excessive and can destroy rice crops and even homes. In winter, it rarely rains and most watercourses are reduced to a trickle. However, winter is a good time for producing vegetables if water for irrigation is available. A few simple innovations to provide more warmth for young crops can also make out-of-season production possible to obtain prices up to five times as high as during the peak season. Farmers from Kaora village think about the market demand first before planting and this approach is critical to helping new vegetable farmers succeed and to gain confidence.

Bottle gourd is normally a summer crop, however if it can be produced in winter, it is one of the most profitable crops. An innovation fostered by the AVRDC-Sir Ratan Tata Trust (SRTT) project in Jharkhand state, northeast India is making winter

vegetable production possible by using plastic sheeting and seepage tanks.

In November, bottle gourd seeds are sown into pits filled with compost, fertilized soil and carbofuran or phorate pesticides to control root-knot nematodes and sucking pests that damage seedlings. The pits are then covered with small plastic sheets to raise the soil temperature. This helps the seeds germinate under cold conditions, starts the crop growing well and allows farmers to harvest the gourds 2-4 weeks earlier than most other crops.

During the peak bottle gourd supply season of April to July, the price of gourds averages around US\$0.06-0.08/kg. Later crops that come onto the market after July get a better price of US\$0.14-0.16/kg, but the very earliest crops grown over winter that come onto the market during March and early April can get premium prices of over US\$0.30/kg.



Once bottle gourd seeds germinate (**left**) and start to grow in early February (**middle**), the plastic sheets are cut to allow the vines to emerge and grow (**right**)



Small, deep earthen-walled dams built with family labor and government funding collect seepage water from the edge of low-lying rice fields (**left**); a counterweight bucket for lifting water from the reservoir to water the vegetables (**right**)

Plastic sheets covering pits are not the only way to produce early bottle gourd. Farmers were initially advised to grow bottle gourd under polythene tunnels, but to reduce the costs they developed the innovation of growing bottle gourd in deep furrows covered by smaller plastic sheets. To reduce the costs even further some came up with the idea of using the smallest squares of polythene necessary to just cover a single pit in which bottle gourd seeds were planted. Once the plants start to grow in early February, the sheets are cut to allow the vines to emerge. Then, a top dressing of fertilizer is applied to keep the crop growing well.

Irrigation is also essential for a good crop. Small, but deep earthen-walled dams built with family labor and government funding collect seepage water from the edge of low-lying rice fields. Farmers use these tanks to water nurseries and plant vegetable crops on nearby upland areas that were formerly fallow. With small pumps, it is also possible to expand the planting areas with continuous irrigation. Farmers who have done this have doubled their income from bottle gourds. The innovation of winter vegetable production has created new income opportunities for farmers and is helping to transform the lives of 20 of the 28 families in Kaora village.



Farmers use polythene tunnels (**top left**) to grow bottle gourds in winter; some farmers use the small squares of polythene (**top & bottom right**) just to cover a single pit (**bottom left**) in which bottle gourd seeds are planted (**bottom middle**) to reduce the cost further

At a recent meeting, representatives of several villages recounted how they had also successfully tried this and other innovative practices to become vegetable farmers.

Joseph Nag from nearby Digri village made US\$280 growing bottle gourd on his small 200 m<sup>2</sup> plot with input costs of only US\$40 and his family's labor. He was inspired by a demonstration plot of early bottle gourd in a neighbor's field and decided to give it a go. Following his success, other farmers in his village are now also enthused and are using the same techniques to grow early crops of bitter melon, watermelon and cucumber.

**Source and photos:**

Warwick Easdown and M. Ravishankar, Regional Center for South Asia, AVRDC-The World Vegetable Center

An added community benefit is that these innovative farmers have made the tasty bottle gourd dishes available for marriage feasts during April and May, the most popular months for local weddings before the onset of the monsoons makes travel difficult.

The simple cultural practices combined with the right crops/varieties and local innovation can make all the difference to a small farmer being able to start successfully in vegetable production – with all sorts of flow-on benefits for the whole community.

## 'Cut-and-come-again' method for harvesting spinach in Bangladesh

Spinach (*Spinacia oleracea*) is normally grown in winter in Bangladesh and usually the whole plant is uprooted during harvesting. However, it is a quick growing leafy vegetable with good sprouting potential, so many homestead vegetable growers repeatedly harvest spinach by using the cut-and-come-again method.

A late bolting spinach variety, 'Sathi', was grown at the experimental field of BRAC Agricultural Research & Development Centre (BARDC) and the cut-and-come-again practice was followed to harvest the fresh spinach regularly from the same plot. Healthy spinach plants were cut 4-5 cm above the ground and harvested around 30 days after sowing. After the first harvest, urea (25kg/ha) and Muriate of Potash (12.5kg/ha) were applied in each bed. Mulching was applied accordingly and sprinkler irrigation was carried out every 7-8 days in the morning and afternoon. Weeding was done weekly.

Within 2-3 days after the first harvest, sprouting occurred and good quality, fresh spinach leaves can be harvested again from the same plants in 10-12 days. The spinach leaves can be repeatedly harvested every 10-12 days until the 5<sup>th</sup> harvest. After that, these spinach plants were kept for seed production and saving the seeds for the next planting. The total yield is 22 t/ha, about three times higher than from traditionally-uprooted harvesting.

Spinach is a short duration leafy vegetable and it can generate early income to growers. In addition, growing spinach in the off-season is very profitable. Cut-and-come-again harvesting



*Cut-and-come-again harvesting method can generate spinach yields three times higher than traditionally uprooted harvesting*

method not only can reduce the total production cost but also save time compared to sequential cropping. However, very few reports and references of this practice are available in Bangladesh. BARDC is now disseminating this technique through extension workers to farmers.

**Source and photos:**

Sitesh Chandra Biswas, Senior Sector Specialist (Vegetable Research), BRAC Agricultural Research & Development Centre, Bangladesh

## Microirrigation for addressing water scarcity and improving livelihoods in West Africa



In the Sahel and semi-arid parts of western Africa, annual rainfall is low and erratic, and the lack of water is one of the major constraints for crop production. Farmers in this region usually carry the water by hand, using calabashes (a hollowed-out, dried squash) or plastic buckets to irrigate their crops. Some farmers may spend more than half a day hauling water to their vegetable plots, if the water source is far away. Irrigating vegetables and other crops is indeed time-consuming and drudgery in the dry areas of West Africa with erratic rainfall and limited public irrigation infrastructure.

“Microirrigation” refers to a family of irrigation systems that apply water through small devices. These devices bring water very near to the plant or below the soil sub-surface. Simple, low-cost microirrigation tools such as bucket and drum drip kits, pedal or mechanized low-pressure pumps, and microsprinklers can save labor and allow farmers to expand their vegetable cropping areas. These simple microirrigation technologies are getting popular in several parts of Africa. With support from the Taiwan Ministry of Foreign Affairs, AVRDC worked with several local partners on evaluation of a range of microirrigation systems in Niger, Burkina Faso, Mali, and Senegal in 2009.

The field survey on the types of microirrigation technologies used in Burkina Faso, Mali, Niger and Senegal showed that around 83% of farmers frequently use a



*Microirrigation system applied with vegetables at ICRISAT research farm (top); farmer uses calabash to draw water from the Niger River for irrigating her vegetable field (bottom right)*



Water storage tanks used for irrigating crops; these are components of an African market garden, which incorporates a simple design and affordable microirrigation system for smallholder farms

bucket/calabash/watering can, 3% use a manual (pedal/hand) pump system, 11% use a motorized pump system and 3% use a gravity/canal system to irrigate their crops. The survey also showed that the microirrigation systems could generate substantial income, employment and livelihood benefits from just 500 m<sup>2</sup> vegetable plots in these four countries.

Despite higher additional monetary benefits from use of such low-cost microirrigation, women farmers' preference for using a traditional watering can or calabash to irrigate their vegetables and other cash crops was much higher than for several other recently introduced microirrigation technologies. A female farmer from Tintolou, Burkina Faso

said, "The pedal pump is helpful but it is hard for women to operate it". This points out that consideration of gender issues and involvement of women farmers in early stages of designing and implementing any agricultural technologies, technology adaptation and adoption is very important.

Several of these affordable microirrigation technologies not only provide farmers income and employment but also help the farmers to manage and conserve scarce water resources. In this process, designing and selecting a system suitable to the local culture and traditions, involving social groups and considering gender issues are all key factors to enable wide-scale adoption of a technology.

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Female farmers use a rope and bucket (**right**) and operate a treadle pump (**left**) to draw water from wells to irrigate their vegetables

**Source and photos:**  
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