

A woman wearing a white sleeveless top, a blue headwrap, and a blue skirt is harvesting tomatoes in a field. She is bending over, holding a yellow bucket, and picking tomatoes from the plants. A blue patterned cloth is visible on the right side of the frame. The background is a lush green field with many tomato plants.

ONE THIRD OF OUR FOOD GOES TO WASTE

# Taking care of the harvest





**In developing countries especially, a lot of food is lost post-harvest. There is much to be gained by using simple existing techniques, especially when applied in close collaboration with local producers. Wageningen is developing a service desk which offers farmers and companies advice on this topic.**

**TEXT RENÉ DIDDE PHOTO RON GILING/LINEAIR INFOGRAPHIC SCHWANDT INFOGRAPHICS**

Melon farmer José Castillo from Zacapa, Guatemala, is bringing in the harvest. One big team of labourers cuts the melons and another team heaves them into trailers. A mat covered in black plastic is in place to protect the fruit from bruising. The harvest then sits in the burning sun for at least half an hour. Only when there are 14 trailers ready does the tractor come to pull them to the cold room.

‘That’s if there is no lunch break in between, because in that case it can take up to three hours before the first harvested melons get cooled down,’ says Eelke Westra, who is showing slides of the harvest. ‘There is no sign of damage on the melons, but without the farmer realizing it, they lose a quarter of their shelf life in three hours,’ says Westra, post-harvest technology research leader at Wageningen UR Food & Biobased Research.

As a result, Castillo gets a lower price for his melons, which are exported to Europe and elsewhere. His crop would be worth more if he employed extra hands during the lunch hour, used white plastic instead of black, and parked the trailers under trees, advises Westra. Simple improvements can be made in the cold room too. Crates of melons are dumped on top of each other, preventing the cold air from reaching all the fruit. The fruit also gives off moisture, which can make them rot or dry out.

### STAGGERING LOSSES

According to the agricultural organization FAO, 1.3 billion tonnes of food is wasted every year. This amounts to one third of total global production. A staggeringly large amount, especially in view of the organization’s projection that by 2050,

70 percent more food will be needed to feed the world’s population, which will have swelled to 10 billion by then. The food waste mainly affects developing countries, where it is largely due to a variety of factors at various points along the chain: from the time of the harvest, slaughter or catch to the consumer’s kitchen. Among the causes are lack of cold storage, insufficient dry storage space, a shortage of transport and inadequate infrastructure. Whether you look at melons in central America, mangos in Kenya, teff in Ethiopia or chicken in Indonesia, the waste is massive. The causes of food waste in rich western countries are different. There, supermarkets and consumers are to blame, mainly because we buy too much food. With a view to reducing post-harvest losses in developing countries, Eelke Westra and

## FOOD LOSSES IN DEVELOPING COUNTRIES

Just as much food is wasted in developing countries as in industrialized countries: approximately one third. In the west, consumers and retailers

are responsible for more than 40 percent of the wastage, whereas in Africa and Asia more than 40 percent of the losses occur during harvesting and processing.



### Differences in food losses





**‘We also offer tried and tested ideas such as using wet cloths to keep vegetables fresh’**

colleagues from the Horticulture Chains chair group, LEI Wageningen UR, RIKILT Wageningen UR and Wageningen International are working on establishing a Network of Excellence. ‘This will be a servicedesk where farmers, companies, governments and NGOs from all around the world can submit their problems to Dutch experts by phone or computer and receive concrete agricultural advice,’ explains Westra. Besides scientists from Wageningen UR, there are also NGOs, companies and the ministries of Economic Affairs and Foreign Affairs involved. The planned service desk will not restrict itself to proposing high-tech solutions such as cold storage units or solar energy. ‘We also offer tried and tested ideas such as using wet cloths to keep freshly picked vegetables fresh, or storage cupboards with air vents

on poles above tubs of water.’ According to Westra, it is important to share this kind of folk wisdom as well. An approach which is common knowledge in India might be unknown in Africa, for instance.

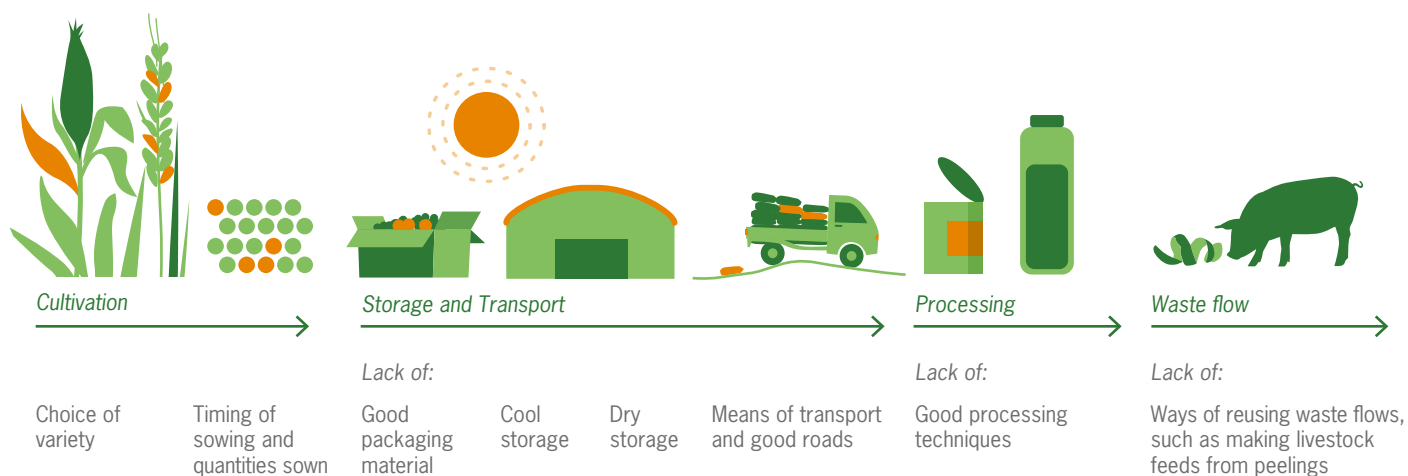
#### PANEL OF EXPERTS

‘Everyone is in favour of reducing food waste. People are upset about the deterioration of agricultural products. What makes it difficult, though, is that they are not familiar enough with the problem of food losses,’ says Toine Timmermans, Sustainable Chains

programme manager at Food & Biobased Research.

In a report called *Food Losses and Waste*, which was produced this summer by the High Level Panel of Experts, a key think tank on food security, Timmermans and an international group of scientists analysed the problem of global food waste. ‘The biggest food losses are of fresh products. That is precisely where too little thought is given to business cases and integral solutions in the food chain. The result is that products do not accrue enough added value on the market,’ says Timmermans. >

#### Losses during harvesting and processing are caused by:



## NOT IN THE BIN

Whereas most of the food waste in developing countries occurs post-harvest, in the west it is primarily a question of too much food being bought and cooked, and subsequently thrown out. The average Dutch person, for example, throws out 50 kilograms of food – or 150 euros – per year. In several places, initiatives are being developed to counter this wastage, and Wageningen UR is collaborating on them.

- **Damn Food Waste** serves free lunches made of products that are 'past their use-by date'.
- **Food2Food** selects usable unsold fruit and vegetables in supermarkets. Caterer Hutten is working on a plan for making soups and sauces from them.
- During **Foodbattle**, participants keep track of what they waste over a period of three weeks. After that, practical tips help them to cut their food waste by 20 to 30 percent.
- **Instock**, a restaurant in the Westergasfabriek in Amsterdam, cooks exclusively with food that would have been thrown out. The restaurant collects food daily from branches of the Albert Heijn.
- In the EU project **FUSIONS**, partners in 13 countries work together on raising awareness, collecting reliable data, giving policy advice and bringing about behavioural changes; according to LEI Wageningen UR, 40 percent less food waste would save the EU 75.5 billion euros.

More initiatives on [www.nowastennetwork.nl](http://www.nowastennetwork.nl), including an app to help combat food waste. The No Waste Network is an initiative by the Ministry of Economic Affairs in close collaboration with the Dutch sustainable food alliance (Alliantie Verduurzaming Voedsel) and Wageningen UR.



One example is the mango trade in Kenya, where the big problem is how to deal with seasonal peaks, explains Timmermans. 'All the fruit ripens at once, creating a surplus which cannot be marketed due to lack of infrastructure and markets. If you juice the surplus mangos, new markets could develop. Drying or conserving mangos are promising options too. These kinds of food manufacture can make a big contribution to food security.' Such steps would not only make mangos available all year round, but would also create export opportunities. 'If the government develops a business case of this kind together with farmer organizations, it might be possible to find international investors to provide the capital for jam factories, juicing machines or drying equipment.' If NGOs participate in such public-private partnerships as well, Timmermans expects they could attract funding from rich funds such as the Rockefeller Foundation and the Bill Gates Foundation.

Plans of this kind for creating added value differ from product to product and from country to country. Timmermans: 'In Egypt, green beans are grown for export to Europe. The losses, in the form of beans that are too small, find their way onto the local market. Kenya grows beans too, but Kenyans don't eat them. There, a canning



**'If you juice the surplus mangos, new markets could develop'**

factory for exporting B quality beans could provide a way of combatting waste.' Such business plans should be drawn up in collaboration with local producers, says Timmermans.

He agrees with Westra that simple techniques can help limit waste. 'You don't need fancy packaging like plastic with holes in it,' he says. 'Reusable packaging such as the grey Euro Pool crates do require some investment, but they are much more robust than the ubiquitous cardboard boxes. You really need to organize that throughout the chain.'

In order to draw attention to new collaborative partnerships between private and public parties to find solutions to waste and losses, the Ministry of Economic Affairs and the FAO are jointly organizing a conference in The Hague from 8 to 10 December.

Jennie van der Mheen agrees that involving local producers is crucial for a sustainable solution to food losses. She works for Wageningen International, the office which coordinates Wageningen UR's international products. 'All too often, a decision is made about a cold room without consultation on the best location, the right size or possible collaboration, for example between growers of mangos, pineapples and tomatoes,' says Van der Mheen, who is involved in Wageningen UR projects in African

countries such as Ghana. 'The government there is not in control of distribution and logistics,' Van der Mheen does notice, however, that export is relatively well-organized thanks to strict conditions imposed from abroad. 'The biggest post-harvest losses occur in crops such as maize, cassava, yams and tomatoes for the home market.'

### SOFT SKINS

The case of Ghanaian tomatoes is particularly sad. Between 50 and 80 percent of the crop goes to waste. 'That is because farmers work with the wrong variety,' says Van der Mheen. 'Its high water content makes it unsuitable for tomato puree, while for the salad tomato market, the tomatoes' skin is too soft.' What is more, the tomatoes are transported in big crates and dumped onto large plastic sheets at the market. 'There is not much left then except pulp. And the farmers all plant their tomatoes at the same time without any idea of the demand or market price,' adds Van der Mheen. Switching to a different tomato seed is expensive, though. Nor are the farmers very eager to try something new.

But Ghana does need to do something about food waste, if only because the African Union has now put the issue on the agenda. Food & Biobased Research is

working on logistical plans for this West African country. The Horticulture Chains chair group is helping farmers to work on varieties with a longer shelf life. The LEI is providing market information for the farmers. RIKILT and the CDI (Centre for Development Innovation) will pass on knowledge to farmers about the best ways of harvesting, storing and selling produce. 'Wageningen scientists are also doing research in Ghana on the use of waste flows,' explains van der Mheen. One example is cassava, which is used to make flour. The peelings currently go unused. 'Plant Research International is working with fungi which break open the cells so that the nutrients in the peel are released and become suitable for livestock feed. Cassava peelings can also be used as substrate for cultivating oyster mushrooms, a traditional but neglected item on the Ghanaian menu.'

Van der Mheen sees the growing middle class as an important driver of agricultural improvements. 'In countries such as Ghana, the middle class will start shopping more at supermarkets such as Carrefour and Wal-Mart. They won't be fobbed off with bruised mangos, tomato pulp and overripe pineapples anymore. ■

[www.wageningenur.nl/foodlosses](http://www.wageningenur.nl/foodlosses)

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## WAGENINGEN ACADEMY

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Wageningen Academy will be running a four-day course on Postharvest Technology in October 2014, with course leaders from Wageningen UR and UC Davis. For an up-to-date insight into post-harvest developments, as well as into techniques for dealing with fresh products.

**Kijk voor meer informatie op [www.wageningenacademy.nl/postharvest](http://www.wageningenacademy.nl/postharvest)**

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