

## The challenge

Mangoes are an important fruit crop in Southern Africa, providing nutrition and employment. However, insect infestations hamper productivity and curtail export opportunities: 80% of mangoes are lost to fruit flies in the region and synthetic pesticides have been largely ineffective in controlling these insects. However, by adopting integrated pest management (IPM) techniques, fruit farmers' yields and incomes are increasing.

## Innovations

- Researchers have developed and validated a fruit fly IPM package for use in Malawi, Mozambique, Zambia, and Zimbabwe.
- The IPM package consists of five interventions: protein food baits (baiting techniques), lures to attract male fruit flies (male annihilation), fungus (biopesticide application), farm cleanliness (orchard sanitation), and biological control using wasps called parasitoids.
- Training on drying and preservation, particularly among women and young people, is providing food and income-generating opportunities.

## Key results

Launched in 2019, the Alien Invasive Fruit Flies in Southern Africa project has been implemented across four Southern African countries to scale up the adoption of innovative fruit fly IPM techniques developed by the International Centre of Insect Physiology and Ecology (*icipe*) in Nairobi. More than 9,000 men (52%) and women (48%) have been trained to use the technologies.

Starter packs containing traps, lures, bait, and biopesticide have been distributed to farmers. One technology is male annihilation, involving mass trapping of male fruit flies using attractants and insecticide – leading to significantly reduced mating and fertilized eggs. Farmers are also provided with small plastic 'bait stations', which hang from mango trees and contain insecticide to kill the flies.

Tent-like structures (augmentorium) trap fruit flies, but smaller parasitoids can escape through the netting. These wasps lay their eggs inside fruit fly larvae which are consumed by the wasps on hatching. To date, *icipe* has shipped over 46,000 parasitoids to the four countries but, to avoid reliance on *icipe*, the project is establishing rearing facilities in all four countries.

So far, 42 farmers' fields have been set up to demonstrate IPM technologies: 10 each in Malawi, Mozambique, and Zimbabwe, and 12 in Zambia. The hosts received training to become 'model' farmers and relay information about IPM technologies. Participatory farmer groups (10-20 per country) – including agricultural extension officers, local farmers, and traditional leaders – also meet regularly to discuss IPM strategies and pool financial resources,



which have helped farmers diversify into other activities. In Zimbabwe, the groups have also established mango grafting activities to increase production and quality.

With these tools, 70% of mangoes are being saved, which has boosted incomes and household nutrition, and enabled families to send children to school. In Zambia, for example, Morris Chiwala's yield and income doubled. The reduction in fruit flies is also improving the production of other fruit (papaya and passion fruit) and vegetable crops (squash, pumpkin, and butternut).

Farmers are boosting incomes by using dryers to add value to their crops. In Zambia, a basket of fresh mangoes fetches ZK 100 (US\$6), while a basket of dried mango costs ZK 800 (US\$49). In Zimbabwe, 841 farmers (502 women and 339 men) have been trained on mango drying and, in Zambia, 28 farmers (27 women and one man) have been trained to make inexpensive dryers, which have been provided to 450 women; some are now using these skills to dry vegetables as well.

## At a glance



**9,000** men and women farmers trained on IPM technologies



**7/10** mangoes saved using IPM technologies



Dried mango is worth **eight times** more than fresh mango in Zambia