Dominican Republic uses nuclear technology to win the war against fruit flies

By Laura Gil

A group of men in sun hats gather around a cardboard trap for flies. They inspect it with their pencil-shaped UV lamp, nod, and smile from time to time. These insect specialists have left their lab coats behind to help the Dominican Republic verify its success in controlling the Mediterranean fruit fly, a pest that cost the country US $40 million in lost exports last year. The men nod again, satisfied that the trap contains no wild flies.

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> *— Ángel Estévez, Minister of Agriculture, Dominican Republic*

The Mediterranean fruit fly was reported for the first time in March 2015 in Punta Cana, the eastern region of the island. As soon as the Government announced the presence of this pest, the United States of America banned the import of 18 fruits and vegetables from the Dominican Republic, severely affecting the country's main source of income after tourism: agricultural exports.

But, thanks to a quick response by the Dominican Republic Ministry of Agriculture and with the support of the IAEA, the Food and Agriculture Organization of the United Nations (FAO) and the United States Department of Agriculture (USDA), the outbreak was contained in just ten months. The result? In January 2016, the USA lifted the agro-ban for most of the country.

"It [the ban] was disastrous," said Pablo Rodríguez, financial manager of Ocoa Avocados, the country's top exporter of green king avocado. "Almost all we do is export, so you can imagine our loss. Just because of a few flies, we all had to pay." Ocoa Avocados' losses amounted to US $8 million.

Others could adapt more easily. Cory St Clair is a small producer in Cabeza de Toro. He had just planted chillies and red peppers when the ban was introduced, and he started looking for other markets straight away. Now he sells mainly to Canada and Europe. "We were lucky," he said. "But bigger exporters were not."

Fear of the flies

While most of the flies were spotted in non-commercial almond trees along the coast, there was a fear that they might also invade commercial fruit and vegetable farms.

"We could have easily lost approximately US $220 million if the fly had reached the areas where the horticultural industry is concentrated," said Minister of Agriculture Ángel Estévez, "which means losing around 30 600 jobs directly and indirectly. We are a small country, and the livelihoods of thousands of people working in the horticultural sector depend on exports."

In 2014 and 2015, fruits and vegetables accounted for approximately 30% of food exports, earning the country around US $610 million per year, according to the Central Bank of the Dominican Republic. The agriculture sector is also the third largest source of employment.

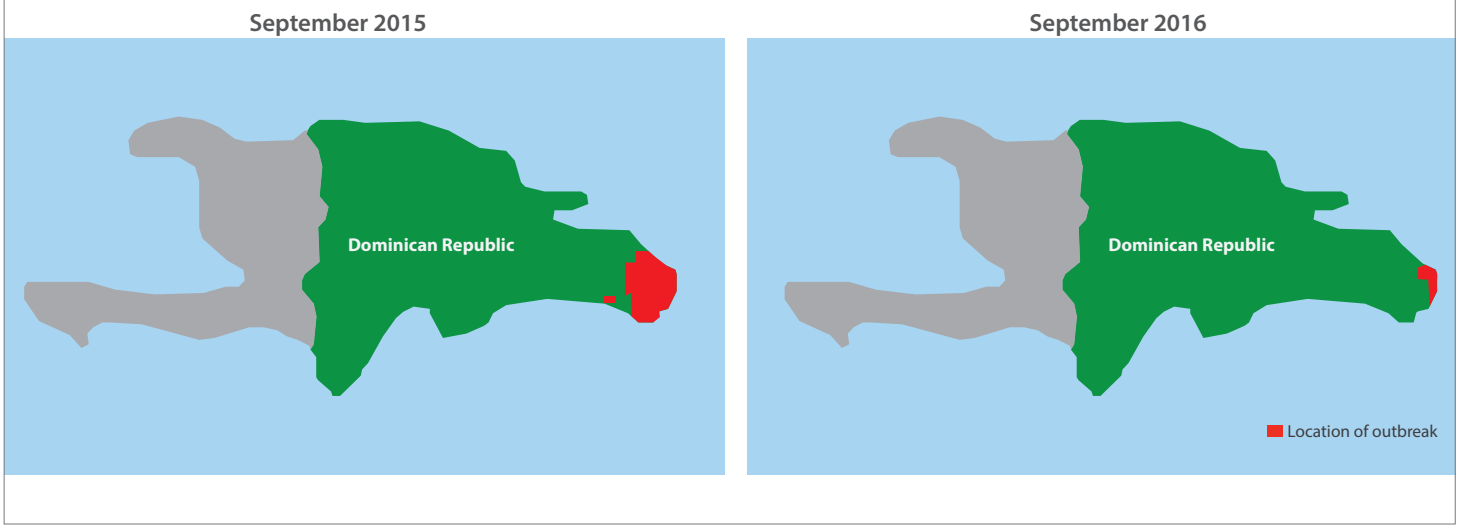
When the Government detected the outbreak, it did not have the adequate institutional capacity to respond, Minister Estévez said. "For us, it became a trauma. I would go to sleep thinking of the fly, I would dream of the fly, and in the morning, I would wake up with the fly in my mind."

Radiation to the rescue

When the Ministry of Agriculture asked for assistance in March 2015, the IAEA and the FAO helped the Ministry and its partners launch an integrated pest eradication campaign with the support of the Animal and Plant Health Inspection Service of USDA (USDA-APHIS), the International Regional Organization for Plant and Animal Health (OIRSA) and the Inter-American Institute for Cooperation on Agriculture (IICA).

The authorities established an extensive network of traps in strategic spots to determine the spread of the pest, destroyed infested almonds, guavas and caya fruits, sprayed insecticide mixed with a food

Location of the Mediterranean Fruit Fly Outbreak



attractant in hot spots, and imposed strict controls in the rest of the country, including ports and airports. But the key to containing the fly population was a nuclear-based method of 'birth control' for insects, called the sterile insect technique (SIT).

SIT involves rearing large numbers of male flies and sterilizing them with ionizing radiation. These sterile flies are then released from the ground and by air over pest-infested areas, where they mate with wild populations, which then do not produce offspring.

"It's amazing to me," St Clair said. "When I first heard about it, it sounded like science fiction." Thanks to the intensive weekly release of millions of sterile Mediterranean fruit flies, the outbreak was controlled and the USA lifted its ban in 23 of the 30 affected provinces within ten months.

SIT is among the most environmentally friendly control tactics available, and is usually applied as part of an integrated campaign to control insect populations. The IAEA and the FAO jointly support about 40 SIT field projects, delivered through the IAEA technical cooperation programme in different parts of Africa, Asia, Europe, and Latin America and the Caribbean.

"We're hitting the fly right where it hurts," said Rafael Antonio Cedarro, a trap reviewer in La Romana, one of the areas under surveillance. "In this area, we have 195 traps, and in the past months we have trapped no wild flies." These 195 are just some of the 14 525 traps placed around the country to verify that the outbreak is under control.

"We're impressed by the fast progress achieved in only a few months," said Walther Enkerlin, an entomologist at the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture.

No future for pests

The technical cooperation assistance provided by the IAEA, the coordinated emergency response and the Ministry's containment of the outbreak have led to a number of knock-on benefits, not only for the Dominican Republic but for the entire region.

"The project has prevented the spread of the fly to other Caribbean and mainland countries, including Mexico and the USA, avoiding large economic losses," Enkerlin said.

The Ministry of Agriculture now has the necessary technical and human capacity to tackle this and other outbreaks and to share lessons learned and know-how, said Frank Lam, IICA representative in the Dominican Republic. "It has been a costly experience that we want to share so that it doesn't happen to other countries. We don't want others to face this without being prepared," Lam said.

Minister Estévez is working together with his counterpart in Haiti to develop a strategy to protect the entire island of Hispaniola, which they share, and avoid future infestations. "It's not worth controlling the outbreak on one side of the island if it will appear on the other," he said. "Insects have neither ID nor passport. But now we have the right capacity in place to face this invisible threat."

As a spinoff from the technical cooperation project, about 300 people worked under the Ministry of Agriculture's programme in charge of controlling and eradicating the outbreak at the peak of the eradication phase.

The IAEA has trained specialists from the Dominican Republic on SIT through 3 technical cooperation interregional projects. The country is currently participating in 2 regional projects related to SIT.