



Controlling and eradicating the Mediterranean fruit fly in the Dominican Republic

The challenge

The horticultural sector is an important driver for economic development in the countries of the Latin American and Caribbean region.

In late 2014, an unexpected outbreak of the Mediterranean fruit fly (medfly) in parts of the Dominican Republic triggered a quarantine response. A number of Medfly-free countries importing peppers, avocados, tomatoes and other horticultural products from the Dominican Republic closed their markets either partially or completely to avoid the potential spread of medfly to their countries. The ban caused significant economic losses for producers and exporters, and had a substantial impact on employment, and on the general welfare of the population, as it threatened the livelihoods of thousands of people working in the horticultural sector in the Dominican Republic and other countries in the region.

Although the outbreak was located in the Dominican Republic, there was a substantial potential risk to the whole region, due to the high dispersal capacity of the pest, and the extensive movement of people and goods. With insufficient coordination at the regional level, lack of harmonized detection, quarantine and control measures, the risk of introducing the medfly to neighbouring countries was very high, and would have had highly detrimental consequences for food and job security in the region.



'Sleepy' sterile male flies being placed into special arial release boxes (photo: Laura Gil-Martinez / IAEA).

The project

The IAEA, with support from the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, and in close cooperation with the United States Department of Agriculture (USDA), the International Regional Organization for Plant and Animal Health (OIRSA) and the Inter-American Institute for Cooperation on Agriculture (IICA), helped the Ministry of Agriculture of the Dominican Republic contain the expanding pest outbreak through an emergency response programme. The project also provided support to many Member States in the Latin America and Caribbean region with strengthening their pest management approaches.

Insect traps were set in strategic sites within the infested area and throughout the country, in order to assess the temporal and spatial distribution of the pest. Infested fruit hosts in marginal non-commercial areas were destroyed, and bait sprays were used to reduce the density of the pest to a fraction of what it had been.

Once the pest was contained and suppressed, a major pest eradication campaign was launched. Using the sterile insect technique (SIT) as part of an area wide integrated pest management system, sterile male medflies were released on a continuous basis, assuring the elimination of any remaining pest populations. The sterile males competed with the remaining wild flies, mating with the last wild females and thus ensuring no offspring.

With IAEA support, the Dominican Republic was able establish adequate local infrastructure to improve pest control operations, including emergency preparedness for non-native fruit fly introductions. Staff were trained to conduct the necessary daily operations, including preparing stocks of sterile male medflies for release and emergency actions. Support was provided through expert advice, fellowships and the supply of equipment and trapping materials. A Technical Advisory Committee of SIT experts has provided technical advice and reviewed the progress of

work done. The response also included the weekly release of millions of sterile medflies supplied by the Moscamed Programme in Guatemala.

The impact

Thanks to the efficient and effective emergency response provided through the project, the expanding outbreak of the medfly was contained in the Dominican Republic. Without the implementation of this coordinated effort, the economic losses would have been of a much greater order of magnitude. An intense surveillance and eradication programme, including the release of millions of sterile medflies, led to the lifting of the export ban in 23 of 30 provinces inside only ten months. As a result, the fruit and vegetable industry has been able to recover export markets which in turn has saved the jobs of thousands of people. Following two years of intensive suppression and eradication efforts, the medfly was officially declared eradicated from the Dominican Republic by the Minister of Agriculture on 7 July 2017. The eradication of the medfly from Dominican Republic will contribute to enhanced fruit and vegetable quality and quantity that will in turn open more opportunities for export and employment, thus ensuring economic growth. Furthermore, this achievement has protected the horticultural industries in the whole Caribbean region, as well as in mainland neighbouring countries including Mexico and the USA, from this devastating pest

The Dominican Republic now has both the capacity and know-how to apply the sterile insect technique and to use the technique in combination with other mechanisms to control the medfly population. Surveillance and pest management mechanisms are in place. The Dominican Republic experience is helping other countries in the Caribbean region with important horticultural sectors, and, based on the success of this project, a regional technical cooperation project was launched in 2016. This new regional project aims to enhance coordination at the regional level and harmonize detection, quarantine and control measures among the participating countries to control pests and reduce the risk of introducing non-native fruit fly species.

The science

The sterile insect technique (SIT) is a type of 'birth control' for insect pests. Insects are mass reared in special facilities. Male and female are separated in an early stage of the rearing process. The male pupae are sterilized with ionizing radiation. When released, the sterile males mate with wild female insects of the pest population. The females lay eggs that are infertile and bear no offspring. Hence, timely and quantitatively releases of the sterilized insects lead to a reduction in pest population numbers. Tangible results on controlling pest populations are achieved by using sterile insects as part of area-wide integrated pest management programmes. The SIT is not only cost-effective but also environmentally friendly. Only the targeted insects are eradicated. Beneficial insects are not affected by the technique.

PROJECT INFORMATION

Project No: RLA5070

Project title: Strengthening Fruit Fly Surveillance and Control Measures Using the Sterile Insect Technique in an Area Wide and Integrated Pest Management Approach for the Protection and Expansion of Horticultural Production (ARCAL CXL1)

Duration: 2016–2018 (3 years)

Budget: €554 000

Regional Agreement: ARCAL

Contributing to:



Partnerships and counterparts

Support was provided through this project to the Dominican Republic in close consultation and cooperation with the Ministry of Agriculture of the Dominican Republic. Coordinated technical and financial assistance was provided by the Moscamed Program in Guatemala and Mexico, the United States Department of Agriculture (USDA), the Food and Agriculture Organization of the United Nations (FAO), the Inter-American Institute for Cooperation in Agriculture of the Organization of American States (IICA) and the International Regional Organization for Plant and Animal Health (OIRSA)

Facts and figures

- US \$40 million in lost export revenues within just 10 months of the outbreak¹.
- US \$11 million dollars of local government investment for the infrastructure and operation of the eradication programme¹.
- The speedy containment of the spread of the pests in the Dominican Republic has prevented large economic losses in the Caribbean and mainland countries, including Mexico and the USA.

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¹ Ministry of Agriculture, Dominican Republic