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Fruit Fly Eradication: Argentina

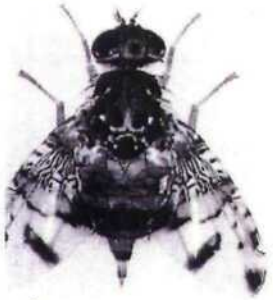
Fruit exports account for 9% of Argentina's total agricultural exports and generate annually close to $450 million. This could be increased but for fruit flies that cause damage equivalent to 15% to 20% of present production value of fruit and also deny export access to countries imposing quarantine barriers. The Department of Technical Co-operation is sponsoring a programme, with technical support from the Joint FAO/IAEA Division, to eradicate the Mediterranean fruit fly using the Sterile Insect Technique (SIT).

Siting the model project

The provinces of Mendoza and San Juan have been the first to establish programmes to eradicate the medfly, including the use of the SIT. The main fruit products for export are apples, pears, peaches and plums and in addition grapes, olives and tomatoes are grown for local consumption.

- Sterile insect rearing facilities have been built in both provinces.
- Monitoring programmes to determine the population are in effect.
- A quarantine barrier to prevent reinfestation of areas undergoing eradication efforts is in operation.

The model project covers five fruit producing areas comprising over half a million hectares. In these areas eradication efforts are favoured by good human and physical infrastructure and the fact that these fruit producing areas are isolated from other fly infested areas by deserts or mountains with no cultivated or wild plants host to medfly.



Adult medfly

Fruit fly eradication from the Mendoza Province

Why the SIT for Argentina?

In the south and western fruit producing regions, medfly (*Ceratitis sp.*) is the only fruit fly present and therefore eradication using the SIT is appropriate and feasible.

Medfly is important because of the damage it does and the quarantine barriers imposed by importing countries free of medfly. Medfly eradication has acquired importance in Argentina for several reasons:

- successful application of techniques for control and eradication of medfly, like the SIT, in other countries
- the leading role played by Argentinian entomologists, who are pioneers in the rearing of sterile insects and parasites
- the establishment of non-tariff barriers to imports from countries not free of fruit flies
- the international acceptance of the concept of pest-free zones
- Chile is fly-free and exporters can use Chilean ports.

Expanding the programme

In 1992, the Argentine Government launched a programme for the eradication of medfly from the south and western fruit producing areas (see map), where 95,000 hectares are devoted to fruit, mainly apples and pears.

Here eradication is achievable in a relatively short time because:

- medfly is the only fly present
- severe winter weather precludes medfly survival in rural areas
- the three main production areas *(see map)* are isolated, making natural reinfestation difficult.

Fruit damaged by medfly

Nearly US$9 million a year are being spent on quarantine and eradication efforts in Argentina, most of which is contributed by Mendoza Province.

Europe and E. Mediterranean

PORTUGAL has initiated construction of a European Union financed mass-rearing facility for the production of 50-100 million sterile medflies per week on the island of Madeira

ITALY, CYPRUS, ISRAEL, as well as other countries of the Near East including JORDAN, LEBANON, SYRIA and TERRITORIES under the jurisdiction of THE PALESTINIAN AUTHORITY could benefit from the SIT, and some are interested in building mass rearing facilities for sterile medfly

The Sterile Insect Technique (SIT) is an environmentally friendly method of pest control that has proved highly effective against several major insect pests. These include several fruit flies, tsetse fly (*Glossina sp.*), the New World Screwworm (*Cochliomyia hominivovax*), and several caterpillar pests *(Lepidoptera)*.

FAO/IAEA has played a leading role in developing the SIT at its Seibersdorf Agriculture and Biotechnology Laboratory near Vienna, Austria, and in collaboration with scientists in national and regional programmes in which the technique has been used.

Colonies of insects are maintained in fly factories for large scale production of offspring which are exposed to a very precise dose of gamma radiation. The radiation is sufficient to induce sterility but does not affect the ability of the treated insects to fly, compete with wild insects or to mate. The treated insects are released aerially on a regular and sustained basis into target areas and by substantially reducing fertile matings they cause a fall in population that leads eventually to eradication.

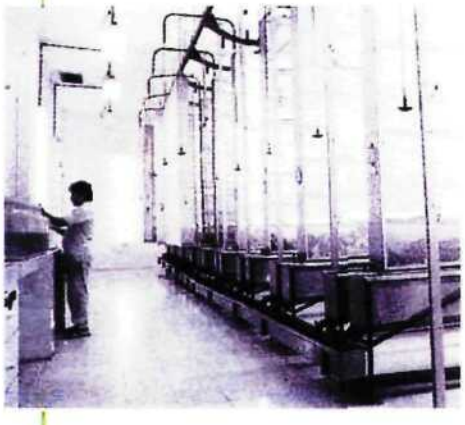
Fruit Fly Eradication: Argentina

National input

The Argentine Institute for Plant Protection (IASCAV) is the national institution responsible for the control and eradication of fruit flies. Several national and provincial institutions co-operate with IASCAV to:

- contact international organisations that certify fly-free zones,
- identify foreign resources (US$1.44 million has been allocated by the Inter American Development Bank)
- provide technical support
- provide funds to institutions responsible for field operations, training and preparation of quarantine legislation.

Institutions involved include CNEA (National Atomic Energy Commission), which assists on the use of the SIT in Argentina, INTA (Institute for Agricultural Technology), and universities undertaking research on specific topics.



Mass rearing of medfly

FAO/IAEA input

The IAEA has provided the mass-rearing facility in Mendoza with the Vienna 60 genetic sexing strain of medfly, which was developed at the IAEA Laboratory at Seibersdorf. The Vienna 60 strain permits selection of male flies by the colour of the pupae prior to treatment with gamma radiation. This reduces the cost of rearing medflies and increases the effectiveness of the SIT.

It has been demonstrated that where only sterile male flies are released they are more effective at mating wild females and thereby increasing the ratio of sterile matings. Also, males do not mark fruit as do female flies.

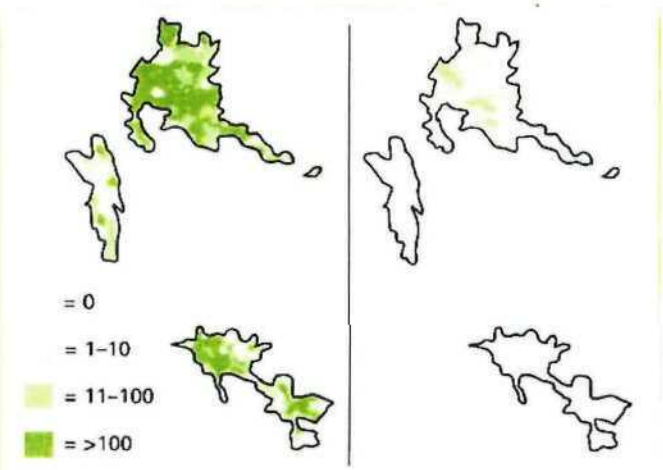
IAEA also provides expert advice on:

- management of the SIT programme
- fly rearing technology and fly release techniques
- public information, control and quarantine barriers
- fruit fly detection and monitoring.

Project impact

Checking fly trap

Major progress in FAO/IAEA projects has been made in the eradication of the Mediterranean fruit fly in Argentina. In the Province of Mendoza, as a result of the weekly release of 220 million sterile flies, eradication has been achieved in the season 1994 95 in the southern and central valleys of the Province (250,000 hectares). Over 95% reduction of the pest has also been achieved in the northern and eastern valleys of Mendoza province (see map below). Fruit in orchards is already worm-free, and growers have no longer to harvest the fruit early to avoid some of the fly damage. Eradication of the other, mainly urban areas, will be attempted in the following seasons, using for the first time a genetic sexing strain developed at the FAO/IAEA Agriculture and Biotechnology Laboratories at Seibersdorf. Eradication activities will then be expanded to the neighbouring provinces of San Juan, Neuquen and Rio Negro, so that eventually all southern provinces of Argentina become fruit fly free.



The SIT project in Mendoza Province has achieved eradiation of medfly in the southern central valleys and over 95% reduction in northern and eastern valleys.

Success in Chile benefits neighbours

Chile is the only country in South America with internationally recognized Mediterranean fruit fly free areas. As a consequence, Chile has developed a very successful multi-billion dollar fruit export industry. Chilean fresh fruits, however, are still restricted internationally from certain markets, because of the fear of outbreaks originating from the presence of medfly in the Arica region in northern Chile.

The Chilean Agricultural Service, after a decade of unsuccessfully attempting to eradicate medfly using insecticides in the Arica region bordering with Peru, requested support from IAEA in 1990 to establish a Sterile Insect Technique medfly eradication programme. As a result, in 1993, a medfly mass rearing facility was built in Lluta, Arica, with a capacity to produce 60 million sterile flies per week. After considerable staff training and provision of expert services, sterile fly releases were initiated in Arica in December 1993. In May 1995, these releases were expanded under a cooperative agreement signed between Chile and Peru to coordinate their actions against medfly in the valleys of southern Peru.

The results have been very encouraging. No wild medflies have been detected in Arica since mid-1995, and if these favourable results continue, all of Chile will be declared medfly-free. Based on these successes, there are now plans to expand the Chile and Argentina projects to include Perú and Uruguay (Phase 1) and other South American countries (Phase 2).

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