

## 2. BIOLOGICAL CONTROL OF INVASIVE CACTUS SPECIES (FAMILY CACTACEAE)

2.14 Australian pest pear/sour prickly pear (*Opuntia stricta*)

## ORIGIN OF WEED

Australian pest pear (fig. 1) is indigenous to Florida, USA

## BIOCONTROL AGENTS

Read more about biological control in general in leaflet 1.3 in this series, and about biocontrol in cactus species in leaflet 2.1.

In South Africa, Australian pest pear is controlled very effectively by a newly introduced, host-adapted biotype of cochineal. The cactus moth that was so successful in clearing the cactus from large areas in Queensland, Australia, also attacks the cactus in South Africa, but as a result of severe predation of its eggs and larvae it does not contribute greatly towards the biological control of Australian pest pear in this country.

a. Prickly pear cochineal, *Dactylopius opuntiae*, stricta biotype

*Dactylopius opuntiae*, which is indigenous to Mexico and the south-western USA, was one of the insects that helped to control *Opuntia stricta* in Australia in the 1930s. A colony of this cochineal was imported from Australia into South Africa in 1937 to control prickly pear (*O. ficus-indica*) - a highly successful project. Incongruously, the cochineal could hardly survive on *O. stricta* in South Africa. Recently it was realised that there are two different host-adapted "strains" or biotypes of prickly pear cochineal (*Dactylopius opuntiae*), although they look identical. The one that has been present in South Africa since 1937 and that prefers prickly pear ("ficus biotype" cochineal) probably originated from Mexico, while the one that prefers Australian pest pear ("stricta biotype") probably originated from Texas and Arizona. A colony of the stricta biotype was introduced from Australia in 1996 and released in South Africa the following year. It has proven very successful in controlling *O. stricta* here.

## Background information on agent

Consult leaflet 2.2 in this series for essential information on the life cycle of this insect, its potential as biological control agent and its implementation.

The life cycle of the stricta biotype of the prickly pear cochineal is very similar to that of the ficus biotype. The only differences are that the females of the stricta biotype (fig. 2) develop slightly faster, are bigger and produce a greater number of offspring on Australian pest pear than the ficus biotype, even when this develops on prickly pear.

## Damage by the stricta biotype of the prickly pear cochineal to Australian pest pear

The nymphs and adult females suck the sap from the cladodes (fig. 3) and in the process, they probably secrete toxic saliva into the plants. This causes yellowing of the cladodes of infested plants before they rot and drop off. Cochineal is more destructive in drier areas, because regular rains erode the wax layers around the females, exposing them to natural enemies such as ladybirds and also wash many crawlers off the cladodes.



Figure 1. Australian pest pear.



Figure 2. The stricta biotype of the prickly pear cochineal that is adapted to Australian pest pear.

When plants are severely infested with cochineal, the segments at the tips start to break off and drop. They soon dry out completely and in due course disintegrate (fig. 4). The stricta biotype of cochineal is more damaging to Australian pest pear than the ficus biotype is to prickly pear. All new growth is attacked rapidly and falls off the plant, and within less than a year the attacked plants could be dead.

Although adult females do not move around, and crawlers can only reach other plants if blown there by the wind, the insects nevertheless spread rapidly within dense infestations and over short distances, especially during the summer months and seasons of prolonged drought. Isolated pest pear plants will have to be inoculated manually by placing a segment infested by cochineal on top of the plant.

## 2.14 Australian pest pear/sour prickly pear (*Opuntia stricta*)

### b. Cactus moth, *Cactoblastis cactorum*

This South American moth has been present in South Africa since the late 1920s, when South African entomologists were allowed to remove a small starter colony from the shipment underway to Australia. In Australia, the cactus moth was the major factor in controlling what was probably the world's worst ever weed problem, *Opuntia stricta*. In this country, it is not such a successful biological control agent, probably because ants, baboons and other predators keep its numbers low.

#### Background information on agent

Consult leaflet 2.3 in this series for essential information on the life cycle of this insect, its potential as biological control agent and its implementation.

#### Cactus moth damage to Australian pest pear

Larval feeding-damage in dense, well-established infestations can cause large plants to collapse, because the stems and supporting branches are destroyed. However, from the fragmented portions many smaller plants will then start to grow, which will still produce the same number of fruit unless they, too, are attacked. Unfortunately, in South Africa the population levels of the cactus moth are usually kept low by predators. Soon after the moth becomes established in any area, ants start carrying the eggs away, and baboons soon learn to excavate the larvae and pupae from the leafpads. Therefore the cactus moth on its own cannot control Australian pest pear in this country. At most, it can supplement the cochineal, because it can be distributed to isolated patches of cactus more easily than cochineal.

#### CONTROL STRATEGY

All dense cactus infestations	Biological control only - cochineal (and cactus moth)
Isolated plants and sparse infestations	Chemical control - MSMA

- Make sure that the stricta biotype of prickly pear cochineal is present in every infestation of Australian pest pear.
- No chemical control is required once cochineal has been established in all areas where Australian pest pear is present.

#### CONTACT PERSONS

Consult leaflet 1.4 in this series for the most updated contact details.

- Biocontrol research: Weeds Research Division, ARC-PPRI (Rietondale), Private Bag X13, Pretoria 0001; Tel (012) 329 3269; Fax (012) 329 3278; e-mail weeds@plant2.agric.za. Alternatively: UCT.
- Chemical control and supply of biocontrol agents: National Department of Agriculture: Directorate of Agricultural Land Resource Management (D-LRM): your nearest Provincial Office

#### FURTHER READING

DODD, A.P. 1940. *The Biological Campaign against Prickly-Pear*. Commonwealth Prickly Pear Board, Brisbane, Australia: 177 pp.



Figure 3. A dense stand of Australian pest pear in Kruger National Park, shortly after cochineal was introduced to the plants.



Figure 4. The same stand of cactus, wiped out by cochineal less than a year later.

ISBN 1-86849-164-1

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Private Bag X134, Pretoria 0001.

Page design: Saret du Plessis. This leaflet was printed by United Litho, with financial assistance from the Working for Water Programme of the Department of Water Affairs and Forestry and the National Department of Agriculture.

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