

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

## 2.12 Smooth prickly pear (*Opuntia monacantha*) (= *O. vulgaris*)

### ORIGIN OF THE WEED

Smooth prickly pear (fig.1) is indigenous to South America, but was already present in South Africa by 1772. This was the first plant species in South Africa to be controlled biologically.

### 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, it is mainly a cochineal species, *Dactylopius ceylonicus* (fig. 2), that is responsible for the biological control of smooth prickly pear. This insect is highly effective and has destroyed most of the smooth prickly pear plants in the country. The cactus moth, *Cactoblastis cactorum*, also attacks the plant, but does not affect its populations significantly. The prickly pear cochineal, *D. opuntiae*, was thought to have replaced *D. ceylonicus* on the residual plants, but recently it was confirmed that *D. ceylonicus* is still present on all smooth prickly pear infestations in the country.

#### a. Smooth prickly pear cochineal, *Dactylopius ceylonicus*

This insect originates from Brazil, and became well known during the early 1800s when it practically wiped out *O. monacantha* in India. In 1913, it was introduced into South Africa to control smooth prickly pear. It is host-specific to smooth prickly pear.

#### 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.

#### Cochineal damage to smooth prickly pear

The nymphs and adult females suck the sap from the cladodes and in the process, they are thought to secrete toxic saliva into the plants. This causes yellowing of the cladodes of infested plants (fig. 3) before these 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 ladybird beetles (fig. 4) and also wash many crawlers off the cladodes.

When plants are heavily infested with cochineal, the leafpads at the outside of the plant start to break off and drop. They soon dry out completely and in due course disintegrate.

This species of cochineal has practically wiped out its host plant within a few years. Only isolated plants or small clumps are left along eastern coastal strip, and these are all colonised by cochineal.

Small black ladybird beetles, as well as their predatory larvae, (fig. 4) prey on the cochineal in South Africa. The beetles can be controlled by spraying a weak solution of a contact insecticide onto the cactus. The waxy layer will protect the cochineal, but the beetles and larvae will pick up the chemicals by walking over the cactus.



Figure 1. Smooth prickly pear.



Figure 2. Clusters of cochineal on a smooth prickly pear plant.

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

This moth species, which is indigenous to Argentina, was never deliberately released on this cactus. It colonised the plant after having been released to control *O. ficus-indica* in 1932.

#### 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 smooth prickly pear

The larvae feed internally in the leafpads, and subsequently the plants may rot and fall over. However, in South Africa, the cactus moth is irrelevant in the biocontrol of *O. monacantha*, probably due to predation by ants and other predators.

CONTROL STRATEGY	
In wet areas	Chemical control - e.g. MSMA
In all other areas	Biological control only - cochineal (and cactus moth)

#### 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 X134, Pretoria 0001; Tel (012) 329 3269; Fax (012) 329 3278; e-mail weeds@plant2.agric.za.
- Chemical control and supply of biocontrol agents: National Department of Agriculture: Directorate of Agricultural Land Resource Management (D:LRM): your nearest Provincial Office.

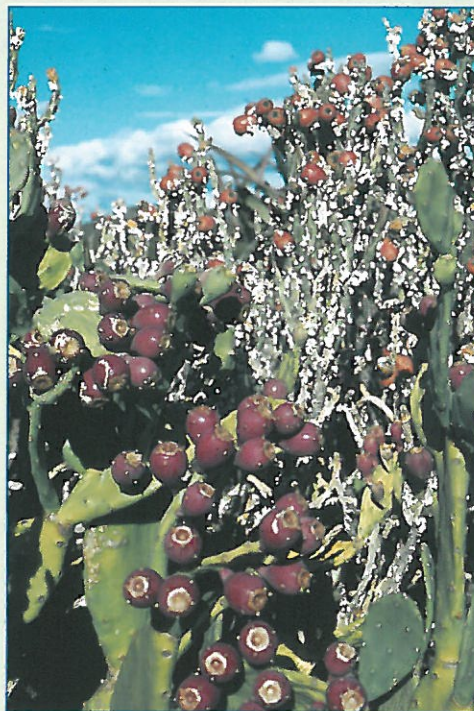


Figure 3. Smooth prickly pear plants heavily infested with cochineal.



Figure 4. Black ladybird beetles and their larvae (bottom) feeding on cochineal.

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