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# Cactoblastis

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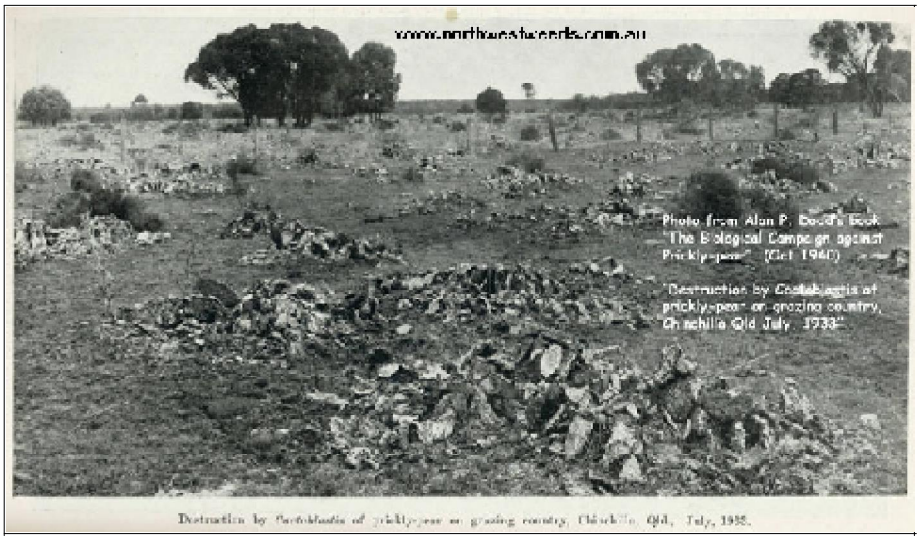



**THE FAMOUS CACTOBLASTIS!**

**Biological control of prickly pear has been one of Australia's success stories when it comes to weed control. This ancient photographic record on the left is one example of the amazing way cactoblastis (Cactoblastis cactorum) chewed its way through tens of thousands of hectares of prickly pear infested grazing country in inland Queensland and New South Wales.**

**And, the good news continues. Cactoblastis is still alive and well, and still helping to control various prickly pear species in many parts of Australia. Biological control continues to play a very significant role in controlling prickly pear species in New South Wales, particularly in the drier, warmer areas.**

Our two main biological control agents are **CACTOBLASTIS** (above right) and **COCHINEAL** (the insects are wandering around on a pad of prickly pear, right).

As you can see, the two are entirely different: **cactoblastis** (*Cactoblastis cactorum*) in its larvae stage is a black and yellow striped "grub". It tunnels into and devours the inside of the prickly pear plant. **Cochineal** (*Dactylopius* spp.) on the other hand, crawls around on the outside of the plant, eventually attaching itself to the plant and (like we think of a mosquito) inserts its mouthpiece to extract the moisture out of the plant. They then cover themselves with a distinctive, white, waxy web - protection against the elements. More information available on our cochineal webpage.

## THE CACTOBLASTIS SUCCESS STORY

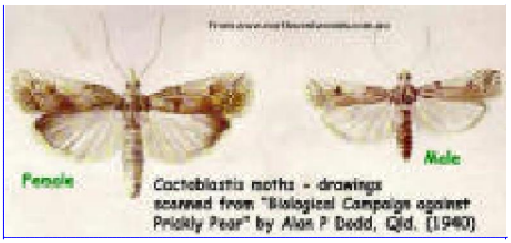
By the year 1920, prickly pear (mainly *Opuntia stricta* spp.) infested 58 million acres (23 million hectares) of land in New South Wales and Queensland. It was spreading at an alarming rate of 1 million acres a year when the cactoblastis insect was first released. Within six (6) years most of the original pear had been destroyed - as in this **image on the right**. It was an amazing result. (See **Prickly Pear History**)

**The success of cactoblastis is still regarded as the world's most spectacular example of effective control of a weed by biological means.**

## THE ORIGIN OF CACTOBLASTIS CACTORUM

In 1920 the then Commonwealth Prickly Pear Board sent entomologists (including one Alan P. Dodd) to America (that's where the pear came from originally) to seek suitable biological control agents. Out of 150 different species, 12 were brought to Australia to undergo strict breeding and feeding evaluation to ensure they would not impact on other plant material. By 1926, cactoblastis was approved for release. The whole operation was a massive project, with the outcome a credit to the hard work and perseverance of all those people involved. (Learn more on this project!)

## DESCRIPTION OF CACTOBLASTIS

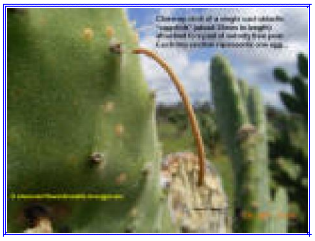



The life cycle of *Cactoblastis cactorum* goes through four (4) stages: moth, eggs, larvae, cocoon and back to moth. In eastern Australia, there are usually two (2) complete generations per year.

### (1) Moth

The moth is plain, grey-brown in colour. The female is much larger than the male. Please see image, right, for a closer look.

The female cactoblastis moths can cover large areas when it is time for them to lay their eggs. They favour the common prickly-pear plant, but if desperate their alternate targets may include tiger pear (*Opuntia aurantiaca*), velvet tree pear (*Opuntia tomentosa*), even Indian fig (Opuntia ficus-indica) - much to the annoyance of those people who legally grow this species because of its edible fruit.



### (2) Egg

The moths lay their eggs on the side of the plant - often attached (carefully, no doubt) to the spines on the plant. The eggsticks average around 25mm long and contain 40-60 50 eggs.

### (3) Larvae

All eggs in the one eggstick hatch at the same time. The tiny larvae move to a nearby point on the plant and then actually work as a team to "chew" a small hole through the tough, outer layer of the plant leaf: they take turns to nibble at the selected site until eventually they work their way through the outer skin and into the soft, edible interior of the plant. As one could imagine, the tiny larvae work quickly to enter the plant as quickly as possible - while out in the open they are very vulnerable to ants, birds and even bad weather!

The larvae feast their way through the plants for some weeks, causing varying degrees of damage to the host plant depending on their numbers and the season. They can devastate a large plant in a matter of weeks! (The **image on the right** is a good example of a prickly-pear plant completely wiped out by cactoblastis.)


### (4) Cocoon

The larvae grow to a length of about 25mm by maturity. When it is their time, they actually leave the plant and find shelter under loose bark, dead leaves or other rubbish at or near the base of the plant. They then enter their cocoon stage.

**Eventually, they emerge as moths to start the whole cycle again.**

[NB Another, similar-in-appearance, larvae can sometimes be found. Slightly smaller, and a paler version of cactoblastis, *Tucamania tapiacola* was introduced into Australia in 1934 for biological control of tiger pear (Dodd 1940). It still plays a minor role in controlling tiger pear and common pear (see image, right).

**Cactoblastis have their enemies.** Ants are their biggest threat, especially when the larvae attempt to move from one plant to another. For this reason, the winter generation of cactoblastis seems to have the best results in northern New South Wales

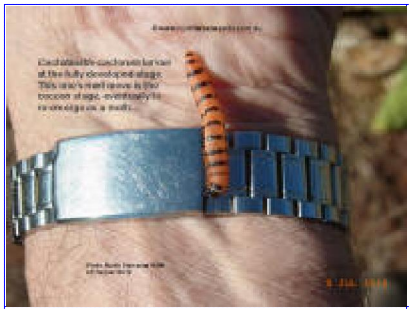
because of the reduced ant presence. Birds sometimes cause problems. Extremely hot weather can take its toll too.

## WHERE AND WHEN TO USE CACTOBLASTIS?

"**Where**" relates to how much common pest pear there is. If you only have a small number of plants and you want to keep your property really clean, don't rely on insects. On the other hand, if you have pear over a large and/or inaccessible area, biological control is an excellent, cost-effective and long-term option (but not if your property is located in a cool climate).

"**When**" to use cactoblastis? There are two cycles per year, so there is no real time barrier. The main thing is to keep a number of prickly pear stacks around the property to encourage the moths to call and deliver their eggs.

Cactoblastis is mainly used for control of common pest pear (*Opuntia stricta* sp.). In some seasons they will also significantly reduce the bulk of individual tiger pear plants (very rare for them to destroy the whole plant, and unless cochineal is also present, the cacto often create a bigger mess because they cause the plant to fall apart: more loose tiger pear segments on the ground to be spread around). In a good season, cactoblastis assists with control of velvet tree pear by destroying seedling growth.



## MEANS OF DISTRIBUTION

Because the moths are so mobile, they can fly to prickly pear plants kilometres away to deposit their eggsticks. Depending on plant numbers, this works quite well. However, **you can assist** the process by making a series of stacks (each several plants together, on rocks or logs but even two or three thrown on top of a large plant) to provide a better target for the moths to find, and a better food source for the hatching larvae. Don't make the stacks too big, because the lower plant material can begin to rot under the weight.

Physically transferring pads of prickly pear containing larvae to un-infected plants works to some extent but ants can be a problem. Ants often attack the vulnerable larvae through the broken, open ends of the pads.

Transferring eggsticks to new plants was the method originally used to distribute cactoblastis to new areas. The job involved pasting the eggsticks to small piece of paper and pinning the paper to the new plant. We find that, generally, this is unnecessary because the moths are periodically moving through the pear areas and will lay their eggs on new plants if they find them. KEEP IN MIND that cactoblastis is ready hard to manage. It works extremely well when the time is right. If you want to combine a more reliable method, consider cochineal.

## MORE INFORMATION

**Cochineal** is the other valuable prickly pear biological control agent. Go to the http://www.northwestweeds.com.au website for more information on biological control for individual plant species like **tiger pear, velvety tree pear, common prickly pear**. Also please check out **Prickly Pear History** to learn about the amazing role played by cactoblastis in controlling prickly pear in E. Australia

## ACKNOWLEDGMENTS:

"*Prickly-pear Pest in NSW*" by V H Gray, Prickly-pear Destruction Commissioner 1951-1979.
*"The Biological Campaign Against Prickly-pear"* Alan P. Dodd (1940)

**DISCLAIMER:** The information contained in this web site is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of North West Weeds or the user's independent adviser.
Les Tanner 31/8/2009, 6/5/2014