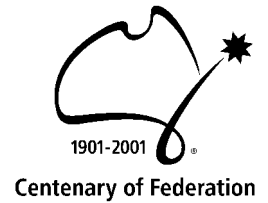


Questacon

Aussie Invaders



Controlling the spread of introduced pests using biological methods.

WHAT'S THE PROBLEM?

Australia is one of the great tourist destinations of the world, but sometimes it isn't just humans that visit. Over the past two centuries, hundreds of plant and animal species from around the world have been accidentally, or deliberately, introduced to our shores.

Feral animals and plants are so successful because they can out-breed, out-eat and out-compete Australian natives, as well as having few natural predators. Introduced animal pests include rabbits, foxes, cats, mice and cane toads. Examples of plant pests include Patterson's curse, lantana and the prickly pear. Of these feral invaders, many have overstayed their welcome by causing massive damage to the Australian environment. The total economic impact of these pests runs into billions of dollars and they can also cause great distress to the people that live on land affected by these pests.

GREAT AUSSIE SOLUTIONS

The range and variety of these pests has meant that Australian scientists have had to develop different means of controlling their numbers. Poisons are often ineffective and can also cause environmental damage. Physical control, through shooting or removal of individuals, involves high energy and high cost. So scientists started looking towards biological control—using living organisms to control the spread of the feral species.

HOW DO THEY WORK?

The first methods of biological control involved introducing a predator that would kill the pest by eating it. This was used successfully in 1925, when *Cactoblastis* moth larvae were introduced to prickly pear populations in New South Wales and Queensland. At the time, prickly pear (*Opuntia stricta*), had spread from being used as a paddock divider on a few farms in South Australia, to rendering over 4 million hectares of farming land unusable. Within ten years, the *Cactoblastis* larvae had virtually wiped prickly pear out.



The *Cactoblastis* larvae have controlled prickly pear populations in Australia. Photo courtesy of Stella Crossley and Don Herbison-Evans and the Macleay Museum.



The cane toad, *Bufo marinus*—
a biological control disaster.

Further attempts at biological control weren't so successful. When farmers tried to eliminate the cane beetle using the South American cane toad, the results were catastrophic. The cane toad did not eat the cane beetle and the toad population spread rapidly, resulting in the decline of native mammal and reptile species.

Disasters such as this led researchers towards designing safer and more specific measures of biological control. Examples of these measures include vaccines against the cattle tick and the introduction of pest-specific diseases such as myxomatosis in rabbits.

THE FUTURE

Australian scientists have recently turned to genetic engineering in a new fight against feral invaders. In 1995, the CSIRO developed a rabbit specific virus, rabbit calicivirus that resulted in numbers of rabbits declining up to 80% in some areas of Australia. This virus had been specially engineered to be highly infectious to only rabbits, and to overcome the difficulty of rabbits becoming immune.

Now the problems of foxes, cats and mice are also being addressed by scientists at the Cooperative Research Centre for Pest Animal Control who are developing a viral vaccine that makes female pests infertile for a period of up to 2 years. This research is currently looking promising and the technique may work for pest plants as well.

FURTHER INFO, FACTS & FUN

- Only 24 rabbits were originally introduced into Australia for the purposes of hunting, giving a new meaning to the saying "breeding like rabbits"!
- Nineteen species of our native small mammals have become extinct since Europeans introduced the cat, fox and rabbit into Australia.
- Australia also has its own tourists! Australian wallabies have become feral in England, possums have run wild in New Zealand, and eucalyptus trees have become a serious problem in the United States.
- Over 10% of the flora in Australia is introduced, with even more (up to 30%) in cities such as Sydney.
- Australia is home to the only population of feral wild camels in the world. We have even exported them to Arab nations!
- For more info about biological control of pests in Australia, check out:
<http://www.csiro/promos/ozadvances>
<http://www.pestanimal.crc.org.au>

For more info on great Australian Science check out:

Questacon's Innovative Australians <http://www.questacon.edu.au/innovaus>

CSIRO's Australia Advances <http://www.csiro.au/promos/ozadvances>

The Australian Academy of Science's Nova <http://www.science.org.au/nova>

The Australian Science Archive Project <http://www.asap.unimelb.edu.au/>