



THE SCIENCE OF BIOLOGICAL CONTROL, often referred to as biocontrol, is the use of natural enemies to control another organism. This fact sheet is restricted to the biological control of invasive alien plants - a separate fact sheet is available on the environmental effects of these plants. Biological control is based on the premise that when organisms are removed from their native range, they are also removed from the natural enemies that evolved alongside them, and which would naturally limit their population and spread. In South Africa, for example, the exotic pompom weed has no natural enemies. As a result, the plant has invaded and is displacing our natural grasslands (i).

HOW IT WORKS

Biological control involves the introduction of natural enemies or agents which are collected in the invasive alien plant's country of origin. The agents used are insects, mites, and pathogens. Pathogens are organisms such as fungi that cause diseases in plants, e.g. the galling of Port Jackson willow (ii). Generally, the most damaging biocontrol agent is selected, and may attack one or more parts of the plant-leaves, stems, roots, flowers, fruit or seed. These agents not only reduce the plant's vigour and spread, but their feeding damage sometimes leads to secondary infection by pathogens, causing further stress. Although rare, a conflict of interest may arise where an invasive alien plant has economic importance. For example, the wood of Australian wattle (ii) is used in certain industries in South Africa, but the tree has become invasive-especially along water courses. Consequently, the agent released on it feeds only on the seed, merely restricting the plant's spread but not killing it.

SAFETY

The introduction of foreign organisms between countries must be undertaken with caution, evidenced by the fact that some alien plants have become invasive. Thus, once biocontrol agents have been collected in the country of origin, they are imported directly into quarantine (iv) where they are thoroughly tested by scientists-sometimes for years-to ensure that they can only survive on the target plant. The agent is then considered to be host specific, and safe for release. Once this fact has been firmly established, and there is consensus among relevant scientists, permission is sought from the Department of Agriculture, Forestry and Fishers for its release. South Africa has practised biological control for one hundred years, has an exemplary safety and success record, and is a leader in this field internationally.

IS BIOCONTROL EFFECTIVE AND SUSTAINABLE?

The aim of biological control is not to eradicate the invasive alien plant, merely to control it to restore local biodiversity and ecosystem functioning. As opposed to chemical and mechanical control, it is the only sustainable, cost-effective and permanent solution to invasive alien plants.



environmental affairs

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