Benefits associated with gall-inducing insects

Several Australian gall-inducing species play a vital role in helping control Australian plants that have become weeds. In addition, Australian gall-inducing wasps are essential pollinators of native figs and some gall-inducing insects, and their galls, are still highly valued by Australian Aboriginal people as traditional food. Naturally occurring benefits like these are often called ecosystem services.

Acacias in South Africa

There are at least 13 Australian species of *Acacia* that have become invasive weeds in South Africa. They can form dense thickets that impede agriculture, suppress native plants and animals, increase fire risks and interfere with flow rates of rivers and streams. Acacias were originally introduced into South Africa as ornamental plants or shade trees and to reclaim or stabilise sand dunes. Other species were, and still are, important sources of firewood, timber for furniture, high-grade pulp wood and tannin.

One of these invasive acacias, long-leaved wattle, *Acacia longifolia*, was introduced into South Africa in 1827 to stabilise dunes and for shade and ornamental purposes. The concentration of seeds dropped in the soil by this plant can be as high as 34 000 seeds per m^2. Seeds germinate in enormous numbers after fire. An Australian gall-inducing chalcidoid wasp, *Trichilogaster acaciaelongifoliae*, was released in 1982–83 to reduce the damage caused by this acacia. It was the first time that a wasp had been used as a biocontrol agent.

Trichilogaster acaciaelongifoliae induces galls in young flower buds of long-leaved wattle. The multi-chambered galls prevent development of flowers and can reduce seed production by more than 95 per cent. High concentrations of galls cause breakage and mortality of large branches and stems. The wasp has proven to be a highly effective natural enemy of this invasive acacia and has spread to all the areas in South Africa where the acacia grows.

Galls of the chalcidoid wasp *Trichilogaster acaciaelongifoliae*, which was introduced into South Africa to control invasive Australian long-leaved wattle, *Acacia longifolia*. Photo: John Hoffmann.