



# BIOCONTROL OF THE GUM LEAF SKELETONISER

Scion is releasing the Australian parasitoid wasp *Cotesia urabae* in locations around New Zealand, as a biological control agent for the gum leaf skeletoniser (*Uraba lugens*). The caterpillar defoliates eucalypts, and poses a serious threat to our commercial forestry industry, urban environments and public health.

## PROTECTING OUR EUCALYPTS

*Eucalyptus* plantations form an important part of a diversified commercial forestry industry that does not rely solely on radiata pine. They provide short-fibre pulp and hardwood timber, with additional benefits in agroforestry, honey production, firewood and carbon sequestration. Eucalypts are also widely used as amenity trees in urban areas.

The gum leaf skeletoniser is an Australian moth whose caterpillar defoliates eucalypts, slowing or killing their growth.

It was first discovered in New Zealand in 1995 and eradicated from the Bay of Plenty with chemical pesticide. A second outbreak discovered in Auckland in 2001 was too widespread for eradication.

## CATERPILLAR CAUSES WIDESPREAD DAMAGE

All *Eucalyptus* species grown in New Zealand production forests appear to be susceptible to the gum leaf skeletoniser. The caterpillar is also hazardous to human health. Its body is covered with hairs which can cause a painful sting and skin irritation on contact with human skin. Many eucalypts are popular as amenity trees in parks, gardens and school grounds, meaning uncontrolled infestations put young children and adults at risk of harm.

**Extends rotation length.** The gum leaf skeletoniser is expected to spread to most eucalypt growing areas in the country.

If outbreaks occur in New Zealand similar to those in their native environments of Australia, it would extend pulpwood rotation length to 14 years in the North Island and 18 years in the South Island, compared to 12 and 15 years respectively, with associated economic effects.

Aerial applications of chemical pesticides reduce gum leaf skeletoniser populations in forestry, but come with significant costs associated with such things as monitoring and aerial application.



*Eucalyptus* leaves stripped by gum leaf skeletoniser caterpillars.



The tiny adult wasp *Cotesia urabae*.

## WHAT IS BIOCONTROL?

The deliberate use of natural enemies to reduce pest populations in modified habitats is called biological control (or biocontrol). It often involves importing an insect parasitoid or predator from the pest's native environment where they have evolved closely together over millennia.

**What is a parasitoid?** A parasitoid lives most of its life attached to, or inside a single host. If it cannot find its host, it will die without being able to reproduce. Scientists can help a new parasitoid to spread by introducing them into places where they know the pest is abundant.

**Sustainable and economic.** Biocontrol is an effective and environmentally sustainable method of managing unwanted pests. It is one of the most important alternatives to chemical pesticides and in many locations, the only economic and practical solution.

Several host-specific biocontrol agents have already been introduced to New Zealand from Australia against other pests. Successful biocontrol of the gum leaf skeletoniser by *Cotesia urabae* could substantially reduce potential economic losses and even remove the need for pesticide application.

***Cotesia urabae*.** A parasitoid wasp that was approved as a biocontrol for the gum leaf skeletoniser by ERMA (now the Environmental Protection Authority, EPA) in 2010, following three years of safety testing by Scion and extensive consultation with industry and community groups. The tiny parasitoid was first released in Auckland in January 2011.

Adult parasitoids are only about 3 mm long with a black body and yellow-brown legs. The wasp specifically hunts for gum leaf skeletoniser, laying its egg inside the caterpillar. Multiple eggs can be inserted but only one develops to maturity within each host.

Wasp larvae emerge from the host caterpillar 14-20 days later to pupate, killing the host. The adult parasitoid hatches about eight days later. Several generations are produced per year.

## DOES *COTESIA URABAE* POSE ANY RISKS?

- *Cotesia urabae* is so small most people will not see it (see above), and it does not sting people like other wasps do.
- The wasp is host-specific. Our research has shown it is unlikely to attack any caterpillar other than the gum leaf skeletoniser.
- There are no native *Uraba* species in New Zealand. Other parasitoid species similar to *Cotesia urabae* have been introduced for biocontrol purposes, for example against the cabbage white butterfly.
- The tiny parasitoid is not expected to be found in native habitats except in areas that are adjacent to *Eucalyptus* plantations.
- The gum leaf skeletoniser is new to New Zealand and not welcome here. It is changing the existing balance between living things. Biological control seeks to restore equilibrium by limiting the frequency and severity of outbreaks typical of this pest in its native environment.

## ABOUT SCION

Scion is a Crown Research Institute that specialises in research, science and technology development for the forestry, wood product and wood-derived materials and other biomaterial sectors. Scion's purpose is to create economic value and contribute to beneficial environmental and social outcomes for New Zealand.

We offer research and development services across the entire forestry value chain, including forest and climate change, forest health and biosecurity, rural fire research, forest management and tree improvement.

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