

Biological control of ragwort with the ragwort plume moth

Keith Turnbull Research Institute, Frankston

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Common and scientific names

Ragwort plume moth, ragwort crown-boring plume moth

Platyptilia isodactyla (Zeller)

Family Pterophoridae (plume moths)

Background

Ragwort, *Senecio jacobaea*, is a noxious weed of European origin found throughout the high rainfall areas of south-eastern Australia. The biological control program involves the establishment of populations of natural enemies in suitable infestations and redistribution of these agents to other sites as populations increase. The ragwort plume moth is the most recently tested of these biological control agents. The plume moth is found naturally in central Europe, Mediterranean North Africa and southern Europe.

Description

Adult – body length 9 mm, wing span 21 mm. The wings are pale fawn or brown in colour with dark bands at the ends and variable ‘V’ or double ‘V’ shaped dark brown bands approximately one third of the wing length from the wing tip. The body and legs are lighter brown. The forewing is divided into two lobes and the hindwing into three feather-like plumes. The middle and hind legs are very long and have prominent spines. The moth has a characteristic resting posture with the body and fully outstretched wings forming a ‘T’ shape, the forewing covering the hindwing, and the hind legs raised and extended parallel with the body. Males have longer, thinner abdomens.

Egg – flat, ovoid, smooth, 1 mm long, 0.5 mm wide, bright shiny green when first laid, turning pale yellow before ‘blackspotting’ (the dark head capsule of the larva becomes visible through the transparent egg shell). Laid singly or in groups of up to five eggs on the underside of mature ragwort leaves, or less commonly on the upper leaf surface near veins, and rarely on stems.

Larva – with a black head capsule and black prothoracic shield (first segment of the body) and long ventral prolegs on segments 3 to 6 of the body. Newly hatched larvae are ivory-white or pale yellow. Larger larvae are pale green, with small dark spots, and sparsely hairy. Larvae become

darker green as they develop further. Mature larvae are around 20 mm long.



Figure 1. Male (left) and female ragwort plume moths.



Figure 2. Ragwort plume moth eggs.



Figure 3. Ragwort plume moth larva.

Pupa – 18-19 mm long, 5-6 mm wide, light brown when first formed but becoming darker; found in the stem or within a curled leaf of the host plant.

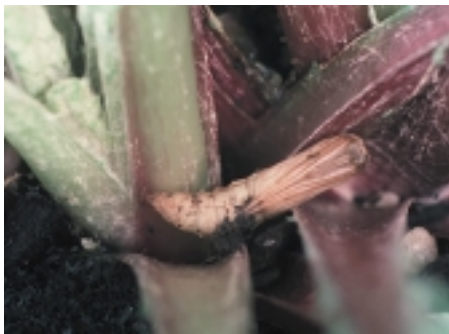


Figure 4. Ragwort plume moth pupa.

Life cycle

The plume moth has two generations per year. Adult moths are active in spring and autumn. Females at 20°C lay an average of 100 eggs during a lifetime of 11.6 days. At cooler temperatures the average number of eggs produced decreases and their mortality increases but the life of the moth is extended. Mortality of eggs kept at 15° is about 50% and eggs do not develop at all at 8°. Newly hatched larvae burrow into the stalk of the leaf until they reach the crown. The larvae pass through five stages (instars). Older larvae tunnel in the crown, stem and roots. Larvae eject their frass (faecal deposits) and shed head capsules from a small hole in the stem and this debris accumulates on silken webbing spun around the hole by the larva. The pupal stage lasts approximately one week.

Impact

The central shoots of ragwort plants attacked by the plume moth are blackened or blemished and the side shoots become wilted. Larval feeding severely damages the crown of the plant, weakening it and reducing the number of flowers and seeds produced. Two or three larvae can completely destroy a plant. Large numbers of plume moths may limit the spread and density of ragwort infestations and enable the establishment and reintroduction of more desirable plant species.



Figure 5. Crown damage to ragwort plants caused by larval feeding with larval frass deposits (excreta) arrowed.

Releases

The ragwort plume moth was first released in Victoria in the summer of 1999-2000. Nursery sites are selected by researchers and local Department of Natural Resources

and Environment area staff in consultation with landowners and Landcare groups. A release site should have a dense and persistent ragwort infestation and be connected to neighbouring infestations so that the moth can disperse more readily. The site should have a low priority for control by other techniques.

Integrated control

Five species of insect which attack ragwort have been released in Victoria. A seedfly, released in the 1950s, failed to establish. The crown boring moth, *Cochylis atricapitana*, was first released in 1987 and is well established at many sites. The cinnabar moth, *Tyria jacobaeae* was released again from 1993 to 1998 but has had no impact. The flea beetles *Longitarsus flavicornis* and *L. jacobaeae* were first released in the late 1970s and are having a major controlling influence on ragwort at many sites in Victoria and Tasmania.

Biological control cannot totally eradicate a weed but can reduce the spread and density of infestations. In some cases control is achieved to the level where the weed is no longer of concern and no other control is necessary. More commonly, other management methods are still required to achieve the desired level of control. Biological control should be used in conjunction with these other measures in an integrated management plan.

Further information

Landcare Notes: Ragwort identification (available from KTRI); Ragwort PP0010, Biocontrol of ragwort using the leaf and crown boring moth, cinnabar moth, and ragwort flea beetles LC0161: *The Ragwort Management Handbook* (ISBN 0730693686) and a *Landcare Note* on ragwort identification are available from KTRI.

For further information on the biological control of ragwort please contact your local Catchment Management Officer of the Department of Natural Resources and Environment or Keith Turnbull Research Institute, PO Box 48, Frankston, Victoria, 3199, Ph. (03) 9785 0111, Fax (03) 9785 2007, email kttri@nre.vic.gov.au

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Prepared by Ian Faithfull, Melinda Newnham, Karen Green and Nicole Freeman.

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