

Horehound suppression with the horehound plume moth

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January 1999
LC0150
ISSN 1329-833X

Common and scientific names

Horehound plume moth

Pterophorus spilodactylus (Curtis)

Family Pterophoridae, plume moths

Background

Horehound, *Marrubium vulgare*, is a weed of pastures, crops and conservation reserves in southern Australia where it thrives on poor soils, in waste places and unmanaged areas. It is a Regionally Prohibited Weed in the Port Phillip East Catchment and Land Protection Region and a Regionally Controlled Weed in the remainder of Victoria. A program is under way to introduce a number of natural enemies of horehound from Europe. Extensive testing of the first of these agents, the horehound plume moth, has demonstrated that it feeds only on horehound and does not attack commercial or native plants. The plume moth was first released in Victoria in 1994.

Description and life cycle

Adult - 10 mm in length with a wingspan of 20 mm, pale cream with fine dark marks on the wings. The forewing is divided into two lobes and the hindwing into three feather-like plumes. The moth has a characteristic resting posture with the body and fully outstretched wings forming a T-shape (Fig. 1).

Egg - laid singly on the undersides of young leaves, flattened, oval, bright green, 0.5 mm long.

Larva - caterpillars are hairy and green with a darker head capsule. They mimic the colour and texture of the horehound leaf (Fig. 2).

Pupa - well camouflaged green to brown; generally found on the upper surfaces of lower leaves.

The plume moth usually has three generations per year. A female moth lays approximately 100 eggs over a two week period, the majority in the first week. Eggs hatch about one week after being laid. Larvae begin feeding in the developing shoot tip. When they have grown larger they move out and feed on the leaves, working their way down



Figure 1. Adult horehound plume moth.

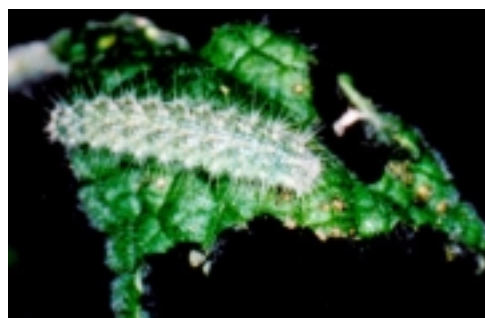


Figure 2. Larva feeding on horehound leaf.

the shoot, progressively defoliating the stem, until ready to pupate.

The first generation of adults emerge in the spring. The second and third generations emerge during the summer and autumn. Each generation takes one to two months to complete its life cycle, depending on environmental conditions. Larvae of the autumn generation overwinter in the leaf buds ready to complete their life cycle when the weather warms up in spring.

Impact

Larval feeding severely damages the growing tips of the plant. This weakens the plant and reduces the number of flowers and seeds produced. Large numbers of plume moths may limit the spread and density of horehound

infestations and enable the establishment or reintroduction of more desirable plant species.



Figure 3. Horehound plant with plume moth larval feeding damage (right) and uninfested horehound plant (left).

Releases

The plume moth is released in the pupal stage at nursery sites where numbers are allowed to build up for later distribution to new sites. Sites appropriate for releases have a persistent horehound population with at least one plant per square metre over a 20 m by 20 m area and scattered plants over at least one hectare, and should be connected to other infestations so that the insects can disperse once they are established. The site should not be grazed and should not be affected by herbicides and insecticides.

Releases have been made at sites in Victoria, New South Wales, South Australia, the Australian Capital Territory and Tasmania. The moth has established at many sites. Significant damage has been observed at several of these sites and the insect is beginning to disperse widely. Evaluation of the moth's effectiveness in controlling the weed is under way.

Integrated control

A second horehound biological control agent, the horehound clearwing moth, *Chamaesphecia mysiniiformis*, was first released in Victoria in March 1997. The clearwing moth has a root boring larva which reduces the flow of water and nutrients through the plant, reduces growth and increases plant mortality. Other potential biological control agents are undergoing testing in France and Australia. The horehound pollen beetle, *Meligethes rotroui*, and a stem boring beetle, *Phytoecia* species, from southern Europe and North Africa are being investigated as potential biological control agents. These insects will complement the damage caused by the plume moth and clearwing moth and impose additional pressures on the horehound population.

Biological control cannot 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 methods are still required to achieve the desired level of control, however these need not be used so frequently or intensively. Biological control should not be considered the complete answer to a horehound problem, but can be used in conjunction with other control measures in an integrated weed management program.

Further Information

For further information on the control of horehound please refer to the Landcare Note *Horehound* or contact Catchment and Agricultural Services staff at your local NRE office. For further information on the biological control of horehound refer to the Landcare Note *Horehound suppression with the horehound clearwing moth*, or contact:

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Acknowledgments

Compiled by John Weiss, Ian Faithfull, and Nicole Freeman, January 1997. Revised December 1998.

Funding for the biological control of horehound program has been provided by NRE's Catchment Management and Sustainable Agriculture and Parks, Flora and Fauna Divisions and the South Australian Animal and Plant Control Commission. Redistribution of the horehound plume moth is funded by the Cooperative Research Centre for Weed Management Systems.



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