Landcare Notes

Horehound suppression with the horehound clearwing moth

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Keith Turnbull Research Institute, Frankston

Common and scientific names

Horehound clearwing moth

Chamaesphecia mysiniformis (Rambur)

Family Sesiidae, clearwing 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 underway to introduce a number of natural enemies of horehound from Europe. Extensive testing of two of these agents, the horehound plume moth, *Pterophorus spilodactylus*, and the horehound clearwing moth, has demonstrated that they feed only on horehound and do not attack species of commercial value or native plants. The plume moth was first released in Victoria in 1994. The clearwing moth was first released in Victoria in March 1997.

Description and life cycle

Adult - 9 to 10 mm in length with a wingspan of 12 to 14 mm, dark brown with fine white lines across the abdomen (Figs. 1 and 2). The narrow wings have clear 'windows' and dark brown edges. At rest the wings are folded back at a 40 degree angle to the body.

Egg - Black, oval, 0.8 mm long. Laid singly, between the flowers and on the leaves.

Larva - Up to 18 mm long., cream with a dark brown head capsule (Fig. 3). Found inside the roots and stems of horehound and rarely seen.

Pupa - Brown. Found inside the roots and stems. Pupal cases can be seen protruding from the site of adult emergence.

The horehound clearwing moth has one generation per year. Adults emerge in summer. Females begin laying eggs the day after mating. In the following 4 to 12 days each female lays an average of just under 100 eggs which hatch after 10 to 14 days.

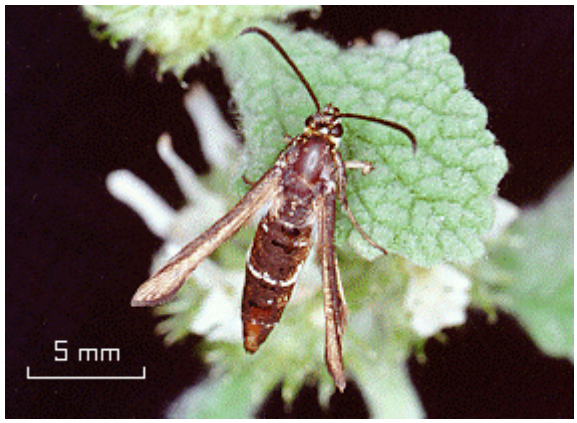

Figure 1. Adult female horehound clearwing moth.

Figure 2. Adult male horehound clearwing moth.

Newly hatched larvae crawl towards the base of the plant and begin to feed on, and burrow into the stems. Larvae continue to feed and develop inside the crown and root of the plant through autumn and become inactive over winter. Usually only one larva completes development per plant.

Pupation takes place inside the plant. Pupae push back up the tunnel formed by larval feeding and emerge from the lower stem or crown. The adults require around 30 minutes of inactivity after emerging to allow their cuticles to dry and harden before they are able to fly. After 1 to 2 hours

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females begin to release a chemical substance, known as a pheromone, which attracts males to mate.

Impact

Larvae feed on the growing tissue in the roots and stems. This affects the flow of water and nutrients through the plant, weakens it, reduces growth and increases plant mortality. Once the clearwing moth has become established it may limit the spread and density of horehound infestations and enable the establishment or reintroduction of more desirable plant species.

Figure 3. Clearwing moth larva feeding inside a horehound root.

Releases

The clearwing moth is released onto suitable field infestations of horehound in the egg stage. Eggs are attached to tooth picks which are packaged and despatched to cooperators for immediate release. At the time of release a stem on each horehound plant is cut with secateurs and a tooth pick with attached eggs is inserted into the cut stem. Appropriate release sites have a large, persistent horehound infestation. The site should not be grazed and should not be treated with herbicides and insecticides for up to five years.

The first releases of the clearwing moth were made at Wyperfeld National Park and Bacchus Marsh in Victoria and Cambrai in South Australia in early 1997. A mass rearing program to provide material for field releases is under way at the Keith Turnbull Research Institute.

Integrated control

The horehound plume moth defoliates horehound plants and has been released in Victoria, New South Wales, South Australia, the Australian Capital Territory and Tasmania. It has established at many sites, is causing significant damage and is beginning to disperse widely.

Other potential biological control agents are undergoing testing in France and Australia. The horehound pollen beetle, *Meligethes rotroui*, and a stem boring beetle, *Phytoecia* sp., 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, it can only 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 horehound please refer to the Landcare Note *Horehound*. For further information on the biological control of horehound refer to Biological Control Landcare Note *Horehound suppression with the horehound plume moth*, or contact:

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