

Biological Control of Weeds Recovery Sheet

(Please refer to the back of this sheet for instructions)



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Landcare Research

Site name:
Organisation:
Observer(s):

Date:
Time of day:



**Horehound clearing moth
pupa & frass**

Current weather conditions

- 1) Sunny / Partly / Overcast / Rain
- 2) Strong wind / Light wind / Calm
- 3) Temperature (°C) < 15 / 15 -20/ 20 -25 / 25 -30 / >30

Insect information

- 4) Number of: Adults: plants with frass at base: Length of line walked:
- 5) Time spent searching (mins):
- 6) Furthest distance insect or wilting/dead plants found from release point (m):
None Found / <20 / 20-50 / 50-100 / 100-300 / 300-500 / Further?
- 7) Overall damage to plants: None / Occasional / Patchy / Heavy / Severe

Weed Information

- 8) Most obvious life stage: New Leafy Growth / Flowers / Seeds, Burrs
- 9) Horehound abundance at the release point: Isolated plants / abundant scattered plants / Dense solid stand
- 10) Infestation: Major (as far as eye can see) / Moderate (>100m²) / Minor (<100m²)
- 11) Percentage cover at densest accessible point:
- 12) Photos taken: Yes / No 13) Photo compass bearing:
- 14) GPS for photopoint: 15) Photo file name:

Comments

- 16) Have any of the following happened to the site recently?
Mowing / Spraying / Grazing / Flood / Drought / Fire / Other?
- 17) Please use the back of this sheet to record any further observations or comments about the site, including any checks for non-target damage.

INSTRUCTIONS FOR FILLING OUT THIS SHEET

(Please note that it is important to complete these questions in order)

Where choices are given mark the correct answer by bolding or highlighting it or by deleting the other options.

- **Site Name** – please be consistent in the use of site names to prevent confusion.
- **Organisation** – the name of your organisation.
- **Observer(s)** – the names of people who helped with this recovery not onlookers.

Current Weather Conditions

1-3) Choose the words that best describe the weather conditions.

Insect information

- 4) Black eggs are laid between flowers and developing burrs. The larvae crawl down the stem and enter the root crown near the soil. They develop and feed entirely within the root crown. Towards the end of development, the larva makes an exit hole at ground level and plugs it with frass (insect excrement). Adults emerge over a period of several weeks during late spring and early summer. They are difficult to spot. Adults require a sequence of hot calm days to mate. If you see dead plants like in the photo below (right), or wilting plants like in the photo on the left in late spring, look for the frass at the base of these plants. Sometimes this frass is distinctive purple like in the photo above. Assess how far from the release area you find impacted plants. Walk in a straight line from the release area. Record the direction of your line (compass bearing). Record how many healthy plants and how many impacted plants you encounter along the line, one meter either side of the line. Confirm presence of frass in plants counted as impacted.



Wilting plant (L) and healthy plant (R)



Dead plant following inoculation with clearwing moth

- 5) Record how long you spent actively searching.
- 6) If you have time to look further afield, we would like to know how far away from the release point you can find impacted plants with frass at their base.
- 7) Record the amount of feeding damage seen overall at the site: occasional (signs of damage present but not common), patchy (signs of damage are present but are variable throughout the site, some plants may have no damage, and others may have heavy damage but this would be rare), heavy (the majority of plants are showing signs of damage and at least some plants are beginning to show signs of severe wilting or are dead), and severe (wilted and dead plants are obvious and widespread).

Weed Information

- 8) Record the most obvious life stage.
- 9) Record the abundance of horehound growing at the release point.
- 10) Estimate and record the approximate size of the infestation using the categories provided.
- 11) Estimate the percentage cover of horehound at the densest accessible point over an area of 5 x 5m, or if the site does not lend itself to a square use an equivalent sized shape.
- 12) Please indicate if you have taken photos.
- 13-15) If you have taken photos please record the photo compass bearing, the GPS point, the file name for the photo and attach hard copies to this form if you can.

Comments

- 16) Please indicate if any of these important events have happened to the site.
- 17) Tell us any other important information we should know about the site (e.g. whether you have been harvesting for release at new sites). Although it is highly unlikely to find non-target damage in the field, if you are able to, check for any species in the mint family if they occur nearby. Please indicate if you look and don't find any non-target damage. If you think you have found some please take photos and specimens to send to us to check. Please write on a separate sheet if you need extra space.