

# Farming Weeds and Biocontrol Insects

## How to Grow Hound's-tongue as a Crop for Weevil Mass-production

The root weevil, *Mogulones cruciger*, is proving highly effective against the invasive rangeland weed, hound's-tongue. A study in the East Kootenay demonstrated that about 100 weevils released in dense patches of hound's-tongue (ca. ¼ acre) brought control within 2 to 3 yrs. Because the weevil is difficult to collect on mass from field sites, a project was initiated in 2002 to develop a cost-effective method of mass-producing the weevil for field release. The project involved learning how to grow hound's-tongue as a crop, 'seeding' the weevil into the crop for multiple generations of propagation, and developing a method of weevil harvest. Production costs were very economical at about 10 to 12 cents per weevil. This fact sheet describes the plant side of the process.



J. Moyer

### Establishing the Crop

Agronomy experiments allowed us to determine the best management practices for growing hound's-tongue for the propagation of the biocontrol weevil. Any practice that increased hound's-tongue root size also increased weevil production, as the root is where the weevil larvae feed and develop.



E. Pavlik



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**Preparation of the seed for planting:** The barbed surfaces of hound's-tongue seed (i.e., burrs) must be dulled so that they do not stick together while passing through a seeder. Small batches of seed can be buffed by rubbing them on coarse sand paper (see above). It also can be done by adding seed to a cement mixer or rock polisher with some sand/gravel abrasive. Separate the seed from abrasive and other plant bits afterward with a coarse soil sieve.

**Planting:** Use a seeder that can handle dry beans or corn, and sow in October at a row spacing of 2 to 3 ft, and a rate of 10 seeds per yd of row. Hound's-tongue can be either direct seeded or seeded after tillage. To plant ¼ acre of cultivated land takes about 1 lb of seed that can be collected from rangeland patches of hound's-tongue.

**Fertilization:** Apply nitrogen-phosphorus fertilizer in the spring after planting at a rate recommended for cereal crop production. Fertilization with nitrogen can increase weevil egg production by 25%, which not only helps boost weevil production in the cropping system, but may also improve the biocontrol success of harvested weevils destined for field release.



H. Goulet

## Managing the Crop

**Weed control:** We recommend applying glyphosate at 0.4 to 0.9 litres per acre (use recommended rate for weeds) in late fall or early spring before hound's-tongue seedlings emerge to control winter annual weeds. Either Odyssey™ or Accent™ at the 1 to 4 leaf stage of hound's-tongue can be used to control annual weeds that emerge after hound's-tongue emergence, however, can cause initial injury to hound's-tongue. Therefore, tillage is preferable for in-crop weed control.



B. van Hezewijk

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**Disease control:** Treatments of Tilt™ at the recommended rate may be needed for powdery mildew control. Start applications at first notice of white mildew spots on the leaves (see above), and continue every 3 to 4 wks until early September.

**Prevention of seed-set:** Cut hound's-tongue flower stalks with hedge trimmers or a swather early in the flowering stage before large numbers of seed develop (May-June). Cut about 6 in above ground. Dispose of stalks either through bagging or burning to destroy any seeds that may be present. A second cut may be necessary if there is significant re-sprout of flower stalks. If seedlings emerge after weevil harvest, they can be suppressed with herbicides (e.g., 2,4-D or 2,4-D plus Banvel™) or through cultivation.

## Planting Trap Plants for Weevil Harvest

It is highly recommended to plant plenty of additional hound's-tongue around and within the crop 1 to 1.5 yrs ahead of weevil harvest. Keep in mind that by the time the weevils to be harvested emerge (almost 2 yrs after set-up) the first crop of hound's-tongue will be dead. A good trap plant crop not only attracts and concentrates spring-emerging weevils ready for collection, but also prevents large numbers from leaving



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the production plot in search of food elsewhere. Although this may be an added benefit if your production plot is near hound's-tongue infested rangeland, you likely will want to reap what you can from the plots. It is recommended that the trap plant crop be no less than ½ the size of the original crop area. Also try to keep the trap crop weed and disease free.

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