

## **Guidelines for propagating and releasing the golden spotted tortoise beetle (*Charidotis auroguttata*) for the biological control of cat's claw creeper**

### **Introduction**

The golden spotted tortoise beetle (*C. auroguttata*) is the first natural enemy of cat's claw creeper that has been cleared for release in South Africa. This insect is reasonably easy to culture. Culturing will be most successful during spring and summer months (September to January).

### **What is required**

1. A starter colony of 40 - 50 adults.
2. Four cages ( $\pm 70 \times 70 \times 90$  cm) which are covered by a gauze material (see-through) to confine the adults and which can hold about 4 cat's claw creeper plants.
3. About 50 black plastic plant bags ( $\pm 20$  l) in each of which 4 cat's claw seedlings have been planted and allowed to grow to develop a reasonable amount of leaf material. Seedlings can be collected from the field.
4. A room which receives some direct sunlight.
5. A ventilated plastic bottle (honey bottle works well) with a funnel inserted in the lid and a fine-haired artist's paintbrush, to collect adults.

### **How to culture the insects**

1. Place the cage on a table or bench in the room in a position where it receives direct sunlight. It is a good idea to stand the table legs in containers (cut off bottoms of 5 l bottles) filled with old motor oil. These keep ants, which are important predators of the larvae, away from the insects.
2. Place 4 cat's claw creeper plants (ant and ant nest free!) in the cage and release the starter colony of insects onto the plants by opening the container with adults and allowing them to find their own way onto the plants.
3. Plants should be watered every second day or as deemed necessary. The rest of the plants should be kept in a semi-shaded area and watered as necessary.
4. Leave the adults on the plants in the cage for  $\pm 1$  week or until they start to show severe signs of damage (this depends on the number of insects in the cage). Collect the adults by using the fine-haired artist's brush and lightly touch the adults to lift or disturb them and letting them fall into the collection bottle held directly underneath.
5. Put 4 new plants into cage no.2 and release the adults into the cage by opening the container and leaving it in the cage for a while.
6. Cage no.1, containing the damaged plants with eggs, should be watered regularly while allowing the eggs to hatch, which takes about 9 - 11 days.
7. Once the eggs are hatched and the larvae are developing, check to see that the plants can provide sufficient food. If there is insufficient food, the leaves will drop and the larvae will be unable to survive. Adding a new plant into the cage and intertwining the leaves of the fresh plant with that of the damaged plants can provide extra food.

8. After hatching the larvae develop for about 23 - 26 days and then pass through a pupal stage which lasts about 8 - 10 days. Larvae move to the lower leaves of the plant or to dead leaves on the soil surface to pupate.
9. As soon as the new adults emerge, the insects are ready for release. Collect the adults using the collection bottle. It is advisable to wait until at least 150 adults are available before making a release at a site.

### **How to release the insects**

**Important:** Suitable release sites should be chosen well in advance. Ant nests in the vicinity should be treated by pouring a solution of a **contact** insecticide (like Dyant) into the nests. A period of 2 months should elapse before the first release is made at this site.

1. Select maximum 2 release sites which are easily accessible and where no control operations are planned for the near future. Ensure that the sites are not exposed to pesticide applications (i.e. next to croplands that are treated for insect pests and where insecticide drift can cause mortality). Open the collection bottle and place it among the leaves allowing the adults to find their own way onto the plants.
2. Follow up with releases at the same spot to allow the insect numbers to build up to high levels.
3. Avoid releasing too low a number of insects at a time (a minimum of 150 adults should be sufficient). Avoid releasing few insects at many different sites as the low numbers may prevent them from establishing.
4. Keep a record of the release dates and the number of adults released in the field (see release sheet).

### **Conclusion**

This procedure is still in an experimental stage and may need to be changed according to what is experienced in the field. At this stage it is impossible to make predictions or to guarantee that this agent will establish and become effective.

## THE GOLDEN SPOTTED TORTOISE BEETLE (*CHARIDOTIS AUROGUTTATA*): A NATURAL ENEMY OF CAT'S CLAW CREEPER (*MACFADYENA UNGUIS-CATI*) IN SOUTH AFRICA

**Description:** The mature adult beetles are dark-red in colour with bright golden spots, while newly emerged adults are a paler red with dull golden spots.



*Charidotis auroguttata* adult

**Life cycle:** The eggs are laid singly on the upper and lower surfaces of the leaves and also on the stems of the plant. Each egg is enveloped by a membranous sheath and is protected by a protruding membranous structure, which are held umbrella-like over the egg. The eggs hatch after 9 to 11 days.

The larvae are yellow (1<sup>st</sup> to 4<sup>th</sup> instar, with 5<sup>th</sup> instar dark grey) in colour, with a fork-like structure at the back on which all old moulds and feces are retained to form a protective covering over the larvae.



*C. auroguttata* larva

The larvae feed on both young and old leaves, undergoing five instars during their development that lasts some 23 days. The late fifth instars undergo a non-feeding prepupal period of 1 to 3 days.

Larvae pupate on the lower leaves or on the leaf litter around the stem. The pupal stage lasts about 8 to 10 days. On emergence adults are pale red, but after 5 to 7 days develop a dark, brownish-red colour with golden speckles. The beetles usually occur singly on the undersides of leaves and also feed on both young and old leaves. Egg laying starts approximately 16 days after adult emergence, with females laying 1 to 3 eggs per day. Adults can live up to 6 months.

**Feeding damage:** Adult and larval feeding are typical linear feeding scars, causing the leaves to become skeletonised which, at **high population densities**, results in premature leaf abscission and die-back of shoot tips.



Cat's claw creeper leaves showing adult and larval damage

**Impact on cat's claw creeper:** As the population of the beetles increases on an infestation of the weed, damage inflicted on it are expected to reduce the densities of weed canopies and mats, allowing indigenous or other desirable plants to compete better with the weed.

