

Bronze Leaf Beetle

The bronze leaf beetle (*Diachus auratus*) is an emerging pest of berry crops in polytunnels, having recently caused significant economic loss. It reduces fruit quality and marketability and has contaminated punnets, resulting in supermarket rejection. The beetle is difficult to control as there are no registered sprays and no effective biocontrol options. Learning to identify and monitor for it is important to reduce its impact.

Identification

At 2 mm long, the bronze leaf beetle is little larger than a strawberry seed (Figure 1). Its antennae are paler near the head and the elytra (hard wing covers) have dotted lines. Just above the elytra is a row of 'beads' (Figure 2) which are not present in similar native species.



Figure 1. The bronze leaf beetle is not much larger than a strawberry seed

Photo credit: Lynne Forster

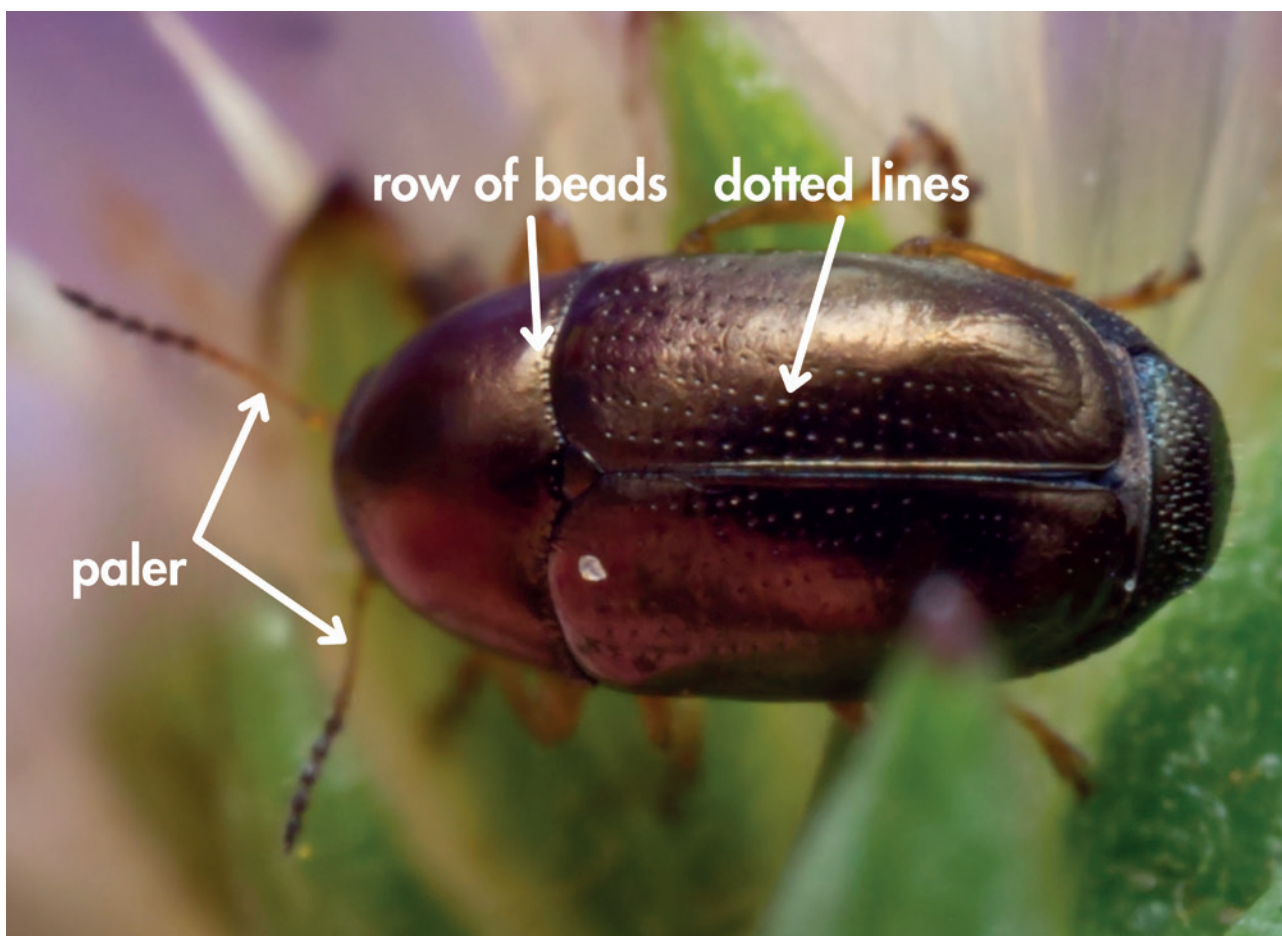


Figure 2. Note the paler antennae near the head, dotted lines on the wing covers (elytra), and a distinctive row of 'beads' just above the elytrae Photo credit: Dan Mendelowitz

Lifecycle

Like many pests, the bronze leaf beetle has a number of clever strategies during its lifecycle that avoid control methods. Firstly, the female protects her eggs by coating each one in frass (waste). Eggs can be recognised by their distinctive spirals (Figures 3) and look like specks of caterpillar frass. They hatch within 2 weeks.

Secondly, hatched larvae enhance their survival strategy by living in the egg case provided by their mother. They extend their upper body to walk about and feed, carrying their case with them. As they grow, they enlarge their case with their own frass (Dickason, 1952) and smooth it (Figure 4). The case deters some predators and parasitoids and probably protects them from contact-based insecticides.

Bronze leaf beetle larvae feed for 4-5 weeks before pupating for 3 weeks inside their case (Figure 4). Empty cases indicate the emergence of a new generation of adults.

The lifecycle from egg to adult lasts around 10 weeks, and adults live for several months. All adults seem to be females which emerge from unfertilised eggs. This strategy enables populations to build from one or two individuals to pest proportions very quickly, since adults of this species lay approximately 250 eggs each in their lifetime.



Figure 3. (Top) Beetle laying an egg and coating it with frass spirals by rotating it with her hind legs (Bottom) Egg stage, 2 weeks Photo credits: Lynne Forster



Figure 4. (Left) 1st instar (Middle) later instar; larval stage, 4-5 weeks (Right) Pupal stage, 3 weeks Photo credits: Lynne Forster

History and host plants

The bronze leaf beetle is originally from Central America. In Australia it was first recorded in 1986 from Queensland on an introduced legume (Reid, 1988). There are very few Australian records since then, but it has recently turned up in Victoria and Tasmania. It is possible that warmer conditions in polytunnels are contributing to outbreaks.

The beetle's feeding strategy enables it to colonise a long list of species including strawberry, raspberry, blueberry, avocado, elderberry, rose, willows, red clover, alfalfa, Acacia, Leucaena (fodder legume) and wild carrot (Clark *et al.* 2004, Agrain *et al.* 2024). While strawberries and raspberries have been hit the hardest in Tasmania, the beetle has been observed feeding on adjacent blueberries and there is concern that it may move on to other crops.

Symptoms

Although such a small beetle may not be easily noticed, its damage is more obvious.

Leaves:

Clues include chewing and skeletonising of leaves by larvae and adults. On strawberries, holes in leaves can be irregular. On young raspberry leaves rows of chewed holes enlarge and merge as the leaf expands, resembling caterpillar damage (Figure 5).

Buds:

On woody plants such as blueberries, they have been observed chewing buds (Figure 6).

Flowers and early forming fruit:

In strawberries look for chewed and shredded petals and deformed fruit. In strawberry flowers, beetles, eggs and larvae may be found around the base of the forming fruit, feeding on the nectaries. On developed fruit beetles can be hidden under the calyx (Figure 7).

Mature fruit:

Look for superficial scarring, pits and tunnelling (Figure 8). Old damage turns brown. Even well-developed, undamaged fruit may suffer superficial grazing and tunnelling just before harvest.



Figure 5. Grazed strawberry leaf (L) and chewed raspberry leaf (R)



**Figure 6 (L). Chewed blueberry bud
Figure 7 (R). Chewed petals and deformed fruit**



Figure 8. Grazing (L) & tunnelling (R) in strawberries

Photo credits: Lynne Forster

Management

Biological and Chemical control

There are no registered biological or chemical control agents for the bronze leaf beetle. This means that growers must rely on preventative action such as monitoring and cultural control to prevent outbreaks.

Monitoring and Cultural control

- Add the bronze leaf beetle to the list of species monitored by crop scouts
- Regularly check flowers, fruit and young leaves on growing tips of plants
- **Act immediately, using an informal action threshold of 1 beetle/5m**
- Enhance monitoring by setting up yellow sticky traps early in the season at entrances to selected tunnels and in the middle of tunnels (Figure 9)
- Minimise and monitor weeds and other plants inside tunnels and the boundary to reduce sources of re-colonisation
- The beetle can be found in low numbers on boundary plants ranging from poplars and willows to native vegetation
- Inside tunnels they are found on weeds including mallow, dock, sow thistle and flat weeds



Figure 9. Monitoring should include sticky traps Photo credit: Catherine Eckert and Ravingka Kannangara

Future management

Research is ongoing to understand the seasonal movement and over-wintering biology of the bronze leaf beetle and discover potential native parasitoids.

Mapping the distribution of the beetle is underway and growers from anywhere in Australia are urged to report sightings on any crop.

Successful management strategies to control the bronze leaf beetle are being developed through collaboration between growers and researchers.

Growers are encouraged to share their observations and provide feedback about their experiences and management of this pest.

Acknowledgements

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