Citrus gall wasp

Fact sheet

Bruchophagus fellis

Jianhua Mo and Scott Munro, NSW DPI, 2022

Table 1. Risk and control periods for citrus gall wasp activity.

		Flowering		Fruit drop		Golf ball			Colour break			Maturation
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	
		Emergence										
		Control										

Description

Eggs: oval-shaped, white, slightly opaque (Figure 1), <0.5 mm, concealed under the bark of new season citrus shoots (not seen).

Immature: larvae are white, slightly opaque (Figure 1) and <0.5 mm before turning off-white and growing to 1 mm. Pupae are off-white and up to 2 mm before turning brown. Both larvae and pupae remain inside the formed gall (not seen).

Adults: shiny black wasp (Figure 2), 2.5 mm long. They can live for 3–7 days (depending on temperature). Females can lay up to 100 eggs. Adults emerge from the gall and take flight.

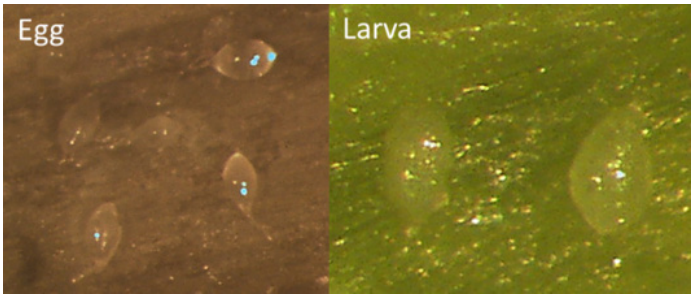

Figure 1. Citrus gall wasp eggs and larvae.

Figure 2. Citrus gall wasp female (left) and male (right).

Life cycle

Citrus gall wasp (CGW) has one generation a year (4 larval stages, a pupal stage and an adult stage; Figure 3). Adults lay eggs under the bark of new season citrus shoots. Most eggs are laid within the first 3 days of wasp emergence. Larvae hatch within 14–28 days and feed inside individually constructed cells. The gall forms gradually until fully formed by mid-Autumn. Larvae turn into pre-pupae and then pupae in early Spring, before turning into adults and emerging in mid-Spring.

Damage

Heavily infested trees have low vigour, resulting in spindly growth, reduced fruit size and yield. Heavily infested rootstock trees can gradually decline and die. Low to medium infestations require annual monitoring to ensure control measures are adequate to prevent a heavy infestation.

Threshold: in orchards where CGW is first found, galls should be cut off during winter. If CGW is well-established and many large galls (Figure 4) are present, chemical intervention might be required to reduce the population.

Risk period: October to December (Table 1).

Figure 3. Citrus gall wasp life cycle. Note: Southern Australia timing is shown. Key developmental stages are earlier in warmer climates.

IPDM for the citrus industry

This project has been funded by Hort Innovation using the citrus research and development funds from the Australian Government. For more information on the fund and the strategic levy investment, visit horticulture.com.au

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Monitoring

Check for galls in the lower to middle canopy of the trees. New season galls are easily seen in late winter and early spring. Look for shoots growing at right angles from the main branch. Rootstock suckers are highly attractive to CGW. Scattered, small galls (< 10 mm long) indicate a recent infestation. Larger galls (> 50 mm) and more prevalent gall presence indicates a longer-term infestation.

Management and control

Biological: 2 naturally occurring parasitic wasps, *Megastigmus brevivalvus* (Figure 5) and *M. trisulcus* (Figure 6) parasitise CGW eggs. They do not eliminate CGW but will reduce the density and size of galls. The parasitoids are currently unavailable commercially and would take many years of augmented releases to be an effective control strategy alone. Soil-applied systemic insecticides also kill the parasitoid wasps. Surround® Crop Protectant is also likely to disrupt the parasitoid wasp activity.

Cultural: heavy hedge pruning and skirting will help control high infestations by removing large numbers of CGW. After hedging, galls need to be either mulched or burned if the timing is near adult emergence. Prune at least 56 days before expected adult wasp emergence if galls remain on the ground (under canopy) in the shade. Prune at least 28 days before expected adult wasp emergence if galls can be mechanically raked to the inter-row. The vigorous new flush after hedging is highly susceptible to CGW. Skirt pruning after egg laying can help to reduce gall wasp pressure.

Chemical: no contact foliar insecticides are registered to kill adult CGW. The residual activity of foliar insecticide is inadequate to provide effective control and is very disruptive to natural predators and parasitoids. Systemic insecticides containing clothianidin or imidacloprid applied through the irrigation system target larvae and provide adequate control. These insecticides have long residue periods. Calcined kaolin is an effective repellent for CGW during emergence, provided adequate coverage of spring flush can be maintained.

Figure 4. A fully formed gall.

Figure 5. Female *Megastigmus brevivalvus* (inset: male).

Figure 6. Female *Megastigmus trisulcus* (inset: male).

More information

Citrus gall wasp prediction tool

Citrus gall wasp in Southern Australia

Rate the level of infestation

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