

Timing of Citrus Gall Wasp Adult Emergence

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Citrus gall wasp (CGW), *Bruchophagus fellis*, has only one generation per year in citrus in Australia. Most of the wasp's lifecycle, from egg to larva to pupa, is spent inside the gall. The only visible stage of its lifecycle is the adult wasp. For a short period in spring, the adults emerge from the galls to mate and lay eggs for the next generation. The exact timing of the emergence period varies from year to year because of climatic conditions mainly temperature. To predict the timing of wasp emergence, we collected data in a citrus orchard in Dareton, NSW, in 2010 and 2011, and analysed the effects of temperature on adult wasp emergence.

Wasp emergence was monitored weekly in 2010 and twice weekly in 2011 with sticky cup traps enclosing individual galls. In 2011, wasp emergence was observed from late October to late December. The estimated timing of 5, 25, 50, 75, and 95% emergence were at 10, 16, 19, 23, and 26 November, respectively (Table 1). Wasp emergence occurred earlier in 2011 from mid October to late November, with estimated timing of 5, 25, 50, 75, and 95% emergence at 19, 27, and 31 October, and 5 and 10 November, respectively (Table 1). The timings for peak emergence (50%) corresponded to 33-42 days after the full bloom for 'Washington' navel in both years (8 October for 2010 and 28 September for 2011), or about 607 degree-days from 1 July (assuming a lower development threshold temperature of 10°C and a higher development threshold temperature of 40°C).

Table 1. Accumulated emergence of CGW adults from sticky cup traps at the study site in Dareton in 2010 and 2011. Days after full bloom were calculated from 8 October for 2010 and 28 September for 2011. Degree-days were accumulated from 1 July based on a lower temperature threshold of 10°C and a higher temperature threshold of 40°C.

Accumulated Emergence (%)	Date of occurrence		Days after full-bloom		Degree-days (DD)	
	2010	2011	2010	2011	2010	2011
5	10 Nov	19 Oct	33	21	517	481
25	16 Nov	27 Oct	39	29	583	571
50	19 Nov	31 Oct	42	33	606	607
75	23 Nov	5 Nov	46	38	660	654
95	26 Nov	10 Nov	49	43	705	723

In addition to CGW adults, a total of 454 parasitic wasps of CGW (*Megastigmus brevivulvus*) were caught by the sticky cup traps (28) and flat yellow sticky traps placed at the same site (426) during the monitoring period in 2011. The parasitic wasps emerged about 2 weeks later than CGW (Figure 1).

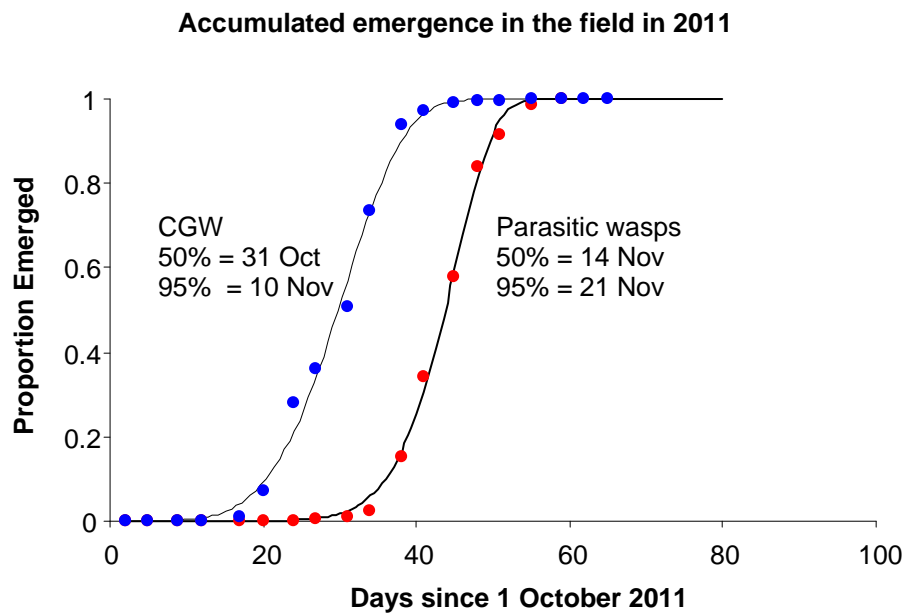


Figure 1. Comparison of emergence patterns of CGW adults and its parasitic wasp *M. brevivulvus* at the study site in 2011.

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