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Understanding and Managing Citrus Gall Wasp

Research update

NSW DPI citrus roadshow 2017

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www.dpi.nsw.gov.au

Description



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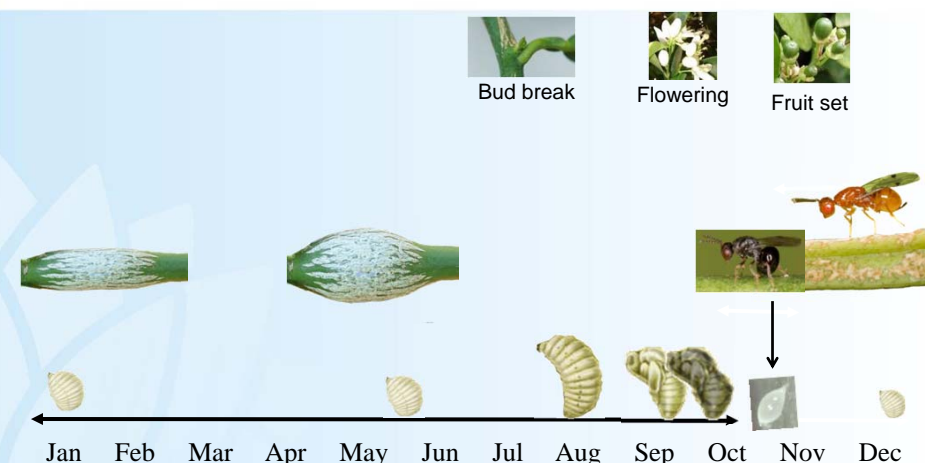
Current Distribution



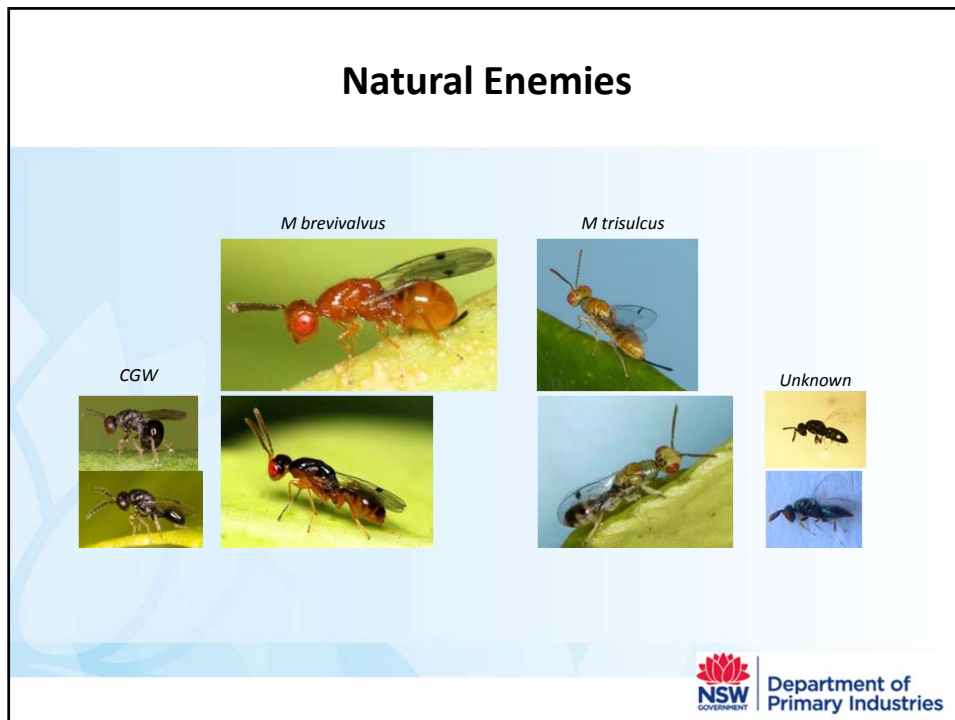
	%Absent	%Low	%Moderate	%High	%Severe
ALL	45	41	11	3	0
LEETON	66	30	3	1	0
GRIFFITH	16	56	23	5	0



Life cycle

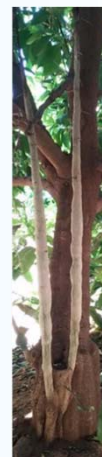


Natural Enemies

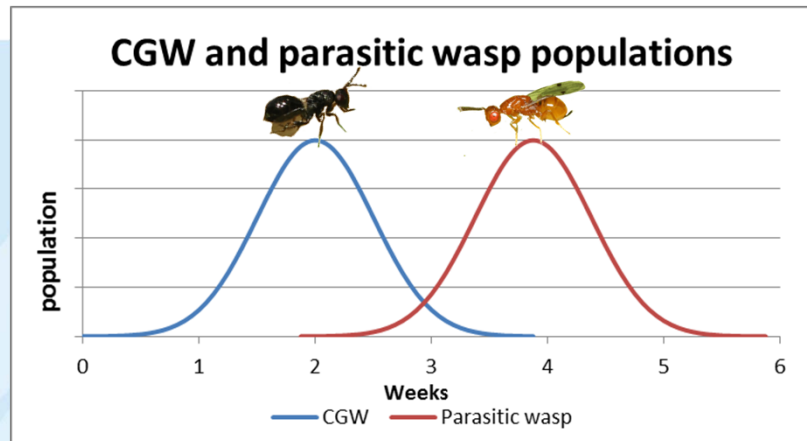


Current understanding

- Native pest
- All citrus varieties are attacked
- Adult wasps live for about 6 days in Oct-Nov in the south
- Each female lay about 100 eggs
- Most eggs are laid in the first three days post emergence
- >50% natural mortality from egg to adult emergence
- Timing of emergence depends on temperature
- A 1-cm section of a gall can contain > 20 wasps
- Eggs hatch in about 18 d in Nov in the south

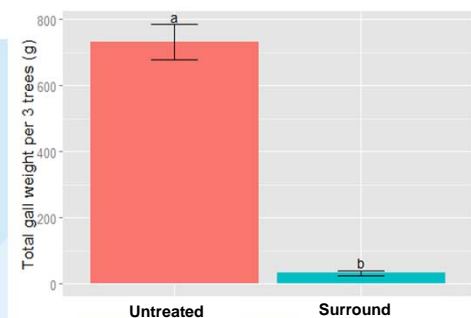


Emergence of parasitic wasps



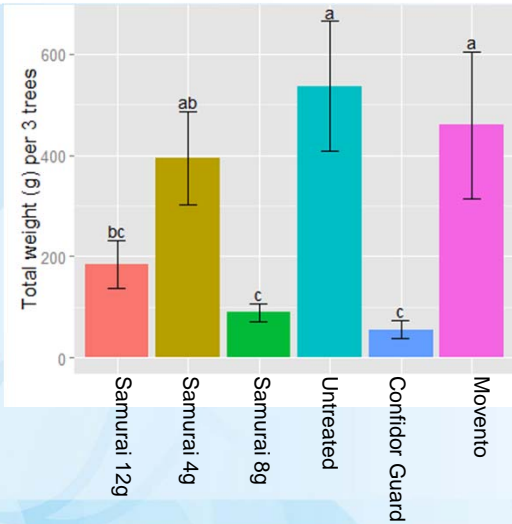
Emergence of parasitic wasps occur 2-3 weeks after the gall wasp emergence

Surround – Sunraysia – 2015-2016



- 2 X Surround sprays at 2.5-5 kg/100 L at CGW emergence reduced galls by >90%
- Applied with Du-Wett, a water rate of 2000 L/ha (half kg/ha rate= half cost) performed similarly well as 4000L/ha with Agral. Further water rate reductions are possible.
- Surround sprays may cause an increase in red scale number.

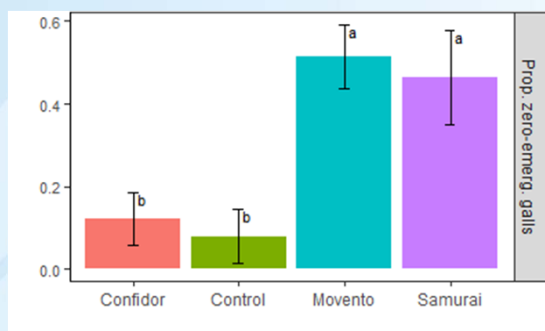
Larvicides – Spring application



Single application of Samurai at 8-12 g/tree and Confidor Guard at 9 ml/tree in late October significantly reduced gall numbers in the following season.



Larvicides – Summer to Autumn application



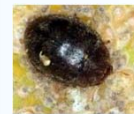
A single application of Movento at 40 ml/100 L + Hasten at 100 mL/100 L or Samurai at 12 g/tree in April suppressed CGW emergence.

Movento applied in January, March or April were all effective with the latter two timings performing better.

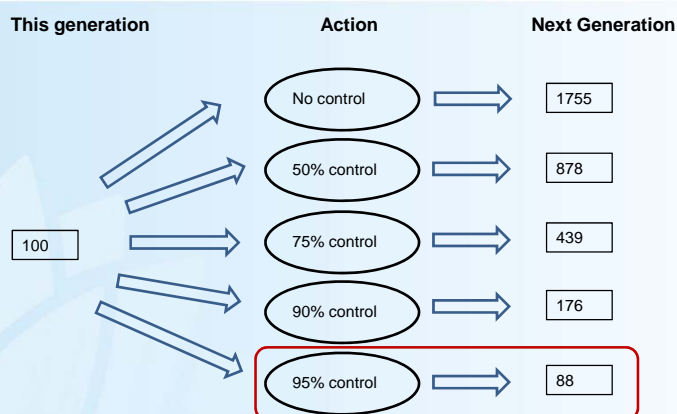


Samurai toxicity

- ❑ Lab tests showed no toxicity to *Chilocorus* ladybird beetles from 7-84 d post spray
- ❑ Field parasitism of red scale by *Aphytis* at 84-d post spray was not affected
- ❑ Abundance of *Rhyzobius* ladybird at 84-d post spray was not affected
- ❑ Field parasitism of red scale by *Comperiella* wasp at 84-d post spray was reduced

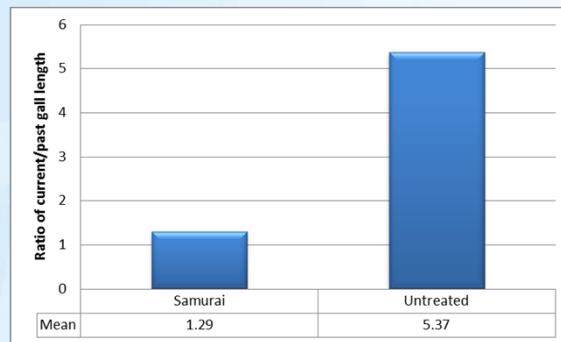


A note on chemical control



1 Female = 108 eggs; Female prop = 0.65; Juvenile mort = 50%; Adult mort = 50%

A snapshot of Samurai control in QLD



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Pruning trial

- Pruning/hedging is an important CGM management option.
- The last date to prune to ensure zero emergence of CGW was 28 days before CGW emergence in the open and 58 days in the shade.
- Pruning will encourage the growth of new shoots, resulting in more egg-lay sites for CGW.



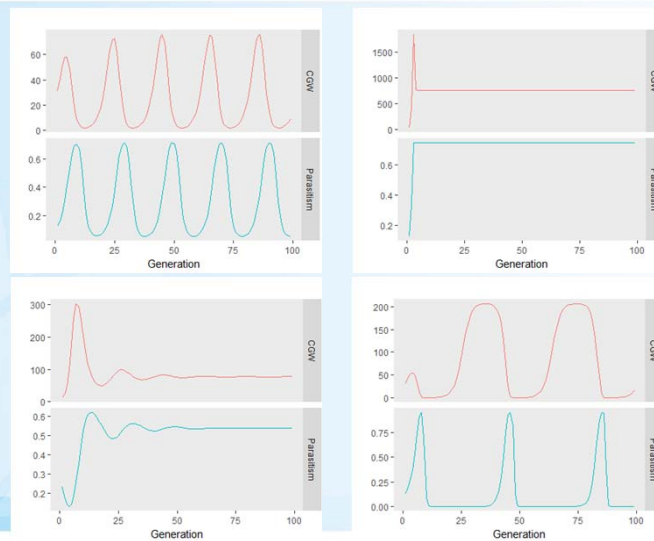
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Parasitic wasps - Heat stress

- ❑ With access to water, *M brevisalvus* was able to tolerate 40°C heat for up to 5 hours.
- ❑ No water access: all die within 5 hours
- ❑ Short intermittent irrigation during a heat wave may enhance survival of parasitic wasps.



Parasitic wasps - potential



Take Home Message

- ❑ **CGW Peak emergence** : late Oct – early Nov 2015, large within-region variations.
- ❑ **Deterring CGW egg-lay**: two sprays of Surround at 2.5-5 kg/ha before and during CGW can achieve >90% gall reduction . Water rate can be reduced to 2000L/ha if applied with DuWett : half kg/ha rate = half the cost.
- ❑ **Larval control** : Confidor Guard at 9ml/tree and Samurai at 8 g/tree in late spring were effective, reducing galls by 53-83%.
- ❑ **Autumn suppression of CGW emergence**: Movento applied during March-Apr were similarly effective.
- ❑ **Larva survival in prunings**: 28-d in the open and 58-d in the shade.
- ❑ **Parasitic wasps**: are in the early stage of establishment in the southern citrus regions. At most sites, their populations are not yet sufficiently high to effectively control CGW.



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Acknowledgement

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Thank You

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