Product Bulletin

Calypso® 480 SC Insecticide

Effects on key mite species

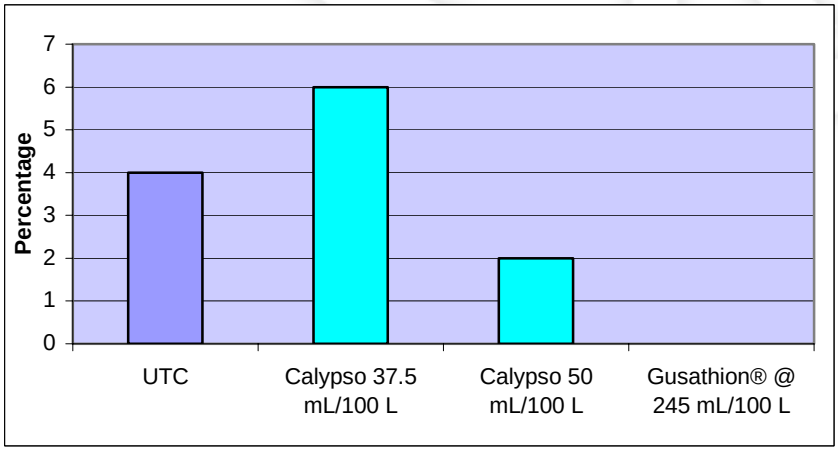
Calypso® 480 SC is a unique chloronicotyinyl insecticide (CNI) which provides excellent control of coding moth and oriental fruit moth when used as directed.

Calypso contains the active ingredient thiacloprid, which is distinguished from other lepidopteran insecticides used in orchard fruit production by its excellent systemic and broad-spectrum activity (controlling a range of both chewing and sucking insect pests), relative safety to honey bees and many beneficial species, and a mode of action that is quite distinct to OPs, SPs, carbamates and the IGRs. Consequently, **Calypso** is an excellent tool for insecticide resistance management strategies.

Calypso is much softer on some beneficial species and mites than most current insecticides used in orchards for the control of certain lepidoptera pests. Overseas studies have shown that it does not disrupt parasitism of woolly apple aphid by *Aphelinus mali*. **Calypso** is also compatible with farming systems that utilise predatory mites as part of a pest management strategy.

Overseas studies have consistently confirmed that when used as directed, **Calypso** has no adverse effect on predatory mites. This was supported by Australian trials conducted during the 2002/2003 (Nashdale in NSW and Wandin in Vic), and during the 1997/98 season (Stanthorpe, Qld). In these trials **Calypso** was considered not to have an adverse impact on the predatory mites *Typhlodromus pyri (Trial No: BAYER /2578/1 and Trial No: EMH 421,) and Typhlodromus occidentalis (Trial No: BAYER/2579/1).*

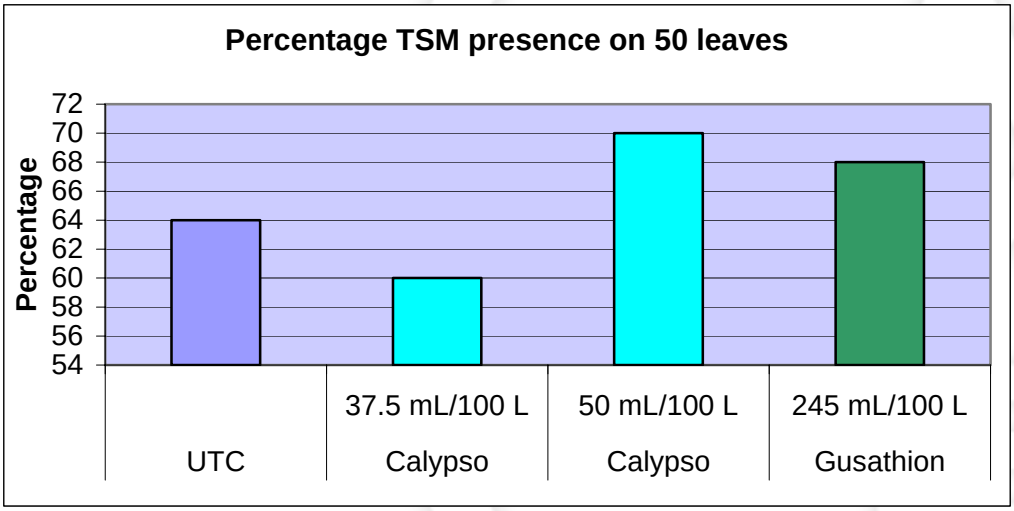
Percentage of *Typhlodromus pyri* predatory mite presence on 50 leaves 4 day after the seventh application of an insecticide



No significant difference were observed between treatments

In comparison to some traditional insecticides used in orchard fruit production, **Calypso** is unlikely to cause mite flare. This has been consistently demonstrated in Australian trials conducted by both Bayer CropScience and independent contractors on behalf of Bayer CropScience. In these trials an exaggerated number of applications was made – a maximum of four applications is recommended for **Calypso**.

During 1997/98 a trial conducted in Stanthorpe Qld (EMH 421) showed that there was no effect on two-spotted mite (TSM) presence on leaves after seven consecutive applications of **Calypso** at rates up to 50 mL/100 L as shown in the below table. Assessment for TSM was made four days after the last application. The label rate for **Calypso** is 37.5 mL/100 L.



NOTE: No significant difference was observed between treatments.

These findings were further supported in trials conducted by Bayer CropScience in Shepparton during the 2000/2001 (RTL 590) and the 2002/03 (VC01/02) seasons. After the last application, the various treatments in each trial where assessed for their effect on mite populations, as measured by a post-harvest leaf scorch rating.

Mite scorch rating post harvest

0 -10 scale of leaf scorch

Trial: RTL 590

Treatments	Leaf Scorch Rating 36 DAT T6
Untreated	0.0 a
6 x Calypso (37.5 mL/100 L)	0.4 a
4 x Calypso (37.5 mL/100 L) 2 x Gusathion (245 mL/100 L)	1.2 b
4 x Gusathion (245 mL/100 L) 2 x Calypso (37.5 mL/100 L)	1.8 bc
6 x Gusathion (245 mL/100 L)	2.4 c

Trial: VC01/02

Treatments	Leaf scorch rating 40 DAT T8
Untreated	1.2 ab
8 x Calypso (25.0 mL/100 L)	1. 2ab
8 x Calypso (31.25 mL/100 L)	0.0 a
8 x Calypso (37.5 mL/100 L)	1.8 b
8 x Gusathion (245 mL 100 L)	3.8 c

Note:

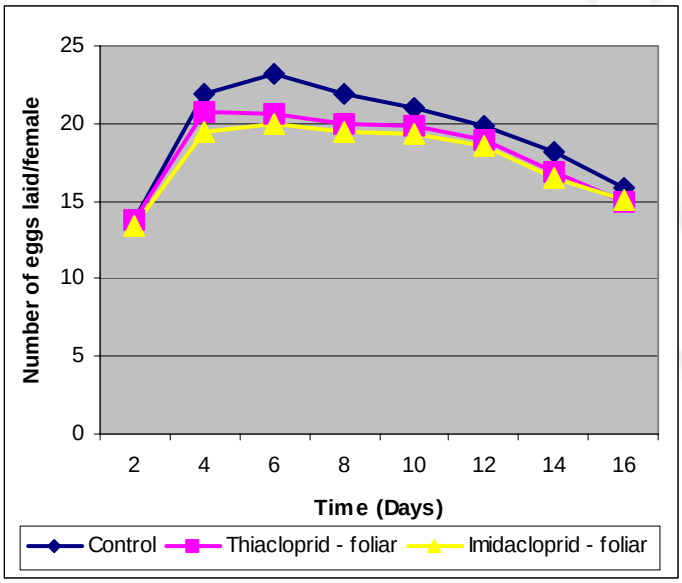
- 36 DAT T6 refers to a leaf scorch rating 36 days after the sixth application of Calypso.
- Leaf scorch ratings followed by the same letter are not significantly different.
- A leaf scorch rating of 0 = no visual leaf scorch, while a leaf scorch rating of 10 = total defoliation.

These results show that all treatments with Gusathion 200 SC were associated with a significant level of mite induced leaf scorch compared to the untreated and **Calypso** only treatments. Compared to **Gusathion, Folidol CS** was associated with a lower, but still significant, level of mite-induced leaf scorch. The overall level of leaf scorch in the **Gusathion** treatment was slight and considered to be commercially acceptable.

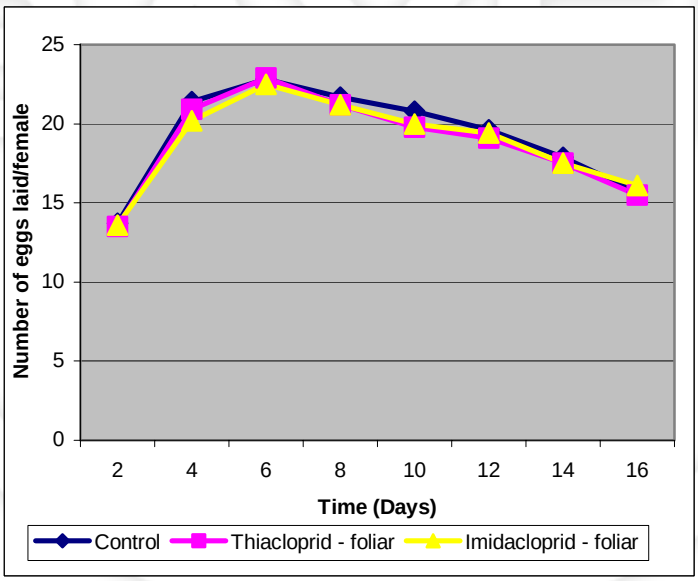
Some synthetic insecticides used in orchard fruit production have been associated with the phenomenon of reproductive stimulation of certain pests such as two-spotted mites following exposure to sublethal doses. Such laboratory observations and speculations include increased fecundity (egg laying). A recent greenhouse study conducted by Ako et al (2004) investigated the potential effects of various CNIs on fecundity, egg viability, larval survival and sex ratio of TSM on french beans. In these studies, all CNIs including thiacloprid were tested at both field relevant and sublethal doses. The results of these studies are summarised in the following charts:

Mean fecundity of Tetranychus urticae (TSM)

a. Field relevant dose rate



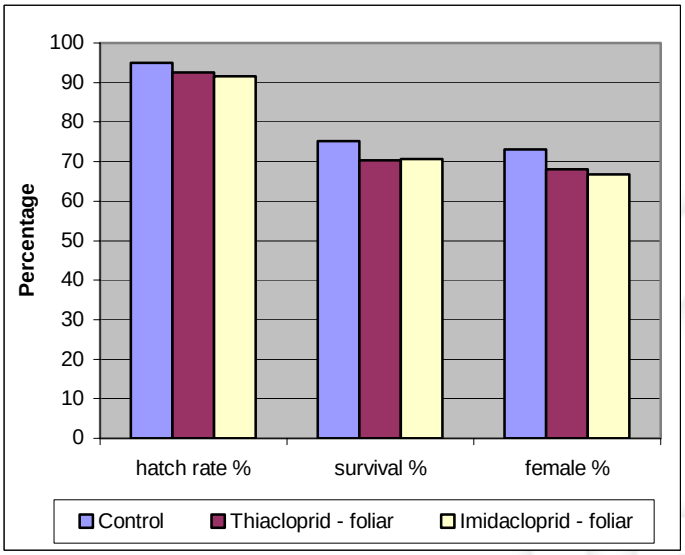
b. sublethal dose rate



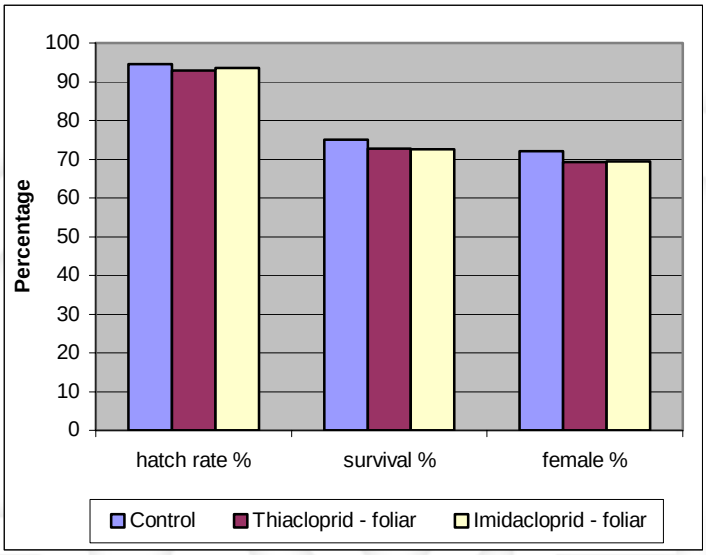
The figures above the field-relevant dose rates of thiacloprid (120 ppm) and imidacloprid (100 ppm) most often caused a significant decrease in oviposition of TSM between day 4 and day 10 after adult emergence. In the sublethal dose experiment, no significant difference was observed between either insecticide and the untreated control. An important observation to make in both the above charts is that neither CNI insecticide caused an increase in the fecundity of TSM at either field or sublethal dose rates during the 16 days of the oviposition period.

Mean hatch rate of eggs, larval survival and sex ratio of T. urticae*.*

a. Field relevant dose rate



b. sublethal dose rate



In the above figures, at both field-relevant and sublethal dose rates, the percentages of egg hatch rates, larval survival and female offspring (sex ratio) were all consistently slightly lower than in the untreated control. Again, the important observation is that neither CNI insecticide stimulated a population build-up of TSM when compared to the untreated control.

The results of all the studies presented clearly demonstrate that when used in accordance with label directions, **Calypso** has no adverse effects on predatory mites and does not stimulate mite fecundity. It is therefore extremely unlikely that the use of **Calypso** could lead to population outbreaks of two-spotted mites.

For further information please contact our local chemical reseller or our free call technical information number:

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