SUMITOMO CHEMICAL

Features of Sumitomo Shield Systemic Insecticide™

- Sumitomo Shield Systemic Insecticide is the most effective neonicotinoid insecticide registered for the control of aphids and green mirids in cotton
- No known resistance or cross-resistance to Sumitomo Shield Systemic Insecticide makes it an ideal partner in a resistance management program
- Differential rates for low or high pressure scenarios, with associated cost saving
- Short five day withholding period, allowing for control of aphids just prior to harvest
- Moderately negative effect on beneficial insects, with less impact on the predator complex than full rates of organophosphates and pyrethroids

Sumitomo Shield Systemic Insecticide, containing 200 g/L clothianidin as the active ingredient, belongs to the neonicotinoid group of insecticides. They act on the central nervous system of insects, causing eventual paralysis which leads to the demise of the pest.

With more than 80% of the Australian cotton crop now planted to genetically modified varieties which are resistant to *Helicoverpa* spp., the sucking pest complex including aphids, mirids, cotton stainers, bugs and jassids have become more prominent, with mirids now regarded as the major pest of cotton. In the neonicotinoid group, imidacloprid has a 13 week withholding period – limiting it to application early in the crop cycle. Thiamethoxam is not registered against mirids, leaving Acetamiprid and Sumitomo Shield Systemic Insecticide as the most flexible and effective representative from this chemistry group.

Field trials conducted in Australia have shown that a single application of Sumitomo Shield Systemic Insecticide will provide control of aphids and green mirids in cotton equal to or better than the level of control provided by current standards.

Damage caused by Aphids & Mirids in Cotton

APHIDS

Large populations of aphids cause curling, yellowing and distortion of leaves, as well as stunting of shoots. They can also produce large amounts of a black sooty substance known as honeydew. The presence of honeydew, especially if present towards ripening, severely downgrades a cotton crop because of the effect it has on modern spinning machinery. Deposits of honeydew on the leaf also affect photosynthesis, which indirectly reduces yield.

Leaf distortion caused by aphid feeding

A colony of nymphs and adult cotton aphids

MIRIDS

Mirids are a highly mobile pest which can damage plant terminals, young leaves, squares and small bolls. Squares damaged by mirids are shed prematurely, reducing yield. When they feed on bolls, the chemical they secrete downgrades lint quality. Mirids have gradually become more troublesome as the number of sprays against *Helicoverpa* declined, and are now considered to be a key pest in Australian cotton.

Green mirid adult

Mirid damage at harvest

To get the Best Result from Sumitomo Shield Systemic Insecticide

- Apply when aphid numbers are low and starting to build up (before there are two leaves per plant with honeydew)
- To control mirids, monitor the crop regularly (every 3 - 5 days during the season) and apply when pest numbers reach the threshold level for treatment
- Always apply Sumitomo Shield Systemic Insecticide with Maxx Organosilicone Surfactant at 200 mL/100 L of water
- Use the high rate in situations where heavy infestation is expected and when longer control is required
- To prevent or delay the development of resistance, do not apply more than two applications per season and these should alternate with an insecticide from a different activity group
- Apply in a minimum spray volume of 100 L/ha (ground application) or 30 L/ha (aerial application)

The Use of Sumitomo Shield Systemic Insecticide in Integrated Pest Management Programs

While the effect of clothianidin varies between insects – ranging from virtually no effect to detrimental, Sumitomo Shield Systemic Insecticide is considered to have moderate detrimental effect on beneficial insects when compared to current insecticide standards. It is similar to other products from this chemistry group. As a general statement, it can be said Sumitomo Shield Systemic Insecticide may cause a temporary reduction in beneficial numbers, but will not completely eradicate beneficial insect populations.

Beneficial groups which appear to be highly sensitive to clothianidin are predatory beetles (including ladybirds) and lacewing adults. Bear in mind though, that both these groups are high density feeders and that their numbers decline rapidly in the absence of prey (mainly aphids) which are well controlled by Sumitomo Shield Systemic Insecticide. Beneficial groups which are less affected are thrips, predatory bugs, wasps and spiders.

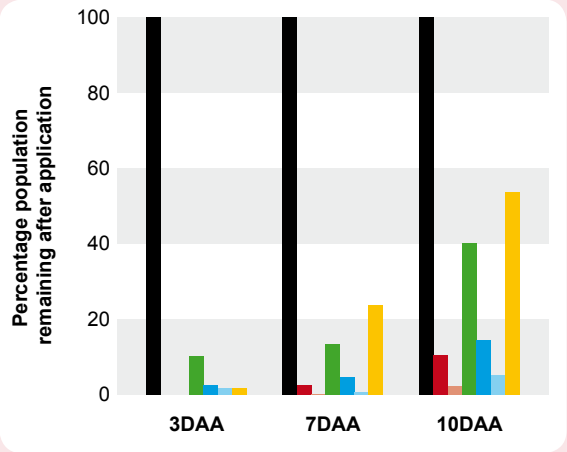
Timely application of Sumitomo Shield Systemic Insecticide at the lower rate while pest numbers are still increasing and below the threshold level will considerably lessen the overall effect against beneficial insects.

The Effect of Sumitomo Shield Systemic Insecticide on Bees

Direct application to foraging bees or indirect application to hives from over-spray or drift will have a detrimental effect. Growers and applicators are advised not to apply Sumitomo Shield Systemic Insecticide during periods of bee activity or when bees may be foraging in the crop, and to be mindful of the location of hives.

Independent Trial Results

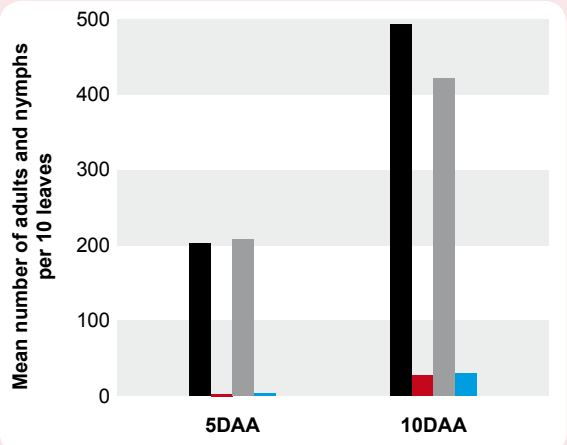
For control of cotton aphids (Kununurra WA)



- UTC
- Shield 125 mL/ha
- Shield 250 mL/ha
- Imidacloprid 250 mL/ha
- Intruder® 50 mL/ha
- Intruder 100 mL/ha
- Omethoate

CONCLUSION
Sumitomo Shield Systemic Insecticide completely eradicated the existing aphid population, and its residual action then delayed the re-establishment of new aphid colonies. For longer control, use the high rate.

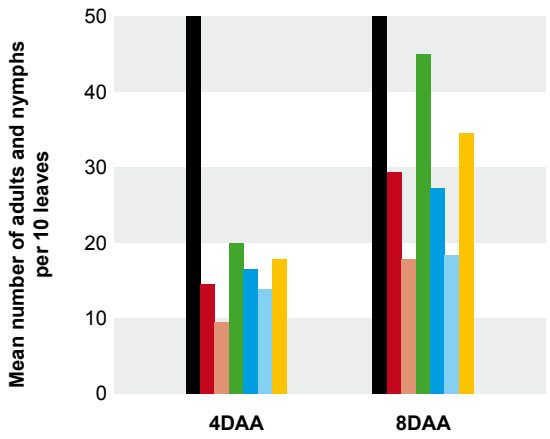
For control of cotton aphids – aerial application (Kununurra WA)



- UTC 1
- Shield 250 mL/ha + Maxx 0.2%
- UTC 2
- Intruder 100 mL/ha + Pulse 0.2%

CONCLUSION
Sumitomo Shield Systemic Insecticide was as good as the industry standard for controlling aphids by air.

The effect of droplet size, spray volume and adjuvant on control of aphids with Sumitomo Shield Systemic Insecticide by air

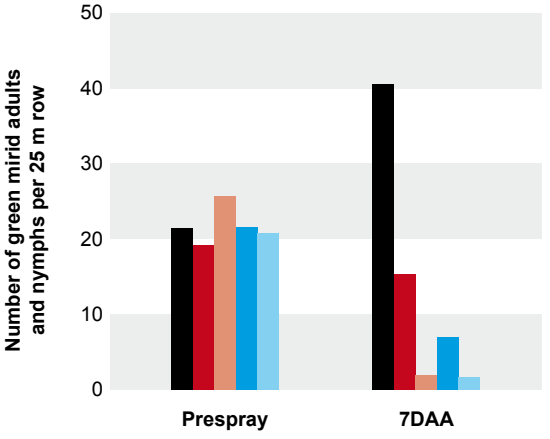


- UTC
- Shield 250 mL/ha, 30 L water/ha, VMD 180 mic
- Shield 250 mL/ha + Maxx 0.2%, 30 L water/ha, VMD 180 mic
- Shield 250 mL/ha, 30 L water/ha, VMD 254 mic
- Shield 250 mL/ha + Maxx 0.2%, 30 L water/ha, VMD 254 mic
- Shield 250 mL/ha + Maxx 0.2%, 50 L water/ha, VMD 254 mic
- Intruder 100 mL/ha + Maxx 0.2%, 30 L water/ha, VMD 294 mic

CONCLUSION

The addition of Maxx Organosilicone Surfactant significantly improves the efficacy of Sumitomo Shield Systemic Insecticide. Better efficacy will be achieved with smaller spray droplets.

For control of green mirids



- UTC
- Shield 125 mL/ha
- Shield 250 mL/ha
- Intruder 50 mL/ha
- Intruder 100 mL/ha

CONCLUSION

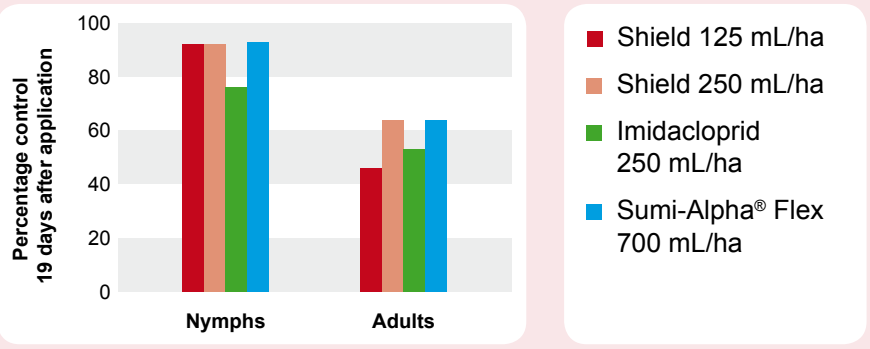
Sumitomo Shield Systemic Insecticide at the low and high rates gave control of mirids equal to the standard, at low and high rates.

Future Developments

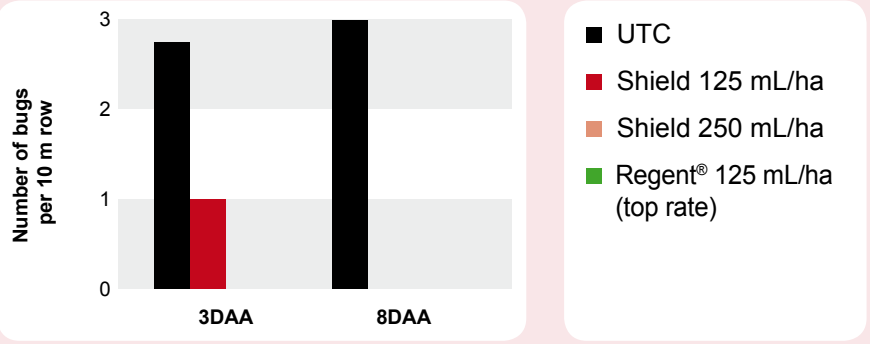
In addition to aphids and green mirids, Sumitomo Shield Systemic Insecticide has also been shown to be highly effective against Green Vegetable Bug* (*Nezara veridula*), Cotton Stainer* (*Dysdercus sidae*) and Jassids* (*Austroasca viridigrisea*). Recommendations for the control of these pests should appear on the product label in due course.

* NOTE that recommendations for the use Sumitomo Shield Systemic Insecticide to control these pests are still pending

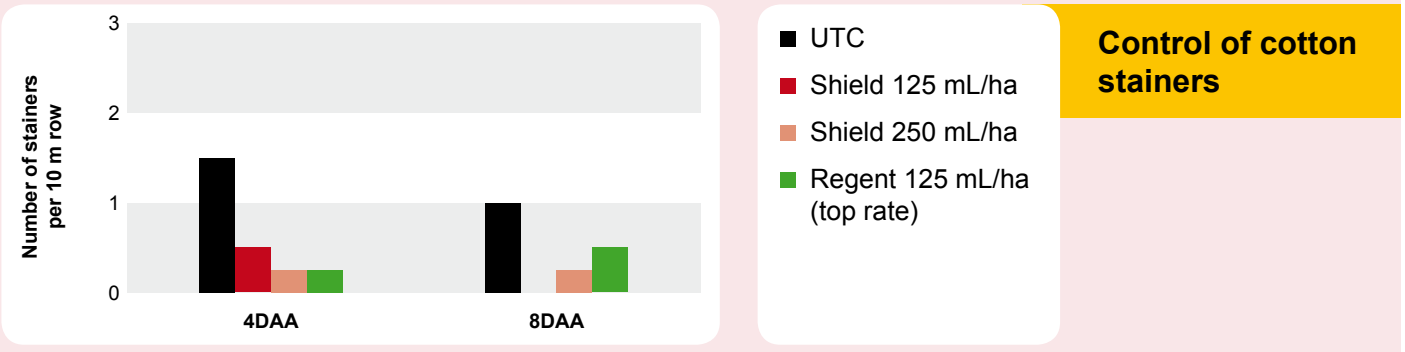
Control of green vegetable bug



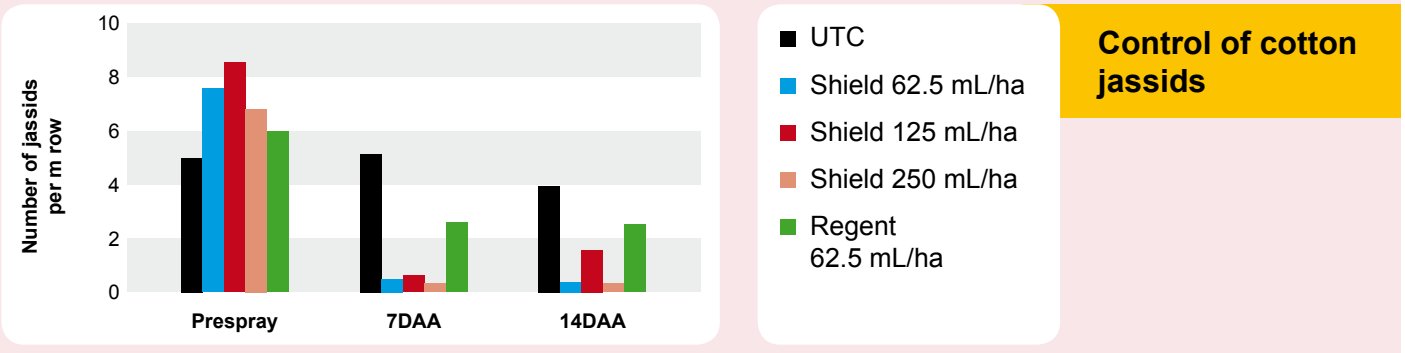
Control of green vegetable bug



Control of cotton stainers



Control of cotton jassids



Directions for Use

Always consult the most recent label for comprehensive directions.

RESTRAINTS
For cotton do not apply more than 2 sprays per season and these should alternate with a pesticide from a different group.

CROP	PEST	RATE	CRITICAL COMMENTS
Cotton	Cotton aphid Green mirid	125 - 250 mL/ha plus Maxx Organosilicone Surfactant at 2 mL/L of water	**Aphids** Apply when aphid numbers are low but starting to build. For example, before there are more than 2 leaves per plant with honeydew. **Mirids** Regular pest monitoring is necessary to determine pest numbers. Apply when numbers reach threshold levels requiring treatment. **For both aphids and mirids** Use the higher rate when heavy infestation is expected and longer control is required. Treated insects may still be on the plant 2 or 3 days after application but will have stopped feeding.

For further information on Sumitomo Shield Systemic Insecticide, please contact:

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