



SIVANTO[®]
prime

PEST MANAGEMENT GUIDE



SILVERLEAF WHITEFLY



FRUIT SPOTTING BUGS



APHIDS



LACE BUGS



PLANTHOPPERS



SCIRTOTHRIPS

SIVANTO[®] prime is an innovative

insecticide which has been developed worldwide in a

wide variety of fruit and vegetable crops. With over a decade

of field research in Australia, it has shown excellent performance

on a wide spectrum of damaging sucking pests including fruit

spotting bugs, banana spotting bugs, lace bugs, aphids, whiteflies,

planthoppers and for the suppression of scirtothrips. It acts fast and

selectively; meeting the needs in most cases of a beneficial species

safe insecticide and diverse environmental safety

requirements in a range of crops.



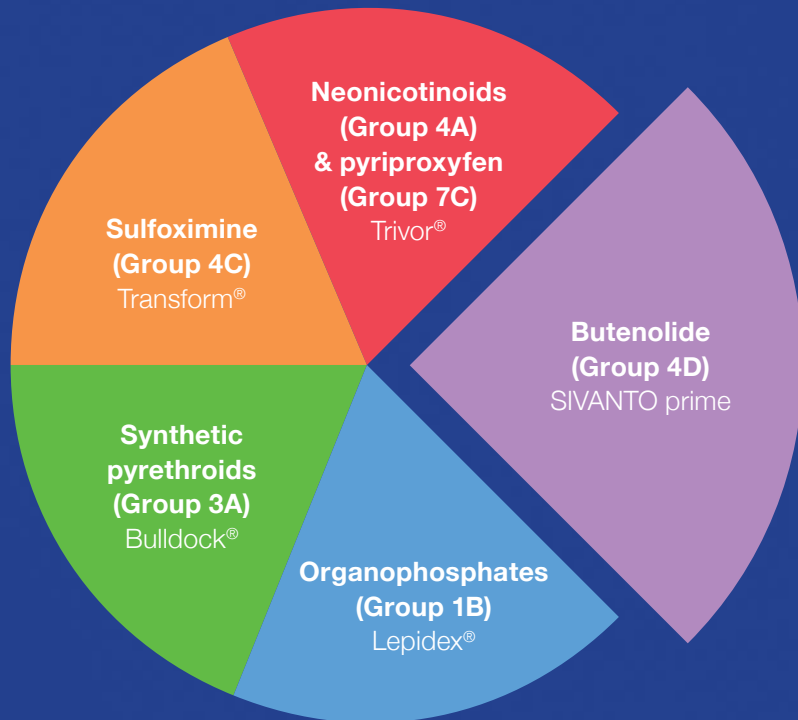
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INTRODUCTION

Introducing innovative and selective insecticide classes is critical for sustainable pest management. SIVANTO prime is a member of the novel **butenolide** class of insecticides, which was inspired by a naturally occurring compound produced by the plant, *Stemona japonica*. It offers advantages over existing management options by offering rapid protection, flexibility for use over flowering and a good level of beneficial species safety.

COMMON PRODUCTS USED IN A FRUIT SPOTTING BUG PROGRAM



COMMON PRODUCTS USED IN A SILVERLEAF WHITEFLY PROGRAM



RAPID PROTECTION

SIVANTO prime is quickly taken up in foliage before moving systemically upwards through the xylem and across the leaf surface (translaminar). Direct spray contact causes feeding to quickly cease, followed by insect death. It offers the maximum benefit when applied to newly establishing pest populations, where younger lifecycle stages are present.

FLEXIBILITY OVER FLOWERING

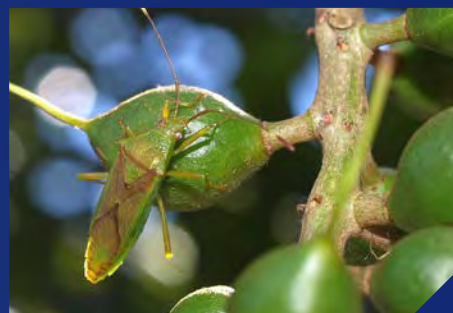
SIVANTO prime shows low toxicity to Australian native stingless bees (*Tetragonula* spp. and *Austroplebeia* spp.) and European honeybees (*Apis mellifera*)¹ when used as directed. It can be safely applied during the period of crop flowering due to the presence of enzymes in these bee species that can break down the active ingredient into biproducts that are harmless to the bee². However, under good agricultural practice, it is recommended not to apply SIVANTO prime or any other insecticides at times when bees are actively foraging. To maintain bee safety, there are limits to the number of applications. When used as per the Directions for Use, SIVANTO prime is not expected to result in adverse impact on colony performance or survival¹.

SAFETY TO BENEFICIAL SPECIES

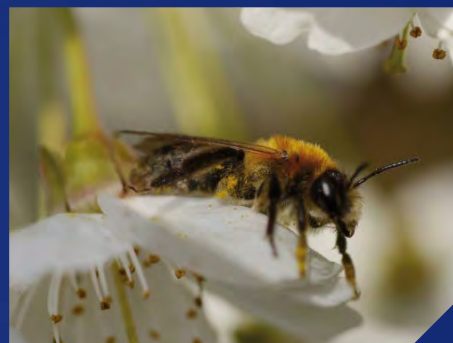
Important beneficial species such as parasitoids, predatory mites, lacewings, hoverflies and ladybird beetles are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has been shown to have minimal impact on most beneficial species, except for predatory bugs, for example *Orius* spp. Use of SIVANTO prime does not flare mites, which can occur with other Group 4 insecticides.

EASY TO APPLY

SIVANTO prime is a water soluble concentrate (SL) formulation that has been optimised for rapid biological activity, without comprising its outstanding safety on beneficial species or pollinators. It contains an in-built adjuvant system, which provides rapid retention and penetration into the leaf, without the need for additional spray adjuvants. This allows the product to be rainfast within a range of 2 to 5 hours in vegetables or tree crops, respectively. It mixes easily and has shown to be robust for use over a wide range of water pH, hardness and temperature.



Adult fruit spotting bug (*Amblypelta nitida*)



European honeybee



Australian native stingless bee



Green lacewings (*Chrysoperla* spp.)

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

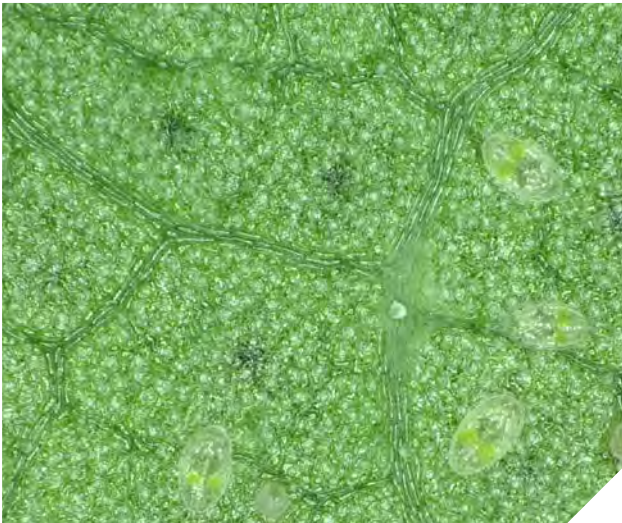
²Only known exception without detoxifying enzymes *Megachile rotunda* (alfalfa leafcutter bee)



SILVERLEAF WHITEFLY

HOW DOES IT WORK?

SIVANTO prime is highly effective against juvenile stages of silverleaf whitefly. It works quickly to prevent sap feeding as well as honeydew excretion and offers excellent residual control. It further reduces the population by reducing the ability of adult silverleaf whiteflies to lay eggs.



Silverleaf whitefly (*Bemisia tabaci* Biotype B)

HOW TO APPLY

Apply at 750 mL/ha to early instar stages of silverleaf whitefly on an establishing population. Using SIVANTO prime early in the season may be important in some regions, such as the dry tropics, to avoid large population peaks later during spring. It can be sprayed during flowering¹. A maximum of two applications may be applied to sprayed areas per year.

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

HOW SAFE IS SIVANTO PRIME TO BENEFICIAL SPECIES?

Important beneficial species such as parasitoids, predatory mites, lacewings, hoverflies and ladybird beetles are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has also been shown to have minimal impact on parasitism with commercial releases of *Eretmocerus hayati*.



Eretmocerus hayati

HOW DOES ITS PERFORMANCE COMPARE?

Trials in the Queensland dry tropics have shown that SIVANTO prime provides strong residual silverleaf whitefly control whilst maintaining excellent safety with parasitoid releases (*Eretmocerus hayati*) (Figure 1). SIVANTO prime was applied at 750 mL/ha in replicated trials in tomatoes and melons as a back-to-back application under high pest pressure near the end of the 2020 season (Figure 2).

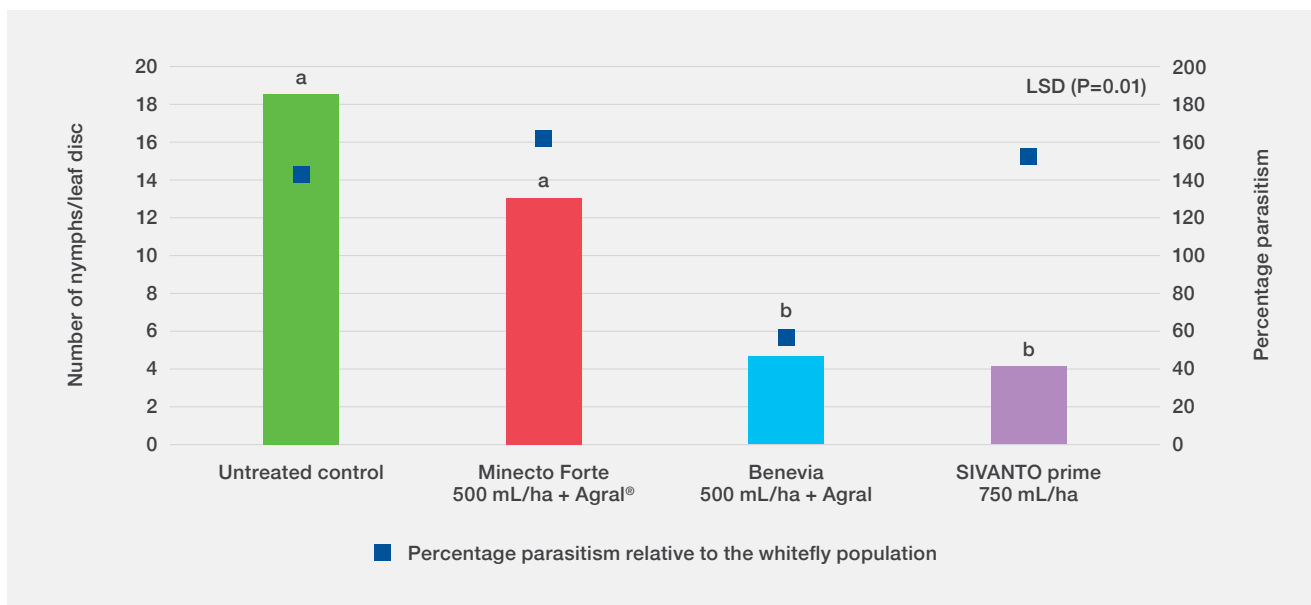


Figure 1. Number of silverleaf whitefly nymphs per leaf disc (16 cm²) and percentage *Eretmocerus hayati* parasitism of silverleaf whitefly in melon or tomato crops at 1 WAA2. Ayr, Qld. 20QM10 & Bowen, Qld. 20QM11



Figure 2. Untreated control at 1 WAA1.



APHIDS

HOW DOES IT WORK?

SIVANTO prime is highly effective against both winged and juvenile stages of green peach and cotton aphids. It works quickly to prevent sap feeding as well as honeydew excretion and offers excellent residual control.



Cotton or melon aphids (*Aphis gossypii*)

HOW TO APPLY

Apply at 750 mL/ha to early instar stages of aphids on an establishing population. Using SIVANTO prime early in the season upon detection of aphids may assist in avoiding population peaks later in the season. It has the flexibility to be applied during flowering¹. A maximum of two applications may be applied to sprayed areas per year.

HOW SAFE IS SIVANTO PRIME TO BENEFICIAL SPECIES?

Important beneficial species such as parasitoids, predatory mites, lacewings, hoverflies and ladybird beetles are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has shown to have minimal impact on most beneficial species except for predatory bugs.

SIVANTO prime is highly compatible with the commercial release of ladybird beetles and parasitoid wasps. Applied under field conditions, it has shown to have minimal impact on parasitism with commercial releases of *Eretmocerus hayati*.



Ladybird beetles (Coccinellidae)

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

HOW DOES ITS PERFORMANCE COMPARE?

A field trial in Queensland has shown that SIVANTO prime provides effective residual cotton aphid control (Figure 3). SIVANTO prime was applied at 750 mL/ha in melons as a back-to-back application under high aphid pressure during 2019 (Figure 4).

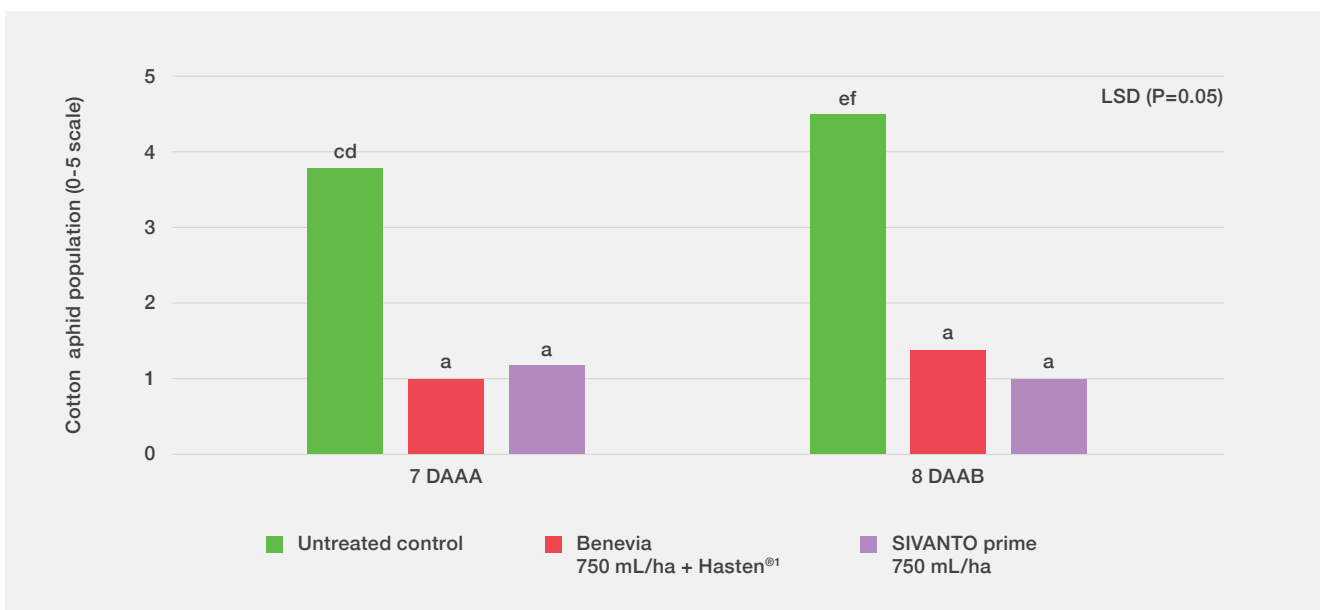


Figure 3. Cotton aphid population (0-5 scale) in cucumbers at 7 DAAA and 8 DAAB. Bowen, Qld. 19QB39. Not all treatments in the trial are included in the graph. ¹Benevia applied at thrips label rate (higher than label rate for cotton aphid).



Figure 4. Untreated control at 7 DAAA.



FRUIT SPOTTING BUGS (AVOCADO)

HOW DOES IT WORK?

SIVANTO prime provides knockdown of juvenile and adult stages of fruit spotting bugs and banana spotting bugs through direct spray contact. It is highly systemic and provides residual control to minimise damage from later reinfestations.



Adult fruit spotting bug (*Amblypelta nitida*)
Image courtesy of NSW Department of Primary Industries

HOW TO APPLY

Monitor orchards and apply when spotting bug populations are first detected. Apply SIVANTO prime at 75 mL/100 L to avoid the population from building and to prolong the abundance of beneficial species in the orchard. It has the flexibility to be applied during flowering¹. Apply at 100 mL/100 L on established populations or when higher levels of residual control are desired. A maximum of two applications are permitted for areas sprayed during a 12-month period.

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

HOW SAFE IS SIVANTO PRIME TO BENEFICIAL SPECIES?

Important beneficial species such as green lacewings, predatory mites, ladybird beetles, hoverflies and parasitoids are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has been shown to have minimal impact on most beneficial species, except for predatory bugs.



Stethorus (*Stethorus punctillum*)



Green lacewing (*Chrysoperla* spp.)

HOW DOES ITS PERFORMANCE COMPARE?

A field trial in Queensland has shown that SIVANTO prime provides strong knockdown of spotting bugs. SIVANTO prime was applied at 75 mL/100 L in a program of consecutive sprays¹ under moderate pest pressure (*Figure 5*).

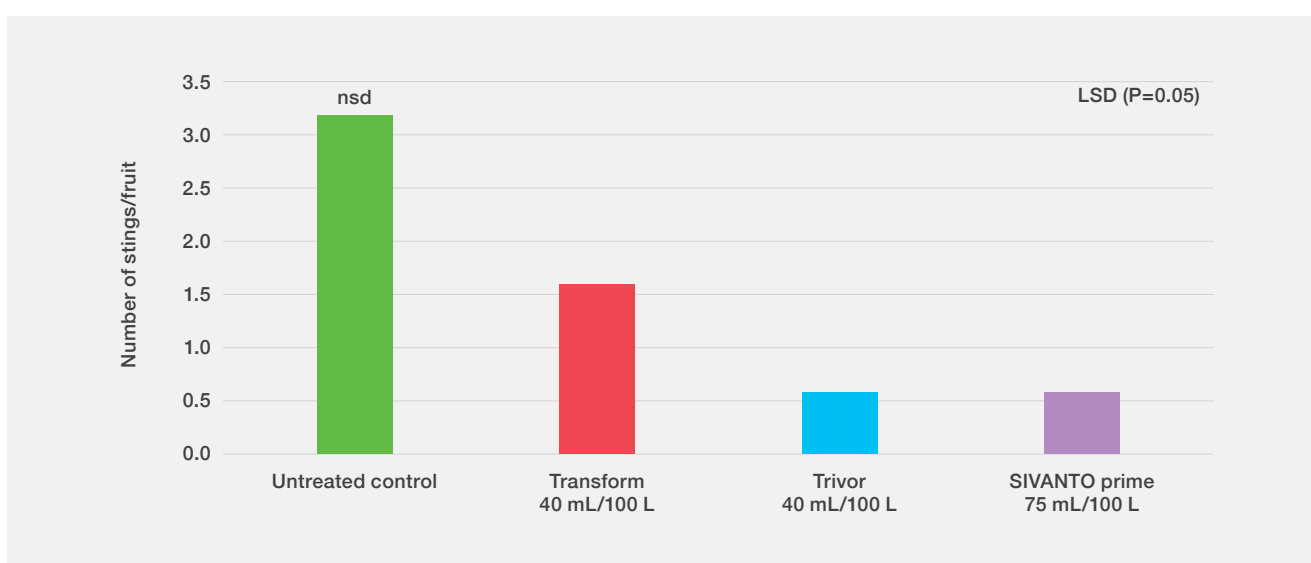


Figure 5. Number of spotting bug stings per avocado fruit at 24 DAC. Hampton, Qld. 21QB09. ¹Spray program not in line with label use, for demonstration purposes only.



Spotting bug stings on avocado fruit



FRUIT SPOTTING BUGS (MACADAMIA)

HOW DOES IT WORK?

SIVANTO prime provides knockdown of juvenile and adult stages of fruit spotting bugs and banana spotting bugs. It is highly systemic and provides residual control to minimise damage from later reinfestations.

SIVANTO prime has the additional benefit of the suppression of scirtothrips.



Adult fruit spotting bug
(*Amblyopelta nitida*)

Scirtothrips
(*Scirtothrips dorsalis*)

HOW TO APPLY

Monitor orchards and apply when spotting bug populations are first detected. Apply SIVANTO prime at 75 mL/100 L early in the spray program commencing around nut set. SIVANTO prime can be applied up to 100 mL/100 L on higher spotting bug pressure or where scirtothrips are present. It has the flexibility to be applied during flowering¹. A maximum of one spray application is permitted in a 12-month period.

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

HOW SAFE IS SIVANTO PRIME TO BENEFICIAL SPECIES?

Important beneficial species such as parasitoids, predatory mites, lacewings, hoverflies and ladybird beetles are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has shown to have minimal impact on most beneficial species, except for predatory bugs.

In macadamias, SIVANTO prime is highly compatible with the commercial release of *Trichogramma* spp. (e.g. MacTriX™), green lacewings and predatory mites.



Green lacewing (*Chrysoperla* spp.)



MacTriX™ (*Trichogramma* spp.)

HOW DOES ITS PERFORMANCE COMPARE?

SIVANTO prime applied at 75 mL/100 L has demonstrated a trend to higher yields when compared to the industry standards (Lepidex 200 mL/100 L or Bulldock 50 mL/100 L) across several small plot replicated trials in New South Wales and Queensland (Figure 6).

SIVANTO prime applied at 100 mL/100 L showed numerically less scirtothrips nut damage compared with other Group 4 products in a 2020/2021 trial conducted by NSW DPI (Figure 7).

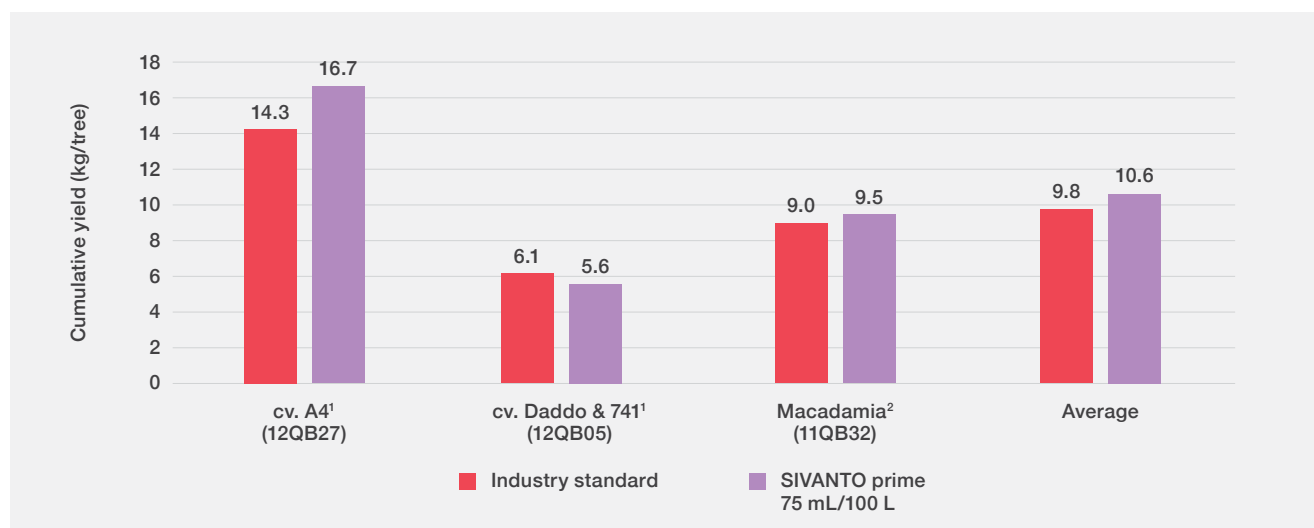


Figure 6. Cumulative yield (kg/tree) as nut in husk after four harvest rounds across three trial sites. Gympie, Qld. 12QB05 & 12QB27 & Amamoor, Qld. 11QB32. ¹Bulldock 50 mL/100 L or ²Lepidex 200 mL/100 L.

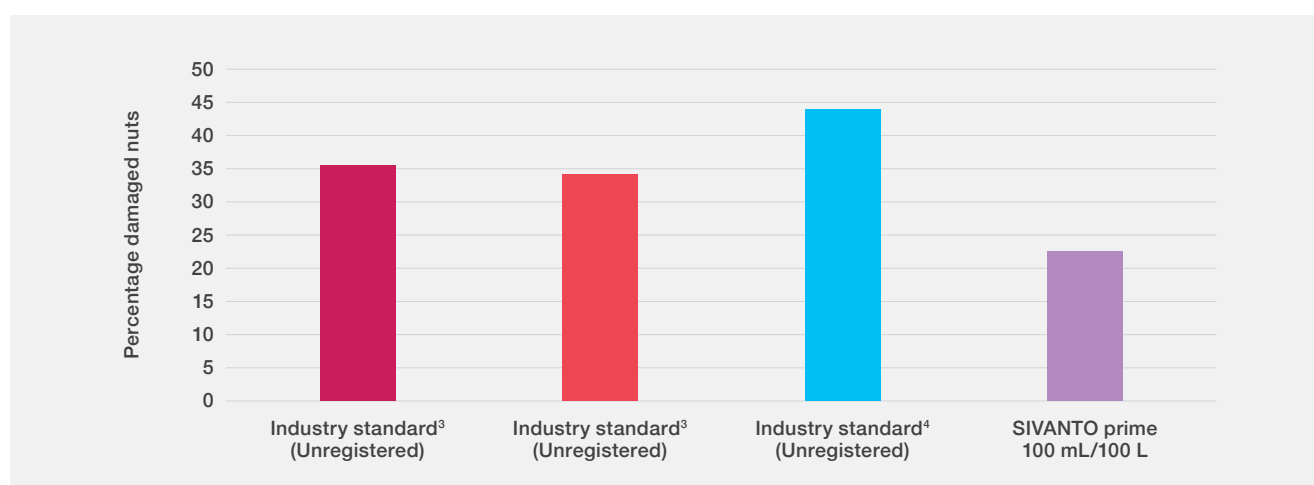


Figure 7. Percentage of scirtothrips damaged nuts⁵. Alstonville, NSW. Reference: NSW Department of Primary Industry, Centre for Tropical Horticulture, Alstonville NSW, 2020/2021. ^{3&4}Scirtothrips control or suppression is not registered on these Group 4³ and Group 3A⁴ product labels. ⁵Scirtothrips damage is counted as nut damage greater than 25% of the overall surface.



LACE BUGS

HOW DOES IT WORK?

SIVANTO prime provides rapid knockdown of both adult and nymph lace bugs from direct spray contact. It is highly systemic and provides residual control in flower racemes to prevent damage from later reinfestations.



Macadamia lace bug (*Ulonemia decoris* or *Ulonemia concave*)

HOW TO APPLY

Industry best practice is to start monitoring when the flower racemes are green and unopened and spray at no later than five percent open flower. Apply SIVANTO prime as a single application at 50 mL/100 L. It has low toxicity to Australian native stingless bees and European honeybees¹. It can be safely applied during flowering, however, under good agricultural practice, it is recommended not to apply SIVANTO prime or any other insecticides at times when bees are actively foraging. A maximum of one application is permitted over sprayed areas during a 12-month period.

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

HOW SAFE IS SIVANTO PRIME TO BENEFICIAL SPECIES?

Important beneficial species such as parasitoids, predatory mites, lacewings, hoverflies and ladybird beetles are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has shown to have minimal impact on many beneficial species, except for predatory bugs.

These beneficial species may not appear in high enough numbers to control a rapid increase in lace bug populations at flowering, but the long-term preservation is an essential part of an IPM program.



Ladybird beetle larvae (Coccinellidae)



Green lacewing (*Chrysoperla* spp.)

HOW DOES ITS PERFORMANCE COMPARE?

SIVANTO prime applied at 50 mL/100 L in macadamias trended towards a lower incidence of lace bug per raceme compared to the broad-spectrum insecticide diazinon in two small plot replicated trials in New South Wales (Figure 8). Across both trials, SIVANTO prime significantly reduced the incidence of macadamia lace bug compared to the untreated control.

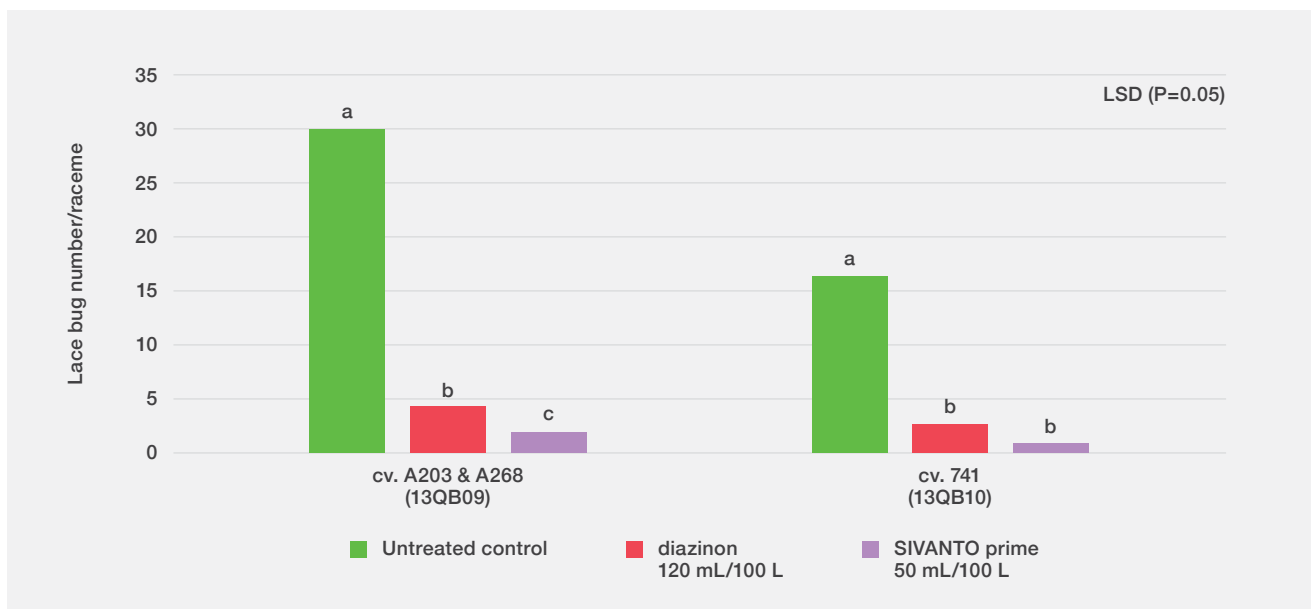


Figure 8. Lace bug number per raceme. Casino, NSW. 13QB09 & Lismore, NSW. 13QB10



Lace bug damage to macadamia raceme



PLANTHOPPERS

HOW DOES IT WORK?

SIVANTO prime provides knockdown and residual control of mango and green planthoppers. It is highly systemic and provides residual control preventing sap feeding and sooty mould development.

It also provides knockdown of juvenile and adult stages of fruit spotting bugs and banana spotting bugs.



Adult mango planthopper (*Colgaroides acuminata*)

HOW TO APPLY

Monitor mango orchards and apply SIVANTO prime at 75 mL/100 L when planthoppers are first detected. Where spotting bugs are also a problem, apply early in the spray program to avoid the population from building. Under high pest pressure or when increased residual control is desired, apply SIVANTO prime at 100 mL/100 L. It has the flexibility to be applied during flowering¹. Apply a maximum of two sprays in a 12-month period.

HOW SAFE IS SIVANTO PRIME TO BENEFICIAL SPECIES?

Important beneficial species such as parasitoids, predatory mites, lacewings, hoverflies and ladybird beetles are highly compatible with the use of SIVANTO prime. Applied under field conditions, it has shown to have minimal impact on most beneficial species except for predatory bugs.

In mangoes, SIVANTO prime is highly compatible with the commercial release of lacewings and does not harm parasitism.



Green lacewing (*Chrysoperla* spp.)

¹SIVANTO prime may cause short-term effects to bees - refer to label statement.

HOW DOES ITS PERFORMANCE COMPARE?

SIVANTO prime applied at 75 mL/100 L significantly reduced the incidence of mango planthoppers compared to the untreated at 15 DAD in a Queensland field trial (Figure 9).

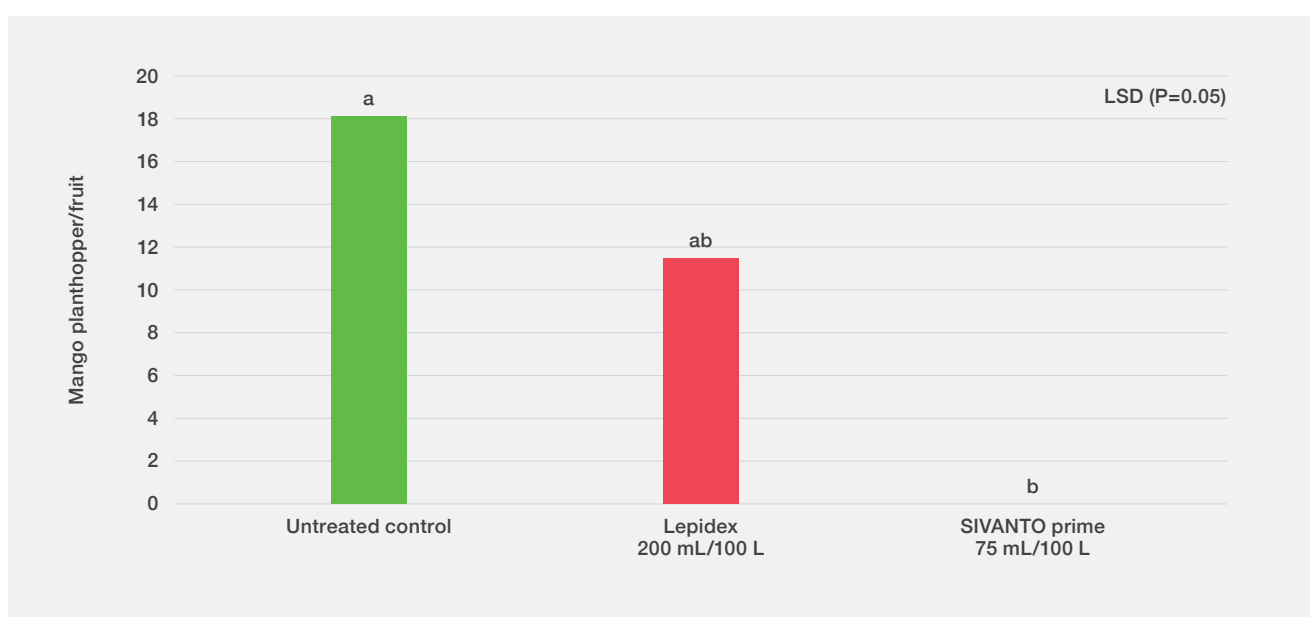


Figure 9. Mango planthopper per fruit at 15 DAD¹. Gin Gin, Qld. 12QF13. ¹Spray program not in line with label use, for demonstration purposes only.



Mango planthopper nymphs with remnant egg capsule

APPLICATION

PRODUCT VOLUME GUIDE AND CRITICAL COMMENTS

SIVANTO prime has labelled limits on the volume of product applied per application and per year, and/or the number of applications per year. Refer to this table:

- 1 Find the crop, target pest and rate
- 2 Find the water volume being applied per hectare
- 3 Note the amount of SIVANTO prime applied per application
- 4 Follow all additional critical comments

MACADAMIAS			
	PEST AND RATE		
	MACADAMIA LACE BUGS	SPOTTING BUGS	SPOTTING BUGS AND SCIRTOTHRIPS
Water volume (L/ha)	50 mL/100 L	75 mL/100 L	100 mL/100 L
800	400 mL/ha	600 mL/ha	800 mL/ha
900	450 mL/ha	675 mL/ha	900 mL/ha
1000	500 mL/ha	750 mL/ha	1000 mL/ha
1100	550 mL/ha	825 mL/ha	1100 mL/ha
1200	600 mL/ha	900 mL/ha	1200 mL/ha
1300	650 mL/ha	975 mL/ha	1300 mL/ha
1400	700 mL/ha	1050 mL/ha	1400 mL/ha
1500	750 mL/ha	1125 mL/ha	1500 mL/ha
1600	800 mL/ha	1200 mL/ha	1600 mL/ha
1700	850 mL/ha	1275 mL/ha	1700 mL/ha
1800	900 mL/ha	1350 mL/ha	1800 mL/ha
1900	950 mL/ha	1425 mL/ha	1900 mL/ha
2000	1000 mL/ha	1500 mL/ha	2000 mL/ha
	Maximum of 1 L/ha during flowering	Maximum of 2 L/ha per 12 months	

Maximum of 1 application per 12 months

AVOCADOS, MANGOES AND PAPAYA		
	PEST AND RATE	
	SPOTTING BUGS AND PLANTHOPPERS	
Water volume (L/ha)	75 mL/100 L	100 mL/100 L
360	270 mL/ha	360 mL/ha
400	300 mL/ha	400 mL/ha
500	375 mL/ha	500 mL/ha
600	450 mL/ha	600 mL/ha
700	525 mL/ha	700 mL/ha
800	600 mL/ha	800 mL/ha
900	675 mL/ha	900 mL/ha
1000	750 mL/ha	1000 mL/ha
1100	825 mL/ha	Maximum of 1 L/ha per application Papaya - minimum recommended water volume 360 L/ha
1200	900 mL/ha	
1300	975 mL/ha	

Maximum of 1 application during flowering. Maximum of 2 applications per 12 months.

SIVANTO PRIME LABEL

CROP	PEST	RATE	WITHHOLDING PERIOD	CRITICAL COMMENTS
Macadamias	Macadamia lace bug (<i>Ulonemia decoris</i> or <i>Ulonemia concave</i>)	50 mL/ 100 L	20 days (H*)	Apply a maximum of 1 application of SIVANTO prime to a macadamia block in a 12-month period. DO NOT exceed 1 L of SIVANTO prime per hectare per application for macadamia lace bug during flowering
	Banana spotting bug (<i>Amblypelta lutescens</i>) and fruit spotting bug (<i>Amblypelta nitida</i>)	75 or 100 mL/100 L		Apply a maximum of 1 application of SIVANTO prime to a macadamia block in a 12-month period. DO NOT exceed 2 L of SIVANTO prime per hectare per application for spotting bug or scirtothrips.
	Scirtothrips (<i>Scirtothrips dorsalis</i>) (suppression only)	100 mL/100 L		
Avocados, mangoes, papayas	Banana spotting bug (<i>Amblypelta lutescens</i>)	75 or 100 mL/100 L	Avocado 1 day (H) Mango, papaya 3 days (H)	Apply a maximum of 2 applications of SIVANTO prime to a block in a 12-month period. DO NOT exceed 1 L of SIVANTO prime per hectare per application. DO NOT apply more than one application during flowering. In papaya a minimum water volume of 360 L/ha is recommended. The use of an adjuvant is not recommended for tropical fruit crops.
	Fruit spotting bug (<i>Amblypelta nitida</i>)			
	Mango planthopper			
	Green planthopper			
Cucurbits, eggplant, peppers (capsicum and chili), tomatoes (includes protected cropping production systems)	Silverleaf whitefly (<i>Bemisia tabaci</i> Biotype B)	750 mL/ha OR Dilute spraying 75 mL/100 L	1 day (H)	Do not apply more than 2 applications of SIVANTO prime per hectare per year to the same cropping ground, including areas which have been double cropped. Do not re-apply within 7 days of a previous SIVANTO prime spray.
	Greenhouse whitefly (<i>Trialeurodes vaporariorum</i>)			
	Green peach aphid (<i>Myzus persicae</i>)			
	Cotton aphid (<i>Aphis gossypii</i>)			
Green beans, potatoes, sweet potatoes	Silverleaf whitefly (<i>Bemisia tabaci</i> Biotype B)	750 mL/ha	7 days (H)	Do not apply more than 2 applications of SIVANTO prime per hectare per year to the same cropping ground, including areas which have been double cropped. Do not re-apply within 7 days of a previous SIVANTO prime spray.
	Green peach aphid (<i>Myzus persicae</i>)			

This is a partial label extract only. Always consult the product label for detailed information.

H*: Harvest; G*: Grazing



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prime

For more information on SIVANTO prime, visit sivantoprime.com.au
or talk to your local Bayer Crop Science representative.

Always consult the product label for detailed information. The information and recommendations set out in this brochure are based on tests and data believed to be reliable at the time of publication. Results may vary, as the use and application of the products is beyond our control and may be subject to climatic, geographical or biological variables, and/ or developed resistance. Any product referred to in this brochure must be used strictly as directed, and in accordance with all instructions appearing on the label for that product and in other applicable reference material. So far as it is lawfully able to do so, Bayer CropScience Pty Ltd accepts no liability or responsibility for loss or damage arising from failure to follow such directions and instructions.

Bayer CropScience Pty Ltd ABN 87 000 226 022 Level 1, 8 Redfern Road, Hawthorn East, Victoria 3123.

Technical enquiries: 1800 804 479 enquiries.australia@bayer.com

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