Updated August 2018

# Skope®

## Technical Product Guide

ADAMA

Simply. Grow. Together.

# Introducing Skope®

SKOPE® is a unique new insecticide ideal for managing multi-pest scenarios in cotton crops. It combines two powerful active ingredients to provide effective and versatile control of key sucking and chewing pests while maintaining a good IPM fit.

## The impact of insect pests in cotton

Effective insect control in cotton crops remains a critical part of successful and profitable crop production. Yield losses and quality downgrades from insect pests can still be significant even with *Helicoverpa* resistant Bollgard* III cotton varieties which make up the majority of the Australian crop.

Sucking pests in particular are now a key focus for agronomists and growers. If not adequately controlled they can cause substantial damage to developing squares, flowers and bolls.

If not controlled, aphids and Silverleaf Whitefly can cause significant inconvenience late in the growing season and at picking, and can also cause quality downgrades at processing due to 'honeydew' contamination.

Adama encourages the implementation of Integrated Pest Management (IPM) systems which combine all available control methods for the sustainable long term management of insect pests in cotton.


*Skope® is available in 10 L packs from Adama Innovation Centres.*

# Skope® at a Glance

## Key Features

- Contains acetamiprid 218 g/L + emamectin 32.5 g/L
- Excellent fit for mid and late season applications where multiple pests are present
- Moderate impact on beneficials and will not flare mites and aphids
- Ability to control up to moderate infestations of Silverleaf Whitefly (SLW)
- Short 7 day withholding period prior to harvest for late season SLW and aphid control preventing honeydew
- SKOPE® has an excellent fit in both Bollgard* III and conventional cotton crops.

# Cotton

| | |
|---|---|
| Pest Spectrum | Silverleaf Whitefly Green Mirid, Green Vegetable Bug, Cotton Bollworm, Native Budworm and Cotton Aphid |
| Formulation Type | Dispersible concentrate (DC) |
| Product Rate/Range | 50 mL to 350 mL/ha depending on target pest and density<br>Refer to the directions of use on the label for specific pest recommendations |
| Water Rates | 80-100 L/ha by ground<br>20 L/ha + by air |

# Mode of Action

GROUP 4A | 6 INSECTICIDE

SKOPE® contains members of both the Mectin (Group 6) and the Neonicotinoid (Group 4A) insecticide groups.

Emamectin's mode of action is via activation of the chloride channel within the target insect's nervous system and is taken into the plant via translaminar movement.

Acetamiprid interferes with neurotransmission in target insects causing feeding to cease within hours or even minutes. Acetamiprid acts through both ingestion and direct contact with insects and displays some translaminar movement within plant tissue.

SKOPE® will stop target pests from feeding within hours of application and from this time on pests will not damage the crop even though affected pests may not appear to die for a few days.

| Parameter | Acetamiprid | Emamectin |
|---|---|---|
| Concentration (g/L) | 218 | 32.5 |
| Insecticide Group | 4A | 6 |
| MOA | Nicotinic acetylcholine agonist Nerve action | Chloride channel activator<br>Acts by causing insect paralysis |
| Translocation | Translaminar | Limited Translaminar |
| Pest action | Contact and stomach uptake | Majority of activity is via stomach ingestion with minor contact action |
| Speed of action | Rapid | Rapid |
| Residual activity | Up to 21 days | 4-7 days |

# Pests Controlled by Skope®

**Cotton Aphid**
*Aphis gossypii*

## Cotton Aphid – 50 to 100 mL/ha

- Cotton Aphid is the most common pest in cotton crops
- Nymphs and wingless adults feed on the underside of leaves, in terminals, young stems and squares
- Cotton Aphid has also been shown to be a vector for Cotton Bunchy Top disease
- Cotton Aphid can also cause quality downgrades and picking and ginning difficulties through their secretions of a sugary 'honeydew' onto the lint

**Green Vegetable Bug**
*Nezara viridula*

## Green Vegetable Bug (GVB)– 300 to 350 mL/ha

- Nymphs and adults can both cause very similar damage to that caused by Green Mirid
- Affected bolls can suffer significant damage resulting in incomplete development, stained lint and reduced yield. Initial signs of damage appears as dull to shiny black spots
- Bolls more than 25 days old are generally immune to damage from GVB.

**Silverleaf Whitefly**
*Bemisia tabaci*

## Silverleaf Whitefly (SLW) – 300 to 350 mL/ha

- SLW is a significant pest of cotton having increased in prevalence in recent years
- SLW adults and nymphs primarily damage cotton through their secretion of honeydew resulting in contamination of lint
- SLW contamination of lint is considered worse than that of Cotton Aphid due to the type of sugar found in SLW honeydew having a lower melting point and causing more processing issues.

**Green Mirid**
*Creontiades dilutus*

## Green Mirid – 175 to 350 mL/ha

- Green Mirids are an important pest which cause significant damage to cotton at the squaring and boll development stage
- Adults and nymphs cause early season damage to terminals and mid-season damage to squares and small bolls
- Damage symptoms include blackening and death of terminals and square loss
- Older bolls are generally immune to damage from Green Mirid.

**Cotton Bollworm**
*Helicoverpa armigera*

## Cotton Bollworm – 300 to 350 mL/ha

- Cotton Bollworm larvae can attack all stages of cotton plant growth in conventional cotton, while in Bollgard* III cotton damage is often confined to developing fruit
- According to Cotton Pest Management Guide 2016-17, "in any year an average of 15 % of Bollgard* cotton area may carry *Helicoverpa* larvae at or above the recommended threshold levels for a short period during peak to late flower."

**Native Budworm**
*Helicoverpa punctigera*

## Native Budworm – 300 to 350 mL/ha

- Similar to Cotton Bollworm, Native Budworm larvae can attack all stages of cotton plant growth in conventional cotton while in Bollgard* III cotton damage is similarly confined to developing fruit
- Thresholds and potential to damage Bollgard* III cotton is again very similar to Cotton Bollworm and Adama recommends consulting the Cotton Pest Management Guide 2016-17 or the Monsanto Bollgard* III Technical Manual for detailed threshold information on both Cotton Bollworm and Native Budworm.

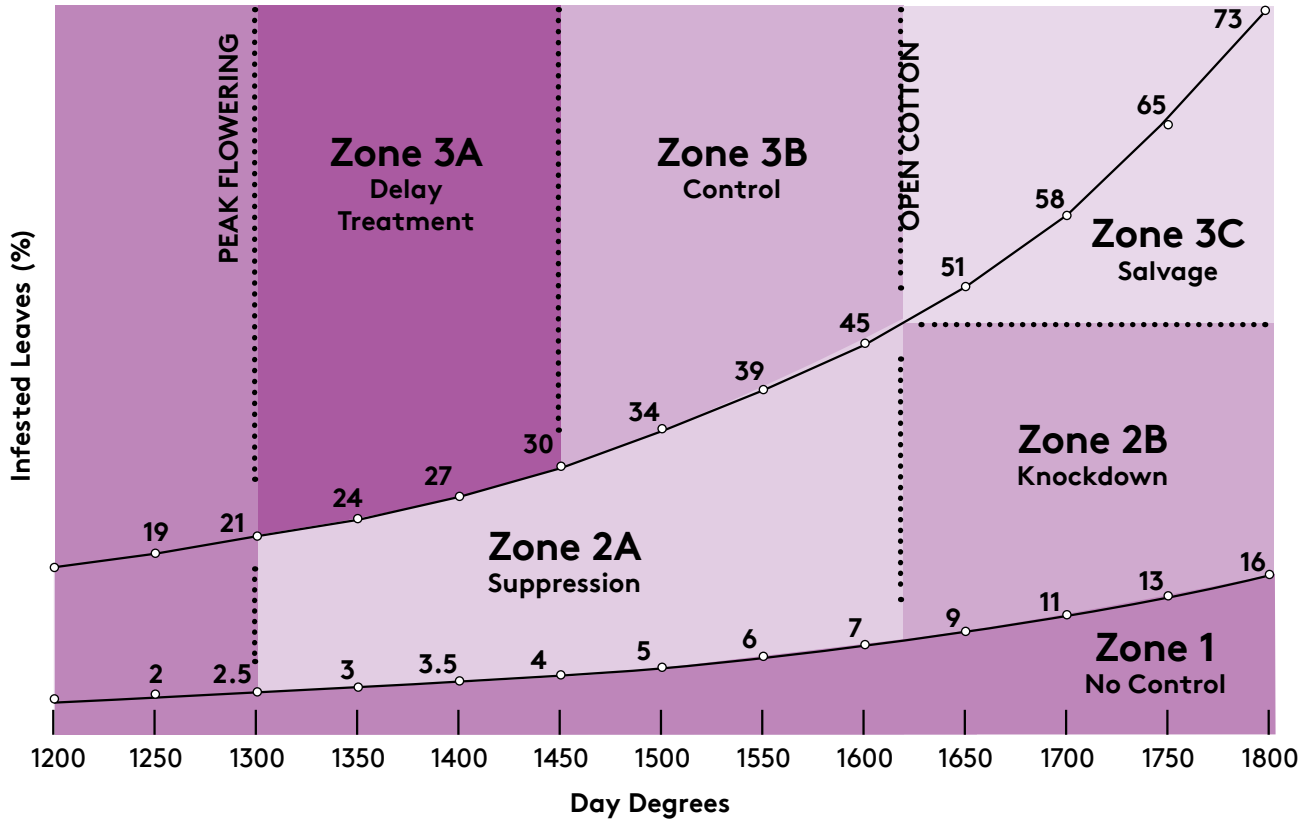
# Use Recommendations

## Silverleaf Whitefly and Green Mirid - 175 or 350 mL/ha

SKOPE® has activity primarily on whitefly nymphs. Apply SKOPE® when whitefly first appear and prior to heavy populations becoming established in the crop. Only use the 175 mL/ha rate where targeting low SLW numbers and where SLW are not the primary target. Apply SKOPE® with Hasten* at 1 L/ha when Silverleaf Whitefly is the primary target.

When targeting SLW Adama recommends following the threshold matrix as outlined in the CRDC/CottonInfo Pest Management Guide.

## SLW Threshold Matrix




### CRDC/CottonInfo Pest Management Guide 2016/17 SLW Threshold Matrix

SKOPE® should ideally be used only in Zone 2A or 2B of the matrix. Where populations fall within Zone 3A, 3B or 3C, a specialist SLW product like pyriproxyfen (Lascar®) should be used.

Refer to the latest Pest Management Guide for recommended Green Mirid thresholds.

### Green Vegetable Bug - 300 or 350 mL/ha

Apply SKOPE® when insect numbers reach action thresholds. Use the higher rate on heavier populations and for faster knockdown. Apply with a non-ionic surfactant at the recommended label rate or an organosilicone adjuvant such as Pulse* Penetrant 0.2 % v/v.

When targeting Green Vegetable Bug, Adama recommends referring to the thresholds as outlined in the CRDC/CottonInfo Pest Management Guide but presence and population density of other pests will also need to be considered in the decision to spray.

# Green Vegetable Bug Thresholds

| Sampling Method | Flowering to First open boll | First open boll to Harvest |
|---|---|---|
| Visual | 0.5 adults/m | 0.5 adults/m |
| Beat Sheet | 1.0 adults/m | 1.0 adults/m |
| Damage to small bolls (14 days old) | 20 % | 20 % |

CRDC/CottonInfo Pest Management Guide 2016/17 GVB Threshold Matrix.

## Cotton Bollworm and Native Budworm - 300 or 350 mL/ha

Best results will be achieved on Cotton Bollworm and Native Budworm where larvae are targeted at the 'very small to small' stage (5 mm or less). Apply with a non-ionic surfactant at the recommended label rate or an organosilicone adjuvant such as Pulse* Penetrant 0.2 % v/v.

Refer to the latest CRDC/CottonInfo Pest Management Guide and Monsanto Bollgard* III Technical Manual for recommended *Helicoverpa* thresholds in Bollgard* III cotton crops.

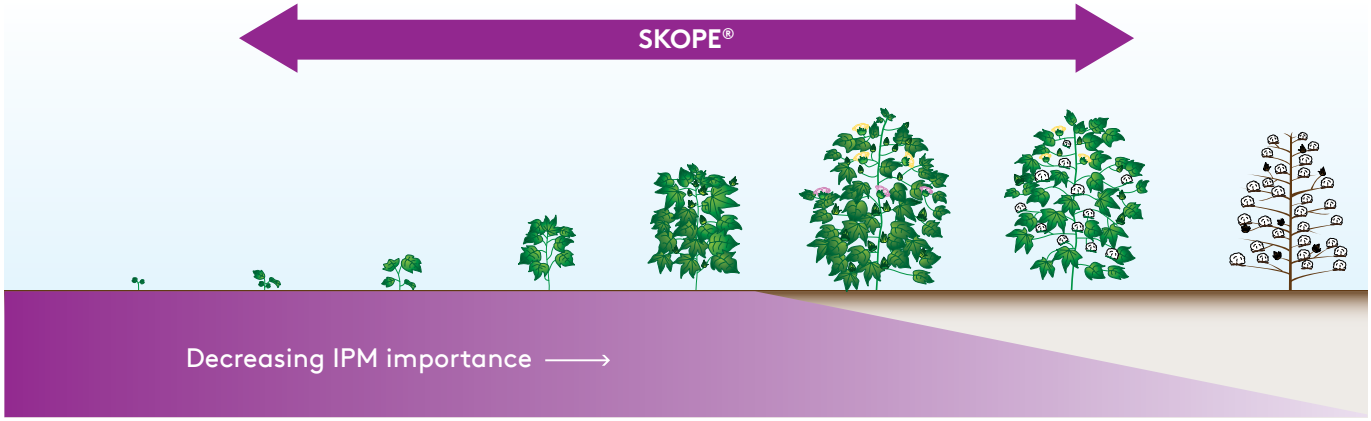
## Cotton Aphid - 50 or 100 mL/ha

Use the higher rate under sustained heavy aphid pressure. If repeat applications are required, alternate with products from a different insecticide group. DO NOT apply more than 2 sprays per season for Cotton Aphid control. Apply with an organosilicone adjuvant such as Pulse* Penetrant at 0.2 % v/v. Refer to the latest Cotton Pest Management Guide for recommended Cotton Aphid thresholds.

# Crop Application Timing

SKOPE® has a flexible application window allowing application early to late within a crop depending upon the need.

SKOPE® is the ideal choice where mixed pest species are present mid-late season and where moderate IPM fit is acceptable.




With a moderate effect on beneficial insects and with no mite or aphid flaring, SKOPE® has a good IPM fit. With an interim TIMS (Transgenic and Insect Management Strategies) committee recommendation for use across all 4 IRMS (Insecticide Resistance Management Strategy) stages, SKOPE® has a flexible use window.

# Spray Application Recommendations

## Ground Application Spraying:

Ensure thorough coverage of foliage. Apply in a spray volume of 80-100 L/ha.

## Aerial application:

Ensure thorough coverage of foliage. Apply using a minimum 20 L/ha spray volume.

*Mandatory no-spray zones apply to SKOPE®. Refer to the label for detailed guidelines.*

## Rainfast:

SKOPE® is rainfast once spray deposit is dry on the leaf surface.

## Restraints:

DO NOT HARVEST FOR 7 DAYS AFTER APPLICATION

The short 7 day prior to harvest withholding period for SKOPE® makes it the ideal choice for late season aphid and SLW clean up to reduce honeydew contamination of lint and quality downgrades.

Sticky cotton from SLW and aphid honeydew can cause difficulty at picking, blockages at gins and price downgrades.

# Resistance Management

SKOPE® contains members of both the mectin (Group 6) and the neonicotinoid (Group 4A) insecticide groups. Robust rates and multiple groups of insecticides are always important for preventing the development of resistance and to preserve useful chemistry into the future.

Whilst the TIMS (Transgenic and Insect Management Strategies) committee has not yet placed SKOPE® into the industry IRMS (Insecticide Resistance Management Strategy), SKOPE® use in the interim should adhere as closely as possible to the guidelines set out in the IRMS for the individual Group 6 and 4A insecticides.

Current guidelines allow Group 6 and 4A insecticides to be used in all 4 stages of the IRMS. The IRMS also allows a maximum of 2 consecutive Group 6 mectins to be used in any cotton crop and dictates that neonicotinoid containing products should ideally not follow a neonicotinoid seed treatment if aphids are present. The latest cotton industry IRMS documents can be found at www.CottonInfo.com.au/publication

Adama also encourage the responsible use of insecticides as outlined in the CropLife Insecticide Resistance Management Guidelines. CropLife guidelines can be found by visiting www.croplifeaustralia.org.au

# Trial Results

## Mean Number of Large Silverleaf Whitefly Nymphs per leaf, NARRABRI, NSW, 14 DAA, 2014

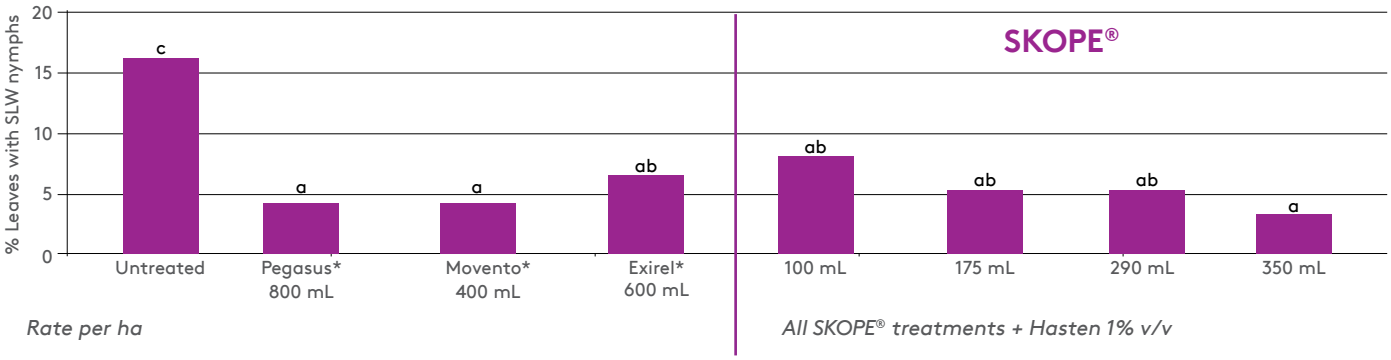



**Chart 1.**

Means followed by same letter do not significantly differ (P = 0.05)
Eurofins Agrisearch: FARMOZ/13/16-3
This trial shows that SKOPE® provides statistically equivalent control of Silverleaf Whitefly to industry standards such as Pegasus*, Movento* and Exirel* although an obvious trend is evident towards the higher rates providing more robust control

## Mean adult Green Mirid density, BROOKSTEAD, QLD, 3 DAA, 2014

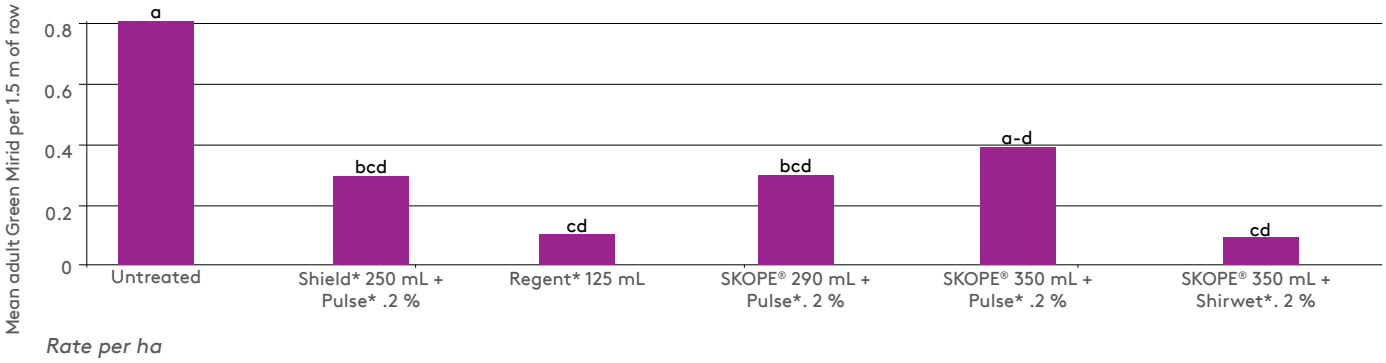



**Chart 2.**

Means followed by same letter do not significantly differ (P = 0.05)
Peracto: FAR13350#1
This trial shows that SKOPE® at all rates plus Pulse* or Shirwet* were equivalent to Shield* and Regent* for adult Green Mirid control.

## Mean Number of Adult Green Vegetable Bug per metre of row, MOREE, NSW, 2015

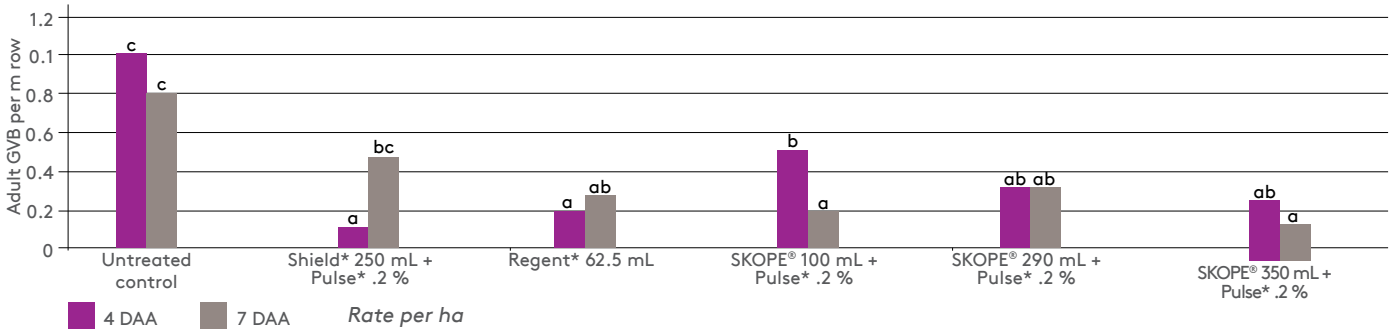
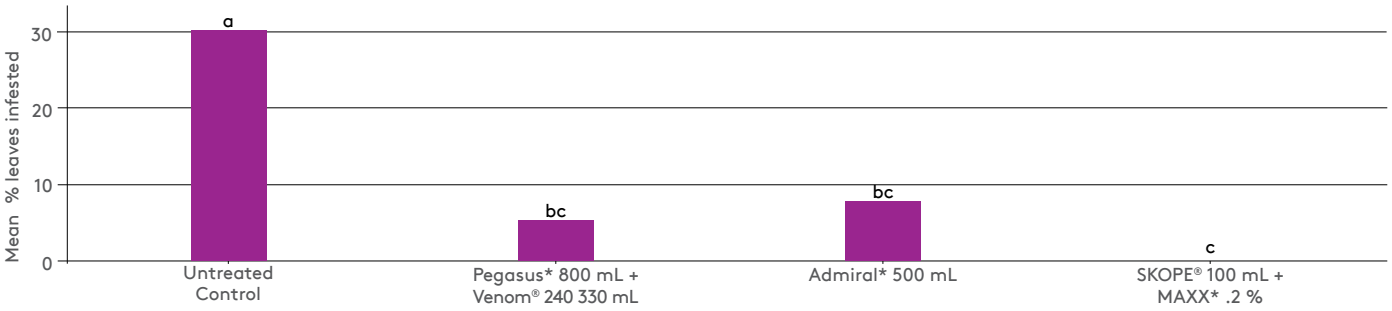



**Chart 3.**

Means followed by same letter do not significantly differ (P = 0.05)
Living Farm: ADAMA/15/03-150280
This trial shows that SKOPE® achieved equivalent control of the Green Vegetable Bug population compared to that provided by the market standard for this pest - Regent*.
All SKOPE® treatments gave better control than Shield* after 7 days.

## Mean incidence of Cotton Aphid on cotton leaves, BUNDABERG, QLD, 7 DAA, 2015

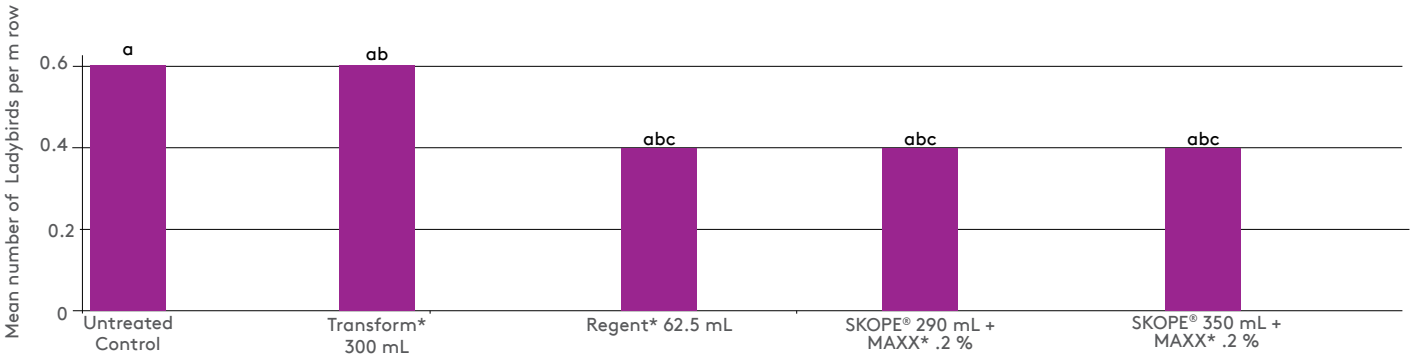



*Rate per ha*

**Chart 4.**

Means followed by same letter do not significantly differ (P = 0.05)
Peracto: FAR13358#1
This trial at Bundaberg in Qld demonstrates that acetamiprid is highly active on aphid species. This is evident where the 100 mL rate has given outstanding knockdown after 7 days. This excellent level of activity allows SKOPE® to have a very low registered rate range on Cotton Aphid of 50 to 100 mL/ha. Whilst not a traditional cotton growing region the trial was located at Bundaberg for its reliably high pressure of sucking pests such as SLW and Cotton Aphid.

## Mean Number of Ladybirds per metre, MOREE, NSW, 7 DAA, 2014




*Rate per ha*

**Chart 5.**

Means followed by same letter do not significantly differ (P = 0.05)
Eurofins Agrisearch: FARMOZ/13/49-1
This trial at Moree in 2014 shows that SKOPE® at the second highest and highest registered rates was statistically no different to the Untreated Control, Transform* or Regent* with respect to its ability to preserve ladybird populations.

# Trial Results Summary

The trial results outlined here, combined with the many other trials undertaken over recent years, demonstrate that SKOPE® provides robust control of the key cotton pests in most cases at least equal to the current market standards for each pest. Also highlighted is SKOPE®'s ability to fit into IPM programs by allowing populations of beneficial insects such as ladybirds to be maintained as highlighted in Chart 5 above.



Transverse Ladybird *(Coccinella transversalis)* adult and larvae.

* Registered Trademark

# Skope® Compatibility Summary

SKOPE® is compatible with a range of products and has been extensively tested. The table below summarises the compatibility testing undertaken with SKOPE®. Always read the label and the critical comments before using.

## Herbicide Mixing Partners and Salt

| Product and maximum rate tested | Formulation | Active Constituents | Company | Physically Compatible Yes/No | Mix partner adjuvant recommendation | Comments |
|---|---|---|---|---|---|---|
| Firepower® 150 mL/ha | EC | 520 g/L haloxyfop | Adama | Yes – at ≥ 30 L/ha | Uptake* 0.5 % | Compatible. |
| Platinum® 500 mL/ha | EC | 240 g/L clethodim | Adama | Yes – at ≥ 30 L/ha | Hasten* 1 % | Compatible. |
| Roundup* Ready Herbicide with PLANTSHIELD* 1.5 kg/ha | WG | 690 g/kg glyphosate | Sinochem | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |
| Salt 10 g per L of spray volume | Coarse Refined Salt | 100 % NaCl | Cheetham | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |
| Shogun® 900 mL/ha | EC | 100 g/L propaquizafop | Adama | Yes – at ≥ 30 L/ha | Hasten* 0.5 % | Compatible. Use Hasten* at 1 L/ha where targeting SLW |

## Defoliants and Plant Growth Regulators

| Product and maximum rate tested | Formulation | Active Constituents | Company | Physically Compatible Yes/No | Mix partner adjuvant recommendation | Comments |
|---|---|---|---|---|---|---|
| Escalate® 200 mL/ha | SC | 500 g/L thidiazuron | Adama | Yes – at ≥ 80 L/ha No – at 30 L/ha | Hasten* 0.5 % | Compatible at 80 L/ha or more of water. Testing showed this mix was incompatible at 30 L/ha of water. Use Hasten* at 1 L/ha when targeting SLW |
| Escalate® UltraMax 200 mL/ha | SC | 240 g/L thidiazuron + 120 g/L diuron | Adama | Yes – at ≥ 80 L/ha No – at 30 L/ha | Hasten* 0.5 % | Compatible at 80 L/ha or more of water. Testing showed this mix was incompatible at 30 L/ha of water. Use Hasten* at 1 L/ha when targeting SLW |
| Prep* 720 3 L/ha | SL | 720 g/L ethephon | Cotton Grower Services | Yes – at ≥ 30 L/ha | Wetspray* 1000 0.2 % | Compatible. Use Hasten* at 1 L/ha when targeting SLW |
| Promote® Plus 900 2.4 L/ha | SL | 900 g/L ethephon | Adama | Yes – at ≥ 30 L/ha | Wetspray* 1000 0.2 % | Compatible. Use Hasten* at 1 L/ha when targeting SLW |
| Reward® 2 L/ha | SL | 38 g/L mepiquat chloride | Adama | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |

## Foliar Fertilisers

| Product and maximum rate tested | Formulation | Active Constituents | Company | Physically Compatible Yes/No | Mix partner adjuvant recommendation | Comments |
|---|---|---|---|---|---|---|
| K-Nite* 30 L/ha | SL | 4 % nitrogen + 12 % potassium as liquid potassium nitrate | Yara | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |
| N42 30 L/ha | SL | 42 % nitrogen as liquid urea, ammonium and nitrate | Yara | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |
| Ranger* 40 L/ha | SL | 24 % nitrogen as a liquid urea formulation | Yara | Yes – at ≥ 80 L/ha No – at 40 L/ha | Not required | Compatible at 80 L/ha or more of water. Incompatible when mixed at 40 L/ha without water. Follow SKOPE® adjuvant recommendations. |
| Glytrel* ZnP 3 L/ha | SL | 10 % zinc + 4 % phosphorus | Yara | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |
| Impact* 15 L/ha | SL | 27.9 % potassium + 12.6 % phosphorus | Yara | Yes – at ≥ 30 L/ha | Not required | Compatible. Follow SKOPE® adjuvant recommendations |

# Adjuvants and Oils

| Product and maximum rate tested | Formulation | Active Constituents | Company | Compatibility | Recommended with SKOPE® |
|---|---|---|---|---|---|
| Agral* 0.2 % v/v | SL | 600 g/L nonyl phenol ethylene oxide condensate non-ionic organic surfactant | Syngenta | Yes – at ≥ 80 L/ha | When targeting GVBß and Helicoverpa spp. |
| BIOPEST* 5 % v/v | EO | 815 g/L emulsifiable paraffinic oil | SACOA | Yes – at ≥ 80 L/ha | Refer Biopest* label |
| BS1000* 0.25 % v/v | SL | 1000 g/L non-ionic surfactant | Crop Care | Yes – at ≥ 80 L/ha | When targeting GVBß and Helicoverpa spp. |
| Canopy* Spray Oil 1 % v/v | EO | 792 g/L paraffinic oil | FMC | Yes – at ≥ 80 L/ha | Refer Canopy* label |
| Hasten* Spray Oil 1 L/ha | EO | 704 g/L ethyl & methyl esters of vegetable oil + 196 g/L non-ionic surfactant | Victorian Chemicals | Yes – at ≥ 80 L/ha | When targeting SLWð |
| MAXX* Organosilicone Surfactant 0.2 % v/v | SL | 1020 g/L polyether modified polysiloxane | Sumitomo | Yes – at ≥ 80 L/ha | When targeting Cotton Aphid |
| Pulse* Organosilicone Surfactant 0.2 % v/v | SL | 1000 g/L organomodified polydimethyl siloxane | Nufarm | Yes – at ≥ 80 L/ha | When targeting Cotton Aphid |
| Shirwet* 0.25 % v/v | SL | 600 g/L non-ionic organic surfactant | Crop Care | Yes – at ≥ 80 L/ha | When targeting GVBß and Helicoverpa spp. |
| Wetspray® 1000 0.2 % v/v | SL | 1000 g/L alcohol alkoxylates | Adama | Yes – at ≥ 80 L/ha | When targeting GVBß and Helicoverpa spp. |

ß Green Vegetable Bug ð Silverleaf Whitefly

## Compatibility Notes:

- Most compatibility tests were conducted with SKOPE® at 350 mL/ha, the highest label rate. Mixing issues if they occur are likely to be reduced at lower rates
- All physical compatibility tests were conducted with the addition of Hasten* at 1 L/ha equivalent
- For all mixtures consider and observe the label requirements of the mixing partner, including recommended crop stage and spray volumes etc
- The physical compatibility test conducted in the laboratory was a more complete test than that conducted in field tests
- SKOPE® requires the addition of adjuvant for best results. Please refer to the product label for full adjuvant recommendation by pest species
- Compatibility is limited to those specific products and product manufacturers listed unless an alternative product is clearly an equivalent formulation
- Products containing varying concentrations of active constituents to those listed may not be compatible with SKOPE®
- Adverse environmental conditions such as heat stress, drought, nutrient deficiency, or anything else that can stress the crop can compound adverse effects to the crop and should be avoided when tank mixing SKOPE®.

*Registered Trademark

# Frequently Asked Questions

**If I am only targeting Green Mirid should I use SKOPE® or continue to use Albatross®/Regent* like I always have?**

Trial results indicate the registered rate range of SKOPE® (300 - 350 mL/ha) will give equivalent control of Green Mirid vs Albatross at the 125 mL rate and improved control vs the 62.5 mL rate.

Whilst Green Mirid may be the primary target, other pests will often be present such as aphids, GVB and SLW. SKOPE® may cost a little more per hectare than fipronil but it represents excellent value for money along with the peace of mind that all key pests are being controlled.

Controlling SLW mid-season with SKOPE® when targeting other pests like Green Mirid will often prevent the need to apply a much more expensive Lascar®/Admiral* later in the season.

**I have heard that high rates of acetamiprid as found in SKOPE® are not as effective on SLW as products like Lascar®/Admiral* or even Receptor®/Pegasus*. Will SKOPE® be effective enough?**

Whilst trial results show that under higher SLW pressure Lascar®/Admiral* is still the most robust option, SKOPE® has proven in trials to offer excellent control when it is targeted against low to moderate level infestations.

Primary activity is on SLW nymphs and in trials, control levels have been equal to or better than solo applications of Receptor®/Pegasus*. Adama recommends using SKOPE® on SLW mid-season before populations reach high levels and where other pests such as Green Mirid, Green Vegetable Bug, *Helicoverpa* spp and aphids are being targeted. This should avoid the need for a more expensive pyriproxyfen application later in the season.

**Given the mix of active ingredients in SKOPE® and the rates involved, I would expect this product to be quite hard on beneficials, is this correct?**

In field trials SKOPE® wasn't as severe as expected and deserves a moderate impact rating based on its effect mainly on ladybirds, spiders, bees and *Eretmocerus* parasitoid. SKOPE® has also not flared any pest species in any trial over more than 5 years of development work and in some ways can be looked upon as an endosulfan replacement, but with the added benefit of SLW control. SKOPE® and endosulfan have a similar IPM profile with a moderate impact. Endosulfan was widely used in GM cotton prior to being removed as an option and SKOPE® is well positioned to fill a similar role.

**In seasons when aphids become a problem in cotton, they can be neonicotinoid resistant, i.e. resistant to the chemical group that acetamiprid belongs to. Will SKOPE® still work?**

Resistance is more of an issue with the weaker neonicotinoids on cotton aphid i.e. clothianidin. Adama has never seen a field failure with acetamiprid on cotton aphid in the 5+ years we have worked with this active. Neonicotinoid resistance isn't a stable trait in cotton aphid populations and has declined in recent years, probably due in part to the declining use of this group for foliar control.

## Features

- Unique combination of two highly effective active ingredients
- Wide pest spectrum covering sucking and chewing pests
- Only moderate impact on beneficial species and will not flare aphids and mites
- Controls hard to kill pests including Silverleaf Whitefly and Green Vegetable Bug
- Short harvest withholding period.

## Benefits

- Key Resistance Management tool that will assist in sustainable production
- Peace of mind that damage to fruit will be prevented maximising quality and yield potential
- Minimal disruption to beneficial insect populations allowing fit in IPM systems
- Confidence that your crop is protected
- Use right up until picking to reduce honeydew contamination and lint downgrades.

# Skope®

## Cotton Insecticide - Beneficial Insect Profile

### Skope is a new broad-spectrum cotton insecticide with a wide window of application and moderate impact on beneficials.

The impact on beneficial insects is of major importance in modern cotton production. This has a large bearing on the timing and which crop protection products are used. Skope is registered for control of bollworms, mirids, aphids, silverleaf white fly and green vegetable bug.

Skope® was launched during the 2016 cotton season. Commercial experience has shown that Skope® provides excellent value for money in both conventional and GM cotton, controlling a wider spectrum of pests than any other registered insecticide.

ADAMA has invested significant resources to broaden the information available on the impact of Skope® on the main beneficial arthropods in cotton. Studies have included comparisons with many commonly used products.

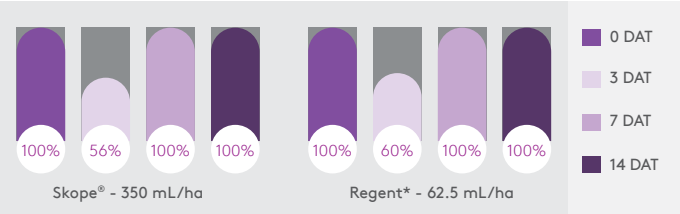
### **Lady Beetles** (*Coccinella* spp.)

**Transverse Ladybird** *(Coccinella transversalis)* **adult and larvae**

Predacious lady beetles such as the Transverse Ladybird *(Coccinella transversalis)* are important predators of aphids, mealy bug, spider mites, silverleaf white fly and thrips.

In the following graph, Skope® applied at the highest rate (350 mL/ha) resulted in a slight reduction in Lady beetle numbers when assessed 3 days after treatment (DAT), similar to Regent. However, at 7 and 14 DAT assessments, Lady beetle numbers recovered to pre-treatment levels. These results represent an average of 5 small plot trials and suggest that Skope® has a low impact on lady beetle numbers when applied up to the highest registered rate.

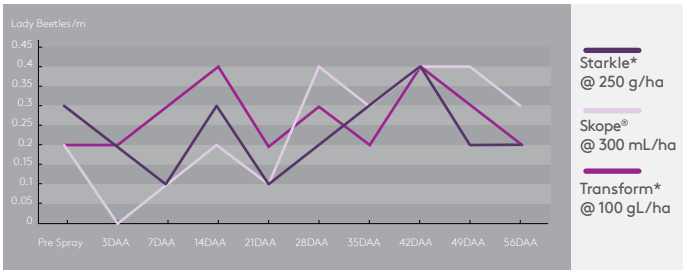
Lady Beetle % Remaining Post Application




Regent* at 62.5 mL/ha – Classified as Low Impact on Lady Beetles

The results of a large-scale in-field evaluation near Griffith in 2017/18 (below) again show that Lady beetle numbers were impacted for 3 days after treatment but recovered to or exceeded pre-treatment levels in the weeks following application, similar to Transform* and Starkle* in adjacent fields.

Lady Beetles at Griffith site from Skope® Commercial Practice May 2018

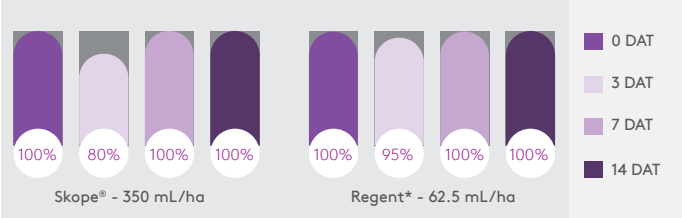



Transform* 100 g/ha – Very Low Impact

### Red and Blue Beetle

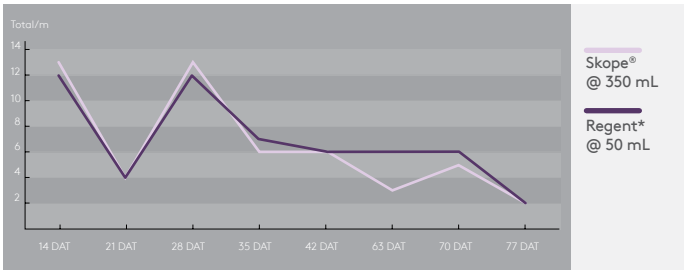
Red and Blue beetles feed on bollworm larvae, aphids and silverleaf white fly. The following graph shows red and blue beetles were only slightly affected by Skope® at 350 mL/ha 3 DAT and rebounded to pre-treatment levels thereafter. These results represent an average of 5 small plot trials and suggest that Skope® has a low impact on Red and Blue beetle numbers when applied up to the highest registered rate, similar to Regent when applied at 62.5 mL/ha.

## Red and Blue % Remaining Post Application




The results of a large-scale commercial evaluation near Narromine in 2017/18 are shown in the graph below. Red and Blue beetle numbers were in good numbers at this site and followed numbers in an adjacent field treated with Regent* over 11 weeks post-application.

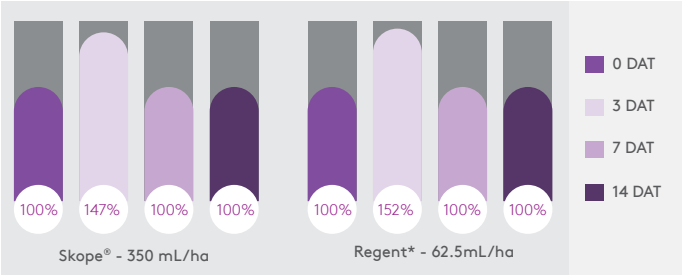
## Skope® efficacy - Red and Blue Beetle




## Spiders

Spiders are important predators in cotton and are known to feed on bollworm larvae, spider mites, silverleaf white fly, green mirids and jassids. The following graph shows that Skope® at 350 mL/ha had minimal impact on the spider population. These results represent an average of 5 small plot trials and suggest that Skope® has a low impact on spider numbers when applied up to the highest registered rate, similar to Regent when applied at 62.5 mL/ha.

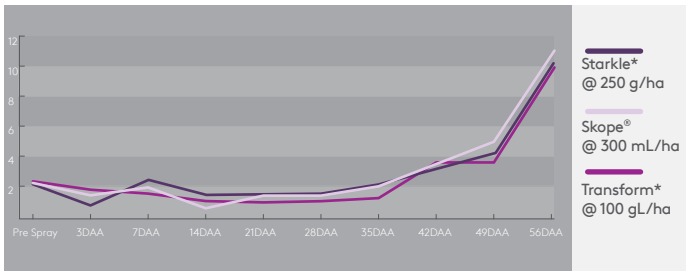
## Spiders % Remaining Post Application




Regent* at 62.5 mL/ha – Classified as Moderate Impact on Spiders

In the large-scale evaluation near Griffith in 2017/18 (following graph), spider numbers remained steady for 5 weeks following treatment before rising steadily to 8 weeks, when monitoring was completed. These results were similar to those in adjacent fields treated with Starkle* or Transform*, which is recognized as having a very low impact on spiders.

## Skope® Efficacy - Spiders



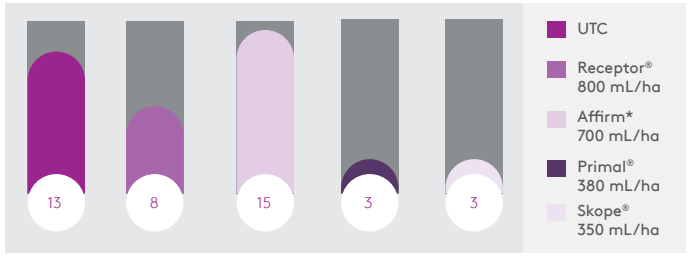

Transform* 100 g/ha – Very Low Impact

## Parasitoid wasps *(Encarsia* sp. and other micro Hymenoptera)

Parasitic wasps are important beneficial insects in cotton. Early in the season, parasitic wasps such as *Encarsia* sp. and *Eretmocerus* sp., can provide significant assistance in managing the pre-adult stages of silverleaf white fly.

Skope® was evaluated on Silverleaf white fly parasitism by *Encarsia* sp. in cotton at Bundaberg (below). While the results do show a negative effect on the number of silverleaf white fly pupae parasitised by *Encarsia* sp., they do not reflect to overall number of pupae present. Hence, these results must be considered together with the superior control that Skope® exerts on silverleaf white fly when applied at an early stage of infestation. If the pupae aren't there, they cannot be parasitised.

## No. of Parasitized SLWF pupae per 100 leaves 21 DAA




Trial No. FZ-14-I04-8a Bundaberg, Qld

### Overall Impact of Skope® on Beneficials in Cotton

- Skope® at the highest registered rate has a Moderate impact on beneficials
- Low impact on insects such as lady beetles, predatory beetles and spiders to high impact on some parasitic wasps based on research
- Comparable impact to low rate of Regent
- Recovery of beneficials, 3 days after application in most cases
- Skope® reduces pest resurgence or flaring due to control or suppression of silverleaf white fly, mites and aphids.

# Summary

- Excellent fit where multiple pests are present
- Moderate impact on beneficial species and will not flare mites and aphids
- Ability to control up to moderate infestations of Silverleaf Whitefly
- Short 7 day withholding prior to harvest for late season whitefly and aphid control to prevent honeydew
- SKOPE® has an excellent fit in both Bollgard* III and conventional cotton crops.

Innovation Centre

Scan here for all the latest information and resources for SKOPE®

Skope

For Technical Assistance:
**1800 327 669**

For more information visit
**adama.com**

For Customer Enquiries:
**1800 4 ADAMA**

SKOPE® is available through Adama Innovation Centre retailers.