



***Flush insect pests from
your crop... Naturally***



TECHNICAL MANUAL



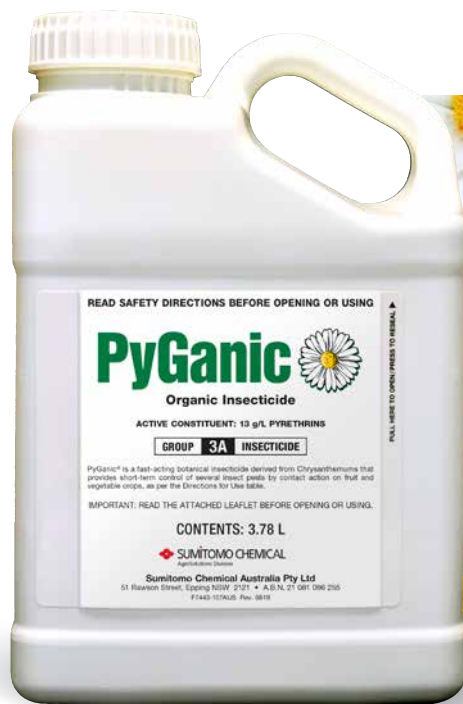
Overview

PyGanic® from Sumitomo Chemical is a fast-acting botanical insecticide derived from Chrysanthemums, providing short-term control of a range of insect pests across a wide variety of crops.

Due to its naturally derived active ingredient PyGanic has a high safety profile for field workers, a low impact on the environment and a high impact on pests.

Key features of PyGanic

- Includes 13 g/L of natural pyrethrins.
- Group 3A insecticide.
- Zero days withholding on many crops – 1 day withholding on others.
- Broad label with wide range of approved uses.
- Low user toxicity.
- Low environmental persistence and totally biodegradable.
- Flushing effect, resulting in cleaner produce.
- Australian certified organic status.



PyGanic is based on naturally grown pyrethrins extracted from Chrysanthemums

PyGanic is available in convenient 1 L and 3.78 L packs

How PyGanic works

The active ingredient in PyGanic is made up of six esters known as Cinerin 1, Cinerin 2, Jasmolin 1, Jasmolin 2, Pyrethrin 1 and Pyrethrin 2, collectively known as Pyrethrum.

Pyrethrum acts primarily by contact and affects the central and peripheral nervous systems by interfering with sodium channel gating causing paralysis and ultimately death in the target insects.

Sodium channels are responsible for nerve signal transmission and when pyrethrum binds it causes hyper excitation of nerve cells, erratic and increased movement by insects – like touching an electric fence.

Called ‘flushing’ – PyGanic exposure leads insects to move excitedly, usually leaving the crop prior to death.

Over dosing may cause death in crop (reducing the flushing affect).

Control of labelled pests will only last approximately 24 hours.



PyGanic's flushing ability combined with its short residual action makes it the ideal option as a cleanup spray in crops like lettuce

Crop and pest use summary

STANDARD USES

Crop	Pests	Rate
Avocados	Greenhouse thrips	200 mL/100 L
Citrus		150 mL/100 L
Kiwifruit	Passion vine hopper	200 mL/100 L
Macadamia nuts	Macadamia lace bug	200 mL/100 L [^]
Flowerhead brassicas	Diamondback moth	2.4 L/ha
Lettuce	Pea aphids	
Tomato	Beet armyworm and potato aphids	

[^] Apply to point of run off to a maximum of 4 L/ha.

PRE-HARVEST CLEAN-UP USES

This table summarises PyGanic's uses as a pre-harvest ‘clean-up spray’ for the removal of insects including beneficial's just prior to harvest that may cause packaging and marketing problems.

Crop	Pests	Rate
Brassica vegetables	Insects (including predators) that may be present just prior to harvest such as fruit fly, Rutherglen bug and spiders	2.4 L/ha
Brassica leafy vegetables		
Leafy vegetables		
Fruiting vegetables		
Legume vegetables		
Strawberries		150-200 mL/100 L*
Citrus		
Grapes (wine and table)		
Stone fruit		

* Use higher rate for denser crops and higher pest pressure.

NOTE:

Refer to label for full directions for use.

Some insect pests like diamondback moth can have significant levels of insecticide resistance, leading to reduced levels of control with PyGanic.

PyGanic as a pre-harvest clean-up spray in fresh produce

Insect contamination in fresh and processed produce is a significant recurring problem for vegetable and fruit growers and processors. Insect contamination causes rejections and lost sales for growers, adds cost for processors and results in bad publicity for retailers.

Recently there have been numerous consumer complaints about redback spiders (*Latrodectus hasselti*) in broccoli.

PyGanic used at label rates immediately prior to harvest (3 to 12 hours) is very effective at flushing spiders and other insects from the crop for cleaner non contaminated produce.



Redback spider contamination in broccoli
Photo: Dee Nott



PyGanic used immediately prior to harvest can significantly reduce the risk of insect contamination in fresh and processed produce
Photo: Daily Mail

Spray application

GENERAL APPLICATION GUIDELINES

- Do not apply in direct sunlight or when temperature exceeds 32°C.
- The addition of a non-ionic surfactant may aid penetration and coverage particularly where tight fruit or crop canopies are present.
- Apply when insects first appear, do not wait until plants are heavily infested.
- Best applied just before dusk or early morning before sun is at full strength.
- Final spray mix should be buffered to between pH 5.5-7.0.

RE-ENTRY

When spray has dried – normally 15 minutes after application.

COMPATIBILITY

PyGanic is compatible with many insecticides, fungicides, adjuvants, liquid fertilizers and wetting agents although care should be taken to avoid mixing with products that can shift the pH of the spray solution outside the range of 5.5-7.0. Products such as lime sulphur and Bordeaux mixture are highly alkaline and should be avoided. Prior to tank mixing, Sumitomo recommends conducting a small-scale bucket test using the correct proportions with water to ensure physical

compatibility and to check pH is within the desired range.

PRE-HARVEST CLEAN-UP

To achieve best flushing/repellency effect it is critical that the PyGanic spray penetrates effectively into the whole crop. For dense crops (such as leafy lettuce) high water rates (750-1000 L/ha) and high pressure/air assisted spraying is required. Consecutive sprays leading up to harvest will give the best results, apply a maximum of 3 sprays at 3 day intervals.

SPRAYING TREE CROPS AND VINES

If using **dilute spraying** use a sprayer designed for high volumes of water setup to achieve even coverage throughout the crop canopy. Apply sufficient water to cover the crop to the point of run-off.

If using **concentrate spraying** use a sprayer designed to apply water volumes less than the point of run-off and again ensure it's set-up to achieve even coverage throughout the canopy. For concentrate spraying consult the product label to calculate the correct PyGanic concentration factor.

To achieve best results it is critical that the PyGanic spray penetrates effectively into the whole crop canopy. High water rates and air assisted sprayers are recommended.



Crop withholding periods

Crop	Withholding period
Avocados	Nil
Citrus including, oranges, mandarins, grapefruit, lemons and limes	Nil
Kiwifruit	Nil
Flowerhead brassica's including, broccoli, cabbage, cauliflower and Brussels sprouts	Nil
Lettuce	Nil
Strawberries	Nil
Grapes – wine and table	Nil
Stone fruit including, apricots, nectarines, peaches, plums and prunes (fresh)	Nil
Fruiting vegetables (field and protected) including, capsicums, chillies, egg plant, tomato (excluding sweetcorn and mushrooms)	Nil
Brassica leafy vegetables including, raab broccoli, Chinese broccoli (gai lan), Chinese cabbage (pak choi), bok choy, Chinese fat cabbage, cress (garden and upland), flowering white cabbage (choisum), kale, Kohlabi leaves, komatsuna (mustard spinach), mizuna, mustard greens (Indian and leaf), purple-stem mustard, radish leaves (inc tops), rape greens, rucola (arrugula and rocket), turnip greens, wasabi leaves and wild rocket	1 day
Leafy vegetables including, endive, fennel, kale, cress, mustard, silverbeet and spinach	1 day
Legume vegetables including, green beans, broad beans, common beans, catjan, cowpea, goa bean, green peas, guar, lablab bean, mung bean and soy bean	1 day
Cherries	1 day
Macadamia nuts	1 day

Rules of thumb for best performance

ENSURE GOOD SPRAY COVERAGE IS ACHIEVED

PyGanic is a contact insecticide and requires thorough coverage for best results.

BUFFER THE SPRAY WATER IF REQUIRED

Keep the pH of the spray solution between 5.5 and 7.0 for better results. Test pH and add buffer as required.

APPLY WITH A NON-IONIC SURFACTANT

Performance of PyGanic has been shown to improve when applied with a surfactant.

APPLY IN EARLY MORNING, LATE EVENING OR NIGHT

Reduced UV exposure and lower temperatures will increase performance and decrease the risk to pollinators.

APPLY PYGANIC BEFORE INSECTS BECOME ENTRENCHED OR REACH MATURE GROWTH STAGES

Monitor crops closely and treat for the first appearance of insects. Pre-harvest flushing applications are best applied leading up to and immediately before harvest (ensure withholding periods are observed).

APPLY PYGANIC WHEN TARGET INSECTS ARE ACTIVE

Target times when the insect pests are visible and actively moving to increase direct contact.

CONSIDER MULTIPLE APPLICATIONS

Trial work has shown that 2 or more applications of PyGanic 3 to 5 days apart significantly improves the final result, for both pre-harvest clean-up and in-season applications.

Trial results

PYGANIC FOR GREEN PEACH APHID CONTROL IN BROCCOLI – STANTHORPE, QLD, 2016

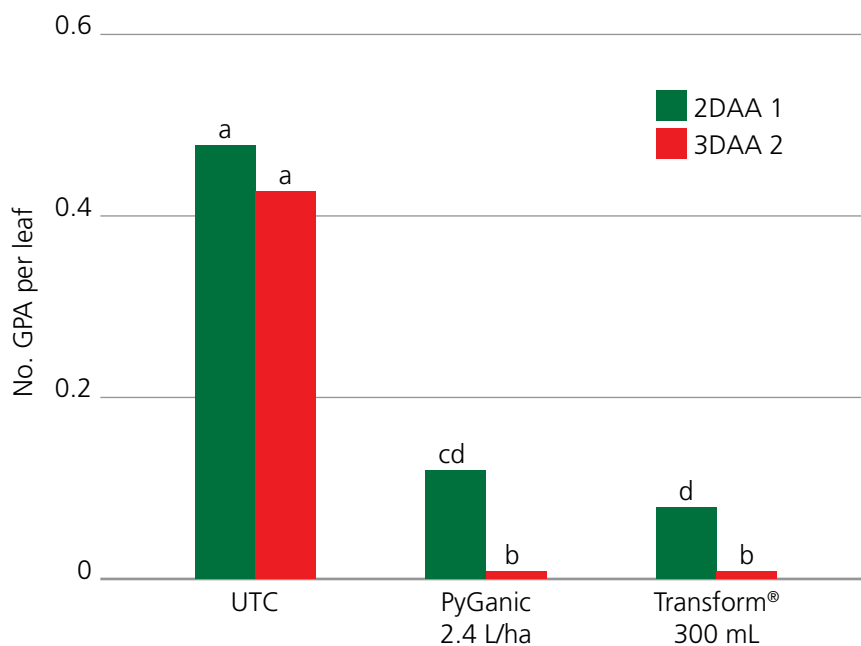
2 foliar sprays 6 days apart

Both applications applied at
388 L/ha of water

Agral® 600 SL was added to both
insecticides at 0.12%

Aphid control was significantly
improved after a second application
of PyGanic

Green peach aphid control in broccoli



Adult green peach aphid 7DAA 2



Winged green peach aphid 7DAA 2

Trial results (continued)

PYGANIC FOR CABBAGE WHITE BUTTERFLY CONTROL ON BROCCOLI – LOCKYER VALLEY, QLD, 2015

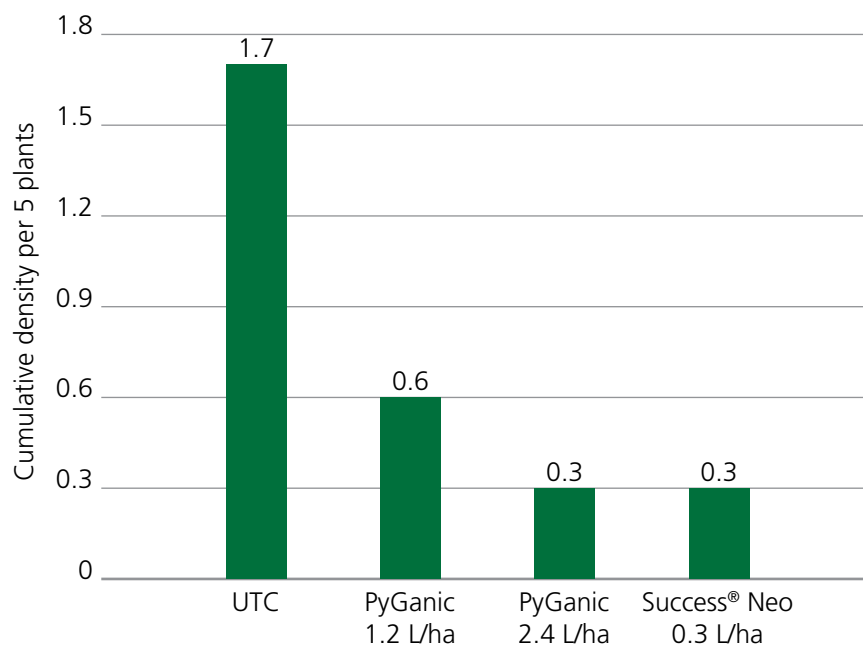
2 foliar sprays 5 days apart

Both applications applied at
400 L/ha of water

PyGanic at 2.4 L/ha performed
much better than 1.2 L/ha

The registered rate is 2.4 L/ha

Cabbage white butterfly control on broccoli 5DAA 2



Cabbage white butterfly larvae

Trial results (continued)

PYGANIC FOR QUEENSLAND FRUIT FLY (QFF) CONTROL ON PEACHES – CHILDERS, QLD, 2016

4 foliar sprays 4 days apart

Applied at 600 L/ha of water

Tree size 2-3 m

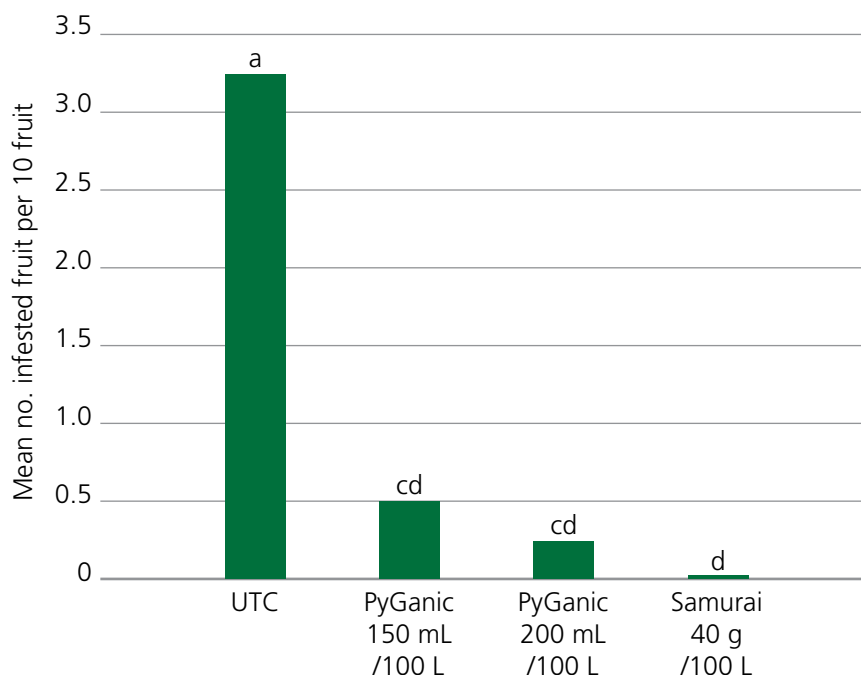
PyGanic was applied with 0.1%
Pomade® surfactant and Samurai®
was applied with 0.05% Maxx®

PyGanic at 200 mL/ha was superior
to the lower 150 mL/ha rate



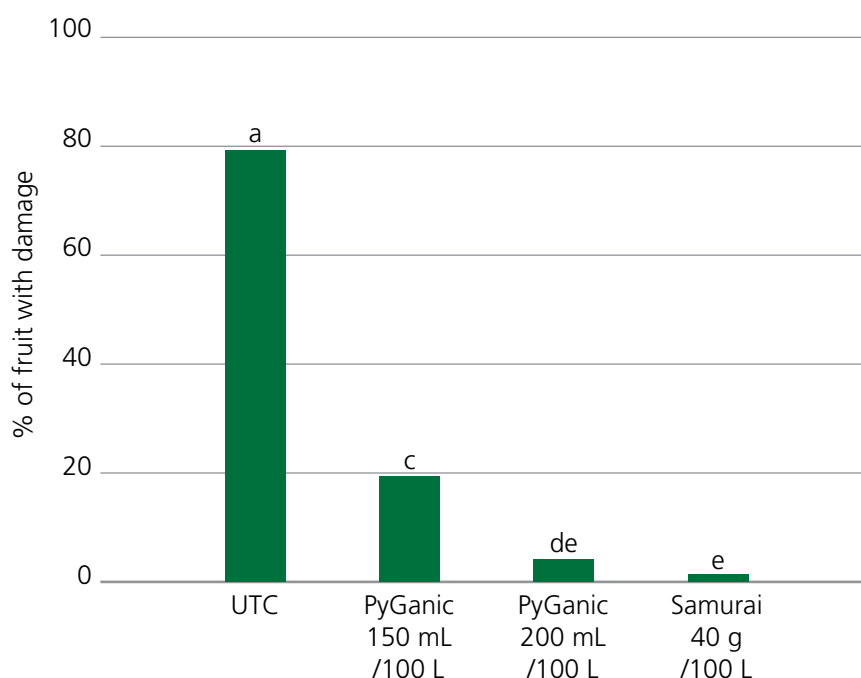
Photos: Top to bottom, dead QFF
recovered under trees, tree rows and
damaged untreated fruit from trial

Mean number of Qld fruit fly infested peaches 6DAA 4



Chewing, biting and piercing pest damage on peaches 6DAA 4

(Pests identified, Rutherglen bug, Carpophilus beetle and
Oriental Fruit moth)



Trial results (continued)

PYGANIC FOR PRE-HARVEST CLEAN-UP IN GREEN CORAL LETTUCE – BACCHUS MARSH, VIC, 2016 AND 2017

2016 trial sprayed by airblast sprayer 800 L/ha water

2017 trial sprayed by conventional non-airblast sprayer at two different water volumes

Results indicate the effectiveness of using air assisted spraying and higher water rates

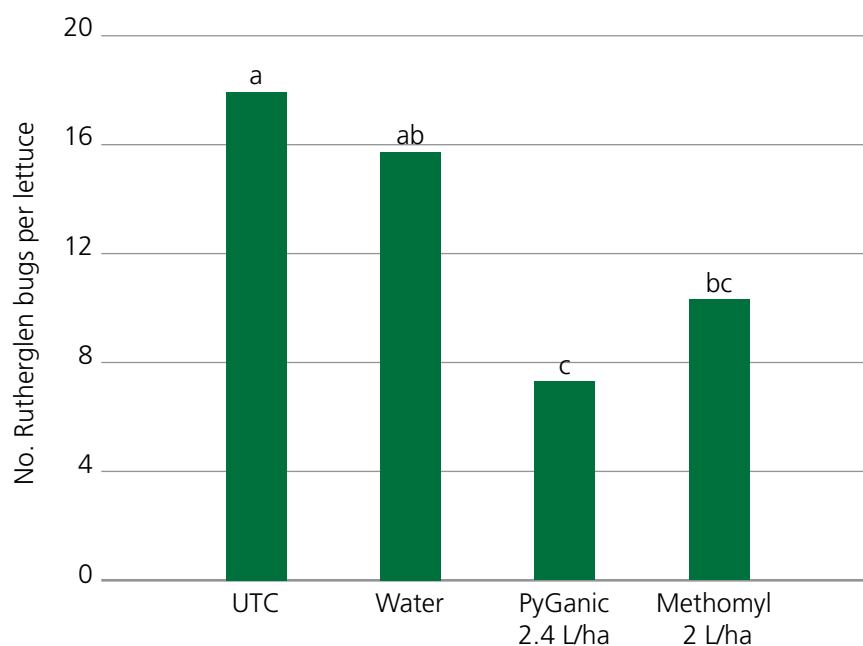


Spiders recovered from green coral lettuce

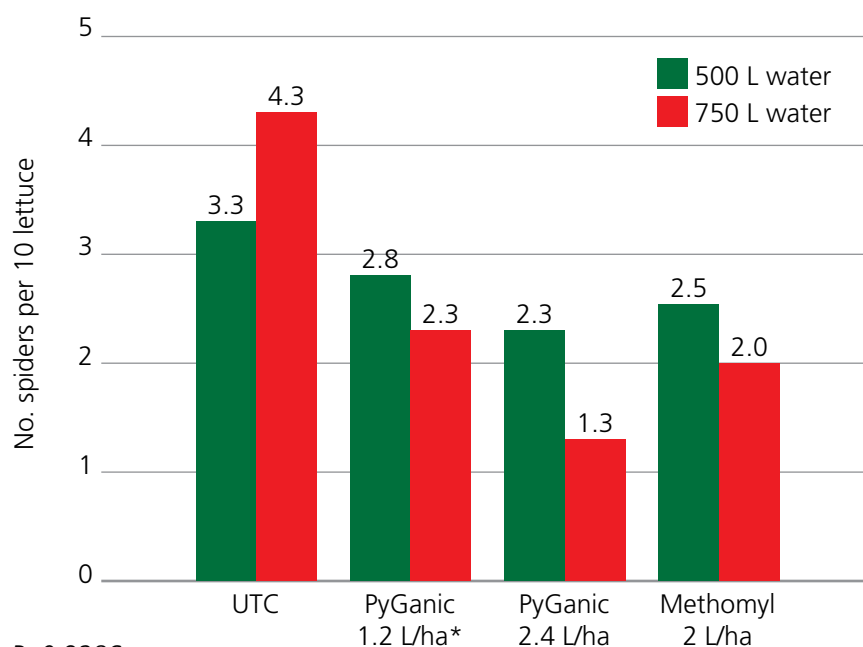


Insects like Rutherglen bug can become entrenched deep inside the crop

Pre-harvest flushing of Rutherglen bugs in lettuce, 2016 2 hrs after application with airblast sprayer



Pre-harvest flushing of spiders in lettuce, 2017 3 hrs after application with water rate comparison



$P=0.9286$

*The registered rate of PyGanic is 2.4 L/ha

Trial results (continued)

PYGANIC FOR PRE-HARVEST CLEAN-UP IN TABLE GRAPES – ROBINVALE, VIC, 2016

Sprayed at 1100 L/ha of water

Applied after bunch closure

Flies, leafhoppers, beetles, spiders,
ants and moths were present

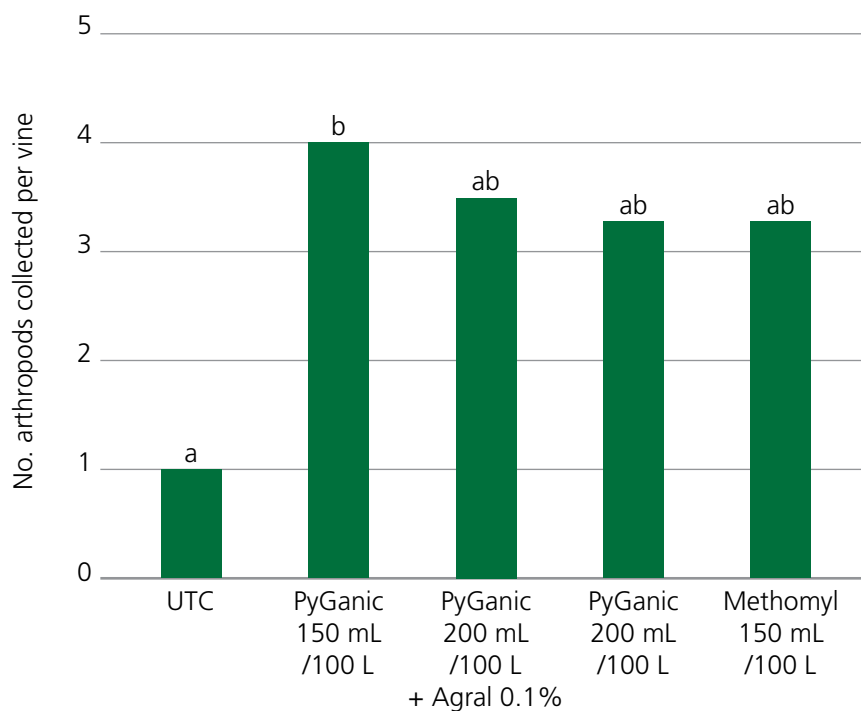


*Examples of dead insects collected
under PyGanic treated vines*



*Tables grape vines with collection
sheets underneath*

Dead arthropods collected under table grapes 4 hrs after application



Calmeria table grape bunches at time of trial

PyGanic



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