



Actigard™ User Guide

August 2016



Mode of action

Actigard™ has a unique mode of action that is different to most other products approved for Psa-V control in NZ. It is a plant activator (or elicitor) which contains the active ingredient Acibenzolar-S-Methyl in the form of a water-soluble granule. This chemical stimulates the plant's natural defence system either as an induced systemic resistance (ISR) or systemic acquired response (SAR).

For optimal management of Psa-V, Actigard must always be used together with other protectant sprays listed in the Zespri [Crop Protection Standard](#) and [Psa-V Best Practice Guide](#).

Use period

Up to four applications of Actigard can be applied to orchards over one season – i.e. from harvest to harvest. Foliar applications are restricted to the pre-flowering and postharvest period on fruiting vines. Syngenta has now removed their limited label claim for soil applications meaning that ground applications are now considered as “off-label”.

Market access requirements have been a key driver in developing the use pattern for Actigard. No residues of the active ingredient Acibenzolar-S-Methyl are permitted on submitted fruit.

Actigard, especially when used with copper, has shown to reduce leaf spot infection when applied prior to prolonged wet periods in spring. Metabolic testing suggests increasing heightening of SAR response with multiple applications. It is best applied *before* infection is evident. Kiwifruit vines are at high risk for Psa infection in the weeks leading into flowering so applications in this window would seem prudent. An application just before flowering may also provide some extended protection through flowering.

Vines should be actively photosynthesising for elicitors to work; therefore applications are less likely to be effective if made late in the season when leaves are senescing (deteriorating). Trials in both France and NZ have indicated late-autumn foliar applications can reduce spring infection in the subsequent season. This has occurred in

Gold3, Hayward and Matua males.
(<http://www.kvh.org.nz/vdb/document/91550>)

No detectable Actigard residues are permitted on Zespri fruit. Nil residues have been a key driver in developing the use pattern for Actigard and meet the residue requirements of Zespri's export markets.

- **Can be applied as a foliar spray only.** Aerial application is not permitted.
- Soil applications may be permitted under JA.
- **A maximum of four applications can be made in any one season (harvest to harvest), regardless of vine-producing status.**
- **The maximum amount of product per hectare permitted in one application is 200g/ha.**
- **Must not be applied as a foliar spray within producing blocks after the start of female flowering through to harvest.**
- Actigard must **not** be applied as a foliar spray to male or non-producing vines within producing blocks (or where there is risk of drift into neighbouring producing blocks) after the start of flowering.

Trial results indicate Actigard applied as a foliar spray will assist in protecting vines from Psa-V.

Results from Europe have shown efficacy from soil-applied treatments in some situations. New Zealand field trials have been unable to validate this in recent research. Soil applications are off-label and are permitted under JA only.

Actigard has a full label claim (when applied as a foliar spray) for the control of Psa-V by the ACVM Group of the Ministry for Primary Industries. Further research is underway to optimise its use.

Applications to stressed vines or potted vines, is likely to result in stunting of plant growth.

Post-harvest applications are allowed but extreme care should be taken to avoid any spray drift or contamination from spray tanks onto fruiting vines.

GROWERS ARE SOLELY RESPONSIBLE FOR REVIEWING, UNDERSTANDING AND COMPLYING WITH ALL APPLICABLE REQUIREMENTS FOR USE OF ACTIGARD OR ANY OTHER PRODUCT.

Efficacy

Experience in other crops has shown that eliciting the SAR response can reduce disease incidence and severity, but rarely leads to complete control. Trials in kiwifruit have indicated efficacy in reducing the progression of Psa-V symptoms. Actigard is best used in control programmes with other agrichemicals; it can be tank-mixed with common copper products. New Zealand research to date has shown Actigard provided some degree of control in all the commercial varieties in greenhouse or field trials.

A 2014 NZ field trial showed combination Actigard + Kocide Opti applications were highly effective at reducing leafspot in Hayward vines and nearly doubled fruitset compared to the untreated control. In this trial the two Actigard + Kocide Opti applications were applied at 21 day intervals and a single Kocide Opti spray was applied 11 days following the first application.

Actigard is unable to cure vines already infected with Psa-V and secondary symptoms. Therefore, monitor for secondary symptoms regularly and remove infected material from the orchard.

Impacts on growth

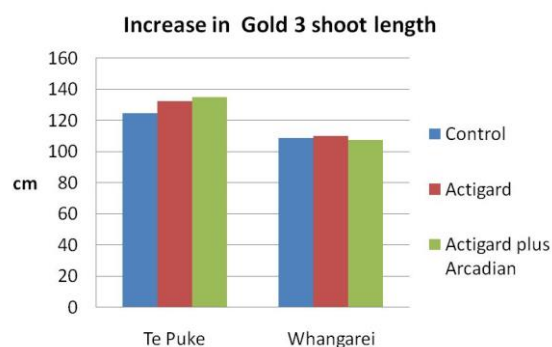
Trials have indicated that two pre-flowering foliar applications to healthy vines are unlikely to impact leaf, fruit size or quality. Various post-flowering foliar and soil-applied trials in Korea and NZ have given variable results.

Some growers have reported vigour reduction with Actigard use. Application to vines that are stressed (e.g. compromised root systems, exposed to drought, excessive moisture, cold weather or disease) may result in poor growth. Industry data analysis from 2014 harvest showed a correlation between *spring* Actigard applications and lower dry matter at harvest in orchards in the Edgecumbe area (where vines are subject to high water table and cold). However, this was not reflected in other growing areas and trial work undertaken in the 2015/2016 season also did not validate this. Syngenta recommend delaying the first Actigard application until approximately 21-28 days prior to flowering.

Trials to assess the impacts of Actigard sprays on developing Gold3 grafts showed no effect on growth from three applications through spring.

There is some evidence in the literature that negative impacts of Actigard on growth and fruit

yields/quality are more evident in a low-nitrogen environment where nutrient deficiencies exist. This relationship requires validation in local conditions.



Impact on floralness

Few trials have been conducted to investigate the impact of Actigard applications on floralness. In 2014/15 spray programme trials indicated a lowering of return bloom in Gold3 but no impact was seen on Hayward vines. It is not clear whether this impact is attributed to Actigard and further work is underway to gain more information.

Application rate

The product application rate of Actigard should not exceed 200g/ha. Excessive application rates or more frequent sprays may result in adverse effects on vine health and/or fruit quality.

Dilute water rate	Actigard/ha	Actigard/100L
800 L/ha	200 g	25 g
1000 L/ha	200 g	20 g
1200 L/ha	200 g	16.5 g

If spraying at two-times concentrate - adjust rate accordingly to deliver 200 g/ha on a full canopy.

Timing

For elicitors to be effective, the plant must be fully activated before an infection period. Initial trials indicate peak efficacy around seven days from application. Applications should therefore occur four to seven days before protection is required – e.g. approximately one week before a pruning round is planned. The presence of healthy leaves is considered necessary to elicit the response. *Applications to dormant vines or cut-off stumps are unlikely to be effective.*

The vine's defence system is thought to be activated for three weeks with the peak activation

at two weeks. Repeat applications in this time may help maintain protection.

A [Justified Approval \(JA\)](#) is required for any proposed use of Actigard other than in accordance with the latest Zespri Crop Protection Standard in producing blocks.

Coverage

Thorough coverage from foliar sprays is considered essential to maximise the vine's defence system response.

Soil application – off label use only

Ground applications of Actigard are an off-label practice since May 2016. Syngenta made the decision not to progress toward a full label claim for soil applications, and the limited label claim was removed at registration renewal in May 2016.

At present, New Zealand-based research on the soil-application method has only generated limited field-trial efficacy data.

For soil applications, Actigard was applied to bare ground and with sufficient water to allow soil absorption. Rainfall or irrigation post-application assisted root uptake. Full activation of the response took up to seven days.

Soil-directed sprays required a minimum of 300 L/ha of water and required the grower to ensure the ground was clear of trash, mulch and weeds. Offshore trials showed reduced Psa-V symptoms on Hort16A vines when Actigard was applied at 25-30 day intervals over summer.

Offshore trial results have also indicated soil-applied Actigard at monthly intervals to Hort16A reduced symptoms in the field at least until autumn when widespread infection occurred throughout the orchard. Additional French trials indicated a single postharvest soil application to Hayward was ineffective in preventing spring infections. However foliar applications applied at the same time and the same rate were effective. This may indicate a variety, rate or application technique difference.

The uptake and efficacy of soil-applied Actigard may have been influenced by:

- rate/number of applications
- root depth/density
- water volume/rainfall
- soil type

Uptake likely to have been increased by:

- shallow soil/roots
- ripping in the previous season
- banding of organic matter
- application to the dripper zone
- moist soils

Italian trials suggest root contact, not root area coverage, may have been more important in inducing a SAR response.

Applications to areas where roots are known to exist (e.g. close to the trunk base) under compost, or irrigation drippers might have helped to achieve root contact. Irrespective of application technique, a 200g/ha rate must be maintained

Residues

Any foliar application directly to flowers, fruitlets or fruit is likely to result in residues, and not meet Zespri's zero-residue requirement for the active ingredient Acibenzolar-S-Methyl in. Any such application should be reported to Zespri

Soil applications did not result in fruit residues when a 14-day pre-harvest interval has been used. Care had to be taken with soil applications through sprinklers or herbicide booms, especially on T-bar structures, to avoid spray drift onto the crop canopy and fruit.

Compatibility

Actigard is compatible with commonly-used coppers, Movento®, Prodigy®, Luna Privilege® and KeyStrepto™. Always read the label. Other combinations should be tested prior to any proposed use. Testing has indicated that the combination of Actigard with Nordox 75 WG™ and KeyStrepto® resulted in undissolved material floating on the surface. Caution should be applied when considering this combination; it may require additional pre-mixing and agitation.

Safety

Actigard is a low toxicity agrichemical. However, overalls, faceshields, waterproof gloves and protective footwear should be worn when mixing or applying. The recommended re-entry period is 12 hours. Do not allow drift to enter waterways as it is toxic to aquatic life. Actigard is bee-safe but do not apply when bees are actively foraging.

Always read the label and follow instructions.

Disclaimer

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