

## BACKGROUND

The active ingredient in Ambitious® and Gro-tech™ is a synthetic compound named CPPU (forchlorfenuron). CPPU acts as an elicitor to reduce the expression of symptoms of Psa in kiwifruit when applied preventatively. Ambitious® and Gro-tech™ have a Full Label Claim for the suppression of Psa-V leaf spot symptoms in kiwifruit granted by the Agricultural Compounds and Veterinary Medicines Group (ACVM). CPPU is a plant growth regulator (PGR) of the cytokinin group, and is used within the global horticultural industry for sizing fruit.

## LIMITED USE

In the Zespri Crop Protection Standard (CPS), one application of Ambitious® or Gro-tech™ on green varieties is allowed in the bud-phase for the suppression of Psa-V symptoms only.

In response to customer expectations, the use of synthetic plant growth regulators to stimulate fruit development or size is not permitted on Zespri-grown fruit. Therefore in the CPS, CPPU is not allowed to be used on kiwifruit as a PGR.

CPPU is not permitted for use on Gold or Red.

Using CPPU outside of the permitted use pattern is likely to negatively impact fruit quality, dry matter and shape.

These limitations manage production and marketing-related risks while allowing growers to use a product with a different mode of action in the management of Psa. CPPU can play an important role in spring protection of leaves, allowing for a break from copper spray application. Research projects, reports and case studies are available [here](#).

## ACCOUNTABILITY

Like other products in the CPS, use of CPPU products is at growers' own risk. Applying CPPU products outside the controls and conditions of use stipulated in this document may have adverse market implications. The GAP Management System Owner and applicator are responsible for understanding and complying with all conditions of use in this document and on the label. Failure to comply with all requirements may result in compliance action and adverse trade implications.

Zespri maintains a zero-residue policy for CPPU residues on fruit. Every supplying orchard is residue tested and fruit that does not meet this requirement will not be accepted into Zespri inventory.

## MODE OF ACTION

The specific mode of action is not well understood but the active ingredient may not reduce bacterial populations directly, but rather may cause morphological changes in the plant which suppress symptom expression. It may assist the plant by enhancing the physiological response to disease (leaf spot development). However, cytokinins can increase natural defenses through salicylic acid responses.

## MANAGING RESISTANCE RISK

CPPU must be used within a comprehensive Psa-V management programme, which includes products with different modes of action and also cultural controls. Monitor vines regularly and remove Psa-V infected material to prevent excessive Psa-V inoculum build-up. Keep pruning tools well sterilised so not to transfer the bacteria.

## EFFECTIVENESS

There is a time delay between spray application and full activation of the CPPU effect, therefore recommendation is to apply product 5-7 days before infection events. Ambitious/Gro-tech are expected to be most efficacious within three weeks of application. Ambitious has shown suppression of Psa-V leaf spot. It is reliant on good coverage of tissue to achieve effects on target canopies. There has been no efficacy in reducing flower bud loss.

Some growers have expressed concern about the effect of CPPU products used in the bud phase, on subsequent fruit shape. Feedback has been that when applied as per label recommendation, fruit shape/appearance has not been an issue. Observed side effects during trials include cytokinin flush (red leaves), thick leaves, thick stalks, unusual appearance of fruit (i.e. hairy and 'rust' coloured) and square fruit (that may be related to the retention of poorer quality flowers). Applications under New Zealand conditions do not appear to have any consistent fruit sizing responses, however some growers have reported more vigorous canopies with its use. For more information, refer to the [CPPU KiwiTech Bulletin](#).

Ambitious®:

[LABEL](#) | [Tech Sheet](#)

[SDS](#) | [Product Safety Card](#)

Gro-tech™:

[LABEL](#) | [SDS](#)

[SAFETY DIRECTIONS](#)



# CPPU USER GUIDE

## CONDITIONS OF USE AND ORCHARD BEST PRACTICES

	REQUIRED ACTIONS	BEST PRACTICE
PLANNING	<ul style="list-style-type: none"> <li>➔ CPPU products with a label claim for Psa-V are permitted for use on green varieties only.</li> <li>➔ The following use is not permitted: on gold or red varieties / onto flowers or fruit / as a plant growth regulator / outside of the bud-phase timing.</li> <li>➔ In the Zespri Crop Protection Standard (CPS), one application of Ambitious® or Gro-tech™ is permitted during the bud phase for the suppression of Psa-V symptoms only. A second application may be allowed under <a href="#">Justified Approval</a> (JA).</li> <li>➔ Application must be post bud-break and at least one week before the first female kiwifruit flowers open in the orchard.</li> <li>➔ Use must be alternated with other proven Psa-V control products.</li> <li>➔ Application to a non-producing block throughout the season is allowed provided there are no vines that will produce fruit for human or animal consumption in the season of treatment (i.e. male, immature or non-producing vines), and no drift onto producing vines can occur.</li> <li>➔ Preventative control needs to be applied 5-7 days prior to a PSA infection event.</li> <li>➔ Apply when leaves are in the early development stage with shoots 15-25cm in length approximately 4-5 weeks post budburst. Application later than this stage is less effective and may increase the risk of undesirable side effects.</li> </ul>	<ul style="list-style-type: none"> <li>★ Most likely to be efficacious when applied during the first half of the bud-break period (before leafspot). Apply when average shoot length is 15-25cm, about 4-5 weeks post budburst.</li> <li>★ Apply as part of a comprehensive Psa-V management programme, including products with different modes of action and cultural controls. See the <a href="#">KVH Psa-V Best Practice Guide</a> and the <a href="#">Kiwiflier Spotlight on Psa: Are you Maximising your Psa programme's potential?</a></li> </ul>
SPRAYING	<ul style="list-style-type: none"> <li>➔ Apply at label rates only. Higher label may increase the risk of potential side effects.</li> <li>➔ Ensure good spray coverage is achieved.</li> <li>➔ Use sufficient water to wet the canopy without excessive runoff. Typically in this period, it will require 600-1000L/ha for mature vines. Read the label and follow instructions carefully.</li> <li>➔ Ensure there is no risk of spray drift onto flowers or fruit.</li> <li>➔ Although Ambitious is classified under the HSNO Act as a non-hazardous substance, ensure appropriate PPE as per the SDS as used when handling and applying.</li> </ul>	<ul style="list-style-type: none"> <li>★ Moderately rainfast but absorption is required. Do not apply if rain is likely within 24 hours of application.</li> </ul>
AFTER SPRAY	<ul style="list-style-type: none"> <li>➔ Notification of any incidence which may have resulted in residues to fruit (e.g. spray drift or tank contamination) must be reported immediately to Zespri.</li> <li>➔ Ensure all tanks, lines and nozzles are thoroughly cleaned after application to reduce risk of tank contamination causing residues.</li> <li>➔ The safe re-entry interval is WFD (when fully dry).</li> </ul>	<ul style="list-style-type: none"> <li>★ Monitor leaf spot symptoms and potential side effects in the weeks following application.</li> </ul>

*This publication has been prepared based on information available at the time of publication which is inherently preliminary in nature and subject to change. No party, including without limitation, Kiwifruit Vine Health Incorporated, GroChem Horticulture Ltd, JatraNZ, and/or Zespri Group Limited, makes any warranty, representation or guarantee as to the accuracy and/or completeness of the information contained in this publication ("Published Material") and none of those parties shall be liable to any person for any loss arising from that person's reliance on the Published Material and/or for any damages arising out of or connected with the use of the Published Material or the products referred to herein. No obligation is accepted or undertaken to update this or any other information or publicly released revisions to this document to reflect additional information, circumstances or changes in expectations which occur after the date of this document. Some of the Published Material may be subject to copyright and shall not be reproduced in any manner without first obtaining the written consent of Kiwifruit Vine Health Incorporated.*