Australian Government

Australian Pesticides and Veterinary Medicines Authority

Public Release Summary

on the evaluation of the new active rescalure in the product CheckMate CRS
APVMA product number 90682
May 2022

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This publication is available from the APVMA website.

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Preface

The Australian Pesticides and Veterinary Medicines Authority (APVMA) is the Australian Government regulator responsible for assessing and approving agricultural and veterinary chemical products prior to their sale and use in Australia. Before approving an active constituent and/or registering a product, the APVMA must be satisfied that the statutory criteria, including the safety, efficacy, trade, and labelling criteria, have been met. The information and technical data required by the APVMA to assess the statutory criteria of new chemical products, and the methods of assessment, must be consistent with accepted scientific principles and processes. Details are outlined on the APVMA website.

The APVMA has a policy of encouraging transparency in its activities and seeking community involvement in decision making. Part of that process is the publication of Public Release Summaries for products containing new active constituents. This Public Release Summary is intended as a brief overview of the assessment that has been conducted by the APVMA and of the specialist advice received from advisory agencies, including other Australian Government agencies and State departments of primary industries. It has been deliberately presented in a manner that is likely to be informative to the widest possible audience to encourage public comment.

About this document

This Public Release Summary indicates that the APVMA is considering an application for registration of an agricultural or veterinary chemical. It provides a summary of the APVMA's assessment, which may include details of:

- the toxicology of both the active constituent and product
- the residues and trade assessment
- occupational exposure aspects
- environmental fate, toxicity, potential exposure and hazard
- efficacy and target crop or animal safety.

Comment is sought from interested stakeholders on the information contained within this document.

Making a submission

In accordance with sections 12 and 13 of the Agvet Code, the APVMA invites any person to submit a relevant written submission as to whether the application for registration of CheckMate CRS containing rescalure should be granted. Submissions should relate only to matters that the APVMA is required, by legislation, to take into account in deciding whether to grant the application. These matters include aspects of public health, occupational health and safety, chemistry and manufacture, residues in food, environmental safety, trade, and efficacy and target crop or animal safety. Submissions should state the grounds on which they are based. Comments received that address issues outside the relevant matters cannot be considered by the APVMA.

Submissions must be received by the APVMA by close of business on 14 June 2022 and be directed to the contact listed below. All submissions to the APVMA will be acknowledged in writing via email or by post.

Relevant comments will be taken into account by the APVMA in deciding whether the product should be registered and in determining appropriate conditions of registration and product labelling.

When making a submission please include:

- contact name
- company or organisation name (if relevant)
- email or postal address (if available)
- the date you made the submission.

Please note: submissions will be published on the APVMA's website, unless you have asked for the submission to remain confidential, or if the APVMA chooses at its discretion not to publish any submissions received (refer to the public consultation coversheet).

Please lodge your submission using the public consultation coversheet, which provides options for how your submission will be published.

Note that all APVMA documents are subject to the access provisions of the *Freedom of Information Act 1982* and may be required to be released under that Act should a request for access be made.

Unless you request for your submission to remain confidential, the APVMA may release your submission to the applicant for comment.

Written submissions should be addressed to:

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GPO Box 3262
Sydney NSW 2001

Phone: +61 2 6770 2300
Email: casemanagement@apvma.gov.au

Further information

Further information can be obtained via the contact details provided above.

Further information on Public Release Summaries can be found on the APVMA website.

Introduction

This Public Release Summary provides a summary of the data reviewed, and an outline of the regulatory considerations for, the proposed registration of CheckMate CRS and approval of the new active constituent, (3S,6R)-(3S,6S)-6-isopropenyl-3-methyl-dec-9-en-1-yl acetate (referred to herein as rescalure).

Applicant

Suterra LLC.

Purpose of application

Suterra LLC has applied to the APVMA for registration of the new product CheckMate CRS, a Slow-Release Generator (SR) formulation containing 716 g/L (70 mg/dispenser) of the new active constituent, rescalure.

Proposed claims and use pattern

CheckMate CRS is proposed for the use in mating disruption of *Aonidiella aurantii Maskell* (California red scale) in citrus and any other crops where this species may be a pest. The product is intended for professional use and will be applied manually by hanging the dispensers from tree branches.

Mode of action

Rescalure is a synthetic insect pheromone, identical to the sex pheromone produced by female *Aonidiella aurantii Maskell* (California red scale). Rescalure is non-toxic and acts by disruption of mating behaviour.

Overseas registrations

The active Rescalure and CheckMate CRS are currently registered overseas for use in an agricultural chemical product. Rescalure (active constituent) is approved in the USA, EU and Uruguay and is under evaluation in South Africa and Argentina. CheckMate (product) is registered in the USA and under evaluation in the EU, South Africa and Argentina.

Chemistry and manufacture

Active constituent

The technical active constituent rescalure is manufactured overseas. Details of the chemical name, structure and physicochemical properties of rescalure are listed below (Tables 1 to 2).

Table 1: Nomenclature and structural formula of the rescalure active constituent

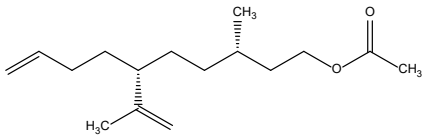
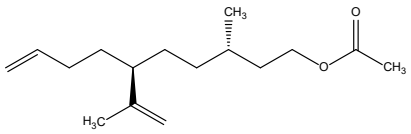
Common name (ISO):	Rescalure	
IUPAC name:	(3*S*,6*RS*)-6-(Prop-1-en-2-yl)-3-methyldec-9-en-1-yl acetate	
CAS registry number:	64309-03-1 (1:1 mixture of 3*S*,6*R* and 3*S*,6*S* isomers) 67601-06-3 for the (3*S*,6*R*) isomer 67601-10-9 for the (3*S*,6*S*) isomer	
Molecular formula:	$C_{16}H_{28}O_2$	
Molecular weight:	252.39 $gmol^{-1}$	
Structural formula:		(3S,6R)-6-(Prop-1-en-2-yl)-3-methyldec-9-en-1-yl acetate, the (3*S*,6*R*) isomer (CAS: 67601-06-3)
		(3S,6S)-6-(Prop-1-en-2-yl)-3-methyldec-9-en-1-yl acetate, the (3S,6S) isomer (CAS: 67601-10-9)

Table 2: Key physicochemical properties of the rescalure active constituent

Physical form:	Oily liquid		
Colour:	Light yellow		
Odour:	Aromatic odour		
Melting point:	-43.5℃		
Boiling point:	278℃		
Density	0.888 g/mL at 20℃		
Stability:	The active constituent rescalure was stable for 12 months at real time storage under ambient temperature (average temperature was 22.2℃, 19.9 to 26.9℃) when stored in a HDPE bottle.		
Safety properties:	The active constituent rescalure is a flammable liquid with a flash point of 13℃ and an auto-ignition temperature of 250℃. Rescalure does not contain explosive or oxidising ingredients, and it is not corrosive to HDPE packaging.		
Solubility in water:	0.2 mg/L (at 20℃, pH 7)		
Organic solvent solubility:	Soluble in organic solvents		
Dissociation constant (PK_a):	N/A		
PH:	N/A		
Octanol/water partition coefficient (Log K_{ow}/K_{OW}):	5.3		
Vapour pressure:	0.2 kPa at 20℃		
Henry's law constant:	N/A		
UV/VIS absorption spectra:		λ	ε (L mol^{-1} cm^{-1})
	0.1 M in methanol	259 nm	6.36
		278 nm	12.3
	0.001 M in methanol	210 nm	559

Rescalure is a water-insoluble oily liquid with a freezing point of -43.5℃. It is flammable with a flash point of 131℃ and an auto-ignition temperature of 250℃.

Rescalure does not contain explosive or oxidising ingredients and it is not corrosive to HDPE packaging.

Formulated product

The product CheckMate CRS will be manufactured overseas. Tables 3 and 4 outline some key aspects of the formulation and physicochemical properties of the product.

Table 3: Key aspects of the formulation of the product CheckMate CRS

Distinguishing name:	CheckMate CRS
Formulation type:	Slow-release generator (SR)
Active constituent concentration:	806.8 g/kg rescalure, or 70 mg rescalure/dispenser

Table 4: Physicochemical properties of the product CheckMate CRS

Physical form:	White rectangular dispenser, with strong aromatic odour
Density:	0.888 g/L for the content in dispenser
Safety properties:	The dispenser is not expected to be flammable, explosive, or oxidizing under normal use conditions and is non-corrosive to the packaging. The pheromone liquid has a relatively high flash point and auto-ignition temperature of 131℃ and 250℃ respectively
Storage stability:	Stable for 24 months at ambient temperature, and 12 weeks at 35℃

Recommendations

The APVMA Chemistry section has evaluated the chemistry of the rescalure active constituent and associated product CheckMate CRS including the manufacturing process, quality control procedures, stability data, batch analysis results and analytical methods, and found them to be acceptable. The available storage stability data indicate that the formulated product is expected to remain stable for at least 2 years when stored under normal conditions.

Based on a review of the chemistry and manufacturing details, the registration of CheckMate CRS and approval of the rescalure active constituent, are supported from a chemistry perspective.

Toxicological assessment

In general, insect pheromone products have low toxicity and low application rates. Accordingly, such pheromones, when released from dispensers into the environment in very small quantities will have both limited human exposure and inherently low health risk.

The APVMA accepted an appropriate toxicology package for the active constituent and product based on the APVMA's guidelines for the regulation of biological agricultural products.[1] As CheckMate CRS is comprised 100% of the active constituent (82.4% purity), all submitted studies were considered to be relevant for both the active constituent and product. QSAR and experimental data were also provided for different genotoxic endpoints to address impurities of potential toxicological concern.

Evaluation of toxicology

The results of the studies evaluated indicate that CheckMate CRS has low toxicity by oral, dermal and inhalation routes; is a moderate eye irritant; is not a skin irritant; and it is a possible skin sensitiser. It is unlikely to be genotoxic.

Chemical class

Rescalure is a synthetic insect pheromone (mixture of the stereoisomers (3S, 6R)-3-methyl-6-isopropenyl-9-decen-1-yl acetate and (3S, 6S)-3-methyl-6-isopropenyl-9-decen-1-yl acetate), identical to the sex pheromone produced by the female California red scale (CRS) species. Its mode of action is non-toxic and acts by disruption of mating behaviour.

Pharmacokinetics

No studies were required for assessment based on the low toxicity profile of semiochemicals.

Acute toxicity (active constituent)

The oral and dermal LD_{50} in rats for CheckMate CRS was >5000 mg/kg bw. The product was non-irritating to rabbit skin, but moderately irritating to rabbit eyes, causing reversible corneal opacity in one third of animals. No acute inhalation or skin sensitisation studies were required.

Acute toxicity (product)

Same or similar to acute toxicity of the active constituent rescalure.

[1] Australian Pesticides and Veterinary Medicines Authority, *Guideline for the regulation of biological agricultural products*, 14 February 2018, APVMA website.

Repeat-dose toxicity

No studies available for assessment.

Chronic toxicity and carcinogenicity

No studies available for assessment.

Reproductive and developmental toxicity

No studies available for assessment.

Genotoxicity

In a reverse mutation assay in *Salmonella typhimurium* (strains TA98, TA100, TA 102, TA 1535 and TA 1537) carried out in accordance with OECD Test Guideline 471, rescalure was not mutagenic (no increase in revertant colonies) at a concentration of up to 5 µL/plate, either with or without metabolic activation (S9).[2]

In addition, there were no concerns from submitted QSARs, although considered to be of limited reliability.

Neurotoxicity/immunotoxicity

No studies available for assessment.

Toxicity of metabolites and/or impurities

No studies were required on mammalian metabolites due to the low toxicity of semiochemicals. The 5-batch analysis of the TGAC reported a number of impurities present above 0.1% weight for weight (w/w), the cut-off for impurities of toxicological concern. QSAR and experimental results for these impurities provided mainly negative results for *in vitro* and *in vivo* genotoxicity. Despite some positive QSAR alerts, the potential daily intake of the TGAC fell below the Cramer Class III TTC for genotoxicity; therefore, the APVMA concludes that none of the impurities are of potential genotoxic concern[3].

QSAR results for 2 impurities provided positive results for skin sensitisation. This resulted in EFSA[4] and ECHA[5] classifying the active constituent as a skin sensitiser. As these impurities comprise 0.5% of the composition of the TGAC, the APVMA agrees that the active constituent may be allergenic. As such, the

[2]Organisation for Economic Co-operation and Development, *OECD Test Guideline 471*, 29 June 2020, OECD iLibrary.

[3] TTC: Threshold of toxicological concern.

[4] European Food Safety Authority, 2015. *Conclusion on the peer review of the pesticide risk assessment of the active substance rescalure*. EFSA Journal 2015;13(2):4031, 40 pp.

[5] European Chemicals Agency, *Registration dossier – Citronellyl acetate*, ECHA website.

warning statement (No 34) has been added to the new FAI entry for rescalure in the FAISD Handbook (see *Recommendations* below).

Reports related to human toxicity

Published studies on compounds similar in structure to arthropod pheromones indicate these compounds have no significant human health effects.

US EPA concluded that the potential risk from exposure to pheromone residues is not a dietary hazard to the general population, including infants and children and as such no tolerance value was established.[6]

The APVMA carried out a search of the scientific literature using the PubMed database of the United States National Library of Medicine. The search terms 'rescalure' or '3-methyl-6-isopropenyl-9-decen-1-yl acetate' or 'CAS 67601-06-3' or 'CAS 67601-10-9' yielded zero references.

Health-based guidance values and poisons scheduling

Poisons Standard

In February 2022, rescalure was included in the Poisons Standard as follows:

> Schedule 6
>
> RESCALURE for agricultural use except when enclosed in a vapour releasing device which in normal use prevents access to its contents.
>
> Index – RESCALURE cross reference: (3S,6R)-(3S,6S)-6-isopropenyl-3-methyldec-9-en-1-yl acetate

As the product, Checkmate CRS, contains only rescalure, the product will require a POISON signal header on the label.

Health-based guidance values

Rescalure is relatively volatile and the liquid product is fully contained inside the plastic device. As such, it is unlikely to result in residues on tree foliage or fruit. Therefore, exposure to rescalure residues from ingestion of fruit from treated trees is unlikely. For this reason, no ADI or ARfD have been proposed by the APVMA and the establishment of a maximum residue limit (MRL) is considered to be unnecessary (see next section).

[6] US EPA, 2004. *Biopesticides Registration Action Document (BRAD). California Red Scale Pheromone ((3S, 6R)-3-methyl-6-isopropenyl-9-decen-1-yl acetate and (3S, 6S)-3-methyl-6-isopropenyl-9-decen-1-yl acetate)*. US Environmental Protection Agency, Office of Pesticide Programs, Biopesticides and Pollution Prevention Division.

Recommendations

Taking into consideration the potential toxicological hazard, the following first aid instructions will be added to the FAISD Handbook and should appear on the product label:

First aid instructions

Table 5: New FAISD Handbook entry

Substance	Concentration	FAI	Warning statement
Rescalure	All	a, n	34

The codes above refer to the following first aid instructions:

Code	Instruction
a	If poisoning occurs, contact a doctor or Poisons Information Centre. *Phone Australia 131126; New Zealand 0800 764 766.*
n	If in eyes wash out immediately with water.
Warning Statement	
34	May cause allergy

Residues assessment

Metabolism

No metabolism data were provided for rescalure. Straight chain lepidopteran pheromones (SCLPs) and other similar arthropod semiochemicals, such as rescalure, are biodegradable by enzyme systems present in most living organisms and should present no problems with their normal physiology[7]. The metabolism of rescalure was considered by the European Food Safety Authority (EFSA) based on closely related molecules and it was determined that metabolism studies were not required for EU registration. As a Table 5 entry is proposed for the Maximum Residue Limit (MRL) Standard (see below), a residue definition is not required.

Crop residues and MRLs

The proposed use of the active constituent rescalure is not expected to result in residues in citrus or other tree crops that are distinguishable from those naturally occurring in foods. Rescalure itself is chemically identical to the pheromone produced by the female California red scale to attract mates and, as with other arthropod semiochemicals, is biodegradable by enzyme systems present in most living organisms.

No acceptable daily intake (ADI) or acute reference dose (ARfD) has been determined at this time noting rescalure's relatively high volatility (vapour pressure of 26 mPa at 25℃) and residues in food (fruits) are unlikely to occur from the proposed use pattern.

A Table 5 entry (uses of substances where MRLs are not necessary) for rescalure covering the use pattern is proposed for inclusion in the MRL Standard.

Residues in animal commodities

Citrus pulp and apple pomace can be fed to cattle and other livestock at up to 20% of the diet[8]. Given that significant residues of rescalure are not expected to occur in citrus or other tree crop by-products from the proposed use, residues are not expected in animal commodities.

Fat solubility and potential for bioaccumulation

The octanol/water partition coefficient (log K_{ow})[9] for rescalure is reported to be 5.3 at 25℃; therefore, rescalure is considered to be fat soluble and would preferentially partition into the fat portion of tissues. However, the active is being administered via a retrievable dispenser and is highly volatile and the exposure

[7] Organisation for Economic Co-operation and Development, *OECD EH&S Publications Guidance for Registration Requirements for Pheromones and Other Semiochemicals Used for Arthropod Pest Control*, 26 February 2002, OECD website, accessed 16 March 2022.

[8] Australian Pesticides and Veterinary Medicines Authority, *Commodities generally accepted as stockfood*, 20 July 2020, APVMA website.

[9] US EPA Office of Pesticide Programs, *California Res Scale Pheromone*, EPA website, accessed 17 March 2022.

to animals is expected to be extremely low; therefore, the potential for bioaccumulation is not considered significant.

Dietary risk assessment

No ADI or ARfD has been determined at this time noting residues in food (fruits) are unlikely to occur from the proposed use pattern. Therefore, the National Estimated Daily Intake (NEDI) and National Estimated Short-Term Intake (NESTI) calculations cannot be performed and are not required.

Recommendations

The following amendments to the MRL Standard are recommended in relation to the proposed use of CheckMate CRS:

Table 6: Amendments to the APVMA MRL Standard

Amendments to Table 5	
Substance	**Use**
Add:	
Rescalure	Pheromone

The following withholding period statement is proposed in conjunction with the above MRL Standard entry:

Withholding periods:

Not required when used as directed.

Assessment of overseas trade aspects of residues in food

The proposed use pattern is not likely to give rise to residues in crops that are distinguishable from those resulting from the natural presence of rescalure or other SCLPs and arthropod semiochemicals.

A MRL for rescalure is considered unnecessary for the use pattern considered here and none are established overseas.

The risk to trade resulting from the proposed use pattern of CheckMate CRS is expected to be low.

Work health and safety assessment

Health hazards

With regard to worker safety, the main hazard is potential eye irritation from exposure to the active constituent. QSAR data indicate that allergic reactions are also possible from skin contact with the active constituent.

Occupational exposure

Exposure during use

Workers are potentially exposed to the product from dermal and/or inhalation routes when opening the bucket and handling dispensers during 'hanging' on tree branches.

No worker exposure studies for CheckMate CRS were submitted for assessment. There is no validated model for assessing exposure from distribution of dispensers nor are there any repeat dose study NOAELs on the active constituent to undertake a formal risk assessment. Therefore, the APVMA adopted a qualitative assessment of potential risks. As the product is contained inside a plastic dispenser, any direct dermal exposure is largely prevented; therefore, acute risks (eye irritation and skin sensitisation) are considered negligible from handling dispensers.

Inhalation exposure is likely to be the main source of exposure to the active constituent. The applicant submitted a study which estimated potential air levels of rescalure from dispenser emissions in the field. The estimated maximum ambient air concentration of rescalure was 7.7 ng/m^3. For light activity (i.e. hanging dispensers), the APVMA estimated a worker may inhale 48 ng/day, equivalent to a dose of 0.0006 µg/kg bw/d for an 80 kg person. This dose provides a safety margin of 2500 when compared to the Cramer Class III TTC of 1.5 ug/kg bw/d. Therefore, no adverse health effects from inhalation exposure are expected for operators handling dispensers.

Exposure during re-entry or rehandling

As inhalation exposure would be expected to be no greater than that of operators during handling dispensers and residues on crop foliage/fruit are likely to be negligible, risks to crop maintenance workers during re-entry/rehandling are expected to be negligible.

Public exposure

The product is intended for professional use only. Therefore, risks from use are not relevant for the general public.

Although the product is not intended for use in the home garden, should a child manage to access and consume the total contents of a single dispenser, it is highly unlikely that a 70 mg (~5 mg/kg bw) dose of rescalure would result in poisoning.

Rescalure is relatively volatile, and the liquid product is fully contained inside the plastic device. As such, it is unlikely to result in residues on fruit. Therefore, exposure to rescalure residues in the diet from consumption of fruit from treated trees is unlikely.

Recommendations

Taking into consideration the potential toxicological hazard, use pattern and likelihood of exposure, the following safety directions and precautionary (warning) statements are recommended for the product label.

Safety directions

The FAISD Handbook is a consolidation of the reports prepared by the Australian Pesticides and Veterinary Medicines Authority (APVMA) up to the date of any amendment. Safety directions are product-specific (middle column of the safety direction entry) and apply regardless of scheduling considerations related to the product.

Table 7: New FAISD Handbook entry

Substance	Formulation	Statement codes
Rescalure	VP 750 g/L or less	161 162 140 141 (dispensers) 290 321 351

These statement codes translate into the following safety directions:

> Will irritate the eyes. Do not touch or rub eyes, nose or mouth with hands. When handling dispensers wear disposable gloves. Wash hands after use.

Precautionary (warning) statements

> Do not use from damaged, punctured, or unsealed containers.
>
> When handling spent dispensers, wear disposable gloves.

Environmental assessment

The APVMA follows OECD guidelines for pheromones and other semiochemicals.[10] The proposed use of Checkmate CRS involves passive vaporisation of rescalure into the air from fixed dispensers, which is considered to have negligible environmental exposure. Based on negligible environmental exposure and non-toxic mode of action of pheromones, there are no objections on efficacy or target crop safety grounds to the registration of the product CheckMate CRS, containing 70 g/dispenser rescalure, for use in mating disruption of California red scale (*Aonidiella aurantii*) in citrus and any other crops where this species may be a pest.

[10] Organisation for Economic Co-operation and Development, *Guidance for Registration Requirements for Pheromones and Other Semiochemicals Used for Arthropod Pest Control*, 26 February 2002, OECD website.

Efficacy and safety assessment

Proposed product use pattern

CheckMate CRS is a 70 mg/dispenser rescalure product based on the sex pheromone of California red scale, *Aonidiella aurantii,* to be used for mating disruption in citrus and other tree crops. The dispensers are to be placed across the orchard on branches in the inner part of the canopy at mid-height at a rate of 450 dispensers per hectare.

Efficacy and target crop safety

Mating disruption (MD) using sex attractant pheromones or analogues thereof has many advantages in pest management for those pests that are ecologically and behaviourally suited to it. It uses small quantities of low toxicity actives that are highly species-specific, so there are few environmental effects and little disruption of biological control, making it suitable for use in integrated pest management (IPM) strategies. CRS is a suitable target because the adult females are immobile MD has only recently become commercially available for this pest due to the complexity of the pheromone and it is now registered in the USA and EU.

MD products differ from conventional pesticides and these differences have important implications for the way in which their efficacy is assessed. For example, MD products are preventive rather than curative; they will not reduce damage from a current infestation but may reduce its reproductive potential, thus reducing damage in subsequent generations. Guidelines for conventional pesticides are generally less relevant for MD products and, while the APVMA does not have specific guidelines for MD products, there are suitable guidelines available from the EU (EPPO). The applicant submitted data from 6 Australian and 25 international trials, many of which were conducted in accordance with the EPPO guidelines.

Efficacy

Mating disruption may be a useful component of integrated pest management even when its efficacy is lower than that of conventional insecticides. It has numerous ecological advantages, is targeting a different life stage, and it is less vulnerable to the development of resistance. There is a good case for accepting lower standards of efficacy for mating disruption products when used in the context of IPM than would be required for a stand-alone treatment with an insecticide, provided grower expectations are managed through clear instructions on the label. In this application not all of the trials have provided unequivocal demonstrations of efficacy to the standards that would be required in commercial practice. However, most of them have demonstrated some level of efficacy and many of them showed efficacy comparable to or better than the standard treatments adopted by local growers. The label makes it clear that mating disruption should not be relied on as a stand-alone treatment, especially under high pest pressure. Therefore, it is believed that the level of efficacy that has been demonstrated justifies registration of the product.

Crop safety

No phytotoxicity was recorded at the recommended rate in any trial, which is consistent with a product that is not applied to the plant but diffused into the air. The total volume applied is only 31.5 g/ha and the product is

gradually released over several months. The estimated emission rate per dispenser is 0.2 mg/day, which at 450 dispensers/ha results in 90 mg/ha/day, and 110 mg/ha/day of all components. It is not known how much product is deposited on, or absorbed by, the trees but it is expected that most of the active ingredient will not directly contact the crop; therefore, phytotoxicity is unlikely to be a concern.

Recommendations

Trial data demonstrated that CheckMate CRS will be effective in reducing damage caused by California red scale in citrus when used as directed at the proposed label rate of 450 dispensers/ha. There are no objections on efficacy or target crop safety grounds to the registration of the product CheckMate CRS, containing 70 g/dispenser rescalure, for use in mating disruption of California red scale (*Aonidiella aurantii*) in citrus and any other crops where this species may be a pest.

Labelling requirements

Label name: CheckMate CRS

Signal headings: POISON

KEEP OUT OF REACH OF CHILDREN

READ SAFETY DIRECTIONS BEFORE OPENING OR USING

Constituent statements: 70 mg/dispenser (3S, 6R)-(3S, 6S)-3-methyl-6-isopropenyl-9-decen-1-yl acetate (rescalure)

Statement of claims: For use in mating disruption of California red scale (*Aonidiella aurantii*) in citrus and any other crops where this species may be a pest

Net contents: 1000 dispensers

Restraints: Do not use from damaged, punctured, or unsealed containers

Directions for use:

Table 8: Directions for use

Crop	Pest	Rate	Critical Comments
Citrus + Other tree crops	California red scale (*Aonidiella aurantii*)	450 dispensers/ha (31.5 g ai/ha)	DO NOT use from damaged, punctured, or unsealed containers. Apply the dispensers shortly before the onset of the first male flight being targeted. One application per year to be conducted in September-October. Distribute dispensers across the orchard to achieve the application rate. Apply dispensers to branches in the inner part of the canopy, at mid-height. Choose sturdy branches to secure placement. If there is a persistent and prevalent wind, the upwind edge may require reinforcement. Place monitoring traps in the treated area before handling. Monitor treatments carefully. Reseal containers immediately after use.

Not to be used for any other purpose or in any manner contrary to this label unless authorised under appropriate legislation.

Withholding periods:

Not required when used as directed.

General instructions:

This product only affects adult males of California red scale and will have no effect on females, eggs or juveniles. Monitor adequately the populations and conduct supplemental insecticide applications during the season if needed. The use of CheckMate CRS should always take place in the context of an Integrated Pest Management strategy. The use of other pest control measures may be necessary and should be based on proper pest monitoring and field scouting and timed accordingly to the use of adequate degree-day models.

Precaution:

Re-handling

When handling spent dispenser, wear disposable gloves.

Protections:

Protection of the environment

DO NOT contaminate streams, rivers, wetlands or watercourses with this product or used containers.

Storage and disposal:

Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Do not dispose of chemicals on site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush, or puncture and deliver empty packaging to an approved waste management facility. If an approved waste management facility is not available, bury the empty packaging 500 mm below the surface in a disposal pit specifically marked and set up for this purpose, clear of waterways, desirable vegetation and tree roots, in compliance with relevant local, state or territory government regulations. Do not burn empty containers or product.

Safety directions:

Will irritate the eyes. Do not touch or rub eyes, nose or mouth with hands. When handling dispensers wear disposable gloves. Wash hands after use.

First Aid instructions:

If poisoning occurs, contact a doctor or Poisons Information Centre. Phone Australia 13 11 26; New Zealand 0800 764 766. If in eyes wash out immediately with water.

First Aid warnings:

May cause allergy.

Acronyms and abbreviations

Shortened term	Full term
ac	Active constituent
ADI	Acceptable daily intake (for humans)
ai	Active ingredient
ARfD	Acute reference dose
d	Day
g	Gram
h	Hour
ha	Hectare
IPM	Integrated pest management
in vitro	Outside the living body and in an artificial environment
in vivo	Inside the living body of a plant or animal
kg	Kilogram
L	Litre
LC_{50}	Concentration that kills 50% of the test population of organisms
LD_{50}	Dosage of chemical that kills 50% of the test population of organisms
Log K_{OW}	Log to base 10 of octanol water partitioning co-efficient, synonym P_{OW}
mg	Milligram
mL	Millilitre
MRL	Maximum residue limit
NEDI	National estimated daily intake
NESTI	National estimated short-term intake
ng	Nanogram
NOAEL	No observed adverse effect level
PPE	Personal protective equipment
Q-value	Quotient-value
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons

Shortened term	Full term
TGA	Therapeutic Goods Administration
TGAC	Technical grade active constituent
TTC	Threshold of toxicological concern
WHP	Withholding period
w/w	Weight for weight

Glossary

Term	Description
Active constituent	The substance that is primarily responsible for the effect produced by a chemical product
Acute	Having rapid onset and of short duration
Carcinogenicity	The ability to cause cancer
Chronic	Of long duration
Efficacy	Production of the desired effect
Formulation	A combination of both active and inactive constituents to form the end use product
Genotoxicity	The ability to damage genetic material
Metabolism	The chemical processes that maintain living organisms
Toxicology	The study of the nature and effects of poisons
Weight for weight	The proportion of a substance within a mixture, measured by weight or mass