

**Generation of Pesticide
Residue Data for Pesticide
Minor Use Permit
Applications in Vegetable
Crops 2007 - Peracto**

Jane Floyed
Peracto Pty Ltd

Project Number: VG06162

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Horticulture Australia Ltd
Level 7
179 Elizabeth Street
Sydney NSW 2000
Telephone: (02) 8295 2300
Fax: (02) 8295 2399
E-Mail: horticulture@horticulture.com.au

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FINAL REPORT

Generation of pesticide residue data for minor use permit applications in vegetable crops 2007

Author: Phillip Frost B Agr Sc (Hons) *et al*

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Peracto Pty Ltd

ABN: 97 109 472 559

Head Office: 16 Hillcrest Road
Devonport, Tas 7310 Australia

Telephone: +61 3 6423 2044

Facsimile: +61 3 6423 4876

Email: reports@peracto.com

Web: www.peracto.com



Horticulture Australia Ltd Project VG06162

31 December 2008

Project Leader -

Jane Floyed
Peracto Pty Ltd
16 Hillcrest Road
Devonport Tasmania 7310
Ph: (03) 6423 2044
Fax: (03) 6423 4876
Email: jfloyed@peracto.com

Key Personnel -

Ian Macleod
Jane Floyed
Clare Crowther/Kate Allen
Andrew Woodcock
David Kohler
Elizabeth Fields/Ryan Blackney
Chris Monsour
Stephen Tancred
Scott Winner

Manager – GLP Test Facility
Project Leader
Study Director
Administration contact
Study Person – Peracto Tasmania
Study Person – Peracto Victoria
Study Person – Peracto Bowen
Study Person – Peracto Stanthorpe
Principal Investigator – AgriSolutions Analytical

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Media Summary

In Australia, before an agrichemical product can be sold or used, the Australian Pesticides and Veterinary Medicines Authority (APVMA) must first register it. In order for a manufacturer to register a product they are required to submit a comprehensive data package to the APVMA. The costs for generating and collating such data are high and unfortunately many horticultural crops are too small individually for agrichemical manufacturers to bear the high cost of registering products for use. As a result, horticulturalists are often placed in situations where they risk severe crop losses from insects, weeds and diseases. On the other hand, they risk buyers rejecting their produce and other penalties if they are detected using products that are not registered.

The need to gain minor-use permits and new registrations has come about due to loss of some agrichemicals and/or uses due to chemical reviews and product rationalisation. Horticultural produce must meet minimum standards relating to quality, safety and consumer expectation. Quality Assurance programs, dealing with the whole production process including agrichemical use, residues, and withholding periods, demand that growers only exercise Good Management Practices. The introduction of new and emerging crops, pesticide resistance, integrated pest management, the continual vigilance of horticultural industries for improved agrichemical choices and the disinclination of manufacturers to register for minor crops led to the need for this project.

The APVMA's National Permit System adds some flexibility to the lengthy registration process and legalises the availability of products for minor-use purposes, not specified on the product label. However, off-label permits issued by the APVMA still must be applied for along with information/data that verifies that the permitted use will be effective and will not have any harmful effects on humans, the crops or the environment.

A total of 25 residue trials were conducted, during the 2007-08 year, in specified regions throughout Australia. All the data from this project will be submitted to the APVMA together with the relevant Applications for Permits/Permit Renewals.

Technical Summary

This project generated pesticide residue data in a range of vegetable crops to support minor-use permit applications to the APVMA. The list of studies undertaken and completed is as follows:

Study ID	Problem	Crop	Product	Active	No. Sites
AVG367	Alternaria, Cercospora & White Blister	Radish & Swede	Dithane Rainshield Neo Tec	mancozeb	3
AVG439	Grass weeds	Rhubarb	Select 240 EC	clethodim	2
HAL1352	Various diseases	Silverbeet, Spinach, Endive & Chicory	Walabi SC	chlorothalonil + pyrimethanil	6
HAL1530	Grasses including winter grass	Parsnip	Select 240 EC	clethodim	2
HAL1544	Helicoverpa spp.	Sweet corn	Prodigy 240 SC	methoxyfenozide	3
HAL1545	Two-spotted mites	Sweet corn	Vertimec 18 EC	abamectin	2
HAL1547	Weeds as per the label	Celeriac	Gesagard 500 SC	prometryn	3
HAL1626	Powdery mildew	Silverbeet	Flint 500 WG	trifloxystrobin	2
HAL1627	Powdery mildew	Silverbeet	Score 250 EC	difenoconazole	2

The formulations of the pesticides used in the studies were as follows:

Product name	Active ingredient (ai)	Concentration of active ingredient	Formulation	Source
Dithane Rainshield Neo Tec	mancozeb	750 g a.i./kg	Suspension Concentrate	Bayer CropScience Pty Ltd
Select 240 EC	clethodim	240 g a.i./L	Emulsifiable Concentrate	Sumitomo Chemical Australia Pty Ltd
Walabi SC	chlorothalonil + pyrimethanil	375 g a.i./L + 150 g a.i./L	Suspension Concentrate	Bayer CropScience Pty Ltd
Prodigy 240 SC	methoxyfenozide	240 g a.i./L	Suspension Concentrate	Dow AgroSciences Australia Ltd
Vertimec 18 EC	abamectin	18 g a.i./L	Emulsifiable Concentrate	Syngenta Crop Protection Pty Ltd
Gesagard 500 SC	prometryn	500 g a.i./L	Suspension Concentrate	Syngenta Crop Protection Pty Ltd
Flint 500 WG	trifloxystrobin	500 g a.i./kg	Water Dispersible Granule	Bayer CropScience Pty Ltd
Score 250 EC	difenoconazole	250 g a.i./kg	Emulsifiable Concentrate	Syngenta Crop Protection Pty Ltd

The field investigation phases of these studies were conducted using Peracto Pty Ltd's Standard Operating Procedures, which comply with the OECD Principles of Good Laboratory Practice Number 1 (revised 1997), Paris 1998 and Number 13, June 2002, GLP Facility No: 14609. All specimens were analysed by AgriSolutions Australia at their laboratory at Deception Bay in Brisbane, Facility No: 14951.

Introduction

In Australia, before an agrichemical product can be sold or used, the (APVMA) must first register it. In order for a manufacturer to register a product they are required to submit a comprehensive data package to the APVMA. The costs for generating and collating such data are high and unfortunately many horticultural crops are too small individually for agrichemical manufacturers to bear the high cost of registering products for use. As a result, horticulturalists are often placed in situations where they risk severe crop losses from insects, weeds and diseases. On the other hand, they risk buyers rejecting their produce and other penalties if they are detected using products that are not registered.

The need to gain minor-use permits and new registrations has come about due to loss of some agrichemicals and/or uses due to chemical reviews and product rationalisation. Horticultural produce must meet minimum standards relating to quality, safety and consumer expectation. Quality Assurance programs, dealing with the whole production process including agrichemical use, residues, and withholding periods, demand that growers only exercise Good Management Practices. The introduction of new and emerging crops, pesticide resistance, integrated pest management, the continual vigilance of horticultural industries for improved agrichemical choices and the disinclination of manufacturers to register for minor crops has led to the need for this project.

The selective use of chemicals to control pests, weeds and diseases plays an important role in increasing production, improving the quality of Australia's horticultural crops and enabling growers to earn reasonable returns on their investments. At the same time, today's health conscious society is extremely sensitive to issues relating to chemical use and it is essential that consumers be protected by adequate regulations governing the use of agrichemicals.

The APVMA's National Permit System adds some flexibility to the lengthy registration process and legalises the availability of products for minor-use purposes, not specified on the product label. However, off-label permits issued by the APVMA still must be applied for along with information/data that verifies that the permitted use will be effective and will not have any harmful effects on humans, the crops or the environment.

In early 2000, the vegetable industry undertook a national approach to permits by working with industry generated 'wishlists' for new pesticide uses, but this led to congestion in the Australian Pesticide & Veterinary Management Authority (APVMA) system and dissatisfaction amongst growers and grower groups. This was in part due to widespread duplication of the requests made for permits in the absence of a truly co-ordinated system and concern over the priority assessment for each pesticide. This approach was also unable to give relevant priority to new pesticide technologies and available Integrated Pest Management (IPM) friendly pesticides that were outside the industry's experience.

A new approach to address the current and future pesticide requirements for horticultural crops has been developed using the Strategic Agrichemical Review Process (SARP). This approach had the benefit of IPM compatibility, where possible, improved scope for resistance management, sound biological profile and residue and trade acceptance domestically and for export.

This review process provides the vegetable industry with sound pesticide options for the future that the industry can pursue for registration with the manufacturer, or minor-use permits with APVMA for clearly identified crop protection needs, many of which will also assist the expansion of effective IPM strategies. All of the studies in this tender have been identified through the SARP.

A total of 25 residue trials were conducted, during the 2007-08 year, in specified regions throughout Australia. All the data from this project will be submitted to the APVMA together with the relevant Applications for Permits/Permit Renewals.

Materials and Methods

The field investigation phases of these studies were conducted using Peracto Pty Ltd's Standard Operating Procedures, which comply with the OECD Principles of Good Laboratory Practice Number 1 (revised 1997), Paris 1998 and Number 13, June 2002, GLP Facility No: 14609. All specimens were analysed by AgriSolutions Australia at their laboratory at Deception Bay in Brisbane, Facility No: 14951.

The formulations of the pesticides used in the studies were as follows:

Product name	Active ingredient (ai)	Concentration of active ingredient	Formulation	Source
Dithane Rainshield Neo Tec	mancozeb	750 g a.i./kg	Suspension Concentrate	Bayer CropScience Pty Ltd
Select 240 EC	clethodim	240 g a.i./L	Emulsifiable Concentrate	Sumitomo Chemical Australia Pty Ltd
Walabi SC	chlorothalonil + pyrimethanil	375 g a.i./L + 150 g a.i./L	Suspension Concentrate	Bayer CropScience Pty Ltd
Prodigy 240 SC	methoxyfenozide	240 g a.i./L	Suspension Concentrate	Dow AgroSciences Australia Ltd
Vertimec 18 EC	abamectin	18 g a.i./L	Emulsifiable Concentrate	Syngenta Crop Protection Pty Ltd
Gesagard 500 SC	prometryn	500 g a.i./L	Suspension Concentrate	Syngenta Crop Protection Pty Ltd
Flint 500 WG	trifloxystrobin	500 g a.i./kg	Water Dispersible Granule	Bayer CropScience Pty Ltd
Score 250 EC	difenoconazole	250 g a.i./L	Emulsifiable Concentrate	Syngenta Crop Protection Pty Ltd

The list of trials undertaken and completed is as follows:

Study ID	Problem	Crop	Product	Active	State
AVG367	Alternaria, Cercospora & White Blister	Radish	Dithane Rainshield Neo Tec	mancozeb	VIC
		Swede			TAS
		Radish			QLD
AVG439	Grass weeds	Rhubarb	Select 240 EC	clethodim	TAS
					QLD
HAL1352	Various diseases	Silverbeet	Walabi SC	chlorothalonil + pyrimethanil	TAS
		Silverbeet			QLD
		Spinach			QLD
		Endive			VIC
		Spinach			VIC
		Chicory			VIC
HAL1530	Grasses including winter grass	Parsnip	Select 240 EC	clethodim	TAS
					VIC
HAL1544	Helicoverpa spp.	Sweet corn	Prodigy 240 SC	methoxyfenozide	QLD
					QLD
					TAS
HAL1545	Two-spotted mites	Sweet corn	Vertimec 18 EC	abamectin	QLD
					QLD
HAL1547	Weeds as per the label	Celeriac	Gesagard 500 SC	prometryn	TAS
					QLD
					VIC
HAL1626	Powdery mildew	Silverbeet	Flint 500 WG	trifloxystrobin	QLD
					TAS
HAL1627	Powdery mildew	Silverbeet	Score 250 EC	difenoconazole	TAS
					QLD

Results and Discussion

For each study, a GLP compliant field trial report and analytical report, to GLP standard, was prepared. The results are summarised below.

HAL1545 – Determination of the levels of abamectin in sweet corn following two (2) applications of Vertimec 18 EC applied as a foliar spray at 31 and 3 days before harvest

This study was conducted at two field sites; Bowen, Queensland and Stanthorpe, Queensland. The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing	
1	Untreated control	Nil	N/A	N/A	Cobs & foliage	3DALA
2	Vertimec 18 EC	abamectin	8.1	31 & 3DBH	Cob	3, 5, 7 & 10DALA
					Foliage	3 & 10DALA

DBH = Days Before Harvest

DALA = Days After Last Application

Residues of abamectin in the treated corn cob samples taken at 10DALA were less than the Limit of Quantitation (LOQ).

Residues of abamectin in the treated corn foliage samples taken at 10DALA were less than the LOQ.

AVG439 – Determination of the level of clethodim residues in rhubarb following one (1) application of Select 240 EC applied as a foliar spray at 63 days before harvest

This study was conducted at two sites; Moriarty, Tasmania and Mt Tamborine, Queensland. The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	56DALA
2	Select 240 EC	clethodim	120	63DBH	63DALA

DBH = Days Before Harvest

DALA = Days After Last Application

Residues of clethodim in the treated rhubarb stem samples taken at harvest ranged from 0.04 to 0.02 mg/kg.

HAL1352 – Determination of the level of chlorothalonil + pyrimethanil residues in spinach, chicory, endive and silverbeet following two (2) applications of Walabi SC applied as a foliar spray at 8 and 1 days before harvest

This study was conducted at six field sites; Northdown, Tasmania, two sites in Bowen, Queensland and three sites in Werribee, Victoria.

The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	1DALA
2	Walabi SC	chlorothalonil + pyrimethanil	750 + 300	8 & 1DBH	0, 1, 3 & 7DALA

DBH = Days Before Harvest

DALA = Days After Last Application

Residues of chlorothalonil in the treated spinach samples taken 7 days after the last application ranged from 0.41 to 1.39 mg/kg and residues of pyrimethanil 7DALA ranged from 0.25 to 0.01 mg/kg.

Residues of chlorothalonil in the treated endive samples taken 7 days after the last application ranged from 1.01 to 6.56 mg/kg and residues of pyrimethanil 7DALA ranged from 0.21 to 1.34 mg/kg.

The residue level of chlorothalonil in the treated chicory sample taken 7 days after the last application was 4.37 mg/kg and the residue level of pyrimethanil 7DALA was 1.06 mg/kg.

HAL1530 – Determination of the level of clethodim residues in parsnips following 1 application of Select 240 EC applied as a foliar spray at 7 days before harvest

This study was conducted at two field sites; Merseylea, Tasmania and Devon Meadows, Victoria.

The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	7DALA
2	Select 240 EC	clethodim	120	7DBH	0, 7 & 14DALA

DBH = Days Before Harvest

DALA = Days After Last Application

Residues of clethodim in the treated parsnip samples taken 14DALA ranged from 0.06 to 0.14 mg/kg.

HAL1627 – Determination of the levels of difenoconazole residues in silverbeet following two (2) applications of Score 250 EC applied as a foliar spray 17 and 7 days before harvest

This study was conducted at two sites; Northdown, Tasmania and Bowen, Queensland.
The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	7DALA
2	Score 250 EC	difenoconazole	125	17 & 7DBH	0, 7, 10 & 14DALA

DBH = Days Before Harvest
DALA = Days After Last Application

Residues of difenoconazole in the treated silverbeet samples taken 14DALA ranged from 0.02 to 0.03 mg/kg.

HAL1547 – Determination of the levels of prometryn residues in celeriac following one application of Gesagard 500 SC applied as a soil spray up to 4 weeks after transplanting

This study was conducted at three sites; East Sassafras, Tasmania, Applethorpe, Queensland and Werribee, Victoria.

The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	Commercial harvest
2	Gesagard 500 SC	prometryn	350	up to 28DAT	Commercial harvest

DAT = Days After Transplanting

Residues of prometryn in the treated celeriac samples taken at harvest were less than the LOQ.

HAL1626 – Determination of the level of trifloxystrobin residues in silverbeet following three (3) applications of Flint 500 WG applied as a foliar spray 21, 14 and 7 days before harvest

This study was conducted at two sites; Northdown, Tasmania and Bowen, Queensland.
The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./100 L)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	0DALA
2	Flint 500 WG	trifloxystrobin	7.5	21, 14 & 7DBH	0, 3, 7 & 14DALA

DBH = Days Before Harvest
DALA = Days After Last Application

Residues of trifloxystrobin in the treated silverbeet samples taken at 14DALA ranged from 0.01 mg/ha to less than the LOQ.

HAL1544 – Determination of the levels of methoxyfenozide residues in sweet corn following three (3) applications of Prodigy 240 SC at 15, 8 and 1 days before harvest

This study was conducted at three sites; Bowen, Queensland, Laidley, Queensland and Leith, Tasmania. The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (g a.i./ha)	Application Timing	Sample Timing	
1	Untreated control	Nil	N/A	N/A	Cobs & foliage	0DALA
2	Prodigy 240 SC	methoxyfenozide	408	15, 8 & 1DBH	Cob	0, 1, 3 & 7DALA
					Foliage	0, 1 & 7DALA

DBH = Days Before Harvest

DALA = Days After Last Application

Residues of methoxyfenozide in the treated corn cob samples taken at 7DALA ranged from 0.01 mg/kg to less than the LOQ.

Residues of methoxyfenozide in the treated corn foliage samples taken at 7DALA ranged from 4.18 to 7.25 mg/kg.

AVG367 – Determination of the level of mancozeb residues in radish, swede or turnip following four (4) applications of Dithane Rainshield Neo Tec applied as a foliar spray at 35, 28, 21 and 14 days before harvest

This study was conducted at three sites; Werribee, Victoria, Riana, Tasmania and Dalveen, Queensland. The treatment information and sample timings were as follows:

Treatment No.	Test Item	Active Ingredient	Rate Applied (kg a.i./ha)	Application Timing	Sample Timing
1	Untreated control	Nil	N/A	N/A	7DALA
2	Dithane Rainshield Neo Tec	mancozeb	1.65	35, 28, 21 & 14DBH	7, 14 & 21DALA

DBH = Days Before Harvest

DALA = Days After Last Application

Residues of mancozeb in the treated radish samples taken at 21DALA ranged from 0.02 to 0.04 mg/ha. The residue level of mancozeb in the treated swede sample taken at 21DALA was 0.01 mg/ha.

Technology Transfer

The results from these trials will be used in permit applications/renewals to the APVMA as detailed below. AgAware Consulting Pty Ltd will notify the relevant interested parties upon issue/renewal of permits.

Problem	Crop	Product	Active	Permit Application/Renewal
Alternaria, Cercospora & White Blister	Radish & Swede	Dithane Rainshield Neo Tec	mancozeb	Minor Use/Emergency Use Permit Application
Grass weeds	Rhubarb	Select 240 EC	clethodim	Permit renewal – Category 20
Various diseases	Silverbeet, Spinach, Endive & Chicory	Walabi SC	chlorothalonil + pyrimethanil	Minor Use/Emergency Use Permit Application
Grasses including winter grass	Parsnip	Select 240 EC	clethodim	Permit renewal – Category 20
Helicoverpa spp.	Sweet corn	Prodigy 240 SC	methoxyfenozide	Minor Use/Emergency Use Permit Application
Two-spotted mites	Sweet corn	Vertimec 18 EC	abamectin	Minor Use/Emergency Use Permit Application
Weeds as per the label	Celeriac	Gesagard 500 SC	prometryn	Permit renewal – Category 20
Powdery mildew	Silverbeet	Flint 500 WG	trifloxystrobin	Minor Use/Emergency Use Permit Application
Powdery mildew	Silverbeet	Score 250 EC	difenoconazole	Minor Use/Emergency Use Permit Application

Recommendations

None applicable at this time.

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