

CEM Analytical Services Ltd
CEMR-3334
PAGE 1 OF 17

FINAL REPORT

STUDY TITLE: TO INVESTIGATE THE PHYTOTOXIC EFFECTS OF VECCID ON POT ROSES, PETUNIAS AND TOMATOES

STUDY NUMBER: CEMS-3334

REPORT NUMBER: CEMR-3334

STUDY DIRECTOR: K.Hutcheson
(based at Test Facility) Kerry.hutcheson@cemas.co.uk

TEST FACILITY: CEM Analytical Services Limited (CEMAS)
Glendale Park, Fernbank Road
North Ascot, Berkshire
SL5 8JB, UK

SPONSOR'S MONITOR: Yacine Faid
YBFaid@SPTEC.com

SPONSOR'S ADDRESS: SPTEC
147 Avenue Paul Doumer
92500 Rueil Malmaison
FRANCE

REPORTING DATE: 15 May 2007

TABLE OF CONTENTS

	Page
GEP COMPLIANCE STATEMENT	3
ARCHIVING STATEMENT	3
FINAL REPORT DISTRIBUTION.....	3
STUDY DATES	4
REPORT REVIEWERS	4
1 SUMMARY	5
2 OBJECTIVE.....	6
3 MATERIALS	6
3.1 Test Item	6
4 METHODOLOGY	6
4.1 Test system	6
4.2 Replication	6
4.3 Application	7
4.4 Assessments.....	7
4.5 Environmental conditions.....	7
5 RESULTS	7
6 DATA ANALYSIS	9
7 OBSERVATIONS	9
8 CONCLUSIONS	10
APPENDIX 1: STUDY PLAN.....	11
APPENDIX 2: STUDY PLAN AMENDMENT	16
APPENDIX 3: GEP CERTIFICATE	17

GEP COMPLIANCE STATEMENT

Study Title: To Investigate the phytotoxic effects of Veccid on pot roses, petunias and tomatoes

Study Number: CEMS-3334

Report Number: CEMR-3334

I, the undersigned, hereby declare that the work was carried out under my direction and that this report presents a true and accurate reflection of the results obtained. I confirm that this study was conducted under CEM Analytical Services certification for 'Official Recognition of Efficacy Testing Facilities or Organisations' in compliance with Commission Directive 93/71/EEC and the requirements of Good Experimental Practice. However, the content of active ingredients in the test item as supplied by the Sponsor has not been confirmed and compliance under GEP cannot be claimed for this information. I also confirm that CEMAS holds a current UK GEP Compliance certificate issued by the Pesticide Safety Directorate on 11 August 2003 and an inspection carried out on 03 December 2003.

K. Hutcheson
K. Hutcheson
Study Director

15 May 2007
Study Completion Date

ARCHIVING STATEMENT

The originals of non-study specific raw data for this study and a copy of the Final Report will be retained in the GLP Archive of CEMAS. Study-specific raw data will be retained for ten years. After completion of the Study, the test items will be disposed of after the expiry date.

FINAL REPORT DISTRIBUTION

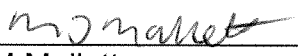
Original Copy
PDF and Word Electronic copies (signed)

CEMAS Archive
Sponsor

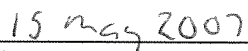
STUDY DATES

Study Initiation Date: 27 March 2007
Test Item Receipt Date: 06 March 2007
Experimental Start Date (Plants sprayed): 02 April 2007
Experimental Completion Date: 30 April 2007


REPORT REVIEWERS



M Mallett
Responsible Officer



Date



J Oliver-Kang
Section Manager



Date

1 SUMMARY

This study was set up to assess the phytotoxic effects of a 1% Veccid solution (diluted in deionised water) applied as an aerosol spray on pot roses, petunias and tomatoes. Veccid is a combination of organic chemical compounds contained in botanically and bio-chemically defined aromatic essences extracted by steam distillation from plants and trees.

A hand held pressurised sprayer was held at a distance of around 10cm away from the plant and sprayed for either three or five seconds. Each treatment was replicated three times. When the plants had dried they were transferred to a Controlled Environment (C.E.) Room and kept at $20 \pm 5^{\circ}\text{C}$. Sodium vapour lamps provided illumination on a 16h/8h light dark photoperiod. Assessments of phytotoxicity (deformations, percentage chlorosis and necrosis) were made three times a week for four weeks following spraying. The only phytotoxic effect seen was necrosis where the spray had landed on the leaves and/or flowers. There was no evidence of chlorosis or any plant deformations (e.g. curling or rolling of leaves, stunting, elongation).

Mean percentage necrosis on pot roses, petunias and tomatoes four weeks after application of a 1% solution of Veccid

Plant	Treatment	Mean % necrosis 4 weeks after application ¹
Pot roses	Control	0
	3 second spray	4
	5 second spray	13.3
Petunias	Control	0
	3 second spray	0.7
	5 second spray	1.3
Tomatoes	Control	0
	3 second spray	16.7
	5 second spray	30.0

¹ Estimated as a percentage of the plant affected, compared against the control treatment.

Tomatoes were the worst affected by the Veccid spray, followed by pot roses and then petunias. On the pot roses necrosis initially was seen on the flowers where the spray had landed, and then on the younger leaves. On the tomatoes necrotic spots were seen on the leaves where the spray had landed. There seemed to be no systemic effects.

2 OBJECTIVE

This study was set up to assess the phytotoxic effects of the novel insecticide Veccid on pot roses, petunias and tomatoes.

3 MATERIALS

3.1 Test Item

Test Item:	Veccid
Packaging / Dispensation:	Liquid form
Reanalysis Date:	Not supplied
Batch / Lot No.:	Not supplied
Storage Policy:	Test items are retained as required and conditions recorded in departmental raw data, at least until the expiry date of the batch. After this date they are returned to the Sponsor or disposed of, by arrangement with the Sponsor.
Test rates:	Negative control (untreated) Three second spray exposure of 1%* Veccid solution Five second spray exposure of 1%* Veccid solution

* 7.8292g of Veccid as supplied made up to 783.01g with deionised water.

Test items are retained until at least the expiry date. On agreement with the Sponsor they will then be returned to the Sponsor or disposed of in an appropriate manner.

4 METHODOLOGY

4.1 Test system

Pot roses (Variety "Mixed"), petunias (variety "Double Red") and tomatoes (variety "Moneymaker") were used as the test system. Tomatoes were supplied by Syngenta, Jealotts Hill, UK; and the pot roses and petunias were obtained from Bourne End Garden Centre, Buckinghamshire, UK. Three days before being used in the study, tomatoes were transplanted into 4" pots in a 50:50 soil:compost mix, and the pot roses and petunias were grown in medium as supplied (multi-purpose compost) in 6" and 4" pots respectively. At the time of application the pot roses were fully grown, the petunias had 4-6 side branches and the tomatoes had 5-6 side branches.

4.2 Replication

There were three replicate plants per treatment. Plants were held individually in pots,

4.3 Application

Treatments were applied to the plants by holding the pressurised hand held sprayer approximately 10cm away and spraying for either three or five seconds.

4.4 Assessments

Chlorosis and necrosis effects as well as any other visible deformations were assessed three times a week for four weeks. An estimated percentage of the plant affected was recorded and compared against the control group of plants.

4.5 Environmental conditions

The test was maintained in a controlled environment (CE) room with the following recorded conditions-

Illumination: Set on a 16-hour light/8-hour dark cycle and recorded as a mean of 7547.5 lux (range 6400 – 8900 lux).

Air temperature: Monitored continuously using IceSpy (Comark)
Range 15 – 25°C.

Humidity: Humidity was not recorded as per Study Plan. This was not seen to have an impact on the integrity of the study. Ambient conditions of humidity were used.

5 RESULTS

Assessments of phytotoxicity (deformations, percentage chlorosis and necrosis) were made three times a week for four weeks following spraying. The only phytotoxic effect seen was necrosis where the spray had landed on the leaves and/or flowers. There was no evidence of chlorosis or any plant deformations (e.g. curling or rolling of leaves, stunting, elongation).

Key: A, B, C – First, Second and Third assessments for each week

Table 1: Percentage of plant affected by necrosis on pot roses at each assessment:

Group	Rep	Wk 1/A	Wk 1/B	Wk 1/C	Wk 2/A	Wk 2/B	Wk 2/C
Control	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0
3 sec	1	0	2	2	2	2	2
	2	5	5	5	5	5	5
	3	2	5	5	5	5	5
	Mean	2.3	4.0	4.0	4.0	4.0	4.0
5 sec	1	10	15	15	20	20	20
	2	5	5	5	5	5	5
	3	10	15	15	15	15	15
	Mean	8.3	11.7	11.7	13.3	13.3	13.3

Group	Rep	Wk 3/A	Wk 3/B	Wk 3/C	Wk 4/A	Wk 4/B	Wk 4/C
Control	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0
3 sec	1	2	2	2	2	2	2
	2	5	5	5	5	5	5
	3	5	5	5	5	5	5
	Mean	4.0	4.0	4.0	4.0	4.0	4.0
5 sec	1	20	20	20	20	20	20
	2	5	5	5	5	5	5
	3	15	15	15	15	15	15
	Mean	13.3	13.3	13.3	13.3	13.3	13.3

Phytotoxic effects on pot roses did not increase from the first assessment in week 2.

Table 2: Percentage of plant affected by necrosis on petunias at each assessment:

Group	Rep	Wk 1/A	Wk 1/B	Wk 1/C	Wk 2/A	Wk 2/B	Wk 2/C
Control	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0
3 sec	1	0	0	0	0	0	0
	2	0	0	0	0	0	1
	3	0	1	1	1	1	1
	Mean	0.0	0.3	0.3	0.3	0.3	0.7
5 sec	1	0	1	1	2	2	2
	2	0	1	1	1	1	1
	3	0	0	0	0	1	1
	Mean	0.0	0.7	0.7	1.0	1.3	1.3

Group	Rep	Wk 3/A	Wk 3/B	Wk 3/C	Wk 4/A	Wk 4/B	Wk 4/C
Control	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0
3 sec	1	0	0	0	0	0	0
	2	1	1	1	1	1	1
	3	1	1	1	1	1	1
	Mean	0.7	0.7	0.7	0.7	0.7	0.7
5 sec	1	2	2	2	2	2	2
	2	1	1	1	1	1	1
	3	1	1	1	1	1	1
	Mean	1.3	1.3	1.3	1.3	1.3	1.3

Phytotoxic effects on petunias did not increase from the first assessment in week 2.

Table 3: Percentage of plant affected by necrosis on tomatoes at each assessment:

Group	Rep	Wk 1/A	Wk 1/B	Wk 1/C	Wk 2/A	Wk 2/B	Wk 2/C
Control	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0
3 sec	1	2	10	10	10	10	10
	2	5	10	20	20	20	20
	3	5	20	20	20	20	20
	Mean	4.0	13.3	16.7	16.7	16.7	16.7
5 sec	1	40	40	40	40	40	40
	2	30	30	30	30	30	30
	3	20	20	20	20	20	20
	Mean	30.0	30.0	30.0	30.0	30.0	30.0

Group	Rep	Wk 3/A	Wk 3/B	Wk 3/C	Wk 4/A	Wk 4/B	Wk 4/C
Control	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0
3 sec	1	10	10	10	10	10	10
	2	20	20	20	20	20	20
	3	20	20	20	20	20	20
	Mean	16.7	16.7	16.7	16.7	16.7	16.7
5 sec	1	40	40	40	40	40	40
	2	30	30	30	30	30	30
	3	20	20	20	20	20	20
	Mean	30.0	30.0	30.0	30.0	30.0	30.0

Phytotoxic effects on tomatoes did not increase from the third assessment in week 1.

6 DATA ANALYSIS

No data analysis was needed for this study.

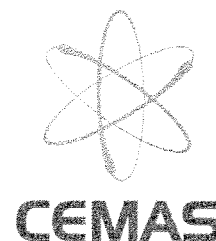
7 OBSERVATIONS

The formulation was not soluble in water – when water was added to the Veccid it formed two separate layers with the formulation on the top. When shaken, the majority of the formulation formed an emulsion with the exception of brown particles, which remained on the surface of the spray solution. When sprayed onto the plants (all three species) coverage was in individual droplets i.e. no wetting achieved.

8 CONCLUSIONS

Necrosis was the only phytotoxic effect seen after the application of a 1% Veccid spray solution, and this was only seen where the spray had landed on the leaves and/or flowers. Petunias were less damaged than either the pot roses or tomatoes. After the third assessment in Week 1 there was little change in the percentage necrosis recorded on tomatoes, petunias or pot roses, suggesting that Veccid does not have any systemic effects.

APPENDIX 1: STUDY PLAN



Page 1 of 5

STUDY PLAN

CEM Study Title: To investigate the phytotoxic effects of Veccid on pot roses, petunias and tomatoes

CEM Study Number: CEMS-3334

Study Director: (based at Test Facility) K Hutcheson
Kerry.hutcheson@cemas.co.uk

Test Facility: CEM Analytical Services Limited (CEMAS)
Glendale Park
Fernbank Road
North Ascot
Berkshire
SL5 8JB, UK
www.cemas.co.uk

Sponsor's Monitor: Yacine Faid
YBFaid@SPTEC.com

Sponsor's Address: SPTEC
147 Avenue Paul Doumer
92500 Rueil Malmaison
France

CEM Study Number: CEMS-3334

page 2 of 5

1) Statement of purpose

To assess the phytotoxic effects of the novel insecticide Veccid on pot roses, petunias, and tomatoes.

2) Statement of Compliance

The study will not be carried out to GLP, but under CEM Analytical Services certification for "Official Recognition of Efficacy Testing Facilities or Organisations " in compliance with Commission Directive 93/71/EEC and the requirements of Good Experimental Practice (GEP).

3) Data Recording and Retention

All raw data recorded directly for this study will be recorded in study notebooks or data sheets bearing the study number. Data pertaining to culture maintenance, medium preparation and environmental records will be recorded on pro-forma data sheets. Temperature records from the Comark ICESPY temperature logger will be in the form of computer printouts.

The study notebooks and authenticated copies of the relevant pro-forma data sheets will be included in the study file assigned to this study. On completion all facility documentation relevant to the study will be retained at CEMAS and will be kept in a study file retained or stored in a secure archive at CEM Analytical Services Ltd, Glendale Park, Fernbank Road, North Ascot, Berkshire, SL5 8JB.

The study plan and the original study-specific raw data will be returned to the Sponsor on completion of the Study and acceptance of the final report.

4) Location of Study and Responsibilities

The study will be conducted at CEM Analytical Services Limited (CEMAS), Glendale Park, Fernbank Road, North Ascot, Berkshire, SL5 8JB, UK.

The Study Director at CEMAS (K Hutcheson) has overall responsibility for the conduct of this study.

5) Test Items

The test item and any safety information will be supplied by the Sponsor:

CEM Study Number: CEMS-3334

page 3 of 5

Test Item:	Veccid
Packaging / Dispensation:	Liquid form
Reanalysis Date:	Not supplied
Batch / Lot No.:	Not supplied
Storage Policy:	Test items are retained as required and conditions recorded in departmental raw data, at least until the expiry date of the batch. After this date they are returned to the Sponsor or disposed of, by arrangement with the Sponsor.
Test rates:	Negative control, three second spray exposure or five second spray exposure

Characterisation of the test items remains the responsibility of the Sponsor.

The samples of test items received will be retained by CEMAS until at least the expiry date. On agreement with the Sponsor they will then be returned to the Sponsor or disposed of in an appropriate manner.

6) Test System

Pot roses, petunias and tomatoes grown in multipurpose compost.

7) Methodology

The plants will be grown individually in pots, and will be treated when at a suitable Growth Stage e.g. 4 leaves. VECCID diluted in deionised water (shaken before use) at 10% will be sprayed onto the plants for a burst of 3-5 seconds around 10cm away from the plant. Formulation will be shaken prior to use.

7.1) Replication

Three replicate plants will be used.

7.2) Assessments

The chlorosis and necrosis effects as well as any other visible deformations will be recorded three times a week until plant death up to a maximum of four weeks. SOP CEM-3239 (based on the EPPO Guidelines) will be followed for making these assessments of phytotoxicity.

8) Location of Experimental Phase of the Study

The experimental phase of this study will be conducted at CEMAS.

CEM Study Number: CEMS-3334

page 4 of 5

9) Environmental Conditions

The study will be conducted in a controlled environment room at $20 \pm 2^{\circ}\text{C}$ and sodium vapour lamps will provide illumination – 16h/8h light dark photoperiod.

Air temperature and relative humidity will be recorded using a data logger and light intensity (LUX) readings will be taken once a week.

10) Data Analysis

Suitable procedures (e.g. t-test, or Dunnetts test) will be used for this analysis if applicable.

11) Study Report

The test report will contain, but not be limited to, the following information:

- Test substance - chemical identification data.
- Source of plants
- Type of test vessels used.
- Rates tested.
- Number of replicates tested.
- Adverse effects and events.
- Raw data including necrosis and chlorosis assessments.
- Results of the statistical analysis of the data if appropriate.
- Recorded environmental conditions.

12) Study Timetable

Proposed experimental start date: March 2007

Proposed completion date: April 2007

Proposed draft report date: May 2007

13) Reference

EPPO guidelines in EPPO Standards, Guidelines for the efficacy evaluation of plant protection products, Volume 1 Introduction, General and Miscellaneous Guidelines, New and Revised Guidelines. PP 1/135(2) Phytotoxicity assessment

CEM Study Number: CEMS-3334

page 5 of 5

14) Authorisations

Study Director: K. Hutcheson 19 March 2007
K Hutcheson Date
(CEMAS)

Authorisation: A R Jutsum 19 March 2007
on behalf of A R Jutsum Date
CEMAS (CEMAS)

Study Acceptance: Yacine Faid 21 March 2007
by Sponsor's Monitor Yacine Faid Date
(SPTEC)

15) Distribution of Study Plan:

Original: Study Director K Hutcheson

Copies: Sponsor (SPTEC) Yacine Faid

16) Study Report Distribution

Original: Yacine Faid

Copies: CEMAS Ecotoxicology Unit
CEMAS Archive

APPENDIX 2: STUDY PLAN AMENDMENT

Study Number: CEMS-3334
Amendment No.1
Page 1 of 1

Amendment No 1

Study Number: CEMS-3334 **Sponsor Ref:**
Study Title: To investigate the phytotoxic effects of Veccid on pot roses, petunias and tomatoes
Reference: **Page Number:** **Various** **Section Number:** **Various**
Amendment: **6) Test System**
Pot roses, petunias and tomatoes grown in multipurpose compost medium as supplied. This will be recorded in the raw data.
7) Methodology
VECCID diluted in deionised water (shaken before use) at 40% 1% will be sprayed onto the plants for a burst of either 3 or 5 seconds around 10cm away from the plant.
10) Environmental Conditions
The study will be conducted in a controlled environment room at $20 \pm 2.5^{\circ}\text{C}$.

Reason: To update the study plan.
Impact on Study: Positive impact on scientific integrity and validity of the study.

Signature Study Director K. Hutcheson **Date:** 30 March 2007

Signature Management M. Marsh **Date:** 30 March 07

Distribution:
Original Study Director
Copies Study Monitor

APPENDIX 3: GEP CERTIFICATE



Certificate of

Official Recognition of Efficacy Testing Facilities or Organisations in the United Kingdom

This certifies that

CEM Analytical Services Ltd. (CEMAS)

complies with the minimum standards laid down in
Commission Directive 93/71/EEC for efficacy testing.

The above Facility/Organisation has been officially
recognised as being competent to carry out efficacy trials/tests
in the United Kingdom in the following categories:

Agriculture/Horticulture

Stored Crops

Date of issue 11 August 2003
Effective date 11 July 2003
Expiry date 10 July 2008

Signature

Authorised signatory

Certification Number

ORETO 172



an Executive Agency of DEFRA

Department of Agriculture
and Rural Development