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**IR-4 Ornamental Horticulture Program
Ametoctradin + Dimethomorph Crop Safety**

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**Acknowledgements
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Abstract

Orvego, registered with EPA on May 21, 2012 is a combination of ametoctradin (FRAC 45) and dimethomorph (FRAC 40). In 2012, IR-4 started testing Orvego (ametoctradin + dimethomorph) for safety on several ornamental horticulture crops as part of the new fungicide and bactericide crop safety project. In 2013, BASF recommended only finishing ongoing research activities due to observations of very little injury across crops. From 2012 through 2014, the IR-4 Project completed 22 trials on 9 ornamental plant genera or species examining phytotoxicity related to primarily drench applications. No injury or grow reduction was observed for any tested crop.

Introduction

Orvego, registered with EPA on May 21, 2012 is a combination of ametoctradin (FRAC 45) and dimethomorph (FRAC 40). In 2012, IR-4 started testing Orvego (ametoctradin + dimethomorph) for safety on several ornamental horticulture crops as part of the new fungicide and bactericide crop safety project. In 2013, BASF recommended only finishing ongoing research activities due to observations of very little injury across crops. From 2012 through 2014, the IR-4 Project completed 22 trials on 9 ornamental plant genera or species examining phytotoxicity related to primarily drench applications.

Materials and Methods

Orvego was tested primarily as a drench application applied once. However, one researcher applied 3 times at monthly intervals. A minimum of six plants (replicate treatments) were required. Phytotoxicity was planned to be recorded on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill), although one research used a 1 to 10 scale instead. Phytotoxicity was rate 7 days after each application. For testing, the following protocols were used: 12-011 and 13-011. Please visit <http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm> to view and download these protocols.

Orvego was supplied to 5 researchers (See list of researchers in Appendix 1) by BASF.

Results and Summary

Based on the type and nature of injury seen with pesticide applications, tested plant species were placed into three categories: 1) no significant phytotoxicity or growth differences from the untreated check or any injury was transitory, 2) no or minimal transitory injury seen at the 1X rate, but the 2X and/or 4X rates did cause significant phytotoxicity, 3) Significant injury sufficient to recommend growers not utilize Orvego.

Phytotoxicity

Across all plant species tested, Orvego exhibited no or minimal negative impact (Table 1) on 3 plant genera or species fell into this category. No crops exhibited significant injury (Table 3). There are 6 species or genera where less than 3 trials were conducted for either foliar or drench applications so there is not enough information available at this time (Table 4).

Please see Table 5 for a summary of the individual trial results.

Table 1. List of Orvego treated crops with no or minimal transitory injury.

Calibrachoa sp.
Osteospermum sp.
Petunia sp.

Table 2. List of Orvego treated crops with no injury at 1X but significant injury at 2X or 4X.

None

Table 3. List of Orvego treated crops with significant injury at 1X.

None

Table 4. List of Orvego treated crops where more information is needed.

<i>Antirrhinum majus</i>	<i>Pseudotsuga menziesii</i>
<i>Lantana sp.</i>	<i>Rhododendron sp. (azalea)</i>
<i>Pelargonium x hortorum</i>	<i>Rhododendron sp. (rhododendron)</i>

Table 5 Detailed Summary of Crop Safety Testing with Orvego

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 5/8/2015 are listed below.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
30899	Snapdragon (<i>Antirrhinum majus</i>) 'Montego Mix'	Greenhouse	Grunwald	OR	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal; all plants marketable.
30899	Snapdragon (<i>Antirrhinum majus</i>) 'Rocket White'	Greenhouse	Catlin	NY	2014	Drench	No injury or significant growth reduction with 14, 28 and 56 oz per 100 gal.
30900	Calibrachoa (<i>Calibrachoa</i> sp.) <i>C. x hybrida</i> 'Cabaret Lavender'	Greenhouse	Hausbeck	MI	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30900	Calibrachoa (<i>Calibrachoa</i> sp.) 'Minifamous Orange'	Greenhouse	Grunwald	OR	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal; all plants marketable.
30900	Calibrachoa (<i>Calibrachoa</i> sp.) 'Minifamous Red'	Greenhouse	Grunwald	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal; all plants saleable.
30907	Shrub Verbena (<i>Lantana</i> sp.) 'Chapel Hill Sunny Side Up'	Greenhouse	Catlin	NY	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30907	Shrub Verbena (<i>Lantana</i> sp.) <i>L. camara</i> 'Confetti'	Greenhouse	Grunwald	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal; all plants saleable.
30909	African Daisy (<i>Osteospermum</i> sp.)	Greenhouse	Williams	IL	2013	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal applied 3 times at monthly intervals.
30909	African Daisy (<i>Osteospermum</i> sp.)	Greenhouse	Williams	IL	2013	Foliar	No injury or growth reduction with 14, 28 and 56 oz per 100 gal applied 3 times at monthly intervals.
30909	African Daisy (<i>Osteospermum</i> sp.) 'Akila Purple'	Greenhouse	Hausbeck	MI	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30909	African Daisy (<i>Osteospermum</i> sp.) 'Copper Purple'	Greenhouse	Grunwald	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal; all plants saleable.
30909	African Daisy (<i>Osteospermum</i> sp.) 'Copper Purple'	Greenhouse	Grunwald	OR	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal; all plants marketable.
30909	African Daisy (<i>Osteospermum</i> sp.) <i>O. ecklonis</i> 'Summertime Blueberry'	Greenhouse	DeFrancesco	OR	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30910	Geranium (<i>Pelargonium</i> sp.) 'Orbit White'	Greenhouse	Catlin	NY	2013	Drench	No significant injury or growth reduction with 14, 28 and 56 oz per 100 gal.
30911	Petunia (<i>Petunia</i> sp.)	Greenhouse	Hausbeck	MI	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30911	Petunia (<i>Petunia</i> sp.) 'Carpet Blue Sky'	Greenhouse	Catlin	NY	2013	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30911	Petunia (<i>Petunia</i> sp.) 'Single Wave Purple'	Greenhouse	Grunwald	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal; all plants saleable.
30912	Fir, Douglas (<i>Pseudotsuga menziesii</i>)	Greenhouse	DeFrancesco	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.

30912	Fir, Douglas (<i>Pseudotsuga menziesii</i>)	Greenhouse	Grunwald	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal; all plants saleable.
30913	Azalea (<i>Rhododendron</i> sp.) 'Hino Crimson'	Greenhouse	DeFrancesco	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.
30914	<i>Rhododendron</i> (<i>Rhododendron</i> sp.) <i>R. catawbiense</i> 'Album'	Greenhouse	Grunwald	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 oz per 100 gal; all plants saleable.
30914	<i>Rhododendron</i> (<i>Rhododendron</i> sp.) 'Vulcan'	Greenhouse	DeFrancesco	OR	2012	Drench	No injury or growth reduction with 14, 28 and 56 fl oz per 100 gal.

Label Suggestions

In this report, 3 species or genera exhibited minimal or no injury after foliar and/or drench treatments of Orvego.

Calibrachoa sp.

Osteospermum sp.

Petunia sp.

Appendix 1: Contributing Researchers

Dr. Nora Catlin	Cornell Cooperative Extension Suite 100 423 Griffing Ave Riverhead, NY 11901
Dr. Joe DeFrancesco	Oregon State University 2040 Cordley Hall Corvallis, OR 97331
Dr. Nik Grunwald	Horticultural Crops Research Lab USDA-ARS 3420 NW Orchard Ave. Corvallis, OR 97330
Dr. Mary Hausbeck	Michigan State University Dept. of Plant Pathology 140 Plant Pathology Building East Lansing, MI 48824
Mr. David Williams	University of Illinois PLS. 1201 S. Dornier Urbana, IL 61801