http://ir4.rutgers.edu/Ornamental/ornamentalSummaryReports.cfm

IR-4 Ornamental Horticulture Program
V-10336 (Flumioxazin + Pyroxasulfone) Crop Safety

Authors: Ely Vea and Cristi L. Palmer
Date: March 14, 2016

Acknowledgements
Susan Bierbrunner
Diane Infante

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2015-34383-23710 with substantial cooperation and support from the State Agricultural Experiment Stations and USDA-ARS.

Table of Contents

Table of Tables

Abstract

Between 2013 and 2015, IR-4 conducted 24 trials evaluating V-10366 76WG (flumioxazin + pyroxasulfone) for crop safety. The data contained in this report was generated to register the use of V-10366 on and around ornamental horticulture plants with directed spray applications. The rates tested were 0.35, 0.71 and 1.42 pounds active ingredient per acre (lb ai per A) as the 1X, 2X and 4X rates.

V-10366 was applied to twenty-three (23) plant species or genera. One genus (*Cornus* spp.) exhibited no or minimal transient injury in at least 3 trials. None of the tested species exhibited injury or growth reduction at either the 2X or 4X rate. Similarly, no species exhibited damage sufficient to recommend growers not utilize V-10366 as a directed spray treatment for pre-emergent weed control at the rates tested. All crops evaluated showed no injury or growth reduction, but have only been screened in 1 trial; hence further testing is required before a conclusion can be made confirming crop safety on these crops.

Introduction

Non-phytotoxic and effective residual control of broadleaved weeds and grasses in the production of woody perennials can be problematic because nurseries grow many different types of plants, and not all genera or species are listed on labels. Some weeds may also be difficult to control in landscape settings for the same reason. Between 2013 and 2015, the IR-4 Project has conducted 24 trials evaluating V-10336 76WG as directed spray applications on and around ornamental horticulture plants. The data contained in this summary report were generated to help register the use of V-10366.

Materials and Methods

One directed spray application of V-10366 was made at rates of 0.35, 0.71 and 1.42 lb ai per acre, plus a water treated control. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. Phytotoxicity was recorded using a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill) at approximately 1, 2, and 4, weeks after application. Plant size was also evaluated for several species at the time of the first application and again at the time of the last evaluation. The protocol used was 13-022. For more detailed materials and methods, please see Protocols at http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm.

V-101336 was supplied to researchers (See list of researchers in Appendix 1) by Valent.

Results and Summary

Phytotoxicity

Based on the type and nature of injury seen with flumioxazin + pyroxasulfone applications in the research conducted between 2013 and 2015, tested plant species were placed into four 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 this product, and 4) more data is needed to make informed recommendations.

In testing from 2013 to 2015, V-10336 76WG exhibited no or minimal negative impact on one plant genus (Table 1). None of the tested species exhibited injury or growth reduction at either the 2X or 4X rate (Table 2). Similarly, no species exhibited damage sufficient to recommend growers not utilize V-10336 as a directed spray treatment for pre-emergent weed control at the rates evaluated (Table 3). All crops evaluated showed no injury or growth reduction, but have only been screened in 1 trial; hence further testing is required before a conclusion can be made confirming crop safety on these crops (Table 4).

Please see Table 5 for a list of research and the summary of the results received for research conducted with V-10336 76WG.

Table 1. List of V-10233 76WG and V-10336 61.5WG treated crops with no or minimal transitory injury.

Cornus spp.
C. florida
C. sp.

Table 2. List of V-10233 76WG and V-10336 61.5WG treated crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity

None

Table 3. List of V-10233 76WG and V-10336 61.5WG treated crops exhibiting significant injury at 1X

None

Table 4. List of V-10233 76WG and V-10336 61.5WG treated crops with no or minimal transitory injury where more research is needed to clarify response.

Acer palmatum
Acer rubrum
Aesculus sp.
Betula alba
Betula nigra
Cercis occidentalis
Crataegus viridis
Eucalyptus henkelii
Fraxinus americana
Gingko biloba
Juglans nigra
Picea abies
Pinus strobus
Platanus racemosa
Populus deltoides
Prunus laurocerasus
Prunus pendula
Quercus rubra
Rhododendron sp.
Salix sp.
Taxus cuspidate

Table 5. Detailed Summary Crop Safety Testing with V-10233 76WG and V-10336 61.5WG.

Notes: Table entries are sorted by crop Latin name. Only those reports received by 3/14/2016 are included.

PR#	Product (Active ingredients)	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
31555	V-10233 76WG (Flumioxazin + pyroxasulfone)	Maple (Acer sp.) A. rubrum	Field Container	Beste/Frank (NER)	MD	2013	Directed	No significant injury or growth reduction with 0.35 and 0.71, slight with 1.42 lb ai per acre applied once; no marketability reduction.
31548	V-10233 76WG (Flumioxazin + pyroxasulfone)	Birch (Betula sp.) B. nigra	Field Container	Beste/Frank (NER)	MD	2013	Directed	No significant injury or growth reduction with 0.35, 0.71 and 1.42 lb ai per acre applied once; no marketability reduction.
31551	V-10233 76WG (Flumioxazin + pyroxasulfone)	Dogwood (Cornus sp.) C. florida	Field Container	Beste/Frank (NER)	MD	2013	Directed	Commercially acceptable injury with 0.36, 0.71 and 1.42 lb ai per acre; no reduction in growth or marketability.
31551	V-10233 76WG (Flumioxazin + pyroxasulfone)	Dogwood (Cornus sp.) C. florida	Field Container	Beste/Frank (NER)	MD	2015	Directed	No significant injury or growth reduction with 0.35, 0.71 and 1.42 lb ai per acre; no reduction in marketability.
31554	V-10233 76WG (Flumioxazin + pyroxasulfone)	Hawthorn (Crataegus sp.) C. viridis	Field Container	Beste/Frank (NER)	MD	2013	Directed	No significant injury or growth reduction with 0.36, 0.71 and 1.42 lb ai per acre; no reduction in marketability.
31547	V-10233 76WG (Flumioxazin + pyroxasulfone)	Ash (Fraxinus sp.) F. americana	Field Container	Beste/Frank (NER)	MD	2013	Directed	No significant injury or growth reduction with 0.36, 0.71 and 1.42 lb ai per acre; no reduction in marketability
30941	V-10233 76WG (Flumioxazin + pyroxasulfone)	Spruce (Picea sp.) P. abies	Field Container	Beste/Frank (NER)	MD	2015	Directed	No injury or significant growth reduction with 0.35, 0.71 and 1.42 lb ai per acre applied once; no marketability reduction.
30942	V-10233 76WG (Flumioxazin + pyroxasulfone)	Pine (Pinus sp.) P. strobus	Field Container	Beste/Frank (NER)	MD	2015	Directed	No injury or significant growth reduction with 0.35, 0.71 and 1.42 lb ai per acre applied once; no marketability reduction.
31557	V-10233 76WG (Flumioxazin + pyroxasulfone)	Aspen, Poplar (Populus sp.) P/ deltoides	Field Container	Beste/Frank (NER)	MD	2013	Directed	Slight, commercially acceptable injury with 0.36, 0.71 and 1.42 lb ai per acre; no reduction in growth or marketability.
31550	V-10233 76WG (Flumioxazin + pyroxasulfone)	Cherry (Non-Bearing) (Prunus sp.) P. laurocerasus ‘Otto Luyken’	Field Container	Beste/Frank (NER)	MD	2013	Directed	No significant injury or growth reduction with 0.36, 0.71 and 1.42 lb ai per acre; no reduction in marketability.
30875	V-10233 76WG (Flumioxazin + pyroxasulfone)	Azalea (Rhododendron sp.) 'Hino-crimson'	Field Container	Beste/Frank (NER)	MD	2015	Directed	Slight initial injury with complete recovery with 0.35, 0.71 and 1.42 lb ai per acre; no reduction in growth or marketability.
31592	V-10233 76WG (Flumioxazin + pyroxasulfone)	Yew, Japanese (Taxus cuspidata) 'Capitata'	Field Container	Beste/Frank (NER)	MD	2013	Directed	No injury or growth reduction with 0.36, 0.71 and 1.42 lb ai per acre; no reduction in marketability.
32707	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Maple (Acer sp.) A. palmatum	Field Container	Uber	CA	2013	Directed	No injury or growth reduction with 7.5, 15 and 30 oz per acre.

PR#	Product (Active ingredients)	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
31549	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Horse Chestnut (Aesculus sp.)	Field Container	Mathers (OSU)	OH	2013	Directed	No injury with 7.5, 15 and 30 oz per acre.
30859	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Barberry (Berberis sp.) B. thunbergii 'Rose Glow'	Field Container	Beste/Frank (NER)	MD	2015	Directed	No significant injury or growth reduction with 0.35, 0.71 and 1.42 lb ai per acre by the end of trial; no reduction in marketability.
32708	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Birch (Betula sp.) B. alba	Field Container	Uber	CA	2013	Directed	Minor injury with complete recovery at 7.5, 15 and 30 oz per acre; no growth reduction.
30860	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Boxwood (Buxus sp.) B. microphylla 'Winter Gem'	Field Container	Beste/Frank (NER)	MD	2015	Directed	No significant injury or growth reduction with 0.36, 0.71 and 1.42 lb ai per acre by the end of trial; no reduction in marketability
31558	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Red Bud, Western (Cercis reniformis) C. occidentalis	Field Container	Uber	CA	2013	Directed	Moderate injury with 7.5, 15 and 30 oz per acre; significant stunting at 2X.
32709	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Dogwood (Cornus sp.) 'Galilean'	Field Container	Mathers (OSU)	OH	2013	Directed	No injury with 7.5, 15 and 30 oz per acre.
31552	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Eucalypt, Australian Gum (Eucalyptus sp.) E. henkelii	Field Container	Uber	CA	2013	Directed	No injury or growth reduction with 7.5, 15 and 30 oz per acre.
31553	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Maidenhair Tree (Ginkgo biloba)	Field Container	Uber	CA	2013	Directed	Slight injury, no growth reduction with 7.5, 15 and 30 oz per acre.
31560	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Walnut, Black (Non-Bearing) (Juglans nigra)	Field Container	Mathers (OSU)	OH	2013	Directed	No injury with 7.5, 15 and 30 oz per acre.
31559	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Plane Tree, Sycamore (Platanus sp.) P. racemosa	Field Container	Uber	CA	2013	Directed	Slight injury, no growth reduction with 7.5, 15 and 30 oz per acre.
32710	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Cherry (Non-Bearing) (Prunus sp.) P. pendula 'Rosea'	Field Container	Mathers (OSU)	OH	2013	Directed	No injury with 7.5, 15 and 30 oz per acre.
31556	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Oak (Quercus sp.)	Field Container	Beste/Frank (NER)	MD	2015	Directed	No significant injury or growth reduction with 0.35, 0.71 and 1.42 lb ai per acre applied once; no marketability reduction.
31556	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Oak (Quercus sp.) Q. rubra'	Field Container	Mathers (OSU)	OH	2013	Directed	No injury with 7.5, 15 and 30 oz per acre.
31561	V-10336 61.5WG (Flumioxazin + pyroxasulfone)	Willow (Salix sp.) 'Prairie Cascade'	Field Container	Mathers (OSU)	OH	2013	Directed	No injury with 7.5, 15 and 30 oz per acre.

Label Suggestions

For V-10336 76WG, it is suggested that the following crop genus or species exhibiting no injury in the testing with directed applications be placed on the label.

Cornus spp.
Cornus florida
Cornus sp.

Appendix 1: Contributing Researchers

Dr. Ed Beste	University of Maryland LESREC – Salisbury Facility 27664 Nanticoke Road Salisbury, MD 21801
Dr. Ray Frank *(retired)*	6916 Boyers Mill Road New Market, MD 21774
Dr. Hannah Mathers	The Ohio State University Dept. Hort. and Crop Science 2001 Fyffe Ct. Columbus, OH 43210
Mr. Buzz Uber	Crop Inspection Service 31130 Hilltop Drive Valley Center, CA 92082