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

IR-4 Ornamental Horticulture Program
Pydiflumetofen + Fludioxonil Crop Safety

Authors: Cristi L. Palmer and Ely Vea
Date: January 13, 2017

Acknowledgements
Susan Bierbrunner

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

Pydiflumetofen + Fludioxonil is a new fungicide being developed by Syngenta for the control of foliar and soil-borne diseases oh ornamental horticulture crops. The IR-4 Project completed 19 crop safety trials on 18 ornamental horticulture plant species or genera during 2015 and 2016. In these trials, all 18 species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop; Syngenta can consider adding these to the label.

Introduction

Pydiflumetofen + Fludioxonil is a new fungicide being developed by Syngenta for the control of foliar and soil-borne diseases of ornamental horticulture crops. The IR-4 Project completed 19 crop safety trials on 18 ornamental horticulture plant species or genera during 2015 and 2016.

Materials and Methods

Pydiflumetofen + Fludioxonil was applied as foliar treatment typically 3 times at approximately 14 days intervals. The application rates were 27.8, 54.6 and 109.2 fl oz per 100 gal, plus a water treated control. A minimum of ten plants (replicate treatments) were required. Phytotoxicity was planned to be recorded on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill). Phytotoxicity was rated weekly up to 6 weeks after initial application. For IR-4 testing, the following protocols were used: 15-003 and 16-004. For more detailed materials and methods, including application rates for various products, please visit http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm to view and download these protocols.

Pydiflumetofen + Fludioxonil was supplied to researchers (See list of researchers in Appendix 1) by Syngenta.

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 at the 1X rate sufficient to recommend growers not utilize Pydiflumetofen + Fludioxonil, and 4) more data is needed to make informed recommendations.

Phytotoxicity

Across all crops tested, Pydiflumetofen + Fludioxonil exhibited no or minimal negative impact on all plant species or genera. However none of these crops had the minimum number of 3 tests for definitive conclusion of crop safety. There are 18 species or genera where less than 3 trials were conducted so there is not enough information available at this time (Table 4). All trials for each of these crops showed no or minimal, transitory phytotoxicity.

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

Table 1. List of Pydiflumetofen + Fludioxonil treated crops with no or minimal transitory injury.

None

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

None

Table 3. List of Pydiflumetofen + Fludioxonil treated crops with significant injury at 1X.

None

Table 4. List of Pydiflumetofen + Fludioxonil treated crops where more information is needed.

Alyssum sp. [1]
Antirrhinum majus [1]
Begonia sp. [2]
Calibrachoa sp. [1]
Chrysanthemum/Dendranthema x morifolium [1]
Coreopsis sp. [1]
Dianthus sp. [1]
Gerbera sp. [1]
Impatiens hawkeri [1]
Impatiens walleriana [1]
Lupinus sp. [1]
Osteospermum sp. [1]
Pelargonium x hortorum [1]
Petunia sp. [1]
Salvia sp. [1]
Verbena sp. [1]
Viola sp. [1]
Viola x wittrockiana [1]

[1] No injury in 1 trial
[2] No injury in 2 trials

Table 5 Detailed Summary of Crop Safety Testing with Pydiflumetofen + Fludioxonil.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 1/7/2017 are listed below.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32447	Madwort (Alyssum sp.) 'Snow Crystals'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32456	Snapdragon (Antirrhinum majus) 'Sonnet Mix'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32459	Begonia (Begonia sp.) B. semperflorens 'Bada Bing'	Greenhouse	Hausbeck	MI	2016	Foliar	No injury or growth reduction with 27.8, 55.6 and 111.2 fl oz per 100 gal applied 3 times.
32459	Begonia (Begonia sp.) 'Dragon Wing Red'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32455	Calibrachoa (Calibrachoa sp.) 'Kabloom Deep Blue'	Greenhouse	Bodine	NJ	2015	Foliar	No injury or growth reduction with 27.8, 54.6, and 109.2 fl oz per 100 gal applied 3 times.
32453	Hardy Mum (Chrysanthemum/Dendranthema x morifolium) 'Orange Blush'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32450	Tickseed (Coreopsis sp.) 'Nana'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32446	Pinks (Dianthus sp.) 'Diabunda Purple Picot'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32451	Transvaal Daisy (Gerbera sp.) 'Garvenia Sweet Honey'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury with 27.8 and 54.6, some leaf necrosis with 109.2 fl oz per 100 gal applied 3 times; decreased flowering and smaller leaf size at all rates.
32462	New Guinea Impatiens (Impatiens hawkeri) 'Super Sonic Purple'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury with 27.8, 54.6 and 109.2 fl oz per 100 gal for first 2 applications, some leaf yellowing after third application increasing with each rate.
32461	Garden Impatiens (Impatiens walleriana) 'Super XP Pink'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times; slight decrease in flowering.
32445	Lupine (Lupinus sp.) 'Gallery Blue'	Greenhouse	Freiberger	NJ	2016	Drench	No injury with 27.8, 54.6 and 109.2 fl oz per 100 gal at first 2 evaluations, last evaluation not done; no growth reduction.
32454	African Daisy (Osteospermum sp.) 'Asti Purple'	Greenhouse	Bodine	NJ	2015	Foliar	No injury or growth reduction with 27.8, 54.6, and 109.2 fl oz per 100 gal applied 3 times.
32458	Geranium, Zonal (Pelargonium x hortorum) 'Zonal Tango Orange'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury with 27.8 and 54.6, some leaf necrosis with 109.2 fl oz per 100 gal applied 3 times; slight to moderate reduction of leaf size and flowering increasing with rates.
32457	Petunia (Petunia sp.) 'Tritunia Blue'	Greenhouse	Bodine	NJ	2015	Foliar	No injury or growth reduction with 27.8, 54.6, and 109.2 fl oz per 100 gal applied 3 times.
32448	Sage (Salvia sp.) 'Evolution White'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32452	Vervain (Verbena sp.) 'Lanai Vintage Vodka'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth reduction with 27.8, 54.6 and 109.2 fl oz per 100 gal applied 3 times.
32460	Pansy (Viola sp.) 'Colossus Yellow'	Greenhouse	Freiberger	NJ	2016	Drench	No injury with 27.8, 54.6 and 109.2 fl oz per 100 gal at first 2 evaluations, last evaluation not done; no growth reduction.
32449	Garden Pansy (Viola x wittrockiana) 'Delta Orange Blotch'	Greenhouse	Bodine	NJ	2015	Foliar	No injury or growth reduction with 27.8, 54.6, and 109.2 fl oz per 100 gal applied 3 times.

Label Suggestions

In this report, all plants exhibited no or minimal injury after foliar treatments of Pydiflumetofen + Fludioxonil at 27.8, 54.6 and 109.2 fl oz per 100 gal, suggesting that this active ingredient is safe to ornamental horticulture crops. Given the lack of phytotoxicity across so many different plant species and genera, it is suggested that all the 18 plants in Table 4 (listed below) that showed no injury be placed on the Pydiflumetofen + Fludioxonil label if Syngenta has similar results on these crops. Or a general statement can be placed on the label such as 'has not been demonstrated to cause damage on various ornamental plant species according to labeled use instructions. Pydiflumetofen + Fludioxonil may be used on a wide number of crops, but must be tested on a limited portion of the crop prior to applying to the whole crop if the grower has no previous experience applying Pydiflumetofen + Fludioxonil to that crop'.

Alyssum sp.
Antirrhinum majus
Begonia sp.
Calibrachoa sp.
Chrysanthemum/Dendranthema x morifolium
Coreopsis sp.
Dianthus sp[1]
Gerbera sp.
Impatiens hawkeri
Impatiens walleriana
Lupinus sp.
Osteospermum sp.
Pelargonium x hortorum
Petunia sp.
Salvia sp.
Verbena sp.
Viola sp.
Viola x wittrockiana

Appendix 1: Contributing Researchers

Mr. Dave Bodine
Rutgers University
Cream Ridge Experiment Station
283 Rt. 539
Cream Ridge, NJ 08514

Mr. Tom Freiberger
Rutgers University
Cream Ridge Experiment Station
283 Rt. 539
Cream Ridge, NJ 08514

Dr. Mary Hausbeck
Mr. Blair Harlan
Michigan State University
Dept. of Plant Pathology
140 Plant Pathology Building
East Lansing, MI 48824
517-355-4534