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IR-4 Ornamental Horticulture Program
Fluopyram (ESP 715, Indemnify) Crop Safety

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Abstract

Fluopyram (ESP 715, Indemnify) is a new fungicide being developed by Bayer for the control of nematodes, needle cast diseases powdery mildew, *Fusarium*, *Botrytis, Sclerotinia, Corynespora*, leaf spots and other foliar diseases. The IR-4 Project completed 14 crop safety trials on 7 ornamental horticulture plant species or genera in 2016. One genera (*Begonia* sp.) exhibited damage sufficient to recommend growers not utilize Fluopyram. Insufficient data were obtained for other species or genera for a definitive conclusion on crop safety.

Introduction

Fluopyram (ESP 715) is a new fungicide being developed by Bayer for the control of nematodes, needle cast diseases powdery mildew, *Fusarium, Botrytis, Sclerotinia, Corynespora*, leaf spots and other foliar diseases. The IR-4 Project completed 14 crop safety trials on 7 ornamental horticulture plant species or genera in 2016.

Materials and Methods

Fluopyram (ESP 715) was applied as foliar treatment typically 3 times at approximately 14 days intervals. The application rates were 4.25, 8.5 and 17.1 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 protocol was used: 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.

Fluopyram (ESP 715) was supplied to researchers (See list of researchers in Appendix 1) by Bayer.

Results and Summary

Phytotoxicity

Based on the type and nature of injury seen with pesticide applications, 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 at the 1X rate sufficient to recommend growers not utilize Fluopyram and 4) more data is needed to make informed recommendations.

Across all crops tested with Fluopyram, no crop that exhibited no or minimal negative impact had the minimum number of 3 tests for definitive conclusion of crop safety. No species or genera exhibited significant injury at higher rates even though little or no injury was observed at lower rates (Table 2). One species tested exhibited damage sufficient to recommend growers not utilize Fluopyram (Table 3). There are 6 species or genera where less than 3 trials were conducted 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 Fluopyram (ESP 715) treated crops with no or minimal transitory injury.

None

Table 2. List of Fluopyram (ESP 715) treated crops with no injury at 1X but significant injury at 2X or 4X.

None

Table 3. List of Fluopyram (ESP 715) treated crops with significant injury at 1X.

Begonia sp.

Table 4. List of Fluopyram (ESP 715) treated crops where more information is needed.

Begonia semperflorens
Chamaerops humilis [1]
Coleus sp. [1]
Leucanthemum x superbum
Petunia hybrida
Zinnia elegans [2]

[1] No or minimal injury in 1 trial.
[2] No or minimal injury in 2 trials.

Table 5 Detailed Summary of Crop Safety Testing with Fluopyram (ESP 715).

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 2/27/18 are listed below.

PR #	Crop	Production Site	Researcher	State	Year	Application Type	Results
32591	Begonia (Begonia sp.) 'Ambassador White'	Greenhouse	Freiberger	NJ	2016	Drench	Moderate injury (leaves turning brown) with 4.25, 8.5 and 17.1 fl oz per 100 gal.
32591	Begonia (Begonia sp.) 'Ambassador White'	Greenhouse	Freiberger	NJ	2016	Foliar	Slight injury (browning at edges of leaves) with 4.25, 8.5 and 17.1 fl oz per 100 gal applied 3 times.
32591	Begonia (Begonia sp.) B. semperflorens 'Bada Bing'	Greenhouse	Hausbeck	MI	2016	Foliar	Slight injury (leaf and flower margin burn) with 4 and 8, moderate with 16 fl oz per 100 gal applied 3 times; no growth reduction.
32591	Begonia (Begonia sp.) 'Dragon Wing Red'	Greenhouse	Freiberger	NJ	2016	Drench	Moderate injury (leaf edges turning brown) with 4.25, 8.5 and 17.1 fl oz per 100 gal; slight to moderate growth reduction with 2X and 4X.
32591	Begonia (Begonia sp.) 'Dragon Wing Red'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury with 4.25 and 8.5, slight (browning at edges of leaves) with 17.1 fl oz per 100 gal applied 3 times.
32591	Begonia (Begonia sp.) 'Illumination Apricot'	Greenhouse	Freiberger	NJ	2016	Drench	Slight to severe injury (chlorosis and stunting) increasing with rates (4.25, 8.5 and 17.1 oz per 100 gal).
33068	Palm, Mediterranean Fan (Chamaerops humilis)	Field Container	Palmateer	FL	2016	Foliar	No injury or growth reduction with 4.25, 8.5 and 17.1 fl oz per 100 gal applied 3 times.
32594	Coleus, Flamenettle (Coleus sp.) 'Exhibition Magma'	Greenhouse	Freiberger	NJ	2016	Drench	No injury or growth reduction with 4.25, 8.5 and 17.1 fl oz per 100 gal.
32587	Daisy (Leucanthemum x superbum) 'Snowcap'	Field Container	Klett	CO	2016	Drench	No injury or growth reduction with 4.25, 8.5 and 17.1 fl oz per 100 gal.
32587	Daisy (Leucanthemum x superbum) 'Snowcap'	Field Container	Klett	CO	2016	Foliar	No injury with 4, 7 and 14 fl oz per 100 gal applied 3 times (7/13, 8/9, 8/23); moderate growth reduction.
32585	Petunia (Petunia hybrida) 'Shockwave Denim'	Greenhouse	Freiberger	NJ	2016	Drench	Moderate injury (leaves turning whitish brown) with 4.25, 8.5 and 17.1 fl oz per 100 gal; slight to moderate growth reduction.
32585	Petunia (Petunia hybrida) 'Shockwave Denim'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury with 4.25 and 8.5, slight (leaf spotting that became less visible and covered by new leaves) with 17.1 fl oz per 100 gal applied 3 times.
32586	Elegant Zinnia (Zinnia elegans) 'Dreamland Yellow'	Greenhouse	Freiberger	NJ	2016	Drench	No injury or growth reduction with 4.25, 8.5 and 17.1 fl oz per 100 gal.
32586	Elegant Zinnia (Zinnia elegans) 'Magellan Pink'	Greenhouse	Hand	OH	2016	Foliar	No injury with 4.25, 8.5 and 17.1 fl oz per 100 gal applied 3 times; increased plant width.

Appendix 1: Contributing Researchers

Mr. Tom Freiberger	Rutgers University Cream Ridge Experiment Station 283 Rt. 539 Cream Ridge, NJ 08514
Dr. Francesca Hand	Ohio State University Department of Plant Pathology 475C Kottman Hall Columbus, OH 43210
Dr. Mary Hausbeck	Michigan State University Department of Plant Pathology 140 Plant Pathology Building East Lansing, MI 48824
Dr. Jim Klett	Colorado State University Department of Horticulture and Landscape Architecture Fort Collins, CO 80423
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