



[Environment Horticulture Program Research Summaries](#)

IR-4 Environmental Horticulture Program Flutianil Crop Safety

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Abstract

Flutianil is a new fungicide being developed by Nichino for the control of powdery mildew on environmental horticulture crops. The IR-4 Project completed 21 crop safety trials on 12 environmental horticulture plant species or genera during 2018 to 2021. In these trials, 12 species or genera exhibited minimal or no injury. Three species or genera (*Gerbera jamesonii*, *Hydrangea macrophylla*, *Rosa sp*) exhibited minimal or no injury in 3 trials and 9 species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop. When first registered, it may be possible to include these in the list of crops with no known adverse impact.

Introduction

Flutianil is a new fungicide being developed by Nichino for the control of powdery mildew on environmental horticulture crops. The IR-4 Project completed 21 crop safety trials on 12 environmental horticulture plant species or genera during 2018 to 2021.

Materials and Methods

Flutianil was applied as foliar treatment typically 3 times at approximately 14 days intervals. The application rates were 6.4, 12.8 and 25.6 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: 18-006, 19-006, 20-011 and 21-011. For more detailed materials and methods, including application rates for various products, please visit <https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-researcher-resources/#Protocols> to view and download these protocols.

Flutianil was supplied to researchers (See list of researchers in Appendix 1) by Landis.

Results and Summary

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 Flutianil, and 4) more data are needed to make informed recommendations.

Phytotoxicity

Across all crops tested, Flutianil exhibited no or minimal negative impact on 12 plant species or genera. Three species (*Gerbera jamesonii*, *Hydrangea macrophylla*, *Rosa sp*) exhibited minimal or no injury in 3 trials (Table 1) and 10 species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop (Table 4). One species, *Saintpaulia ionantha*, showed no phytotoxicity on foliage but some phytotoxicity on open blooms.

Please see Table 6 for a summary of the individual trial results.

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

Gerbera sp. *Rosa sp.*²
Hydrangea macrophylla

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

None

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

None

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

*Begonia sp.*¹ *Vinca minor.*¹
*Calibrachoa sp.*² *Viola x wittrockiana*¹
*Coreopsis sp.*² *Zinnia sp.*
*Dahlia sp.*¹ *Zinnia violaceae*¹
*Hydrangea sp.*¹
Saintpaulia ionantha

¹ No injury in 1 trial

² No injury in 2 trials

Table 5. Average Crop Safety Rating after Foliar Applications of Gatten

Crop	Gatten (flutianil)
<i>Begonia sp.</i>	1.0 (1 - 1) n1
<i>Chrysanthemum sp.</i>	1.0 (1 - 1) n1
<i>Coreopsis sp.</i>	1.0 (1 - 1) n2
<i>Dahlia sp.</i>	1.0 (1 - 1) n1
<i>Gerbera sp.</i>	1.0 (1 - 1) n3
<i>Hydrangea sp.</i>	1.0 (1 - 1) n3
<i>Rosa sp.</i>	1.3 (1 - 2) n3
<i>Saintpaulia ionantha</i>	3.0 (3 - 3) n1
<i>Vinca sp.</i>	1.0 (1 - 1) n1
<i>Viola X wittrockiana</i>	1.0 (1 - 1) n1
<i>Zinnia sp.</i>	2.0 (1 - 3) n2

Average rating on a scale of 1 – 5 with 1 = 0 to about no injury and 5 = severe injury and mortality; minimum to maximum rating; number of trials. A rating of 3 or higher is considered commercially unacceptable.

Table 6. Detailed Summary of Crop Safety Testing with Flutianil.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 9/10/2021 are listed below.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results	Data Summary Link
33268	Begonia (Begonia sp.) B. x benariensis 'Whopper Rose Bronze Leaf'	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20181220a.pdf
33269	Calibrachoa (Calibrachoa sp.) 'Blue Legend'	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times.	20190618a.pdf
33269	Calibrachoa (Calibrachoa sp.) 'Kabloom Pink Deep'	Greenhouse	Vafaie	TX	2019	Foliar	Significant blanching due to high salinity of irrigation water may have masked phytotoxicity of treatments; no growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times.	20191118d.pdf
33270	Daisy/Chrysanthemum (Chrysanthemum sp.) Catharanthus roseus 'Jasoda Orange', 'Jasoda Yello	Field Container	Beckerman	IL	2020	Foliar	No injury and growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20210412a.pdf
33271	Tickseed (Coreopsis sp.) American Dream'	Field Container	Wade	SC	2018	Foliar	No injury with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly; all plants marketable.	20180904a.pdf
33274	Tickseed (Coreopsis sp.)	Field Container	Larson	WA	2021	Foliar	No injury with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20210916a.pdf
33272	Dahlia (Dahlia sp.) 'Figaro Mix'	Greenhouse	Freiberger	NJ	2019	Foliar	No injury with or growth reduction with 6.4, 12.8 and 25.6 fl oz per 100 gal applied 3 times.	20190618a.pdf
33273	Transvaal Daisy (Gerbera sp.)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20181220a.pdf
33273	Transvaal Daisy (Gerbera sp.) G. jamesonii Garvinea Sweet Series	Greenhouse	Koski	CO	2019	Foliar	No significant injury or growth reduction with 6.4, 12.8 and 25.6 fl oz per 100 gal applied 3 times to Garvinia Sweet Series cultivars 'Fiesta', 'Frost', 'Glow', 'Memories', and 'Sunset'.	20200714b.pdf
33273	Transvaal Daisy (Gerbera sp.) 'Jaguar Yellow'	Greenhouse	Vafaie	TX	2020	Foliar	No significant injury or growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20200908e.pdf
33274	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Baysal-Gurel	TN	2018	Foliar	No injury or growth reduction with Gatten at 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times. Powdery mildew efficacy at the high rates comparable to Mural.	20181029b.pdf
33274	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Fraelich	GA	2020	Foliar	No injury or significant growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times; all treated plants marketable.	20210816l.pdf

33274	Hydrangea (Hydrangea sp.) 'Nikko Blue'	Field Container	Wade	SC	2018	Foliar	No injury with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly; all plants marketable.	20180904a.pdf
33274	Hydrangea (Hydrangea sp.) 'Nikko Blue'	Field Container	Wade	SC	2018	Foliar	No injury with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly; all plants marketable.	20180904a.pdf
33274	Hydrangea (Hydrangea sp.)	Field Container	Larson	WA	2021	Foliar	No injury with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20210916a.pdf
33279	Rose (Rosa sp.) 'OSO Easy Double Red'	Field Container	Beckerman	IN	2020	Foliar	No significant injury with 6.4 and 12.8, minor leaf distortion with 25.4 fl oz per 100 gal applied 3 times biweekly; no growth reduction.	20210623d.pdf
33279	Rose (Rosa sp.) 'Oso Easy® Double Red'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20180926a.pdf
33279	Rose (Rosa sp.)	Greenhouse	Cheng	HI	2020	Foliar	No injury or growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly.	20210909a.pdf
33280	African Violet (Saintpaulia ionantha)	Greenhouse	Catlin	NY	2020	Foliar	No injury or growth reduction with 6.4, 12.8, and 25.4 fl oz per 100 gal applied 3 times. Moderate injury on flowers.	20210525d.pdf
33277	Periwinkle (Vinca sp.) Vinca minor	Greenhouse	Fraelich	GA	2021	Foliar	No injury or growth reduction with 6.4, 12.8 and 25.4 fl oz per 100 gal applied 3 times biweekly. All plants marketable.	20210524i.pdf
33282	Pansy, Large Flowering; Wittrock's Violet (Viola X wittrockiana) 'Matrix Yellow'	Greenhouse	Vafaie	TX	2020	Foliar	No significant injury or growth reduction with 6.4, 12.8 and 25.6 fl oz per 100 gal applied 3 times biweekly.	20200908f.pdf
33278	Zinnia (Zinnia sp.)	Greenhouse	Saha	MI	2021	Foliar	No significant injury with 3.2, 6.4 and 12.8 fl oz per 100 gal after 1st applic; minor and moderate after 2nd and 3rd applic. No significant growth reduction.	20210922b.pdf
33278	Zinnia (Zinnia sp.) Z. violaceae 'Zesty Fuschia'	Greenhouse	Koski	CO	2019	Foliar	No significant injury or growth reduction with 6.4, 12.8 and 25.6 fl oz per 100 gal applied 3 times.	20200714b.pdf

Label Suggestions

In this report, all plants, except one, exhibited no or minimal injury after foliar treatments of Flutianil at 6.4, 12.8 and 25.4 fl oz per 100 gal, suggesting that this active ingredient is safe to environmental horticulture crops. Given the lack of phytotoxicity across so many different plant species and genera, we suggest that all the 12 plants in Table 1 and Table 4 (listed below) that showed no injury be placed on the Flutianil label if Nichino 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 environmental plant species according to labeled use instructions. Flutianil 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 Flutianil to that crop'.

Begonia sp.

Calibrachoa sp

Catharansus roseus

Coreopsis sp.

Dahlia sp.

Gerbera jamesonii

Hydrangea macrophylla

Hydrangea sp.

Rosa sp.

Vinca sp.

Viola x wittrockiana

Zinnia violaceae

Appendix 1: Contributing Researchers

Dr. Fulya Baysal-Gurel	Tennessee State University Otis L. Floyd Research Center 472 Cadillac Lane McMinnville, TN 37110
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