



[Environment Horticulture Program Research Summaries](#)

IR-4 Environmental Horticulture Program Picarbutrazox Crop Safety

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**Acknowledgements
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Abstract

Picarbutrazox is a novel fungicide with a new mode of action being developed by Nisso America for the control of oomycete diseases such as *Bremia*, *Peronospora*, *Pseudoperonospora*, *Phytophthora* and *Pythium*. The IR-4 Project completed 27 crop safety trials on 12 environmental horticulture plant species or genera during 2018. In these trials, all 12 species or genera exhibited no or minimal injury. Three species or genera (*Impatiens hawkeri*, *Impatiens walleriana* and *Rosa* sp.) exhibited no injury in 3 trials, and 9 species or genera exhibited no or minimal injury in the limited number of trials (one or two) for each crop. Nisso America may consider including these to a future label.

Introduction

Picarbutrazox is a novel fungicide with a new mode of action being developed by Nisso America for the control of oomycetes disease such as *Bremia*, *Peronospora*, *Pseudoperonospora*, *Phytophthora* and *Pythium*. The IR-4 Project completed 27 crop safety trials on 12 environmental ornamental horticulture plant species or genera during 2018.

Materials and Methods

Picarbutrazox at 2 formulations (20WG and SC) was tested as foliar treatment typically three times at approximately 14 days interval. Picarbutrazox 20WG was applied at rates of 7.2, 14.4 and 28.8 oz per 100 gal, and Picarbutrazox SC at 13.6, 27.2 and 54.4 fl oz per 100 gal. A minimum of three plants (replicate treatments) were required with most researchers exceeding this minimum. Phytotoxicity was recorded on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill) one to four times from 1 to 6 weeks after initial application. For IR-4 testing, the following protocol was used: 18-006. 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 this protocol.

Picarbutrazox was supplied to researchers (See list of researchers in Appendix 1) by Nisso America.

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

Across all 12 crops tested, Picarbutrazox 20WG and SC exhibited no or minimal negative impact on all plant species or genera. Three species or genera (*Impatiens hawkeri*, *Impatiens walleriana* and *Rosa* sp.) exhibited no or minimal injury in 3 trials (Table 1), and 9 species or genera exhibited no or minimal injury in the limited number of trials (one or two) for each crop (Table 4).

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

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

Impatiens hawkeri
Impatiens walleriana
Rosa sp.

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

None

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

None

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

<i>Antirrhinum majus</i> ¹	<i>Rudbeckia hirta</i> ¹
<i>Aster</i> sp. ¹	<i>Salvia nemorosa</i> ¹
<i>Coleus</i> sp. ¹	<i>Salvia splendens</i> ¹
<i>Pelargonium x hortorum</i> ¹	<i>Viburnum</i> sp. ¹
<i>Potentilla</i> sp. ¹	

¹For these plants, the one or two trials presented here indicate no phytotoxicity or slight, transient injury, but these findings need to be confirmed.

Table 5 Detailed Summary of Crop Safety Testing with Picarbutrazox.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 2/28/2019 are listed below.

PR#	Product	Crop	ProductionSite	Researcher	State	Year	Application Type	Results
33289	Picarbutrazox 20WG	Garden Snapdragon (Antirrhinum majus)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33292	Picarbutrazox 20WG	Aster (Aster sp.) 'Pot and Patio Mix'	Field Container	Reding	OH	2018	Foliar	No injury or significant growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; all plants marketable.
33300	Picarbutrazox 20WG	Coleus, Flamenettle (Coleus sp.)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33296	Picarbutrazox 20WG	Impatiens, New Guinea (Impatiens hawkeri)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33295	Picarbutrazox 20WG	Impatiens, New Guinea (Impatiens hawkeri) 'Sonic Salmon'	Field Container	Reding	OH	2018	Foliar	No injury or significant growth reduction with 7.2, 14.4, suppressed growth and flowering with 28.8 oz per 100 gal after the 3rd aplic.; all plants marketable.
33295	Picarbutrazox 20WG	Impatiens, New Guinea (Impatiens hawkeri) 'Harmony Snow'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33294	Picarbutrazox 20WG	Buzzy Lizzy; Impatiens, Common Garden (Impatiens walleriana) 'Dazzler Orange'	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; plants flowered normally.
33293	Picarbutrazox 20WG	Buzzy Lizzy; Impatiens, Common Garden (Impatiens walleriana) 'Super Elfin XP Rose'	Field Container	Reding	OH	2018	Foliar	No injury or significant growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; all plants marketable.
33293	Picarbutrazox 20WG	Buzzy Lizzy; Impatiens, Common Garden (Impatiens walleriana) 'Rockapulco Purple'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33299	Picarbutrazox 20WG	Geranium, Zonal (Pelargonium x hortorum) 'Ringo 2000 Deep Red'	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; plants flowered normally.
33290	Picarbutrazox 20WG	Cinquefoil (Potentilla sp.) 'Happy Face Yellow'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33283	Picarbutrazox 20WG	Rose (Rosa sp.) 'Iceberg White'	Field Container	Uber	CA	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.

33285	Picarbutrazox 20WG	Black-Eyed Susan (Rudbeckia hirta) 'Denver Daisy'	Field Container	Reding	OH	2018	Foliar	No injury or significant growth reduction with 7.2, 14.4, suppressed growth and flowering with 28.8 oz per 100 gal after the 3rd aplic.; all plants marketable.
33288	Picarbutrazox 20WG	Woodland Sage (Salvia nemorosa) 'Blue Marvel'	Field Container	Reding	OH	2018	Foliar	No injury or significant growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; all plants marketable.
33288	Picarbutrazox 20WG	Woodland Sage (Salvia nemorosa) 'Maynight'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33286	Picarbutrazox 20WG	Scarlet Sage (Salvia splendens) 'Vista Red'	Field Container	Reding	OH	2018	Foliar	No injury or significant growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; all plants marketable.
33286	Picarbutrazox 20WG	Scarlet Sage (Salvia splendens) 'Vista Purple'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly.
33228	Picarbutrazox SC	Garden Snapdragon (Antirrhinum majus)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly.
33225	Picarbutrazox SC	Aster (Aster sp.) 'Wood's Purple'	Field Container	Wade	SC	2018	Foliar	No injury with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33219	Picarbutrazox SC	Coleus, Flamenettle (Coleus sp.)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly.
33220	Picarbutrazox SC	Impatiens, New Guinea (Impatiens hawkeri)	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction, all plants flowered normally, with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly.
33224	Picarbutrazox SC	Buzzy Lizzy; Impatiens, Common Garden (Impatiens walleriana) 'Dazzler Orange'	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly; plants flowered normally.
33221	Picarbutrazox SC	Geranium, Zonal (Pelargonium x hortorum) 'Ringo 2000 Deep Red'	Greenhouse	Freiberger	NJ	2018	Foliar	No injury or growth reduction with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly; plants flowered normally.
33227	Picarbutrazox SC	Cinquefoil (Potentilla sp.) 'Happy Face Yellow'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly.
33233	Picarbutrazox SC	Rose (Rosa sp.) 'Iceberg White'	Field Container	Uber	CA	2018	Foliar	No injury or growth reduction with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly.
33233	Picarbutrazox SC	Rose (Rosa sp.) 'Oso Easy® Double Red'	Field Container	Gu	TX	2018	Foliar	No injury or growth reduction with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly.
33232	Picarbutrazox SC	Arrowwood (Viburnum sp.) 'Sweet Viburnum'	Field Container	Wade	SC	2018	Foliar	No injury with 13.6, 27.2 and 54.4 fl oz per 100 gal applied 3 times biweekly; all plants marketable.

Label Suggestions

In this report, all 12 crops tested exhibited no or minimal injury after foliar treatments of Picarbutrazox 20WG was applied at rates of 7.2, 14.4 and 28.8 oz per 100 gal and Picarbutrazox SC at 13.6, 27.2 and 54.4 fl oz per 100 gal; these results suggest that this active ingredient is safe to environmental horticulture crops. Given the lack of phytotoxicity across many different plant species and genera, it is suggested that all the 12 plants in Table 1 and Table 4 (listed below) that showed no injury be placed on the Picarbutrazox label if Nisso America 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 when used according to labeled use instructions. Picarbutrazox 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 Picarbutrazox to that crop’.

Antirrhinum majus

Aster sp.

Coleus sp.

Impatiens hawkeri

Impatiens walleriana

Pelargonium x hortorum

Potentilla sp.

Rosa sp.

Rudbeckia hirta

Salvia nemorosa

Salvia splendens

Viburnum sp.

Appendix 1: Contributing Researchers

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