



[Environment Horticulture Program Research Summaries](#)

IR-4 Environmental Horticulture Program Mefentrifluconazole Crop Safety

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Abstract

Avelyo (mefentrifluconazole) is a fungicide developed by BASF that has been registered for use since May 2020. It is used for the control of diseases such as anthracnose, powdery mildew, leaf spot, scab, rust, and blight of environmental horticulture crops. The IR-4 Project has completed 59 crop safety trials on 25 environmental horticulture plant species or genera during 2019 to 2021. This summary contains data across all reports available through IR-4 since 2019.

Twenty-five species or genera exhibited no or minimal injury after drench or foliar treatments of Mefentrifluconazole. Eight of the tested plants exhibited no injury across multiple trials, while the remaining 17 plants showed the same with less than 3 trials. All twenty-five species or genera could be added to the label based on this data, provided that BASF has similar results.

Introduction

Avelyo (mefentrifluconazole) is a fungicide developed by BASF for the control of diseases such as anthracnose, powdery mildew, leaf spot, scab, rust, and blight of environmental horticulture crops. The IR-4 Project completed 59 crop safety trials on 25 environmental horticulture plant species or genera during 2019 to 2021.

Materials and Methods

Avelyo was applied as a foliar treatment typically 3 times at approximately 14 days intervals or as a single drench treatment. The application rates were 3, 6, and 12 fl oz per 100 gal for foliar sprays or 7.2, 14.4, and 28.8 fl oz per 100 gal for drench applications 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: 19-006, 19-007, 20-011, 20-012 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.

Avelyo was supplied to researchers (See list of researchers in Appendix 1) by BASF.

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 Mefentrifluconazole, and 4) more data is needed to make informed recommendations.

Phytotoxicity

Across all crops tested, Avelyo exhibited no or minimal negative impact on 25 plant species or genera (Tables 1 and 4).

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

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

<i>Astilbe sp.</i>	<i>Monarda didyma</i>
<i>Coreopsis sp.</i>	<i>Phlox paniculata</i>
<i>Delphinium grandiflorum</i>	<i>Rosmarinus officinalis</i>
<i>Euonymus alatus</i>	<i>Verbena sp.</i>

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

None

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

None

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

<i>Callistemon citrinus</i> ¹	<i>Juniperus sp.</i> ¹
<i>Camellia japonica</i> ¹	<i>Lagerstroemia indica</i>
<i>Campanula sp.</i> ¹	<i>Loropetalum sp.</i>
<i>Clematis sp.</i> ¹	<i>Paeonia lactiflora</i> ¹
<i>Cuprocyparis leylandii</i>	<i>Pieris japonica</i> ¹
<i>Gaillardia x grandiflora</i>	<i>Solidago speciosa</i> ¹
<i>Helianthus maximiliani</i>	<i>Syringa vulgaris</i> ¹
<i>Hosta sieboldiana</i> ¹	<i>Viburnum davidii</i> ¹
<i>Hypericum sp.</i> ¹	

¹ No injury in 2 trials

Table 5. Detailed Summary of Crop Safety Testing with Mefentrifluconazole.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 3/1/2022 are listed below.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
33466	False Goat's Beard (Astilbe sp.) A. arendsii 'Fanal'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
33466	False Goat's Beard (Astilbe sp.) 'Showstar mix'	Field Container	Grunwald	OR	2019	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33466	False Goat's Beard (Astilbe sp.) 'Showstar mix'	Field Container	Grunwald	OR	2019	Foliar	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
34079	Bottlebrush, Crimson (Callistemon citrinus)	Field Container	Wade	SC	2020	Drench	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal. All plants marketable.
34079	Bottlebrush, Crimson (Callistemon citrinus)	Field Container	Wade	SC	2020	Foliar	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly. All plants marketable.
33482	Camellia (Camellia japonica)	Field Container	Wade	SC	2020	Drench	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal. All plants marketable.
33482	Camellia (Camellia japonica)	Field Container	Wade	SC	2020	Foliar	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly. All plants marketable.
33467	Bellflower (Campanula sp.)	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33467	Bellflower (Campanula sp.) 'Bellflower Blue',	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33468	Leather Flower (Clematis sp.) 'Hybrid Prince Charles'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33468	Leather Flower (Clematis sp.) 'Hybrid Prince Charles'	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33469	Tickseed (Coreopsis sp.)	Field Container	Wade	SC	2019	Foliar	No injury or growth reduction with 7.2, 14.4 and 28.8 oz per 100 gal applied 3 times biweekly; all plants marketable.
33469	Tickseed (Coreopsis sp.) C. auriculata 'Nana'	Field Container	Fraelich	GA	2019	Drench	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied twice; treated plants marketable.
33469	Tickseed (Coreopsis sp.) C. auriculata 'Nana'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
33487	Leyland Cypress (Cuprocyparis leylandii)	Field Container	Wade	SC	2019	Foliar	No injury or growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33471	Siberian Lackspur (Delphinium grandiflorum) 'Dark Bee'	Field Container	Grunwald	OR	2021	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33471	Siberian Lackspur (Delphinium grandiflorum) 'Magic fountain mix'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33483	Burning Bush (Euonymus alatus)	Field Container	Wade	SC	2020	Drench	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal. All plants marketable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
33483	Burning Bush (<i>Euonymus alatus</i>)	Field Container	Wade	SC	2020	Foliar	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly. All plants marketable.
33483	Burning Bush (<i>Euonymus alatus</i>) 'compacta'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33470	Blanket Flower (<i>Gaillardia x grandiflora</i>) 'Mesa Red'	Field Container	Grunwald	OR	2019	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33470	Blanket Flower (<i>Gaillardia x grandiflora</i>) 'Mesa red'	Field Container	Grunwald	OR	2019	Foliar	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33470	Blanket Flower (<i>Gaillardia x grandiflora</i>) 'Sunset Snappy'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
33472	Sunflower, Maximilian (<i>Helianthus maximiliani</i>) H. salicifolius 'Autumn Gold'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
34078	Plantain Lily (<i>Hosta sieboldiana</i>) 'Plantain Lily Blue Mouse Ears'	Field Container	Grunwald	OR	2021	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
34078	Plantain Lily (<i>Hosta sieboldiana</i>) 'Plantain Lily Blue Mouse Ears'	Field Container	Grunwald	OR	2021	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33474	St. John's Wort (<i>Hypericum</i> sp.)	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33474	St. John's Wort (<i>Hypericum</i> sp.)	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33486	Juniper (<i>Juniperus</i> sp.)	Field Container	Wade	SC	2019	Foliar	No injury or growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33486	Juniper (<i>Juniperus</i> sp.) J. horizontalis 'Monber'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
33480	Crape Myrtle (<i>Lagerstroemia indica</i>)	Field Container	Wade	SC	2019	Foliar	No injury or growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33488	Loropetalum (<i>Loropetalum</i> sp.)	Field Container	Wade	SC	2019	Foliar	No injury or growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33463	Bee Balm, Scarlet (<i>Monarda didyma</i>) 'Panarama Red'	Field Container	Grunwald	OR	2019	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33463	Bee Balm, Scarlet (<i>Monarda didyma</i>) 'Panarama Red'	Field Container	Grunwald	OR	2019	Foliar	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33463	Bee Balm, Scarlet (<i>Monarda didyma</i>) 'Bee-Merry'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
33475	Peony, Common Garden (<i>Paeonia lactiflora</i>) 'Dr. Alexander Fleming'	Field Container	Grunwald	OR	2021	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33475	Peony, Common Garden (<i>Paeonia lactiflora</i>) 'Dr. Alexander Fleming'	Field Container	Grunwald	OR	2021	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
33465	Phlox, Fall (Phlox paniculata)	Field Container	Wade	SC	2020	Drench	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal. All plants marketable.
33465	Phlox, Fall (Phlox paniculata)	Field Container	Wade	SC	2020	Foliar	No injury and growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly. All plants marketable.
33465	Phlox, Fall (Phlox paniculata) 'Magenta Pearl'	Field Container	Grunwald	OR	2021	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33465	Phlox, Fall (Phlox paniculata) 'Magenta Pearl'	Field Container	Grunwald	OR	2021	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33484	Andromeda, Japanese; Japanese Pieris (Pieris japonica) 'Scarlett O'Hara'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33484	Andromeda, Japanese; Japanese Pieris (Pieris japonica) 'Scarlett O'Hara'	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33464	Rosemary (Rosmarinus officinalis)	Field Container	Cochran (IA)	IA	2019	Drench	No significant injury or growth effects with 3, 6 and 12 fl oz per 100 gal applied once.
33464	Rosemary (Rosmarinus officinalis) 'Tuscan Blue'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33464	Rosemary (Rosmarinus officinalis) 'Tuscan Blue'	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33464	Rosemary (Rosmarinus officinalis) 'Blue Spires'	Field Container	Fraelich	GA	2019	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; treated plants marketable.
33476	Goldenrod, Showy (Solidago speciosa) 'Baby Gold'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33476	Goldenrod, Showy (Solidago speciosa) 'Baby Gold'	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33479	Lilac, Common (Syringa vulgaris) 'Agincourt Beauty'	Field Container	Grunwald	OR	2020	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33479	Lilac, Common (Syringa vulgaris) 'Agincourt Beauty'	Field Container	Grunwald	OR	2020	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33477	Vervain (Verbena sp.)	Field Container	Wade	SC	2019	Drench	No injury or growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33477	Vervain (Verbena sp.)	Field Container	Wade	SC	2019	Foliar	No injury or growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times biweekly; all plants marketable.
33477	Vervain (Verbena sp.) 'Obsession Burgandy'	Field Container	Grunwald	OR	2018	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates
33477	Vervain (Verbena sp.) 'Obsession Burgandy'	Field Container	Grunwald	OR	2019	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33477	Vervain (Verbena sp.) 'Obsession Burgandy'	Field Container	Grunwald	OR	2019	Foliar	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal
33477	Vervain (Verbena sp.) Verbena x hybrida 'Balendakle'	Field Container	Fraelich	GA	2020	Drench	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal; all treated plants marketable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
33477	Vervain (Verbena sp.) Verbena x hybrida 'Balendakle'	Field Container	Fraelich	GA	2020	Foliar	No injury or significant growth reduction with 3, 6 and 12 fl oz per 100 gal applied 3 times; all treated plants marketable.
33481	Viburnum, David (Viburnum davidii)	Field Container	Grunwald	OR	2021	Drench	No injury, growth or flowering reduction when applied at 3, 6 and 12 fl oz per 100 gal rates
33481	Viburnum, David (Viburnum davidii)	Field Container	Grunwald	OR	2021	Foliar	No injury, growth or flowering reduction at 3, 6, and 12 fl oz per 100 gal rates

Label Suggestions

In this report, all plants exhibited no or minimal injury after drench or foliar treatments of Avelyo at 3, 6, and 12 fl oz per 100 gal for foliar sprays or 7.2, 14.4, and 28.8 fl oz per 100 gal for drench applications, suggesting that this active ingredient is safe to environmental horticulture crops. Given the lack of phytotoxicity across so many different plant species and genera, it is suggested that the eight plants exhibiting no injury and the 17 plants with less than 3 trials showing no injury be placed on the Avelyo label if BASF 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. Avelyo 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 Avelyo to that crop.'

Astilbe sp.

Callistemon citrinus

Camellia japonica

Campanula sp.

Clematis sp.

Coreopsis sp.

Cuprocyparis leylandii

Delphinium grandiflorum

Euonymus alatus

Gaillardia x grandiflora

Helianthus maximiliani

Hosta sieboldiana

Hypericum sp.

Juniperus sp.

Lagerstroemia indica

Loropetalum sp.

Monarda didyma

Paeonia lactiflora

Phlox paniculata

Pieris japonica

Rosmarinus officinalis

Solidago speciosa

Syringa vulgaris

Verbena sp.

Viburnum davidii

Appendix 1: Contributing Researchers

Dr. Diana Cochran <i>(Past affiliate)</i>	Iowa State University Department of Horticulture 125 Horticulture Hall Ames, IA 50011
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