



[Environmental Horticulture Program Research Summaries](#)

## **IR-4 Environmental Horticulture Program Afidopyropen Crop Safety**

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## Table of Contents

Table of Contents .....	2
Table of Tables .....	3
Abstract .....	4
Introduction.....	5
Materials and Methods.....	5
Results and Summary .....	5
Phytotoxicity .....	5
Label Suggestions .....	15
Appendix 1: Contributing Researchers .....	16

## Table of Tables

Table 1.	Average crop safety rating after afidopyropen foliar applications. ....	6
Table 2.	List of Ventigra treated crops with no or minimal transitory injury.....	6
Table 3.	List of Ventigra treated crops with no injury at 1X but significant injury at 2X or 4X. ....	7
Table 4.	List of Ventigra treated crops with significant injury at 1X. ....	7
Table 5.	List of Ventigra treated crops where more information is needed.....	7
Table 6.	List of Ventigra treated crops with less than 3 trials. ....	7
Table 7.	Detailed Summary of Crop Safety Testing with Ventigra (afidopyropen).....	8

## **Abstract**

Ventiga (afidopyropen) is an insecticide registered by BASF for the control of piercing and sucking insect pests such as aphids, whiteflies, psyllids, scales and leafhoppers. The IR-4 Project completed 120 crop safety trials on 46 environmental horticulture plant species or genera from 2015 through 2019. In these trials, 28 genera or species exhibited minimal or no injury after foliar applications in a minimum of 3 trials for each crop. Nineteen species or genera exhibited minimal or no injury in limited number of trials (one or two) for each crop, and two crops exhibited variable responses (*Aquilegia* sp. and *Dahlia* sp.) so further screening for cultivar or species differences is necessary.

## Introduction

Ventigra (afidopyropen) is an insecticide registered by BASF for the control of piercing and sucking insect pests such as aphids, whiteflies, psyllids, scales and leafhoppers. The IR-4 Project completed 120 crop safety trials on 46 environmental horticulture plant species or genera from 2015 to 2019. In addition, phytotoxicity information collected during efficacy experiments is included in this summary.

## Materials and Methods

Ventigra was applied as foliar treatment mixed with NIS typically 3 times at approximately 14 days intervals. The application rates were at 7, 14 and 28 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: 15-008, 16-008, 17-008, 18-011, and 19-011. 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.

Ventigra 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 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 afidopyrofen, and 4) more data are needed to make informed recommendations and 5) less than 3 trials have been completed.

## Phytotoxicity

Across most crops tested, Ventigra exhibited no or minimal negative impact on all plant species or genera. Twenty-eight of these crops had the minimum number of 3 tests for definitive conclusion of crop safety (Table 2). No crop displayed significant injury with Ventigra (Table 3, Table 4). Two crops (*Aquilegia sp.* and *Dahlia sp.*) had variable responses which warrant additional testing for species or cultivar differences (Table 5). There are 19 species or genera where less than 3 trials were conducted so there is not enough information available at this time for recommendations (Table 6). However, all trials for each of these crops showed no or minimal, transitory phytotoxicity.

Please see Table 7 for a summary of the individual trial results.

**Table 1. Average crop safety rating after afidopyropen foliar applications.**

Crop Latin Name	Rating with Foliar Sprays	Crop Latin Name	Rating with Foliar Sprays
<i>Alnus sp.</i>	1.0 (1 - 1) n1	<i>Hedera sp.</i>	1.0 (1 - 1) n3
<i>Angelonia angustifolia</i>	1.0 (1 - 1) n2	<i>Helichrysum sp.</i>	1.0 (1 - 1) n2
<i>Aquilegia sp.</i>	2.5 (1 - 4) n2	<i>Hibiscus sp.</i>	1.3 (1 - 2) n4
<i>Aster sp.</i>	1.0 (1 - 1) n4	<i>Hydrangea sp.</i>	1.3 (1 - 2) n4
<i>Astilbe sp.</i>	1.0 (1 - 1) n3	<i>Ilex sp.</i>	1.0 (1 - 1) n1
<i>Begonia sp.</i>	1.0 (1 - 1) n3	<i>Lagerstroemia indica</i>	1.3 (1 - 2) n3
<i>Camellia japonica</i>	1.0 (1 - 1) n1	<i>Leucanthemum x superbum</i>	1.0 (1 - 1) n2
<i>Camellia sp.</i>	1.0 (1 - 1) n3	<i>Ligustrum sp.</i>	1.0 (1 - 1) n2
<i>Chrysanthemum x rubellum</i>	1.0 (1 - 1) n1	<i>Malus sp.</i>	1.0 (1 - 1) n1
<i>Chrysanthemum/ Dendranthema sp.</i>	1.0 (1 - 1) n3	<i>Monarda didyma</i>	1.0 (1 - 1) n3
<i>Coleus sp.</i>	1.0 (1 - 1) n4	<i>Nerium oleander</i>	1.3 (1 - 2) n3
<i>Plectranthus scutellarioides</i>	1.0 (1 - 1) n3	<i>Paeonia sp.</i>	1.0 (1 - 1) n2
<i>Coreopsis tinctoria</i>	1.0 (1 - 1) n3	<i>Pandanus sp.</i>	1.0 (1 - 1) n1
<i>Cornus sp.</i>	1.0 (1 - 1) n3	<i>Papaver orientale</i>	1.5 (1 - 2) n2
<i>Cotoneaster sp.</i>	1.3 (1 - 2) n3	<i>Picea sp.</i>	1.0 (1 - 1) n1
<i>Crataegus sp.</i>	1.0 (1 - 1) n1	<i>Platanus sp.</i>	2.0 (2 - 2) n1
<i>Dahlia sp.</i>	2.3 (1 - 5) n3	<i>Pyrus calleryana</i>	1.0 (1 - 1) n1
<i>Delphinium sp.</i>	1.0 (1 - 1) n3	<i>Rhododendron sp.</i>	1.0 (1 - 1) n2
<i>Dianthus sp.</i>	1.0 (1 - 1) n3	<i>Rosa sp.</i>	1.3 (1 - 2) n3
<i>Digitalis purpurea</i>	1.0 (1 - 1) n3	<i>Salix sp.</i>	1.0 (1 - 1) n3
<i>Echinacea sp.</i>	1.0 (1 - 1) n4	<i>Sedum sp.</i>	1.0 (1 - 1) n3
<i>Euonymus sp.</i>	1.7 (1 - 3) n3	<i>Solidago sp.</i>	1.0 (1 - 1) n3
<i>Euphorbia pulcherrima</i>	1.7 (1 - 3) n3	<i>Taxus sp.</i>	1.0 (1 - 1) n3
<i>Fraxinus sp.</i>	1.0 (1 - 1) n1	<i>Veronica sp.</i>	1.0 (1 - 1) n3
<i>Gerbera sp.</i>	1.0 (1 - 1) n2	<i>Viburnum sp.</i>	1.0 (1 - 1) n3
		<i>Zinnia sp.</i>	2.0 (1 - 5) n4

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

**Table 2. List of Ventigra treated crops with no or minimal transitory injury.**

<i>Aster sp.</i>	<i>Delphinium sp.</i>	<i>Monarda didyma</i>
<i>Astilbe simplicifolia</i>	<i>Dianthus sp.</i>	<i>Nerium oleander</i>
<i>Begonia sp.</i>	<i>Digitalis purpurea</i>	<i>Rosa sp.</i>
<i>Chrysanthemum/Dendranthe ma sp.</i>	<i>Echinacea sp.</i>	<i>Salix sp.</i>
<i>Coleus sp../ Plectranthus scutellarioides</i>	<i>Euonymus sp.</i>	<i>Sedum sp.</i>
<i>Coreopsis tinctoria.</i>	<i>Euphorbia pulcherrima</i>	<i>Solidago sp.</i>
<i>Cornus sp.</i>	<i>Hedera sp.</i>	<i>Taxus sp.</i>
<i>Cotoneaster sp.</i>	<i>Hibiscus sp.</i>	<i>Veronica longifolia</i>
	<i>Hydrangea sp.</i>	<i>Viburnum sp.</i>
	<i>Lagerstroemia indica</i>	<i>Zinnia sp.</i>

**Table 3. List of Ventigra treated crops with no injury at 1X but significant injury at 2X or 4X.**

None

**Table 4. List of Ventigra treated crops with significant injury at 1X.**

None

**Table 5. List of Ventigra treated crops where more information is needed.**

*Aquilegia sp.*

*Dahlia sp.*

**Table 6. List of Ventigra treated crops with less than 3 trials.**

*Alnus sp.*

*Angelonia angustifolia*<sup>2</sup>

*Camelia japonica*<sup>1</sup>

*Chrysanthemum x rubellum*

*Crataegus sp.*

*Fraxinus sp.*

*Gerbera sp.*<sup>2</sup>

*Helichrysum sp.*<sup>2</sup>

*Ilex sp.*<sup>1</sup>

*Leucanthemum x superbum*<sup>2</sup>

*Ligustrum sp.*<sup>2</sup>

*Malus sp.*<sup>1</sup>

*Paeonia sp.*<sup>2</sup>

*Pandanus sp.*<sup>1</sup>

*Papaver orientale*<sup>1</sup>

*Picea sp.*<sup>1</sup>

*Platanus sp.*<sup>1</sup>

*Pyrus calleryana*<sup>1</sup>

*Rhododendron sp.*<sup>2</sup>

<sup>1</sup> No injury in 1 trial

<sup>2</sup> No injury in 2 trials

**Table 7. Detailed Summary of Crop Safety Testing with Ventigra (afidopyropen)**

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 1/4/2004 are listed below.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32289	Alder ( <i>Alnus</i> sp.) <i>A. rubra</i>	Field Container	Nackley	OR	2019	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied twice biweekly.
32409	Narrowleaf Angelonia ( <i>Angelonia angustifolia</i> ) 'Anbluim Angelface'	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32409	Narrowleaf Angelonia ( <i>Angelonia angustifolia</i> ) 'Serena Purple'	Field Container	Freiberger	NJ	2015	Foliar	No injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal applied 4 times.
32310	Columbine ( <i>Aquilegia</i> sp.) <i>A. caerulea</i> 'Origami'	Field Container	Gilrein	NY	2016	Foliar	Moderate to severe injury with 7, 14 and 28 fl oz per 100 gal; significant growth reduction at 2X and 4X.
32310	Columbine ( <i>Aquilegia</i> sp.)	Field Container	Persad	OH	2016	Foliar	No significant injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal + UltraPure Oil applied 3 times.
33446	Aster ( <i>Aster</i> sp.) Professor Kippenburg	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
33446	Aster ( <i>Aster</i> sp.) Wood's Blue	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
33446	Aster ( <i>Aster</i> sp.) Wood's Pink	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
33446	Aster ( <i>Aster</i> sp.) 'Crimson Red'	Field Container	Uber	CA	2019	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied twice weekly.
32311	False Goat's Beard ( <i>Astilbe</i> sp.) <i>A. simplicifolia</i> 'Hennie Graafland'	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32311	False Goat's Beard ( <i>Astilbe</i> sp.) Fanal	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32311	False Goat's Beard ( <i>Astilbe</i> sp.) Rheinland	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32329	Begonia ( <i>Begonia</i> sp.) 'Ambassador Pink'	Field Container	Freiberger	NJ	2015	Foliar	No injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal applied 4 times.
32329	Begonia ( <i>Begonia</i> sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32329	Begonia ( <i>Begonia</i> sp.) 'Super Olympia Mix'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32308	Camellia ( <i>Camellia</i> sp.)	Field Container	Frank	NC	2019	Foliar	No injury or growth impact with 7, 14, or 28 fl oz per 100 gal.
32308	Camellia ( <i>Camellia</i> sp.) <i>C. japonica</i> 'April Kiss'	Field Container	Gilrein	NY	2019	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32308	Camellia ( <i>Camellia</i> sp.) <i>C. sinensis</i>	Field Container	Nackley	OR	2019	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice biweekly.



PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32714	Chrysanthemum x rubellum (Chrysanthemum x rubellum) Dendranthema zawadskii 'Clara Curtis'	Field Container	Klett	CO	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal applied twice at 6-week intervals.
32315	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) 'Regal Cheryl Purple'	Field Container	Freiberger	NJ	2015	Foliar	No injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal applied 4 times.
32315	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) C. indicum	Field Container	Uber	CA	2020	Foliar	No injury and growth reduction with 11, 22 and 44 fl oz per 100 gal rates applied twice.
32315	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.)	Field Container	Vafaie	TX	2018	Foliar	No injury nor growth reduction with 7, 14 and 28 fl oz per 100 gal applied twice.
32327	Coleus, Flamenettle (Coleus sp.) 'Wizard Jade'	Field Container	Gilrein	NY	2017	Foliar	No injury nor effect on plant growth and quality with 7, 14 and 28 fl oz per 100 gal.
32327	Coleus, Flamenettle (Coleus sp.) 'Wizard Velvet Red'	Field Container	Gilrein	NY	2017	Foliar	No injury nor effect on plant growth and quality with 7, 14 and 28 fl oz per 100 gal.
32327	Coleus, Flamenettle (Coleus sp.) 'Dark Chocolate'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32327	Coleus, Flamenettle (Coleus sp.) 'Trusty Rusty'	Field Container	Uber	CA	2017	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied 3 times biweekly.
32313	Golden Tickseed, Garden Coreopsis (Coreopsis tinctoria) C. grandiflora 'Early Sunrise'	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32313	Golden Tickseed, Garden Coreopsis (Coreopsis tinctoria)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32313	Golden Tickseed, Garden Coreopsis (Coreopsis tinctoria) C. verticillata 'Moonbeam'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32299	Dogwood (Cornus sp.) C. alba 'Ivory Halo'	Field Container	Gilrein	NY	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal.
32299	Dogwood (Cornus sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32299	Dogwood (Cornus sp.) C. officinalis	Field Container	Persad	OH	2016	Foliar	No significant injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + UltraPure Oil applied 3 times.
32304	Cotoneaster (Cotoneaster sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32304	Cotoneaster (Cotoneaster sp.) C. adpressus 'Tom Thumb'	Field Container	Reding	OH	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; slight growth reduction; all plants marketable.
32304	Cotoneaster (Cotoneaster sp.) 'Coral Beauty'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32292	Hawthorn (Crataegus sp.) C. douglasii	Field Container	Nackley	OR	2019	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied twice biweekly.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32326	Dahlia (Dahlia sp.)	Field Container	Harvey	WA	2016	Foliar	Moderate to severe injury increasing with rates (7, 14 and 28 fl oz per 100 gal) applied twice weekly. Environmental damage may be a significant factor.
32326	Dahlia (Dahlia sp.) 'Hypnotica Purple Bicolor'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32326	Dahlia (Dahlia sp.)	Field Container	Uber	CA	2018	Foliar	No injury or growth reduction with 7, 14 and 21 fl oz per 100 gal + Capsil applied 3 times.
32314	Larkspur (Delphinium sp.) D. belladonna 'Summer Blue'	Field Container	Gilrein	NY	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal.
32314	Larkspur (Delphinium sp.) 'Summer Morning'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32314	Larkspur (Delphinium sp.)	Field Container	Uber	CA	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied 3 times.
32316	Pink (Dianthus sp.) 'Amazon Rose Magic'	Field Container	Freiberger	NJ	2015	Foliar	No injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal applied 4 times.
32316	Pink (Dianthus sp.) Dianthus gratianopolitanus 'Firewitch'	Field Container	Klett	CO	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal applied twice at 6-week intervals.
32316	Pink (Dianthus sp.) "Super Trooper Velvet Red'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32317	Foxglove, Purple (Digitalis purpurea) Dalmatian Peach	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32317	Foxglove, Purple (Digitalis purpurea) Dalmatian Rose	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32317	Foxglove, Purple (Digitalis purpurea) 'Camelot Rose'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32312	Purple Coneflower (Echinacea sp.) Echinacea Supreme™ 'Flamingo'	Field Container	Klett	CO	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal applied twice at 6-week intervals.
32312	Purple Coneflower (Echinacea sp.)	Field Container	Persad	OH	2016	Foliar	No injury or significant growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal + UltraPure Oil applied 3 times.
32312	Purple Coneflower (Echinacea sp.) 'Pow Wow Wild Berry'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32312	Purple Coneflower (Echinacea sp.)	Field Container	Uber	CA	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied 3 times.
32306	Spindletree (Euonymus sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7 and 14 fl oz, moderate with 28 fl oz, per 100 gal applied twice weekly.
32306	Spindletree (Euonymus sp.) E. fortunei 'Gold Splash'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32306	Spindletree (Euonymus sp.) 'Wintercreeper'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32331	Poinsettia (Euphorbia pulcherrima) Ascot Rainbow	Greenhouse	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal a

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32331	Poinsettia ( <i>Euphorbia pulcherrima</i> ) 'Poinsettia Jubilee Red'	Greenhouse	Frank	NC	2019	Foliar	Minor to moderate injury increasing with rate (7, 14, 28 fl oz per 100 gal).
32331	Poinsettia ( <i>Euphorbia pulcherrima</i> ) 'Jubilee Red'	Greenhouse	Freiberger	NJ	2016	Foliar	No injury or growth or growth reduction with 7, 14 and 28 fl oz per 100 gal applied 3 times weekly.
32288	Ash ( <i>Fraxinus</i> sp.) <i>F. latifolia</i>	Field Container	Nackley	OR	2019	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied twice biweekly.
32330	Transvaal Daisy ( <i>Gerbera</i> sp.) 'Royal Premium Mix'	Field Container	Freiberger	NJ	2015	Foliar	No injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal applied 3 times.
32330	Transvaal Daisy ( <i>Gerbera</i> sp.) 'Festival Grower Select Mix'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32303	Ivy ( <i>Hedera</i> sp.)	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32303	Ivy ( <i>Hedera</i> sp.) <i>H. helix</i>	Field Container	Fraelich	GA	2016	Foliar	No injury or difference in plant growth and marketability with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32303	Ivy ( <i>Hedera</i> sp.) English Ivy	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
34593	Strawflower ( <i>Helichrysum</i> sp.) 'Copper Red'	Greenhouse	Frank	NC	2021	Foliar	No injury or change with Ventigra applied as a foliar spray at 7, 14 and 28 fl oz per 100 gallons plus Capsil
32318	Strawflower ( <i>Helichrysum</i> sp.) 'Licorice'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32319	Rosemallow ( <i>Hibiscus</i> sp.) <i>H. moscheutos</i> 'Luna Rose'	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32319	Rosemallow ( <i>Hibiscus</i> sp.)	Field Container	Harvey	WA	2016	Foliar	Minor injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32319	Rosemallow ( <i>Hibiscus</i> sp.) 'Brilliant Red'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32302	Hydrangea ( <i>Hydrangea</i> sp.) 'Nikko Blue'	Field Container	Fraelich	GA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times; moderate stunting at 4X; all plants marketable.
32302	Hydrangea ( <i>Hydrangea</i> sp.) 'Quick Fire'	Field Container	Persad	OH	2016	Foliar	No significant injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + UltraPure Oil applied 3 times.
32302	Hydrangea ( <i>Hydrangea</i> sp.) <i>H. macrophylla</i>	Field Container	Uber	CA	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied 3 times.
32302	Hydrangea ( <i>Hydrangea</i> sp.) 'Nikko Blue'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32309	Crape Myrtle ( <i>Lagerstroemia indica</i> ) 'Natchez'	Field Container	Gilrein	NY	2017	Foliar	No injury nor effect on plant growth and quality with 7, 14 and 28 fl oz per 100 gal.
32309	Crape Myrtle ( <i>Lagerstroemia indica</i> )	Field Container	Koivunen	CA	2016	Foliar	No injury with 7, minor injury (brown interveinal spots) with complete recovery at 14 and 28, fl oz per 100 gal + Dyne-Amic applied 3 times biweekly; no growth reduction.
32309	Crape Myrtle ( <i>Lagerstroemia indica</i> ) 'Natchez'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
33004	Daisy, Shasta ( <i>Leucanthemum x superbum</i> ) 'Snow Lady'	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
33004	Daisy, Shasta ( <i>Leucanthemum x superbum</i> ) 'Crazy Daisy and 'Snow Lady'	Field Container	Gilrein	NY	2019	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32307	Privet ( <i>Ligustrum sp.</i> ) <i>L. japonicum</i>	Field Container	Uber	CA	2017	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied 3 times biweekly.
32307	Privet ( <i>Ligustrum sp.</i> ) Wax Privet	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32290	Apple, Non-bearing ( <i>Malus sp.</i> ) <i>M. fusca</i>	Field Container	Nackley	OR	2019	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied twice biweekly.
32323	Bee Balm, Scarlet ( <i>Monarda didyma</i> ) Blue Stocking	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32323	Bee Balm, Scarlet ( <i>Monarda didyma</i> ) Marshall's Delight	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32323	Bee Balm, Scarlet ( <i>Monarda didyma</i> ) 'Balmy Purple'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32301	Oleander, Rosebay ( <i>Nerium oleander</i> ) 'Marie Bracey'	Field Container	Frank	NC	2019	Foliar	No injury or growth impact with 7, 14, or 28 fl oz per 100 gal.
32301	Oleander, Rosebay ( <i>Nerium oleander</i> )	Field Container	Koivunen	CA	2016	Foliar	No injury with 7, minor injury on flower (browning at edges) with complete recovery at 14 and 28, fl oz per 100 gal + Dyne-Amic applied 3 times biweekly; no growth reduction.
32301	Oleander, Rosebay ( <i>Nerium oleander</i> ) 'Cardinal Red'	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32324	Peony ( <i>Paeonia sp.</i> )	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32324	Peony ( <i>Paeonia sp.</i> ) <i>P. lactiflora</i> 'Sarah Bernhardt'	Field Container	Gilrein	NY	2019	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32322	Oriental Poppy ( <i>Papaver orientale</i> ) Champagne Bubble Mix	Field Container	Davis	MI	2017	Foliar	No significant injury with 7 and 14, minor with complete recovery with 28 fl oz per 100 gal applied 4 times weekly.
32322	Oriental Poppy ( <i>Papaver orientale</i> ) 'Pizzicato Mix'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32294	Spruce ( <i>Picea sp.</i> ) <i>P. omorika</i> 'Serbian spruce'	Field Container	Gilrein	NY	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal.
32298	Plane Tree, Sycamore ( <i>Platanus sp.</i> )	Field Container	Koivunen	CA	2016	Foliar	No significant injury with 7, minor to moderate injury (browning of youngest leaves) with complete recovery at 14 and 28, fl oz per 100 gal + Dyne-Amic applied 3 times biweekly; no growth reduction.
32291	Callery Pear ( <i>Pyrus calleryana</i> )	Field Container	Nackley	OR	2019	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied twice biweekly.
32293	Azalea ( <i>Rhododendron sp.</i> ) 'Pink Gumpo'	Field Container	Fraelich	GA	2016	Foliar	No injury or difference in plant growth and marketability with 7, 14 and 28 fl oz per 100 gal applied 3 times.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32293	Azalea ( <i>Rhododendron</i> sp.)	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32296	Rose ( <i>Rosa</i> sp.) 'Forever & Ever® Flamingo Kolorscape®'	Field Container	Frank	NC	2017	Foliar	No injury with 7 and 14, minor with 25 fl oz per 100 gal + surfactant applied twice.
32296	Rose ( <i>Rosa</i> sp.) 'Oso Easy Fragrant Spreader'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32297	Willow ( <i>Salix</i> sp.) <i>S. integra</i> 'Hakuro Nishiki'	Field Container	Frank	NC	2017	Foliar	No injury or growth reduction with 7, 14 and 25 fl oz per 100 gal + surfactant applied twice.
32297	Willow ( <i>Salix</i> sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32297	Willow ( <i>Salix</i> sp.) <i>S. caprea</i> 'French Pussy'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32325	Stonecrop ( <i>Sedum</i> sp.) 'Autumn Fire'	Field Container	Gilrein	NY	2017	Foliar	No injury nor effect on plant growth and quality with 7, 14 and 28 fl oz per 100 gal.
32325	Stonecrop ( <i>Sedum</i> sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32325	Stonecrop ( <i>Sedum</i> sp.) 'Angelina'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32321	Goldenrod ( <i>Solidago</i> sp.) <i>S. canadensis</i> 'Solidago Little Lemon'	Field Container	Gilrein	NY	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal.
32321	Goldenrod ( <i>Solidago</i> sp.) 'Little Lemon'	Field Container	Klett	CO	2020	Foliar	No injury or growth reduction, and no effect on flower production or bloom time, with 7, 14 and 28 fl oz per 100 gal + R-11 applied 3 times weekly.
32321	Goldenrod ( <i>Solidago</i> sp.) <i>S. canadensis</i>	Field Container	Uber	CA	2019	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Capsil applied twice weekly.
32305	Yew ( <i>Taxus</i> sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.
32305	Yew ( <i>Taxus</i> sp.) <i>T. x media</i> 'Hicksii'	Field Container	Persad	OH	2016	Foliar	No significant injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + UltraPure Oil applied 3 times.
32305	Yew ( <i>Taxus</i> sp.) <i>T. media</i> 'Margarita'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.
32320	Speedwell ( <i>Veronica</i> sp.) <i>V. longifolia</i> 'Candied Candle'	Field Container	Davis	MI	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32320	Speedwell ( <i>Veronica</i> sp.) Georgia Blue	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32320	Speedwell ( <i>Veronica</i> sp.) Giles van Hees	Field Container	Davis	MI	2017	Foliar	No significant injury with 7, 14 and 28 fl oz per 100 gal applied 4 times weekly.
32300	Arrowwood ( <i>Viburnum</i> sp.) 'Opening Day'	Field Container	Fraelich	GA	2017	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied three times at weekly intervals.
32300	Arrowwood ( <i>Viburnum</i> sp.)	Field Container	Harvey	WA	2016	Foliar	No injury with 7, 14 and 28 fl oz per 100 gal applied twice weekly.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
32300	Arrowwood (Viburnum sp.)	Field Container	Wade	SC	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + Ultra-Pure Oil applied 3 times; all plants marketable.
32410	Zinnia (Zinnia sp.) Z. angustifolia	Field Container	Fraelich	GA	2016	Foliar	No injury or difference in plant growth and marketability with 7, 14 and 28 fl oz per 100 gal applied 3 times.
32410	Zinnia (Zinnia sp.) 'Magnificent Mix'	Field Container	Freiberger	NJ	2015	Foliar	No injury or growth reduction with 1.5, 3.5 and 14 fl oz per 100 gal applied 4 times.
32410	Zinnia (Zinnia sp.)	Field Container	Harvey	WA	2016	Foliar	Moderate to severe injury increasing with rates (7, 14 and 28 fl oz per 100 gal) applied twice weekly. Environmental damage may be a significant factor.
32410	Zinnia (Zinnia sp.) 'Profusion 5 Color Mix'	Field Container	Reding	OH	2016	Foliar	No injury or growth reduction with 7, 14 and 28 fl oz per 100 gal + NIS applied 3 times biweekly; all plants marketable.

## Label Suggestions

In this report, 28 crops exhibited no or minimal injury after foliar treatments of Ventigra (afidopyropen) at 7, 14 and 28 fl oz per 100 gal. If tested crops will be listed on the label, these can be included in a future label:

*Aster* sp.  
*Astilbe simplicifolia*  
*Begonia* sp.  
*Chrysanthemum/Dendranthema* sp.  
*Coleus* sp./ *Plectranthus scutellarioides*  
*Coreopsis tinctoria*.  
*Cornus* sp.  
*Cotoneaster* sp.  
*Delphinium* sp.  
*Dianthus* sp.  
*Digitalis purpurea*  
*Echinacea* sp.  
*Euonymus* sp.  
*Euphorbia pulcherrima*  
*Hedera* sp.  
*Hibiscus* sp.  
*Hydrangea* sp.  
*Lagerstroemia indica*  
*Monarda didyma*  
*Nerium oleander*  
*Rosa* sp.  
*Salix* sp.  
*Sedum* sp.  
*Solidago* sp.  
*Taxus* sp.  
*Veronica longifolia*  
*Viburnum* sp.  
*Zinnia* sp.

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