

**IR-4 Ornamental Horticulture Program  
Mesotrione Crop Safety**

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Date: May 1, 2009**

**Acknowledgements**

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## Abstract

During 2007 and 2008, IR-4 completed 113 trials on Mesotrione SC. The data contained in this report was generated to register uses of mesotrione on and around ornamental horticulture plants with over-the-top applications. The mesotrione rates were 0.187, 0.25 and 0.37 pounds active ingredient per acre (lb ai per A) as the 1X, 1.5X and 2X rates. Mesotrione SC had been applied to 39 plant genera or species. Of these, five exhibited no or minimal transient injury after application at all three rates. Twenty crops exhibited significant phytotoxicity at even the lowest rate: *Buddleia davidii*, *Dianthus gratianopolitanus*, *Echinacea purpurea*, *Hydrangea quercifolia*, *Ilex sp.*, *Lagerstroemia indica*, *Liriope sp.*, *Ophiopogon sp.*, *Phlox paniculata*, *Phlox subulata*, *Picea sp.*, *Pseudotsuga menziesii*, *Rosa sp.*, *Salvia sylvestris*, *Spiraea sp.*, *Taxus sp.*, *Thuja occidentalis*, *Veronica sp.*, *Viburnum sp.*, and *Vinca sp.*

## Introduction

Control of broadleaved weeds and sedges in the production of woody and herbaceous perennials can be problematic because nurseries grow many different types of plants and not all genera or species are listed on labels. These weeds can also be difficult to control in landscape settings for the same reason. Starting in 2007, crops safety for the new active ingredient mesotrione was investigated. Both Mesotrione G and Mesotrione SC were examined.

## Materials and Methods

Two applications of Mesotrione SC were made approximately 4 or 6 weeks apart. The application rates were 0.187, 0.25 and 0.37 lb ai per acre, plus a water treated control. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. Phytotoxicity was recorded on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill) at 1, 2, 4, 8, and 12 weeks after initial application. Some researchers also included readings 3 to 4 days after the initial and second applications. For more detailed materials and methods, please see Appendix 1: Protocols.

Mesotrione G and Mesotrione SC was supplied to researchers (See list of researchers in Appendix 2) by Syngenta Corporation.

## Results and Summary

### ***Phytotoxicity***

Based on the type and nature of injury seen with Mesotrione SC applications in the conducted research, 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 1.5X and/or 2X rates did cause significant phytotoxicity, 3) significant injury sufficient to recommend growers not utilize this product, and 4) more data is needed to make informed recommendations.

Mesotrione SC exhibited no or minimal negative impact on five plant genera or species with over the top applications (Table 1). Some minimal injury may be acceptable for growers if applications are made several weeks to months in advance of crop sale particularly for woody ornamental crops. Twenty tested crops exhibited damage sufficient to recommend growers not utilize Mesotrione SC as an over-the-top treatment for pre-emergent weed control (Table 3): *Buddleia davidii*, *Dianthus gratianopolitanus*, *Echinacea purpurea*, *Hydrangea quercifolia*, *Ilex sp.*, *Lagerstroemia indica*, *Liriope sp.*, *Ophiopogon sp.*, *Phlox paniculata*, *Phlox subulata*, *Picea sp.*, *Pseudotsuga menziesii*, *Rosa sp.*, *Salvia sylvestris*, *Spiraea sp.*, *Taxus sp.*, *Thuja occidentalis*, *Veronica sp.*, *Viburnum sp.*, and *Vinca sp.* For 14 genera/species, more information is needed either because only 1 or 2 trials were conducted or because consistent results were not achieved among the research sites (Table 4).

A single trial was conducted with Mesotrione G on *Viburnum opulus*. No phytotoxicity symptoms were observed, but plants at the two higher rates were stunted.

See Table 5 for a list of completed trials.

**Table 1. List of Mesotrione SC treated crops with no or minimal transitory injury.**

<i>Abies fraseri</i> (See Marshall)	<i>Miscanthus sinensis</i>
<i>Calamagrostis acutiflora</i>	<i>Rhododendron sp.</i> <sup>1</sup>
<i>Festuca ovina glauca</i> (See Klett)	

**Table 2. List of Mesotrione SC treated crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity**

None.

**Table 3. List of Mesotrione SC treated crops exhibiting significant injury.**

<i>Buddleia davidii</i>	<i>Picea sp.</i>
<i>Dianthus gratianopolitanus</i>	<i>Pseudotsuga menziesii</i>
<i>Echinacea purpurea</i>	<i>Rosa sp.</i> <sup>1</sup>
<i>Hydrangea quercifolia</i>	<i>Salvia sylvestris</i>
<i>Ilex sp.</i>	<i>Spiraea sp.</i>
<i>Lagerstroemia indica</i>	<i>Taxus sp.</i>
<i>Liriope sp.</i>	<i>Thuja occidentalis</i> <sup>1</sup>
<i>Ophiopogon sp.</i>	<i>Veronica sp.</i>
<i>Phlox paniculata</i>	<i>Viburnum sp.</i>
<i>Phlox subulata</i>	<i>Vinca sp.</i>

**Table 4. List of Mesotrione SC treated crops where more information is needed.**

<i>Acer rubrum</i>	<i>Hydrangea macrophylla</i> <sup>1</sup>
<i>Berberis thunbergii</i>	<i>Hydrangea paniculata</i>
<i>Buxus sempervirens</i>	<i>Iris siberica</i>
<i>Cladrastis sp.</i>	<i>Juniperus communis</i>
<i>Euonymus sp.</i>	<i>Juniperus horizontalis</i>
<i>Hemerocallis sp.</i> <sup>1</sup>	<i>Juniperus squamata</i>
<i>Hosta sp.</i> <sup>2</sup>	<i>Tsuga heterophylla</i>

<sup>1</sup> Differential response possibly due to different cultivars.

<sup>2</sup> In two trials, no injury after 2 applications at all rates.

**Table 5. Detailed Summary of Crop Safety Testing with Mesotrione SC**

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 4/29/09 are listed below.

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26323	Fir, Fraser	Abies fraseri		Field Container	Freiberger	2007	Over the top	No significant injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26540	Fir, Fraser	Abies fraseri		Field In-Ground	Ahrens/Mervosh	2007	Over the top	No injury at 0.187, 0.25 and 0.374 lb ai per acre	20070401a.pdf
26540	Fir, Fraser	Abies fraseri		Field In-Ground	Beste/Frank	2007	Over the top	Data indicated no significant injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080613a.pdf
26323	Fir, Fraser	Abies fraseri	'Roan Mountain'	Field Container	Marshall	2007	Over the top	One application. Slight injury at 0.187 and 0.25, moderate at 0.37 lb ai per acre	20080401b.pdf
26197	Maple, Red	Acer rubrum		Field Container	Freiberger	2007	Over the top	Slight injury at 0.187 and 0.25, moderate at 0.37 lb ai per acre	20080227l.pdf
26197	Maple, Red	Acer rubrum	'Red Sunset'	Field Container	Williams	2007	Over the top	Virtually no injury at 0.187 and 0.25, very slight at 0.38 lb ai per acre	20080530b.pdf
26286	Barberry	Berberis sp.	B. thunbergii 'Crimson Pygmy'	Field Container	Williams	2007	Over the top	Very slight injury at 0.187, moderate at 0.25 and 0.38 lb ai per acre	20080530b.pdf
26286	Barberry	Berberis sp.	B. thunbergii 'Atropurpurea'	Field Container	Beste/Frank	2007	Over the top	No significant injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; all plants marketable; poor control of oxalis, no control of Pennsylvania bittercress and spotted spurge	20080613a.pdf
26338	Butterfly Bush	Buddleia davidii	'Pink Delight'	Field Container	Williams	2007	Over the top	Moderate injury at 0.187, high at 0.25 and 0.38 lb ai per acre	20080530b.pdf
26338	Butterfly Bush	Buddleia davidii	'White Ball'	Field Container	Marshall	2007	Over the top	One application. Moderate to high injury at 0.187, 0.25 and 0.37 lb ai per acre	20080401b.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26307	Boxwood	Buxus sp.	B. sempervirens 'Green Mountain'	Field Container	Beste/Frank	2007	Over the top	No significant injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; all plants marketable; poor control of oxalis, no control of spotted spurge	20080613a.pdf
26307	Boxwood	Buxus sp.	'Green Velvet'	Field Container	Marshall	2007	Over the top	One application. Slight injury at 0.187, 0.25 and 0.37 lb ai per acre	20080401b.pdf
26207	Feather Reed Grass	Calamagrostis acutiflora		Field Container	Trader	2007	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26207	Feather Reed Grass	Calamagrostis acutiflora	'Karl Forester'	Field Container	Boydston	2007	Over the top	No injury or significant growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20071120t.pdf
26207	Feather Reed Grass	Calamagrostis acutiflora	'Karl Forester'	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; all plants saleable	20090129e.pdf
26319	Yellowwood	Cladrastis sp.	C. kentukea	Field Container	Freiberger	2007	Over the top	Slight injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26243	Pinks	Dianthus sp.	'Fire Witch'	Field Container	Williams	2007	Over the top	High injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
26243	Pinks	Dianthus sp.	D. deltoides 'Brilliant'	Field Container	Senesac	2007	Over the top	Slight injury after first, severe injury after 2nd application at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26243	Pinks	Dianthus sp.	'Firewitch'	Field Container	Boydston	2007	Over the top	No injury after first, significant injury after 2nd application at 0.187, 0.25 and 0.37 lb ai per acre; 0.187 and 0.25 lb treated plants saleable	20071120s.pdf
26357	Purple Coneflower	Echinacea sp.		Field Container	Trader	2007	Over the top	Severe injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26357	Purple Coneflower	Echinacea sp.	E. purpurea	Field Container	Mathers	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20071106d.pdf
26357	Purple Coneflower	Echinacea sp.	E. purpurea	Field Container	Williams	2007	Over the top	Severe injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26357	Purple Coneflower	Echinacea sp.	E. purpurea 'Magnus'	Field Container	Fraelich	2007	Over the top	Moderate to severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26357	Purple Coneflower	Echinacea sp.	E. purpurea 'Magnus'	Field Container	Wade	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116e.pdf
26357	Purple Coneflower	Echinacea sp.	E. purpurea 'White Swan'	Field Container	Boydston	2007	Over the top	High injury at 0.187, 0.25 and 0.37 lb ai per acre	20071120w.pdf
28014	Winged Burning Bush	Euonymus alatus	'Compacta'	Field Container	Williams	2007	Over the top	Slight injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
28015	Purpleleaf Wintercreeper	Euonymus radicans	E. fortunei 'Coloratus'	Field Container	Williams	2007	Over the top	Slight injury at 0.187, 0.25 and 0.37 lb ai per acre	20080530b.pdf
26210	Blue Fescue	Festuca ovina glauca		Field Container	Klett	2007	Over the top	Two trials; slight injury (leaf discoloration) after the 2nd application at 0.187, 0.25 and 0.37 lb ai per acre; no growth reduction	20071220i.pdf
26210	Blue Fescue	Festuca ovina glauca		Field Container	Trader	2007	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26210	Blue Fescue	Festuca ovina glauca	'Elijah Blue'	Field Container	Boydston	2007	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; treated plants saleable	20071120r.pdf
26210	Blue Fescue	Festuca ovina glauca	'Elijah Blue'	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20090129e.pdf
26345	Daylily	Hemerocallis sp.		Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26345	Daylily	Hemerocallis sp.	'Second Glance'	Field Container	Lieth	2007	Over the top	Moderate to high injury at 0.187, 0.25 and 0.37 lb ai per acre	20071005e.pdf
26345	Daylily	Hemerocallis sp.	'Stella d'Oro'	Field Container	Wade	2007	Over the top	Some chlorosis at 0.187, 0.25 and 0.37 lb ai per acre after 1st application; complete recovery in 2 weeks	20080116e.pdf
26264	Hosta	Hosta sp.	H. fortunei 'Francee'	Field Container	Wade	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116e.pdf
26264	Hosta	Hosta sp.	'Krossa Regal'	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26253	Hydrangea	Hydrangea sp.		Field Container	Mathers	2007		No visible injury at 0.97, 1.94 and 3.88 lb ai per acre	20080228a.pdf
26253	Hydrangea	Hydrangea sp.	H. macrophylla 'Week End'	Field Container	Williams	2007	Over the top	Slight injury at 0.187 and 0.25, moderate at 0.38 lb ai per acre	20080530b.pdf
26253	Hydrangea	Hydrangea sp.	H. macrophylla 'Endless Summer'	Field Container	Wade	2007	Over the top	Some chlorosis at 0.187, 0.25 and 0.37 lb ai per acre after 1st application; complete recovery in 2 weeks	20080116e.pdf
26253	Hydrangea	Hydrangea sp.	H. macrophylla 'Nikko Blue'	Field Container	Beste/Frank	2007	Over the top	Severe injury (chlorosis) and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; treated plants not marketable	20080613a.pdf
26253	Hydrangea	Hydrangea sp.	H. macrophylla 'Nikko Blue'	Field Container	Fraelich	2007	Over the top	Slight injury (chlorosis) at 0.187, 0.25 and 0.37 lb ai per acre; only one plant at 2X rate not marketable	20080227r.pdf
26253	Hydrangea	Hydrangea sp.	H. paniculata 'Pee Wee'	Field Container	Williams	2007	Over the top	Virtually no injury at 0.187, slight at 0.25 and 0.38 lb ai per acre	20080530b.pdf
26253	Hydrangea	Hydrangea sp.	H. quercifolia 'Alice'	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26334	Holly	Ilex sp.		Field Container	Trader	2007	Over the top	Unacceptable injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26334	Holly	Ilex sp.	I. cornuta 'Carissa'	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26334	Holly	Ilex sp.	I. verticillata 'Winter Gold'	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
27676	Holly, Dwarf Yaupon	Ilex vomitoria 'nana'		Field Container	Trader	2007	Over the top	Unacceptable injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26351	Flag	Iris sp.	I. siberica 'Harpswell Happiness'	Field Container	Beste/Frank	2007	Over the top	Significant injury with some recovery, no significant growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; plants marketable at 1X and 2X rates	20080613a.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26271	Juniper	Juniperus sp.	J. communis 'Gold Totem Pole'	Field Container	Senesac	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26271	Juniper	Juniperus sp.	J. horizontalis 'Wiltonii'	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26271	Juniper	Juniperus sp.	J. squamata 'Blue Star'	Field Container	Ahrens/Mervosh	2007	Over the top	No injury after 1st, slight to moderate injury after 2nd application at 0.187, 0.25 and 0.375 lb ai per acre	20080229d.pdf
26342	Crape Myrtle	Lagerstroemia indica		Field Container	Trader	2007	Over the top	Severe injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26435	Lilyturf, Creeping	Liriope sp.		Field Container	Trader	2007	Over the top	Severe injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26213	Silver Grass	Miscanthus sp.		Field Container	Trader	2007	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26213	Silver Grass	Miscanthus sp.	M. sinensis	Field Container	Boydston	2007	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; plants saleable	20071120m.pdf
26213	Silver Grass	Miscanthus sp.	M. sinensis 'Graziella'	Field Container	Mathers	2007	Over the top	No injury at 0.187 and 0.25 lb ai per acre, slight injury with complete recovery at 0.37 lb ai	20071106c.pdf
26438	Mondo Grass, Lilyturf, Ker-Gawl	Ophiopogon sp.		Field Container	Trader	2007	Over the top	Unacceptable injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26216	Phlox, Perennial	Phlox paniculata	P. paniculata 'Robert Poore'	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26216	Phlox, Perennial	Phlox paniculata	'Starfire'	Field Container	Boydston	2007	Over the top	High injury and significant growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; plants not saleable	20071120n.pdf
26218	Creeping Phlox, Moss Pink	Phlox subulata	'McDaniels Cushion'	Field Container	Boydston	2007	Over the top	Slight injury at 0.187, 0.25 and 0.37 lb ai per acre; plants saleable	20071120l.pdf
26218	Creeping Phlox, Moss Pink	Phlox subulata	P. subulata 'Emerald Blue'	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26294	Spruce	Picea sp.	P. glauca	Field Container	Freiberger	2007	Over the top	Moderate to severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26294	Spruce	Picea sp.	P. pungens	Field Container	Senesac	2007	Over the top	No injury after 1st, slight to moderate injury after 2nd application at 0.187, 0.25 and 0.37 lb ai per acre; complete recovery 8 weeks after 2nd application	20080128b.pdf
26225	Fir, Douglas	Pseudotsuga menziesii		Field Container	Boydston	2007	Over the top	No injury at 0.187, significant injury at 0.25 and 0.37 lb ai per acre; 0.187 lb treated plants saleable	20071120q.pdf
26225	Fir, Douglas	Pseudotsuga menziesii	'Blue'	Field Container	Marshall	2007	Over the top	One application. Slight injury at 0.187, 0.25 and 0.37 lb ai per acre	20080401b.pdf
26225	Fir, Douglas	Pseudotsuga menziesii	P. menziesii glauca	Field Container	Freiberger	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26290	Azalea	Rhododendron sp.	'Fashion'	Field Container	Fraelich	2007	Over the top	Very slight injury (chlorosis) at 0.187, 0.25 and 0.37 lb ai per acre; all plants marketable	20080227r.pdf
26290	Azalea	Rhododendron sp.	'Gwenda'	Field Container	Wade	2007	Over the top	Some chlorosis at 0.187, 0.25 and 0.37 lb ai per acre after 1st application; complete recovery in 2 weeks	20080116e.pdf
26290	Azalea	Rhododendron sp.	R. x 'Crete' (Yakushmanum hybrid)	Field Container	Senesac	2007	Over the top	Slight to moderate injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26290	Azalea	Rhododendron sp.	'Vulcan'	Field Container	Regan	2007	Over the top	No significant injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080108d.pdf
26200	Rose	Rosa sp.		Field Container	Trader	2007	Over the top	Unacceptable injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
26200	Rose	Rosa sp.	'Nearly Wild'	Field Container	Wade	2007	Over the top	Some chlorosis at 0.187, 0.25 and 0.37 lb ai per acre after 1st application; complete recovery in 2 weeks	20080116e.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26200	Rose	Rosa sp.	'Nearly Wild'	Field Container	Williams	2007	Over the top	Very slight to slight injury increasing with rate (0.17, 0.25, 0.38 lb ai per acre).	20080530b.pdf
26200	Rose	Rosa sp.	R. meiglise 'White Drift'	Field Container	Boydston	2007	Over the top	High injury at 0.187, 0.25 and 0.37 lb ai per acre; plants not saleable	20071120j.pdf
26200	Rose	Rosa sp.	R. virginiana	Field Container	Senesac	2007	Over the top	Moderate to severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26200	Rose	Rosa sp.	R. x hybrida 'Knockout'	Field Container	Williams	2007	Over the top	Virtually no injury at 0.187, slight at 0.25 and 0.38 lb ai per acre	20080530b.pdf
26204	Sage, Ramona	Salvia sylvestris	'East Friesland'	Field Container	Boydston	2007	Over the top	High injury at 0.187, 0.25 and 0.37 lb ai per acre	20071120k.pdf
26204	Sage, Ramona	Salvia sylvestris	'Rhea'	Field Container	Beste/Frank	2007		Severe injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; treated plants with greatly reduced quality and marketability	20080613a.pdf
26282	Bridal-Wreath	Spiraea sp.	S. decumbens	Field Container	Senesac	2007	Over the top	Slight to moderate injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26282	Bridal-Wreath	Spiraea sp.	S. prunifolia	Field Container	Freiberger	2007	Over the top	Moderate to severe injury increasing with rates at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26282	Bridal-Wreath	Spiraea sp.	Spiraea x bumalda 'Gold Mound'	Field Container	Ahrens/Mervosh	2007	Over the top	Moderate to high injury at 0.187, 0.25 and 0.375 lb ai per acre	20080229d.pdf
26311	Yew	Taxus sp.	T. baccata	Field Container	Senesac	2007	Over the top	Slight to moderate injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26311	Yew	Taxus sp.	T. baccata fasigata	Field Container	Freiberger	2007	Over the top	Slight to high injury increasing with rates at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26278	Arborvitae	Thuja sp.	T. occidentalis 'Emerald Green'	Field Container	Ahrens/Mervosh	2007	Over the top	Moderate to high injury at 0.187, 0.25 and 0.375 lb ai per acre	20080229c.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26278	Arborvitae	Thuja sp.	T. occidentalis 'Emerald Green'	Field Container	Lieth	2007	Over the top	Unacceptable injury (bleaching, necrosis of shoot tips) and delayed/distorted growth at 0.187, 0.25 and 0.37 lb ai per acre	20071022c.pdf
26278	Arborvitae	Thuja sp.	T. occidentalis 'Nigra'	Field Container	Senesac	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26240	Hemlock, Western	Tsuga heterophylla		Field Container	Boydston	2007	Over the top	No injury at 0.187, significant injury at 0.25 and 0.37 lb ai per acre; 0.187 lb treated plants saleable	20071120f.pdf
26267	Speedwell, Brooklime	Veronica sp.	'Red Fox'	Field Container	Boydston	2007	Over the top	High injury at 0.187, 0.25 and 0.37 lb ai per acre; plants not saleable	20071120.pdf
26267	Speedwell, Brooklime	Veronica sp.	'Sunny Border Blue'	Field Container	Williams	2007	Over the top	Severe injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
26267	Speedwell, Brooklime	Veronica sp.	V. peduncularis 'Waterperry'	Field Container	Senesac	2007	Over the top	Slight to moderate injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26257	Arrowwood	Viburnum sp.	V. dentatum 'Chicago Lustre'	Field Container	Williams	2007	Over the top	Slight injury at 0.187 and 0.25, moderate at 0.38 lb ai per acre	20080530b.pdf
26257	Arrowwood	Viburnum sp.	V. nudum 'Winterthur'	Field Container	Senesac	2007	Over the top	Moderate to severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116s.pdf
26257	Arrowwood	Viburnum sp.	V. opulus	Field Container	Regan	2007	Over the top	High injury and growth reduction at 0.187, 0.25 and 0.37 lb ai per acre	20080108d.pdf
26257	Arrowwood	Viburnum sp.	V. plicatum 'Shasta'	Field Container	Ahrens/Mervosh	2007	Over the top	Severe injury at 0.187, 0.25 and 0.375 lb ai per acre	20080229d.pdf
26297	Periwinkle	Vinca sp.	'Pinkstar'	Field Container	Wade	2007	Over the top	Some chlorosis at 0.187, 0.25 and 0.37 lb ai per acre after 1st application; complete recovery in 2 weeks	20080116e.pdf
26297	Periwinkle	Vinca sp.	V. major 'Maculata'	Field Container	Boydston	2007	Over the top	High injury and stunting at 0.187, 0.25 and 0.37 lb ai per acre	20071120h.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Method	Results Summary	File Name
	Common Name	Latin Name	Cultivar						
26297	Periwinkle	Vinca sp.	V. minor	Field Container	Freiberger	2007	Over the top	Moderate to high injury increasing with rates at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26297	Periwinkle	Vinca sp.	V. minor	Field Container	Senesac	2007	Over the top	Slight to moderate injury at 0.187, 0.25 and 0.37 lb ai per acre; complete recovery 8 weeks after 2nd application	20080128b.pdf
The Trial Below was conducted using Mesotrione G instead of Mesotrione SC									
27464	Arrowwood	Viburnum sp.	V. opulus	Field Container	Regan	2007	Over the top	No significant injury at 0.187, 0.25 and 0.37 lb ai per acre; growth reduction only at 2X and 4X	20080108d.pdf

## **Label Suggestions**

If either formulation will be commercialized for use on or around ornamental horticulture plants, it is suggested that the initial label(s) be quite restrictive with over-the-top applications along with fully listing those species exhibiting sensitivity to treatment.

## **Appendix 1: Protocols**

## Phytotoxicity with over the top applications of select sedge control materials

### Ornamental Protocol Number: 07-009

**Objective:** Determine phytotoxicity of dimethenamid-p + pendimethalin G, F6875, and mesotrione to certain herbaceous ornamental plants, and these three plus dimethenamid-P EC on woody ornamental plants.

### Experimental Design:

**Plot Size:** Must be adequate to reflect actual use conditions.

**Replicates:** Minimum of 3 replications (preferably 4) with 3 plants per replicate

**Application Instructions:** Two applications made approximately 4 weeks apart for Mesotrione and 8 weeks apart for F6875 and dimethenamid formulations, with the first application 7 days after potting. However, plant materials must have broken dormancy prior to first application. For liquid applications, use a minimum of 20 gal per acre. Applications should be made over the top of the plants using application equipment consistent with conventional commercial equipment. Please see table below for instructions for post-application irrigation.

**Plant Materials:** *Contact your Regional Coordinator for an up-to-date list.* Plants grown in field containers are preferred to in-ground. PR Numbers in the attached table refer to only those plants grown in field containers. Additional new PR Numbers will be assigned to plant material grown in-ground.

**Evaluations:** Record plant height & width at initial and final evaluations only. At 1, 2, and 4 weeks after each application, record phytotoxicity on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill). If appropriate, also include ratings for chlorosis, defoliation, stunting or other growth effects on a scale of 0 to 10 (0 = No effect; 10 = Complete plant affected). If any phytotoxicity is observed in treated plants, take pictures comparing treated and untreated plant material.

**Recordkeeping:** Keep detailed records of weather conditions including temperature and precipitation, soil-type or soil-less media, application equipment, irrigation, liner size, plant height & width, and plant growth stage at application and data collection dates.

### Treatments:

Product	Rate	Special Instructions	Contact Information to obtain materials and any needed adjuvants
BAS 656h 63.9%EC (dimethenamid-p)	21 fl oz per acre (0.97 lb ai)	Woody ornamentals only. Irrigate within 1 and 4 hours after application.	BASF, Kathie Kalmowitz, 919-270-4592, <a href="mailto:kathie.kalmowitz@basf.com">kathie.kalmowitz@basf.com</a>
	42 fl oz per acre (1.94 lb ai)		
	84 fl oz per acre (3.88 lb ai)		
BAS 659h 1.75G (dimethenamid-p + pendimethalin)	150 lb per acre (2.65 lb ai)	Shipments planned for March/April 2007. Irrigate within 1 and 4 hours after application.	BASF, Kathie Kalmowitz, 919-270-4592, <a href="mailto:kathie.kalmowitz@basf.com">kathie.kalmowitz@basf.com</a>
	300 lb per acre (5.3 lb ai)		
	600 lb per acre (10.6 lb ai)		
F6875 (sulfentrazone )	0.375 lb ai per acre		FMC, Bobby Walls, 919-735-3862, <a href="mailto:bobby_walls@fmc.com">bobby_walls@fmc.com</a>
	0.75 lb ai per acre		
	1.5 lb ai per acre		
Mesotrione	0.187 lb ai per acre (6 oz/A)		Syngenta, Nancy Rechsigl, 941-708-9338, <a href="mailto:nancy.rechsigl@syngenta.com">nancy.rechsigl@syngenta.com</a>
	0.25 lb ai per acre (8 oz/A)		
	0.37 lb ai per acre (12oz/A)		
Untreated	--	--	

### Reports:

Reports submitted on the standard IR-4 Ornamental Horticulture Research Report Form are preferred.

A report submitted electronically is preferred but not required. If the report is provided electronically, the basic report can be sent in MS Word or WordPerfect, the recordkeeping information as pdf or other electronic documents, and the raw data in MS Excel or other suitable program such as ARM.

**Please direct questions to:** Cristi Palmer, IR-4 HQ, Rutgers University, 681 US Hwy 1 S, North Brunswick, NJ 08902-3390, Phone 732-932-9575 x4629, [palmer@aesop.rutgers.edu](mailto:palmer@aesop.rutgers.edu).

Draft Date: 3/14/07  
Revised By: CLP

## Appendix 2: Contributing Researchers

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### **Appendix 3: Submitted Data**

Researcher reports included in the printed copy of this report and those received by 4/29/09.  
Reports on following pages are in alphanumeric order of author PR number.