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

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Acknowledgements

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Abstract

From 2007 to 2010, IR-4 completed 124 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 48 plant genera or species. Of these, seven exhibited no or minimal transient injury after application at all three rates. Twenty one crops exhibited significant phytotoxicity at even the lowest rate: *Buddleia davidii*, *Cortaderia selloana*, *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, crop 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. Mesotrione G was applied at similar rates in single trial. 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 = Plant death) 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 IR-4 testing, the following protocols were used: 07-009, 09-011, and 10-018. Please visit <http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm> to view and download these protocols.

Mesotrione G and Mesotrione SC were supplied to researchers (See list of researchers in Appendix 1) 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 seven 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 one 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*, *Cortaderia selloana*, *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>Festuca ovina glauca</i> (see Klett)
<i>Berberis thunbergii</i> (see Williams)	<i>Miscanthus sinensis</i>
<i>Buxus sempervirens</i>	<i>Rhododendron sp.</i> ¹
<i>Calamagrostis acutiflora</i>	

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

<i>Euonymus sp.</i> (see Boydston)	<i>Thuja plicata</i>
<i>Hemerocallis sp.</i>	<i>Tsuga heterophylla</i>
<i>Hydrangea macrophylla</i>	

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

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

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

<i>Acer rubrum</i>	<i>Juniperus horizontalis</i>
<i>Cladrastis sp.</i>	<i>Juniperus squamata</i>
<i>Hibiscus sp.</i>	<i>Loropetalum chinensis</i>
<i>Hosta sp.</i> ²	<i>Magnolia grandiflora</i>
<i>Hydrangea paniculata</i>	<i>Magnolia soulangeana</i>
<i>Iris siberica</i>	<i>Muhlenbergia capillaris</i>
<i>Juniperus communis</i>	<i>Pennisetum alopecuroides</i>

¹ Differential response possibly due to different cultivars.

² 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 10/1/11 are listed below.

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26540	Abies fraseri	Fir, Fraser	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	Abies fraseri	Fir, Fraser	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	Abies fraseri	Fir, Fraser	Field Container	Freiberger	2007	Over the top	No significant injury at 0.187, 0.25 and 0.37 lb ai per acre	200802271.pdf
26323	Abies fraseri 'Roan Mountain'	Fir, Fraser	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	Acer rubrum	Maple, Red	Field Container	Freiberger	2007	Over the top	Slight injury at 0.187 and 0.25, moderate at 0.37 lb ai per acre	200802271.pdf
26197	Acer rubrum 'Red Sunset'	Maple, Red	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	Berberis sp. B. thunbergii 'Crimson Pygmy'	Barberry	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	Berberis sp. B. thunbergii 'Atropurpurea'	Barberry	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
26286	Berberis sp. B. x gladwynsis 'William Penn'	Barberry	Field Container	Czarnota	2009	Over the top	No significant injury at 0.187, 0.25 and 0.37 lb ai per acre.	20091214a.pdf
26338	Buddleia davidii 'Pink Delight'	Butterfly Bush	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	Buddleia davidii 'White Ball'	Butterfly Bush	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
26307	Buxus sp.	Boxwood	Field Container	Mathers	2007	Over the top	No or slight visible injury at 0.187, 0.25 and 0.37 lb ai per acre.	20080228a.pdf
26307	Buxus sp. B. sempervirens 'Green Mountain'	Boxwood	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	Buxus sp. 'Green Velvet'	Boxwood	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

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26207	Calamagrostis acutiflora	Feather Reed Grass	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	Calamagrostis acutiflora 'Karl Forester'	Feather Reed Grass	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
26207	Calamagrostis acutiflora 'Karl Forester'	Feather Reed Grass	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
26319	Cladrastis sp. C. kentukea	Yellowwood	Field Container	Freiberger	2007	Over the top	Slight injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
28167	Cortaderia sp. C. selloana	Pampas Grass	Field Container	Gilliam	2010	Over the top	Minor to severe injury with increasing with rate (2.62, 5.25, and 10.5 lb ai per acre) and significant growth reduction at 2x and 4x.	20110615g.pdf
28167	Cortaderia sp. C. selloana	Pampas Grass	Field Container	Uber	2010	Over the top	Slight to moderate injury with 6, 8, 12 fl oz per acre.	20101223c.pdf
26243	Dianthus sp. 'Fire Witch'	Pinks	Field Container	Williams	2007	Over the top	High injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
26243	Dianthus sp. D. deltooides 'Brilliant'	Pinks	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	Dianthus sp. 'Firewitch'	Pinks	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	Echinacea sp.	Purple Coneflower	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	Echinacea sp. E. purpurea	Purple Coneflower	Field Container	Mathers	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20071106d.pdf
26357	Echinacea sp. E. purpurea	Purple Coneflower	Field Container	Williams	2007	Over the top	Severe injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
26357	Echinacea sp. E. purpurea 'Magnus'	Purple Coneflower	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	Echinacea sp. E. purpurea 'Magnus'	Purple Coneflower	Field Container	Wade	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116e.pdf
26357	Echinacea sp. E. purpurea 'White Swan'	Purple Coneflower	Field Container	Boydston	2007	Over the top	High injury at 0.187, 0.25 and 0.37 lb ai per acre	20071120w.pdf
28014	Euonymus alatus 'Compacta'	Winged Burning Bush	Field Container	Williams	2007	Over the top	Slight injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
28014	Euonymus alatus E. alatus 'Compacta'	Winged Burning Bush	Field Container	Mathers	2010	Over the top	Minor to moderate injury at 0.187 and 0.25 lb ai per acre; significant injury at 0.5 lb ai per acre.	20101005a.pdf

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
28014	Euonymus alatus E. alatus 'compactus'	Winged Burning Bush	Field Container	Boydston	2010	Over the top	Significant injury at 0.187, 0.25, 0.37 lb ai per acre at 4WAT and 4WAT2. Most 1x plants saleable. Half 1.3x and all 2x plants not saleable.	20101105n.pdf
28015	Euonymus radicans E. fortunei 'Coloratus'	Purpleleaf Wintercreeper	Field Container	Williams	2007	Over the top	Slight injury at 0.187, 0.25 and 0.37 lb ai per acre	20080530b.pdf
26210	Festuca ovina glauca	Blue Fescue	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	Festuca ovina glauca	Blue Fescue	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	Festuca ovina glauca 'Elijah Blue'	Blue Fescue	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
26210	Festuca ovina glauca 'Elijah Blue'	Blue Fescue	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
26345	Hemerocallis sp.	Daylily	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26345	Hemerocallis sp. 'Second Glance'	Daylily	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	Hemerocallis sp. 'Stella d'Oro'	Daylily	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
26301	Hibiscus sp. H. rosa-sinensis 'Butterfly Yellow'	Mallow, Rose Mallow	Field Container	Uber	2010	Over the top	Moderate but transient crop injury with 6, 8, 12 fl oz per acre.	20101223c.pdf
26301	Hibiscus sp. H. syriacus	Mallow, Rose Mallow	Field Container	Czarnota	2010	Over the top	Severe crop injury with 6, 8, 12 oz per acre.	20110330a.pdf
26264	Hosta sp. H. fortunei 'Francee'	Hosta	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 sp. 'Krossa Regal'	Hosta	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26253	Hydrangea sp.	Hydrangea	Field Container	Mathers	2007	Over the top	No visible injury at 6, 8 and 12 oz per acre	20080228a.pdf
26253	Hydrangea sp. H. macrophylla 'Week End'	Hydrangea	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 sp. H. macrophylla 'Endless Summer'	Hydrangea	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 sp. H. macrophylla 'Nikko Blue'	Hydrangea	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

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26253	Hydrangea sp. H. macrophylla 'Nikko Blue'	Hydrangea	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 sp. H. paniculata 'Pee Wee'	Hydrangea	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 sp. H. quercifolia 'Alice'	Hydrangea	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26334	Ilex sp. I. x meserveae 'China Girl'	Holly	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	Ilex sp. I. cornuta 'Carissa'	Holly	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26334	Ilex sp. I. verticillata 'Winter Gold'	Holly	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
27676	Ilex vomitoria 'nana'	Holly, Dwarf Yaupon	Field Container	Czarnota	2010	Over the top	Moderate to severe crop injury 0.187, 0.25 and 0.37 lb ai per acre.	20110330a.pdf
27676	Ilex vomitoria 'nana'	Holly, Dwarf Yaupon	Field Container	Trader	2007	Over the top	Moderate to severe injury at 0.187, 0.25 and 0.37 lb ai per acre.	20080116i.pdf
26351	Iris sp. I. siberica 'Harpwell Happiness'	Flag	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
26271	Juniperus sp.	Juniper	Field Container	Mathers	2007	Over the top	No visible injury at 0.187, 0.25 and 0.37 lb ai per acre.	20080228a.pdf
26271	Juniperus sp. J. communis 'Gold Totem Pole'	Juniper	Field Container	Senesac	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26271	Juniperus sp. J. horizontalis 'Wiltonii'	Juniper	Field Container	Fraelich	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227r.pdf
26271	Juniperus sp. J. squamata 'Blue Star'	Juniper	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	Lagerstroemia indica	Crape Myrtle	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	Liriope sp.	Lilyturf, Creeping	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
26330	Loropetalum sp. L. chinensis 'Ruby'	Loropetalum	Field Container	Gilliam	2010	Over the top	Minor crop injury with one and two applications at 0.187, 0.25 and 0.37 lb ai per acre increasing wit rate but decreasing with time. No growth reduction.	20110615g.pdf

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26315	Magnolia sp. M. grandiflora 'Majestic Beauty'	Magnolia	Field Container	Uber	2010	Over the top	No crop injury with 0.187, 0.25 and 0.37 lb ai per acre.	20101223c.pdf
26315	Magnolia sp. M. soulangeana 'Jon Jon'	Magnolia	Field Container	Gilliam	2010	Over the top	Moderate to significant crop injury with one and two applications at 0.187, 0.25 and 0.37 lb ai per acre and growth reduction at 2x and 4x.	20110615g.pdf
26213	Miscanthus sp.	Silver Grass	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	Miscanthus sp. M. sinensis	Silver Grass	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	Miscanthus sp. M. sinensis 'Graziella'	Silver Grass	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
28169	Muhlenbergia capillaris	Muhly, hairyawn	Field Container	Uber	2009	Over the top	Slight, acceptable injury at 0.187, 0.25 and 0.37 lb ai per acre.	20100111b.pdf
26438	Ophiopogon sp.	Mondo Grass, Lilyturf, Ker-Gawl	Field Container	Trader	2007	Over the top	Unacceptable injury at 0.187, 0.25 and 0.37 lb ai per acre	20080116i.pdf
28170	Pennisetum sp.	Feathergrass	Field Container	Uber	2010	Over the top	No crop injury with 6, 8, 12 fl oz/A.	20101223c.pdf
28170	Pennisetum sp. P. alopecuroides var. viridescens	Feathergrass	Field Container	Boydston	2009	Over the top	No injury or growth reduction at 0.187, 0.25 and 0.37 lb ai per acre; all plants saleable.	20091103j.pdf
26216	Phlox paniculata P. paniculata 'Robert Poore'	Phlox, Perennial	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 paniculata 'Starfire'	Phlox, Perennial	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	Phlox subulata 'McDaniels Cushion'	Creeping Phlox, Moss Pink	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	Phlox subulata P. subulata 'Emerald Blue'	Creeping Phlox, Moss Pink	Field Container	Senesac	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080128b.pdf
26294	Picea sp. P. glauca	Spruce	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	Picea sp. P. glauca 'Conica'	Spruce	Field Container	Mathers	2009	Over the top	Moderate injury at 0.187, 0.25 and 0.37 lb ai per acre	20091028g.pdf
26294	Picea sp. P. pungens	Spruce	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

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26225	<i>Pseudotsuga menziesii</i>	Fir, Douglas	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	<i>Pseudotsuga menziesii</i> 'Blue'	Fir, Douglas	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	<i>Pseudotsuga menziesii</i> P. <i>menziesii</i> glauca	Fir, Douglas	Field Container	Freiberger	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre	20080227l.pdf
26290	<i>Rhododendron</i> sp. 'Fashion'	Azalea	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	<i>Rhododendron</i> sp. 'Gwenda'	Azalea	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	<i>Rhododendron</i> sp. R. x 'Crete' (Yakushimanum hybrid)	Azalea	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	<i>Rhododendron</i> sp. 'Vulcan'	Azalea	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	<i>Rosa</i> sp.	Rose	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	<i>Rosa</i> sp. 'Nearly Wild'	Rose	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
26200	<i>Rosa</i> sp. R. meiglise 'White Drift'	Rose	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	<i>Rosa</i> sp. R. virginiana	Rose	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	<i>Rosa</i> sp. R. x hybrida 'Knockout'	Rose	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
26200	<i>Rosa</i> sp. R. x hybrida 'Nearly Wild'	Rose	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
26204	<i>Salvia sylvestris</i> 'East Friesland'	Sage, Ramona	Field Container	Boydston	2007	Over the top	High injury at 0.187, 0.25 and 0.37 lb ai per acre	20071120k.pdf
26204	<i>Salvia sylvestris</i> 'Rhea'	Sage, Ramona	Field Container	Beste/Frank	2007	Over the top	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
26204	<i>Salvia sylvestris</i> S. <i>sylvestris</i> 'May Night'	Sage, Ramona	Field Container	Williams	2007	Over the top	Severe injury at 0.187, 0.25 and 0.37 lb ai per acre.	20080530b.pdf

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26282	<i>Spiraea</i> sp. <i>S. decumbens</i>	Bridal-Wreath	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	<i>Spiraea</i> sp. <i>S. prunifolia</i>	Bridal-Wreath	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	<i>Spiraea</i> sp. <i>Spiraea</i> x <i>bumalda</i> 'Gold Mound'	Bridal-Wreath	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	<i>Taxus</i> sp. <i>T. baccata</i>	Yew	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	<i>Taxus</i> sp. <i>T. baccata</i> <i>fasigata</i>	Yew	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
26229	<i>Thuja plicata</i>	Cedar, Western Red	Field Container	Boydston	2010	Over the top	Slight injury at 0.187, slight to moderate at 0.25 and 0.37 lb ai per acre; no growth reduction; all treated plants saleable.	20101105f.pdf
26229	<i>Thuja plicata</i>	Cedar, Western Red	Field Container	Czarnota	2010	Over the top	No crop injury with during the evaluation period with 0.187, 0.25 and 0.37 lb ai per acre.	20110330a.pdf
26229	<i>Thuja plicata</i> T. <i>plicata</i> 'Green Giant'	Cedar, Western Red	Field Container	Gilliam	2010	Over the top	No crop injury with 0.187 lb ai per acre but moderate injury decreasing with time at 0.25 and 0.37 lb ai per acre. Growth reduction with the 4x rate.	20110615g.pdf
26278	<i>Thuja</i> sp.	Arborvitae	Field Container	Mathers	2007	Over the top	No injury at 0.187 and 0.25 lb ai/A but slight at 0.37 lb ai/A per acre.	20080228a.pdf
26278	<i>Thuja</i> sp. <i>T. occidentalis</i> 'Emerald Green'	Arborvitae	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
26278	<i>Thuja</i> sp. <i>T. occidentalis</i> 'Emerald Green'	Arborvitae	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	<i>Thuja</i> sp. <i>T. occidentalis</i> 'Nigra'	Arborvitae	Field Container	Senesac	2007	Over the top	No injury at 0.187, 0.25 and 0.37 lb ai per acre.	20080128b.pdf
26240	<i>Tsuga heterophylla</i>	Hemlock, Western	Field Container	Boydston	2010	Over the top	All plants saleable after two sequential applications of Mesotrione 4SC applied 4 weeks apart at 0.187, 0.25, 0.37 lb ai per acre. However, 0.25 and 0.37 lb ai/A caused chlorosis on plant tips but plant height and width were not affected.	20101105h.pdf
26240	<i>Tsuga heterophylla</i>	Hemlock, Western	Field Container	Boydston	2009	Over the top	No injury or growth reduction at 0.19, 0.25 and 0.37 lb ai per acre; all treated plants saleable.	20091201l.pdf
26240	<i>Tsuga heterophylla</i>	Hemlock, Western	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

PR#	Crop Name		Production Site	Researcher	Year	Application Type	Results	File name
	Latin	Common						
26267	Veronica sp. 'Red Fox'	Speedwell, Brooklime	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	Veronica sp. 'Sunny Border Blue'	Speedwell, Brooklime	Field Container	Williams	2007	Over the top	Severe injury at 0.187, 0.25 and 0.38 lb ai per acre	20080530b.pdf
26267	Veronica sp. V. peduncularis 'Waterperry'	Speedwell, Brooklime	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	Viburnum sp. V. dentatum 'Chicago Lustre'	Arrowwood	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	Viburnum sp. V. nudum 'Winterthur'	Arrowwood	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
27464	Viburnum sp. V. opulus	Arrowwood	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
26257	Viburnum sp. V. opulus	Arrowwood	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	Viburnum sp. V. plicatum 'Shasta'	Arrowwood	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	Vinca sp. 'Pinkstar'	Periwinkle	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	Vinca sp. V. major 'Maculata'	Periwinkle	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
26297	Vinca sp. V. minor	Periwinkle	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	Vinca sp. V. minor	Periwinkle	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

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.

For Mesotrione SC, it is suggested that the following four crop species exhibiting no injury in the testing with over-the-top applications be placed on the label. (Table 1)

Buxus sempervirens

Calamagrostis acutiflora

Festuca ovina glauca

Miscanthus sinensis

The following species demonstrated safety in two or more trials but had one trial with slight to moderate injury.

Abies fraseri

Berberis thunbergii

Rhododendron sp.

It is advisable to list the following 21 crops as sensitive to Mesotrione SC treatment. (Table 3)

Buddleia davidii

Cortaderia selloana

Dianthus gratianopolitanus

Echinacea purpurea

Hydrangea quercifolia

Ilex sp.

Lagerstroemia indica

Liriope sp.

Ophiopogon sp.

Phlox paniculata

Phlox subulata

Picea sp.

Pseudotsuga menziesii

*Rosa sp.*¹

Salvia sylvestris

Spiraea sp.

Taxus sp.

*Thuja occidentalis*¹

Veronica sp.

Viburnum sp.

Vinca sp.

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Appendix 2: Submitted Data

Researcher reports included in the printed copy of this report are those received by 10/1/11. Reports on following pages are in alphanumeric order of author and PR number. Electronic reports can be found at <http://ir4.rutgers.edu/Ornamental/Ornamentals.cfm>.