



# Ornamental Horticulture Program Research Project Sheet

<http://ir4.rutgers.edu/Ornamental/ornamentalProjectInformationSheets.cfm>

**Project Name:** Pre Emergent Herbicide Crop Safety – Mesotrione

<b>New</b>	<b>Ongoing</b>	<b>Completed</b>	X	<b>Duration if ongoing or completed:</b>	2007-2011
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**Project Description:**

The Pre-Emergent Herbicide Crop Safety Project began in 2004 and has continued through 2013. While specific crops and herbicides have changed, the intent of this research has been to screen over-the-top applications of pre-emergent herbicides as plants are breaking dormancy, or beginning new growth, and then 4 to 6 weeks later once foliage is more mature. This research project sheet covers three formulations containing mesotrione: EXC3898, Mesotrione 4SC, and Mesotrione G.

**Research Project Abstract (if available):**

**Abstract from 2009 EXC3898 Crop Safety Summary**

During 2008, IR-4 completed 97 trials on EXC3898 (mesotrione + prodiamine + s-metolachlor). The data contained in this report was generated to register uses of EXC3898 on and around ornamental horticulture plants with over-the-top applications. The mesotrione rates were 2.1, 4.2 and 6.3 pounds active ingredient per acre (lb ai per A) as the 1X, 2X and 3X rates. EXC3898 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.*

**Abstract from 2015 Mesotrione Crop Safety Summary**

From 2007 to 2011, IR-4 completed 144 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, nine 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.*

**Target Species (Phytotoxicity, or common and Latin name of arthropod, pathogen, weed):**

Crop Safety

**Target Crops (list tested crops if ongoing or completed project)**

See "IR-4 Crop Safety to Date" below

**Target Product(s) (list tested products or numbered compounds if ongoing or completed project)**

EXC3898  
Mesotrione 4SC  
Mesotrione G

Product Registration and Research Status	
	<b>Registration Status</b>
Labeled & Commercialized Wide range of ornamental horticulture crops listed	
Labeled & Commercialized Opportunity to add additional ornamental horticulture crops	
Labeled But NOT Commercialized	
Not yet registered or labeled	
No longer available for development	EXC3898 Mesotrione 4SC Mesotrione G
* IR-4 Data contributed to registration decision – either adding pest to label or not pursuing further research	
1 At least one crop species screened fully	
2 Product not available for production ornamentals	

Project Pros	Project Cons
1 Additional research could yield data favorable for further label expansion	1 A large percentage of plants were injured with over-the-top applications
2	

**IR-4 Crop Safety Trials to Date**

Average rating on a scale of 1 – 5 with 1 = 0 to about no injury and 5 = severe injury and mortality; minimum to maximum rating; number of trials. A rating of 3 or higher is considered commercially unacceptable (*red text*). A rating of 1 or 2 is considered commercially acceptable and those with more than 3 trials are complete (*green text*). ‘Labeled’ indicates that IR-4 generated data in at least one trial and that this crop is listed on the label. For crop/product combinations that are blank, IR-4 has not screened this combination.

Plant Group	Crop	Mesotrione 4SC (Mesotrione)	Mesotrione G (Mesotrione)	EXC3898 (Mesotrione + prodiamine & S-metolachlor)
Broadleaf Evergreen Tree/Shrub	Boxwood ( <i>Buxus</i> sp.)	1.3 (1 - 2) n3		MFG Hold
	Camellia ( <i>Camellia</i> sp.)			MFG Hold
	Purpleleaf Wintercreeper ( <i>Euonymus radicans</i> )	2.0 (2 - 2) n1		
	Inkberry ( <i>Ilex glabra</i> )			MFG Hold
	Holly ( <i>Ilex</i> sp.)	3.0 (1 - 4) n3		MFG Hold
	Holly, Dwarf Yaupon ( <i>Ilex vomitoria</i> ‘nana’)	4.0 (4 - 4) n2		
	Loropetalum ( <i>Loropetalum</i> sp.)	2.0 (2 - 2) n1		
	Heavenly Bamboo ( <i>Nandina domestica</i> )			MFG Hold
	Holly Olive;False ( <i>Osmanthus heterophyllus</i> )			MFG Hold
	Photinia ( <i>Photinia</i> sp.)			MFG Hold
	Andromeda ( <i>Pieris</i> sp.)			MFG Hold
	Indian Hawthorn ( <i>Raphiolepis indica</i> )			MFG Hold
	Azalea ( <i>Rhododendron</i> sp.)	2.0 (1 - 3) n4		MFG Hold
	Azalea, & Rhododendron ( <i>Rhododendron</i> sp.)			MFG Hold
Broadleaf Evergreen/Deciduous Tree/Shrub	Abelia ( <i>Abelia</i> sp.)			MFG Hold
	Barberry ( <i>Berberis</i> sp.)	1.7 (1 - 3) n3		MFG Hold
	Cotoneaster ( <i>Cotoneaster</i> sp.)			MFG Hold
	Privet ( <i>Ligustrum</i> sp.)			MFG Hold
	Magnolia ( <i>Magnolia</i> sp.)	2.0 (1 - 3) n2		MFG Hold
Bulbs & Corms	Daylily ( <i>Hemerocallis</i> sp.)	2.3 (1 - 4) n3		
	Flag ( <i>Iris</i> sp.)	MFG Hold		
Cactus & Succulents	Stonecrop ( <i>Sedum</i> sp.)			MFG Hold
	Maple, Japanese ( <i>Acer palmatum</i> )			MFG Hold

Plant Group	Crop	Mesotrione 4SC (Mesotrione)	Mesotrione G (Mesotrione)	EXC3898 (Mesotrione + prodiamine & S-metolachlor)
Deciduous Tree/Shrub/Vine	Maple, Red ( <i>Acer rubrum</i> )	2.5 (2 - 3) n2		MFG Hold
	Maple ( <i>Acer</i> sp.)			MFG Hold
	Butterfly Bush ( <i>Buddleia davidii</i> )	3.0 (3 - 3) n2		MFG Hold
	Caryopteris ( <i>Caryopteris x clandonensis</i> )			MFG Hold
	Yellowwood ( <i>Cladrastis</i> sp.)	2.0 (2 - 2) n1		
	Clematis ( <i>Clematis</i> sp.)			MFG Hold
	Dogwood, Flowering ( <i>Cornus florida</i> )			MFG Hold
	Winged Burning Bush ( <i>Euonymus alatus</i> )	2.8 (2 - 4) n4		MFG Hold
	Golden Bells ( <i>Forsythia</i> sp.)			MFG Hold
	Hydrangea ( <i>Hydrangea</i> sp.)	2.3 (1 - 4) n7		MFG Hold
	Crape Myrtle ( <i>Lagerstroemia indica</i> )	4.0 (4 - 4) n1		MFG Hold
	Lavender ( <i>Lavandula</i> sp.)			MFG Hold
	Oak, Northern Red ( <i>Quercus rubra</i> )	4.0 (4 - 4) n1		
	Oak ( <i>Quercus</i> sp.)			MFG Hold
	Rose ( <i>Rosa</i> sp.)	2.8 (1 - 4) n6		MFG Hold
	Elder, Elderberry ( <i>Sambucus</i> sp.)	MFG Hold		
	Bridal-Wreath ( <i>Spiraea</i> sp.)	3.7 (3 - 4) n3		MFG Hold
	Lilac ( <i>Syringa</i> sp.)			MFG Hold
Arrowwood ( <i>Viburnum</i> sp.)	3.5 (3 - 4) n4		MFG Hold	
Hardy Ground Cover Foliage	Lilyturf, Creeping ( <i>Liriope</i> sp.)	4.0 (4 - 4) n1		
	Catnip ( <i>Nepeta cataria</i> )			MFG Hold
	Catmint ( <i>Nepeta x faasseni</i> )			MFG Hold
	Periwinkle ( <i>Vinca</i> sp.)	3.0 (2 - 4) n4		
Herbaceous Flowering Plant	Lily-Of-The-Nile ( <i>Agapanthus</i> sp.)			MFG Hold
	Mallow, Rose Mallow ( <i>Hibiscus</i> sp.)	3.5 (3 - 4) n2		
	Cinquefoil ( <i>Potentilla</i> sp.)			MFG Hold
	Sage, Ramona ( <i>Salvia sylvestris</i> )	4.0 (4 - 4) n3		MFG Hold
	Speedwell, Brooklime ( <i>Veronica</i> sp.)	3.7 (3 - 4) n3		
Herbaceous Flowering Plant - Perennial	Pinks ( <i>Dianthus</i> sp.)	3.0 (2 - 4) n3		
	Purple Coneflower ( <i>Echinacea</i> sp.)	3.5 (1 - 4) n6		
	Hosta ( <i>Hosta</i> sp.)	MFG Hold		
	Phlox, Perennial ( <i>Phlox paniculata</i> )	4.0 (4 - 4) n2		
	Creeping Phlox, Moss Pink ( <i>Phlox subulata</i> )	3.0 (2 - 4) n2		
Narrowleaf Evergreen Tree/Shrub	Fir, Fraser ( <i>Abies fraseri</i> )	1.7 (1 - 3) n3		
	Fir ( <i>Abies</i> sp.)			MFG Hold
	Juniper ( <i>Juniperus</i> sp.)	1.0 (1 - 1) n4		MFG Hold
	Spruce ( <i>Picea</i> sp.)	3.0 (2 - 4) n3		MFG Hold
	Pine ( <i>Pinus</i> sp.)	1.0 (1 - 1) n1		MFG Hold
	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	2.3 (1 - 4) n4		
	Yew ( <i>Taxus</i> sp.)	3.5 (3 - 4) n2		MFG Hold
	Cedar, Western Red ( <i>Thuja plicata</i> )	1.8 (1 - 3) n4		
	Arborvitae ( <i>Thuja</i> sp.)	2.3 (1 - 4) n4		MFG Hold
	Hemlock, Canada ( <i>Tsuga canadensis</i> )	2.0 (2 - 2) n1		
Hemlock, Western ( <i>Tsuga heterophylla</i> )	2.0 (1 - 3) n4			
Ornamental Grass	Feather Reed Grass ( <i>Calamagrostis acutiflora</i> )	1.0 (1 - 1) n3		
	Pampas Grass ( <i>Cortaderia</i> sp.)	4.0 (4 - 4) n2		
	Blue Fescue ( <i>Festuca glauca</i> )	1.3 (1 - 2) n4		
	Silver Grass ( <i>Miscanthus</i> sp.)	1.0 (1 - 1) n3		
	Muhly, hairyawn ( <i>Muhlenbergia capillaris</i> )	2.0 (2 - 2) n2		
	Mondo Grass, Lilyturf, Ker-Gawl ( <i>Ophiopogon</i> sp.)	4.0 (4 - 4) n1		MFG Hold
	Feathergrass ( <i>Pennisetum</i> sp.)	1.3 (1 - 2) n3		
Palm	Palmetto Palm ( <i>Sabal minor</i> )		MFG Hold	