

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

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Acknowledgements

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Abstract

During 2008, IR-4 completed 95 trials on Broadstar 0.25G VC1604 (flumioxazin). The data contained in this report was generated to confirm register uses of flumioxazin on and around ornamental horticulture plants with over-the-top applications. The flumioxazin rates in the 2008 testing program were 0.375, 0.75, and 1.5 pounds active ingredient per acre (lb ai per A) as the 1X, 2X and 4X rates. Broadstar 0.25G VC1604 had been applied to 51 plant genera or species. Of these, 43 exhibited no or minimal transient injury after application at all three rates. No crops exhibited significant phytotoxicity at even the lowest rate, but 8 species or genera need additional information to clarify crop response.

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. Valent reformulated the Broadstar G formulation to reduce non-target phytotoxicity. During 2008, Broadstar 0.25G VC1604 was tested to determine whether the new formulation could broaden the plant safety list.

Materials and Methods

A single application of Broadstar 0.25G VC1604 was made approximately 8 – 10 weeks after plants broke dormancy. The application rates were 0.375, 0.75, and 1.5 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. For more detailed materials and methods, please see Appendix 1: Protocols.

Broadstar 0.25G VC1604 was supplied to researchers (See list of researchers in Appendix 2) by Valent.

Results and Summary

Phytotoxicity

Based on the type and nature of injury seen with Broadstar 0.25G VC1604 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 2X and/or 4X 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.

Broadstar 0.25G VC1604 exhibited no or minimal negative impact on 43 plant 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. In the research presented here, no plants exhibited significant injury at higher rates consistently among the research sites. No crops tested in 2007 exhibited damage sufficient to recommend growers not utilize Broadstar 0.25G VC1604 as an over-the-top treatment for pre-emergent weed control (Table 3). For 8 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).

Please see Table 5 for a list of individual trial summaries on Broadstar 0.25G VC1604.

Table 1. List of Broadstar 0.25G VC1604 treated crops with no or minimal transitory injury.

<i>Abelia sp.</i> ¹	<i>Juniper conferta</i> ¹
<i>Abies balsamea</i> ¹	<i>Lagerstromia indica</i> ¹
<i>Abies fraseri</i> ¹	<i>Ligustrum lucidum</i> ¹
<i>Acer palmatum</i> ¹	<i>Magnola stellata</i> ¹
<i>Acer rubrum</i> ¹	<i>Photinia x fraseri</i> ¹
<i>Acer saccharum</i> ¹	<i>Picea ornoriki</i> ¹
<i>Berberis thunbergii</i> ¹	<i>Pinus mugo</i> ¹
<i>Buddleia davidii</i>	<i>Pinus taeda</i> ¹
<i>Buxus sp.</i> ¹	<i>Potentilla fruticosa</i> ¹
<i>Camelia japonica</i> ¹	<i>Quercus alba</i> ¹
<i>Camelia sasanqua</i> ¹	<i>Quercus rubra</i> ¹
<i>Cotoneaster glaucophyllus</i> ¹	<i>Raphiolepis indica</i> ¹
<i>Euonymus alatus</i> ¹	<i>Rhododendron sp.</i> ¹
<i>Euonymus fortunei</i> ¹	<i>Rosa sp. (See Harvey)</i> ¹
<i>Forsythia x intermedia</i> ¹	<i>Syringa macrophylla</i> ¹
<i>Hydrangea sp (See Lieth; two applications)</i>	<i>Syringa patula</i> ¹
<i>Ilex creanata</i> ¹	<i>Syringa reticulata</i> ¹
<i>Ilex glabra</i> ¹	<i>Taxus baccata</i> ¹
<i>Ilex vomitoria</i> ¹	<i>Taxus x media</i> ¹
<i>Juniper andorra</i> ¹	<i>Thuja occidentalis</i> ¹
<i>Juniper chinensis</i> ¹	<i>Viburnum sp.</i> ¹
<i>Juniper communis</i> ¹	

Table 2. List of Broadstar 0.25G VC1604 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 Broadstar 0.25G VC1604 treated crops exhibiting significant injury.

None

Table 4. List of Broadstar 0.25G VC1604 treated crops where more information is needed.

<i>Agapanthus africanus</i>	<i>Nepeta sp.</i>
<i>Clematis sp.</i>	<i>Salvia sp.</i>
<i>Lavandula sp.</i>	<i>Sedum sp.</i>
<i>Nandina domestica</i>	<i>Spirea sp.</i> ²

¹ Genera or closely related species already registered already on original Broadstar label

² More information on cultivar differences might be warranted.

Table 5. Detailed Summary of Crop Safety Testing with Broadstar 0.25G VC1604 (flumioxazin)

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 Type	Results Summary	Reg ?	File Name
	Common Name	Latin Name	Cultivar							
27076	Abelia	Abelia sp.	A. zanderi 'Little Richard'	Field Container	Senesac	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
27076	Abelia	Abelia sp.	'Edward Goucher'	Field Container	Lieth	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420c.pdf
27079	Fir	Abies sp.	A. balsamea	Field Container	Freiberger	2008	Directly on soil surface	No injury at 0.375, 0.75 and 1.5 lb ai per acre	N	20090319c.pdf
27079	Fir	Abies sp.	A. fraseri	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090129b.pdf
27084	Maple, Japanese	Acer palmatum	'Atropurpureum'	Field Container	Beste/Frank	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20081217e.pdf
27088	Maple, Red	Acer rubrum		Field Container	Senesac	2008	Over the top	Slight injury with complete recovery at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20081219a.pdf
27088	Maple, Red	Acer rubrum	'Summer'	Field Container	Gilliam	2008	Over the top	No injury at 0.375, 0.75, and 1.5 lb ai per acre with two applications.	N	20081224a.pdf
27093	Maple	Acer sp.	A. saccharum	Field Container	Senesac	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
28469	Lily-Of-The-Nile	Agapanthus sp.	A. africanus 'Peter Pan'	Field Container	Uber	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420h.pdf
27100	Barberry	Berberis sp.	B. thunbergii 'Amber Glow'	Field Container	Uber	2008	Over the top	Although plants suffered environmental stress, data showed no or less injury and taller plants than Untreated at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420h.pdf
27100	Barberry	Berberis sp.	B. thunbergii atropurpureum 'Crimson Pygmy'	Field Container	Beste/Frank	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20081224b.pdf
27100	Barberry	Berberis sp.	B. thunbergii 'Crimson Pigmy'	Field Container	Lieth	2008	Over the top	Phytotoxicity data inconclusive, no significant growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420c.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary	Reg ?	File Name
	Common Name	Latin Name	Cultivar							
27100	Barberry	Berberis sp.	B. thunbergii 'Crimson Pygmy'	Field Container	Williams	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre	N	20081030g.pdf
27103	Butterfly Bush	Buddleia davidii		Field Container	Derr	2008	Over the top	No significant injury at 0.375, 0.75, and 1.5 lb ai per acre	N	20090420g.pdf
27103	Butterfly Bush	Buddleia davidii	'Nanho Blue'	Field Container	Mathers	2008	Over the top	No significant injury and growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081030r.pdf
27103	Butterfly Bush	Buddleia davidii	'Pink Delight'	Field Container	Beste/Frank	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20081217g.pdf
27106	Boxwood	Buxus sp.	B. 'Green Mountain'	Field Container	Senesac	2008	Over the top	No injury but slight growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
27106	Boxwood	Buxus sp.	B. 'Wintergem'	Field Container	Trader	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924f.pdf
27111	Camellia	Camellia sp.	C. japonica	Field Container	Wade	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20080915a.pdf
27111	Camellia	Camellia sp.	C. sasanqua 'Pink Charm'	Field Container	Trader	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924f.pdf
27117	Clematis	Clematis sp.		Field Container	Derr	2008	Over the top	No significant injury at 0.375, 0.75, and 1.5 lb ai per acre	N	20090420g.pdf
27117	Clematis	Clematis sp.	C. integrifolia	Field Container	Klett	2008	Over the top	Trial 1: No injury at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20090319i.pdf
27117	Clematis	Clematis sp.	C. integrifolia	Field Container	Klett	2008	Over the top	Trial 2: No injury at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20090319i.pdf
27132	Cotoneaster	Cotoneaster sp.	C. glaucophyllus	Field Container	Uber	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420h.pdf
27132	Cotoneaster	Cotoneaster sp.	C. horizontalis 'Perpusillus'	Field Container	Lieth	2008	Over the top	Phytotoxicity data inconclusive due to heat stress, no growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420c.pdf
27147	Winged Burning Bush	Euonymus alatus	E. alatus 'Compactus'	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090129b.pdf
27147	Winged Burning Bush	Euonymus alatus	E. fortunei 'Coloratus'	Field Container	Williams	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre	N	20081030g.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary	Reg ?	File Name
	Common Name	Latin Name	Cultivar							
28258	Golden Bells	Forsythia sp.	F. x intermedia 'Golden Bell'	Field Container	Mickelbart	2008	Over the top	No injury at 0.375, 0.75, and 1.5 lb ai per acre with single application 3 weeks after transplanting.	N	20081029a.pdf
27157	Hydrangea	Hydrangea sp.		Field Container	Derr	2008	Over the top	No significant injury at 0.375 and 0.75, unacceptable at 1.5 lb ai per acre	N	20090420g.pdf
27157	Hydrangea	Hydrangea sp.		Field Container	Lieth	2008	Over the top	Unacceptable injury and growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420c.pdf
27157	Hydrangea	Hydrangea sp.	H. macrophylla 'Nikko Blue'	Field Container	Fraelich	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre; all plants marketable	N	20081030c.pdf
27157	Hydrangea	Hydrangea sp.	H. paniculata 'PeeGee'	Field Container	Mickelbart	2008	Over the top	No injury at 0.375, 0.75, and 1.5 lb ai per acre with single application 3 weeks after transplanting.	N	20081029a.pdf
27160	Holly	Ilex sp.	I. crenata 'Convexa'	Field Container	Mathers	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081030m.pdf
27160	Holly	Ilex sp.	I. glabra 'Densa'	Field Container	Senesac	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
27160	Holly	Ilex sp.	I. vomitoria	Field Container	Lieth	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420c.pdf
27163	Juniper	Juniperus sp.	J. andorra	Field Container	Harvey	2008	Over the top	1 application only; no injury at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924c.pdf
27163	Juniper	Juniperus sp.	J. chinensis 'Sea Green'	Field Container	Mickelbart	2008	Over the top	No injury at 0.375, 0.75, and 1.5 lb ai per acre with single application 3 weeks after transplanting.	N	20081029a.pdf
27163	Juniper	Juniperus sp.	J. communis 'Gold Totem Pole'	Field Container	Senesac	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
27163	Juniper	Juniperus sp.	J. conferta	Field Container	Trader	2008	Over the top	No significant injury at 0.375 and 0.75, slight at 1.5 lb ai per acre; no growth reduction	N	20090420h.pdf
27166	Crape Myrtle	Lagerstroemia indica		Field Container	Derr	2008	Over the top	No significant injury at 0.375, 0.75, and 1.5 lb ai per acre	N	20090420g.pdf
27166	Crape Myrtle	Lagerstroemia indica		Field Container	Fraelich	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre; all plants marketable	N	20081030c.pdf
27166	Crape Myrtle	Lagerstroemia indica	'Acoma'	Field Container	Gilliam	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre with two applications.	N	20081224a.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary	Reg ?	File Name
	Common Name	Latin Name	Cultivar							
27166	Crape Myrtle	Lagerstroemia indica	'Natchez'	Field Container	Wade	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20080915a.pdf
27171	Lavender	Lavandula sp.	L. angustifolia 'Munstead'	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090129m.pdf
28472	Privet	Ligustrum sp.	L. lucidum	Field Container	Uber	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre after 1st, moderate after 2nd application; growth reduction at 2X and 4X	N	20090420h.pdf
27182	Magnolia	Magnolia sp.	M. stellata 'Royal Star'	Field Container	Beste/Frank	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090316i.pdf
27190	Heavenly Bamboo	Nandina domestica	'Firepower'	Field Container	Gilliam	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre with two applications.	N	20081224a.pdf
27195	Catnip	Nepeta cataria	'Psfike'	Field Container	Klett	2008	Over the top	Trial 2: No injury at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20090319i.pdf
27195	Catnip	Nepeta cataria	'Psfike'	Field Container	Klett	2008	Over the top	Trial 1: No injury at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20090319i.pdf
27200	Catmint	Nepeta x faasseni		Field Container	Lieth	2008	Over the top	Unacceptable injury and growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420c.pdf
28476	Photinia	Photinia sp.	P. fraseri	Field Container	Uber	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420h.pdf
27206	Spruce	Picea sp.	P. omorika	Field Container	Harvey	2008	Over the top	1 application only; no injury at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924c.pdf
27216	Pine	Pinus sp.	P. mugo	Field Container	Harvey	2008	Over the top	1 application only; no injury at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924c.pdf
27216	Pine	Pinus sp.	P. taeda	Field Container	Wade	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20080915a.pdf
27221	Cinquefoil	Potentilla sp.	P. fruticosa 'Goldfinger'	Field Container	Uber	2008	Over the top	No injury or significant growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20090420h.pdf
27221	Cinquefoil	Potentilla sp.	P. fruticosa 'Monsidh'	Field Container	Klett	2008	Over the top	Trial 2: No injury at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20090319i.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary	Reg ?	File Name
	Common Name	Latin Name	Cultivar							
27221	Cinquefoil	Potentilla sp.	P. fruticosa 'Monsidh'	Field Container	Klett	2008	Over the top	Trial 1: No injury at 0.375, 0.75 and 1.5 lb ai per acre; no growth reduction	N	20090319i.pdf
27227	Oak	Quercus sp.	Q. alba	Field Container	Freiberger	2008	Directly on soil surface	Very slight injury at 0.375, 0.75 and 1.5 lb ai per acre	N	20090319c.pdf
27227	Oak	Quercus sp.	Q. rubra	Field Container	Mathers	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081030p.pdf
27232	Indian Hawthorn	Raphiolepis indica		Field Container	Gilliam	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre with two applications.	N	20081224a.pdf
27232	Indian Hawthorn	Raphiolepis indica		Field Container	Lieth	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre; growth reduction data inconclusive	N	20090420c.pdf
27235	Azalea, & Rhododendron	Rhododendron sp.	'Fasticata'	Field Container	Senesac	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
27235	Azalea, & Rhododendron	Rhododendron sp.	'Girard's Hot Shot'	Field Container	Wade	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20080915a.pdf
27235	Azalea, & Rhododendron	Rhododendron sp.	'Midnight Flare'	Field Container	Trader	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924f.pdf
27238	Rose	Rosa sp.		Field Container	Derr	2008	Over the top	No significant injury at 0.375, 0.75, and 1.5 lb ai per acre	N	20090420g.pdf
27238	Rose	Rosa sp.	R. woodsii	Field Container	Harvey	2008	Over the top	1 application only; very slight injury at 0.375, moderate at 0.75 and 1.5 lb ai per acre	N	20080924c.pdf
27238	Rose	Rosa sp.	'Raspberry Sunblaze'	Field Container	Boydston	2008	Over the top	No injury or growth and flower number reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090129m.pdf
27238	Rose	Rosa sp.	'Red Cascade'	Field Container	Wade	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20080915a.pdf
27241	Sage, Ramona	Salvia sylvestris	S. 'May Night'	Field Container	Williams	2008	Over the top	Virtually no injury at 150, 300 and 600 lb per acre; all rates reduced plant growth	N	20090218c.pdf
28726	Stonecrop	Sedum sp.	S. x spectabile 'Autumn Joy'	Field Container	Williams	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre	N	20090218c.pdf
27245	Bridal-Wreath	Spiraea sp.	'Dolchica'	Field Container	Trader	2008	Over the top	Moderate to high injury at 0.375, 0.75 and 1.5 lb ai per acre	N	20080924f.pdf
27245	Bridal-Wreath	Spiraea sp.	'Reeves'	Field Container	Gilliam	2008	Over the top	No injury at 0.375, 0.75 and 1.5 lb ai per acre with two applications.	N	20081224a.pdf

PR #	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary	Reg ?	File Name
	Common Name	Latin Name	Cultivar							
27245	Bridal-Wreath	Spiraea sp.	S. thunbergii	Field Container	Mickelbart	2008	Over the top	No injury at 0.375, 0.75, and 1.5 lb ai per acre with single application 3 weeks after transplanting.	N	20081029a.pdf
27250	Lilac	Syringa sp.	'Miss Kim'	Field Container	Harvey	2008	Over the top	1 application only; no injury at 0.375 and 0.75, very slight at 1.5 lb ai per acre	N	20080924c.pdf
27250	Lilac	Syringa sp.	S. microphylla 'Superba'	Field Container	Beste/Frank	2008	Over the top	No significant injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090316i.pdf
27250	Lilac	Syringa sp.	S. patula 'Miss Kim'	Field Container	Williams	2008	Over the top	Virtually no injury or growth reduction at 150, 300 and 600 lb per acre	N	20090218c.pdf
27250	Lilac	Syringa sp.	S. reticulata 'Ivory Silk'	Field Container	Mathers	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081030l.pdf
27253	Yew	Taxus sp.	T. baccata	Field Container	Senesac	2008	Over the top	No significant injury at 0.375, slight at 0.75 and 1.5 lb ai per acre; no growth reduction	N	20081219a.pdf
27253	Yew	Taxus sp.	T. x media 'Densiformis'	Field Container	Williams	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre	N	20081030g.pdf
27253	Yew	Taxus sp.	T. x media 'Runyun'	Field Container	Mathers	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081030n.pdf
27261	Arborvitae	Thuja sp.	T. occidentalis 'Degroot's Spire'	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090129b.pdf
27261	Arborvitae	Thuja sp.	T. occidentalis 'Smaragd'	Field Container	Harvey	2008	Over the top	1 application only; no injury at 0.375 and 0.75, slight transient injury at 1.5 lb ai per acre	N	20080924c.pdf
27270	Arrowwood	Viburnum sp.	'Northern Burgundy'	Field Container	Boydston	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre; all plants marketable	N	20090129b.pdf
27270	Arrowwood	Viburnum sp.	V. x burkwoodii	Field Container	Senesac	2008	Over the top	No injury or growth reduction at 0.375, 0.75 and 1.5 lb ai per acre	N	20081219a.pdf
27270	Arrowwood	Viburnum sp.	V. x 'Juddi'	Field Container	Mickelbart	2008	Over the top	No injury at 0.375, 0.75, and 1.5 lb ai per acre with single application 3 weeks after transplanting.	N	20081029a.pdf

Label Suggestions

Based on the current data available, the Broadstar 0.25G VC1604 formulation appears to be an acceptable substitute base on crop safety. In addition to the list of plants already on the Broadstar label, it is suggested two additional species may be added for over-the-top applications.

Buddleia davidii

Hydrangea sp

Appendix 1: Protocol

2008/2009 Crop Safety with Over-the-top Applications of Select Herbicide Materials

Final Draft

Ornamental Protocol Number: 08-010

Objective: Determine phytotoxicity of BAS 656EC, BAS 659G, Broadstar 0.25G VC1604, Mesotrione G, and V-10161 G to woody ornamental plants and BAS 659G on herbaceous perennials.

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: Depending upon research site and plant materials, various experiments can be established. Two applications are to be made approximately 6 weeks apart, with the first application within 7 days after potting, preferable between 24 and 48 hours. However, plant materials must have broken dormancy prior to first application. See notes below for Broadstar New Formulation. 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. For all materials, target dry foliage. If dew is present at the time of application, note it. Irrigate with ½ inch water between 1 and 4 hours after application. Note: Liquid materials need at least 1 hour drying time prior to irrigation.

Plant Materials: Contact your Regional Coordinator for an up-to-date list. Plants grown in field containers are preferred to 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
BAS 656h 63.9%EC (dimethenamid-p)	21 fl oz per acre (0.97 lb ai)	Woody ornamentals only	BASF, Kathie Kalmowitz, 919-270-4592, kathie.kalmowitz@basf.com
	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)		BASF, Kathie Kalmowitz, 919-270-4592, kathie.kalmowitz@basf.com
	300 lb per acre (5.3 lb ai)		
	600 lb per acre (10.6 lb ai)		
Broadstar 0.25G VC1604	150 lb per acre (0.375 lb ai)	Do not apply at the first application timing within 7 days after potting; <i>only apply at the second application timing.</i>	Valent, Joe Chamberlin, 770-985-0303, jcham@valent.com
	300 lb per acre (0.75 lb ai)		
	600 lb per acre (1.5 lb ai)		
Mesotrione G	100 lb product per acre (2.1 lb ai/A)	Woody ornamentals only	Syngenta, Nancy Rechsigl, 941-708-9338, nancy.rechsigl@syngenta.com
	200 lb product per acre (4.2 lb ai/A)		
	300 lb product per acre (6.3 lb ai/A)		
V-10142 0.5G	150 lb per acre (0.75 lb ai/acre)		Valent, Joe Chamberlin, 770-985-0303, jcham@valent.com
	300 lb per acre (1.5 lb ai/acre)		
	600 lb per acre (3.0 lb ai/acre)		
Untreated	--	--	

Reports:

Reports submitted electronically 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 **OR** Ely Vea, 308 Aston Forest Lane, Crownsville, MD 21032, Phone & FAX#: 410-923-4880, E-mail: evvea@comcast.net.

Draft Date: 3/4/08

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 2/20/08.
Reports on following pages are in alphanumeric order of author PR number.