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IR-4 Ornamental Horticulture Program Isoxaben Crop Safety

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Abstract

Gallery 75DF (isoxaben) was initially registered in 1992 for ornamental horticulture uses. This initial label contained an extensive list of ornamental horticulture crops where Gallery could be used without causing phytotoxicity. It also included a short list of crops where Gallery applications were not recommended. Between 1992 and 2013, IR-4 examined 98 crop species / genera to expand this label to other crops, including several different fern species grown in field containers. Of these, 24 crop species exhibited no or minimal transient injury with 20 already placed on the Gallery label. Eight crops exhibited injury in this research: *Astilbe sp.*, *Athyrium filix-femina*, *Buddleia davidii*, *Dendranthema x morifolium*, *Digitalis purpurea*, *Echinacea purpurea*, *Stachys byzantine*, and *Thymus sp.*. A new formulation, Gallery SC, was tested between 2014 and 2016 to determine crop safety on 34 species / genera in 57 trials. Of these, two species, *Chasmanthium latifolium* and *Sorghastrum nutans*, exhibited no or minimal transient injury; *C. latifolium* is already in the Gallery SC label.

Introduction

Gallery 75DF (isoxaben) was initially registered in 1992 for ornamental horticulture uses. This initial label contained an extensive list of ornamental horticulture crops where Gallery could be used without causing phytotoxicity. It also included a short list of crops where Gallery applications were not recommended. From 1992 through 2013, IR-4 examined 98 crop species / genera in 165 trials to expand this label to other crops including several different fern species grown in field containers. A new formulation, Gallery SC, was tested starting in 2014 to determine crop safety on 34 species / genera in 57 trials.

Materials and Methods

Several different protocols were used between 1992 and 2016 to test Gallery 75DF and Gallery SC (isoxaben) crop safety. In the early work, a single application of 1.0 and 2.0 lb ai per acre was used with some researchers including 0.5 lb ai per acre. In the later research, two applications were made approximately 30 days apart using 0.5, 1.0, and 2.0 lb ai per acre, plus a water treated control. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. In the more recent research, 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, but in the earlier research other scales were utilized. Some researchers also included readings 3 to 4 days after the initial and second applications. To view the more detailed materials and methods in these protocols (10-001, 11-004, 12-014, 13-014, 14-009, 14-010, 15-009, 15-010, 16-010 and 16-011), please visit <http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm> to view and download these protocols.

Gallery 75DF or Gallery SC was supplied to researchers (See list of researchers in Appendix 1) by Dow Agro Sciences.

Results and Summary

Phytotoxicity

Based on the type and nature of injury seen with isoxaben applications in the research conducted between 1992 and 2016, 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.

In testing from 1992 through 2016, Gallery 75 DF and SC exhibited no or minimal negative impact on 24 and 2 plant species / genera, respectively (Tables 1 and 2). Of these many have already been placed on the Gallery labels as label expansions have occurred.

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 this report one crop species were found to exhibit little or no injury at the 0.5 or 1.0 lb ai per acre rates of Gallery 75DF or SC with significant phytotoxicity at the 2.0 lb ai per acre rate (Tables 3 and 4).

There were 8 crops in the testing that exhibited damage sufficient to recommend growers not utilize Gallery 75DF as an over-the-top treatment for pre-emergent weed control (Table 5).

IR-4 has not generated sufficient information to categorize crop response to Gallery 75DF applications on 60 species / genera and to Gallery SC on 30 species / genera (Tables 6 and 7). It is recommended that additional trials be conducted to clarify their response. However, 21 have already been placed on the Gallery labels based upon other research.

Please see Table 8 for a list of research and the summary of the results received for research conducted with Gallery 75DF from 1992-2013 and Gallery SC from 2014-2016.

Table 1. List of Gallery 75DF treated crops with no or minimal transitory injury.

<i>Acer rubrum</i> ¹	<i>Leucanthemum maximum</i> ¹
<i>Achillea millefolium</i> ¹	<i>Limonium latifolium</i>
<i>Aquilegia sp.</i> ¹	<i>Matteuccia struthiopteris</i> ¹
<i>Artemisia lactiflora</i> ¹	<i>Onoclea sensibilis</i> ¹
<i>Athyrium nipponicum</i> ¹	<i>Origanum libanoticum</i> ¹
<i>Cupressocyparis leylandii</i> ¹	<i>Osmunda cinnamomea</i> ¹
<i>Cyrtomium fortunei</i> ¹	<i>Osmunda regalis</i> ¹
<i>Dryopteris erythrosora</i> ¹	<i>Polystichum acrostichoides</i> ¹
<i>Dryopteris ludoviciana</i>	<i>Polystichum polyblepharum</i> ¹
<i>Dryopteris marginalis</i> ¹	<i>Ruscus aculeatus</i> ²
<i>Dryopteris x australis</i> ¹	<i>Salvia daghestanica</i> ¹
<i>Kniphofia caulescens</i> ¹	<i>Schizachyrium scoparium</i>

¹ Already registered

² Crop safety testing was conducted with 4 applications over 2 years.

Table 2. List of Gallery SC treated crops with no or minimal transitory injury.

*Chasmanthium latifolium*¹
Sorghastrum nutans

¹ Already registered

Table 3. List of Gallery 75DF treated crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity

Buddleia davidii *

* Variable response observed possibly due to cultivar differences of multiple applications; further testing is warranted limiting to single application.

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

Muhlenbergia capillaris

Table 5. List of Gallery 75DF treated crops exhibiting significant injury at 1X

<i>Astilbe sp.</i>	<i>Digitalis purpurea</i>
<i>Athyrium filix-femina</i>	<i>Echinacea purpurea</i> ¹
<i>Buddleia davidii</i>	<i>Stachys byzantina</i>
<i>Dendranthema x morifolium</i>	<i>Thymus sp</i>

Table 6. List of Gallery 75DF treated crops where more research is needed to clarify response

<i>Abies balsamea var phanerolepis</i> ¹	<i>Echinocactus grusonii</i>	<i>Philadelphus sp.</i>
<i>Acer freemani</i>	<i>Fagus sp.</i>	<i>Phoenix roebelinii</i> ¹
<i>Adiantum pedatum</i>	<i>Festuca cinerea</i> ¹	<i>Picea glauca</i>
<i>Antennaria sp.</i>	<i>Festuca ovina glauca</i> ¹	<i>Pinus strobus</i>
<i>Arachniodes simplicor</i>	<i>Forsythia sp.</i>	<i>Poa pratensis</i> ¹
<i>Asparagus virgatus</i> ¹	<i>Fothergilla gardenia</i>	<i>Potentilla sp.</i>
<i>Aspidistra elatior</i>	<i>Gaillardia aristata</i>	<i>Quercus palustris</i>
<i>Aucuba japonica</i>	<i>Gaillardia x grandiflora</i>	<i>Rosa sp.</i>
<i>Berberis sp.</i>	<i>Geum sp.</i> ¹	<i>Rudbeckia sp.</i> ¹
<i>Calamagrostis acutiflora</i>	<i>Gypsophila elegans</i> ¹	<i>Rumohra adiantiformis</i>
<i>Callirhoe involucrata</i>	<i>Hemerocallis sp.</i> ¹	<i>Salvia sp.</i>
<i>Cerastium tomentosum</i> ¹	<i>Heuchera sanguinea</i>	<i>Scutellaria racemosa</i>
<i>Chasmanthium latifolium</i> ¹	<i>Kerria japonica</i>	<i>Sedum sp.</i> ¹
<i>Chrysalidocarpus madagascariensis</i> ¹	<i>Koeleria binnata</i>	<i>Stokesia sp.</i>
<i>Cornus kousa</i> *	<i>Koeleria paniculata</i>	<i>Syringa sp.</i>
<i>Crassula ovata</i>	<i>Liriodendron tulipifera</i>	<i>Thuja sp.</i>
<i>Cyrtomium falcatum</i>	<i>Myrica pensylvanica</i>	<i>Veronica sp.</i>
<i>Delosperma nubigenum</i>	<i>Pennisetum alopecuroides</i> ¹	<i>Viburnum sp.</i>
<i>Doronicum sp.</i>	<i>Penstemon sp.</i>	<i>Washingtonia robusta</i>
<i>Echeveria sp.</i>	<i>Phalaris arundinacea</i> ¹	<i>Zelkova serrata</i>

Table 7. List of Gallery SC treated crops where more research is needed to clarify response

<i>Andropogon gerardii</i>	<i>Erianthus sp.</i>	<i>Muhlenbergia dubia</i>
<i>Aronia melanocarpa</i>	<i>Erythronium americanum</i>	<i>Muhlenbergia dumosa</i>
<i>Calamagrostis acutiflora</i>	<i>Festuca ovina glauca</i> ¹	<i>Muhlenbergia rigens</i>
<i>Carex buchanani</i> ¹	<i>Fritillaria meleagris</i>	<i>Nassella tenuissima</i>
<i>Carex cherokeensis</i>	<i>Hakonechloa sp.</i>	<i>Paeonia sp.</i>
<i>Carex morrowi</i> ¹	<i>Hierochloe odorata</i>	<i>Panicum virgatum</i>
<i>Cortaderia selloana</i> ¹	<i>Hyacinthus orientalis</i>	<i>Pennisetum alopecuroides</i> ¹
<i>Crocus tommasinianus</i>	<i>Juncus effusus</i>	<i>Schizachyrium scoparium</i>
<i>Deschampsia caespitosa</i> ¹	<i>Leymus arenarius</i>	<i>Sporobolus heterolepis</i>
<i>Eragrostis spectabilis</i>	<i>Lilium Asiatic Hybrids</i>	<i>Stipa sp.</i>

¹ Already registered

Table 8. Detailed Summary Crop Safety Testing with Gallery 75DF and SC.

Notes: Table entries are sorted by crop Latin name. Only those reports received by 3/1/2017 are included.

PR#	Product	Crop	Production Site	Researcher	State	Year	Application Type	Results
20815	Gallery 75DF (Isoxaben)	Fir (Abies sp.) A. balsamea var phanerolepsis	Field In-Ground	Ahrens/Mervosh	CT	2001	Over the top	No visible injury with dormant application of 1, 2, and 4 lb ai per acre; good broadleaved weed control, but poor grassy weed control.
08428	Gallery 75DF (Isoxaben)	Maple, Red (Acer rubrum)	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; no reduction in marketability.
08428	Gallery 75DF (Isoxaben)	Maple, Red (Acer rubrum)	Field Container	DeFrancesco	OR	2010	Over the top	Little to no crop injury with one or two applications at 0.5, 1.0, 2.0 lb ai per acre
08428	Gallery 75DF (Isoxaben)	Maple, Red (Acer rubrum) A. rubrum	Field Container	Derr	VA	2010	Over the top	No crop injury observed 5 and 46 DAT with 20.5, 1.0, 2.0 lb ai per acre. Increasing control of eclipta, crabgrass, spotted spurge and annual sedge with increasing rates.
31338	Gallery 75DF (Isoxaben)	Maple (Acer sp.) A. freemani 'Autumn Blaze'	Field Container	Mathers (OSU)	OH	2011	Over the top	Significant crop injury and reduction in growth with two sequential applications at 0.66, 1.32, 2.64 lb ai per acre. All plants marketable.
10706	Gallery 75DF (Isoxaben)	Yarrow (Achillea millefolium)	Field In-Ground	Elmore	CA	1993	Broadcast	Very slight, non-significant injury, with no impact on salability at all tested rates (0.5, 1.0, 2.0 lb ai per acre); excellent control of broadleaved weeds.
10743	Gallery 75DF (Isoxaben)	Yarrow (Achillea millefolium)	Field Container	Klett	CO	1993	Drench	No injury or growth reduction with single pre-emergent application at 1 and 2 lb ai per acre; excellent control of pigweed, common groundsel, shepherd's purse, barnyard grass, yellow foxtail, and annual bluegrass.
10743	Gallery 75DF (Isoxaben)	Yarrow (Achillea millefolium) 'Cloth of Gold'	Field Container	Ahrens/Mervosh	CT	1998	Over the top	No to very slight injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with complete recovery by 3 MAT.
10743	Gallery 75DF (Isoxaben)	Yarrow (Achillea millefolium) 'Pink Deb'	Field Container	Fare	TN	1997	Foliar	No injury at 0.5, 1.0, and 2.0 lb ai per acre.
25533	Gallery 75DF (Isoxaben)	Fern, Northern Maidenhair (Adiantum pedatum)	Field Container	Derr	VA	2007	Over the top	No injury at 0.5, 1 and 2 lb ai per acre; excellent control of spotted spurge and eclipta at the higher rates
25533	Gallery 75DF (Isoxaben)	Fern, Northern Maidenhair (Adiantum pedatum)	Field Container	Senesac	NY	2006	Over the top	No data due to limited emergence.
11321	Gallery 75DF (Isoxaben)	Pussy-Toes, Everlasting (Antennaria sp.)	Field Container	Klett	CO	1993	Drench	Due to poor plant health and overwatering, no phytotoxicity data were taken; Excellent control of pigweed, common groundsel, shepherd's purse, barnyardgrass, yellow foxtain and annual bluegrass.
11421	Gallery 75DF (Isoxaben)	Columbine (Aquilegia sp.) A. cearula 'McKana's Giant'	Field Container	Klett	CO	1994	Drench	No injury with single pre-emergent application of 1 and 2 lb ai per acre; Excellent control of purslane, common groundsel, shepherd's purse, barnyardgrass, yellow foxtail and annual bluegrass.
11421	Gallery 75DF (Isoxaben)	Columbine (Aquilegia sp.) A. hybrida 'Dragon Fly'	Field Container	Ahrens/Mervosh	CT	1998	Broadcast	Very slight, nonsignificant injury with 0.5, 1.0, and 2.0 lb ai per acre.

22939	Gallery 75DF (Isoxaben)	Mugwort, White (<i>Artemisia lactiflora</i>) 'Guizho'	Field Container	Klett	CO	2002	Directed	No injury at 1 and 2 lb ai per acre; good control of weeds.
22939	Gallery 75DF (Isoxaben)	Mugwort, White (<i>Artemisia lactiflora</i>) 'Guizho'	Field Container	Klett	CO	2002	Directed	No injury at 1 lb ai per acre (the 2 lb ai per acre could not be rated due to crop failure); good broadleaved weed control.
11274	Gallery 75DF (Isoxaben)	Fern, Tree (<i>Asparagus virgatus</i>)	Shadehouse /Lathehouse	Stamps	FL	1992	Foliar	No impact of 4 consecutive applications over 2 years at 1 and 2 lb ai per acre; poor to fair weed control (long-stalked phyllanthus, hairy bittercress, american burnweed).
11273	Gallery 75DF (Isoxaben)	Cast-Iron Plant, Ker-Gawl (<i>Aspidistra elatior</i>)	Shadehouse /Lathehouse	Stamps	FL	1992	Foliar	No impact of 4 consecutive applications over 2 years at 1 and 2 lb ai per acre; poor to fair weed control (long-stalked phyllanthus, hairy bittercress, american burnweed).
12336	Gallery 75DF (Isoxaben)	False Spirea (<i>Astilbe</i> sp.)	Field Container	Senesac	NY	1996	Over the top	Significant injury at 0.5, 1.0 and 2.0 lb ai per acre with single application.
12336	Gallery 75DF (Isoxaben)	False Spirea (<i>Astilbe</i> sp.) A. x aren 'Gloria Purpurea'	Field Container	Ahrens/Mervosh	CT	1998	Broadcast	Very slight to slight injury at 0.5, 1.0, and 2.0 lb ai per acre.
25639	Gallery 75DF (Isoxaben)	Fern, Lady (<i>Athyrium filix-femina</i>)	Field Container	Derr	VA	2006	Over the top	Stand and growth reduction at all rates.
25639	Gallery 75DF (Isoxaben)	Fern, Lady (<i>Athyrium filix-femina</i>)	Field Container	Neal	NC	2006	Over the top	No to moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre).
25640	Gallery 75DF (Isoxaben)	Fern, Lady (<i>Athyrium nipponicum</i>)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25640	Gallery 75DF (Isoxaben)	Fern, Lady (<i>Athyrium nipponicum</i>)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.
30946	Gallery 75DF (Isoxaben)	Aucuba (<i>Aucuba</i> sp.) A. japonica 'Variegata'	Field Container	Pemberton	TX	2012	Over the top	Slight injury, but moderate stunting, with 0.5 and 1 lb ai per acre applied twice.
30946	Gallery 75DF (Isoxaben)	Aucuba (<i>Aucuba</i> sp.) A. japonica 'Variegata'	Field Container	Beste/Frank (ARS)	MD	2012	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
30949	Gallery 75DF (Isoxaben)	Barberry (<i>Berberis</i> sp.)	Field Container	Freiberger	NJ	2012	Over the top	Inconclusive results because plants died off early in both treated and control plants.
24289	Gallery 75DF (Isoxaben)	Butterfly Bush (<i>Buddleia davidii</i>)	Field Container	Chandran	WV	2010	Over the top	No crop injury and little to no reduction in growth observed on established plants with 0.66, 1.32 and 2.64 lb ai per acre.
24289	Gallery 75DF (Isoxaben)	Butterfly Bush (<i>Buddleia davidii</i>)	Field Container	Uber	CA	2011	Over the top	No crop injury and little to no reduction in growth observed with 0.66, 1.32 and 2.64 lb ai per acre.
24289	Gallery 75DF (Isoxaben)	Butterfly Bush (<i>Buddleia davidii</i>) B. davidii 'Harlequin'	Field Container	Senesac	NY	2010	Over the top	Severe crop injury (70-100%) with 2 applications 1-4WAT at 0.5, 1.0, 2.0 lb ai per acre. One application caused 78% injury 4WAT at 2.0 lb ai per acre.
24289	Gallery 75DF (Isoxaben)	Butterfly Bush (<i>Buddleia davidii</i>) B. davidii 'Pink Delight'	Field Container	Gilliam	AL	2010	Over the top	Moderate to high crop injury with the second application at 0.5, 1.09, 2.0 lb ai per acre and reduced growth at the 4x rate.
24289	Gallery 75DF (Isoxaben)	Butterfly Bush (<i>Buddleia davidii</i>) B. 'Nanho White'	Field Container	Derr	VA	2010	Over the top	No crop injury observed 5 and 46 DAT with 20.5, 1.0, 2.0 lb ai per acre. Increasing control of eclipta, crabgrass, spotted spurge and annual sedge with increasing rates.

24289	Gallery 75DF (Isoxaben)	Butterfly Bush (<i>Buddleia davidii</i>) 'Royal Red'	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	Moderate injury with some recovery at 0.5, high injury at 1 and 2 lb ai per acre; reduced growth and flower number at all rates. 1X rate marketable at reduced price; higher rates not marketable.
12342	Gallery 75DF (Isoxaben)	Reed Grass (<i>Calamagrostis arundinacea</i>) <i>C. acutiflora</i> 'Overdam'	Field Container	Senesac	NY	2013	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
11785	Gallery 75DF (Isoxaben)	Poppy Mallow (<i>Callirhoe involucrata</i>)	Field Container	Klett	CO	1995	Over the top	No injury at 1 and 2 lb ai per acre; excellent weed control (purslane, common groundsel, barnyardgrass, yellow foxtail, and annuyal bluegrass).
11322	Gallery 75DF (Isoxaben)	Snow-In-Summer (<i>Cerastium tomentosum</i>)	Field In-Ground	Klett	CO	1993	Over the top	No injury with single application of 1 and 2 lb ai per acre; good control of pigweed, commongroundsel, shepherd's purse, barnyardgrass, yellow foxtail, annual bluegrass, and purslane.
12338	Gallery 75DF (Isoxaben)	Northern Sea Oats, Wild Oats (<i>Chasmanthium latifolium</i>)	Field Container	Fain	MS	2002	Over the top	No injury with single application of 1, 2 and 4 lb ai per acre.
12338	Gallery 75DF (Isoxaben)	Northern Sea Oats, Wild Oats (<i>Chasmanthium latifolium</i>)	Field Container	Hanson	CA	2013	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
13441	Gallery 75DF (Isoxaben)	Palm, Areca (<i>Chrysalidocarpus lutescens</i>) <i>C. madagascariensis</i>	Field Container	Broschat	FL	1999	Over the top	No injury with 1 and 2 lb ai per acre.
11798	Gallery 75DF (Isoxaben)	Hardy Mum (<i>Chrysanthemum/Dendranthema x morifolium</i>)	Field Container	Derr	VA	2013	Over the top	Minor injury but no flower rating reduction with 1 lb ai per acre applied twice.
11798	Gallery 75DF (Isoxaben)	Hardy Mum (<i>Chrysanthemum/Dendranthema x morifolium</i>) 'Jennifer'	Field Container	Klett	CO	1995	Over the top	Moderate to significant injury increasig with rate (1, 2, lb ai per acre); excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
12782	Gallery 75DF (Isoxaben)	Dogwood, Kousa (<i>Cornus kousa</i>)	Field Container	DeFrancesco	OR	2010	Over the top	Slight to moderate crop injury predominately on youngest foliage with one or two applications at 0.5, 1.0, 2.0 lb ai per acre.
31168	Gallery 75DF (Isoxaben)	Stonecrop (<i>Crassula</i> sp.) <i>C. ovata</i>	Field Container	Villavicencio	CA	2012	Over the top	Very slight reddish color with 2.64 lb per acre applied twice; no growth reduction.
31168	Gallery 75DF (Isoxaben)	Stonecrop (<i>Crassula</i> sp.) <i>C. ovata</i> 'Hobbit'	Field Container	Villavicencio	CA	2013	Over the top	No chlorosis at 0.66, very slight with 1.32 and 2.64, lb per acre applied twice; slight necrosis only at 4X; no growth reduction.
10988	Gallery 75DF (Isoxaben)	Cypress, Leyland (<i>Cupressocyparis leylandii</i>)	Field Container	Glaze	GA	1992	Broadcast	No injury with single pre-emergent application using 0.5, 1.0, and 2.0 lb ai per acre; excellent weed control.
10988	Gallery 75DF (Isoxaben)	Cypress, Leyland (<i>Cupressocyparis leylandii</i>)	Field Container	Glaze	GA	1993	Broadcast	No injury with single post-emergent application using 0.5, 1.0, and 2.0 lb ai per acre; excellent weed control.
10988	Gallery 75DF (Isoxaben)	Cypress, Leyland (<i>Cupressocyparis leylandii</i>) <i>C. leylandii</i>	Field Container	Fraelich	GA	1996	Broadcast	No injury with single pre-emergent application us 0.5, 1.0, and 2.0 lb ai per acre; some control of oxalis.
25641	Gallery 75DF (Isoxaben)	Fern, Japanese Holly (<i>Cyrtomium fortunei</i>)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25641	Gallery 75DF (Isoxaben)	Fern, Japanese Holly (<i>Cyrtomium fortunei</i>)	Field Container	Gilliam	AL	2007	Over the top	No injury at 0.5, 1 and 2 lb ai per acre; slight growth reduction at the highest rate

25641	Gallery 75DF (Isoxaben)	Fern, Japanese Holly (Cyrtomium fortunei)	Field Container	Neal	NC	2006	Over the top	Slight injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre.)
11791	Gallery 75DF (Isoxaben)	Hardy Ice Plant, Yellow Ice Plant (Delosperma nubigenum)	Field Container	Klett	CO	1995	Over the top	No injury with single application of 1 and 2 lb ai per acre; excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
30948	Gallery 75DF (Isoxaben)	Delosperma sp. (Delosperma sp.) D. cooperi	Field Container	Derr	VA	2013	Over the top	Virtually no injury and no flower count reduction with 1 lb ai per acre applied twice.
30948	Gallery 75DF (Isoxaben)	Delosperma sp. (Delosperma sp.) D. nubigenum	Field Container	Klett	CO	2012	Over the top	No injury with 2 lb ai per acre applied twice; slight growth reduction.
30948	Gallery 75DF (Isoxaben)	Delosperma sp. (Delosperma sp.) 'Fire Spinner'	Field Container	Derr	VA	2013	Over the top	Virtually no injury with 1 lb ai per acre applied twice.
11418	Gallery 75DF (Isoxaben)	Foxglove (Digitalis sp.) D. purpurea	Field Container	Klett	CO	1994	Drench	Mortality at both application rates (1 ad 2 lb ai per acre).
11418	Gallery 75DF (Isoxaben)	Foxglove (Digitalis sp.) D. purpurea 'Excelsior'	Field Container	Klett	CO	1992	Drench	Significant chlorosis followed by plant death at 1 and 2 lb ai per acre.
11418	Gallery 75DF (Isoxaben)	Foxglove (Digitalis sp.) D. purpurea 'Excelsior'	Field Container	Senesac	NY	1996	Over the top	Mortality resulted from single application of 0.5, 1.0 and 2.0 lb ai per acre.
11422	Gallery 75DF (Isoxaben)	Leopards-Bane (Doronicum sp.) D. cordatum	Field Container	Klett	CO	1994	Drench	Due to Phytophthora disease no crop injury could be assessed; excellend control of purslance, common groundsel, shepherd' purse, yellow foxtail and annual bluegrass.
25534	Gallery 75DF (Isoxaben)	Fern, Autumn (Dryopteris erythrosora)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25534	Gallery 75DF (Isoxaben)	Fern, Autumn (Dryopteris erythrosora)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.
25596	Gallery 75DF (Isoxaben)	Fern, Southern Shield (Dryopteris ludoviciana)	Field Container	Gilliam	AL	2013	Over the top	Slight injury with complete recovery at 0.5, 1 and 2 lb ai per acre applied twice.
25596	Gallery 75DF (Isoxaben)	Fern, Southern Shield (Dryopteris ludoviciana)	Field Container	Neal	NC	2013	Over the top	Variable injury (up to 20 %) that may be unacceptable with 0.5, 1 and 2 lb ai per acre; researcher suggested repeating trial.
25656	Gallery 75DF (Isoxaben)	Fern, Marginal Wood (Dryopteris marginalis)	Field Container	Gilliam	AL	2007	Over the top	No injury at 0.5, 1.0 and 2.0 lb ai per acre.
25656	Gallery 75DF (Isoxaben)	Fern, Marginal Wood (Dryopteris marginalis)	Field Container	Senesac	NY	2006	Over the top	No injury at all rates.
25656	Gallery 75DF (Isoxaben)	Fern, Marginal Wood (Dryopteris marginalis) 'Summer Shield'	Field Container	Gilliam	AL	2012	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic., minor injury only with 2 lb ai after 2nd applic.; no growth reduction; all plants marketable.
25642	Gallery 75DF (Isoxaben)	Fern, Dixie Wood (Dryopteris x australis)	Field Container	Derr	VA	2006	Over the top	No stand reduction but growth reduced at all rates.
25642	Gallery 75DF (Isoxaben)	Fern, Dixie Wood (Dryopteris x australis)	Field Container	Gilliam	AL	2006	Over the top	No injury or growth reduction at all rates.
25642	Gallery 75DF (Isoxaben)	Fern, Dixie Wood (Dryopteris x australis)	Field Container	Gilliam	AL	2007	Over the top	No injury or growth reduction at 0.5, 1 and 2 lb ai per acre.
25642	Gallery 75DF (Isoxaben)	Fern, Dixie Wood (Dryopteris x australis)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.

31210	Gallery 75DF (Isoxaben)	Echeveria sp. (Echeveria sp.) 'Imbricata'	Field Container	Villavicencio	CA	2012	Over the top	Moderate necrosis and discoloration, and slight spotting with 2.64 lb per acre applied twice; no growth reduction.
11343	Gallery 75DF (Isoxaben)	Purple Coneflower (Echinacea sp.) E. purpurea	Field Container	Derr	VA	1993	Over the top	Slight to moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with reduction in stand; excellent control of spotted spurge and yellow woodsorrel.
31211	Gallery 75DF (Isoxaben)	Echinocactus grusonii (Echinocactus grusonii)	Field Container	Villavicencio	CA	2012	Over the top	Slight spotting and necrosis with quick recovery at 2.64 lb per acre applied twice; no growth reduction.
31211	Gallery 75DF (Isoxaben)	Echinocactus grusonii (Echinocactus grusonii)	Field Container	Villavicencio	CA	2013	Over the top	Very minor injury (chlorosis) and no growth reduction with 0.66, 1.32 and 2.64 lb per acre applied twice.
31237	Gallery 75DF (Isoxaben)	Beech (Fagus sp.)	Field Container	Freiberger	NJ	2012	Over the top	No sufficient data collected because plants never broke dormancy and died, or died before trial conclusion.
11778	Gallery 75DF (Isoxaben)	Blue Fescue (Festuca glauca) F. cinerea 'Sea Urchin'	Field Container	Klett	CO	1995	Over the top	No injury with single application of 1 and 2 lb ai per acre; excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
11778	Gallery 75DF (Isoxaben)	Blue Fescue (Festuca glauca) F. ovina 'Elijah Blue'	Field Container	Ahrens/Mervosh	CT	1998	Broadcast	No injury with 0.5, 1.0, and 2.0 lb ai per acre.
30957	Gallery 75DF (Isoxaben)	Golden Bells (Forsythia sp.)	Field Container	Freiberger	NJ	2012	Over the top	No injury or growth reduction with 2.64 lb per acre.
12753	Gallery 75DF (Isoxaben)	Witch Alder (Fothergilla gardenii) F. 'Mt. Airy'	Field Container	Mathers (OSU)	OH	2011	Over the top	First application of 0.66, 1.32, 2.64 lb ai per acre significantly greater crop injury compared to control; ratings after 2nd application were unacceptable for control and treated 2WAT2.
11417	Gallery 75DF (Isoxaben)	Blanket Flower (Gaillardia sp.) G. aristata	Field Container	Klett	CO	1994	Drench	No injury with single application of 1 and 2 lb ai per acre; excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
11417	Gallery 75DF (Isoxaben)	Blanket Flower (Gaillardia sp.) G. x grandiflora	Field Container	Fare	TN	1997	Foliar	No injury with single applicatin of 0.5, 1 and 2 lb ai per acre.
11110	Gallery 75DF (Isoxaben)	Avens (Geum sp.)	Field In-Ground	Elmore	CA	1993	Broadcast	No injury with single application of 0.5, 1 and 2 lb ai per acre; excellent broadleaved weed control.
11111	Gallery 75DF (Isoxaben)	Avens (Geum sp.) 'Mrs. Bradshaw'	Field Container	Klett	CO	1992	Drench	No injury at 1 and 2 lb ai per acre; excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
11111	Gallery 75DF (Isoxaben)	Avens (Geum sp.) 'Mrs. Bradshaw'	Field Container	Linderman	OR	1993	Foliar	No injury with single application of 0.5, 1 and 2 lb ai per acre.
10744	Gallery 75DF (Isoxaben)	Baby's Breath (Gypsophila elegans) G. paniculata 'Pink Fairy'	Field Container	Klett	CO	1995	Over the top	No injury at 1 and 2 lb ai per acre; excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
10744	Gallery 75DF (Isoxaben)	Baby's Breath (Gypsophila elegans) G. paniculata 'Snowflake'	Field Container	Ferree	IL	1992	Broadcast	No injury with single application at 0.5, 1.0, and 2.0 lb ai per acre.
10984	Gallery 75DF (Isoxaben)	Daylily (Hemerocallis sp.) 'Stella de Oro'	Field Container	Ferree	IL	1992	Broadcast	No significant difference with 0, 0.5, 1.0, and 2.0 lb ai per acre.
30959	Gallery 75DF (Isoxaben)	Coral Bells, Alumroot (Heuchera sanguinea) 'Ruby Bells'	Field Container	Beste/Frank (ARS)	MD	2012	Over the top	Moderate injury to severe injury with plant death increasing with rate (0.5, 1.0, and 2.0 lb ai per acre).

31170	Gallery 75DF (Isoxaben)	Japanese Kerria, Japanese Rose (Kerria japonica) K. japonica 'Pleniflora'	Field Container	Senesac	NY	2013	Over the top	Minor injury with complete recovery with 0.5, 1 and 2 lb ai per acre applied twice.
24294	Gallery 75DF (Isoxaben)	Poker Plant, Red-Hot-Poker (Kniphofia sp.) K. caulescens	Field Container	Klett	CO	2010	Over the top	Trial 1: no crop injury from 0.66, 1.32, 2.64 lb ai per acre. Treated containers had fewer weeds than weeded control.
24294	Gallery 75DF (Isoxaben)	Poker Plant, Red-Hot-Poker (Kniphofia sp.) K. caulescens	Field Container	Klett	CO	2010	Over the top	Trial 2: no crop injury from 0.66, 1.32, 2.64 lb ai per acre. No differences among 1x,2x, 4x rates in height, width, dry mass or weed control compared to weeded control.
24294	Gallery 75DF (Isoxaben)	Poker Plant, Red-Hot-Poker (Kniphofia sp.) K. 'Red Hot Poker'	Field Container	Boydston	WA	2011	Over the top	No crop injury or reduction in growth with 0.5, 1.0, 2.0 lb ai per acre.
24294	Gallery 75DF (Isoxaben)	Poker Plant, Red-Hot-Poker (Kniphofia sp.) K. uvaria	Field Container	Lieth	CA	2010	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
24294	Gallery 75DF (Isoxaben)	Poker Plant, Red-Hot-Poker (Kniphofia sp.) K. uvaria 'Alcazar'	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	No significant injury or reduction of growth and flower number with 0.5, 1 and 2 lb ai per acre.
12763	Gallery 75DF (Isoxaben)	Golden-Rain Tree (Koelreuteria bipinnata)	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; no reduction in marketability.
12764	Gallery 75DF (Isoxaben)	Varnish Tree (Koelreuteria paniculata)	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; no reduction in marketability.
11815	Gallery 75DF (Isoxaben)	Shasta Daisy (Leucanthemum maximum)	Field Container	Fare	TN	1996	Foliar	Slight to severe injury (leaf distortion and stunting) increasing with rate (0.5, 1.0, 2.0 lb ai per acre), but by 60 DAT plants had outgrown symptoms.
11815	Gallery 75DF (Isoxaben)	Shasta Daisy (Leucanthemum maximum) 'Alaska'	Field Container	Derr	VA	2013	Over the top	Minor to moderate injury with 1 lb ai per acre applied twice.
11815	Gallery 75DF (Isoxaben)	Shasta Daisy (Leucanthemum maximum) 'Alaska'	Field Container	Klett	CO	1992	Drench	Significant injury with single application at 1 and 2 lb ai per acre; mediocre weed control.
11815	Gallery 75DF (Isoxaben)	Shasta Daisy (Leucanthemum maximum) 'Snow Lady'	Field Container	Fare	TN	1997	Foliar	Minor to moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre), but all plants marketable at 60 DAT.
11112	Gallery 75DF (Isoxaben)	Statice (Limonium sp.) L. latifolia	Field In-Ground	Ferree	IL	1992	Broadcast	No difference among treatments (0, 0.5, 1.0, and 2.0 lb ai per acre).
11449	Gallery 75DF (Isoxaben)	Statice (Limonium sp.) L. latifolium	Field Container	Klett	CO	1994	Drench	No injury at 1 and 2 lb ai per acre; excellent control of purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
12768	Gallery 75DF (Isoxaben)	Tulip Tree (Liriodendron tulipifera)	Field Container	Mathers (OSU)	OH	2011	Over the top	Although not statistically different all plants treated with 0.66, 1.32, 2.64 lb ai per acre were smaller than control. 4x rate caused unacceptable injury.
25535	Gallery 75DF (Isoxaben)	Fern, Ostrich (Matteuccia struthiopteris)	Field Container	Derr	VA	2006	Broadcast	No growth reduction at all rates; stand reduction at higher rates after second application
25535	Gallery 75DF (Isoxaben)	Fern, Ostrich (Matteuccia struthiopteris)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.

25535	Gallery 75DF (Isoxaben)	Fern, Ostrich (<i>Matteuccia struthiopteris</i>)	Field Container	Senesac	NY	2006	Over the top	Significant injury at all rates with some recovery.
12774	Gallery 75DF (Isoxaben)	Bayberry (<i>Myrica pensylvanica</i>)	Field Container	Freiberger	NJ	2012	Over the top	No sufficient data collected because plants never broke dormancy and died, or died before trial conclusion.
25643	Gallery 75DF (Isoxaben)	Fern, Sensitive (<i>Onoclea sensibilis</i>)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25643	Gallery 75DF (Isoxaben)	Fern, Sensitive (<i>Onoclea sensibilis</i>)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.
24961	Gallery 75DF (Isoxaben)	Hopflower Oregano (<i>Origanum libanoticum</i>)	Field Container	Klett	CO	2002	Directed	Trial 1: No injury with single application of 1, 2 and 4 lb ai per acre; good control of broadleaved weeds.
24961	Gallery 75DF (Isoxaben)	Hopflower Oregano (<i>Origanum libanoticum</i>)	Field Container	Klett	CO	2002	Directed	Trial 2: No injury with single application of 1, 2 and 4 lb ai per acre; good control of broadleaved weeds.
25536	Gallery 75DF (Isoxaben)	Fern, Cinnamon (<i>Osmunda cinnamomea</i>)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25536	Gallery 75DF (Isoxaben)	Fern, Cinnamon (<i>Osmunda cinnamomea</i>)	Field Container	Gilliam	AL	2006	Over the top	No injury or growth reduction at all rates.
25536	Gallery 75DF (Isoxaben)	Fern, Cinnamon (<i>Osmunda cinnamomea</i>)	Field Container	Neal	NC	2006	Over the top	All plants grew poorly regardless of treatment.
25536	Gallery 75DF (Isoxaben)	Fern, Cinnamon (<i>Osmunda cinnamomea</i>)	Field Container	Senesac	NY	2006	Over the top	No injury at all rates.
25644	Gallery 75DF (Isoxaben)	Fern, Royal (<i>Osmunda regalis</i>)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25644	Gallery 75DF (Isoxaben)	Fern, Royal (<i>Osmunda regalis</i>)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.
12339	Gallery 75DF (Isoxaben)	Chinese Pennisetum (<i>Pennisetum alopecuroides</i>) 'Hamelin'	Field Container	Ahrens/Mervosh	CT	1998	Over the top	No injury with single application of 0.5, 1 and 2 lb ai per acre.
12196	Gallery 75DF (Isoxaben)	Beard-Tongue (<i>Penstemon</i> sp.) <i>P. digitalis</i> 'Husker's Red'	Field Container	Senesac	NY	1996	Over the top	Slight to moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre).
12196	Gallery 75DF (Isoxaben)	Beard-Tongue (<i>Penstemon</i> sp.) 'Prairie Dusk'	Field Container	Beste/Frank (ARS)	MD	2012	Over the top	Slight injury, no growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
20158	Gallery 75DF (Isoxaben)	Ribbon-Grass, Gardeners-Garters (<i>Phalaris arundinacea</i>) 'Picta'	Field Container	Ahrens/Mervosh	CT	1998	Broadcast	No injury with single application of 0.5, 1 and 2 lb ai per acre.
31238	Gallery 75DF (Isoxaben)	Mock Orange (<i>Philadelphus</i> sp.)	Field Container	Freiberger	NJ	2012	Over the top	Inconclusive results because plants died off early in both treated and control plants.
13442	Gallery 75DF (Isoxaben)	Palm, Pygmy Date (<i>Phoenix roebelinii</i>)	Field Container	Broschat	FL	1999	Foliar	No injury with single application of 1 and 2 lb ai per acre.
31239	Gallery 75DF (Isoxaben)	Spruce, White; Cat (<i>Picea glauca</i>)	Field Container	Freiberger	NJ	2012	Over the top	No sufficient data collected because plants never broke dormancy and died, or died before trial conclusion.
31240	Gallery 75DF (Isoxaben)	Pine, White (<i>Pinus strobus</i>)	Field Container	Freiberger	NJ	2012	Over the top	No sufficient data collected because plants never broke dormancy and died, or died before trial conclusion.
11325	Gallery 75DF (Isoxaben)	Kentucky Bluegrass (<i>Poa pratensis</i>) 'Challenger'	Turf	Klett	CO	1993	Over the top	No injury at 1 and 2 lb ai per acre; excellent control of pigweed, purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.

25606	Gallery 75DF (Isoxaben)	Fern, Christmas (Polystichum acrostichoides)	Field Container	Derr	VA	2006	Over the top	No stand reduction but growth reduced at all rates.
25606	Gallery 75DF (Isoxaben)	Fern, Christmas (Polystichum acrostichoides)	Field Container	Gilliam	AL	2006	Over the top	No injury or growth reduction at all rates.
25606	Gallery 75DF (Isoxaben)	Fern, Christmas (Polystichum acrostichoides)	Field Container	Gilliam	AL	2007	Over the top	No injury or growth reduction at 0.5, 1 and 2 lb ai per acre.
25606	Gallery 75DF (Isoxaben)	Fern, Christmas (Polystichum acrostichoides)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5 and 1.0 lb ai per acre, but slight injury with 2.0 lb ai per acre.
25606	Gallery 75DF (Isoxaben)	Fern, Christmas (Polystichum acrostichoides)	Field Container	Senesac	NY	2006	Over the top	Slight, transient injury at all rates.
25537	Gallery 75DF (Isoxaben)	Fern, Tassel (Polystichum polyblepharum)	Field Container	Derr	VA	2006	Over the top	No stand or growth reduction at all rates.
25537	Gallery 75DF (Isoxaben)	Fern, Tassel (Polystichum polyblepharum)	Field Container	Gilliam	AL	2006	Over the top	Slight injury (browning) at all rates; no growth reduction.
25537	Gallery 75DF (Isoxaben)	Fern, Tassel (Polystichum polyblepharum)	Field Container	Neal	NC	2006	Over the top	No injury at 0.5, 1.0, 2.0 lb ai per acre.
25537	Gallery 75DF (Isoxaben)	Fern, Tassel (Polystichum polyblepharum)	Field Container	Senesac	NY	2006	Over the top	Slight, transient injury at all rates.
11323	Gallery 75DF (Isoxaben)	Cinquefoil (Potentilla sp.) P. tabernaemontani	Field In-Ground	Klett	CO	1993	Drench	No injury at 1 and 2 lb ai per acre.
30963	Gallery 75DF (Isoxaben)	Oak (Quercus sp.) Q. palustris	Field Container	Freiberger	NJ	2012	Over the top	No sufficient data collected because plants never broke dormancy and died, or died before trial conclusion.
18847	Gallery 75DF (Isoxaben)	Rose (Rosa sp.) 'Radrazz'	Field Container	Freiberger	NJ	2012	Over the top	Very minor injury, no growth reduction with 2.64 lb per acre.
10745	Gallery 75DF (Isoxaben)	Coneflower (Rudbeckia sp.) R. fulgida 'Golstrum'	Field Container	Klett	CO	1992	Drench	No visible injury with 1 and 2 lb ai per acre.
11879	Gallery 75DF (Isoxaben)	Fern, Leatherleaf (Rumohra adiantiformis)	Greenhouse	Stamps	FL	1992	Foliar	Transient injury to immature fronds, but no impact on leatherleaf fern yield at 1 and 2 lb ai per acre with 4 applications over 2 years.
11883	Gallery 75DF (Isoxaben)	Butchers Broom, Israeli Ruscus (Ruscus aculeatus)	Greenhouse	Stamps	FL	1992	Foliar	No injury at 1 and 2 lb ai per acre with 4 applications over 2 years.
22941	Gallery 75DF (Isoxaben)	Sage (Salvia daghestanica)	Field Container	Klett	CO	2002	Directed	Trial 1: No visible injury but 1 and 2 lb ai per acre did shorten treated plants; good control of broadleaved weeds, but poor control of grassy weeds.
22941	Gallery 75DF (Isoxaben)	Sage (Salvia daghestanica)	Field Container	Klett	CO	2002	Directed	Trial 2: No visible injury but 1 and 2 lb ai per acre did moderately stunt treated plants; good control of broadleaved weeds, but poor control of grassy weeds.
31049	Gallery 75DF (Isoxaben)	Pasture Sage (Salvia nemorosa)	Field Container	Peachey	OR	2013	Over the top	Moderate injury and slight growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31049	Gallery 75DF (Isoxaben)	Pasture Sage (Salvia nemorosa) S. sylvestris 'Blue Hill'	Field Container	Senesac	NY	2013	Over the top	Minor injury with 0.5, moderate with 1 and 2, lb ai per acre applied twice.
12343	Gallery 75DF (Isoxaben)	Little Blue Stem (Schizachyrium scoparium)	Field Container	Lieth	CA	2011	Over the top	No injury or significant growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
12343	Gallery 75DF (Isoxaben)	Little Blue Stem (Schizachyrium scoparium) 'Blaze'	Field Container	Klett	CO	2010	Broadcast	Trial 1: no crop injury with 0.66, 1.32, 2.64 lbs ai/A. No differences in height, width, dry mass or efficacy between treated and weeded check.

12343	Gallery 75DF (Isoxaben)	Little Blue Stem (<i>Schizachyrium scoparium</i>) 'Blaze'	Field Container	Klett	CO	2010	Broadcast	Trial 2: no crop injury with 0.66, 1.32, 2.64 lbs ai/A. No differences in height, dry mass or efficacy between treated and weeded check.
22942	Gallery 75DF (Isoxaben)	Skullcap (<i>Scutellaria racemosa</i>)	Field Container	Klett	CO	2002	Directed	Trial 1: Crop injury could not be evaluated due to crop failure; good control of broadleaved weeds.
22942	Gallery 75DF (Isoxaben)	Skullcap (<i>Scutellaria racemosa</i>)	Field Container	Klett	CO	2002	Directed	Trial 2: No injury at 1 and 2 lb ai per acre; good control of broadleaved weeds.
11324	Gallery 75DF (Isoxaben)	Stonecrop (<i>Sedum</i> sp.) <i>S. acre</i>	Field In-Ground	Klett	CO	1993	Drench	No significant injury at 1 and 2 lb ai per acre.
24291	Gallery 75DF (Isoxaben)	Stonecrop (<i>Sedum</i> sp.) <i>S. spurium</i> 'Red Carpet'	Field Container	Klett	CO	2012	Over the top	No injury but slight plant growth reduction with 2 lb ai per acre applied twice.
10746	Gallery 75DF (Isoxaben)	Lamb's-Ears (<i>Stachys byzantina</i>)	Field Container	Fare	TN	1995	Over the top	Significant injury even mortality increasing with rate (0.5, 1.0, 2.0 lb ai per acre); suppression of mare's tail germination, but not crabgrass.
10746	Gallery 75DF (Isoxaben)	Lamb's-Ears (<i>Stachys byzantina</i>)	Field Container	Fare	TN	1996	Over the top	Significant injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with some plants dying at the 2.0 lb ai per acre rate.
10709	Gallery 75DF (Isoxaben)	Lamb's-Ears (<i>Stachys byzantina</i>)	Field In-Ground	Talbert	AR	1993	Broadcast	Minor to significant injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre).
10746	Gallery 75DF (Isoxaben)	Lamb's-Ears (<i>Stachys byzantina</i>)	Field Container	Talbert	AR	1993	Over the top	Mortality at all tested rates (0.5, 1.0, 2.0 lb ai per acre).
10709	Gallery 75DF (Isoxaben)	Lamb's-Ears (<i>Stachys byzantina</i>) 'Silver Carpet'	Field In-Ground	Ferree	IL	1993	Broadcast	Some potential negative impact, but overall growing conditions were poor for this trial.
10710	Gallery 75DF (Isoxaben)	Stokes Aster (<i>Stokesia</i> sp.) <i>S. laevis</i> 'Blue Danube'	Field In-Ground	Ferree	IL	1993	Broadcast	Slight injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre).
10747	Gallery 75DF (Isoxaben)	Stokes Aster (<i>Stokesia</i> sp.) <i>S. laevis</i> 'Blue Danube'	Field Container	Klett	CO	1992	Drench	No injury at 1 and 2 lb ai per acre.
30967	Gallery 75DF (Isoxaben)	Lilac (<i>Syringa</i> sp.)	Field Container	Freiberger	NJ	2012	Over the top	No injury or growth reduction with 2.64 lb per acre.
30966	Gallery 75DF (Isoxaben)	Arborvitae (<i>Thuja</i> sp.)	Field Container	Freiberger	NJ	2012	Over the top	No injury or growth reduction with 2.64 lb per acre.
11320	Gallery 75DF (Isoxaben)	Thyme (Non-Bearing) (<i>Thymus</i> sp.) <i>T. pseudolanuginosus</i>	Field Container	Klett	CO	1993	Drench	Moderate to significant injury increasing with rate (1, 2 lb ai per acre).
11420	Gallery 75DF (Isoxaben)	Speedwell, Brooklime (<i>Veronica</i> sp.) <i>V. incana</i>	Field Container	Klett	CO	1994	Drench	No injury at 1 and 2 lb ai per acre; excellent control of pigweed, purslane, common groundsel, barnyardgrass, yellow foxtail and annual bluegrass.
12781	Gallery 75DF (Isoxaben)	Arrowwood (<i>Viburnum</i> sp.)	Field Container	Freiberger	NJ	2012	Over the top	No injury or growth reduction with 2.64 lb per acre.
13443	Gallery 75DF (Isoxaben)	Palm, Mexican Fan (<i>Washingtonia robusta</i>)	Field Container	Broschat	FL	1999	Foliar	No injury with single application of 1 and 2 lb ai per acre.
12780	Gallery 75DF (Isoxaben)	Japanese Zelkova (<i>Zelkova serrata</i>)	Field Container	DeFrancesco	OR	2010	Over the top	Slight crop injury predominately on youngest foliage with one or two applications at 0.5, 1.0, 2.0 lb ai per acre increasing with rate.
31979	Gallery SC (Isoxaben)	Big Blue Stem (<i>Andropogon gerardii</i>)	Field Container	Derr	VA	2015	Over the top	No shoot weight reduction with 1, 2 and 4 lb ai per acre applied twice.

31979	Gallery SC (Isoxaben)	Big Blue Stem (<i>Andropogon gerardii</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
32597	Gallery SC (Isoxaben)	<i>Aronia melanocarpa</i> (<i>Aronia melanocarpa</i>)	Field Container	Cochran	IA	2016	Over the top	Slight to moderate injury with complete recovery with 1 and 2, slight injury at end of trial with 4 lb ai per acre; no growth reduction.
31968	Gallery SC (Isoxaben)	Feather Reed Grass (<i>Calamagrostis acutiflora</i>)	Field Container	Mathers	OH	2015	Over the top	Slight injury with 1, moderate and severe with 2 and 4 lb ai per acre applied twice.
31968	Gallery SC (Isoxaben)	Feather Reed Grass (<i>Calamagrostis acutiflora</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31989	Gallery SC (Isoxaben)	<i>Carex buchanani</i> (<i>Carex buchanani</i>)	Field Container	Koivunen	CA	2016	Over the top	No injury or growth reduction with 1, 2, and 4 lb ai per acre applied twice.
31989	Gallery SC (Isoxaben)	<i>Carex buchanani</i> (<i>Carex buchanani</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31989	Gallery SC (Isoxaben)	<i>Carex buchanani</i> (<i>Carex buchanani</i>) 'Red Rooster'	Field Container	Neal	NC	2015	Over the top	Moderate to high injury and growth reduction increasing with rates (1.3, 2.6 and 5.3 lb ai per acre) applied twice.
32382	Gallery SC (Isoxaben)	Sedge, Cherokee (<i>Carex cherokeensis</i>)	Field Container	Derr	VA	2016	Over the top	Moderate injury and high growth reduction with 1, 2 and 4 lb ai per acre applied twice.
32382	Gallery SC (Isoxaben)	Sedge, Cherokee (<i>Carex cherokeensis</i>)	Field Container	Neal	NC	2015	Over the top	Slight injury with 1.3, moderate and high with 2.6 and 5.3 lb ai per acre, applied twice; moderate and high growth reduction with 2X and 4X.
32382	Gallery SC (Isoxaben)	Sedge, Cherokee (<i>Carex cherokeensis</i>)	Field Container	Senesac	NY	2016	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31990	Gallery SC (Isoxaben)	<i>Carex morrowii</i> (<i>Carex morrowii</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31929	Gallery SC (Isoxaben)	Northern Sea Oats, Wild Oats (<i>Chasmanthium latifolium</i>)	Field Container	Boydston	WA	2014	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice; all treated plants marketable.
31929	Gallery SC (Isoxaben)	Northern Sea Oats, Wild Oats (<i>Chasmanthium latifolium</i>)	Field Container	Wilén	CA	2014	Over the top	Acceptable injury with 31, 62 and 123 fl oz per acre applied twice; no growth reduction.
31929	Gallery SC (Isoxaben)	Northern Sea Oats, Wild Oats (<i>Chasmanthium latifolium</i>)	Field Container	Wilén	CA	2015	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
31981	Gallery SC (Isoxaben)	Pampas grass (<i>Cortaderia selloana</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
33007	Gallery SC (Isoxaben)	Woodland Crocus (<i>Crocus tommasinianus</i>)	Field In-Ground	Senesac	NY	2015	Over the top	Minimal injury with 1 lb ai per acre applied on Oct 2015 to dormant crop.
31994	Gallery SC (Isoxaben)	Tufted hairgrass (<i>Deschampsia caespitosa</i>)	Field Container	Neal	NC	2015	Over the top	No injury or growth reduction with 1.3 lb ai per acre applied twice; slight and moderate injury, and moderate growth reduction with 2.6 and 5.3 lb ai.
31982	Gallery SC (Isoxaben)	Purple Lovegrass (<i>Eragrostis spectabilis</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
32008	Gallery SC (Isoxaben)	Plume Grass; Ravenna (<i>Erianthus</i> sp.)	Field Container	Senesac	NY	2016	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
33008	Gallery SC (Isoxaben)	Yellow Trout Lily (<i>Erythronium americanum</i>)	Field In-Ground	Senesac	NY	2015	Over the top	Minimal injury with 1 lb ai per acre applied on Oct 2015 to dormant crop.
31971	Gallery SC (Isoxaben)	Blue Fescue (<i>Festuca glauca</i>)	Field Container	Senesac	NY	2015	Over the top	Slight injury at 1 and 2, moderate at 4 lb ai per acre applied twice.

33009	Gallery SC (Isoxaben)	Snakeshead Lily (<i>Fritillaria meleagris</i>)	Field In-Ground	Senesac	NY	2015	Over the top	Minimal injury with 1 lb ai per acre applied on Oct 2015 to dormant crop.
31973	Gallery SC (Isoxaben)	Hakone Grass, Japanese Forest Grass (<i>Hakonechloa</i> sp.)	Field Container	Klett	CO	2015	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
31973	Gallery SC (Isoxaben)	Hakone Grass, Japanese Forest Grass (<i>Hakonechloa</i> sp.)	Field Container	Neal	NC	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31996	Gallery SC (Isoxaben)	Indian Grass (<i>Hierochloa odorata</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
33006	Gallery SC (Isoxaben)	(<i>Hyacinthus orientalis</i>) 'Gipsy Queen'	Field In-Ground	Senesac	NY	2015	Over the top	Minor injury with 1 lb ai per acre applied once on Oct 2015 to dormant crop.
31997	Gallery SC (Isoxaben)	Soft rush (<i>Juncus effusus</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31997	Gallery SC (Isoxaben)	Soft rush (<i>Juncus effusus</i>)	Field Container	Witcher	TN	2016	Over the top	No injury with 1, minor leaf chlorosis with 2 and 4, lb ai per acre after 2nd application; no growth reduction.
31983	Gallery SC (Isoxaben)	Blue Lyme Grass (<i>Leymus arenarius</i>)	Field Container	Derr	VA	2015	Over the top	No shoot weight reduction with 1, 2 and 4 lb ai per acre applied twice.
31983	Gallery SC (Isoxaben)	Blue Lyme Grass (<i>Leymus arenarius</i>) 'Blue Dune'	Field Container	Neal	NC	2015	Over the top	No injury with 1.3, 2.6 and 5.3 lb ai per acre applied twice; slight growth reduction only with 2X.
33005	Gallery SC (Isoxaben)	(<i>Lilium Asiatic Hybrids</i>)	Field In-Ground	Senesac	NY	2015	Over the top	Moderate injury with 1 lb ai per acre applied once on Oct 2015 to dormant crop.
31966	Gallery SC (Isoxaben)	Muhly, hairyawn (<i>Muhlenbergia capillaris</i>)	Field Container	Derr	VA	2015	Over the top	No significant shoot weight reduction with 1 and 2, moderate with 4 lb ai per acre, applied twice.
31966	Gallery SC (Isoxaben)	Muhly, hairyawn (<i>Muhlenbergia capillaris</i>)	Field Container	Klett	CO	2015	Over the top	No injury, but slight growth reduction, with 1, 2 and 4 lb ai per acre applied twice.
31966	Gallery SC (Isoxaben)	Muhly, hairyawn (<i>Muhlenbergia capillaris</i>)	Field Container	Neal	NC	2014	Over the top	No injury, growth reduction or delayed blooming with 0.5, 1 and 2 lb ai per acre applied twice.
31984	Gallery SC (Isoxaben)	Mexican deergrass (<i>Muhlenbergia dubia</i>)	Field Container	Marble	FL	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31984	Gallery SC (Isoxaben)	Mexican deergrass (<i>Muhlenbergia dubia</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre after 1st application, moderate after 2nd application
31999	Gallery SC (Isoxaben)	Bamboo Muhly (<i>Muhlenbergia dumosa</i>)	Field Container	Marble	FL	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
31999	Gallery SC (Isoxaben)	Bamboo Muhly (<i>Muhlenbergia dumosa</i>) M. <i>dubia</i>	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
32000	Gallery SC (Isoxaben)	Deer Grass (<i>Muhlenbergia rigens</i>)	Field Container	Derr	VA	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
31976	Gallery SC (Isoxaben)	Mexican feather grass (<i>Nassella tenuissima</i>)	Field Container	Koivunen	CA	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
31976	Gallery SC (Isoxaben)	Mexican feather grass (<i>Nassella tenuissima</i>)	Field Container	Mathers	OH	2015	Over the top	No significant injury with 1 and 2, severe with 4 lb ai per acre applied twice. Abnormally hot weather might have increased injury.
31976	Gallery SC (Isoxaben)	Mexican feather grass (<i>Nassella tenuissima</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
24511	Gallery SC (Isoxaben)	Peony (<i>Paeonia</i> sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2015	Over the top	Moderate foliar injury with 31, 62 and 123 fl oz per acre applied twice.

31977	Gallery SC (Isoxaben)	Switch-Grass (<i>Panicum virgatum</i>)	Field Container	Senesac	NY	2015	Over the top	No injury at 1, 2 and 4 lb ai per acre applied twice.
31977	Gallery SC (Isoxaben)	Switch-Grass (<i>Panicum virgatum</i>) 'Heavy Metal'	Field Container	Mathers	OH	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31977	Gallery SC (Isoxaben)	Switch-Grass (<i>Panicum virgatum</i>) 'Northwind'	Field Container	Neal	NC	2015	Over the top	No injury or growth reduction with 1.3, 2.6 and 5.3 lb ai per acre applied twice.
31985	Gallery SC (Isoxaben)	Chinese Pennisetum (<i>Pennisetum alopecuroides</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
31967	Gallery SC (Isoxaben)	Little Blue Stem (<i>Schizachyrium scoparium</i>)	Field Container	Neal	NC	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31967	Gallery SC (Isoxaben)	Little Blue Stem (<i>Schizachyrium scoparium</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
32009	Gallery SC (Isoxaben)	Indian Grass (<i>Sorghastrum nutans</i>)	Field Container	Derr	VA	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
32009	Gallery SC (Isoxaben)	Indian Grass (<i>Sorghastrum nutans</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
32009	Gallery SC (Isoxaben)	Indian Grass (<i>Sorghastrum nutans</i>) 'Indian Steel'	Field Container	Marble	FL	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
32010	Gallery SC (Isoxaben)	Prairie dropseed (<i>Sporobolus heterolepis</i>)	Field Container	Cochran	IA	2016	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
32010	Gallery SC (Isoxaben)	Prairie dropseed (<i>Sporobolus heterolepis</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.
32011	Gallery SC (Isoxaben)	Feather Grass, Mexican (<i>Stipa</i> sp.)	Field Container	Koivunen	CA	2015	Over the top	No injury or growth reduction with 1, 2 and 4 lb ai per acre applied twice.
32011	Gallery SC (Isoxaben)	Feather Grass, Mexican (<i>Stipa</i> sp.)	Field Container	Senesac	NY	2016	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice.

Label Suggestions

For Gallery 75DF, it is suggested that the following four crop species exhibiting no injury in the testing with over-the-top applications of Gallery 75DF be placed on the label.

Dryopteris ludoviciana

Limonium latifolium

Ruscus aculeatus

Schizachyrium scoparium

For Gallery SC, it is suggested that the following species exhibiting no injury in the testing with over-the-top applications of Gallery SC be placed on the label.

Sorghastrum nutans

It is advisable to list the following crops as sensitive to isoxaben treatment.

Astilbe sp.

Athyrium filix-femina

Buddleia davidii

Dendranthema x morifolium

Digitalis purpurea

Muhlenbergia capillaris

Stachys byzantina

Thymus sp

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