



[Environment Horticulture Program Research Summaries](#)

## **IR-4 Environmental Horticulture Program Dimethenamid-p + Pendimethalin Crop Safety**

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## Abstract

From 2007 to 2022, IR-4 completed 700 trials on Freehand 1.75G (BAS 659 G; dimethenamid-p + pendimethalin). The data contained in this report was generated to register uses of dimethenamid-p + pendimethalin on and around environmental horticulture plants with broadcast applications, including over the top of established plants. The Freehand rates in this testing program were 2.65, 5.3 and 10.6 pounds active ingredient per acre (lb ai per A) as the 1X, 2X and 4X rates. Freehand 1.75G had been applied to 195 plant genera or species. Of these genera and species, 116 exhibited no or minimal transient injury after application at all three rates. Thirteen (13) crops exhibited little or no phytotoxicity at 2.65 lb ai per acre but did have some injury at 5.3 and/or 10.6 lb ai per acre or showed injury after the second application. Seventeen (17) genera or species exhibited damage at the lowest rate sufficient to recommend growers not utilize Freehand 1.75G as an over-the-top treatment for pre-emergent weed control. Twelve (12) crops exhibited variable responses sufficient to recommend further testing of specific species or cultivars. Of the 39 crops which IR-4 has screen in under 3 trials, BASF has sufficient information to include 18 crops on the Freehand 1.75G label. Additional trials are indicated to establish species or cultivar sensitivities for the remaining 21 crops.

## 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. Four herbicides, Freehand 1.75G (BAS 659 G; dimethenamid-p + pendimethalin), F6874 0.3G (sulfentrazone + prodiamine), Mesotrione SC, and Tower EC (BAS 646 EC; dimethenamid-p), were chosen for 2007 research activities into level of crop safety on over 40 different plant species. In 2008, 2010 and 2011, Freehand (dimethenamid-p + pendimethalin), was again tested in a study with other products, including Broadstar 0.24G VC1602 (flumioxazin), EXC3898 G (mesotrione), Tower EC and V-10122 G (sulfosulfuron). The priority for herbicide crop safety shifted to primarily to liquid herbicides in 2012; however, additional research was conducted on granular broadcast materials including Freehand. This summary covers the results for Freehand 1.75G from 2007 through 2022.

## Materials and Methods

In the 2007 protocol, two applications of Freehand 1.75G were made approximately 8 weeks apart. In the 2008, and 2010 through 2022 protocols, two applications of Freehand G were made approximately 6 weeks apart. The application rates were 2.65, 5.3 and 10.6 lb ai per acre, plus a water treated control. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. Phytotoxicity was recorded on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill) at 1, 2, 4, 8, and 12 weeks after initial application. Some researchers also included readings 3 to 2 days after the initial and second applications. To view the more detailed materials and methods in these protocols (07-009, 08-010, 09-011, 10-001, 11-004, 12-014, 13-014, 14-009, 15-009, 16-010, 17-010, 18-012, 19-012, 20-013, 21-013, 22-017), please see <https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-researcher-resources/#Protocols> to view and download these protocols.

Freehand 1.75G was supplied to researchers (See list of researchers in Appendix 1) by BASF Corporation.

## Results and Summary

### *Phytotoxicity*

Based on the type and nature of injury seen with Freehand 1.75G 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 at the 1X rate sufficient to recommend growers not utilize this product, and 4) more data is needed to make informed recommendations.

Freehand 1.75G exhibited no or minimal negative impact on 116 plant genera or species with Broadcast 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. Of the plants showing little or no injury, 93 genera or species were already on

the label, partially based on previous summary reports. In the research presented here, 13 plants exhibited significant injury at higher rates or after the second application even though little or no injury was observed at lower rates or before the second application (Table 2). Seventeen (17) crops tested from 2007 to 2022 showed damage at the lowest rate sufficient to recommend growers not utilize Freehand 1.75G as an over-the-top treatment for pre-emergent weed control (Table 3). Twelve (12) crops exhibited variable responses sufficient to recommend further testing of specific species or cultivars. (Table 4). For 39 genera/species, more information may be needed because only 1 or 2 trials were conducted (Table 5); however, 18 are already listed on the Freehand 1.75G label.

Please see Table 6 for a list of individual trial summaries on Freehand 1.75G.

**Table 1. List of Freehand 1.75G treated crops with no or minimal transitory injury.**

<i>Abies fraseri</i> <sup>1</sup>	<i>Cuprocyparis leylandii</i> <sup>1</sup>	<i>Ophiopogon sp.</i> <sup>1</sup>
<i>Acer negundo</i> var. <i>negundo</i> <sup>1</sup>	<i>Delosperma sp.</i> <sup>1</sup>	<i>Pachysandra terminalis</i> <sup>1</sup>
<i>Acer palmatum</i> <sup>1</sup>	<i>Dianthus sp.</i> <sup>1</sup>	<i>Paeonia sp.</i> <sup>1</sup>
<i>Acer rubrum</i> <sup>1</sup>	<i>Distylium sp.</i>	<i>Penstemon sp.</i>
<i>Acer sp.</i> <sup>1</sup>	<i>Echinacea purpurea</i> <sup>1,3</sup> (See	<i>Petunia sp.</i> <sup>1</sup>
<i>Achillea millefolium</i> <sup>1</sup>	Klett)	<i>Phlox subulata</i> <sup>1,4</sup>
<i>Aesculus sp.</i>	<i>Eupatorium sp.</i> <sup>1</sup>	<i>Photinia fraseri</i> <sup>1,3</sup>
<i>Agastache sp.</i> <sup>1</sup>	<i>Fagus sp.</i>	<i>Picea sp.</i> <sup>1</sup>
<i>Agave sp.</i>	<i>Forsythia sp.</i> <sup>1</sup>	<i>Pieris sp.</i> <sup>1</sup>
<i>Aloe sp.</i>	<i>Fothergilla gardenii</i> <sup>1</sup>	<i>Pinus sp.</i> <sup>1</sup>
<i>Amelanchier sp.</i> <sup>1</sup> (see	<i>Fraxinus sp.</i> <sup>1</sup>	<i>Pinus taeda</i>
Mathers 2010)	<i>Gaillardia sp.</i> <sup>1</sup> (See Reding	<i>Potentilla sp.</i> <sup>1</sup>
<i>Anemone sp.</i> <sup>1,2</sup>	2015)	<i>Pseudotsuga menziesii</i> <sup>1</sup>
<i>Arctostaphylos sp.</i>	<i>Gardenia sp.</i> <sup>1</sup>	<i>Quercus shumardii</i> <sup>1</sup>
<i>Asclepias sp.</i>	<i>Gaura lindheimeri</i> <sup>1,3</sup>	<i>Quercus sp.</i> <sup>1</sup>
<i>Athyrium nipponicum</i>	<i>Gladiolus sp.</i> <sup>1</sup>	<i>Quercus virginiana</i> <sup>1</sup>
<i>Aucuba sp.</i>	<i>Gleditsia sp.</i> <sup>1</sup>	<i>Rhaphiolepis indica</i> <sup>1</sup>
<i>Berberis sp.</i> <sup>1</sup>	<i>Hemerocallis sp.</i> <sup>1</sup>	<i>Rhododendron sp.</i> <sup>1</sup>
<i>Berlandiera lyrata</i>	<i>Hibiscus sp.</i> <sup>1</sup>	<i>Rosa sp.</i> <sup>1</sup>
<i>Buddleia davidii</i> <sup>1</sup>	<i>Hosta sp.</i> <sup>1</sup>	<i>Sabal minor</i>
<i>Buxus sp.</i> <sup>1</sup>	<i>Hydrangea sp.</i> <sup>1,3</sup>	<i>Saccharum sp.</i>
<i>Cactaceae</i>	<i>Ilex sp.</i> <sup>1</sup>	<i>Salvia x sylvestris</i> <sup>1,3</sup>
<i>Callistemon sp.</i> <sup>1</sup>	<i>Ipomoea sp.</i> <sup>1</sup>	<i>Solidago spp.</i> <sup>1,3</sup>
<i>Calycanthus sp.</i>	<i>Iris sp.</i> <sup>1</sup>	<i>Solidago sphacelata</i> <sup>1,3</sup>
<i>Camellia sp.</i>	<i>Itea virginica</i> <sup>1</sup>	<i>Spiraea sp.</i> <sup>1,3</sup>
<i>Carex divulsa</i> <sup>1</sup>	<i>Juniperus sp.</i> <sup>1</sup>	<i>Stewartia sp.</i> <sup>1</sup>
<i>Ceanothus maritimus</i> <sup>1</sup>	<i>Kerria japonica</i> <sup>1</sup>	<i>Syringa sp.</i> <sup>1</sup>
<i>Ceanothus sp.</i> <sup>1,3</sup>	<i>Lagerstroemia indica</i>	<i>Taxus sp.</i> <sup>1</sup>
<i>Ceanothus x pallida</i> <sup>1,3</sup>	<i>Lantana sp.</i> <sup>1</sup>	<i>Ternstroemia sp.</i>
<i>Cercis canadensis</i> <sup>1</sup>	<i>Larix sp.</i>	<i>Thuja plicata</i> <sup>1</sup>
<i>Chamaecyparis sp.</i> <sup>1</sup>	<i>Lavandula sp.</i> <sup>1</sup>	<i>Thuja sp.</i> <sup>1</sup>
<i>Chrysanthemum/</i>	<i>Leucanthemum maximum</i> <sup>1</sup>	<i>Trachelospermum asiaticum</i> <sup>1</sup>
<i>Dendranthema x</i>	<i>Leucothoe sp.</i> <sup>1</sup>	<i>Trachycarpus fortunei</i>
<i>morifolium</i> <sup>1</sup>	<i>Liriope sp.</i> <sup>1</sup>	<i>Tsuga heterophylla</i> <sup>1,3</sup> (See
<i>Cladrastis sp.</i> <sup>1</sup> (See Reding	<i>Lobularia maritima</i> <sup>1</sup>	Beste/Frank for field in
2010)	<i>Loropetalum sp.</i> <sup>1,3</sup>	ground trial)
<i>Clematis sp.</i> <sup>1</sup>	<i>Magnolia sp.</i> <sup>1,3</sup>	<i>Ulmus sp.</i> <sup>1</sup>
<i>Cornus florida</i> <sup>1</sup>	<i>Mahonia aquifolium</i> <sup>1</sup>	<i>Verbena sp.</i>
<i>Cornus kousa</i> <sup>1</sup>	<i>Malus sp.</i> <sup>1</sup>	<i>Viburnum sp.</i> <sup>1,3</sup>
<i>Cotoneaster sp.</i> <sup>1</sup>	<i>Miscanthus sp.</i> <sup>4</sup>	<i>Vinca major</i>
<i>Crataegus sp.</i> <sup>1</sup>	<i>Nepeta cataria</i> <sup>1,3</sup>	<i>Zelkova serrata</i> <sup>1</sup>
<i>Cryptomeria japonica</i> <sup>1</sup>	<i>Nepeta x faassenii</i> <sup>1,3</sup>	

<sup>1</sup> Registered already

<sup>2</sup> More information on cultivar differences might be warranted.

<sup>3</sup> Perhaps a single application only is or could be a label restriction.

<sup>4</sup> Listed on label as sensitive with special precautions.

**Table 2. List of Freehand 1.75G treated crops with no or minimal transitory injury seen at 1X rate, but the 2X or 4X rate did cause significant phytotoxicity**

<i>Aquilegia sp.</i> <sup>4</sup>	<i>Cortaderia spp.</i> (see Boydston)	<i>Phlox subulata</i> <sup>1, 4</sup>
<i>Campanula spp.</i> <sup>1, 3</sup>	<i>Heuchera sanguinea</i> <sup>1</sup>	<i>Sedum spp.</i> <sup>1, 4</sup> (see Boydston)
<i>Canna spp.</i> <sup>1, 3</sup>	<i>Ligustrum spp.</i> <sup>1, 3</sup>	<i>Tagetes sp.</i> <sup>1</sup>
<i>Catharanthus roseus</i> <sup>1, 4</sup>	<i>Oenothera spp.</i> <sup>1</sup>	<i>Teucrium chamaedrys</i> <sup>1, 3</sup>
<i>Chelone spp.</i> <sup>1, 3</sup>		

**Table 3. List of Freehand 1.75G treated crops exhibiting significant injury at 1X.**

<i>Calamagrostis acutiflora</i> <sup>4</sup>	<i>Liatris spicata</i> <sup>4</sup>	<i>Rudbeckia fulgida</i> <sup>4</sup>
<i>Echeveria sp.</i>	<i>Matthiola incana</i> <sup>4</sup>	<i>Scabiosa spp.</i> <sup>4</sup>
<i>Festuca ovina glauca</i> <sup>5</sup>	<i>Muhlenbergia capillaris</i> <sup>4</sup>	<i>Scaevola spp.</i> <sup>4</sup>
<i>Gazania spp.</i> <sup>1, 3</sup>	<i>Muhlenbergia dubia</i> <sup>4</sup>	<i>Veronica spicata</i> <sup>4</sup>
<i>Impatiens hawkeri</i> <sup>4</sup>	<i>Osmunda regalis</i> <sup>4</sup>	<i>Vinca minor</i> <sup>4</sup>
<i>Lamium spp.</i> <sup>4</sup>	<i>Pennisetum setaceum</i> <sup>4</sup>	

**Table 4. List of Freehand 1.75G treated crops with variable response.**

<i>Agapanthus sp.</i> <sup>1</sup>	<i>Dryopteris erythrosora</i>	<i>Lobelia spp.</i> <sup>1, 4</sup>
<i>Armeria maritima</i> <sup>4</sup>	<i>Echinacea sp.</i> <sup>1</sup>	<i>Phlox paniculata</i> <sup>4</sup>
<i>Astilbe sp.</i> <sup>1</sup>	<i>Helianthus sp.</i>	<i>Sambucus spp.</i> <sup>2, 4</sup>
<i>Clethra alnifolia</i> <sup>4</sup>	<i>Iberis sempervirens</i> <sup>1, 3</sup> (see Klett)	
<i>Coreopsis sp.</i> <sup>4</sup>		

**Table 5. List of Freehand 1.75G treated crops with less than 3 trials.**

<i>Allamanda cathartica</i> <sup>1</sup>	<i>Epilobium canum</i> <sup>4</sup>	<i>Ribes viburnifolium</i> <sup>1</sup>
<i>Alnus sp.</i>	<i>Euonymus fortunei</i> <sup>1</sup>	<i>Rudbeckia hirta</i>
<i>Amsonia sp.</i> <sup>4</sup>	<i>Gymnocalycium baldianum</i>	<i>Ruscus hypophyllum</i>
<i>Caladium sp.</i> <sup>1</sup>	<i>Hamelia patens</i>	<i>Salvia splendens</i> <sup>1, 3</sup>
<i>Carex sp.</i> <sup>1, 3</sup>	<i>Heteromeles arbutifolia</i>	<i>Santolina chamaecyparissus</i>
<i>Ceanothus spp.</i> <sup>1, 2</sup>	<i>Juncus effusus</i>	<i>Sedum acre</i> <sup>1</sup>
<i>Cedrus atlantica</i>	<i>Kalmia sp.</i>	<i>Sedum rupestre</i> <sup>1</sup>
<i>Chrysogonum virginianum</i>	<i>Osmanthus heterophyllus</i> <sup>1</sup>	<i>Stachys byzantina</i>
<i>Crassula sp.</i>	<i>Oxydendrum arboreum</i> <sup>1</sup>	<i>Stromanthe sp.</i>
<i>Cycas revoluta</i>	<i>Philadelphus sp.</i>	<i>Taxodium distichum</i> <sup>1</sup>
<i>Dryopteris cycadina</i>	<i>Phlox carolinia</i> <sup>4</sup>	<i>Tsuga sp.</i> <sup>1</sup>
<i>Duranta erecta</i>	<i>Phoenix roebelinii</i>	<i>Vernonia noveboracensis</i> <sup>1</sup>
<i>Dypsis lutescens</i>	<i>Portulaca sp.</i> <sup>1</sup>	<i>Wodyetia bifurcata</i>

<sup>1</sup> Registered already

<sup>2</sup> More information on cultivar differences might be warranted.

<sup>3</sup> Perhaps a single application only could be a label restriction.

<sup>4</sup> Listed on label as sensitive plant.



**Table 6. Detailed Summary of Crop Safety Testing with Freehand 1.75G.**

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 12/20/2022 listed below.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26538	Fir, Fraser ( <i>Abies fraseri</i> )	Field In-Ground	Ahrens/ Mervosh	CT	2007	Broadcast	BAS 656 EC + Pendulum Aquacap sprayed at 0.9 + 1.5, 1.8 + 3.0 and 2.7 + 4.5 lb ai per acre; no injury at 1X and 2X, slight injury at 4X.
26538	Fir, Fraser ( <i>Abies fraseri</i> )	Field In-Ground	Beste/Frank (ARS)	MD	2007	Broadcast	Results not useful because of severe injury caused by very high temperature and drought conditions.
26321	Fir, Fraser ( <i>Abies fraseri</i> )	Field Container	Boydston	WA	2007	Broadcast	Two sequential applications 8 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre did not cause injury but reduced height and width at 8 WAT; all treated plants are saleable.
26321	Fir, Fraser ( <i>Abies fraseri</i> )	Field Container	Freiberger	NJ	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26321	Fir, Fraser ( <i>Abies fraseri</i> ) 'Roan Mountain'	Field Container	Marshall	MI	2007	Broadcast	One application. No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26321	Fir, Fraser ( <i>Abies fraseri</i> )	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27391	Maple, Boxelder ( <i>Acer negundo</i> var. <i>negundo</i> ) A. <i>negundo</i> 'Variegatum'	Field Container	Boydston	WA	2011	Broadcast	No crop injury or reduction in growth with two applications at 2.65, 5.3, 10.6 lb ai per acre.
27391	Maple, Boxelder ( <i>Acer negundo</i> var. <i>negundo</i> )	Field Container	Freiberger	NJ	2008	Broadcast	Very slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
27391	Maple, Boxelder ( <i>Acer negundo</i> var. <i>negundo</i> )	Field Container	Jones	OH	2013	Broadcast	Virtually no injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27083	Maple, Japanese ( <i>Acer palmatum</i> )	Field Container	Ahrens/ Mervosh	CT	2009	Broadcast	Little to no injury or reduction in growth with two applications at 2.65, 5.3, 10.6 lb ai per acre.
27083	Maple, Japanese ( <i>Acer palmatum</i> ) 'Atropurpureum'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27083	Maple, Japanese ( <i>Acer palmatum</i> ) 'Atropurpureum'	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27083	Maple, Japanese ( <i>Acer palmatum</i> )	Field Container	Harvey	WA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27083	Maple, Japanese ( <i>Acer palmatum</i> )	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
27083	Maple, Japanese ( <i>Acer palmatum</i> ) 'Atropurpureum'	Field Container	Senesac	NY	2008	Broadcast	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
26542	Maple, Red ( <i>Acer rubrum</i> )	Field In-Ground	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury and height reduction at 2.65 lb ai per acre, significant at 5.3 and 10.6 lb; all plants marketable.
26542	Maple, Red ( <i>Acer rubrum</i> )	Field In-Ground	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre; height reduction at 4X but all plants marketable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26195	Maple, Red ( <i>Acer rubrum</i> )	Field Container	Freiberger	NJ	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st; slight at 1X and 2X, moderate at 4X after 2nd application.
26195	Maple, Red ( <i>Acer rubrum</i> ) 'Summer'	Field Container	Gilliam	AL	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre with two applications.
26195	Maple, Red ( <i>Acer rubrum</i> ) 'October Glory'	Field Container	Harvey	WA	2008	Broadcast	Slight injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
26195	Maple, Red ( <i>Acer rubrum</i> ) 'Sun Valley'	Field Container	Mathers (OSU)	OH	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26195	Maple, Red ( <i>Acer rubrum</i> )	Field Container	Senesac	NY	2008	Broadcast	Slight injury at 2.63 and 5.25, moderate at 10.5 lb ai per acre.
27092	Maple ( <i>Acer</i> sp.) <i>A. saccharinum</i>	Field Container	Derr	VA	2009	Broadcast	No injury or growth reduction at 2.63, 5.25 and 10.6 lb ai per acre.
27092	Maple ( <i>Acer</i> sp.) <i>A. ginnala</i>	Field Container	Reding	OH	2009	Broadcast	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
27092	Maple ( <i>Acer</i> sp.) <i>A. saccharinum</i>	Field Container	Senesac	NY	2008	Broadcast	No injury or growth reduction at 2.63, 5.25 and 10.5 lb ai per acre.
27096	Yarrow, Common ( <i>Achillea millefolium</i> ) 'Paprika'	Field Container	Boydston	WA	2008	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27096	Yarrow, Common ( <i>Achillea millefolium</i> ) 'Moonshine'	Field Container	Neal	NC	2008	Broadcast	No injury to delayed stunting at the highest rate tested (2.65, 5.3, 10.6 lb ai per acre).
27096	Yarrow, Common ( <i>Achillea millefolium</i> ) 'Moonshine'	Field Container	Trader	MS	2008	Broadcast	Moderate injury with slow recovery at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
28173	Horse Chestnut ( <i>Aesculus</i> sp.) <i>A. pavia</i>	Field Container	Freiberger	NJ	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
28173	Horse Chestnut ( <i>Aesculus</i> sp.)	Field Container	Miller	WA	2018	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
28173	Horse Chestnut ( <i>Aesculus</i> sp.) <i>A. glabra</i>	Field Container	Reding	OH	2011	Broadcast	No crop injury or reduction in growth at 2.65, 5.3 and 10.6 lb ai per acre.
27385	Lily-Of-The-Nile ( <i>Agapanthus</i> sp.) 'Peter Pan'	Field Container	Lieth	CA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 2X and 4X; fewer leaves at all rates may delay or reduce marketability.
27385	Lily-Of-The-Nile ( <i>Agapanthus</i> sp.)	Field Container	Neal	NC	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27385	Lily-Of-The-Nile ( <i>Agapanthus</i> sp.) <i>A. africanus</i> 'Alba'	Field Container	Trader	MS	2008	Broadcast	Significant injury with slow recovery at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27385	Lily-Of-The-Nile ( <i>Agapanthus</i> sp.) <i>A. africanus</i> 'Peter Pan'	Field Container	Uber	CA	2008	Broadcast	No significant injury or growth reduction at 2.6, 5.3 and 10.6 lb ai per acre.
26272	Giant Hyssop ( <i>Agastache</i> sp.) 'Blue Fortune'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26272	Giant Hyssop ( <i>Agastache</i> sp.)	Field Container	Derr	VA	2009	Broadcast	No injury at 2.63, 5.25 and 10.6 lb ai per acre.
26272	Giant Hyssop ( <i>Agastache</i> sp.) <i>A. barberi</i> 'Tutti Frutti'	Field Container	Trader	MS	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26272	Giant Hyssop (Agastache sp.) 'Black Adder'	Field Container	Trader	MS	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
31329	Agave (Agave sp.) 'Blue Flame'	Field Container	Villavicencio	CA	2012	Broadcast	Slight discoloration and spotting with 150, 300 and 600 lb per acre, very slight necrosis at 2X and 4X; no growth reduction.
31329	Agave (Agave sp.) A. parrasana	Field Container	Villavicencio	CA	2013	Broadcast	Minor injury and no growth reduction with 150, 300 and 600 lb per acre applied twice.
31329	Agave (Agave sp.) A. ellemeetiana 'Santina'	Field Container	Wilén	CA	2013	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
29648	Golden Trumpet (Allamanda cathartica) 'Hendersonii'	Field Container	Stamps	FL	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
29648	Golden Trumpet (Allamanda cathartica) 'Brown bud'	Field Container	Wade	SC	2022	Broadcast	Minor injury from 2.65 and 5.3 lb ai per acre 4 weeks after each application. Minor injury from 10.6 lb ai per acre 4 weeks after first application, increasing to moderate 4 weeks after second application.
28228	Alder (Alnus sp.) Alnus rubra	Field In-Ground	Miller	WA	2017	Broadcast	No injury with 150, 300 and 600 lb per acre applied twice; minor growth reduction at all rates.
31328	Aloe (Aloe sp.) 'Blue Elf'	Field Container	Villavicencio	CA	2012	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre.
31328	Aloe (Aloe sp.) A. brevifolia	Field Container	Villavicencio	CA	2013	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31328	Aloe (Aloe sp.) 'Little Gator'	Field Container	Wilén	CA	2014	Broadcast	Slight injury with 150, 300 and 600 lb per acre; no significant growth reduction.
28174	Serviceberry (Amelanchier sp.) A. canadensis	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre; No reduction in marketability for all plants.
28174	Serviceberry (Amelanchier sp.) A. x grandifolia 'Autumn Brilliance'	Field Container	DeFrancesco	OR	2010	Broadcast	No injury with one application at 2.65, 5.3 and 10.6 lb ai per acre. A second application at any rate resulted in slight leaf cupping and twisting.
28174	Serviceberry (Amelanchier sp.) Amelanchier stolonifera	Field Container	Mathers (OSU)	OH	2010	Broadcast	Unacceptable crop injury at 5.3 and 10.6 lb ai per acre (acceptable at 2.65 lb ai per acre).
28174	Serviceberry (Amelanchier sp.)	Field Container	Reding	OH	2009	Broadcast	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
27392	Bluestar (Amsonia sp.) A. hubrichtii	Field Container	Senesac	NY	2008	Broadcast	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
27392	Bluestar (Amsonia sp.) A. hubrichtii	Field Container	Trader	MS	2008	Broadcast	Moderate to high injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27393	Anemone (Anemone sp.) 'Max Vogel'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27393	Anemone (Anemone sp.) 'Little Princess'	Field Container	Klett	CO	2009	Broadcast	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27393	Anemone (Anemone sp.) 'Little Princess'	Field Container	Klett	CO	2009	Broadcast	Trial 2: Very slight injury to moderate injury increasing with rate (2.65, 5.3 and 10.6 lb ai per acre).
27393	Anemone (Anemone sp.) 'Pamina'	Field Container	Trader	MS	2008	Broadcast	Slight injury with complete recovery at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.

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27097	Columbine ( <i>Aquilegia</i> sp.) 'Clementine Red'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction and reduced marketability at 2X and 4X.
27097	Columbine ( <i>Aquilegia</i> sp.) 'Winky Double Dark Blue and White'	Field Container	Boydston	WA	2008	Broadcast	No significant injury or growth reduction at 2.65 and 5.3, unacceptable at 10.6 lb ai per acre; 1X and 2X plants probably marketable.
27097	Columbine ( <i>Aquilegia</i> sp.) 'McKana Giants'	Field Container	Derr	VA	2009	Broadcast	No significant injury at 2.63, 5.25 and 10.6 lb ai per acre.
27097	Columbine ( <i>Aquilegia</i> sp.) A. caerulea	Field Container	Klett	CO	2008	Broadcast	Trial 1: Slight to moderate injury (chlorosis) at 2.65 and 5.3, severe at 10.6 lb ai per acre; growth reduction.
27097	Columbine ( <i>Aquilegia</i> sp.) A. caerulea	Field Container	Klett	CO	2008	Broadcast	Trial 2: Some injury (chlorosis) at 2.65, 5.3 and 10.6 lb ai per acre; slight growth reduction at 1X.
27097	Columbine ( <i>Aquilegia</i> sp.) 'Winky Mix'	Field Container	Neal	NC	2008	Broadcast	No to significant injury increasing with rate (2.65, 5.3, and 10.6 lb ai per acre).
27097	Columbine ( <i>Aquilegia</i> sp.) A. caerulea 'Songbird Blue Jay'	Field Container	Trader	MS	2008	Broadcast	High injury at 2.65, 5.3 and 10.6 lb ai per acre.
31106	Manzanita ( <i>Arctostaphylos</i> sp.) A. uva ursi 'Massachusetts'	Field Container	DeFrancesco	OR	2016	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31106	Manzanita ( <i>Arctostaphylos</i> sp.) 'Pacific Mist'	Field Container	Koivunen	CA	2016	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31106	Manzanita ( <i>Arctostaphylos</i> sp.)	Field Container	Miller	WA	2016	Broadcast	No injury or significant growth reduction with 150, 300 and 600 lb per acre applied twice.
31106	Manzanita ( <i>Arctostaphylos</i> sp.) A. uva ursi 'Massachusetts'	Field Container	Senesac	NY	2017	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27098	Thrift Sea Pink ( <i>Armeria maritima</i> ) 'Armada Rose'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; growth reduction and reduced marketability at all rates.
27098	Thrift Sea Pink ( <i>Armeria maritima</i> ) 'Dusseldorfer-stolz'	Field Container	Boydston	WA	2008	Broadcast	Significant injury and height reduction at 2.65, 5.3 and 10.6 lb ai per acre; width reduction at 2X and 4X.
27098	Thrift Sea Pink ( <i>Armeria maritima</i> ) 'Alba'	Field Container	Boydston	WA	2009	Broadcast	No significant injury at 2.65, high at 5.3 and 10.6 lb ai per acre.
27098	Thrift Sea Pink ( <i>Armeria maritima</i> ) 'Splendens'	Field Container	Trader	MS	2009	Broadcast	No significant injury at 2.65 and 5.3, moderate injury at 10.6 lb ai per acre; growth reduction at all rates.
27394	Milkweed ( <i>Asclepias</i> sp.) A. incarnata	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	Significant injury (shortened internode, leaf distortion) only after 1st application at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction; all plants marketable.
27394	Milkweed ( <i>Asclepias</i> sp.)	Field Container	Derr	VA	2009	Broadcast	No significant injury at 2.63 and 5.25, slight at 10.6 lb ai per acre.
27394	Milkweed ( <i>Asclepias</i> sp.) A. sp.	Field Container	Derr	VA	2010	Broadcast	Little to no crop injury, plant stand or flower reduction with 2.63, 5.25, 10.5 lb ai per acre. Good to excellent control of crabgrass and longstalked phyllanthus with all rates and good to excellent control of tassleflower with two higher rates 48 DAT.
27394	Milkweed ( <i>Asclepias</i> sp.) A. tuberosa	Field Container	Klett	CO	2009	Broadcast	Trial 1: No to significant injury (chlorosis, stunting) increasing with rate (2.65, 5.3, 10.6 lb ai per acre).

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27394	Milkweed (Asclepias sp.) A. tuberosa	Field Container	Klett	CO	2009	Broadcast	Trial 2: No to significant injury (chlorosis, stunting) increasing with rate (2.65, 5.3, 10.6 lb ai per acre).
27394	Milkweed (Asclepias sp.) A. incarnata	Field Container	Trader	MS	2008	Broadcast	No significant injury at 2.65, moderate injury with slow recovery at 5.3 and 10.6 lb ai per acre.
27394	Milkweed (Asclepias sp.) A. tuberosa	Field Container	Trader	MS	2009	Broadcast	No significant injury or at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 2X and 4X.
27099	False Goat's Beard (Astilbe sp.) 'Bridal Veil' and Peach Blossom'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27099	False Goat's Beard (Astilbe sp.)	Field Container	Klett	CO	2009	Broadcast	Trial 1: visual injury (chlorosis, stunting) at 2.65, 5.3 and 10.6 lb ai per acre.
27099	False Goat's Beard (Astilbe sp.)	Field Container	Klett	CO	2009	Broadcast	Trial 2: visual injury (chlorosis, stunting) at 2.65, 5.3 and 10.6 lb ai per acre.
27099	False Goat's Beard (Astilbe sp.) A. xarendsii 'Final' and 'Bridal Veil'	Field Container	Mathers (OSU)	OH	2010	Broadcast	Unacceptable crop injury at 10.6 lb ai per acre (acceptable at 2.65 - 5.3 lb ai per acre).
27099	False Goat's Beard (Astilbe sp.) A. japonica 'Rheinland'	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
31343	Fern, Lady (Athyrium nipponicum) A. 'Japanese Painted fern'	Field Container	Derr	VA	2011	Broadcast	Little to no crop injury but significant reduction in fresh shoot weight with 2.65, 5.3, 10.6 lb ai per acre. Good groundsel control.
32699	Fern, Lady (Athyrium nipponicum)	Greenhouse	Mansue	NJ	2015	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31343	Fern, Lady (Athyrium nipponicum) 'Metallicum'	Field Container	Nackley	OR	2018	Broadcast	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31107	Aucuba (Aucuba sp.) A. japonica 'Variegata'	Field Container	Pemberton	TX	2012	Broadcast	No injury but very slight stunting with 2.65, 5.3 and 10.6 lb ai per acre applied twice
31107	Aucuba (Aucuba sp.) A. japonica 'Golden King'	Field Container	Senesac	NY	2021	Broadcast	Transient, minor injury with 2.65 and 5.3 lb ai per acre with recovery by 4 WAT; minor injury with 10.6 lb ai per acre.
31107	Aucuba (Aucuba sp.) A. japonica 'Picturata'	Field Container	Uber	CA	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
26284	Barberry (Berberis sp.) B. thunbergii 'Atropurpurea'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26284	Barberry (Berberis sp.) B. thunbergii atropurpureum 'Crimson Pygmy'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; plants marketable.
26284	Barberry (Berberis sp.) 'Ruby Carosel'	Field Container	Freiberger	NJ	2008	Broadcast	Moderate injury at 2.65, 5.3 and 10.6 lb ai per acre; 6 out of 12 untreated plants dead.
26284	Barberry (Berberis sp.) B. thunbergii 'Crimson Pigmy'	Field Container	Lieth	CA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; significantly reduced plant width at 4X.
26284	Barberry (Berberis sp.) B. thunbergii 'Amber Glow'	Field Container	Uber	CA	2008	Broadcast	Results inconclusive due to environmental stress; no significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre after 1st application.
26284	Barberry (Berberis sp.) B. thunbergii 'Crmson Pygmy'	Field Container	Williams	IL	2008	Broadcast	No injury or growth reduction at 2.65 and 5.3 lb ai per acre, slight injury at 10.6 lb ai per acre.

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31108	Chocolate Flower/Lyreleaf Greeneyes ( <i>Berlandiera lyrata</i> )	Field Container	Aulakh	CT	2017	Broadcast	Minor to moderate injury after the 1st applic increasing with rates (150, 300 and 600 lb per acre), with complete recovery; minor growth reduction with 1X and 2X, moderate with 4X.
31108	Chocolate Flower/Lyreleaf Greeneyes ( <i>Berlandiera lyrata</i> )	Field Container	Beste	MD	2018	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice; plants flowered normally.
31108	Chocolate Flower/Lyreleaf Greeneyes ( <i>Berlandiera lyrata</i> )	Field Container	Seefeldt	WA	2020	Broadcast	No injury with 2.65, 5.3 or 10.6 lb ai per acre.
26336	Butterfly Bush ( <i>Buddleia davidii</i> ) 'Royal Red'	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26336	Butterfly Bush ( <i>Buddleia davidii</i> ) 'White Ball'	Field Container	Marshall	MI	2007	Broadcast	One application. No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26336	Butterfly Bush ( <i>Buddleia davidii</i> ) 'Purple Emperor'	Field Container	Reding	OH	2007	Broadcast	No injury but reduced plant growth at 2.65, 5.3 and 10.6 lb ai per acre.
26336	Butterfly Bush ( <i>Buddleia davidii</i> ) 'Nanho Purple'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26367	Boxwood ( <i>Buxus</i> sp.) <i>B. microphylla</i> 'Faulkner'	Field Container	Klett	CO	2007	Broadcast	Two trials; no significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26367	Boxwood ( <i>Buxus</i> sp.) 'Green Velvet'	Field Container	Marshall	MI	2007	Broadcast	One application. No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26367	Boxwood ( <i>Buxus</i> sp.) <i>B. sinica</i> var. <i>insularis</i> 'Wintergreen'	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
31109	Cactus, Cacti (Cactaceae)	Field Container	Cochran	MD	2021	Broadcast	No injury or growth reduction when applied 2x, six weeks apart, at 150, 300, and 600 lb per acre (2.65 ai, 5.3 ai, and 10.6 ai)
31109	Cactus, Cacti (Cactaceae) <i>C. mammillaria</i>	Field Container	Mathers	OH	2022	Broadcast	No injury with 2.65, 5.30 and 10.6 lb ai per acre with two application 6 weeks apart.
31109	Cactus, Cacti (Cactaceae) <i>Echinocactus grusonii</i> 'Golden Barrel Cactus'	Field Container	Uber	CA	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
27395	Elephant's-Ear, Angel-Wings ( <i>Caladium</i> sp.) <i>C. Florida</i> 'Cardinal'	Field Container	Derr	VA	2010	Broadcast	No crop injury with 2.63, 5.25, 10.5 lb ai per acre.
27395	Elephant's-Ear, Angel-Wings ( <i>Caladium</i> sp.) <i>C. bicolor</i> 'Frieda Hemple'	Field Container	Senesac	NY	2016	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26205	Feather Reed Grass ( <i>Calamagrostis acutiflora</i> )	Field Container	Boydston	WA	2007	Broadcast	Two sequential applications 8 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre significantly stunted growth of young Feather reed grass plants. The 1X treated plants were saleable, but not the 2X and 4X treated plants.
26205	Feather Reed Grass ( <i>Calamagrostis acutiflora</i> )	Field Container	Harvey	WA	2007	Broadcast	No injury after the first, high injury (stunting and chlorosis) after the second application at 2.65, 5.3 and 10.6 lb ai per acre.
26205	Feather Reed Grass ( <i>Calamagrostis acutiflora</i> ) 'Karl Forester'	Field Container	Klett	CO	2007	Broadcast	Two trials; moderate to high injury (stunting) at 2.65, 5.3 and 10.6 lb ai per acre; reduced dry mass.

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26205	Feather Reed Grass ( <i>Calamagrostis acutiflora</i> )	Field Container	Trader	MS	2007	Broadcast	Some injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27396	Bottlebrush ( <i>Callistemon</i> sp.) <i>C. citrinus</i> (Curtis)	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	No crop injury or growth reduction with one or two applications at 2.65, 5.3 and 10.6 lb ai per acre.
27396	Bottlebrush ( <i>Callistemon</i> sp.) <i>C. viminalis</i>	Field Container	Senesac	NY	2011	Broadcast	Slight to significant crop injury with two applications at 2.65, 5.3, 10.6 lb aia but all plants marketable by 4WAT2.
27396	Bottlebrush ( <i>Callistemon</i> sp.) <i>C. lanceolata</i>	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, slight at 5.3 and moderate at 10.6 lb ai per acre.
27396	Bottlebrush ( <i>Callistemon</i> sp.) 'Little John'	Field Container	Wilen	CA	2012	Broadcast	Very minor injury with 150, 300 and 600 lb ai per acre applied twice; no growth reduction.
27795	Sweetshrub ( <i>Calycanthus</i> sp.) <i>C. floridus</i>	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27795	Sweetshrub ( <i>Calycanthus</i> sp.) <i>C. floridus</i>	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants marketable.
27795	Sweetshrub ( <i>Calycanthus</i> sp.) <i>C. occidentalis</i>	Field Container	Nackley	OR	2018	Broadcast	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27110	Camellia ( <i>Camellia</i> sp.) <i>C. vernalis</i> 'Yuletide'	Field Container	Gilliam	AL	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27110	Camellia ( <i>Camellia</i> sp.) <i>C. japonica</i> 'Fireball Red'	Field Container	Trader	MS	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27110	Camellia ( <i>Camellia</i> sp.) <i>C. japonica</i>	Field Container	Wade	SC	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27110	Camellia ( <i>Camellia</i> sp.) <i>C. japonica</i>	Field Container	Wade	GA	2009	Broadcast	No injury or significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27114	Bellflower ( <i>Campanula</i> sp.) 'Blue Uniform'	Field Container	Boydston	WA	2008	Broadcast	Slight injury at 2.65, moderate and high at 5.3 and 10.6 lb ai per acre; no growth reduction; most 1X plants marketable.
27114	Bellflower ( <i>Campanula</i> sp.) <i>C. carpatica</i>	Field Container	Klett	CO	2013	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight to moderate growth reduction increasing with rates.
27114	Bellflower ( <i>Campanula</i> sp.)	Field Container	Peachey	OR	2013	Broadcast	Slight to moderate injury increasing with rates (150, 300 and 600 lb per acre) applied twice; slight growth reduction with 4X.
26430	Canna ( <i>Canna</i> sp.) <i>C. 'Robert Kent'</i>	Field Container	Derr	VA	2010	Broadcast	No crop injury with 2.63, 5.25, 10.5 lb ai per acre and shoot and flower stalk count were unaffected. Very good to excellent control of spotted spurge, chamberbitter, and s. crabgrass.
26430	Canna ( <i>Canna</i> sp.) 'Freckle Face'	Field Container	Derr	VA	2011	Broadcast	Minor injury with two applications at 2.65, 5.3 and 10.6 lb ai per acre increasing with rates. Good control of eclipta, mulberryweed, rice flatsedge, fragrant flatsedge.
26430	Canna ( <i>Canna</i> sp.) <i>C. indica</i>	Field Container	Lieth	CA	2009	Broadcast	Crop injury based on phytotoxicity ratings with 2.6, 5.3, 10.6 lb ai per acre not conclusive. Significant growth suppression occurred at all rates.
26430	Canna ( <i>Canna</i> sp.) <i>C. x generalis</i> 'Ermine'	Field Container	Stamps	FL	2009	Broadcast	No significant injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre; no significant growth reduction.
28706	Sedge, Grassland ( <i>Carex divulsa</i> ) <i>C. oshimensis</i> 'Evergold'	Field Container	Boydston	WA	2010	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre but data inconclusive due to variability.

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28706	Sedge, Grassland ( <i>Carex divulsa</i> )	Field Container	Wilén	CA	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre; root dry weight significantly reduced at all rates.
28706	Sedge, Grassland ( <i>Carex divulsa</i> )	Field Container	Wilén	CA	2010	Broadcast	Minor injury yet all plants were marketable. Some chlorosis and necrosis with one application at 600 lbA rate and at all rates when applied twice.
31110	Sedge ( <i>Carex</i> sp.)	Field Container	Cheng	HI	2019	Broadcast	No significant injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31110	Sedge ( <i>Carex</i> sp.) <i>C. morrowii</i> 'Ice Dance'	Field Container	Mathers	OH	2018	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; moderate growth reduction with 4X rate.
28179	Periwinkle, Madagascar ( <i>Catharanthus roseus</i> ) Rose Periwinkle 'G. Don'	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre after 1st application, unacceptable with 10.6 lb after 2nd application; reduced flower number at 2X and 4X; greatly reduced marketability at 4X rate.
28179	Periwinkle, Madagascar ( <i>Catharanthus roseus</i> )	Field Container	Gilliam	AL	2009	Broadcast	No significant injury at 2.65, significant but minor at 5.3 and 10.6 lb ai per acre after 1st, no injury after 2nd application; no growth reduction.
28179	Periwinkle, Madagascar ( <i>Catharanthus roseus</i> )	Field Container	Lieth	CA	2012	Broadcast	No significant injury but severe growth reduction with 150, 300 and 600 lb per acre applied twice.
28179	Periwinkle, Madagascar ( <i>Catharanthus roseus</i> ) 'Titan White'	Field Container	Trader	MS	2009	Broadcast	No significant injury or growth reduction at 2.65, minor injury and significant growth reduction at 5.3 and 10.6 lb ai per acre.
28730	Ceanothus, Maritime ( <i>Ceanothus maritimus</i> )	Field Container	Grunwald	OR	2010	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
28730	Ceanothus, Maritime ( <i>Ceanothus maritimus</i> ) <i>C. maritimus</i> 'Valley Violet'	Field Container	Lieth	CA	2010	Broadcast	No crop injury or differences in growth with one or two applications at 2.65, 5.3, 10.6 lb ai per acre.
28730	Ceanothus, Maritime ( <i>Ceanothus maritimus</i> ) <i>C. maritimus</i> 'Dark Star'	Field Container	Wilén	CA	2010	Broadcast	No crop injury or reduction in growth 28DAT with one application at 150 and 300 lb per acre. Unacceptable injury observed with one application at 600 lb per acre and with all three rates applied twice.
26234	Ceanothus ( <i>Ceanothus</i> sp.) <i>C. impressus</i> 'Victoria'	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26234	Ceanothus ( <i>Ceanothus</i> sp.) 'Concha'	Field Container	Wilén	CA	2009	Broadcast	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; root and shoot dry weights significantly reduced at 2X and 4X.
28734	Wild Lilac ( <i>Ceanothus x pallida</i> ) 'Marie Simon'	Field Container	Grunwald	OR	2010	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
28734	Wild Lilac ( <i>Ceanothus x pallida</i> ) 'Marie Simon'	Field Container	Lieth	CA	2010	Broadcast	No crop injury or differences in growth with one or two applications at 2.65, 5.3, 10.6 lb ai per acre.
28734	Wild Lilac ( <i>Ceanothus x pallida</i> ) 'Marie Bleu'	Field Container	Mathers (OSU)	MI	2010	Broadcast	Spring Meadow: Moderate crop injury at high rates (5.3-10.6 lb ai per acre).
28734	Wild Lilac ( <i>Ceanothus x pallida</i> ) 'Marie Simon'	Field Container	Reding	OH	2011	Broadcast	No crop injury at 2.65, 5.3, 10.6 lb ai per acre but significant reduction in height and width with 2x and 4x.
28175	Cedar, Atlas ( <i>Cedrus atlantica</i> )	Field Container	Freiberger	NJ	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.



PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
28175	Cedar, Atlas ( <i>Cedrus atlantica</i> ) 'Glauca'	Field Container	Nackley	OR	2018	Broadcast	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27397	American Redbud, Eastern Redbud ( <i>Cercis canadensis</i> )	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27397	American Redbud, Eastern Redbud ( <i>Cercis canadensis</i> )	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27397	American Redbud, Eastern Redbud ( <i>Cercis canadensis</i> )	Field Container	Freiberger	NJ	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27397	American Redbud, Eastern Redbud ( <i>Cercis canadensis</i> ) <i>C. chinensis</i> 'Avondale'	Field Container	Mathers (OSU)	OH	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28181	Cedar ( <i>Chamaecyparis</i> sp.) <i>C. 'Golden spangel'</i>	Field Container	Mathers (OSU)	MI	2010	Broadcast	Lincoln: No crop injury at 2.65, 5.3, and 10.6 lb ai per acre.
28181	Cedar ( <i>Chamaecyparis</i> sp.) <i>C. 'Golden spangel'</i>	Field Container	Mathers (OSU)	MI	2010	Broadcast	Spring Meadow: No crop injury at 2.65, 5.3, and 10.6 lb ai per acre.
28181	Cedar ( <i>Chamaecyparis</i> sp.) <i>C. pisifer 'Filfiera Golden Mop'</i>	Field Container	Mathers (OSU)	OH	2010	Broadcast	Ohio: Minor crop injury at high rate of 10.6 lb ai per acre, no injury at 2.65 or 5.3 lb ai per acre.
28181	Cedar ( <i>Chamaecyparis</i> sp.) <i>C. thyoides</i>	Field Container	Neal	NC	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28181	Cedar ( <i>Chamaecyparis</i> sp.)	Field Container	Reding	OH	2009	Broadcast	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
28181	Cedar ( <i>Chamaecyparis</i> sp.)	Field Container	Reding	OH	2011	Broadcast	No crop injury or reduction in growth with two applications at 2.65, 5.3 and 10.6 lb ai per acre.
27398	Turtlehead, Snakehead ( <i>Chelone</i> sp.) <i>C. lyonii 'Hot Lips'</i>	Field Container	Neal	NC	2008	Broadcast	No initial injury but crinkled and malformed new leaves occurred over time with severity increasing with rate (2.65, 5.3, 10.6 lb ai per acre).
27398	Turtlehead, Snakehead ( <i>Chelone</i> sp.)	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27398	Turtlehead, Snakehead ( <i>Chelone</i> sp.) <i>C. lyonii 'Hot Lips'</i>	Field Container	Senesac	NY	2009	Broadcast	Slight injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
26247	Hardy Mum ( <i>Chrysanthemum/Dendranthema x morifolium</i> ) 'Sheffield Pink'	Field Container	Czarnota	GA	2007	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26247	Hardy Mum ( <i>Chrysanthemum/Dendranthema x morifolium</i> ) 'Dazzler Stacy'	Field Container	Derr	VA	2007	Broadcast	3-7 % injury at 2.63, 5.25 and 10.5 lb ai per acre; 100 % control of rice flatsedge and fragrant flatsedge.
26247	Hardy Mum ( <i>Chrysanthemum/Dendranthema x morifolium</i> )	Field Container	Klett	CO	2009	Broadcast	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26247	Hardy Mum ( <i>Chrysanthemum/Dendranthema x morifolium</i> )	Field Container	Klett	CO	2009	Broadcast	Trial 2: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.

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27399	Golden Star ( <i>Chrysogonum virginianum</i> ) <i>C. virginianum</i>	Field Container	Klett	CO	2015	Broadcast	No injury, but severe stunting, with 5.25, 10.5 and 21 lb ai per acre applied twice.
27399	Golden Star ( <i>Chrysogonum virginianum</i> ) <i>C. virginianum</i> var. <i>australe</i>	Field Container	Senesac	NY	2009	Broadcast	Slight injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
26317	Yellowwood ( <i>Cladrastis</i> sp.) <i>C. lutea</i>	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	No significant differences in phytotoxicity or growth with one or two applications at 2.65, 5.3 or 10.65 lb ai per acre.
26317	Yellowwood ( <i>Cladrastis</i> sp.) <i>C. kentukea</i>	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre; no reduction in marketability.
26317	Yellowwood ( <i>Cladrastis</i> sp.) <i>C. kentukea</i>	Field Container	Freiberger	NJ	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight after 2nd application.
26317	Yellowwood ( <i>Cladrastis</i> sp.) <i>C. Kentuckea</i>	Field Container	Mathers (OSU)	OH	2011	Broadcast	Transplant shock made evaluations difficult but ratings indicate little to no crop injury with two sequential applications at 2.65, 5.3, 10.6 lb ai per acre.
26317	Yellowwood ( <i>Cladrastis</i> sp.) <i>C. kentukea</i>	Field Container	Reding	OH	2010	Broadcast	Significant injury with 2.65, 5.3 and 10.6 lb ai per acre after each application.
27116	Leather Flower ( <i>Clematis</i> sp.) 'ASAO' and 'Nellie Moser'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27116	Leather Flower ( <i>Clematis</i> sp.)	Field Container	Derr	VA	2008	Broadcast	No injury at 150, 300 and 600 lb product per acre.
27116	Leather Flower ( <i>Clematis</i> sp.) <i>C. jackmannii</i>	Field Container	Derr	VA	2009	Broadcast	No injury at 2.63, 5.25 and 10.6 lb ai per acre.
27116	Leather Flower ( <i>Clematis</i> sp.) <i>C. integrifolia</i>	Field Container	Klett	CO	2008	Broadcast	Trial 1: No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction
27116	Leather Flower ( <i>Clematis</i> sp.) <i>C. integrifolia</i>	Field Container	Klett	CO	2008	Broadcast	Trial 2: No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27116	Leather Flower ( <i>Clematis</i> sp.) <i>C. integrifolia</i>	Field Container	Klett	CO	2009	Broadcast	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27116	Leather Flower ( <i>Clematis</i> sp.) <i>C. integrifolia</i>	Field Container	Klett	CO	2009	Broadcast	Trial 2: No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27116	Leather Flower ( <i>Clematis</i> sp.) 'Ramona'	Field Container	Stamps	FL	2009	Broadcast	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; no growth reduction.
27121	Sweet Pepperbush, Summersweet ( <i>Clethra alnifolia</i> )	Field Container	Ahrens/Mervosh	CT	2011	Broadcast	No crop injury with two sequential applications at 2.65, 5.3 or 10.6 lb ai per acre.
27121	Sweet Pepperbush, Summersweet ( <i>Clethra alnifolia</i> ) <i>C. alnifolia</i>	Field Container	Gilliam	AL	2010	Broadcast	Minor crop injury and no reduction in growth with one to two applications at 2.62, 5.25, 10.5 lb ai per acre.
27121	Sweet Pepperbush, Summersweet ( <i>Clethra alnifolia</i> ) <i>C. alnifolia</i> 'Sixteen Candles'	Field Container	Neal	NC	2010	Broadcast	No crop injury during first 6 weeks but second applicaation caused significant injury (stunting) with 2.65, 5.3 and 10.6 lb ai per acre; some girdling at soil line with 4x rate.
27121	Sweet Pepperbush, Summersweet ( <i>Clethra alnifolia</i> )	Field Container	Reding	OH	2010	Broadcast	Significant crop injury at 2.65, 5.3 and 10.6 lb ai per acre; plants not marketable.
26219	Tickseed ( <i>Coreopsis</i> sp.) <i>C. auriculata</i> 'Nana'	Field Container	Boydston	WA	2007	Broadcast	Significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; most treated plants not saleable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26219	Tickseed ( <i>Coreopsis</i> sp.) <i>C. auriculata</i> 'Zamphir'	Field Container	Fraelich	GA	2008	Broadcast	Slight injury and stunting at 2.65 lb ai per acre, moderate at 5.3 and 10.6 lb ai per acre; all plants marketable at 1X.
26219	Tickseed ( <i>Coreopsis</i> sp.) <i>C. rosea</i>	Field Container	Harvey	WA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26219	Tickseed ( <i>Coreopsis</i> sp.) 'Moonbeam'	Field Container	Neal	NC	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27126	Dogwood, Flowering ( <i>Cornus florida</i> )	Field Container	Ahrens/ Mervosh	CT	2008	Broadcast	No injury at 2.63, 5.25 and 10.5 lb ai per acre after 1st application; slight, variable injury after 2nd application; poor plant vigor made evaluations difficult.
27126	Dogwood, Flowering ( <i>Cornus florida</i> )	Field Container	Ahrens/ Mervosh	CT	2009	Broadcast	Little to no injury or reduction in growth with two applications at 2.65, 5.3, 10.6 lb ai per acre.
27126	Dogwood, Flowering ( <i>Cornus florida</i> )	Field Container	Knox	FL	2009	Broadcast	No crop injury with two sequential applications at 0.375, 0.75 or 1.5 lb ai per acre. Some root stunting with 4x observed.
27126	Dogwood, Flowering ( <i>Cornus florida</i> )	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre
28861	Dogwood, Kousa ( <i>Cornus kousa</i> )	Field Container	Ahrens/ Mervosh	CT	2009	Broadcast	Little to no injury or reduction in growth with two applications at 2.65, 5.3, 10.6 lb ai per acre.
28861	Dogwood, Kousa ( <i>Cornus kousa</i> )	Field Container	Ahrens/ Mervosh	CT	2011	Broadcast	Little to no crop injury with two sequential applications at 2.65, 5.3 or 10.6 lb ai per acre.
28861	Dogwood, Kousa ( <i>Cornus kousa</i> ) 'Chinensis'	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
28861	Dogwood, Kousa ( <i>Cornus kousa</i> )	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
28861	Dogwood, Kousa ( <i>Cornus kousa</i> )	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No significant injury, growth or marketability reduction with 2.63, 5.3 and 10.6 lb ai per acre applied twice.
28861	Dogwood, Kousa ( <i>Cornus kousa</i> ) <i>C. kousa</i> 'Milky Way'	Field Container	Mathers (OSU)	OH	2010	Broadcast	Ohio: Minor crop injury at 2.65 and 5.3 lb ai per acre; moderate crop injury at 10.6 lb ai per acre.
28171	Pampas Grass ( <i>Cortaderia</i> sp.)	Field Container	Boydston	WA	2011	Broadcast	significant crop injury and reduction in growth with two sequential applications of at 2.65, 5.3, and 10.6 lb ai per acre. 2x and 4x treated plants not saleable.
28171	Pampas Grass ( <i>Cortaderia</i> sp.) <i>C. selloana</i>	Field Container	Gilliam	AL	2010	Broadcast	No crop injury or reduction in growth with one or two applications at 2.62, 5.25, 10.5 lb ai per acre.
28171	Pampas Grass ( <i>Cortaderia</i> sp.)	Field Container	Neal	NC	2010	Broadcast	No injury at 2.6 lb ai per acre; significant crop injury with 2x and 4x (5.3 and 10.6 lb ai per acre) and inhibition of root growth.
28171	Pampas Grass ( <i>Cortaderia</i> sp.) <i>C. sp. 'Rosea'</i>	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre, but significant reduction in growth with 2x and 4x rate.
27131	Cotoneaster ( <i>Cotoneaster</i> sp.) <i>C. horizontalis</i> 'Perpusillus'	Field Container	Lieth	CA	2008	Broadcast	No injury but unacceptable growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27131	Cotoneaster ( <i>Cotoneaster</i> sp.) <i>C. apiculatus</i>	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
27131	Cotoneaster ( <i>Cotoneaster</i> sp.) <i>C. glaucophyllus</i>	Field Container	Uber	CA	2008	Broadcast	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; significant growth reduction at 4X.

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31112	Pygmyweed (Crassula sp.) C. radicans 'Red Carpet'	Field Container	Aulakh	CT	2017	Broadcast	Minor injury, discoloration and stunting with 150, moderate with 300 and 600 lb per acre applied twice.
31112	Pygmyweed (Crassula sp.) C. capitella 'Campfire'	Field Container	Senesac	NY	2017	Broadcast	No injury with 2.65, minor to moderate with 5.3 and 10.6 lb ai per acre applied twice.
27136	Hawthorn (Crataegus sp.) C. crus-galli	Field Container	Boydston	WA	2011	Broadcast	No crop injury with two applications at 2.65, 5.3, 10.6 lb ai per acre.
27136	Hawthorn (Crataegus sp.) C. coccinoid	Field Container	Freiberger	NJ	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27136	Hawthorn (Crataegus sp.) C. phaenopyrum	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27141	Japanese Cedar (Cryptomeria japonica) C. japonica 'Radicans'	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	No significant injury or growth reduction with 2.65, 5.30 and 10.60 lb ai per acre; no reduction in marketability.
27141	Japanese Cedar (Cryptomeria japonica) 'Yoshino'	Field Container	Czarnota	GA	2009	Broadcast	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
27141	Japanese Cedar (Cryptomeria japonica) 'Black Dragon'	Field Container	Neal	NC	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27141	Japanese Cedar (Cryptomeria japonica) C. japonica 'Yoshino'	Field Container	Neal	NC	2010	Broadcast	No crop injury with 1 or 2 x rate (2.65, 5.3 lb ai per acre) but some minor stunting with the 4x (10.6 lbs ai per acre) rate.
28180	Leyland Cypress (Cuprocyparis leylandii)	Field Container	Czarnota	GA	2009	Broadcast	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
28180	Leyland Cypress (Cuprocyparis leylandii)	Field Container	Neal	NC	2010	Broadcast	No crop injury with any rate during the evaluation period.
28180	Leyland Cypress (Cuprocyparis leylandii)	Field Container	Uber	CA	2010	Broadcast	No crop injury with two applications at 2.65, 5.3 and 10.6 lb ai per acre.
34752	Sago Palm (Cycas revoluta)	Field Container	Marble	FL	2022	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice
31113	Delosperma (Delosperma sp.) D. cooperi	Field Container	Derr	VA	2017	Broadcast	No injury or growth reduction with 150 lb per acre applied twice, moderate injury with 300 and 600 lb.
31113	Delosperma (Delosperma sp.) D. cooperi 'Table Mountain'	Field Container	Senesac	NY	2017	Broadcast	Minor injury with 2.65 and 5.3 and 10.6 lb ai per acre applied twice.
31113	Delosperma (Delosperma sp.) 'Hardy Yellow'	Field Container	Uber	CA	2018	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26241	Pink (Dianthus sp.) 'Firewitch'	Field Container	Boydston	WA	2007	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.
26241	Pink (Dianthus sp.) D. gratianopolitanus 'Firewitch'	Field Container	Mathers (OSU)	OH	2007	Broadcast	Slight injury (burning) at 2.65, 5.3 and 10.6 lb ai per acre after 1st application, plants recovered quickly.
26241	Pink (Dianthus sp.) 'Amazon Neon Purple'	Field Container	Neal	NC	2008	Broadcast	No to moderate injury at 2.65, 5.3 and 10.6 lb ai per acre.
26241	Pink (Dianthus sp.) D. gratianopolitanus 'Bath's Pink'	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
31853	Distylium (Distylium sp.) D. vintage 'Jade'	Field Container	Nackley	OR	2018	Broadcast	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.

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31853	Distylium (Distylium sp.)	Field Container	Neal	NC	2017	Broadcast	No significant injury or growth reduction with 150, minor injury but moderate growth reduction with 300 and 600 lb per acre, applied twice.
31853	Distylium (Distylium sp.)	Field Container	Witcher	TN	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31957	Fern, Shaggy Shield (Dryopteris cycadina) D. atrata	Field Container	Neal	NC	2013	Broadcast	Severe injury (foliar necrosis) with 150, 300 and 600 lb per acre applied twice.
29650	Fern, Autumn (Dryopteris erythrosora) D.'Autumn Brilliance'	Field Container	Derr	VA	2011	Broadcast	Minor to no crop injury with 2.63, 5.3, 10.6 lb ai per acre. Significant reduction in shoot weight. Good control of groundsel but not tassleflower
29650	Fern, Autumn (Dryopteris erythrosora) D. 'Brilliance'	Field Container	Gilliam	AL	2011	Broadcast	No crop injury with 2.65, 5.3, 10.6 lb ai per acre but slight reduction in growth at 2 and 4x rates.
29650	Fern, Autumn (Dryopteris erythrosora)	Field Container	Neal	NC	2013	Broadcast	Severe injury (foliar necrosis) with 150, 300 and 600 lb per acre applied twice.
29650	Fern, Autumn (Dryopteris erythrosora) 'Brilliance'	Field Container	Stamps	FL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
34754	Golden Dewdrops (Duranta erecta) 'Cuban Gold'	Field Container	Marble	FL	2022	Broadcast	No to minor injury increasing with rate (150, 300, 600 lb per acre) after both applications, with reduced growth rate observed at 600 lb per acre.
34754	Golden Dewdrops (Duranta erecta) 'Blue'	Field Container	Wade	SC	2022	Broadcast	Minor crop injury from 2.65 lb ai/a 4 weeks after each application. Minor injury from 5.3 lb ai per acre 4 weeks after first application (WA1), increasing to moderate 4 weeks after second application (WA2). Minor injury from 10.6 lb ai/a 4 WA1, increasing
34755	Palm, Yellow Butterfly; Areca Palm (Dypsis lutescens)	Field Container	Marble	FL	2022	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice
34755	Palm, Yellow Butterfly; Areca Palm (Dypsis lutescens)	Field Container	Wade	SC	2022	Broadcast	No injury from 2.65 lb ai per acre; minor injury from 5.3 and 10.6 lb ai per acre.
31219	Echeveria (Echeveria sp.) E. shaviana 'Black Prince'	Field Container	Senesac	NY	2017	Broadcast	Minor injury with 2.65 and 5.3, moderate with 10.6 lb ai per acre applied twice.
31219	Echeveria (Echeveria sp.) 'Blue 2'	Field Container	Wilten	CA	2016	Broadcast	Moderate to severe injury increasing with rates (150, 300 and 600 lb per acre) applied twice.
26355	Purple Coneflower (Echinacea sp.) 'Ruby Star'	Field Container	Derr	VA	2009	Broadcast	No significant injury at 2.63, 5.25 and 10.6 lb ai per acre.
26355	Purple Coneflower (Echinacea sp.) E. purpurea	Field Container	Klett	CO	2007	Broadcast	Trial A: unacceptable injury (slight discoloration and twisting of foliage) at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
26355	Purple Coneflower (Echinacea sp.) E. purpurea	Field Container	Klett	CO	2007	Broadcast	Trial B - unacceptable injury (slight discoloration and twisting of foliage) at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
26355	Purple Coneflower (Echinacea sp.) E. purpurea 'Magnus'	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26355	Purple Coneflower (Echinacea sp.)	Field Container	Trader	MS	2007	Broadcast	No injury or growth reduction at 2.65, minor at 5.3 and 10.6 lb ai per acre.
26355	Purple Coneflower (Echinacea sp.) E. purpurea 'Magnus'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.

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28710	Hummingbird Trumpet ( <i>Epilobium canum</i> )	Field Container	Klett	CO	2015	Broadcast	plants failed to thrive
28710	Hummingbird Trumpet ( <i>Epilobium canum</i> )	Field Container	Wilen	CA	2009	Broadcast	Moderate to high injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre); root and shoot dry weights significantly reduced at all rates.
27146	Wintercreeper ( <i>Euonymus fortunei</i> ) <i>E. fortunei</i> 'Coloratus'	Field Container	Williams	IL	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; slight width reduction
26439	Thoroughwort ( <i>Eupatorium</i> sp.) <i>E. rugosum</i> 'Chocolate Boneset'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26439	Thoroughwort ( <i>Eupatorium</i> sp.) <i>E. rugosum</i> 'Chocolate'	Field Container	Boydston	WA	2010	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26439	Thoroughwort ( <i>Eupatorium</i> sp.) <i>E. hyssopifolium</i>	Field Container	Senesac	NY	2009	Broadcast	Slight injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre.
26439	Thoroughwort ( <i>Eupatorium</i> sp.) <i>E. hyssopifolium</i>	Field Container	Senesac	NY	2011	Broadcast	No crop injury with two applications at 2.65, 5.3 or 10.6 lb aia.
27274	Beech ( <i>Fagus</i> sp.)	Field Container	Cochran (IA)	IA	2016	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27274	Beech ( <i>Fagus</i> sp.) <i>F. sylvatica</i>	Field Container	Gilliam	AL	2016	Broadcast	Unacceptable injury, although not significant from untreated check, with 150, 300 and 600 lb per acre applied twice.
27274	Beech ( <i>Fagus</i> sp.) <i>F. sylvatica</i>	Field Container	Nackley	OR	2018	Broadcast	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26208	Field Fescue ( <i>Festuca glauca</i> ) 'Elijah Blue'	Field Container	Boydston	WA	2007	Broadcast	Unacceptable injury (leaf necrosis) and stunting at 2.65, 5.3 and 10.6 lb ai per acre.
26208	Field Fescue ( <i>Festuca glauca</i> )	Field Container	Klett	CO	2007	Broadcast	Trial A: moderate to high injury (stunting and browning of foliage) after the 2nd application at 2.65, 5.3 and 10.6 lb ai per acre; reduced dry mass.
26208	Field Fescue ( <i>Festuca glauca</i> )	Field Container	Klett	CO	2007	Broadcast	Trial B: moderate to high injury (stunting and browning of foliage) after the 2nd application at 2.65, 5.3 and 10.6 lb ai per acre; reduced dry mass.
26208	Field Fescue ( <i>Festuca glauca</i> ) <i>Festuca ovina</i> 'Glaucua'	Field Container	Trader	MS	2007	Broadcast	Some injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28176	Forsythia ( <i>Forsythia</i> sp.) <i>F. hybrid</i> 'Golden Peep'	Field Container	Czarnota	GA	2009	Broadcast	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
28176	Forsythia ( <i>Forsythia</i> sp.) <i>Forsythia</i> x.'Meadowlark'	Field Container	Mathers (OSU)	OH	2009	Broadcast	Plants under drought stress. No injury or growth reduction at 2.65 and 5.3, significant for both at 10.6 lb ai per acre.
28176	Forsythia ( <i>Forsythia</i> sp.) <i>F. x intermedia</i> 'Golden Bell'	Field Container	Mickelbart	IN	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre with single application 3 weeks after transplanting.
28176	Forsythia ( <i>Forsythia</i> sp.)	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28182	Dwarf Fothergilla ( <i>Fothergilla gardenii</i> ) <i>F. major</i> 'Mt. Airy'	Field Container	Boydston	WA	2011	Broadcast	No crop injury or reduction in growth with two applications at 2.65, 5.3, 10.6 lb ai per acre.
28182	Dwarf Fothergilla ( <i>Fothergilla gardenii</i> ) <i>F. hybrid</i> 'Mt. Airy'	Field Container	Czarnota	GA	2009	Broadcast	No significant injury at 2.65, 5.25 and 10.5 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
28182	Dwarf Fothergilla (Fothergilla gardenii)	Field Container	Neal	NC	2010	Broadcast	No injury from any rate but leaf scorch from high salt in substrate lowers conclusion confidence.
28182	Dwarf Fothergilla (Fothergilla gardenii)	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
26259	Ash (Fraxinus sp.) F. americana	Field In-Ground	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury or height reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26259	Ash (Fraxinus sp.) F. pensylvanica	Field In-Ground	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
31340	Ash (Fraxinus sp.) F. arizonica	Field Container	Uber	CA	2012	Broadcast	No injury or growth reduction with 150, acceptable with 300 and 600 lb per acre, applied twice.
26442	Blanket Flower (Gaillardia sp.) G. x grandiflora 'Oranges & Lemons'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury at 2.65 and 5.3, high at 10.6 lb ai per acre; no growth reduction at all rates; plants marketable except at 4X.
26442	Blanket Flower (Gaillardia sp.) G. x grandiflora 'Goblin'	Field Container	DeFrancesco	OR	2015	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26442	Blanket Flower (Gaillardia sp.) G. aristata 'Arizona Sun'	Field Container	Klett	CO	2016	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26442	Blanket Flower (Gaillardia sp.) G. grandiflora 'Arizona Red Shades'	Field Container	Reding	OH	2015	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre after 1st application, moderate to severe after 2nd; all treated plants not marketable.
31114	Gardenia (Gardenia sp.) G. jasminoides 'Buttons'	Field Container	Gilliam	AL	2017	Broadcast	No significant injury or growth reduction with 150 and 300, moderate with 600 lb per acre applied twice.
31114	Gardenia (Gardenia sp.) G. jasminoides 'Radicans'	Field Container	Gilliam	AL	2017	Broadcast	No to minor injury with 150, 300 and 600 lb per acre applied twice; moderate growth reduction with 4X.
31114	Gardenia (Gardenia sp.) G. jasminoides 'Frostproof'	Field Container	Neal	NC	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre after 1st applic. Moderate injury and growth reduction at 2X and 4X after 2nd applic.
31114	Gardenia (Gardenia sp.) G. jasminoides 'Veitchii'	Field Container	Uber	CA	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri)	Field Container	Boydston	WA	2007	Broadcast	Slight transient injury at 2.65, 5.3 and 10.6 lb ai per acre.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Pink Fountains'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Pink Fountain'	Field Container	Boydston	WA	2012	Broadcast	Slight, but not significant, injury at 2.65, 5.3 and 10.6 lb ai per acre.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Pink Fountain'	Field Container	Derr	VA	2009	Broadcast	No significant injury at 2.63, 5.25 and 10.6 lb ai per acre.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri)	Field Container	Klett	CO	2009	Broadcast	Trial 1: slight transient injury at 2.65, 5.3 and 10.6 lb ai per acre; dry mass lower at 2X and 4X.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri)	Field Container	Klett	CO	2009	Broadcast	Trial 2: slight transient to moderate injury increasing with rate (2.65, 5.3 and 10.6 lb ai per acre); dry mass lower at 2X and 4X.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri) G. lindheimeri	Field Container	Lieth	CA	2009	Broadcast	No crop injury and little growth suppression at 2.5 lb ai per acre (1x) but substantial growth suppression and crop injury (20-40%) at 5.3 and 10.6 lb ai per acre 60 DAT.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27400	Gazania (Gazania sp.) G. rigens 'Daybreak Yellow'	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	Unacceptable crop injury with all rates applied to newly potted plants 2" high plants.
27400	Gazania (Gazania sp.) G. rigens leucolaena	Field Container	Lieth	CA	2009	Broadcast	Crop injury ratings on plants treated with 2.6 lb ai per acre (1x) not significantly different from control but slight reduction in width and volume was observed. Treatments of 5.3 and 10.6 lb ai per acre (2 x, 4x) resulted in 20-40% crop injury suggestin
27400	Gazania (Gazania sp.)	Field Container	Lieth	CA	2012	Broadcast	Severe injury and growth reduction with 150, 300 and 600 lb per acre applied twice.
27400	Gazania (Gazania sp.) G. linearis 'Colorado Gold'	Field Container	Reding	OH	2010	Broadcast	Significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre; plants not marketable.
27400	Gazania (Gazania sp.) G. splendens 'Kiss Lemon Shades'	Field Container	Senesac	NY	2009	Broadcast	No injury at 2.65, slight at 5.3 and 10.6 lb ai per acre.
27150	Gladiolus (Gladiolus sp.) G. sp. 'King's Gold'	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	First application was broadcast preemergence and second application was broadcast over the top. No crop injury with 2.65, 5.30, and 10.6 lb ai per acre. Effective control of bittercress, yellow woodsorrel, large crabgrass and stinkgrass was noted.
27150	Gladiolus (Gladiolus sp.)	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27150	Gladiolus (Gladiolus sp.) 'Giamini Charlotte'	Field Container	Senesac	NY	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight injury after 2nd application.
26231	Locust (Gleditsia sp.) G. triacanthos	Field In-Ground	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27152	Locust (Gleditsia sp.) C. tiacanthos L. 'Inermis'	Field Container	Beste/Frank (ARS)	MD	2010	Broadcast	No crop injury or reduction in growth with one or two applications at 2.65, 5.30, 10.60 lb ai per acre. Effective control of spotted spurge, yellow woodsorrel, Pennsylvania bittercress and large crabgrass were noted.
27152	Locust (Gleditsia sp.) Gleditsia triacanthos	Field Container	Mathers (OSU)	OH	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27152	Locust (Gleditsia sp.) G. triacanthos	Field Container	Mathers (OSU)	OH	2011	Broadcast	Transplant shock made evaluations difficult but ratings indicate little to no crop injury with two sequential applications at 2.65, 5.3, 10.6 lb ai per acre.
27152	Locust (Gleditsia sp.) G. triacanthos	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
33639	Spider-cactus, dwarf chin cactus (Gymnocalycium baldianum)	Field Container	Marble	FL	2018	Broadcast	Minor to moderate injury, and moderate to severe growth reduction, increasing with rates (150, 300 and 600 lb per acre).
34756	Scarlet bush, Mexican Firebush (Hamelia patens) H. glabra 'Firebush'	Field Container	Marble	FL	2022	Broadcast	Minor injury after both applications of 150, 300 and 600 lb/a along with reduced growth rate.
26446	Sunflower (Helianthus sp.) H. salicifolius 'Low Down'	Field Container	Klett	CO	2012	Broadcast	Moderate to severe injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26446	Sunflower (Helianthus sp.) H. microcephalus 'Lemon Queen'	Field Container	Senesac	NY	2009	Broadcast	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.



PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26446	Sunflower (Helianthus sp.) 'Table Mountain'	Field Container	Trader	MS	2009	Broadcast	No significant injury at 2.65 and 5.3, slight injury at 10.6 lb ai per acre; no growth reduction.
26343	Daylily (Hemerocallis sp.) H. Happy Returns'	Field Container	Derr	VA	2010	Broadcast	No crop injury with 2.62, 5.25, 10.5 lb ai per acre 19 and 33 DAT and 4DAT2. Excellent control of spotted spurge with all rates 19 and 33DAT.
26343	Daylily (Hemerocallis sp.) 'Second Glance'	Field Container	Lieth	CA	2007	Broadcast	Unacceptable injury at 2.65, 5.3 and 2.6 lb ai per acre.
26343	Daylily (Hemerocallis sp.) H. hemerocallis 'Better Believe It'	Field Container	Reding	OH	2007	Broadcast	No significant injury at 2.65, injury at 5.3 and 10.6 lb ai per acre; no significant growth reduction.
26343	Daylily (Hemerocallis sp.) 'Stella d'Oro'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26343	Daylily (Hemerocallis sp.) H. hybrida 'Stella D'Oro'	Field Container	Whitwell	SC	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28742	Toyon (Heteromeles arbutifolia)	Field Container	Wilen	CA	2009	Broadcast	Acceptable injury at 2.65, 5.3 and 10.6 lb ai per acre; root and shoot dry weights not significantly reduced.
27156	Alumroot (Heuchera sp.) H. micrantha var diversifolia 'Purple Palace'	Field Container	Boydston	WA	2008	Broadcast	Slight, moderate and high injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction at 1X and 2X; 1X plants probably marketable.
27156	Alumroot (Heuchera sp.) H. americana 'Chatterbox'	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre
27156	Alumroot (Heuchera sp.) H. americana 'Palace Purple'	Field Container	Senesac	NY	2008	Broadcast	No injury or growth reduction at 2.63, 5.25 and 10.5 lb ai per acre.
26299	Rosemallow (Hibiscus sp.) H. syriacus 'Aphrodite'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury, growth or flower number reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26299	Rosemallow (Hibiscus sp.) H. syriacus 'Red Heart'	Field Container	Freiberger	NJ	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26299	Rosemallow (Hibiscus sp.) H. syriacus	Field Container	Knox	FL	2009	Broadcast	No crop injury with two sequential applications at 0.375, 0.75 or 1.5 lb ai per acre. Some root stunting with 4x noted.
26299	Rosemallow (Hibiscus sp.) H. rosa-sinensis 'Fire-N-Ice'	Field Container	Stamps	FL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
26299	Rosemallow (Hibiscus sp.) 'White Wing'	Field Container	Uber	CA	2009	Broadcast	Moderate injury (chlorosis and stunting) at 2.65, 5.3 and 10.6 lb ai per acre.
26299	Rosemallow (Hibiscus sp.) 'Rose Queen'	Field Container	Wade	SC	2009	Broadcast	No injury or significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26262	Plantain Lily (Hosta sp.) 'Krossa Regal'	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26262	Plantain Lily (Hosta sp.) 'Honey Bells'	Field Container	Gilliam	AL	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26262	Plantain Lily (Hosta sp.)	Field Container	Harvey	WA	2007	Broadcast	No injury after the first application at 2.65, 5.3 and 10.6 lb ai per acre, slight injury at 2X and 4X rates after the second application.
26262	Plantain Lily (Hosta sp.) H. sieboldiana 'Frances Williams'	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.

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26262	Plantain Lily (Hosta sp.) H. sieboldiana	Field Container	Regan	OR	2007	Broadcast	No injury at 2.65, minor at 5.3 and 10.6 lb ai per acre after the 2nd application; significant growth reduction at 2X.
26251	Hydrangea (Hydrangea sp.)	Field Container	Ahrens/Mervosh	CT	2011	Broadcast	Minor crop injury and reduction in growth increasing with rate from two sequential applications at 2.65, 5.3, 10.6 lb ai per acre.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Czarnota	GA	2007	Broadcast	Percent injury was 38, 23 and 18 % injury for 2.65, 5.3 and 10.6 lb ai per acre, respectively.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26251	Hydrangea (Hydrangea sp.) 'Angel Robe'	Field Container	Lieth	CA	2007	Broadcast	Minor visible injury and moderate growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26251	Hydrangea (Hydrangea sp.) H. paniculata 'PeeGee'	Field Container	Mickelbart	IN	2008	Broadcast	No injury at 2.65, 5.3, 10.6 lb ai per acre with single application 3 weeks after transplanting.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Pink Shira'	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Endless Summer'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
31115	Candytuft (Iberis sp.) 'Candytuft'	Field Container	Boydston	WA	2013	Broadcast	No injury or growth reduction at 2.65 and 5.3 lb ai per acre applied twice; minor with 10.6 lb; all plants saleable.
31115	Candytuft (Iberis sp.) Iberis sempervirens	Field Container	Klett	CO	2013	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight to severe growth reduction increasing with rates.
31115	Candytuft (Iberis sp.) I. sempervirens	Field Container	Uber	CA	2013	Broadcast	Severe injury with 150, 300 and 600 lb per acre applied twice.
26332	Holly (Ilex sp.) 'Conaf'	Field Container	Czarnota	GA	2007	Broadcast	Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre.
26332	Holly (Ilex sp.) I. cornuta 'Carissa'	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26332	Holly (Ilex sp.) I. cornuta 'Bufordii Nana'	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26332	Holly (Ilex sp.) I. cornuta 'Needlepoint'	Field Container	Neal	NC	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26332	Holly (Ilex sp.) Ilex x meserveae 'Castle Spire'	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26332	Holly (Ilex sp.) I. crenata 'Compacta'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27401	Impatiens, New Guinea (Impatiens hawkeri) I. wallerana 'Sonic Lilac'	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	Slight injury with good recovery at 2.65 and 5.3, significant injury at 10.6 lb ai per acre; reduction of growth and flower number at all rates. Reduction in marketability with 2X and 4X rates.
27401	Impatiens, New Guinea (Impatiens hawkeri)	Field Container	Lieth	CA	2008	Broadcast	Unacceptable injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27401	Impatiens, New Guinea (Impatiens hawkeri)	Field Container	Reding	OH	2010	Broadcast	No significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre but significant reduction in growth.

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27401	Impatiens, New Guinea (Impatiens hawkeri) I. hawkeri 'Clebrette Purple'	Field Container	Senesac	NY	2010	Broadcast	Slight to moderate injury with 2.65, 5.3, 10.6 lb ai per acre.
27402	Morning Glory (Ipomoea sp.) I. batata 'Marguerite'	Field Container	Klett	CO	2010	Broadcast	Trial 1: No crop injury with 2.65, 5.3, 10.6 lb ai per acre. Untreated plants had greater width and dry mass compared to treated.
27402	Morning Glory (Ipomoea sp.) I. batata 'Marguerite'	Field Container	Klett	CO	2010	Broadcast	Trial 2: No crop injury with 2.65, 5.3, 10.6 lb ai per acre. Plants treated with 300 lb ai had greater height compared to untreated. No weed control differences among treatments and weeded control.
27402	Morning Glory (Ipomoea sp.)	Field Container	Lieth	CA	2012	Broadcast	No significant injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
27402	Morning Glory (Ipomoea sp.) I. batata 'Blackie'	Field Container	Senesac	NY	2010	Broadcast	Slight to moderate injury with 2.65, 5.3 and 10.6 lb ai per acre.
26349	Iris (Iris sp.) 'Yellow Flag'	Field Container	Gilliam	AL	2007	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26349	Iris (Iris sp.)	Field Container	Harvey	WA	2007	Broadcast	No injury after the first, slight injury at 2.65 and moderate injury at 5.3 and 10.6 lb ai per acre after the second application.
26349	Iris (Iris sp.) 'Eleanor Roosevelt'	Field Container	Lieth	CA	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28183	Virginia Sweetspire (Itea virginica) 'Henry's Garnet'	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
28183	Virginia Sweetspire (Itea virginica) 'Henry's Garnet'	Field Container	Czarnota	GA	2009	Broadcast	No significant injury at 2.65, 5.25 and 10.5 lb ai per acre.
28183	Virginia Sweetspire (Itea virginica)	Field Container	Neal	NC	2009	Broadcast	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
31864	Common Rush (Juncus effusus)	Field Container	Derr	VA	2022	Broadcast	Severe injury with 200 lb product per acre with reduction in fresh weight.
26269	Juniper (Juniperus sp.) J. squamata 'Blue Star'	Field Container	Ahrens/Mervosh	CT	2007	Broadcast	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
26269	Juniper (Juniperus sp.) J. chinensis 'Sea Green'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26269	Juniper (Juniperus sp.)	Field Container	Harvey	WA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26269	Juniper (Juniperus sp.) J. chinensis 'Sea Green'	Field Container	Mickelbart	IN	2008	Broadcast	No injury at 0.97, 1.94, and 3.88 lb ai per acre with single application 3 weeks after transplanting.
26269	Juniper (Juniperus sp.) J. davurica 'Parsonii'	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26269	Juniper (Juniperus sp.) J. horizontalis 'Youngstown'	Field Container	Regan	OR	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28177	Laurel (Kalmia sp.) K. latifolia 'Olympic Fire'	Field Container	Beste	MD	2017	Broadcast	No significant injury or growth reduction with 150 and 300, minor injury (reduction of new growth) with 600 lb per acre applied twice.

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28177	Laurel ( <i>Kalmia</i> sp.) <i>K. latifolia</i> 'Raspberry Glow'	Field Container	Senesac	NY	2017	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27403	Japanese Rose ( <i>Kerria japonica</i> ) 'Golden Guinea'	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	Slight to moderate injury with some recovery at 2.65, 5.3 and 10.6 lb ai per acre; treated plants with reduced marketability.
27403	Japanese Rose ( <i>Kerria japonica</i> ) 'Golden Guinea'	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27403	Japanese Rose ( <i>Kerria japonica</i> ) 'Pleniflora'	Field Container	Mickelbart	IN	2009	Broadcast	No injury or plant impact with 150, 300, and 600 lb per acre.
27403	Japanese Rose ( <i>Kerria japonica</i> ) <i>K. 'Pleniflora'</i>	Field Container	Senesac	NY	2011	Broadcast	No crop injury with two applications at 2.65, 5.3 or 10.6 lb aia.
26340	Crape Myrtle ( <i>Lagerstroemia indica</i> ) 'Dynamite'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury but significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; plants marketable.
26340	Crape Myrtle ( <i>Lagerstroemia indica</i> )	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26340	Crape Myrtle ( <i>Lagerstroemia indica</i> ) <i>L. x 'Muskogee'</i>	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65 and 5.3, slight at 10.6 lb ai per acre after 1st application; no injury after 2nd application.
26340	Crape Myrtle ( <i>Lagerstroemia indica</i> ) 'Catawea'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27278	Dead Nettle ( <i>Lamium</i> sp.) <i>L. maculatum</i> 'Red Nancy'	Field Container	Boydston	WA	2008	Broadcast	Data not useful because of injury from early season cold weather and transplant shock.
27278	Dead Nettle ( <i>Lamium</i> sp.) <i>L. maculatum</i> 'Orchid Frost'	Field Container	Klett	CO	2009	Broadcast	Trial 1: Severe injury (stunting, plant death) at 2.65, 5.3 and 10.6 lb ai per acre.
27278	Dead Nettle ( <i>Lamium</i> sp.) <i>L. maculatum</i> 'Orchid Frost'	Field Container	Klett	CO	2009	Broadcast	Trial 2: Moderate to severe injury (stunting, plant death) at 2.65, 5.3 and 10.6 lb ai per acre.
27278	Dead Nettle ( <i>Lamium</i> sp.) <i>L. galeobdolon</i>	Field Container	Lieth	CA	2008	Broadcast	Unacceptable injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26352	Lantana ( <i>Lantana</i> sp.) 'New Gold'	Field Container	Czarnota	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26352	Lantana ( <i>Lantana</i> sp.)	Field Container	Harvey	WA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26352	Lantana ( <i>Lantana</i> sp.) <i>L. camara</i>	Field Container	Klett	CO	2007	Broadcast	Slight stunting only at 10.6 lb ai per acre (4X) in 1 of 2 trials; no growth reduction.
26352	Lantana ( <i>Lantana</i> sp.) <i>L. x hybrida</i> 'New Gold'	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65 and 5.3, significant at 10.6 lb ai per acre after 1st application; no injury after 2nd application.
28172	Larch ( <i>Larix</i> sp.) <i>L. laricina</i>	Field Container	Freiberger	NJ	2009	Broadcast	No injury at 2.65 and 5.3, slight at 10.6 lb ai per acre..
28172	Larch ( <i>Larix</i> sp.) <i>L. occidentalis</i>	Field Container	Miller	WA	2018	Broadcast	No significant injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
28172	Larch ( <i>Larix</i> sp.) <i>L. kaempferi</i>	Field Container	Persad	OH	2016	Broadcast	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Hidcote'	Field Container	Boydston	WA	2008	Broadcast	No significant injury at 2.65, slight at 5.3 and 10.6 lb ai per acre; no growth reduction; all plants marketable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Hidcote'	Field Container	Boydston	WA	2009	Broadcast	No significant injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre.
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Hicote Blue'	Field Container	Klett	CO	2009	Broadcast	Trial 1: No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 4X.
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Hicote Blue'	Field Container	Klett	CO	2009	Broadcast	Trial 2: No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 4X.
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Munstead'	Field Container	Neal	NC	2009	Broadcast	Unacceptable injury at 2.65, 5.3 and 10.6 lb ai per acre.
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Munstead'	Field Container	Trader	MS	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27170	Lavender ( <i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Munstead'	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; minor stunting with quick recovery at 4X.
27404	Max Chrysanthemum ( <i>Leucanthemum maximum</i> ) Chrysanthemum x superbum 'Becky'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth and flower number reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27404	Max Chrysanthemum ( <i>Leucanthemum maximum</i> ) 'Gold Rush'	Field Container	Boydston	WA	2009	Broadcast	No injury but significant stunting at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27404	Max Chrysanthemum ( <i>Leucanthemum maximum</i> ) Leucanthemum x superbum 'Snowcap'	Field Container	Derr	VA	2017	Broadcast	No significant injury with 150, minor with 300, and moderate with 600 lb per acre applied twice.
27404	Max Chrysanthemum ( <i>Leucanthemum maximum</i> ) <i>L. x superbum</i> 'Daisy'	Field Container	Senesac	NY	2009	Broadcast	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
27175	Doghobble ( <i>Leucothoe</i> sp.) 'Rainbow'	Field Container	Aulakh	CT	2016	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
27175	Doghobble ( <i>Leucothoe</i> sp.) <i>L. axillaris</i>	Field Container	Gilliam	AL	2015	Broadcast	No significant injury with 150, 300 and 600 lb per acre applied twice; slight growth reduction at 2X and 4X; considered safe by researcher.
27175	Doghobble ( <i>Leucothoe</i> sp.) <i>L. fontanesiana</i> 'Rainbow'	Field Container	Grunwald	OR	2010	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26448	Blazing-Star ( <i>Liatris</i> sp.) <i>L. spicata</i> 'Kobold'	Field Container	Boydston	WA	2008	Broadcast	Slight injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre; no growth reduction; most treated plants saleable.
26448	Blazing-Star ( <i>Liatris</i> sp.) <i>L. spicata</i> 'Kobold'	Field Container	Boydston	WA	2009	Broadcast	No significant injury at 2.65 and 5.3, severe at 10.6 lb ai per acre; all 1X treated plants saleable.
26448	Blazing-Star ( <i>Liatris</i> sp.) <i>L. spicata</i> 'Kobold'	Field Container	Klett	CO	2009	Broadcast	Trial 1: significant visual injury (stunting, leaf chlorosis and browning) at 2.65, 5.3 and 10.6 lb ai per acre; dry mass lower at all rates.
26448	Blazing-Star ( <i>Liatris</i> sp.) <i>L. spicata</i> 'Kobold'	Field Container	Klett	CO	2009	Broadcast	Trial 2: moderate to significant injury (stunting, leaf chlorosis and browning) at 2.65, 5.3 and 10.6 lb ai per acre; dry mass lower at all rates.

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27405	Privet ( <i>Ligustrum</i> sp.) <i>L. vulgare</i>	Field Container	Freiberger	NJ	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
27405	Privet ( <i>Ligustrum</i> sp.) <i>L. japonicum</i>	Field Container	Knox	FL	2009	Broadcast	No crop injury with two sequential applications at 0.375 and 0.75 lb ai per acre. Chlorosis on some plants 2WAT treated with 4x. Some root stunting with 4x observed.
27405	Privet ( <i>Ligustrum</i> sp.) <i>L. japonicum</i>	Field Container	Lieth	CA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; unacceptable growth reduction at 2X and 4X.
27405	Privet ( <i>Ligustrum</i> sp.) <i>L. lucidum</i>	Field Container	Uber	CA	2008	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, moderate at 2X and 4X after 2nd application; significant growth reduction at 4X
26433	Lilyturf ( <i>Liriope</i> sp.) <i>Muscari</i> sp. 'Big Blue'	Field Container	Boydston	WA	2008	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.
26433	Lilyturf ( <i>Liriope</i> sp.) <i>L. muscari</i> 'Big Blue'	Field Container	Fraelich	GA	2008	Broadcast	No injury at 150, 300 and 600 lb per acre; very slight stunting at 4X; all plants marketable.
26433	Lilyturf ( <i>Liriope</i> sp.) <i>L. muscari</i> 'Green Giant'	Field Container	Neal	NC	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26433	Lilyturf ( <i>Liriope</i> sp.) <i>L. spicata</i>	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
27406	<i>Lobelia</i> ( <i>Lobelia</i> sp.) <i>L. fulgens</i> 'Queen Victoria'	Field Container	Boydston	WA	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27406	<i>Lobelia</i> ( <i>Lobelia</i> sp.) <i>L. fulgens</i> 'Queen Victoria'	Field Container	Boydston	WA	2010	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction; all treated plants saleable.
27406	<i>Lobelia</i> ( <i>Lobelia</i> sp.)	Field Container	Lieth	CA	2012	Broadcast	No significant injury but severe growth reduction with 150, 300 and 600 lb per acre applied twice.
27406	<i>Lobelia</i> ( <i>Lobelia</i> sp.)	Field Container	Reding	OH	2010	Broadcast	Significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre; plants not marketable.
27406	<i>Lobelia</i> ( <i>Lobelia</i> sp.) <i>L. cardinalis</i>	Field Container	Senesac	NY	2009	Broadcast	Slight to severe injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre).
27829	Sweet Alyssum ( <i>Lobularia maritima</i> )	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3, and 10.6 lb ai per acre; no significant difference in plant growth or marketability.
27829	Sweet Alyssum ( <i>Lobularia maritima</i> )	Field Container	Lieth	CA	2008	Broadcast	No significant injury and growth reduction at 2.65, moderate and significant at 5.3 and 10.6 lb ai per acre.
27829	Sweet Alyssum ( <i>Lobularia maritima</i> )	Field Container	Lieth	CA	2012	Broadcast	No significant injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
26328	Loropetalum ( <i>Loropetalum</i> sp.) <i>L. chinense rubrum</i>	Field Container	Czarnota	GA	2007	Broadcast	Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre.
26328	Loropetalum ( <i>Loropetalum</i> sp.) <i>L. chinense rubrum</i>	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26328	Loropetalum ( <i>Loropetalum</i> sp.) <i>L. chinense</i> var <i>rubrum</i> 'Burgundy'	Field Container	Derr	VA	2009	Broadcast	No injury or growth reduction at 2.63, 5.25 and 10.6 lb ai per acre.
26328	Loropetalum ( <i>Loropetalum</i> sp.) <i>L. chinensis</i> 'Ruby'	Field Container	Neal	NC	2007	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.

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26328	Loropetalum (Loropetalum sp.) L. chinensis 'Ruby'	Field Container	Neal	NC	2009	Broadcast	No significant injury at 2.65 and 5.3, slight stunting at 10.6 lb ai per acre.
26313	Magnolia (Magnolia sp.) M. stellata 'Centennial'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; plants marketable.
26313	Magnolia (Magnolia sp.)	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26313	Magnolia (Magnolia sp.) M. grandiflora 'Alta'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27407	Barberry, Hollyleaved (Mahonia aquifolium)	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27407	Barberry, Hollyleaved (Mahonia aquifolium)	Field Container	Grunwald	OR	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27407	Barberry, Hollyleaved (Mahonia aquifolium)	Field Container	Grunwald	OR	2010	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27407	Barberry, Hollyleaved (Mahonia aquifolium) B. aquifolium	Field Container	Lieth	CA	2009	Broadcast	No impact on plant growth and no crop injury observed with two application 2.65, 5.3, and 10.6 lb ai per acre.
27186	Apple (Malus sp.) M. domestica	Field Container	Mathers (OSU)	OH	2008	Broadcast	No injury at 2.65, 5.3, and 10.6 lb ai per acre.
27186	Apple (Malus sp.) 'M.domestica'	Field Container	Mathers (OSU)	OH	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27186	Apple (Malus sp.)	Field Container	Reding	OH	2009	Broadcast	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
27279	Tenweeks Stock (Matthiola incana)	Field Container	Klett	CO	2011	Broadcast	Trial 2: Moderate injury dissipating over time at all rates; reduction in dry mass occurred with 0.375,0.75 and 1.5 lb ai per acre compared to the control.
27279	Tenweeks Stock (Matthiola incana) M. 'Cherry Blossom'	Field Container	Klett	CO	2011	Broadcast	Trial 1: Moderate injury dissipating over time at all rates; reduction in dry mass occurred with 0.375,0.75 and 1.5 lb ai per acre compared to the control.
27279	Tenweeks Stock (Matthiola incana) 'Harmony Mix'	Field Container	Wilen	CA	2012	Broadcast	Severe injury and growth reduction increasing with rates (150, 300 and 600 lb ai per acre) applied twice.
26211	Silver Grass (Miscanthus sp.) M. sinensis 'Purpurascens'	Field Container	Boydston	WA	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26211	Silver Grass (Miscanthus sp.) M. sinensis 'Purpurascens'	Field Container	Regan	OR	2007	Broadcast	Minor injury after the 2nd application and no significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26211	Silver Grass (Miscanthus sp.) 'Miscanthus sinensis'	Field Container	Trader	MS	2007	Broadcast	Slight injury and no growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28185	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Derr	VA	2022	Broadcast	Minor injury with 200 lb product per acre, but significant reduction in fresh weight and in percent flowering.
28185	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Neal	NC	2010	Broadcast	Crop injury with all rates ( 2.65, 5.3, 10.6 ai per acre) increasing with rate. Root inhibition with 2x and 4x rates.
28185	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Stamps	FL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.

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28185	Muhly, Hairyawn ( <i>Muhlenbergia capillaris</i> )	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, slight (delayed flowering and stunting) at 5.3 and 10.6 lb ai per acre.
28714	Pine Muhly ( <i>Muhlenbergia dubia</i> )	Field Container	Klett	CO	2013	Broadcast	Slight to moderate injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre) applied twice; moderate to severe growth reduction increasing with rates.
28714	Pine Muhly ( <i>Muhlenbergia dubia</i> )	Field Container	Wilén	CA	2009	Broadcast	Moderate to high injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre); significant growth reduction at all rates.
27194	Catnip ( <i>Nepeta cataria</i> ) N. grandiflora 'Dusk-to-Dawn'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27194	Catnip ( <i>Nepeta cataria</i> ) 'Psfike'	Field Container	Klett	CO	2008	Broadcast	Trial 1: No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 4X.
27194	Catnip ( <i>Nepeta cataria</i> ) 'Psfike'	Field Container	Klett	CO	2008	Broadcast	Trial 2: Slight injury (minor chlorosis) at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction.
27194	Catnip ( <i>Nepeta cataria</i> )	Field Container	Lieth	CA	2009	Broadcast	Crop injury observed (approx. 40-60%) and significant reduction in plant growth parameters at 2.65, 5.3 and 10.6 lb ai per acre.
27199	<i>Nepeta</i> ( <i>Nepeta</i> x <i>faassenii</i> ) 'Walkers Low'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27199	<i>Nepeta</i> ( <i>Nepeta</i> x <i>faassenii</i> ) 'Walker's Low'	Field Container	Klett	CO	2009	Broadcast	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27199	<i>Nepeta</i> ( <i>Nepeta</i> x <i>faassenii</i> ) 'Walker's Low'	Field Container	Klett	CO	2009	Broadcast	Trial 2: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27199	<i>Nepeta</i> ( <i>Nepeta</i> x <i>faassenii</i> )	Field Container	Lieth	CA	2008	Broadcast	Slight injury but unacceptable growth reduction increasing with rate (2.65, 5.3 and 10.6 lb ai per acre)
27199	<i>Nepeta</i> ( <i>Nepeta</i> x <i>faassenii</i> ) 'Walker's Low'	Field Container	Senesac	NY	2008	Broadcast	Slight injury at 2.63, moderate at 5.25 and 10.5 lb ai per acre
27408	Evening Primrose; Sundrops ( <i>Oenothera</i> sp.) <i>O. berlandieri</i> 'Siskiyou'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27408	Evening Primrose; Sundrops ( <i>Oenothera</i> sp.) <i>O. berlandiera</i>	Field Container	Neal	NC	2008	Broadcast	No significant injury at 2.65 and 5.3 lb ai per acre, but stunting did occur at 10.6 lb ai per acre.
27408	Evening Primrose; Sundrops ( <i>Oenothera</i> sp.) <i>O. berlandiera</i>	Field Container	Neal	NC	2008	Broadcast	Second, non-IR-4 trial in a different location: significant stunting observed at 5.3 lb ai per acre.
27408	Evening Primrose; Sundrops ( <i>Oenothera</i> sp.) <i>O. fruticosa</i>	Field Container	Neal	NC	2008	Broadcast	No significant injury at 2.65 and 5.3 lb ai per acre, but stunting did occur at 10.6 lb ai per acre.
27408	Evening Primrose; Sundrops ( <i>Oenothera</i> sp.) <i>O. speciosa</i>	Field Container	Senesac	NY	2009	Broadcast	Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre.
26436	Mondo Grass; Lilyturf; Ker-Gawl ( <i>Ophiopogon</i> sp.) <i>O. japonicas</i>	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26436	Mondo Grass; Lilyturf; Ker-Gawl ( <i>Ophiopogon</i> sp.) <i>O. japonicus</i> 'Nana'	Field Container	Senesac	NY	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26436	Mondo Grass; Lilyturf; Ker-Gawl ( <i>Ophiopogon</i> sp.) <i>O. japonica</i>	Field Container	Wilén	CA	2012	Broadcast	Slight, acceptable injury with 150, 300 and 600 lb per acre applied twice; no growth reduction.



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27409	Olive, Holly (Osmanthus heterophyllus) Holly Olive; False	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27409	Olive, Holly (Osmanthus heterophyllus) O. fragrans	Field Container	Gilliam	AL	2013	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31344	Fern, Royal (Osmunda regalis) O. 'American Royal'	Field Container	Derr	VA	2011	Broadcast	Reduction in fresh shoot rate and minor crop injury at 2.65, 5.3, 10.6 lb ai per acre. Good groundsel control.
31344	Fern, Royal (Osmunda regalis)	Field Container	Neal	NC	2013	Broadcast	Moderate injury (foliar necrosis) with 150, severe with 300 and 600, lb per acre applied twice.
27387	Sourwood, Sorrel Tree (Oxydendrum arboreum)	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre; no reduction in marketability.
28178	Japanese Pachysandra (Pachysandra terminalis) 'Green Sheen'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
28178	Japanese Pachysandra (Pachysandra terminalis)	Field Container	Boydston	WA	2010	Broadcast	No injury or growth reduction with 2.65, 5.3, and 10.6 lb ai per acre; all treated plants saleable.
28178	Japanese Pachysandra (Pachysandra terminalis) P. terminalis 'Green Sheen'	Field Container	Lieth	CA	2009	Broadcast	No crop injury with two applications of 2.65, 5.3, and 10.6 lb ai per acre up to 60 DAT and no growth suppression observed.
29083	Peony (Paeonia sp.) P. lactiflora 'Shirley Temple'	Field Container	Boydston	WA	2011	Broadcast	No crop injury or reduction in growth with 2.65, 5.3, 10.6 lb ai per acre.
31934	Peony (Paeonia sp.) P. lactiflora 'Alexander Fleming'	Field In-Ground	Mathers	OH	2017	Broadcast	No injury with 2.65, 5.2 and 10.6 lb ai per acre applied twice.
31934	Peony (Paeonia sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2015	Broadcast	No injury with 150, 300 and 600 lb per acre applied twice.
31934	Peony (Paeonia sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2016	Broadcast	No injury or reduction of flower numbers with 150, 300 and 600 lb per acre applied twice.
29083	Peony (Paeonia sp.) P. sp. 'Dr. Alex Fleming'	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
29083	Peony (Paeonia sp.) P. lactiflora 'Edulis Superba'	Field Container	Senesac	NY	2016	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27203	Crimson Fountain Grass (Pennisetum setaceum)	Field Container	Klett	CO	2009	Broadcast	Trial 1: Moderate to significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27203	Crimson Fountain Grass (Pennisetum setaceum)	Field Container	Klett	CO	2009	Broadcast	Trial 2: Moderate to significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27203	Crimson Fountain Grass (Pennisetum setaceum)	Field Container	Neal	NC	2010	Broadcast	Significant crop injury with all rates (2.65, 5.3 and 10.6 lb ai per acre) and inhibition of root growth suggesting not safe for labeling in container.
27203	Crimson Fountain Grass (Pennisetum setaceum)	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27203	Crimson Fountain Grass (Pennisetum setaceum) P. setaceum 'Rubrum'	Field Container	Senesac	NY	2010	Broadcast	Significant injury with 2.65, 5.3 and 10.6 lb ai per acre.

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31116	Beard-Tongue (Penstemon sp.) P. confertus	Field Container	DeFrancesco	OR	2016	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31116	Beard-Tongue (Penstemon sp.) 'Dark Towers'	Field Container	Klett	CO	2016	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31116	Beard-Tongue (Penstemon sp.) 'Husker Red'	Field Container	Mathers	OH	2016	Broadcast	No injury with 2.65 lb ai per acre applied twice, moderate and high with 5.3 and 10.6 lb ai per acre after 1st applic, with complete recovery 2 weeks after 2nd applic; no growth reduction.
31116	Beard-Tongue (Penstemon sp.) P. digitalis 'Husker's Red'	Field Container	Miller	WA	2017	Broadcast	No injury with 150, 300 and 600 lb per acre applied twice; very minor growth reduction at 4X.
26346	Petunia (Petunia sp.)	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26346	Petunia (Petunia sp.)	Field Container	Harvey	WA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26346	Petunia (Petunia sp.) P. hybrida	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26346	Petunia (Petunia sp.) 'Double Cascade Blue'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28738	Mock Orange (Philadelphus sp.) P. viginalis 'Snow Dwarf'	Field Container	Czarnota	GA	2009	Broadcast	No significant injury at 2.65, 5.25 and 10.5 lb ai per acre.
28738	Mock Orange (Philadelphus sp.)	Field Container	Reding	OH	2010	Broadcast	Stunting and chlorosis with 2.65, 5.3 and 10.6 lb ai per acre at 56DAT and significant reduction in height with 1x and 4x rate; plants marketable.
27204	Phlox, Carolina (Phlox carolinia) P. carolina 'Miss Lingard'	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
26214	Phlox, Fall (Phlox paniculata)	Field Container	Boydston	WA	2007	Broadcast	Two sequential applications 8 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre significantly injured young perennial phlox plants.
26214	Phlox, Fall (Phlox paniculata) 'Purple Flame'	Field Container	Boydston	WA	2008	Broadcast	Moderate to high injury, no growth reduction but reduced flower clusters at 2.65, 5.3 and 10.6 lb ai per acre; 1X plants marketable.
26214	Phlox, Fall (Phlox paniculata) 'Juliet'	Field Container	Fraelich	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; slight stunting at 1X and 2X, moderate at 4X; all plants marketable.
26214	Phlox, Fall (Phlox paniculata) 'Robert Poore'	Field Container	Senesac	NY	2008	Broadcast	Moderate injury and growth reduction at 2.63, 5.25 and 10.5 lb ai per acre
26214	Phlox, Fall (Phlox paniculata) 'Sub Snowflake'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26365	Phlox, Moss (Phlox subulata) 'Fort Hill'	Field Container	Boydston	WA	2008	Broadcast	Slight injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre; slight growth reduction at 2X and 4X; 1X and 2X treated plants probably saleable.
26365	Phlox, Moss (Phlox subulata) 'Red Wings'	Field Container	Fraelich	GA	2008	Broadcast	No injury at 150, 300 and 600 lb per acre; slight stunting at 4X; all plants marketable
26365	Phlox, Moss (Phlox subulata) P. subulata	Field Container	Harvey	WA	2008	Broadcast	No injury at 2.65, minor stunting at 5.3 and 10.6 lb ai per acre
26365	Phlox, Moss (Phlox subulata) 'Emerald Blue'	Field Container	Senesac	NY	2008	Broadcast	Moderate injury at 2.63, 5.25 and 10.5 lb ai per acre

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
34760	Palm, Dwarf Date; Pygmy Date Palm (Phoenix roebelinii)	Field Container	Marble	FL	2022	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice
34760	Palm, Dwarf Date; Pygmy Date Palm (Phoenix roebelinii)	Field Container	Wade	SC	2022	Broadcast	No injury from 2.65 lb ai per acre. Minor injury from 5.3 and 10.6 lb ai per acre 4 weeks after each application.
27388	Chokeberry (Photinia sp.) P. x fraseri 'Red Tip'	Field Container	Gilliam	AL	2011	Broadcast	No crop injury or reduction in growth with 2.65, 5.3, 10.6 lb ai per acre.
27388	Chokeberry (Photinia sp.) P. fraseri	Field Container	Lieth	CA	2010	Broadcast	Minor crop injury with 2.65 and 5.3 lb ai per acre but may be due to low temp. injury. No differences in growth at any rate compared to untreated.
27388	Chokeberry (Photinia sp.) P. fraseri	Field Container	Mickelbart	IN	2009	Broadcast	No injury at 2.65, 5.3, 10.6 lb ai per acre, but all treated plants exhibited significantly stunting (50% reduction or more).
27388	Chokeberry (Photinia sp.) P. fraseri	Field Container	Uber	CA	2008	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, severe at 4X after 2nd application; growth reduction at 2X and 4X.
26545	Spruce (Picea sp.) P. glauca	Field In-Ground	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury or height reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26292	Spruce (Picea sp.) P. glauca	Field Container	Freiberger	NJ	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26292	Spruce (Picea sp.) P. pungens gauca	Field Container	Reding	OH	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26292	Spruce (Picea sp.) P. pungens	Field Container	Senesac	NY	2007	Broadcast	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
27210	Andromeda, Fetterbush (Pieris sp.) P. japonica 'Dorothy Wycoff'	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27210	Andromeda, Fetterbush (Pieris sp.) P. japonica 'Shojo'	Field Container	Senesac	NY	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27210	Andromeda, Fetterbush (Pieris sp.) P. japonica 'Mountain Fire'	Field Container	Trader	MS	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27215	Pine (Pinus sp.) P. strobisormis	Field Container	Boydston	WA	2010	Broadcast	No injury with two sequential applications applied 6 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre; all plants were saleable.
27215	Pine (Pinus sp.) P. taeda	Field Container	Fraelich	GA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27215	Pine (Pinus sp.) P. mugo	Field Container	Harvey	WA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27215	Pine (Pinus sp.) P. mugo	Field Container	Harvey	WA	2009	Broadcast	No injury at 0.75, 1.5 and 3 lb ai per acre.
27215	Pine (Pinus sp.) P. strobus	Field Container	Senesac	NY	2008	Broadcast	Slight injury at 2.63 and 5.25, moderate at 10.5 lb ai per acre.
27215	Pine (Pinus sp.) P. eldarica	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27215	Pine (Pinus sp.) P. halapensis	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27215	Pine (Pinus sp.) P. taeda	Field Container	Wade	SC	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.

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28232	Pine, Loblolly (Pinus taeda) 'loblolly pine'	Field In-Ground	Beste/Frank (ARS)	MD	2011	Broadcast	No injury with 2.62, 5.25 and 10.5 lb ai per acre after 1st application, some injury with good recovery at 10.5 lb after 2nd application; height reduction with 4X; plants marketable w/o reduction with 1X and 2X rates.
28232	Pine, Loblolly (Pinus taeda) P. palustris	Field In-Ground	Czarnota	GA	2013	Broadcast	No significant injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
28232	Pine, Loblolly (Pinus taeda)	Field In-Ground	Neal	NC	2015	Broadcast	No injury or significant stunting with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27410	Purslane (Portulaca sp.) P. grandiflora	Field Container	Lieth	CA	2009	Broadcast	No crop injury with any rate (0.375, 0.75, 1.5 lb ai per acre) but significant growth suppression at 0.75 and 1.5 lb ai per acre were observed.
27410	Purslane (Portulaca sp.) 'Margarita Rosita'	Field Container	Mathers (OSU)	OH	2009	Broadcast	No or acceptable injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st.; unacceptable injury (stem brittleness) at 2X and 4X after 2nd application.
27220	Cinquefoil; Potentilla (Potentilla sp.) P. fruticosa 'Monsidh'	Field Container	Klett	CO	2008	Broadcast	Trial 1: Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27220	Cinquefoil; Potentilla (Potentilla sp.) P. fruticosa 'Monsidh'	Field Container	Klett	CO	2008	Broadcast	Trial 2: No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27220	Cinquefoil; Potentilla (Potentilla sp.) P. fruticosa 'Goldfinger'	Field Container	Senesac	NY	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27220	Cinquefoil; Potentilla (Potentilla sp.) P. fruticosa 'Goldfinger'	Field Container	Uber	CA	2008	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, moderate at 4X after 2nd application; no significant growth reduction.
26223	Fir, Douglas (Pseudotsuga menziesii)	Field Container	Boydston	WA	2007	Broadcast	Two sequential applications 8 weeks apart at 0.97, 1.94, and 3.88 lb ai per acre did not injure young Douglas fir trees, all treated plants are saleable except 4X treated trees were smaller.
26223	Fir, Douglas (Pseudotsuga menziesii) P. menziesii glauca	Field Container	Freiberger	NJ	2007	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26223	Fir, Douglas (Pseudotsuga menziesii) 'Blue'	Field Container	Marshall	MI	2007	Broadcast	No injury with single application at 2.65, 5.3 and 10.6 lb ai per acre.
27411	Oak, Shumard Red (Quercus shumardii) 'Oak'	Field Container	Denny	MS	2013	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight trunk diameter growth reduction at 2X and 4X.
27411	Oak, Shumard Red (Quercus shumardii)	Field Container	Knox	FL	2009	Broadcast	No crop injury with two sequential applications at 0.375 lb ai per acre. Minor necrosis 2WAT with 0.75 and 1.5 lb ai per acre. Some root stunting with 4x observed.
27411	Oak, Shumard Red (Quercus shumardii)	Field Container	Reding	OH	2011	Broadcast	No crop injury or reduction in growth with two applications at 2.65, 5.3 and 10.6 lb ai per acre.
27226	Oak (Quercus sp.) Q. rubra	Field Container	Beste/Frank (ARS)	MD	2009	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27226	Oak (Quercus sp.) Q. alba	Field Container	Freiberger	NJ	2008	Broadcast	Virtually no injury at 2.65, slight at 5.3 and moderate at 10.6 lb ai per acre.
27226	Oak (Quercus sp.) Q. rubra	Field Container	Mathers (OSU)	OH	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.

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27226	Oak (Quercus sp.) Q. phellos	Field Container	Neal	NC	2015	Broadcast	No injury or significant stunting with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27412	Oak, Southern Live (Quercus virginiana)	Field Container	Gilliam	AL	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
27412	Oak, Southern Live (Quercus virginiana)	Field Container	Knox	FL	2009	Broadcast	No crop injury with two sequential applications at 0.375, 0.75 lb ai per acre. Reduction in growth with 1.5 lb ai per acre. Some root stunting with 4x observed.
27231	Indian Hawthorn (Raphiolepis indica) R. umbellata 'Eleanor Taber'	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27231	Indian Hawthorn (Raphiolepis indica)	Field Container	Gilliam	AL	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre with two applications.
27231	Indian Hawthorn (Raphiolepis indica) 'Pink Lady'	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26288	Azalea (Rhododendron sp.) 'Fashion'	Field Container	Fraelich	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26288	Azalea (Rhododendron sp.) 'Amelia Rose'	Field Container	Gilliam	AL	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26288	Azalea (Rhododendron sp.) 'Fashion'	Field Container	Neal	NC	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight at 4X after 2nd application.
26288	Azalea (Rhododendron sp.) 'Vulcan'	Field Container	Regan	OR	2007	Broadcast	No injury at 2.65, minor at 5.3 and 10.6 lb ai per acre after the 2nd application; no growth reduction.
26288	Azalea (Rhododendron sp.) 'Gwenda'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28718	Island Gooseberry (Ribes viburnifolium)	Field Container	Reding	OH	2011	Broadcast	No crop injury or reduction in growth with two applications at 2.65, 5.3 and 10.6 lb ai per acre.
28718	Island Gooseberry (Ribes viburnifolium)	Field Container	Wilen	CA	2009	Broadcast	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; root and shoot dry weights not significantly reduced.
26199	Rose (Rosa sp.) R. meidomonac 'Bonica'	Field Container	Boydston	WA	2007	Broadcast	No injury or significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.
26199	Rose (Rosa sp.) 'Nearly Wild'	Field Container	Czarnota	GA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) 'Nearly Wild'	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) 'Nearly Wild'	Field Container	Lieth	CA	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) 'Flower Carpet Red'	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) 'Nearly Wild'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26451	Coneflower, Orange, var. speciosa (Rudbeckia fulgida var. speciosa) 'Goldsturm'	Field Container	Boydston	WA	2013	Broadcast	Moderate to severe injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre) applied twice; plants not saleable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26451	Coneflower, Orange, var. speciosa (Rudbeckia fulgida var. speciosa)	Field Container	Gilliam	AL	2013	Broadcast	Unacceptable injury with 150, 300 and 600 lb per acre applied twice.
26451	Coneflower, Orange, var. speciosa (Rudbeckia fulgida var. speciosa) R. hirta	Field Container	Klett	CO	2013	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; moderate growth reduction at 1X and 2X, high at 4X.
29654	Thick-Leaved Butcher's Broom (Ruscus hypophyllum)	Field Container	Stamps	FL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
27427	Dwarf Palmetto (Sabal minor) Palmetto Palm	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27427	Dwarf Palmetto (Sabal minor)	Field Container	Czarnota	GA	2013	Broadcast	No significant injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
27427	Dwarf Palmetto (Sabal minor)	Field Container	Marble	FL	2015	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27427	Dwarf Palmetto (Sabal minor)	Field Container	Stamps	FL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
28184	Plumegrass; Sugarcane (Saccharum sp.) Erianthus ravennae	Field Container	Klett	CO	2013	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight to moderate growth reduction increasing with rates.
28184	Plumegrass; Sugarcane (Saccharum sp.) S. ravennae	Field Container	Marble	FL	2018	Broadcast	No injury or growth reduction with 2.6 and 5.3, moderate with 10.6, lb ai per acre applied twice.
28184	Plumegrass; Sugarcane (Saccharum sp.) a.k.a Saccharum ravennae	Field Container	Neal	NC	2010	Broadcast	No crop injury with one or two applications any rate (2.65, 5.3 and 10.6 lb ai per acre) at any time in the evaluation period.
30969	Scarlet Sage (Salvia splendens) S. splendens 'Bonfire'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury or growth reduction at 2.65 lb ai per acre, significant at 5.3 and 10.6 lb; 4X treated plants unmarketable.
26202	Woodland Sage (Salvia x sylvestris) 'May Night'	Field Container	Beste/Frank (ARS)	MD	2012	Broadcast	No significant injury, growth or marketability reduction with 2.65 lb ai per acre applied twice; potential marketability reduction with 5.3 and 10.6 lb due to reduced growth.
26202	Woodland Sage (Salvia x sylvestris) 'Snow Hill'	Field Container	Boydston	WA	2007	Broadcast	Slight injury with complete recovery, no significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.
26202	Woodland Sage (Salvia x sylvestris) S. nemorosa 'Cardonna'	Field Container	Derr	VA	2007	Broadcast	8, 13 and 23 % injury at 2.63, 5.25 and 10.5 lb ai per acre; 100 % control of rice flatsedge and fragrant flatsedge.
26202	Woodland Sage (Salvia x sylvestris) 'May Night'	Field Container	Derr	VA	2012	Broadcast	Slight injury with 2.65, 5.3, 10.6 lb ai per acre applied twice.
26202	Woodland Sage (Salvia x sylvestris) 'May Night'	Field Container	Klett	CO	2007	Broadcast	Two trials; significant injury (slight stunting and discoloration) at 2.65, 5.3 and 10.6 lb ai per acre but plants still very saleable.
26202	Woodland Sage (Salvia x sylvestris) S. nemorosa 'May Night'	Field Container	Mathers (OSU)	OH	2007	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st application; significant injury (burning and yellowing) at 2X and 4X after 2nd application.
26202	Woodland Sage (Salvia x sylvestris) S. 'May Night'	Field Container	Williams	IL	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27413	Elderberry (Sambucus sp.) S. canadensis 'Aurea'	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.

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27413	Elderberry ( <i>Sambucus</i> sp.) <i>S. racemosa</i> 'Sutherland'	Field Container	Czarnota	GA	2012	Broadcast	29-43 % injury with 150, 300 and 600 lb per acre applied twice.
27413	Elderberry ( <i>Sambucus</i> sp.) <i>S. hybridus</i> 'Adams'	Field Container	Czarnota	GA	2013	Broadcast	No significant injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
27413	Elderberry ( <i>Sambucus</i> sp.) <i>S. canadensis</i> 'Adams'	Field Container	Reding	OH	2015	Broadcast	Severe injury and growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice; all treated plants not marketable.
27413	Elderberry ( <i>Sambucus</i> sp.) <i>S. nigra</i> 'Black Lace'	Field Container	Trader	MS	2008	Broadcast	High injury at 2.65, 5.3 and 10.6 lb ai per acre.
31916	Lavender Cotton ( <i>Santolina chamaecyparissus</i> )	Field Container	Neal	NC	2018	Broadcast	No injury and growth reduction with 200 lb per acre applied twice.
26302	Pincushions ( <i>Scabiosa</i> sp.)	Field Container	Boydston	WA	2007	Broadcast	Unacceptable injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26302	Pincushions ( <i>Scabiosa</i> sp.) 'Butterfly Blue'	Field Container	Boydston	WA	2008	Broadcast	No injury after 1st application, minor after 2nd (leaf necrosis), at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction; treated plants saleable.
26302	Pincushions ( <i>Scabiosa</i> sp.)	Field Container	Harvey	WA	2007	Broadcast	No injury after the first application at 2.65, 5.3 and 10.6 lb ai per acre, high injury at 2X and 4X after the second application.
26302	Pincushions ( <i>Scabiosa</i> sp.) 'Butterfly Blue'	Field Container	Neal	NC	2008	Broadcast	No initial injury but crinkled leaves and malformed new leaves occurred over time with severity increasing with rate (2.65, 5.3, 10.6 lb ai per acre).
27414	Naupaka; Fan-flower ( <i>Scaevola</i> sp.) <i>S. 'Cajun Blue'</i>	Field Container	Derr	VA	2010	Broadcast	No crop injury or reduction in plant stand or flower numbers at 2.63, 5.25, 10.5 lb ai per acre, but 4X caused temporary reduction in flower size at 14 DAT2; good to excellent control of crabgrass and longstalked phyllanthus with all rates and good to exc
27414	Naupaka; Fan-flower ( <i>Scaevola</i> sp.) <i>S. aemula</i> 'Scala Blue'	Field Container	Pemberton	TX	2012	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice; delayed flowering up to 4 weeks.
27414	Naupaka; Fan-flower ( <i>Scaevola</i> sp.) <i>S. aemula</i> 'Sky Blue'	Field Container	Senesac	NY	2010	Broadcast	Moderate to severe injury with 2.65, 5.3 and 10.6 lb ai per acre.
27414	Naupaka; Fan-flower ( <i>Scaevola</i> sp.)	Field Container	Wilen	CA	2012	Broadcast	Severe injury with 150, 300 and 600 lb per acre applied twice; plant death at high rate.
31870	Stonecrop, Moss ( <i>Sedum acre</i> ) 'Aurea'	Field Container	Neal	NC	2018	Broadcast	Severe injury and growth reduction with 150 lb per acre applied twice.
34341	Stonecrop, Jenny's ( <i>Sedum rupestre</i> ) 'Angelina'	Field Container	Neal	NC	2018	Broadcast	Severe injury with 150 lb per acre applied twice.
27244	Stonecrop ( <i>Sedum</i> sp.) <i>S. spurium</i> 'Fuldaglut'	Field Container	Boydston	WA	2008	Broadcast	Moderate injury at 2.65, high at 5.3 and 10.6 lb ai per acre; width reduction at 2X and 4X.
27244	Stonecrop ( <i>Sedum</i> sp.) 'Autumn Joy'	Field Container	Neal	NC	2008	Broadcast	No injury at 2.65, 5.3 or 10.6 lb ai per acre.
27244	Stonecrop ( <i>Sedum</i> sp.) <i>S. spectabile</i> 'Neon'	Field Container	Reding	OH	2008	Broadcast	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
27244	Stonecrop ( <i>Sedum</i> sp.) <i>S. spurium</i> 'John Creech'	Field Container	Senesac	NY	2008	Broadcast	Slight injury at 2.63 and 5.25, moderate at 10.5 lb ai per acre.

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27244	Stonecrop (Sedum sp.) S. x spectabile 'Autumn Joy'	Field Container	Williams	IL	2008	Broadcast	No injury at 2.65 and 5.3 lb ai per acre, slight injury at 10.6 lb ai per acre; no growth reduction at all rates.
26454	Goldenrod (Solidago sp.) 'Little Lemon'	Field Container	Boydston	WA	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26454	Goldenrod (Solidago sp.) S. sphacelata 'Golden Fleece'	Field Container	Senesac	NY	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight after 2nd application.
26454	Goldenrod (Solidago sp.)	Field Container	Uber	CA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; delayed flowering with full recovery after 2nd application.
28467	Goldenrod, Autumn (Solidago sphacelata) 'Golden Fleece'	Field Container	Klett	CO	2010	Broadcast	Trial 1: No crop injury with 2.65, 5.3 and 10.6 lb ai per acre. No efficacy differences between treatments and weeded control.
28467	Goldenrod, Autumn (Solidago sphacelata) 'Golden Fleece'	Field Container	Klett	CO	2010	Broadcast	Trial 2: No crop injury with 2.65, 5.3 and 10.6 lb ai per acre, but a reduction in dry mass and width at 4X. No efficacy differences between treatments and weeded control.
28467	Goldenrod, Autumn (Solidago sphacelata) S. sphacelata 'Golden Fleece';	Field Container	Senesac	NY	2008	Broadcast	No injury or growth reduction at 2.63, 5.25 and 10.5 lb ai per acre.
26280	Bridal-Wreath (Spiraea sp.) Spiraea x bumalda 'Gold Mound'	Field Container	Ahrens/Mervosh	CT	2007	Broadcast	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
26280	Bridal-Wreath (Spiraea sp.) S. prunifolia	Field Container	Freiberger	NJ	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight after 2nd application.
26280	Bridal-Wreath (Spiraea sp.)	Field Container	Harvey	WA	2007	Broadcast	Very slight injury only at 4X rate (10.6 lb ai per acre).
26280	Bridal-Wreath (Spiraea sp.) S. thunbergii	Field Container	Mickelbart	IN	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre with single application 3 weeks after transplanting.
29103	Lamb's Ears (Stachys byzantina) 'Silver Carpet'	Field Container	Neal	NC	2008	Broadcast	Slight to severe stunting increasing with rate (2.63, 5.3, 10.6 lb ai per acre).
29103	Lamb's Ears (Stachys byzantina) 'Countess Helen von Stein'	Field Container	Senesac	NY	2016	Broadcast	Minimal injury with 2.65, moderate injury with good recovery with 5.3 and 10.6 lb ai per acre applied twice.
27281	Camellia, Mountain (Stewartia sp.) S. pseudocamellia	Field Container	Boydston	WA	2011	Broadcast	No crop injury with two applications at 2.65, 5.3, and 10.6 lb ai per acre.
27281	Camellia, Mountain (Stewartia sp.) S. pseudocamellia	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27281	Camellia, Mountain (Stewartia sp.) S. pseudocamellia	Field Container	Senesac	NY	2011	Broadcast	No crop injury with two applications at 2.65, 5.3 or 10.6 lb aia.
34763	Never-Never Plant (Stromanthe sp.) S. sanguinea 'Triostar'	Field Container	Marble	FL	2022	Broadcast	No injury after first application of 150, 300 and 600 lb per acre, but minimal, transient injury after second application at all rates.
34763	Never-Never Plant (Stromanthe sp.) 'Tricolor'	Field Container	Wade	SC	2022	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice
27249	Lilac (Syringa sp.) S. microphylla 'Superba'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27249	Lilac (Syringa sp.) 'Miss Kim'	Field Container	Harvey	WA	2008	Broadcast	Slight injury at 2.65, moderate at 5.3 and high at 10.6 lb ai per acre.



PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27249	Lilac (Syringa sp.) S x tribida 'Lark Song'	Field Container	Mathers (OSU)	OH	2008	Broadcast	No significant injury or growth reduction at 2.65 and 5.3, slight injury at 10.6 lb ai per acre.
27249	Lilac (Syringa sp.) S. patula 'Miss Kim'	Field Container	Williams	IL	2008	Broadcast	No injury or growth reduction at 150, 300 and 600 lb per acre.
27415	Marigold (Tagetes sp.) T. lemnii	Field Container	Beste/Frank (ARS)	MD	2011	Broadcast	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice; no reduction in marketability.
27415	Marigold (Tagetes sp.) T. erecta 'Inca II Yellow'	Field Container	Klett	CO	2011	Broadcast	Trial 1: No to moderate injury increasing with rate (0.375, 0.75 and 1.5 lb ai per acre) significant growth and dry weight reduction with the 4x rate.
27415	Marigold (Tagetes sp.) T. erecta 'Inca II Yellow'	Field Container	Klett	CO	2011	Broadcast	Trial 2: No injury at 0.375, 0.75 and 1.5 lb ai per acre, but a slight statistically significant reduction in dry mass was observed at 4x.
27415	Marigold (Tagetes sp.) T. patula 'Durango Bolero'	Field Container	Senesac	NY	2010	Broadcast	No to severe injury increasing with rate (2.65, 5.3 and 10.6 lb ai per acre).
27415	Marigold (Tagetes sp.)	Field Container	Uber	CA	2011	Broadcast	Acceptable injury with 150 lb per acre, moderate 300 and significant injury and growth reduction with 600 lb per acre.
28227	Bald Cypress (Taxodium distichum) 'l. rich'	Field In-Ground	Beste/Frank (ARS)	MD	2011	Broadcast	No growth reduction with 2.62, unacceptable with 5.25 and 10.5 lb ai per acre applied twice; phyto ratings unreliable due to extremely high temperatures.
28227	Bald Cypress (Taxodium distichum) 'Shawnee Brave'	Field In-Ground	Czarnota	GA	2013	Broadcast	No injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
34985	Bald Cypress (Taxodium distichum)	Field Container	Jones	OH	2013	Broadcast	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26309	Yew (Taxus sp.) T. baccata 'Repandens'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26309	Yew (Taxus sp.) T. baccata fasigata	Field Container	Freiberger	NJ	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26309	Yew (Taxus sp.) T. baccata	Field Container	Senesac	NY	2007	Broadcast	Slight to moderate injury at 2.63, 5.25 and 10.5 lb ai per acre with complete recovery by 4 weeks after 2nd application.
26309	Yew (Taxus sp.) T. x media 'Densiformis'	Field Container	Williams	IL	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; slight width reduction.
27257	Ternstroemia (Ternstroemia sp.) 'Leann'	Field Container	Gilliam	AL	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27257	Ternstroemia (Ternstroemia sp.) T. gymnanthera	Field Container	Gilliam	AL	2011	Broadcast	No crop injury or reduction in growth with 2.65, 5.3, 10.6 lb ai per acre.
27257	Ternstroemia (Ternstroemia sp.)	Field Container	Neal	NC	2010	Broadcast	No crop injury observed with any rate during the evaluation period.
28722	Wall Germander (Teucrium chamaedrys)	Field Container	Klett	CO	2013	Broadcast	No to slight injury increasing with rate (150, 300, 600 lb per acre) after first application; slight to severe injury after 2nd application with recovery.
28722	Wall Germander (Teucrium chamaedrys)	Field Container	Peachey	OR	2013	Broadcast	No injury with 150, 300 and 600 lb per acre applied twice; severe growth reduction with 4X.
28722	Wall Germander (Teucrium chamaedrys)	Field Container	Wilén	CA	2009	Broadcast	No significant injury at 2.65 and 5.3, slight at 10.6 lb ai per acre; root dry weight significantly reduced at all rates.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26227	Red Cedar, Western (Thuja plicata) 'Atrovirens'	Field Container	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26227	Red Cedar, Western (Thuja plicata)	Field Container	Boydston	WA	2007	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26227	Red Cedar, Western (Thuja plicata)	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26276	Red Cedar, Arborvitae (Thuja sp.) T. occidentalis 'Emerald Green'	Field Container	Ahrens/Mervosh	CT	2007	Broadcast	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
26276	Red Cedar, Arborvitae (Thuja sp.) T. orientalis 'Green Giant'	Field Container	Gilliam	AL	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26276	Red Cedar, Arborvitae (Thuja sp.) T. occidentalis 'Emerald Green'	Field Container	Lieth	CA	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st application; unacceptable only at 4X after 2nd application
26276	Red Cedar, Arborvitae (Thuja sp.) T. orientalis 'Green Giant'	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27264	Jasmine, Asian Star (Trachelospermum asiaticum)	Field Container	Gilliam	AL	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
27264	Jasmine, Asian Star (Trachelospermum asiaticum)	Field Container	Koivunen	CA	2020	Broadcast	No injury and significant growth reduction with 150, 300 and 600 lb per acre applied twice.
27264	Jasmine, Asian Star (Trachelospermum asiaticum)	Field Container	Wade	SC	2022	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice
29653	Palm, Chinese Windmill (Trachycarpus fortunei)	Field Container	Marble	FL	2022	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice
29653	Palm, Chinese Windmill (Trachycarpus fortunei)	Field Container	Stamps	FL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
29653	Palm, Chinese Windmill (Trachycarpus fortunei)	Field Container	Wade	SC	2022	Broadcast	No injury with 150, 300 or 600 lb ai per acre with two applications.
26664	Hemlock, Western (Tsuga heterophylla)	Field In-Ground	Beste/Frank (ARS)	MD	2007	Broadcast	Results not useful because of severe injury caused by very high temperature and drought conditions.
26664	Hemlock, Western (Tsuga heterophylla)	Field In-Ground	Beste/Frank (ARS)	MD	2008	Broadcast	No significant injury after the 1st application, but severe injury to mortality occurred after 2nd application increasing with rate (2.65, 5.3 and 10.6 lb ai per acre).
26238	Hemlock, Western (Tsuga heterophylla)	Field Container	Boydston	WA	2007	Broadcast	No crop injury with two sequential applications 8 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre; treated plants saleable.
26238	Hemlock, Western (Tsuga heterophylla)	Field Container	Boydston	WA	2009	Broadcast	No crop injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26238	Hemlock, Western (Tsuga heterophylla)	Field Container	Boydston	WA	2010	Broadcast	No crop injury or reduction in growth with two sequential applications 8 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre did not injure or reduce growth. Were saleable.
26238	Hemlock, Western (Tsuga heterophylla)	Field Container	Boydston	WA	2011	Broadcast	Two sequential applications at 2.65, 5.3, and 10.6 lb ai per acre did not injure or negatively affect the growth.
27266	Hemlock (Tsuga sp.)	Field Container	Ahrens/Mervosh	CT	2011	Broadcast	No crop injury with two sequential applications at 2.65, 5.3 or 10.6 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27266	Hemlock (Tsuga sp.) T. canadensis	Field Container	Boydston	WA	2011	Broadcast	Two applications at 2.65, 5.3 and 10.6 lb ai per acre did not injury or reduce growth.
27416	Elm (Ulmus sp.) U. 'Homestead'	Field Container	Boydston	WA	2011	Broadcast	No crop injury or reduction in growth with two applications at 2.65, 5.3, 10.6 lb ai per acre.
27416	Elm (Ulmus sp.) U. americana	Field Container	Knox	FL	2009	Broadcast	No crop injury with two sequential applications at 0.375 and 0.75 lb ai per acre. Reduction in growth with 1.5 lb ai per acre. Reduced root growth observed with 2 and 4x.
27416	Elm (Ulmus sp.) U. parvifolia	Field Container	Neal	NC	2015	Broadcast	No injury with 2.65 and 5.3 lb ai per acre applied twice, slight with complete recovery at 10.6 after 2nd applic.; moderate stunting with 2X and 4X.
27417	Vervain (Verbena sp.) 'Homestead Purple'	Field Container	Boydston	WA	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27417	Vervain (Verbena sp.) 'Aztec White'	Field Container	Gilliam	AL	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 4X.
27417	Vervain (Verbena sp.) V. stricta	Field Container	Senesac	NY	2009	Broadcast	No injury at 2.65, slight at 5.3 and 10.6 lb ai per acre.
27417	Vervain (Verbena sp.) V. canadensis 'Homestead Purple'	Field Container	Trader	MS	2009	Broadcast	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26457	Ironweed, New York (Vernonia noveboracensis)	Field Container	Neal	NC	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
26457	Ironweed, New York (Vernonia noveboracensis)	Field Container	Senesac	NY	2009	Broadcast	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
26265	Speedwell (Veronica sp.)	Field Container	Chandran	WV	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
26265	Speedwell (Veronica sp.) V. teucium 'Crater Lake Blue'	Field Container	Klett	CO	2011	Broadcast	Trial 1: Minor crop injury with 2.65, 5.3 and 10.6 lb ai per acre and reduction in dry mass among 4x treated plants.
26265	Speedwell (Veronica sp.) V. teucium 'Crater Lake Blue'	Field Container	Klett	CO	2011	Broadcast	Trial 2: Significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre decreasing to acceptable by the last evaluation.
26265	Speedwell (Veronica sp.)	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
26265	Speedwell (Veronica sp.) V. peduncularis 'Watersperry'	Field Container	Senesac	NY	2008	Broadcast	Slight injury at 2.63, moderate at 5.25 and 10.5 lb ai per acre.
27418	Speedwell, Spiked (Veronica spicata) 'Goodness Grows'	Field Container	Boydston	WA	2009	Broadcast	Severe injury at 2.65, 5.3 and 10.6 lb ai per acre.
27418	Speedwell, Spiked (Veronica spicata) 'Sunny Border Blue'	Field Container	Gilliam	AL	2010	Broadcast	Little to no injury with 2.65 lb ai per acre but moderate to significant injury and reduction in growth with 5.3, 10.6 lb ai per acre.
27418	Speedwell, Spiked (Veronica spicata) 'Red Fox'	Field Container	Senesac	NY	2009	Broadcast	Severe injury at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. plicatum 'Shasta'	Field Container	Ahrens/Mervosh	CT	2007	Broadcast	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. plicatum 'Shoshoni'	Field Container	Beste/Frank (ARS)	MD	2007	Broadcast	No significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26255	Arrowwood (Viburnum sp.) V. plicatum tomentosum 'Shasta'	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. tinus	Field Container	Czarnota	GA	2008	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. x 'Juddi'	Field Container	Mickelbart	IN	2008	Broadcast	No injury at 0.97, 1.94, and 3.88 lb ai per acre with single application 3 weeks after transplanting.
26255	Arrowwood (Viburnum sp.) V. odoratissimum	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. x pragense	Field Container	Neal	NC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. tinus 'Compactum'	Field Container	Neal	NC	2009	Broadcast	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, moderate at 4X after 2nd application.
26255	Arrowwood (Viburnum sp.) V. opulus	Field Container	Regan	OR	2007	Broadcast	No injury but significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
30568	Periwinkle, Big (Vinca major) 'Cora White'	Field Container	Gilliam	AL	2017	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
30568	Periwinkle, Big (Vinca major)	Field Container	Miller	WA	2017	Broadcast	No injury with 150, 300 and 600 lb per acre applied twice; minor growth reduction 4X.
30568	Periwinkle, Big (Vinca major) 'Expoflora'	Field Container	Senesac	NY	2017	Broadcast	Minor injury with 2.65 and 5.3, moderate with 10.6 lb ai per acre applied twice.
26295	Periwinkle, Common (Vinca minor)	Field Container	Boydston	WA	2007	Broadcast	Two sequential applications 8 weeks apart at 2.65, 5.3, and 10.6 lb ai per acre caused slight to severe injury over time increasing with rate.
26295	Periwinkle, Common (Vinca minor) 'Ralph Shugert'	Field Container	Reding	OH	2007	Broadcast	No injury after the first application; however, severe reduction in foliage occurred at all rates (2.65, 5.3 and 10.6 lb ai per acre by 4 weeks after the second application.
26295	Periwinkle, Common (Vinca minor)	Field Container	Senesac	NY	2007	Broadcast	Slight to moderate injury at 2.63, 5.25 and 10.5 lb ai per acre with partial recovery 4 weeks after 2nd application.
26295	Periwinkle, Common (Vinca minor) 'Pinkstar'	Field Container	Wade	SC	2007	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
34766	Palm, Foxtail (Wodyetia bifurcata)	Field Container	Marble	FL	2022	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice
27286	Japanese Zelkova (Zelkova serrata)	Field Container	DeFrancesco	OR	2010	Broadcast	No crop injury with one or two applications at 2.6, 5.3, 10.6 lb ai per acre.
27286	Japanese Zelkova (Zelkova serrata)	Field Container	Freiberger	NJ	2009	Broadcast	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27286	Japanese Zelkova (Zelkova serrata)	Field Container	Reding	OH	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.

## Label Suggestions

We recommend that the six (6) genera exhibiting no injury in these experiments be added to the current Freehand 1.75G label for broadcast applications.

*Aesculus sp.*

*Agave sp.*

*Aloe sp.*

*Arctostaphylos sp.*

*Asclepias sp.*

*Athyrium nipponicum*

*Aucuba sp.*

*Berlandiera lyrata*

*Cactaceae*

*Calycanthus sp.*

*Camellia sp.*

*Distylium sp.*

*Fagus sp.*

*Lagerstroemia indica*

*Larix sp.*

*Penstemon sp.*

*Pinus taeda*

*Sabal minor*

*Saccharum sp.*

*Ternstroemia sp.*

*Trachycarpus fortunei*

*Verbena sp.*

*Vinca major*

We also suggest that the following genus be added to the “Sensitive Ornamental Species – Special Precautions” section of the Freehand 1.75G label.

*Echeveria sp.*

Of note is that *Phlox subulata* is listed as a sensitive species, but three of four IR-4 trials suggest over the top broadcast application may be acceptable.

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