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IR-4 Ornamental Horticulture Program Dimethenamid-p + Pendimethalin Crop Safety

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Abstract

From 2007 to 2017, IR-4 completed 637 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 ornamental 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 185 plant genera or species. Of these genera and species, 73 exhibited no or minimal transient injury after application at all three rates. Thirty three (35) 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. Twenty two (22) genera or species exhibited damage sufficient to recommend growers not utilize Freehand G as an over-the-top treatment for pre-emergent weed control. Of the fifty eight (58) crops that still need additional information, there are twelve (12) genera or species in which three or more trials do not show significant injury, but one or more additional trials shows some sort of notable injury, necessitating additional research. Additional trials are also indicated to establish species or cultivar sensitivities.

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 2017.

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 2017 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 (10-001, 11-004, 12-014, 13-014, 14-009, 15-009, 16-010 and 17-010), please see <http://ir4.rutgers.edu/Ornamental/Ornamentals.cfm> 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 73 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 59 genera or species were already on the label, partially based on previous summary reports. In the research presented here, thirty-five

(35) 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). Twenty two (22) crops tested from 2007 to 2017 showed damage sufficient to recommend growers not utilize Freehand 1.75G as an over-the-top treatment for pre-emergent weed control (Table 3). Note that three of these crops (*Gardenia jasminoides*, *Gazania spp.* and *Lobelia spp.*) are already labeled, so the addition of a cautionary note is suggested. For 58 genera/species, more information is needed either because only 1 or 2 trials were conducted or because consistent results were not achieved across research sites (Table 4).

Please see Table 5 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> ¹	<i>Iris</i> spp. ¹
<i>Acer palmatum</i> ¹	<i>Juniperus</i> spp. ^{1, 2}
<i>Acer negundo</i> ¹	<i>Lagerstroemia indica</i> ¹
<i>Agastache</i> spp. ^{1, 2}	<i>Lantana</i> spp. ¹
<i>Agave</i> sp.	<i>Liriope muscari</i> ¹
<i>Aloe</i> sp.	<i>Lobularia maritima</i> ¹
<i>Amelanchier</i> spp. ¹	<i>Magnolia</i> spp. ^{1, 2, 4}
<i>Anemone hupehensis</i> ^{1, 2}	<i>Mahonia aquifolium</i> ^{1, 2}
<i>Arctostaphylos</i> sp.	<i>Malus</i> spp. ¹
<i>Berberis</i> spp. ¹	<i>Miscanthus</i> spp. ¹
<i>Buddleia davidii</i> ¹	<i>Ophiopogon japonica</i> ¹
<i>Buxus macrophyla</i> ^{1, 2}	<i>Pachysandra terminalis</i> ¹
<i>Callistemon</i> spp. ¹	<i>Penstemon</i> sp.
<i>Camellia</i> spp. ¹	<i>Petunia</i> spp. ¹
<i>Cercis canadensis</i> ¹	<i>Picea</i> spp. ¹
<i>Clematis integrifolia</i> ^{1, 2}	<i>Pieris japonica</i> ¹
<i>Cornus florida</i> ^{1, 2}	<i>Pinus</i> spp. ^{1, 2} (see Senesac 2008)
<i>Cornus kousa</i>	<i>Potentilla fruticosa</i> ^{1, 2} (See Uber)
<i>Cotoneaster</i> spp. ¹	<i>Pseudotsuga menziesii</i> ¹
<i>Cryptomeria japonica</i> ¹	<i>Quercus shumardii</i>
<i>Cupressocyparis leylandii</i> ¹	<i>Raphiolepis indica</i> ¹
<i>Chrysanthemum/Dendranthema</i> spp. ¹	<i>Rhododendron</i> spp. ^{1, 2}
<i>Dendranthema x morifolium</i>	<i>Rosa</i> spp. ^{1, 2}
<i>Dianthus gratianopolitanus</i> ^{1, 2}	<i>Sabal minor</i> ¹
<i>Eupatorium</i> spp. ^{1, 2}	<i>Salvia</i> spp. ^{1, 2}
<i>Fothergilla gardenii</i>	<i>Spiraea</i> spp. ^{1, 2, 4}
<i>Forsythia x intermedia</i> ¹	<i>Stewartia pseudocamellia</i> ¹
<i>Gaura lindheimeri</i> ¹ (see Klett)	<i>Syringa</i> spp. ¹
<i>Gladiolus</i> spp. ¹	<i>Taxodium distichum</i> ¹
<i>Gleditsia triacanthos</i> ¹	<i>Taxus</i> spp. ¹
<i>Hemerocallis</i> spp. ^{1, 2}	<i>Ternstroemia</i> spp.(see Gilliam)
<i>Hibiscus</i> spp. ^{1, 2}	<i>Teucrium chamaedrys</i> ¹
<i>Hosta</i> spp. ¹	<i>Thuja</i> spp. ¹ (See Lieth)
<i>Hydrangea macrophylla</i> ⁴	<i>Tsuga heterophylla</i> ^{3, 4} (Beste & Frank)
<i>Ilex</i> spp. ^{1, 2}	<i>Verbena</i> spp. ¹ (See Gilliam)
<i>I. cornuta</i> ¹	<i>Viburnum</i> spp. ^{1, 2, 3, 4}
<i>I. crenata</i> ¹	<i>Zelkova serrata</i> ¹
<i>Ipomea batata</i> ¹ (See Senesac)	

¹ Registered already

² More information on cultivar differences might be warranted.

³ Perhaps a single application only could be a label restriction.

⁴ 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 the 1X rate, but the 2X or 2X rate did cause significant phytotoxicity

<i>Acer rubrum</i> ¹	<i>Helianthus</i> spp. ^{1, ^}
<i>Achillea millefolium</i> ^{1, 2}	<i>Heuchera sanguinea</i> ¹
<i>Amelanchier</i> spp. ^{1, 3} (see Mathers)	<i>Iberis sempervirens</i> (see Klett)
<i>Asclepias incarnata</i> ^{2^} (see Beste/Frank)	<i>Itea virginica</i>
<i>Asclepias tuberosa</i> ^{3,4^}	<i>Lavandula angustifolia</i> ¹ (see Neal)
<i>Campanula</i> spp. ¹	<i>Leucanthemum maximum</i> ¹
<i>Canna</i> spp. ¹	<i>Liatris spicata</i>
<i>Catharanthus roseus</i> ¹	<i>Ligustrum</i> spp. ^{1, 3}
<i>Ceanothus</i> spp. ^{1, 2}	<i>Loropetalum chinense</i> ^{1, 4}
<i>Chamaecyparis</i> spp. ^{1, 3}	<i>Oenothera</i> spp. ¹
<i>Chelone</i> spp. ^{1, 4}	<i>Phlox subulata</i> ^{1, 4}
<i>Cortaderia</i> spp.(see Boydston)	<i>Photinia fraseri</i> ^{1, 3}
<i>Cotoneaster</i> spp. ¹	<i>Picea</i> spp. ¹
<i>Crassula</i> sp.	<i>Quercus</i> spp. ¹
<i>Dryopteris erythrosora</i> ¹ (see Neal)	<i>Sedum</i> spp. ^{1, 4} (see Boydston)
<i>Echinacea purpurea</i> ^{1, 4} (See Klett)	<i>Solidago</i> spp. ^{1, 4}
<i>Gardenia jasminoides</i> ^{1, 2}	<i>Vinca minor</i> ⁴

Table 3. List of Freehand 1.75G treated crops exhibiting significant injury.

<i>Amsonia hubrichtii</i> ⁴	<i>Matthiola incana</i>
<i>Aquilegia</i> spp. ⁴	<i>Muhlenbergia capillaris</i> ⁵
<i>Armeria maritima</i> ⁴	<i>Muhlenbergia dubia</i> ⁵
<i>Calamagrostis acutiflora</i> ⁵	<i>Osmunda regalis</i> ⁴
<i>Coreopsis auriculata</i> ⁴	<i>Pennisetum setaceum</i> ⁵
<i>Echeveria</i> sp.	<i>Phlox paniculata</i> ⁴
<i>Festuca ovina glauca</i> ⁵	<i>Rudbeckia</i> spp.
<i>Gazania</i> spp. ¹	<i>Rudbeckia fulgida</i> ⁴
<i>Impatiens</i> spp. ⁴ (New Guinea Hybrids)	<i>Sambucus</i> spp. ^{2, 4}
<i>Lamium</i> spp. ⁴	<i>Scabiosa</i> spp. ⁴
<i>Lobelia</i> spp. ⁴	<i>Scaevola</i> spp. ⁴
<i>Matthiola</i> spp. ⁴	<i>Veronica spicata</i> ⁴

¹ Registered already

² More information on cultivar or species differences might be warranted.

³Perhaps a single application only could be a label restriction.

⁴Listed on label as sensitive plant.

⁵Ornamental Grass, Freehand 1.75G should not be applied, as per label.

[^]Have three trials, but there are some indications of injury, more trials recommended.

Table 4. List of Freehand 1.75G treated crops where more information is needed.

<i>Acer</i> spp. ¹	<i>Fraxinus americana</i> ¹
<i>A. ginnala</i>	<i>Fraxinus arisonica</i>
<i>A. saccharinum</i> ¹	<i>Fraxinus pennsylvanica</i> ¹
<i>Aesculus pavia</i>	<i>Gaillardia</i> spp. ¹
<i>Agapanthus</i> spp. ^{1, ^}	<i>Heteromeles arbutifolia</i> ^ (see Lieth)
<i>Allamanda cathartica</i> ¹	<i>Kerria japonica</i> ^{1, ^}
<i>Asclepias incarnate</i>	<i>Larix laricina</i>
<i>Astilbe</i> spp. ¹ (see Mathers)^	<i>Leucothoe</i> spp. ^{1, 2}
<i>Athyrium nipponicum</i>	<i>L. axillaris</i>
<i>Berlandiera lyrata</i>	<i>L. fontanesiana</i>
<i>Caladium</i> spp. ¹	<i>Nepeta cataria</i> (see Lieth) ^
<i>Calycanthus floridus</i>	<i>Nepeta x faasseni</i> (see Lieth) ^
<i>Carex divulsa</i> ^{1, 3}	<i>Osmanthus heterophyllus</i> ¹
<i>Cedrus atlantica</i>	<i>Paeonia</i> spp. ¹
<i>Cercis chinensis</i> ¹	<i>Philadelphus viginialis</i> [#]
<i>Chrysogonum virginianum</i>	<i>Pinus mugo</i> ¹
<i>Cladrastis</i> spp. ¹ (see Reding) ^	<i>Portulaca</i> spp. ¹
<i>Clethra alnifolia</i> ³ (see Reding) ^	<i>Quercus</i> spp. ¹
<i>Coreopsis</i> spp. ²	<i>Quercus alba</i>
<i>C. auriculata</i> ^{2, ^}	<i>Quercus phellos</i>
<i>C. rosea</i>	<i>Quercus rubra</i>
<i>C. verticulata</i>	<i>Quercus virginiana</i>
<i>Cortaderia</i> spp. ¹ (see Boydston) ^	<i>Ribes viburnifolium</i> ¹
<i>Crataegus</i> spp. ^{1, 2}	<i>Ruscus hypophyllum</i>
<i>C. coccinoid</i>	<i>Stachys byzantina</i>
<i>C. crus-galli</i>	<i>Tagetes</i> spp. ^{1, ^}
<i>C. phaenoprum</i>	<i>Trachycarpus fortunei</i>
<i>Delosperma cooperi</i>	<i>Ulmus</i> spp.
<i>Distylium</i> sp.	<i>U. japonica</i> ¹
<i>Epilobium canum</i> ¹	<i>Vernonia noveboracensis</i> ¹
<i>Erianthus</i> spp. (<i>Saccharum ravennae</i>)	<i>Vinca major</i>
<i>Euonymus alatus</i> ¹	
<i>Fagus</i> sp.	

¹ Registered already

² More information on cultivar differences might be warranted.

³ Perhaps a single application only could be a label restriction.

⁴ Listed on label as sensitive plant.

^ Have at least three trials with no or transitory injury, but other trial(s) indicate significant injury, more trials recommended.

Note: *Pittosporum tobira* is on the label as mock orange, but it is more correctly called Japanese mock orange. The shrub commonly called mock orange belongs to the genus *Philadelphus*, an entirely different family.

Table 5. 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 1/30/2018 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	Over the top	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	Over the top	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	Over the top	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	Over the top	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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26321	Fir, Fraser (<i>Abies fraseri</i>) 'Roan Mountain'	Field Container	Marshall	MI	2007	Over the top	One application. No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27391	Boxelder (<i>Acer negundo</i> L. var. <i>negundo</i>)	Field Container	Freiberger	NJ	2008	Directed	Very slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
27391	Boxelder (<i>Acer negundo</i> L. var. <i>negundo</i>)	Field Container	Jones	OH	2013	Over the top	Virtually no injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27391	Boxelder (<i>Acer negundo</i> L. var. <i>negundo</i>) <i>A. 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.
27083	Maple, Japanese (<i>Acer palmatum</i>)	Field Container	Reding	OH	2008	Over the top	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	Beste/Frank (ARS)	MD	2008	Over the top	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	Over the top	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	Senesac	NY	2008	Over the top	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
27083	Maple, Japanese (<i>Acer palmatum</i>) Maple Japanese	Field Container	Harvey	WA	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26542	Maple, Red (<i>Acer rubrum</i>)	Field In-Ground	Beste/Frank (ARS)	MD	2007	Over the top	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	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre; height reduction at 4X but all plants marketable.
26195	Maple, Red (<i>Acer rubrum</i>)	Field Container	Freiberger	NJ	2007	Over the top	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>)	Field Container	Senesac	NY	2008	Over the top	Slight injury at 2.63 and 5.25, moderate at 10.5 lb ai per acre.
26195	Maple, Red (<i>Acer rubrum</i>) 'October Glory'	Field Container	Harvey	WA	2008	Over the top	Slight injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26195	Maple, Red (<i>Acer rubrum</i>) 'Summer'	Field Container	Gilliam	AL	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre with two applications.
26195	Maple, Red (<i>Acer rubrum</i>) 'Sun Valley'	Field Container	Mathers (OSU)	OH	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27092	Maple (<i>Acer</i> sp.) <i>A. ginnala</i>	Field Container	Reding	OH	2009	Over the top	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. 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.
27092	Maple (<i>Acer</i> sp.) <i>A. saccharinum</i>	Field Container	Derr	VA	2009	Over the top	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. saccharinum</i>	Field Container	Senesac	NY	2008	Over the top	No injury or growth reduction at 2.63, 5.25 and 10.5 lb ai per acre.
27096	Yarrow, Common (<i>Achillea millefolium</i>) 'Moonshine'	Field Container	Neal	NC	2008	Over the top	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	Over the top	Moderate injury with slow recovery at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27096	Yarrow, Common (<i>Achillea millefolium</i>) 'Paprika'	Field Container	Boydston	WA	2008	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
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.
28173	Horse Chestnut (<i>Aesculus</i> sp.) <i>A. pavia</i>	Field Container	Freiberger	NJ	2009	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
27385	Lily-Of-The-Nile (<i>Agapanthus</i> sp.)	Field Container	Neal	NC	2008	Over the top	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	Over the top	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	Over the top	No significant injury or growth reduction at 2.6, 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	Over the top	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.
26272	Giant Hyssop (<i>Agastache</i> sp.)	Field Container	Derr	VA	2009	Over the top	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	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26272	Giant Hyssop (<i>Agastache</i> sp.) 'Black Adder'	Field Container	Trader	MS	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26272	Giant Hyssop (<i>Agastache</i> sp.) 'Blue Fortune'	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
31329	Agave (<i>Agave</i> sp.) <i>A. ellemeeetiana</i> 'Santina'	Field Container	Wilén	CA	2013	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31329	Agave (<i>Agave</i> sp.) <i>A. parrasana</i>	Field Container	Villavicencio	CA	2013	Over the top	Minor injury and no growth reduction with 150, 300 and 600 lb per acre applied twice.
31329	Agave (<i>Agave</i> sp.) 'Blue Flame'	Field Container	Villavicencio	CA	2012	Over the top	Slight discoloration and spotting with 150, 300 and 600 lb per acre, very slight necrosis at 2X and 4X; no growth reduction.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
29648	Golden Trumpet (<i>Allamanda cathartica</i>) 'Hendersonii'	Field Container	Stamps	FL	2009	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
31328	Aloe (<i>Aloe</i> sp.) <i>A. brevifolia</i>	Field Container	Villavicencio	CA	2013	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31328	Aloe (<i>Aloe</i> sp.) 'Blue Elf'	Field Container	Villavicencio	CA	2012	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre.
31328	Aloe (<i>Aloe</i> sp.) 'Little Gator'	Field Container	Wilen	CA	2014	Over the top	Slight injury with 150, 300 and 600 lb per acre; no significant growth reduction.
28174	Serviceberry (<i>Amelanchier</i> sp.)	Field Container	Reding	OH	2009	Over the top	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
28174	Serviceberry (<i>Amelanchier</i> sp.) <i>A. canadensis</i>	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	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 (<i>Amelanchier</i> sp.) <i>A. x grandifolia</i> 'Autumn Brilliance'	Field Container	DeFrancesco	OR	2010	Over the top	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 (<i>Amelanchier</i> sp.) <i>Amelanchier stolonifera</i>	Field Container	Mathers (OSU)	OH	2010	Over the top	Unacceptable crop injury at 5.3 and 10.6 lb ai per acre (acceptable at 2.65 lb ai per acre).
27392	Bluestar (<i>Amsonia</i> sp.) <i>A. hubrichtii</i>	Field Container	Senesac	NY	2008	Over the top	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
27392	Bluestar (<i>Amsonia</i> sp.) <i>A. hubrichtii</i>	Field Container	Trader	MS	2008	Over the top	Moderate to high injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27393	Anemone (<i>Anemone</i> sp.) 'Little Princess'	Field Container	Klett	CO	2009	Over the top	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27393	Anemone (<i>Anemone</i> sp.) 'Little Princess'	Field Container	Klett	CO	2009	Over the top	Trial 2: Very slight injury to moderate injury increasing with rate (2.65, 5.3 and 10.6 lb ai per acre).
27393	Anemone (<i>Anemone</i> sp.) 'Max Vogel'	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27393	Anemone (<i>Anemone</i> sp.) 'Pamina'	Field Container	Trader	MS	2008	Over the top	Slight injury with complete recovery at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27097	Columbine (<i>Aquilegia</i> sp.)	Field Container	Neal	NC	2008	Over the top	No to significant injury increasing with rate (2.65, 5.3, and 10.6 lb ai per acre).
27097	Columbine (<i>Aquilegia</i> sp.) <i>A. caerulea</i>	Field Container	Klett	CO	2008	Over the top	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.) <i>A. caerulea</i>	Field Container	Klett	CO	2008	Over the top	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.) <i>A. caerulea</i> 'Songbird Blue Jay'	Field Container	Trader	MS	2008	Over the top	High injury at 2.65, 5.3 and 10.6 lb ai per acre.
27097	Columbine (<i>Aquilegia</i> sp.) 'Clementine Red'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	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	Over the top	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.

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31106	Manzanita (<i>Arctostaphylos</i> sp.)	Field Container	Miller	WA	2016	Over the top	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	DeFrancesco	OR	2016	Over the top	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.) A. uva ursi 'Massachusetts'	Field Container	Senesac	NY	2017	Over the top	No injury 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	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27098	Thrift, Sea Pink (<i>Armeria maritima</i>) 'Alba'	Field Container	Boydston	WA	2009	Over the top	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>) 'Armada Rose'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	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	Over the top	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>) 'Splendens'	Field Container	Trader	MS	2009	Over the top	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.)	Field Container	Derr	VA	2009	Over the top	No significant injury at 2.63 and 5.25, slight at 10.6 lb ai per acre.
27394	Milkweed (<i>Asclepias</i> sp.) A. incarnata	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	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.) A. incarnata	Field Container	Trader	MS	2008	Over the top	No significant injury at 2.65, moderate injury with slow recovery at 5.3 and 10.6 lb ai per acre.
27394	Milkweed (<i>Asclepias</i> sp.) A. sp.	Field Container	Derr	VA	2010	Over the top	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	Over the top	Trial 1: No to significant injury (chlorosis, stunting) increasing with rate (2.65, 5.3, 10.6 lb ai per acre).
27394	Milkweed (<i>Asclepias</i> sp.) A. tuberosa	Field Container	Klett	CO	2009	Over the top	Trial 2: No to significant injury (chlorosis, stunting) increasing with rate (2.65, 5.3, 10.6 lb ai per acre).
27394	Milkweed (<i>Asclepias</i> sp.) A. tuberosa	Field Container	Trader	MS	2009	Over the top	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 (<i>Astilbe</i> sp.)	Field Container	Klett	CO	2009	Over the top	Trial 1: visual injury (chlorosis, stunting) at 2.65, 5.3 and 10.6 lb ai per acre.
27099	False Goat's Beard (<i>Astilbe</i> sp.)	Field Container	Klett	CO	2009	Over the top	Trial 2: visual injury (chlorosis, stunting) at 2.65, 5.3 and 10.6 lb ai per acre.
27099	False Goat's Beard (<i>Astilbe</i> sp.) A. japonica 'Rheinland'	Field Container	Reding	OH	2008	Over the top	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
27099	False Goat's Beard (<i>Astilbe</i> sp.) A. xarensii 'Final' and 'Bridal Veil'	Field Container	Mathers (OSU)	OH	2010	Over the top	Unacceptable crop injury at 10.6 lb ai per acre (acceptable at 2.65 - 5.3 lb ai per acre).

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27099	False Goat's Beard (Astilbe sp.) 'Bridal Veil' and Peach Blossom'	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
32699	Fern, Lady (Athyrium nipponicum)	Greenhouse	Mansue	NJ	2015	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
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.
26284	Barberry (Berberis sp.) B. thunbergii 'Amber Glow'	Field Container	Uber	CA	2008	Over the top	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 'Atropurpurea'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	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	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; plants marketable.
26284	Barberry (Berberis sp.) B. thunbergii 'Crimson Pigmy'	Field Container	Lieth	CA	2008	Over the top	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 'Crimson Pygmy'	Field Container	Williams	IL	2008	Over the top	No injury or growth reduction at 2.65 and 5.3 lb ai per acre, slight injury at 10.6 lb ai per acre.
26284	Barberry (Berberis sp.) 'Ruby Carosel'	Field Container	Freiberger	NJ	2008	Over the top	Moderate injury at 2.65, 5.3 and 10.6 lb ai per acre; 6 out of 12 untreated plants dead.
31108	Chocolate Flower/Lyreleaf Greeneyes (Berlandiera lyrata)	Field Container	Aulakh	CT	2017	Over the top	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.
26336	Butterfly Bush (Buddleia davidii) 'Nanho Purple'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26336	Butterfly Bush (Buddleia davidii) 'Purple Emperor'	Field Container	Reding	OH	2007	Over the top	No injury but reduced plant growth at 2.65, 5.3 and 10.6 lb ai per acre.
26336	Butterfly Bush (Buddleia davidii) 'Royal Red'	Field Container	Fraelich	GA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26336	Butterfly Bush (Buddleia davidii) 'White Ball'	Field Container	Marshall	MI	2007	Over the top	One application. No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26367	Boxwood (Buxus sp.) B. microphylla 'Faulkner'	Field Container	Klett	CO	2007	Over the top	Two trials; no significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26367	Boxwood (Buxus sp.) B. sinica var. insularis 'Wintergreen'	Field Container	Neal	NC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26367	Boxwood (Buxus sp.) 'Green Velvet'	Field Container	Marshall	MI	2007	Over the top	One application. No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27395	Elephant's-Ear, Angel-Wings (Caladium sp.) C. bicolor 'Frieda Hemple'	Field Container	Senesac	NY	2016	Over the top	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27395	Elephant's-Ear, Angel-Wings (Caladium sp.) C. 'Florida Cardinal'	Field Container	Derr	VA	2010	Over the top	No crop injury with 2.63, 5.25, 10.5 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26205	Feather Reed Grass (<i>Calamagrostis acutiflora</i>)	Field Container	Boydston	WA	2007	Over the top	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	Over the top	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>)	Field Container	Trader	MS	2007	Over the top	Some injury and growth reduction 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	Over the top	Two trials; moderate to high injury (stunting) at 2.65, 5.3 and 10.6 lb ai per acre; reduced dry mass.
27396	Bottlebrush (<i>Callistemon</i> sp.) <i>C. citrinus</i> (Curtis)	Field Container	Beste/Frank (ARS)	MD	2010	Over the top	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. lanceolata</i>	Field Container	Uber	CA	2009	Over the top	No injury at 2.65, slight at 5.3 and moderate at 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.) 'Little John'	Field Container	Wilén	CA	2012	Over the top	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	Over the top	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	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants marketable.
27110	Camellia (<i>Camellia</i> sp.) <i>C. japonica</i>	Field Container	Wade	SC	2008	Over the top	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	Over the top	No injury or significant 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	Over the top	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. vernalis</i> 'Yuletide'	Field Container	Gilliam	AL	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27114	Bellflower (<i>Campanula</i> sp.)	Field Container	Peachey	OR	2013	Over the top	Slight to moderate injury increasing with rates (150, 300 and 600 lb per acre) applied twice; slight growth reduction with 4X.
27114	Bellflower (<i>Campanula</i> sp.) 'Blue Uniform'	Field Container	Boydston	WA	2008	Over the top	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	Over the top	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight to moderate growth reduction increasing with rates.
26430	Canna (<i>Canna</i> sp.) <i>C. indica</i>	Field Container	Lieth	CA	2009	Over the top	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.

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26430	Canna (Canna sp.) C. 'Robert Kent'	Field Container	Derr	VA	2010	Over the top	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 (Canna sp.) C. x generalis 'Ermine'	Field Container	Stamps	FL	2009	Over the top	No significant injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre; no significant growth reduction.
26430	Canna (Canna 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.
28706	Sedge, Grassland (Carex divulsa)	Field Container	Wilen	CA	2009	Over the top	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 (Carex divulsa)	Field Container	Wilen	CA	2010	Over the top	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.
28706	Sedge, Grassland (Carex divulsa) C. oshimensis 'Evergold'	Field Container	Boydston	WA	2010	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre but data inconclusive due to variability.
28179	Madagascar Periwinkle (Catharanthus roseus)	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	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	Madagascar Periwinkle (Catharanthus roseus)	Field Container	Gilliam	AL	2009	Over the top	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	Madagascar Periwinkle (Catharanthus roseus)	Field Container	Lieth	CA	2012	Over the top	No significant injury but severe growth reduction with 150, 300 and 600 lb per acre applied twice.
28179	Madagascar Periwinkle (Catharanthus roseus) 'Titan White'	Field Container	Trader	MS	2009	Over the top	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 (Ceanothus maritimus)	Field Container	Grunwald	OR	2010	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
28730	Ceanothus, Maritime (Ceanothus maritimus) C. maritimus 'Dark Star'	Field Container	Wilen	CA	2010	Over the top	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.
28730	Ceanothus, Maritime (Ceanothus maritimus) C. maritimus '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.
26234	Ceanothus (Ceanothus sp.) C. x pal. 'Marie bleu'	Field Container	Mathers (OSU)	MI	2010	Over the top	Spring Meadow: Moderate crop injury at high rates (5.3-10.6 lb ai per acre).
26234	Ceanothus (Ceanothus sp.) 'Concha'	Field Container	Wilen	CA	2009	Over the top	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.
26234	Ceanothus (Ceanothus sp.) 'Victoria'	Field Container	Uber	CA	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
28734	Wild Lilac (Ceanothus x pallida) C. '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.
28734	Wild Lilac (Ceanothus x pallida) C. x pallida '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 (Ceanothus x pallida) 'Marie Simon'	Field Container	Grunwald	OR	2010	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
28175	Cedar, Atlas (Cedrus atlantica)	Field Container	Freiberger	NJ	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27397	Red Bud, Eastern (Cercis canadensis)	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27397	Red Bud, Eastern (Cercis canadensis)	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27397	Red Bud, Eastern (Cercis canadensis)	Field Container	Freiberger	NJ	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27397	Red Bud, Eastern (Cercis canadensis) C. chinensis 'Avondale'	Field Container	Mathers (OSU)	OH	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28181	Cedar (Chamaecyparis sp.)	Field Container	Reding	OH	2009	Over the top	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
28181	Cedar (Chamaecyparis 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.
28181	Cedar (Chamaecyparis sp.) C. 'Golden spangel'	Field Container	Mathers (OSU)	MI	2010	Over the top	Lincoln: No crop injury at 2.65, 5.3, and 10.6 lb ai per acre.
28181	Cedar (Chamaecyparis sp.) C. 'Golden spangel'	Field Container	Mathers (OSU)	MI	2010	Over the top	Spring Meadow: No crop injury at 2.65, 5.3, and 10.6 lb ai per acre.
28181	Cedar (Chamaecyparis sp.) C. pisifer 'Filifera Golden Mop'	Field Container	Mathers (OSU)	OH	2010	Over the top	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 (Chamaecyparis sp.) C. thyoides	Field Container	Neal	NC	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27398	Turtlehead, Snakehead (Chelone 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 (Chelone sp.) C. lyonii 'Hot Lips'	Field Container	Neal	NC	2008	Over the top	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 (Chelone sp.) C. lyonii 'Hot Lips'	Field Container	Senesac	NY	2009	Over the top	Slight injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
26247	Hardy Mum (Chrysanthemum/Dendranthema x morifolium)	Field Container	Klett	CO	2009	Over the top	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26247	Hardy Mum (Chrysanthemum/Dendranthema x morifolium)	Field Container	Klett	CO	2009	Over the top	Trial 2: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26247	Hardy Mum (Chrysanthemum/Dendranthema x morifolium) 'Dazzler Stacy'	Field Container	Derr	VA	2007	Over the top	3-7 % injury at 2.63, 5.25 and 10.5 lb ai per acre; 100 % control of rice flatsedge and fragrant flatsedge.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26247	Hardy Mum (Chrysanthemum/Dendranthema x morifolium) 'Sheffield Pink'	Field Container	Czarnota	GA	2007	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
27399	Golden Star (Chrysogonum virginianum) C. virginianum	Field Container	Klett	CO	2015	Over the top	No injury, but severe stunting, with 5.25, 10.5 and 21 lb ai per acre applied twice.
27399	Golden Star (Chrysogonum virginianum) C. virginianum var. australe	Field Container	Senesac	NY	2009	Over the top	Slight injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
26317	Yellowwood (Cladrastis sp.) C. Kentuckea	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 (Cladrastis sp.) C. kentuckea	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre; no reduction in marketability.
26317	Yellowwood (Cladrastis sp.) C. kentuckea	Field Container	Freiberger	NJ	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight after 2nd application.
26317	Yellowwood (Cladrastis sp.) C. kentuckea	Field Container	Reding	OH	2010	Broadcast	Significant injury with 2.65, 5.3 and 10.6 lb ai per acre after each application.
26317	Yellowwood (Cladrastis sp.) C. lutea	Field Container	Beste/Frank (ARS)	MD	2010	Over the top	No significant differences in phytotoxicity or growth with one or two applications at 2.65, 5.3 or 10.65 lb ai per acre.
27116	Leather Flower (Clematis sp.)	Field Container	Derr	VA	2008	Over the top	No injury at 150, 300 and 600 lb product per acre.
27116	Leather Flower (Clematis sp.) 'ASAO' and 'Nellie Moser'	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants saleable.
27116	Leather Flower (Clematis sp.) C. integrifolia	Field Container	Klett	CO	2008	Over the top	Trial 1: No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction
27116	Leather Flower (Clematis sp.) C. integrifolia	Field Container	Klett	CO	2008	Over the top	Trial 2: No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27116	Leather Flower (Clematis sp.) C. integrifolia	Field Container	Klett	CO	2009	Over the top	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27116	Leather Flower (Clematis sp.) C. integrifolia	Field Container	Klett	CO	2009	Over the top	Trial 2: No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27116	Leather Flower (Clematis sp.) 'Ramona'	Field Container	Stamps	FL	2009	Over the top	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; no growth reduction.
27121	Costal Sweetpepperbush (Clethra alnifolia)	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	Costal Sweetpepperbush (Clethra alnifolia)	Field Container	Reding	OH	2010	Over the top	Significant crop injury at 2.65, 5.3 and 10.6 lb ai per acre; plants not marketable.
27121	Costal Sweetpepperbush (Clethra alnifolia) C. alnifolia	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	Costal Sweetpepperbush (Clethra alnifolia) C. alnifolia 'Sixteen Candles'	Field Container	Neal	NC	2010	Broadcast	No crop injury during first 6 weeks but second applicaiaon caused significant injury (stunting) with 2.65, 5.3 and 10.6 lb ai per acre; some girdling at soil line with 4x rate.
26219	Tickseed (Coreopsis sp.) C. auriculata 'Nana'	Field Container	Boydston	WA	2007	Over the top	Significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; most treated plants not saleable.

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26219	Tickseed (<i>Coreopsis</i> sp.) <i>C. auriculata</i> 'Zamphir'	Field Container	Fraelich	GA	2008	Over the top	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	Over the top	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	Over the top	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	Over the top	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	Over the top	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	Over the top	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>)	Field Container	Beste/Frank (ARS)	MD	2010	Over the top	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	Over the top	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	Over the top	Ohio: Minor crop injury at 2.65 and 5.3 lb ai per acre; moderate crop injury at 10.6 lb ai per acre.
28861	Dogwood, Kousa (<i>Cornus kousa</i>) 'Chinensis'	Field Container	Beste/Frank (ARS)	MD	2009	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
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.)	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. 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.) <i>C. sp. 'Rosea'</i>	Field Container	Reding	OH	2010	Over the top	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. apiculatus</i>	Field Container	Reding	OH	2008	Over the top	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	Over the top	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre; significant growth reduction at 4X.
27131	Cotoneaster (<i>Cotoneaster</i> sp.) <i>C. horizontalis</i> 'Perpusillus'	Field Container	Lieth	CA	2008	Over the top	No injury but unacceptable growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.

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31112	Pygmyweed (Crassula sp.) C. capitella 'Campfire'	Field Container	Senesac	NY	2017	Over the top	No injury with 2.65, minor to moderate with 5.3 and 10.6 lb ai per acre applied twice.
31112	Pygmyweed (Crassula sp.) C. radicans 'Red Carpet'	Field Container	Aulakh	CT	2017	Over the top	Minor injury, discoloration and stunting with 150, moderate with 300 and 600 lb per acre applied twice.
27136	Hawthorn (Crataegus sp.) C. coccinoid	Field Container	Freiberger	NJ	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27136	Hawthorn (Crataegus sp.) C. crugalli	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. phaenopyrum	Field Container	Reding	OH	2010	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27141	Japanese Cedar (Cryptomeria japonica) 'Black Dragon'	Field Container	Neal	NC	2009	Over the top	No injury at 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	Over the top	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) 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.
27141	Japanese Cedar (Cryptomeria japonica) 'Yoshino'	Field Container	Czarnota	GA	2009	Over the top	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
28180	Cypress, Leyland (Cupressocyparis leylandii)	Field Container	Czarnota	GA	2009	Over the top	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
28180	Cypress, Leyland (Cupressocyparis leylandii)	Field Container	Neal	NC	2010	Broadcast	No crop injury with any rate during the evaluation period.
28180	Cypress, Leyland (Cupressocyparis leylandii)	Field Container	Uber	CA	2010	Over the top	No crop injury with two applications at 2.65, 5.3 and 10.6 lb ai per acre.
31113	Delosperma (Delosperma sp.) D. cooperi	Field Container	Derr	VA	2017	Over the top	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	Over the top	Minor injury with 2.65 and 5.3 and 10.6 lb ai per acre applied twice.
26241	Pink (Dianthus sp.) D. gratianopolitanus 'Bath's Pink'	Field Container	Reding	OH	2007	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26241	Pink (Dianthus sp.) D. gratianopolitanus 'Firewitch'	Field Container	Mathers (OSU)	OH	2007	Over the top	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.) 'Firewitch'	Field Container	Boydston	WA	2007	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.
31853	Distylium (Distylium sp.)	Field Container	Witcher	TN	2017	Over the top	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	Over the top	Severe injury (foliar necrosis) with 150, 300 and 600 lb per acre applied twice.
29650	Fern, Autumn (Dryopteris erythrosora)	Field Container	Neal	NC	2013	Over the top	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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.

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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) 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 tasselflower
31219	Echeveria (Echeveria sp.) 'Blue 2'	Field Container	Wilen	CA	2016	Over the top	Moderate to severe injury increasing with rates (150, 300 and 600 lb per acre) applied twice.
31219	Echeveria (Echeveria sp.) E. shaviana 'Black Prince'	Field Container	Senesac	NY	2017	Over the top	Minor injury with 2.65 and 5.3, moderate with 10.6 lb ai per acre applied twice.
26355	Purple Coneflower (Echinacea sp.)	Field Container	Trader	MS	2007	Over the top	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	Field Container	Klett	CO	2007	Over the top	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	Over the top	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	Over the top	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.) 'Magnus'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28710	Hummingbird Trumpet (Epilobium canum)	Field Container	Klett	CO	2015	Over the top	plants failed to thrive
28710	Hummingbird Trumpet (Epilobium canum)	Field Container	Wilen	CA	2009	Over the top	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	Burning Bush (Euonymus alatus) E. fortunei 'Coloratus'	Field Container	Williams	IL	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; slight width reduction
26439	Thoroughwort (Eupatorium sp.) E. hyssopifolium	Field Container	Senesac	NY	2009	Over the top	Slight injury at 2.65, moderate at 5.3 and 10.6 lb ai per acre.
26439	Thoroughwort (Eupatorium sp.) E. hyssopifolium	Field Container	Senesac	NY	2011	Broadcast	No crop injury with two applications at 2.65, 5.3 or 10.6 lb aia.
26439	Thoroughwort (Eupatorium sp.) E. rugosum 'Chocolate'	Field Container	Boydston	WA	2010	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
26439	Thoroughwort (Eupatorium sp.) E. rugosum 'Chocolate Bonaset'	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27274	Beech (Fagus sp.)	Field Container	Cochran	IA	2016	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27274	Beech (Fagus sp.) F. sylvatica	Field Container	Gilliam	AL	2016	Over the top	Unacceptable injury, although not significant from untreated check, with 150, 300 and 600 lb per acre applied twice.
26208	Field Fescue (Festuca glauca)	Field Container	Klett	CO	2007	Over the top	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.

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26208	Field Fescue (<i>Festuca glauca</i>)	Field Container	Klett	CO	2007	Over the top	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>)	Field Container	Trader	MS	2007	Over the top	Some injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26208	Field Fescue (<i>Festuca glauca</i>) 'Elijah Blue'	Field Container	Boydston	WA	2007	Over the top	Unacceptable injury (leaf necrosis) and stunting at 2.65, 5.3 and 10.6 lb ai per acre.
28176	Forsythia (<i>Forsythia</i> sp.)	Field Container	Uber	CA	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28176	Forsythia (<i>Forsythia</i> sp.) F. hybrid 'Golden Peep'	Field Container	Czarnota	GA	2009	Over the top	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
28176	Forsythia (<i>Forsythia</i> sp.) F. x intermedia 'Golden Bell'	Field Container	Mickelbart	IN	2008	Over the top	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.) Forsythia x.'Meadowlark'	Field Container	Mathers (OSU)	OH	2009	Over the top	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.
28182	Dwarf Fothergilla (<i>Fothergilla gardenii</i>)	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 (<i>Fothergilla gardenii</i>)	Field Container	Reding	OH	2010	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
28182	Dwarf Fothergilla (<i>Fothergilla gardenii</i>) F. hybrid 'Mt. Airy'	Field Container	Czarnota	GA	2009	Over the top	No significant injury at 2.65, 5.25 and 10.5 lb ai per acre.
28182	Dwarf Fothergilla (<i>Fothergilla gardenii</i>) F. major '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.
26259	Ash (<i>Fraxinus</i> sp.) F. americana	Field In-Ground	Beste/Frank (ARS)	MD	2007	Over the top	No significant injury or height reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
31340	Ash (<i>Fraxinus</i> sp.) F. arizonica	Field Container	Uber	CA	2012	Over the top	No injury or growth reduction with 150, acceptable with 300 and 600 lb per acre, applied twice.
26259	Ash (<i>Fraxinus</i> sp.) F. pennsylvanica	Field In-Ground	Beste/Frank (ARS)	MD	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26442	Blanket Flower (<i>Gaillardia</i> sp.) G. aristata 'Arizona Sun'	Field Container	Klett	CO	2016	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26442	Blanket Flower (<i>Gaillardia</i> sp.) G. grandiflora 'Arizona Red Shades'	Field Container	Reding	OH	2015	Over the top	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.
26442	Blanket Flower (<i>Gaillardia</i> sp.) G. x grandiflora 'Goblin'	Field Container	DeFrancesco	OR	2015	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26442	Blanket Flower (<i>Gaillardia</i> sp.) G. x grandiflora 'Oranges & Lemons'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	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.
31114	Gardenia (<i>Gardenia</i> sp.) G. jasminoides 'Buttons'	Field Container	Gilliam	AL	2017	Over the top	No significant injury or growth reduction with 150 and 300, moderate with 600 lb per acre applied twice.
31114	Gardenia (<i>Gardenia</i> sp.) G. jasminoides 'Radicans'	Field Container	Gilliam	AL	2017	Over the top	No to minor injury with 150, 300 and 600 lb per acre applied twice; moderate growth reduction with 4X.
26244	Beeblossom, Lindheimer's (<i>Gaura lindheimeri</i>)	Field Container	Boydston	WA	2007	Over the top	Slight transient injury at 2.65, 5.3 and 10.6 lb ai per acre.

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26244	Beeblossom, Lindheimer's (Gaura lindheimeri)	Field Container	Klett	CO	2009	Over the top	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	Over the top	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	Over the top	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.
26244	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Pink Fountain'	Field Container	Boydston	WA	2012	Over the top	Slight, but not significant, 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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27400	Gazania (Gazania sp.)	Field Container	Lieth	CA	2012	Over the top	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	Over the top	Significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre; plants not marketable.
27400	Gazania (Gazania sp.) G. rigens 'Daybreak Yellow'	Field Container	Beste/Frank (ARS)	MD	2010	Over the top	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	Over the top	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.) G. splendens 'Kiss Lemon Shades'	Field Container	Senesac	NY	2009	Over the top	No injury at 2.65, slight at 5.3 and 10.6 lb ai per acre.
27150	Gladiolus (Gladiolus sp.)	Field Container	Reding	OH	2010	Over the top	No crop injury with 2.65, 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	Over the top	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.) 'Giamini Charlotte'	Field Container	Senesac	NY	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight injury after 2nd application.
27152	Locust (Gleditsia sp.) C. tiacanthos L. 'Inermis'	Field Container	Beste/Frank (ARS)	MD	2010	Over the top	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.) 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	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
26231	Locust (Gleditsia sp.) G. triacanthos	Field In-Ground	Beste/Frank (ARS)	MD	2007	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27152	Locust (Gleditsia sp.) Gleditsia triacanthos	Field Container	Mathers (OSU)	OH	2009	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26446	Sunflower (Helianthus sp.) H. microcephalus 'Lemon Queen'	Field Container	Senesac	NY	2009	Over the top	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
26446	Sunflower (Helianthus sp.) H. salicifolius 'Low Down'	Field Container	Klett	CO	2012	Over the top	Moderate to severe injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26446	Sunflower (Helianthus sp.) 'Table Mountain'	Field Container	Trader	MS	2009	Over the top	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	Over the top	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.) H. hemerocallis 'Better Believe It'	Field Container	Reding	OH	2007	Over the top	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.) H. hybrida 'Stella D'Oro'	Field Container	Whitwell	SC	2007	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26343	Daylily (Hemerocallis sp.) 'Second Glance'	Field Container	Lieth	CA	2007	Over the top	Unacceptable injury at 2.65, 5.3 and 2.6 lb ai per acre.
26343	Daylily (Hemerocallis sp.) 'Stella d'Oro'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28742	Toyon (Heteromeles arbutifolia)	Field Container	Wilen	CA	2009	Over the top	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. americana 'Chatterbox'	Field Container	Reding	OH	2008	Over the top	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	Over the top	No injury or growth reduction at 2.63, 5.25 and 10.5 lb ai per acre.
27156	Alumroot (Heuchera sp.) H. micrantha var diversifolia 'Purple Palace'	Field Container	Boydston	WA	2008	Over the top	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.
26299	Rosemallow (Hibiscus sp.) H. rosasinensis 'Fire-N-Ice'	Field Container	Stamps	FL	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
26299	Rosemallow (Hibiscus sp.) H. syriacus	Field Container	Knox	FL	2009	Over the top	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. syriacus 'Aphrodite'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	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	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26299	Rosemallow (Hibiscus sp.) 'Rose Queen'	Field Container	Wade	SC	2009	Over the top	No injury or significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26299	Rosemallow (Hibiscus sp.) 'White Wing'	Field Container	Uber	CA	2009	Over the top	Moderate injury (chlorosis and stunting) at 2.65, 5.3 and 10.6 lb ai per acre.
26262	Plantain Lily (Hosta sp.)	Field Container	Harvey	WA	2007	Over the top	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.

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26262	Plantain Lily (Hosta sp.) H. sieboldiana	Field Container	Regan	OR	2007	Over the top	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.
26262	Plantain Lily (Hosta sp.) H. sieboldiana 'Frances Williams'	Field Container	Reding	OH	2007	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26262	Plantain Lily (Hosta sp.) 'Honey Bells'	Field Container	Gilliam	AL	2007	Over the top	No injury or 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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
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.) 'Angel Robe'	Field Container	Lieth	CA	2007	Over the top	Minor visible injury and moderate growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Czarnota	GA	2007	Over the top	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 'Endless Summer'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Nikko Blue'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	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	Fraelich	GA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26251	Hydrangea (Hydrangea sp.) H. macrophylla 'Pink Shira'	Field Container	Reding	OH	2007	Over the top	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. paniculata 'PeeGee'	Field Container	Mickelbart	IN	2008	Over the top	No injury at 2.65, 5.3, 10.6 lb ai per acre with single application 3 weeks after transplanting.
31115	Candytuft (Iberis sp.) 'Candytuft'	Field Container	Boydston	WA	2013	Over the top	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.) I. sempervirens	Field Container	Uber	CA	2013	Over the top	Severe injury with 150, 300 and 600 lb per acre applied twice.
31115	Candytuft (Iberis sp.) Iberis sempervirens	Field Container	Klett	CO	2013	Over the top	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight to severe growth reduction increasing with rates.
26332	Holly (Ilex sp.) 'Conaf'	Field Container	Czarnota	GA	2007	Over the top	Virtually 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	Over the top	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	Over the top	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	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26332	Holly (Ilex sp.) I. crenata 'Compacta'	Field Container	Wade	SC	2007	Over the top	No 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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27401	Impatiens, New Guinea (Impatiens hawkeri)	Field Container	Lieth	CA	2008	Over the top	Unacceptable injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.

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27401	Impatiens, New Guinea (Impatiens hawkeri)	Field Container	Reding	OH	2010	Over the top	No significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre but significant reduction in growth.
27401	Impatiens, New Guinea (Impatiens hawkeri) I. hawkeri 'Clebrette Purple'	Field Container	Senesac	NY	2010	Over the top	Slight to moderate injury with 2.65, 5.3, 10.6 lb ai per acre.
27401	Impatiens, New Guinea (Impatiens hawkeri) I. wallerana 'Sonic Lilac'	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	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.
27402	Morning Glory (Ipomoea sp.)	Field Container	Lieth	CA	2012	Over the top	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	Over the top	Slight to moderate injury with 2.65, 5.3 and 10.6 lb ai per acre.
27402	Morning Glory (Ipomoea sp.) I. batata 'Marguerite'	Field Container	Klett	CO	2010	Over the top	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	Over the top	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.
26349	Iris (Iris sp.)	Field Container	Harvey	WA	2007	Over the top	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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26349	Iris (Iris sp.) 'Yellow Flag'	Field Container	Gilliam	AL	2007	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28183	Virginia Sweetspire (Itea virginica)	Field Container	Neal	NC	2009	Over the top	No significant injury at 2.65 and 5.3, moderate at 10.6 lb ai per acre.
28183	Virginia Sweetspire (Itea virginica) 'Henry's Garnet'	Field Container	Beste/Frank (ARS)	MD	2009	Over the top	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	Over the top	No significant injury at 2.65, 5.25 and 10.5 lb ai per acre.
26269	Juniper (Juniperus sp.)	Field Container	Harvey	WA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26269	Juniper (Juniperus sp.) J. chinensis 'Sea Green'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	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.) J. chinensis 'Sea Green'	Field Container	Mickelbart	IN	2008	Over the top	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	Over the top	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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26269	Juniper (Juniperus sp.) J. squamata 'Blue Star'	Field Container	Ahrens/Mervosh	CT	2007	Over the top	No injury at 2.63, 5.25 and 10.5 lb ai per acre.

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28177	Laurel, Mountain (<i>Kalmia</i> sp.) <i>K. latifolia</i> 'Raspberry Glow'	Field Container	Senesac	NY	2017	Over the top	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	Over the top	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	Over the top	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>) <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>)	Field Container	Fraelich	GA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26340	Crape Myrtle (<i>Lagerstroemia indica</i>) 'Catawea'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26340	Crape Myrtle (<i>Lagerstroemia indica</i>) 'Dynamite'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	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>) <i>L. x 'Muskogee'</i>	Field Container	Neal	NC	2007	Over the top	No injury at 2.65 and 5.3, slight at 10.6 lb ai per acre after 1st application; no injury after 2nd application.
27278	Dead Nettle (<i>Lamium</i> sp.) <i>L. galeobdolon</i>	Field Container	Lieth	CA	2008	Over the top	Unacceptable injury and growth reduction 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	Over the top	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	Over the top	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. maculatum</i> 'Red Nancy'	Field Container	Boydston	WA	2008	Over the top	Data not useful because of injury from early season cold weather and transplant shock.
26352	Lantana (<i>Lantana</i> sp.)	Field Container	Harvey	WA	2007	Over the top	No injury 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	Over the top	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	Over the top	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	Over the top	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. kaempferi</i>	Field Container	Persad	OH	2016	Over the top	No significant injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
28172	Larch (<i>Larix</i> sp.) <i>L. laricina</i>	Field Container	Freiberger	NJ	2009	Over the top	No injury at 2.65 and 5.3, slight at 10.6 lb ai per acre..
27170	Lavender (<i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Hicote Blue'	Field Container	Klett	CO	2009	Over the top	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	Over the top	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> 'Hidcote'	Field Container	Boydston	WA	2008	Over the top	No significant injury at 2.65, slight at 5.3 and 10.6 lb ai per acre; no growth reduction; all plants marketable.
27170	Lavender (<i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Hidcote'	Field Container	Boydston	WA	2009	Over the top	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> 'Munstead'	Field Container	Neal	NC	2009	Over the top	Unacceptable injury at 2.65, 5.3 and 10.6 lb ai per acre.

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27170	Lavender (<i>Lavandula</i> sp.) <i>L. angustifolia</i> 'Munstead'	Field Container	Trader	MS	2009	Over the top	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	Over the top	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>) <i>Chrysanthemum x superbum</i> 'Becky'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	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	Over the top	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>) <i>L. x superbum</i> 'Daisy'	Field Container	Senesac	NY	2009	Over the top	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
27175	Doghobble (<i>Leucothoe</i> sp.) <i>L. axillaris</i>	Field Container	Gilliam	AL	2015	Over the top	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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27175	Doghobble (<i>Leucothoe</i> sp.) 'Rainbow'	Field Container	Aulakh	CT	2016	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
26448	Blazing-Star (<i>Liatris</i> sp.) <i>L. spicata</i> 'Kobold'	Field Container	Boydston	WA	2008	Over the top	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	Over the top	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	Over the top	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	Over the top	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.
27405	Privet (<i>Ligustrum</i> sp.) <i>L. japonicum</i>	Field Container	Knox	FL	2009	Over the top	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	Over the top	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	Over the top	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
27405	Privet (<i>Ligustrum</i> sp.) <i>L. vulgare</i>	Field Container	Freiberger	NJ	2009	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26433	Lilyturf (<i>Liriope</i> sp.) <i>L. muscari</i> 'Big Blue'	Field Container	Fraelich	GA	2008	Over the top	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	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.

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26433	Lilyturf (Liriope sp.) L. spicata	Field Container	Reding	OH	2008	Over the top	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
26433	Lilyturf (Liriope sp.) Muscari sp. 'Big Blue'	Field Container	Boydston	WA	2008	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.
27406	Lobelia (Lobelia sp.)	Field Container	Lieth	CA	2012	Over the top	No significant injury but severe growth reduction with 150, 300 and 600 lb per acre applied twice.
27406	Lobelia (Lobelia sp.)	Field Container	Reding	OH	2010	Over the top	Significant crop injury with 2.65, 5.3 and 10.6 lb ai per acre; plants not marketable.
27406	Lobelia (Lobelia sp.) L. cardinalis	Field Container	Senesac	NY	2009	Over the top	Slight to severe injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre).
27406	Lobelia (Lobelia sp.) L. fulgens 'Queen Victoria'	Field Container	Boydston	WA	2009	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27406	Lobelia (Lobelia sp.) L. fulgens 'Queen Victoria'	Field Container	Boydston	WA	2010	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction; all treated plants saleable.
27829	Sweet Alyssum (Lobularia maritima)	Field Container	Fraelich	GA	2007	Over the top	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 (Lobularia maritima)	Field Container	Lieth	CA	2008	Over the top	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 (Lobularia maritima)	Field Container	Lieth	CA	2012	Over the top	No significant injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
26328	Loropetalum (Loropetalum sp.) L. chinense rubrum	Field Container	Czarnota	GA	2007	Over the top	Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre.
26328	Loropetalum (Loropetalum sp.) L. chinense rubrum	Field Container	Czarnota	GA	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26328	Loropetalum (Loropetalum sp.) L. chinense var rubrum 'Burgundy'	Field Container	Derr	VA	2009	Over the top	No injury or growth reduction at 2.63, 5.25 and 10.6 lb ai per acre.
26328	Loropetalum (Loropetalum sp.) L. chinensis 'Ruby'	Field Container	Neal	NC	2007	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
26328	Loropetalum (Loropetalum sp.) L. chinensis 'Ruby'	Field Container	Neal	NC	2009	Over the top	No significant injury at 2.65 and 5.3, slight stunting at 10.6 lb ai per acre.
26313	Magnolia (Magnolia sp.)	Field Container	Fraelich	GA	2007	Over the top	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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26313	Magnolia (Magnolia sp.) M. stellata 'Centennial'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; plants marketable.
27407	Barberry, Hollyleaved (Mahonia aquifolium)	Field Container	Beste/Frank (ARS)	MD	2009	Over the top	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	Over the top	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	Over the top	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	Over the top	No impact on plant growth and no crop injury observed with two application 2.65, 5.3, and 10.6 lb ai per acre.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27186	Apple (Malus sp.)	Field Container	Reding	OH	2009	Over the top	No injury and no significant difference in growth or marketability with 2.65, 5.3 and 10.6 lb ai per acre.
27186	Apple (Malus sp.) M. domestica	Field Container	Mathers (OSU)	OH	2008	Over the top	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	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27279	Tenweeks Stock (Matthiola incana)	Field Container	Klett	CO	2011	Over the top	Trial 2: Reduction in dry mass for plants treated 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	Over the top	Severe injury and growth reduction increasing with rates (150, 300 and 600 lb ai per acre) applied twice.
27279	Tenweeks Stock (Matthiola incana) M. 'Cherry Blossom'	Field Container	Klett	CO	2011	Over the top	Trial 1: Reduction in dry mass for plants treated with 0.375,0.75 and 1.5 lb ai per acre compared to the control.
26211	Silver Grass (Miscanthus sp.)	Field Container	Trader	MS	2007	Over the top	Slight injury and no growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26211	Silver Grass (Miscanthus sp.) M. sinensis 'Purpurascens'	Field Container	Boydston	WA	2007	Over the top	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	Over the top	Minor injury after the 2nd application and no significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
28185	Muhly, Hairawn (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, Hairawn (Muhlenbergia capillaris)	Field Container	Stamps	FL	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
28185	Muhly, Hairawn (Muhlenbergia capillaris)	Field Container	Uber	CA	2009	Over the top	No injury at 2.65, slight (delayed flowering and stunting) at 5.3 and 10.6 lb ai per acre.
28714	Pine Muhly (Muhlenbergia dubia)	Field Container	Klett	CO	2013	Over the top	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 (Muhlenbergia dubia)	Field Container	Wilen	CA	2009	Over the top	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 (Nepeta cataria) N. cataria	Field Container	Lieth	CA	2009	Over the top	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.
27194	Catnip (Nepeta cataria) N. grandiflora 'Dusk-to-Dawn'	Field Container	Boydston	WA	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27194	Catnip (Nepeta cataria) 'Psfike'	Field Container	Klett	CO	2008	Over the top	Trial 1: No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 4X.
27194	Catnip (Nepeta cataria) 'Psfike'	Field Container	Klett	CO	2008	Over the top	Trial 2: Slight injury (minor chlorosis) at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction.
27199	Nepeta (Nepeta x faassenii)	Field Container	Lieth	CA	2008	Over the top	Significant injury and unacceptable growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27199	Nepeta (Nepeta x faassenii) 'Walker's Low'	Field Container	Klett	CO	2009	Over the top	Trial 1: No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27199	Nepeta (Nepeta x faassenii) 'Walker's Low'	Field Container	Klett	CO	2009	Over the top	Trial 2: No 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
27199	Nepeta (Nepeta x faassenii) 'Walker's Low'	Field Container	Senesac	NY	2008	Over the top	Slight injury at 2.63, moderate at 5.25 and 10.5 lb ai per acre
27199	Nepeta (Nepeta x faassenii) 'Walkers Low'	Field Container	Boydston	WA	2009	Over the top	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 (Oenothera sp.) O. berlandiera	Field Container	Neal	NC	2008	Over the top	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 (Oenothera sp.) O. berlandieri 'Siskiyou'	Field Container	Boydston	WA	2009	Over the top	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 (Oenothera sp.) O. fruticosa	Field Container	Neal	NC	2008	Over the top	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 (Oenothera sp.) O. speciosa	Field Container	Senesac	NY	2009	Over the top	Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre.
26436	Mondo Grass, Lilyturf, Ker-Gawl (Ophiopogon sp.) O. japonica	Field Container	Wilén	CA	2012	Over the top	Slight, acceptable injury with 150, 300 and 600 lb per acre applied twice; no growth reduction.
26436	Mondo Grass, Lilyturf, Ker-Gawl (Ophiopogon sp.) O. japonicas	Field Container	Czarnota	GA	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26436	Mondo Grass, Lilyturf, Ker-Gawl (Ophiopogon sp.) O. japonicus 'Nana'	Field Container	Senesac	NY	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27409	Holly Olive (Osmanthus heterophyllus) Holly Olive; False	Field Container	Czarnota	GA	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27409	Holly Olive (Osmanthus heterophyllus) O. fragrans	Field Container	Gilliam	AL	2013	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
31344	Fern, Royal (Osmunda regalis)	Field Container	Neal	NC	2013	Over the top	Moderate injury (foliar necrosis) with 150, severe with 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.
27387	Sourwood, Sorrel Tree (Oxydendrum arboreum)	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	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)	Field Container	Boydston	WA	2010	Over the top	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) 'Green Sheen'	Field Container	Boydston	WA	2009	Over the top	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) P. terminalis 'Green Sheen'	Field Container	Lieth	CA	2009	Over the top	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 'Edulis Superba'	Field Container	Senesac	NY	2016	Over the top	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
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.
29083	Peony (Paeonia sp.) P. sp. 'Dr. Alex Fleming'	Field Container	Reding	OH	2010	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.

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31934	Peony (<i>Paeonia</i> sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2015	Over the top	No injury with 150, 300 and 600 lb per acre applied twice.
31934	Peony (<i>Paeonia</i> sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2016	Over the top	No injury or reduction of flower numbers with 150, 300 and 600 lb per acre applied twice.
27203	Crimson Fountain Grass (<i>Pennisetum setaceum</i>)	Field Container	Klett	CO	2009	Over the top	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 (<i>Pennisetum setaceum</i>)	Field Container	Klett	CO	2009	Over the top	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 (<i>Pennisetum setaceum</i>)	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 (<i>Pennisetum setaceum</i>)	Field Container	Reding	OH	2010	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27203	Crimson Fountain Grass (<i>Pennisetum setaceum</i>) P. setaceum 'Rubrum'	Field Container	Senesac	NY	2010	Over the top	Significant injury with 2.65, 5.3 and 10.6 lb ai per acre.
31116	Beard-Tongue (<i>Penstemon</i> sp.) 'Dark Towers'	Field Container	Klett	CO	2016	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
31116	Beard-Tongue (<i>Penstemon</i> sp.) 'Husker Red'	Field Container	Mathers	OH	2016	Over the top	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 (<i>Penstemon</i> sp.) P. confertus	Field Container	DeFrancesco	OR	2016	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
26346	Petunia (<i>Petunia</i> sp.)	Field Container	Fraelich	GA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26346	Petunia (<i>Petunia</i> sp.)	Field Container	Harvey	WA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26346	Petunia (<i>Petunia</i> sp.) 'Double Cascade Blue'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26346	Petunia (<i>Petunia</i> sp.) P. hybrida	Field Container	Reding	OH	2007	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
28738	Mock Orange (<i>Philadelphus</i> sp.)	Field Container	Reding	OH	2010	Over the top	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.
28738	Mock Orange (<i>Philadelphus</i> sp.) P. viginialis 'Snow Dwarf'	Field Container	Czarnota	GA	2009	Over the top	No significant injury at 2.65, 5.25 and 10.5 lb ai per acre.
27204	Carolinia Phlox (<i>Phlox carolinia</i>) P. carolina 'Miss Lingard'	Field Container	Reding	OH	2008	Over the top	No injury and no significant difference in growth or marketability at 2.65, 5.3 and 10.6 lb ai per acre.
27204	Carolinia Phlox (<i>Phlox carolinia</i>) P. paniculata 'Juliet'	Field Container	Fraelich	GA	2008	Over the top	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.
27204	Carolinia Phlox (<i>Phlox carolinia</i>) P. paniculata 'Purple Flame'	Field Container	Boydston	WA	2008	Over the top	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.
27204	Carolinia Phlox (<i>Phlox carolinia</i>) P. paniculata 'Robert Poore'	Field Container	Senesac	NY	2008	Over the top	Moderate injury and growth reduction at 2.63, 5.25 and 10.5 lb ai per acre

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26214	Phlox, Fall (Phlox paniculata)	Field Container	Boydston	WA	2007	Over the top	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) 'Sub Snowflake'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26365	Moss Phlox (Phlox subulata ssp. Australis) 'Emerald Blue'	Field Container	Senesac	NY	2008	Over the top	Moderate injury at 2.63, 5.25 and 10.5 lb ai per acre
26365	Moss Phlox (Phlox subulata ssp. Australis) 'Fort Hill'	Field Container	Boydston	WA	2008	Over the top	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	Moss Phlox (Phlox subulata ssp. Australis) P. subulata	Field Container	Harvey	WA	2008	Over the top	No injury at 2.65, minor stunting at 5.3 and 10.6 lb ai per acre
26365	Moss Phlox (Phlox subulata ssp. Australis) 'Red Wings'	Field Container	Fraelich	GA	2008	Over the top	No injury at 150, 300 and 600 lb per acre; slight stunting at 4X; all plants marketable
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	Over the top	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	Over the top	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.
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.
26545	Spruce (Picea sp.) P. glauca	Field In-Ground	Beste/Frank (ARS)	MD	2007	Over the top	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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26292	Spruce (Picea sp.) P. pungens	Field Container	Senesac	NY	2007	Over the top	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
26292	Spruce (Picea sp.) P. pungens gauca	Field Container	Reding	OH	2007	Over the top	No 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 'Mountain Fire'	Field Container	Trader	MS	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27210	Andromeda, Fetterbush (Pieris sp.) P. japonica 'Shojo'	Field Container	Senesac	NY	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27210	Andromeda, Fetterbush (Pieris sp.) P. japonica 'Dorothy Wycoff'	Field Container	Beste/Frank (ARS)	MD	2009	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
27215	Pine (Pinus sp.) P. eldarica	Field Container	Uber	CA	2009	Over the top	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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27215	Pine (Pinus sp.) P. mugo	Field Container	Harvey	WA	2008	Over the top	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	Over the top	No injury at 0.75, 1.5 and 3 lb ai per acre.
27215	Pine (Pinus sp.) P. strobisormis	Field Container	Boydston	WA	2010	Over the top	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.

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27215	Pine (Pinus sp.) P. strobus	Field Container	Senesac	NY	2008	Over the top	Slight injury at 2.63 and 5.25, moderate at 10.5 lb ai per acre.
27215	Pine (Pinus sp.) P. taeda	Field Container	Fraelich	GA	2009	Over the top	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. taeda	Field Container	Wade	SC	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
28232	Pine, Loblolly (Pinus taeda)	Field In-Ground	Beste/Frank (ARS)	MD	2011	Over the top	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)	Field In-Ground	Neal	NC	2015	Over the top	No injury or significant stunting with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
28232	Pine, Loblolly (Pinus taeda) P. palustris	Field In-Ground	Czarnota	GA	2013	Over the top	No significant injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
27410	Purslane (Portulaca sp.) 'Margarita Rosita'	Field Container	Mathers (OSU)	OH	2009	Over the top	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.
27410	Purslane (Portulaca sp.) P. grandiflora	Field Container	Lieth	CA	2009	Over the top	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.
27220	Cinquefoil (Potentilla sp.) P. fruticosa 'Goldfinger'	Field Container	Senesac	NY	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27220	Cinquefoil (Potentilla sp.) P. fruticosa 'Goldfinger'	Field Container	Uber	CA	2008	Over the top	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.
27220	Cinquefoil (Potentilla sp.) P. fruticosa 'Monsidh'	Field Container	Klett	CO	2008	Over the top	Trial 1: Virtually no injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27220	Cinquefoil (Potentilla sp.) P. fruticosa 'Monsidh'	Field Container	Klett	CO	2008	Over the top	Trial 2: No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
26223	Fir, Douglas (Pseudotsuga menziesii)	Field Container	Boydston	WA	2007	Over the top	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) 'Blue'	Field Container	Marshall	MI	2007	Over the top	No injury with single application at 2.65, 5.3 and 10.6 lb ai per acre.
26223	Fir, Douglas (Pseudotsuga menziesii) P. menziesii glauca	Field Container	Freiberger	NJ	2007	Over the top	No significant injury at 2.65, 5.3 and 10.6 lb ai per acre.
27411	Oak, Shumard Red (Quercus shumardii)	Field Container	Denny	MS	2013	Over the top	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	Over the top	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.

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27226	Oak (Quercus sp.) Q. alba	Field Container	Freiberger	NJ	2008	Directed	Virtually no injury at 2.65, slight at 5.3 and moderate at 10.6 lb ai per acre.
27226	Oak (Quercus sp.) Q. phellos	Field Container	Neal	NC	2015	Over the top	No injury or significant stunting with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27226	Oak (Quercus sp.) Q. rubra	Field Container	Beste/Frank (ARS)	MD	2009	Over the top	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. rubra	Field Container	Mathers (OSU)	OH	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27412	Oak, Southern Live (Quercus virginiana)	Field Container	Gilliam	AL	2017	Over the top	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	Over the top	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)	Field Container	Gilliam	AL	2008	Over the top	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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27231	Indian Hawthorn (Raphiolepis indica) R. umbellata 'Eleanor Taber'	Field Container	Czarnota	GA	2008	Over the top	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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26288	Azalea (Rhododendron sp.) 'Fashion'	Field Container	Fraelich	GA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26288	Azalea (Rhododendron sp.) 'Fashion'	Field Container	Neal	NC	2009	Over the top	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.) 'Gwenda'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26288	Azalea (Rhododendron sp.) 'Vulcan'	Field Container	Regan	OR	2007	Over the top	No injury at 2.65, minor at 5.3 and 10.6 lb ai per acre after the 2nd application; no growth reduction.
28718	Island Gooseberry (Ribes viburnifolium)	Field Container	Reding	OH	2011	Over the top	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	Over the top	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.) 'Nearly Wild'	Field Container	Czarnota	GA	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) 'Flower Carpet Red'	Field Container	Neal	NC	2007	Over the top	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	Over the top	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	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) 'Nearly Wild'	Field Container	Wade	SC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26199	Rose (Rosa sp.) R. meidomonac 'Bonica'	Field Container	Boydston	WA	2007	Over the top	No injury or significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
26451	Coneflower, Orange (<i>Rudbeckia fulgida</i> var. <i>speciosa</i>)	Field Container	Gilliam	AL	2013	Over the top	Unacceptable injury with 150, 300 and 600 lb per acre applied twice.
26451	Coneflower, Orange (<i>Rudbeckia fulgida</i> var. <i>speciosa</i>) 'Goldsturm'	Field Container	Boydston	WA	2013	Over the top	Moderate to severe injury increasing with rates (2.65, 5.3 and 10.6 lb ai per acre) applied twice; plants not saleable.
26451	Coneflower, Orange (<i>Rudbeckia fulgida</i> var. <i>speciosa</i>) R. <i>hirta</i>	Field Container	Klett	CO	2013	Over the top	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 (<i>Ruscus hypophyllum</i>)	Field Container	Stamps	FL	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
27427	Dwarf Palmetto (<i>Sabal minor</i>)	Field Container	Czarnota	GA	2013	Over the top	No significant injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
27427	Dwarf Palmetto (<i>Sabal minor</i>)	Field Container	Marble	FL	2015	Over the top	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
27427	Dwarf Palmetto (<i>Sabal minor</i>)	Field Container	Stamps	FL	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no growth reduction.
27427	Dwarf Palmetto (<i>Sabal minor</i>) Palmetto Palm	Field Container	Czarnota	GA	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
28184	Plumegrass, Sugarcane, Ravennagrass (<i>Saccharum</i> sp.) a.k.a <i>Saccharum ravennae</i>	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.
28184	Plumegrass, Sugarcane, Ravennagrass (<i>Saccharum</i> sp.) <i>Erianthus ravennae</i>	Field Container	Klett	CO	2013	Over the top	No injury with 2.65, 5.3 and 10.6 lb ai per acre applied twice; slight to moderate growth reduction increasing with rates.
30969	Scarlet Sage (<i>Salvia splendens</i>) S. <i>splendens</i> 'Bonfire'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	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 (<i>Salvia x sylvestris</i>) 'May Night'	Field Container	Beste/Frank (ARS)	MD	2012	Over the top	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 (<i>Salvia x sylvestris</i>) 'May Night'	Field Container	Derr	VA	2012	Over the top	Slight injury with 2.65, 5.3, 10.6 lb ai per acre applied twice.
26202	Woodland Sage (<i>Salvia x sylvestris</i>) 'May Night'	Field Container	Klett	CO	2007	Over the top	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 (<i>Salvia x sylvestris</i>) S. 'May Night'	Field Container	Williams	IL	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26202	Woodland Sage (<i>Salvia x sylvestris</i>) S. <i>nemorosa</i> 'Cardonna'	Field Container	Derr	VA	2007	Over the top	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 (<i>Salvia x sylvestris</i>) S. <i>nemorosa</i> 'May Night'	Field Container	Mathers (OSU)	OH	2007	Over the top	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 (<i>Salvia x sylvestris</i>) 'Snow Hill'	Field Container	Boydston	WA	2007	Over the top	Slight injury with complete recovery, no significant growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; treated plants saleable.

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27413	Elder, Elderberry (<i>Sambucus</i> sp.) <i>S. canadensis</i> 'Adams'	Field Container	Reding	OH	2015	Over the top	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	Elder, Elderberry (<i>Sambucus</i> sp.) <i>S. canadensis</i> 'Aurea'	Field Container	Czarnota	GA	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
27413	Elder, Elderberry (<i>Sambucus</i> sp.) <i>S. hybridus</i> 'Adams'	Field Container	Czarnota	GA	2013	Over the top	No significant injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
27413	Elder, Elderberry (<i>Sambucus</i> sp.) <i>S. nigra</i> 'Black Lace'	Field Container	Trader	MS	2008	Over the top	High injury at 2.65, 5.3 and 10.6 lb ai per acre.
27413	Elder, Elderberry (<i>Sambucus</i> sp.) <i>S. racemosa</i> 'Sutherland'	Field Container	Czarnota	GA	2012	Over the top	29-43 % injury with 150, 300 and 600 lb per acre applied twice.
26302	Pincushions (<i>Scabiosa</i> sp.)	Field Container	Boydston	WA	2007	Over the top	Unacceptable injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26302	Pincushions (<i>Scabiosa</i> sp.)	Field Container	Harvey	WA	2007	Over the top	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	Boydston	WA	2008	Over the top	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.) 'Butterfly Blue'	Field Container	Neal	NC	2008	Over the top	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 (<i>Scaevola</i> sp.)	Field Container	Wilen	CA	2012	Over the top	Severe injury with 150, 300 and 600 lb per acre applied twice; plant death at high rate.
27414	Naupaka (<i>Scaevola</i> sp.) <i>S. aemula</i> 'Scala Blue'	Field Container	Pemberton	TX	2012	Over the top	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 (<i>Scaevola</i> sp.) <i>S. aemula</i> 'Sky Blue'	Field Container	Senesac	NY	2010	Over the top	Moderate to severe injury with 2.65, 5.3 and 10.6 lb ai per acre.
27414	Naupaka (<i>Scaevola</i> sp.) <i>S. 'Cajun Blue'</i>	Field Container	Derr	VA	2010	Over the top	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
27244	Stonecrop (<i>Sedum</i> sp.)	Field Container	Neal	NC	2008	Over the top	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	Over the top	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> 'Fuldaglut'	Field Container	Boydston	WA	2008	Over the top	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.) <i>S. spurium</i> 'John Creech'	Field Container	Senesac	NY	2008	Over the top	Slight injury at 2.63 and 5.25, moderate at 10.5 lb ai per acre.
27244	Stonecrop (<i>Sedum</i> sp.) <i>S. x spectabile</i> 'Autumn Joy'	Field Container	Williams	IL	2008	Over the top	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 (<i>Solidago</i> sp.)	Field Container	Uber	CA	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; delayed flowering with full recovery after 2nd application.

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26454	Goldenrod (Solidago sp.) 'Little Lemon'	Field Container	Boydston	WA	2009	Over the top	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	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre after 1st, slight after 2nd application.
28467	Goldenrod, Autumn (Solidago sphacelata) 'Golden Fleece'	Field Container	Klett	CO	2010	Over the top	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	Over the top	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	Over the top	No injury or growth reduction at 2.63, 5.25 and 10.5 lb ai per acre.
26280	Bridal-Wreath (Spiraea sp.)	Field Container	Harvey	WA	2007	Over the top	Very slight injury only at 4X rate (10.6 lb ai per acre).
26280	Bridal-Wreath (Spiraea sp.) S. prunifolia	Field Container	Freiberger	NJ	2007	Over the top	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.) S. thunbergii	Field Container	Mickelbart	IN	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre with single application 3 weeks after transplanting.
26280	Bridal-Wreath (Spiraea sp.) Spiraea x bumalda 'Gold Mound'	Field Container	Ahrens/Mervosh	CT	2007	Over the top	No significant injury at 2.63, 5.25 and 10.5 lb ai per acre.
29103	Lamb's Ears (Stachys byzantina) 'Countess Helen von Stein'	Field Container	Senesac	NY	2016	Over the top	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	Senesac	NY	2011	Broadcast	No crop injury with two applications at 2.65, 5.3 or 10.6 lb aia.
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	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
27249	Lilac (Syringa sp.) 'Miss Kim'	Field Container	Harvey	WA	2008	Over the top	Slight injury at 2.65, moderate at 5.3 and high at 10.6 lb ai per acre.
27249	Lilac (Syringa sp.) S x tribida 'Lark Song'	Field Container	Mathers (OSU)	OH	2008	Over the top	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. microphylla 'Superba'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27249	Lilac (Syringa sp.) S. patula 'Miss Kim'	Field Container	Williams	IL	2008	Over the top	No injury or growth reduction at 150, 300 and 600 lb per acre.
27415	Marigold (Tagetes sp.)	Field Container	Uber	CA	2011	Broadcast	Acceptable injury with 150 lb ai per acre, moderate 300 and significant injury and growth reduction with 600 lb ai per acre.
27415	Marigold (Tagetes sp.) T. erecta 'Inca II Yellow'	Field Container	Klett	CO	2011	Broadcast	Trial 1: Reduction in dry mass for plants treated with 0.375, 0.75 and 1.5 lb ai per acre compared to the control.
27415	Marigold (Tagetes sp.) T. erecta 'Inca II Yellow'	Field Container	Klett	CO	2011	Broadcast	Trial 2: Reduction in dry mass for plants treated with 0.375, 0.75 and 1.5 lb ai per acre compared to the control.

PR#	Crop	Production Site	Researcher	State	Year	Application Type	Results
27415	Marigold (<i>Tagetes</i> sp.) <i>T. lemonnii</i>	Field Container	Beste/Frank (ARS)	MD	2011	Over the top	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 (<i>Tagetes</i> sp.) <i>T. patula</i> 'Durango Bolero'	Field Container	Senesac	NY	2010	Over the top	Significant injury with 2.65, 5.3 and 10.6 lb ai per acre.
28227	Bald Cypress (<i>Taxodium distichum</i>)	Field In-Ground	Beste/Frank (ARS)	MD	2011	Over the top	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 (<i>Taxodium distichum</i>)	Field In-Ground	Jones	OH	2013	Over the top	No injury or significant growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
28227	Bald Cypress (<i>Taxodium distichum</i>) 'Shawnee Brave'	Field In-Ground	Czarnota	GA	2013	Over the top	No injury with 2.63, 5.25 and 10.5 lb ai per acre applied twice.
26309	Yew (<i>Taxus</i> sp.) <i>T. baccata</i>	Field Container	Senesac	NY	2007	Over the top	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 (<i>Taxus</i> sp.) <i>T. baccata</i> <i>f. asigata</i>	Field Container	Freiberger	NJ	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26309	Yew (<i>Taxus</i> sp.) <i>T. baccata</i> 'Repandens'	Field Container	Beste/Frank (ARS)	MD	2007	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26309	Yew (<i>Taxus</i> sp.) <i>T. x media</i> 'Densiformis'	Field Container	Williams	IL	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; slight width reduction.
27257	<i>Ternstroemia</i> (<i>Ternstroemia</i> sp.)	Field Container	Neal	NC	2010	Broadcast	No crop injury observed with any rate during the evaluation period.
27257	<i>Ternstroemia</i> (<i>Ternstroemia</i> sp.) 'Leann'	Field Container	Gilliam	AL	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27257	<i>Ternstroemia</i> (<i>Ternstroemia</i> sp.) <i>T. gymnanthera</i>	Field Container	Gilliam	AL	2011	Broadcast	No crop injury or reduction in growth with 2.65, 5.3, 10.6 lb ai per acre.
28722	Wall Germander (<i>Teucrium chamaedrys</i>)	Field Container	Klett	CO	2013	Over the top	Moderate injury after 2nd applic. with some recovery at 2.65, 5.3 and 10.6 lb ai per acre; moderate to severe growth reduction increasing with rates.
28722	Wall Germander (<i>Teucrium chamaedrys</i>)	Field Container	Peachey	OR	2013	Over the top	No injury with 150, 300 and 600 lb per acre applied twice; severe growth reduction with 4X.
28722	Wall Germander (<i>Teucrium chamaedrys</i>)	Field Container	Wilen	CA	2009	Over the top	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.
26227	Red Cedar, Western (<i>Thuja plicata</i>)	Field Container	Boydston	WA	2007	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26227	Red Cedar, Western (<i>Thuja plicata</i>)	Field Container	Czarnota	GA	2008	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26227	Red Cedar, Western (<i>Thuja plicata</i>) 'Atrovirens'	Field Container	Beste/Frank (ARS)	MD	2008	Over the top	No significant injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre; all plants marketable.
26276	Red Cedar, Arborvitae (<i>Thuja</i> sp.) <i>T. occidentalis</i> 'Emerald Green'	Field Container	Ahrens/Mervosh	CT	2007	Over the top	No injury at 2.63, 5.25 and 10.5 lb ai per acre.
26276	Red Cedar, Arborvitae (<i>Thuja</i> sp.) <i>T. occidentalis</i> 'Emerald Green'	Field Container	Lieth	CA	2007	Over the top	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 (<i>Thuja</i> sp.) <i>T. orientalis</i> 'Green Giant'	Field Container	Gilliam	AL	2009	Over the top	No 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
26276	Red Cedar, Arborvitae (Thuja sp.) T. orientalis 'Green Giant'	Field Container	Neal	NC	2007	Over the top	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	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
29653	Chinese Windmill Palm (Trachycarpus fortunei)	Field Container	Stamps	FL	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; no significant growth reduction.
26664	Hemlock, Western (Tsuga heterophylla)	Field In-Ground	Beste/Frank (ARS)	MD	2007	Over the top	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	Over the top	No significant injury after the 1st, severe after 2nd application at 2.65, 5.3 and 10.6 lb ai per acre.
26238	Hemlock, Western (Tsuga heterophylla)	Field Container	Boydston	WA	2007	Over the top	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	Over the top	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	Over the top	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.
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 injure or reduce growth.
27416	Elm (Ulmus sp.) U. americana	Field Container	Knox	FL	2009	Over the top	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. '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. parvifolia	Field Container	Neal	NC	2015	Over the top	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.) 'Aztec White'	Field Container	Gilliam	AL	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; growth reduction at 4X.
27417	Vervain (Verbena sp.) 'Homestead Purple'	Field Container	Boydston	WA	2009	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre; all treated plants saleable.
27417	Vervain (Verbena sp.) V. canadensis 'Homestead Purple'	Field Container	Trader	MS	2009	Over the top	No injury or growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
27417	Vervain (Verbena sp.) V. stricta	Field Container	Senesac	NY	2009	Over the top	No injury at 2.65, slight at 5.3 and 10.6 lb ai per acre.
26457	Ironweed, New York (Vernonia noveboracensis)	Field Container	Senesac	NY	2009	Over the top	Slight injury at 2.65, 5.3 and 10.6 lb ai per acre.
26265	Speedwell, Brooklime (Veronica sp.)	Field Container	Chandran	WV	2010	Broadcast	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.

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26265	Speedwell, Brooklime (Veronica sp.)	Field Container	Reding	OH	2010	Over the top	No crop injury with 2.65, 5.3 and 10.6 lb ai per acre.
26265	Speedwell, Brooklime (Veronica sp.) V. 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.
26265	Speedwell, Brooklime (Veronica sp.) V. teucrium '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.
27418	Speedwell, Spiked (Veronica spicata) 'Goodness Grows'	Field Container	Boydston	WA	2009	Over the top	Severe injury at 2.65, 5.3 and 10.6 lb ai per acre.
27418	Speedwell, Spiked (Veronica spicata) 'Red Fox'	Field Container	Senesac	NY	2009	Over the top	Severe injury at 2.65, 5.3 and 10.6 lb ai per acre.
27418	Speedwell, Spiked (Veronica spicata) V. peduncularis 'Watersperry'	Field Container	Senesac	NY	2008	Over the top	Slight injury at 2.63, moderate at 5.25 and 10.5 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. odoratissimum	Field Container	Neal	NC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. opulus	Field Container	Regan	OR	2007	Over the top	No injury but significant growth reduction 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	Over the top	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	Over the top	No significant injury and growth reduction at 2.65, 5.3 and 10.6 lb ai per acre.
26255	Arrowwood (Viburnum sp.) V. plicatum tomentosum 'Shasta'	Field Container	Czarnota	GA	2008	Over the top	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	Over the top	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	Over the top	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. x 'Juddi'	Field Container	Mickelbart	IN	2008	Over the top	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. x pragense	Field Container	Neal	NC	2007	Over the top	No injury at 2.65, 5.3 and 10.6 lb ai per acre.
30568	Big Periwinkle (Vinca major) 'Cora White'	Field Container	Gilliam	AL	2017	Over the top	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
30568	Big Periwinkle (Vinca major) 'Expoflora'	Field Container	Senesac	NY	2017	Over the top	Minor injury with 2.65 and 5.3, moderate with 10.6 lb ai per acre applied twice.

Label Suggestions

We recommend that the five (5) genera exhibiting no injury in these experiments be added to the current Freehand 1.75G label for broadcast applications.

Agave sp.

Aloe sp.

Arctostaphylos sp.

Penstemon sp.

Ternstroemia spp.

The following genera are already on the label, but with the additional data, the species could be specified.

Cornus kousa

Clematis integrifolia

Dendranthema x morifolium

Fothergilla gardenii

Mahonia aquifolium

Quercus shumardii

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.

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