



[Environment Horticulture Program Research Summaries](#)

IR-4 Environmental Horticulture Program Pendimethalin Crop Safety

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Acknowledgements

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Abstract

Pendimethalin has been registered in the United States since 1994 for uses in and around environmental horticulture plants in production nurseries and in landscapes. Between 1981 and 2023, the IR-4 Project has conducted 559 trials using two granular formulations (Corral 2.68G and Pendulum 2G), three liquid formulations (Pendulum AquaCap, Pendulum 3.3EC and Prowl 4E) and a wettable dry granular formulation (Pendulum WDG). Between 2014 and 2018, Pendulum 2G was examined for use on ornamental grasses. During 2020 and 2021, Pendulum 2G was a part of a project to examine options for field in-ground cutflower growers. This summary contains data across all the reports available through IR-4 since screenings began in 1981.

Two hundred twenty-four (224) genera or species have been screened with the six different pendimethalin formulations. Sixty-three plant species or genera exhibited no or minimal, transitory phytotoxicity to over the top applications of Corral 2.68G and Pendulum 2G formulations, eight plant species or genera exhibited no or minimal, transitory phytotoxicity to over the top applications of Pendulum AquaCap and Pendulum WDG formulations, and six species or genera exhibited no or minimal, transitory phytotoxicity to over the top applications of Pendulum 3.3 EC or Prowl 4E. This research has been beneficial for adding new crop to the Pendulum 2G and Pendulum WDG formulations.

Introduction

Pendimethalin has been registered in the United States since 1994 for uses in and around environmental horticulture plants in production nurseries and in landscapes. Between 1981 and 2008, the IR-4 Project has conducted 559 trials using two granular formulations (Corral 2.68G and Pendulum 2G), three liquid formulations (Pendulum AquaCap, Pendulum 3.3 EC and Prowl 4E) and a wettable dry granular formulation (Pendulum WDG). Between 2014 and 2018, Pendulum 2G was examined for use on ornamental grasses. Between 2014 and 2018, 70 trials were conducted on ornamental grasses to determine crop safety of the Pendulum 2G formulation. During 2020 and 2021, Pendulum 2G was a part of a project to examine options for field in-ground cutflower growers. This compilation contains information on pendimethalin since screenings began in 1981.

Materials and Methods

Because this research was conducted over several years with different protocols, application rates and whether repeat applications were made varied. Rates ranged from 0.75 to 13.2 lb ai per acre and either 1 or more applications were made. Typically, treatment was applied over the top 1-2 times at 2.0, 4.0 and 8.0 lb ai per acre, plus an untreated Check. Trials between 2014 and 2018 with Pendulum 2G used 3, 6 and 12 lb ai per acre applied twice. A minimum of three plants (replicate treatments) were required with many researchers exceeding this minimum. Phytotoxicity was generally recorded on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill) at various intervals from 1 week to 4 months after application. A researcher also took readings one year after application.

Pendulum formulations were supplied to researchers (See list of researchers in Appendix 1) by American Cyanamid, BASF, and Scotts.

For IR-4 testing, the following protocols were used: 05-001, 06-009, 14-010, 15-010, 16-010, 16-011, 17-010, 17-011, 18-012, 18-020, 19-012, 19-020, 20-013, 21-013, 22-017, 22-028, 23-017 and 23-028. Please visit <https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-researcher-resources/#Protocols> to view and download these protocols.

Results and Summary

Based on the type and nature of injury seen with pendimethalin applications, tested plant species were placed into five 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 are needed to make informed recommendations because variable results were observed, and .5) less than 3 trials have been conducted through IR-4.

Table 1. Average crop safety rating after applications with pendimethalin formulations.

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Abies fraseri</i>						1.0 (1 - 1) n3	
<i>Acer griseum</i>		2.0 (2 - 2) n2					
<i>Acer sp.</i>						1.0 (1 - 1) n1	
<i>Achillea millefolium</i>		1.0 (1 - 1) n4			1.0 (1 - 1) n3		
<i>Actaea racemosa var. racemosa</i>		3.0 (3 - 3) n1					
<i>Agastache rupestris</i>		1.0 (1 - 1) n2					
<i>Agastache sp.</i>		2.0 (1 - 4) n3					
<i>Alchemilla sp.</i>		1.1 (1 - 2) n7					
<i>Alyssum sp.</i>					1.0 (1 - 1) n1		
<i>Ammophila breviligulata</i>		1.0 (1 - 1) n3					
<i>Amsonia hubrichtii</i>		1.0 (1 - 1) n2	3.0 (3 - 3) n1				
<i>Amsonia sp.</i>					1.0 (1 - 1) n1		
<i>Amsonia tabernaemontana</i>		4.0 (4 - 4) n1					
<i>Andropogon gerardii</i>		1.3 (1 - 2) n3					
<i>Antennaria dioica</i>		1.0 (1 - 1) n2					
<i>Antennaria parvifolia</i>		1.0 (1 - 1) n2					
<i>Aquilegia sp.</i>		1.0 (1 - 1) n1			1.0 (1 - 1) n2		
<i>Arachis sp</i>		1.0 (1 - 1) n1					
<i>Arachniodes simplicior</i>		1.0 (1 - 1) n1		1.0 (1 - 1) n1			
<i>Armeria maritima</i>		1.3 (1 - 2) n3					
<i>Artemisia lactiflora</i>		1.0 (1 - 1) n2					
<i>Artemisia ludoviciana</i>					1.0 (1 - 1) n1		
<i>Asarum canadense</i>		1.0 (1 - 1) n3					
<i>Asparagus virgatus</i>	1.0 (1 - 1) n1						
<i>Aspidistra elatior</i>	1.0 (1 - 1) n1						
<i>Aster dumosus x Aster novi belgii</i>		1.0 (1 - 1) n1					
<i>Aster sp.</i>		2.0 (2 - 2) n2					
<i>Astilbe sp.</i>		2.0 (2 - 2) n2					
<i>Athyrium goeringianum</i>					2.0 (2 - 2) n1		
<i>Athyrium nipponicum</i>		3.0 (2 - 4) n3		1.0 (1 - 1) n1			
<i>Aubrieta sp.</i>		1.2 (1 - 2) n6					

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Aurinia saxatilis</i>					2.0 (2 - 2) n1		
<i>Baptisia australis</i>		1.3 (1 - 2) n6					
<i>Begonia sp.</i>					2.5 (2 - 3) n2		
<i>Bergenia cordifolia</i>		1.0 (1 - 1) n5					
<i>Betula nigra</i>						1.5 (1 - 2) n2	
<i>Buddleia alternifolia</i>		1.0 (1 - 1) n2					
<i>Buddleia davidii</i>		1.0 (1 - 1) n3					
<i>Calamagrostis acutiflora</i>		1.0 (1 - 1) n3					
<i>Calamagrostis arundinacea</i>	1.0 (1 - 1) n1						
<i>Campanula carpatica</i>					2.0 (2 - 2) n1		
<i>Campanula medium</i>					1.0 (1 - 1) n1		
<i>Carex buchananii</i>		1.0 (1 - 1) n3					
<i>Carex cherokeensis</i>		1.0 (1 - 1) n3					
<i>Carex morrowii</i>		1.3 (1 - 2) n3					
<i>Centranthus ruber</i>		1.0 (1 - 1) n2					
<i>Chasmanthium latifolium</i>	1.0 (1 - 1) n1	1.3 (1 - 2) n4					
<i>Chelone sp.</i>		1.3 (1 - 2) n4					
<i>Chionanthus retusus</i>					1.0 (1 - 1) n1		
<i>Chrysanthemum/Dendranthema sp.</i>					1.0 (1 - 1) n3		
<i>Chrysogonum virginianum</i>		1.3 (1 - 2) n3					
<i>Clematis sp.</i>		1.0 (1 - 1) n1					
<i>Coreopsis sp.</i>		1.0 (1 - 1) n1			1.0 (1 - 1) n2		
<i>Coreopsis verticillata</i>				1.0 (1 - 1) n1			
<i>Cosmos sp.</i>		1.3 (1 - 2) n3					
<i>Cuphea hyssopifolia</i>		1.0 (1 - 1) n1					
<i>Cuprocyparis leylandii</i>					1.0 (1 - 1) n2		
<i>Cyrtomium falcatum</i>		2.0 (1 - 3) n2		1.0 (1 - 1) n1			
<i>Cyrtomium fortunei</i>		2.0 (2 - 2) n1					
<i>Cytisus purgans</i>		1.0 (1 - 1) n1					
<i>Dahlia sp.</i>		3.0 (3 - 3) n1					
<i>Delosperma nubigenum</i>		1.3 (1 - 2) n3					
<i>Dennstaedtia punctilobula</i>					2.0 (2 - 2) n1		
<i>Deschampsia caespitosa</i>		1.7 (1 - 3) n3					
<i>Dianthus deltoides</i>		1.0 (1 - 1) n1					
<i>Diascia integerrima</i>		1.0 (1 - 1) n2					
<i>Digitalis sp.</i>		1.0 (1 - 1) n6			1.3 (1 - 2) n4		

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Doronicum sp.</i>					1.0 (1 - 1) n1		
<i>Dryopteris erythrosora</i>		1.0 (1 - 1) n1		1.0 (1 - 1) n1			
<i>Dryopteris ludoviciana</i>		1.0 (1 - 1) n1		1.0 (1 - 1) n1			
<i>Dypsis lutescens</i>					1.0 (1 - 1) n2		
<i>Echinacea purpurea</i>		1.0 (1 - 1) n2					
<i>Echinacea sp.</i>		1.0 (1 - 1) n5			1.0 (1 - 1) n2		
<i>Epilobium fleischeri</i>		1.0 (1 - 1) n2					
<i>Epimedium sp.</i>		2.0 (2 - 2) n2					
<i>Eragrostis curvula</i>		1.0 (1 - 1) n3					
<i>Eragrostis spectabilis</i>		1.5 (1 - 2) n2					
<i>Eucalyptus sp.</i>					1.0 (1 - 1) n1		
<i>Eupatorium maculatum</i>		1.0 (1 - 1) n1					
<i>Eupatorium perfoliatum</i>		1.0 (1 - 1) n1					
<i>Eupatorium purpureum</i>		1.0 (1 - 1) n4					
<i>Eupatorium sp.</i>		1.0 (1 - 1) n3					
<i>Fallugia paradoxa</i>		1.0 (1 - 1) n2					
<i>Forsythia sp.</i>					1.0 (1 - 1) n1	1.0 (1 - 1) n3	
<i>Fothergilla gardenii</i>					1.0 (1 - 1) n1		
<i>Fraxinus sp.</i>						1.0 (1 - 1) n2	
<i>Gaillardia sp.</i>					1.2 (1 - 2) n6		
<i>Gaura lindheimeri</i>		1.0 (1 - 1) n4					
<i>Gazania linearis</i>		1.3 (1 - 2) n3					
<i>Gazania sp.</i>		1.0 (1 - 1) n1			2.0 (2 - 2) n1		
<i>Gerbera sp.</i>		1.5 (1 - 3) n6					
<i>Geum sp.</i>					1.4 (1 - 3) n5		
<i>Gomphrena sp.</i>		1.3 (1 - 2) n4					
<i>Goniolimon tataricum</i>					1.0 (1 - 1) n1		
<i>Gypsophila paniculata</i>					1.0 (1 - 1) n3		
<i>Hakonechloa sp.</i>		1.0 (1 - 1) n1					
<i>Helenium autumnale</i>		1.0 (1 - 1) n5					
<i>Helenium sp.</i>		1.0 (1 - 1) n1					
<i>Helianthemum sp.</i>		1.0 (1 - 1) n1					
<i>Helianthus annuus</i>		2.7 (2 - 3) n3					
<i>Helianthus salicifolius</i>		1.0 (1 - 1) n1					
<i>Helianthus sp.</i>		1.5 (1 - 2) n2					
<i>Heliopsis helianthoides</i>		1.0 (1 - 1) n4					

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Helleborus niger</i>		3.0 (2 - 4) n2					
<i>Hemerocallis sp.</i>	1.0 (1 - 1) n1			1.0 (1 - 1) n1	1.0 (1 - 1) n1		
<i>Heuchera sanguinea</i>		1.3 (1 - 2) n4					
<i>Heucherella sp.</i>		2.0 (2 - 2) n1					
<i>Hierochloe odorata</i>		1.0 (1 - 1) n2					
<i>Hosta fortunei</i>		1.0 (1 - 1) n1					
<i>Hydrangea quercifolia</i>					1.0 (1 - 1) n1		
<i>Hylotelephium sieboldii</i>		3.5 (2 - 5) n2					
<i>Iberis sp.</i>		1.0 (1 - 1) n1					
<i>Ilex cornuta</i>						1.0 (1 - 1) n1	
<i>Ilex crenata</i>						1.0 (1 - 1) n1	
<i>Impatiens sp.</i>					4.0 (4 - 4) n2		
<i>Iris kaempferi</i>					1.0 (1 - 1) n1		
<i>Juncus effusus</i>		1.0 (1 - 1) n3					
<i>Juniperus sp.</i>						1.0 (1 - 1) n3	
<i>Kniphofia sp.</i>		1.1 (1 - 2) n8					
<i>Lagerstroemia indica</i>						1.0 (1 - 1) n2	
<i>Lantana sp.</i>		1.0 (1 - 1) n2		1.0 (1 - 1) n1			
<i>Lavandula angustifolia</i>		1.0 (1 - 1) n6					
<i>Lavandula sp.</i>		1.0 (1 - 1) n1					
<i>Leucanthemum maximum</i>		1.0 (1 - 1) n2					
<i>Leucanthemum x superbum</i>			1.0 (1 - 1) n1				
<i>Leymus arenarius</i>		1.0 (1 - 1) n3					
<i>Liatris sp.</i>					1.0 (1 - 1) n1		
<i>Ligularia stenocephala</i>		1.0 (1 - 1) n4					
<i>Limonium sp.</i>					1.0 (1 - 1) n3		
<i>Linum perenne</i>		1.0 (1 - 1) n5					
<i>Liriope muscari</i>		1.0 (1 - 1) n1				2.0 (2 - 2) n1	
<i>Liriope sp.</i>						2.0 (2 - 2) n1	
<i>Lysimachia sp.</i>		2.0 (2 - 2) n1					
<i>Monarda didyma</i>		1.3 (1 - 2) n3					
<i>Muhlenbergia capillaris</i>		1.0 (1 - 1) n3					
<i>Muhlenbergia dubia</i>		1.0 (1 - 1) n2					
<i>Muhlenbergia dumosa</i>		1.7 (1 - 2) n3					
<i>Nassella tenuissima</i>		2.7 (1 - 4) n3					
<i>Nepeta x faassenii</i>		1.5 (1 - 4) n8					

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Oenothera sp.</i>		1.3 (1 - 2) n3					
<i>Opuntia humifusa</i>		1.0 (1 - 1) n1					
<i>Origanum libanoticum</i>		1.0 (1 - 1) n6					
<i>Othonna capensis</i>		1.0 (1 - 1) n2					
<i>Paeonia sp.</i>		1.0 (1 - 1) n1					1.0 (1 - 1) n12
<i>Panicum virgatum</i>	1.0 (1 - 1) n1	1.7 (1 - 4) n7					
<i>Pelargonium sp.</i>		2.0 (2 - 2) n1					
<i>Pennisetum alopecuroides</i>		1.0 (1 - 1) n3					
<i>Pennisetum orientale</i>		1.8 (1 - 2) n4					
<i>Penstemon sp.</i>		1.0 (1 - 1) n6					
<i>Pentas sp.</i>		1.0 (1 - 1) n1					
<i>Perovskia sp.</i>		2.0 (2 - 2) n1					
<i>Petunia sp.</i>					4.0 (3 - 5) n3		
<i>Phlox paniculata</i>		3.0 (2 - 4) n2					
<i>Phlox subulata</i>		1.5 (1 - 2) n4					
<i>Phoenix roebelinii</i>					1.0 (1 - 1) n3		
<i>Phormium tenax</i>		1.0 (1 - 1) n1					
<i>Photinia sp.</i>						1.0 (1 - 1) n1	
<i>Physostegia sp.</i>		1.0 (1 - 1) n1					
<i>Physostegia virginiana</i>					4.0 (4 - 4) n1		
<i>Picea sp.</i>						1.0 (1 - 1) n2	
<i>Pinus sp.</i>						1.3 (1 - 2) n6	
<i>Polemonium sp.</i>		1.6 (1 - 3) n5					
<i>Polystichum acrostichoides</i>					2.0 (2 - 2) n1		
<i>Polystichum polyblepharum</i>		2.0 (2 - 2) n1		1.0 (1 - 1) n1			
<i>Primula malacoides</i>		1.0 (1 - 1) n1					
<i>Pulmonaria sp.</i>		4.0 (4 - 4) n1					
<i>Quercus sp.</i>						1.0 (1 - 1) n2	
<i>Rhamnus sp.</i>		1.0 (1 - 1) n2					
<i>Rhodiola pachyclados</i>		3.7 (3 - 4) n3					
<i>Rhododendron sp.</i>						2.0 (2 - 2) n1	
<i>Rodgersia sp.</i>					1.0 (1 - 1) n1		
<i>Rudbeckia hirta</i>		1.7 (1 - 3) n3					
<i>Rudbeckia sp.</i>					1.5 (1 - 2) n2		
<i>Ruellia caroliniensis</i>		1.0 (1 - 1) n1					
<i>Rumohra adiantiformis</i>	1.0 (1 - 1) n1						

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Ruscus aculeatus</i>	1.0 (1 - 1) n1						
<i>Russelia equisetiformis</i>		2.0 (2 - 2) n1					
<i>Saccharum sp.</i>		1.0 (1 - 1) n3					
<i>Salvia daghestanica</i>		1.0 (1 - 1) n2					
<i>Salvia x sylvestris</i>		1.0 (1 - 1) n1					
<i>Santolina chamaecyparissus</i>		1.0 (1 - 1) n2					
<i>Scabiosa sp.</i>		1.0 (1 - 1) n7					
<i>Schizachyrium scoparium</i>		1.8 (1 - 3) n4					
<i>Scutellaria racemosa</i>		1.0 (1 - 1) n2					
<i>Sedum acre</i>		2.3 (1 - 3) n4					
<i>Sedum hybridum</i>		3.0 (2 - 4) n4					
<i>Sedum kamtschaticus</i>		2.5 (1 - 4) n4					
<i>Sedum rupestre</i>		2.3 (1 - 4) n3					
<i>Sedum sexamgulare</i>		3.3 (2 - 5) n3					
<i>Sedum sp.</i>	1.0 (1 - 1) n1	1.0 (1 - 1) n3			1.5 (1 - 2) n2		
<i>Sedum spurium</i>		2.0 (1 - 3) n3					
<i>Sempervivum arachnoideum</i>		1.0 (1 - 1) n2					
<i>Sempervivum tectorum</i>		1.0 (1 - 1) n4					
<i>Solidago caesia</i>		1.0 (1 - 1) n2					
<i>Solidago rugosa</i>		1.0 (1 - 1) n4					
<i>Solidago sempervirens</i>		1.0 (1 - 1) n3					
<i>Solidago sp.</i>		1.3 (1 - 2) n6					
<i>Solidago speciosa</i>		1.0 (1 - 1) n2					
<i>Solidago sphacelata</i>		1.0 (1 - 1) n2					
<i>Sorghastrum nutans</i>		1.3 (1 - 2) n3					
<i>Sporobolus heterolepis</i>		1.0 (1 - 1) n3					
<i>Stachys byzantina</i>		1.0 (1 - 1) n1			2.4 (1 - 4) n5		
<i>Stokesia sp.</i>					1.0 (1 - 1) n2		
<i>Symphyotrichum ericoides</i>		1.0 (1 - 1) n2					
<i>Symphyotrichum novi-belgii</i>		1.0 (1 - 1) n4					
<i>Tagetes sp.</i>					3.0 (3 - 3) n1		
<i>Taxus sp.</i>						2.0 (1 - 3) n3	
<i>Thuja sp.</i>						1.0 (1 - 1) n2	
<i>Thymus sp.</i>		1.0 (1 - 1) n1					
<i>Tiarella cordifolia</i>		1.5 (1 - 3) n4					
<i>Tiarella sp.</i>		4.0 (4 - 4) n1					

Crop Latin Name	Broadcast		Over the Top				Soil Applied
	Corral 2.68G	Pendulum 2G	Pendulum 3.3 EC	Pendulum Aqua Cap	Pendulum WDG	Prowl 4E	Prowl 4E
<i>Tradescantia sp.</i>		1.0 (1 - 1) n1					
<i>Tradescantia virginiana</i>		1.0 (1 - 1) n2					
<i>Tradescantia x andersoniana</i>		1.0 (1 - 1) n2					
<i>Tsuga canadensis</i>						1.4 (1 - 2) n5	
<i>Ulmus alata</i>					1.0 (1 - 1) n1		
<i>Verbena sp.</i>		1.0 (1 - 1) n2					
<i>Vernonia noveboracensis</i>		1.0 (1 - 1) n2					
<i>Veronica liwanensis</i>		2.7 (1 - 4) n3					
<i>Vinca sp.</i>					2.0 (2 - 2) n1		
<i>Viola sp.</i>		1.0 (1 - 1) n1			4.0 (4 - 4) n1		
<i>Washingtonia robusta</i>					1.0 (1 - 1) n1		
<i>Zauschneria californica</i>					1.0 (1 - 1) n2		
<i>Zinnia sp.</i>		2.0 (1 - 3) n2					

Average rating on a scale of 1 – 5 with 1 = no to slight transitory injury and 5 = severe injury with mortality; minimum to maximum rating; number of trials. A rating of 3 or higher is considered commercially unacceptable.

Phytotoxicity of Corral 2.68G and Pendulum 2G

Sixty-three plant species or genera exhibited no or minimal, transitory phytotoxicity to over the top applications of Corral 2.68G and Pendulum 2G formulations (Table 2). No to minor injury was observed at 1X, but severe injury was observed at 4X for *Helianthus annuus* (Table 3). Ten species exhibited significant injury at the 1X rate (Table 4), including many succulent species produced for greenroof installations. Two species exhibited variable responses after application (Table 5), and, for 92 genera/species, more information is needed because only 1 or 2 trials were conducted (Table 6).

Please see Table 13 and Table 14 for a list of research and a summary of the individual trial results with Corral 2.68G and Pendulum 2G, respectively.

Phytotoxicity of Pendulum AquaCap and Pendulum WDG Formulations

Eight plant species or genera exhibited no or minimal, transitory phytotoxicity to over the top applications of Pendulum AquaCap and Pendulum WDG formulations (Table 7). Two species exhibited significant injury at the 1X rate (Table 8). *Stachys byzantina* needs additional research to clarify response (Table 9). In Table 10, 46 genera or species are listed where only 1 or 2 trials were conducted through IR-4.

Please see Table 15 and Table 16 for a list of research and a summary of the individual trial results with Pendulum AquaCap and Pendulum 60WDG formulations, respectively.

Phytotoxicity of Pendulum 3.3 EC and Prowl 4E Formulations

Six species or genera exhibited no or minimal, transitory phytotoxicity to over the top applications of Pendulum 3.3 EC or Prowl 4E (Table 11), and thirteen genera or species were tested in less than three trial through IR-4 (Table 12).

Please see Table 17 and Table 18 for a list of research and a summary of the individual trial results with Pendulum 3.3 EC and Prowl 4E.

Table 2. List of Corral 2.68G and Pendulum 2G treated crops with no or minimal transitory injury.

<i>Ammophila breviligulata</i>	<i>Scabiosa sp.</i>
<i>Asarum canadense</i>	<i>Alchemilla sp.</i>
<i>Buddleia davidii</i>	<i>Kniphofia sp.</i>
<i>Calamagrostis acutiflora</i>	<i>Aubrieta sp.</i>
<i>Carex buchananii</i>	<i>Andropogon gerardii</i>
<i>Carex cherokeensis</i>	<i>Armeria maritima</i>
<i>Eragrostis curvula</i>	<i>Carex morrowii</i>
<i>Eupatorium sp.</i>	<i>Chrysogonum virginianum</i>
<i>Juncus effusus</i>	<i>Cosmos sp.</i>
<i>Leymus arenarius</i>	<i>Delosperma nubigenum</i>
<i>Muhlenbergia capillaris</i>	<i>Gazania linearis</i>
<i>Pennisetum alopecuroides</i>	<i>Monarda didyma</i>
<i>Saccharum sp.</i>	<i>Oenothera sp.</i>
<i>Solidago sempervirens</i>	<i>Sorghastrum nutans</i>
<i>Sporobolus heterolepis</i>	<i>Chelone sp.</i>
<i>Achillea millefolium</i>	<i>Gomphrena sp.</i>
<i>Eupatorium purpureum</i>	<i>Heuchera sanguinea</i>
<i>Gaura lindheimeri</i>	<i>Chasmanthium latifolium</i>
<i>Heliopsis helianthoides</i>	<i>Baptisia australis</i>
<i>Ligularia stenocephala</i>	<i>Solidago sp.</i>
<i>Sedum sp.</i>	<i>Phlox subulata</i>
<i>Sempervivum tectorum</i>	<i>Tiarella cordifolia</i>
<i>Solidago rugosa</i>	<i>Gerbera sp.</i>
<i>Symphyotrichum novi-belgii</i>	<i>Nepeta x faassenii</i>
<i>Bergenia cordifolia</i>	<i>Polemonium sp.</i>
<i>Echinacea sp.</i>	<i>Muhlenbergia dumosa</i>
<i>Helenium autumnale</i>	<i>Deschampsia caespitosa</i>
<i>Linum perenne</i>	<i>Rudbeckia hirta</i>
<i>Digitalis sp.</i>	<i>Panicum virgatum</i>
<i>Lavandula angustifolia</i>	<i>Pennisetum orientale</i>
<i>Origanum libanoticum</i>	<i>Schizachyrium scoparium</i>
<i>Penstemon sp.</i>	

Table 3. List of Corral 2.68G and Pendulum 2G treated crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity

Helianthus annuus

Table 4. List of Corral 2.68G and Pendulum 2G treated crops exhibiting significant injury at 1X

Athyrium nipponicum
Helianthus annuus
Nassella tenuissima
Rhodiola pachyclados
Sedum acre

Sedum hybridum
Sedum kamtschaticus
Sedum rupestre
Sedum sexangulare
Veronica liwanensis

Table 5. List of Corral 2.68G and Pendulum 2G treated crops where more research is needed to clarify response

Agastache sp.
Sedum spurium

Table 6. List of Corral 2.68G and Pendulum 2G treated crops with insufficient trials to determine response

<i>Acer griseum</i>	<i>Echinacea purpurea</i>	<i>Phlox paniculata</i>
<i>Actaea racemosa</i> var. <i>racemosa</i>	<i>Epilobium fleischeri</i>	<i>Phormium tenax</i>
<i>Agastache rupestris</i>	<i>Epimedium</i> sp.	<i>Physostegia</i> sp.
<i>Amsonia hubrichtii</i>	<i>Eragrostis spectabilis</i>	<i>Polystichum polyblepharum</i>
<i>Amsonia tabernaemontana</i>	<i>Eupatorium maculatum</i>	<i>Primula malacoides</i>
<i>Antennaria dioica</i>	<i>Eupatorium perfoliatum</i>	<i>Pulmonaria</i> sp.
<i>Antennaria parvifolia</i>	<i>Fallugia paradoxa</i>	<i>Rhamnus</i> sp.
<i>Aquilegia</i> sp.	<i>Gazania</i> sp.	<i>Ruellia caroliniensis</i>
<i>Arachis</i> sp.	<i>Hakonechloa</i> sp.	<i>Rumohra adiantiformis</i>
<i>Arachniodes simplicior</i>	<i>Helenium</i> sp.	<i>Ruscus aculeatus</i>
<i>Artemisia lactiflora</i>	<i>Helianthemum</i> sp.	<i>Russelia equisetiformis</i>
<i>Asparagus virgatus</i>	<i>Helianthus salicifolius</i>	<i>Salvia daghestanica</i>
<i>Aspidistra elatior</i>	<i>Helianthus</i> sp.	<i>Salvia x sylvestris</i>
<i>Aster dumosus x Aster novi</i> <i>belgii</i>	<i>Helleborus niger</i>	<i>Santolina chamaecyparissus</i>
<i>Aster</i> sp.	<i>Hemerocallis</i> sp.	<i>Scutellaria racemosa</i>
<i>Astilbe</i> sp.	<i>Heucherella</i> sp.	<i>Sempervivum arachnoideum</i>
<i>Buddleia alternifolia</i>	<i>Hierochloe odorata</i>	<i>Solidago caesia</i>
<i>Calamagrostis arundinacea</i>	<i>Hosta fortunei</i>	<i>Solidago speciosa</i>
<i>Centranthus ruber</i>	<i>Hylotelephium sieboldii</i>	<i>Solidago sphacelata</i>
<i>Clematis</i> sp.	<i>Iberis</i> sp.	<i>Stachys byzantina</i>
<i>Coreopsis</i> sp.	<i>Lantana</i> sp.	<i>Symphyotrichum ericoides</i>
<i>Cuphea hyssopifolia</i>	<i>Lavandula</i> sp.	<i>Thymus</i> sp.
<i>Cyrtomium falcatum</i>	<i>Leucanthemum maximum</i>	<i>Tiarella</i> sp.
<i>Cyrtomium fortunei</i>	<i>Liriope muscari</i>	<i>Tradescantia</i> sp.
<i>Cytisus purgans</i>	<i>Lysimachia</i> sp.	<i>Tradescantia virginiana</i>
<i>Dahlia</i> sp.	<i>Muhlenbergia dubia</i>	<i>Tradescantia x andersoniana</i>
<i>Dianthus deltoides</i>	<i>Opuntia humifusa</i>	<i>Verbena</i> sp.
<i>Diascia integerrima</i>	<i>Othonna capensis</i>	<i>Vernonia noveboracensis</i>
<i>Dryopteris erythrosora</i>	<i>Paeonia</i> sp.	<i>Viola</i> sp.
<i>Dryopteris ludoviciana</i>	<i>Pelargonium</i> sp.	<i>Zinnia</i> sp.
	<i>Pentas</i> sp.	
	<i>Perovskia</i> sp.	

Table 7. List of Pendulum AquaCap and Pendulum WDG treated crops with no or minimal transitory injury.

Achillea millefolium
Chrysanthemum/Dendranthema sp.
Gaillardia sp.
Digitalis sp.
Geum sp.
Gypsophila paniculata
Limonium sp.
Phoenix roebelinii

Table 8. List of Pendulum AquaCap and Pendulum WDG treated crops exhibiting significant injury at 1X.

Impatiens sp.
Petunia sp.

Table 9. List of Pendulum AquaCap and Pendulum WDG treated crops where more information is needed.

Stachys byzantina

Table 10. List of Pendulum AquaCap and Pendulum WDG treated crops with less than 3 trials

<i>Alyssum sp.</i>	<i>Dennstaedtia punctilobula</i>	<i>Liatris sp.</i>
<i>Amsonia sp.</i>	<i>Doronicum sp.</i>	<i>Physostegia virginiana</i>
<i>Aquilegia sp.</i>	<i>Dryopteris erythrosora</i>	<i>Polystichum acrostichoides</i>
<i>Arachniodes simplicior</i>	<i>Dryopteris ludoviciana</i>	<i>Polystichum polyblepharum</i>
<i>Artemisia ludoviciana</i>	<i>Dypsis lutescens</i>	<i>Rodgersia sp.</i>
<i>Athyrium goeringianum</i>	<i>Echinacea sp.</i>	<i>Rudbeckia sp.</i>
<i>Athyrium nipponicum</i>	<i>Eucalyptus sp.</i>	<i>Sedum sp.</i>
<i>Aurinia saxatilis</i>	<i>Forsythia sp.</i>	<i>Stokesia sp.</i>
<i>Begonia sp.</i>	<i>Fothergilla gardenii</i>	<i>Tagetes sp.</i>
<i>Campanula carpatica</i>	<i>Gazania sp.</i>	<i>Ulmus alata</i>
<i>Campanula medium</i>	<i>Goniolimon tataricum</i>	<i>Vinca sp.</i>
<i>Chionanthus retusus</i>	<i>Hemerocallis sp.</i>	<i>Viola sp.</i>
<i>Coreopsis sp.</i>	<i>Hydrangea quercifolia</i>	<i>Washingtonia robust</i>
<i>Coreopsis verticillata</i>	<i>Impatiens sp.</i>	<i>Zauschneria californica</i>
<i>Cuprocyparis leylandii</i>	<i>Iris kaempferi</i>	
<i>Cyrtomium falcatum</i>	<i>Lantana sp.</i>	

Table 11. List of Pendulum EC and Prowl 4E treated crops with no or minimal transitory injury.

Abies fraseri
Forsythia sp.
Juniperus sp.
Pinus sp.
Taxus sp.
Tsuga canadensis

Table 12. List of Pendulum EC and Prowl 4E treated crops with less than 3 trials.

Acer sp.
Ilex cornuta
Ilex crenata
Liriope muscari
Liriope sp.
Photinia sp.
Rhododendron sp.
Betula nigra
Fraxinus sp.
Lagerstroemia indica
Picea sp.
Quercus sp.
Thuja sp.

Table 13. Detailed Summary of Crop Safety Testing with Corral / Southern Weed Grass Control 2.68G (Pendimethalin).

Notes: Table entries are sorted by crop Latin name. Only those reports received before 4/10/2019 are included.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
11278	Fern, Tree (<i>Asparagus virgatus</i>)	Shadehouse/ Lath House	Stamps	FL	1992	Over the top	No injury or growth reduction at 2 and 4 lb ai per acre after 4 applications.
11277	Cast-Iron Plant, Ker-Gawl (<i>Aspidistra elatior</i>)	Shadehouse/ Lath House	Stamps	FL	1992	Over the top	No injury or growth reduction at 2 and 4 lb ai per acre.
12395	Reed Grass (<i>Calamagrostis arundinacea</i>) C. acutiflora 'Karl Foerster'	Field Container	Fain	MS	2002	Over the top	No injury at 3, 6 and 12 lb ai per acre.
12392	Indian Woodoats (<i>Chasmanthium latifolium</i>)	Field Container	Fain	MS	2002	Over the top	No injury at 3, 6 and 12 lb ai per acre.
11469	Daylily (<i>Hemerocallis</i> sp.) <i>hemerocallis</i>	Field Container	Fraelich	GA	1996	Over the top	No injury at 3, 6 and 12 lb ai per acre; all plants marketable.
12394	Switch Grass (<i>Panicum virgatum</i>) 'Heavy Metal'	Field Container	Fain	MS	2002	Over the top	No injury at 3, 6 and 12 lb ai per acre; excellent weed control.
11878	Fern, Iron; Fern, Leather-Leaf (<i>Rumohra adiantiformis</i>)	Shadehouse/ Lath House	Stamps	FL	1992	Over the top	Slight injury to fronds, but not decrease in quality (frond weight or shelf life) at 2 and 4 lb ai per acre; mediocre control of long stalked <i>phyllanthus</i> , hairy bittercress, and american burnweed.
11884	Butchers Broom; Israeli Ruscus (<i>Ruscus aculeatus</i>)	Shadehouse/ Lath House	Stamps	FL	1992	Over the top	No significant injury with 2 and 4 lb ai per acre; poor to good weed control.
11461	Stonecrop (<i>Sedum</i> sp.) S. telephium 'Autumn Joy'	Field Container	Beste (ARS)	MD	1994	Over the top	No significant injury at 1, 2 and 4 lb ai per acre, but significant growth reduction at 4 lb; excellent control of prostrate spurge, good control of yellow woodsorrel and Pennsylvania bittercress.

Table 14. Detailed Summary of Crop Safety Testing with Pendulum 2G (Pendimethalin).

Notes: Table entries are sorted by crop Latin name. Only those reports received before 5/23/2024 are included.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
13208	Maple, Paperbark (<i>Acer griseum</i>)	Field Container	Senesac	NY	1997	Broadcast	Field Container: No to slight injury increasing with rate (1.5, 3.0, 6.0 lb ai per acre) occurring at the last rating date 8 WAT.
13208	Maple, Paperbark (<i>Acer griseum</i>)	Field Container	Senesac	NY	1997	Broadcast	Pot in Pot: Very slight injury at all rates (1.5, 3.0, 6.0 lb ai per acre).
24395	Yarrow, Common (<i>Achillea millefolium</i>) 'Apple Blossom'	Field Container	Boydston	WA	2005	Broadcast	No injury
24395	Yarrow, Common (<i>Achillea millefolium</i>) 'Moonshine'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
24395	Yarrow, Common (<i>Achillea millefolium</i>)	Field Container	Reding	OH	2005	Broadcast	No injury
12382	Yarrow, Common (<i>Achillea millefolium</i>) 'Cerise Queen'	Field Container	Senesac	NY	1997	Broadcast	No significant injury at 1.5, 3 and 6 lb ai per acre.
23754	Black Bugbane (<i>Actaea racemosa</i> var. <i>racemosa</i>)	Field Container	Neal	NC	2005	Broadcast	No injury at the 2 and 4 lb ai per acre rates; moderate injury at 8 lb ai per acre
18717	Giant Hyssop, Sunset (<i>Agastache rupestris</i>)	Field Container	Klett	CO	1999	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
18717	Giant Hyssop, Sunset (<i>Agastache rupestris</i>)	Field Container	Klett	CO	2000	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24678	Giant Hyssop (<i>Agastache</i> sp.) <i>A. rugosa</i> X <i>foeniculum</i> 'Blue Fortune'	Field Container	Boydston	WA	2005	Broadcast	No visible injury; the 8 lb ai per acre rate caused brittle stems that make plants susceptible to wind damage
24678	Giant Hyssop (<i>Agastache</i> sp.) <i>A. aurantiaca</i> 'Coronado'	Field Container	Klett	CO	2005	Broadcast	No injury
24678	Giant Hyssop (<i>Agastache</i> sp.) <i>A. aurantiaca</i> 'Coronado'	Field Container	Klett	CO	2005	Broadcast	No injury
24678	Giant Hyssop (<i>Agastache</i> sp.) 'Blue Fortune'	Field Container	Mathers (OSU)	OH	2005	Broadcast	No injury at the 2 and 4 lb ai per acre rates; severe injury (brittle stems) at the 8 lb ai per acre rate
23745	Lady's-Mantle (<i>Alchemilla</i> sp.) <i>A. mollis</i> 'Thriller'	Field Container	Ahrens/Mervosh	CT	2005	Broadcast	No injury
23745	Lady's-Mantle (<i>Alchemilla</i> sp.) <i>A. mollis</i> 'Auslese'	Field Container	Derr	VA	2004	Broadcast	Slight injury at 2, 4 and 8 lb ai per acre
23745	Lady's-Mantle (<i>Alchemilla</i> sp.)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23745	Lady's-Mantle (<i>Alchemilla</i> sp.)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
23745	Lady's-Mantle (Alchemilla sp.) A. mollis 'Auslese'	Field Container	Lieth	CA	2004	Broadcast	No significant injury or growth reduction at 2, 4 and 8 lb ai per acre
23745	Lady's-Mantle (Alchemilla sp.) A. mollis	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23745	Lady's-Mantle (Alchemilla sp.) A. mollis 'Thriller'	Field Container	Senesac	NY	2004	Broadcast	No significant injury at 3, 6 and 12 lb ai per acre
31901	American Beachgrass (Ammophila breviligulata)	Field Container	Klett	CO	2015	Broadcast	No injury or growth reduction with with 3, 6 and 12 lb ai per acre applied twice.
31901	American Beachgrass (Ammophila breviligulata)	Field Container	Mathers	OH	2015	Broadcast	No injury with 3, 6, and 12 lb ai per acre applied twice.
31901	American Beachgrass (Ammophila breviligulata)	Field Container	Senesac	NY	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
23746	Hubricht's Bluestar, Arkansas Amsonia (Amsonia hubrichtii) A. hubrichtii	Field Container	Neal	NC	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23746	Hubricht's Bluestar, Arkansas Amsonia (Amsonia hubrichtii) A. hubrichtii	Field Container	Senesac	NY	2004	Broadcast	No injury at 3, 6 and 12 lb ai per acre
35747	Eastern Bluestar (Amsonia tabernaemontana) A. tabernaemontana	Field Container	Gilliam	AL	2004	Broadcast	Significant injury (leaf burn) at 2, 4 and 8 lb ai per acre
32031	Big Blue Stem (Andropogon gerardii)	Field Container	Derr	VA	2015	Broadcast	No shoot weight reduction with 3, 6 and 12 lb ai per acre applied twice.
32031	Big Blue Stem (Andropogon gerardii)	Field Container	Robbins	NM	2023	Broadcast	No injury and no impact on plant growth with 150, 300, and 600 lb per acre.
32031	Big Blue Stem (Andropogon gerardii)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3 lb ai per acre applied twice, minor with some recovery at 6 and 12 lb after 2nd application.
23747	Pussy-Toes, Stoloniferous (Antennaria dioica)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23747	Pussy-Toes, Stoloniferous (Antennaria dioica)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23748	Pussy-Toes, Small-leaf (Antennaria parvifolia)	Field Container	Neal	NC	2005	Broadcast	No injury
23748	Pussy-Toes, Small-leaf (Antennaria parvifolia)	Field Container	Senesac	NY	2004	Broadcast	No injury
29101	Columbine (Aquilegia sp.) 'Winky Mix'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
30324	Peanut (Arachis sp) 'Eco Turf'	Field Container	Robbins	NM	2023	Broadcast	No injury or impact on plant growth with 150, 300, and 600 lb per acre.
25569	Fern, Variegated Leatherleaf (Arachniodes simplicior) 'Variegata'	Field Container	Gilliam	AL	2004	Broadcast	No significant injury or growth reduction at 3 and 6 lb ai per acre

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
24684	Thrift Sea Pink (<i>Armeria maritima</i>) 'Splendens'	Field Container	Boydston	WA	2005	Broadcast	No injury
24684	Thrift Sea Pink (<i>Armeria maritima</i>) 'Splendens'	Field Container	Gilliam	AL	2005	Broadcast	No injury
24684	Thrift Sea Pink (<i>Armeria maritima</i>) 'Dusseldorf'	Field Container	Lieth	CA	2005	Broadcast	No injury at the 2 lb ai per acre rate; the 8 lb ai per acre rate reduced plant growth
22947	Mugwort, White (<i>Artemisia lactiflora</i>) 'Guizho'	Field Container	Klett	CO	2002	Broadcast	Trial 1: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
22947	Mugwort, White (<i>Artemisia lactiflora</i>) 'Guizho'	Field Container	Klett	CO	2002	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
23749	Canadian Wildginger (<i>Asarum canadense</i>) A. chinensis	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury
23749	Canadian Wildginger (<i>Asarum canadense</i>) A. chinensis	Field Container	Neal	NC	2005	Broadcast	No injury
23749	Canadian Wildginger (<i>Asarum canadense</i>)	Field Container	Senesac	NY	2005	Broadcast	No significant injury
24392	Aster, Michaelmas (<i>Aster dumosus</i> x <i>Aster novi belgii</i>)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
33401	Aster (<i>Aster</i> sp.) A. laevis 'Bluebird'	Field In-Ground	Cochran	MD	2020	Broadcast	Minor initial injury, with complete recovery, with 150, 300 and 600 lb per acre applied twice.
33401	Aster (<i>Aster</i> sp.)	Field In-Ground	Marble	FL	2021	Broadcast	Minor stunting and leaf injury at 150, 300, and 600 lb product per acre; plants were marketable throughout the experiment.
13204	False Goat's Beard (<i>Astilbe</i> sp.) A. chinensis	Field Container	Buriff	OH	1998	Broadcast	Slight injury at 2, moderate at 4 and 8 lb ai per acre.
13204	False Goat's Beard (<i>Astilbe</i> sp.)	Field Container	Senesac	NY	1997	Broadcast	No significant injury at 1.5 and 3 lb ai per acre, but moderate injury occurred at 6 lb ai per acre 8 WAT.
24693	Fern, Lady (<i>Athyrium nipponicum</i>)	Field Container	Derr	VA	2005	Broadcast	All rates caused no visible injury but reduced shoot weight
24693	Fern, Lady (<i>Athyrium nipponicum</i>) 'Pretum'	Field Container	Mathers (OSU)	OH	2005	Broadcast	No significant injury at the 2 lb ai per acre rate; the 4 and 8 lb ai per acre rates caused moderate to severe injury (frond scorching)
24693	Fern, Lady (<i>Athyrium nipponicum</i>)	Field Container	Reding	OH	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre) after 1st, high injury and growth reduction after 2nd application
26017	Lilacbush (<i>Aubrieta</i> sp.) 'Large Flo'	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre)
23750	Lilacbush (<i>Aubrieta</i> sp.)	Field Container	Klett	CO	2004	Broadcast	No injury
23750	Lilacbush (<i>Aubrieta</i> sp.)	Field Container	Klett	CO	2004	Broadcast	No injury
23750	Lilacbush (<i>Aubrieta</i> sp.) 'White Gem'	Field Container	Lieth	CA	2004	Broadcast	All rates caused no injury but reduced plant width

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26017	Lilacbush (Aubrieta sp.) 'Whitwell Gem'	Greenhouse	Mickelbart	IN	2006	Broadcast	No significant injury or growth reduction (2, 4 and 8 lb ai per acre)
23750	Lilacbush (Aubrieta sp.) A. deltoidea 'Whitwell Gem'	Field Container	Neal	NC	2004	Broadcast	No significant injury
23751	Blue Wild Indigo (Baptisia australis)	Field Container	Derr	VA	2004	Broadcast	All rates caused slight injury
23751	Blue Wild Indigo (Baptisia australis)	Field Container	Gilliam	AL	2004	Broadcast	No injury at the 2 and 4 lb ai per acre rates; slight injury at the 8 lb ai per acre rate
23751	Blue Wild Indigo (Baptisia australis)	Field Container	Klett	CO	2004	Broadcast	No injury
23751	Blue Wild Indigo (Baptisia australis)	Field Container	Klett	CO	2004	Broadcast	No injury
23751	Blue Wild Indigo (Baptisia australis)	Field Container	Neal	NC	2004	Broadcast	No injury
23751	Blue Wild Indigo (Baptisia australis)	Field Container	Senesac	NY	2005	Broadcast	No injury
24694	Siberian Tea (Bergenia cordifolia) 'Red Bloom'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
24694	Siberian Tea (Bergenia cordifolia) 'Rotblum'	Field Container	Lieth	CA	2005	Broadcast	No injury
26020	Siberian Tea (Bergenia cordifolia) 'Winter Glow'	Greenhouse	Mickelbart	IN	2006	Broadcast	No significant injury or growth reduction (2, 4 and 8 lb ai per acre)
24694	Siberian Tea (Bergenia cordifolia) New Hybrid bergenia	Field Container	Neal	NC	2005	Broadcast	No injury
24694	Siberian Tea (Bergenia cordifolia) New Hybrids	Field Container	Treat	WA	2006	Broadcast	No injury or growth reduction at all rates (2.5, 5 and 10 lb ai per acre)
20153	Butterfly Bush, Silver (Buddleia alternifolia)	Field Container	Klett	CO	2000	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
20153	Butterfly Bush, Silver (Buddleia alternifolia) 'Argentea'	Field Container	Klett	CO	2001	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24386	Butterfly Bush (Buddleia davidii) 'White Profusion'	Field Container	Beste/Frank (ARS)	MD	2005	Broadcast	No significant injury
24386	Butterfly Bush (Buddleia davidii) 'Pink Delight'	Field Container	Boydston	WA	2005	Broadcast	No injury
24386	Butterfly Bush (Buddleia davidii)	Field Container	Simmons	SC	2005	Broadcast	No significant injury
31902	Feather Reed Grass (Calamagrostis acutiflora)	Field Container	Derr	VA	2014	Broadcast	Excellent crop tolerance with 3, 6 and 12 lb ai per acre applied twice.
31902	Feather Reed Grass (Calamagrostis acutiflora) 'Overdam'	Field Container	Marble	FL	2017	Broadcast	No significant injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.

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31902	Feather Reed Grass (Calamagrostis acutiflora)	Field Container	Wade	SC	2014	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice; all plants marketable.
31903	Sedge, Leatherleaf (Carex buchananii) 'Red Rooster'	Field Container	Marble	FL	2017	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31903	Sedge, Leatherleaf (Carex buchananii) 'Red Rooster'	Field Container	Neal	NC	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31903	Sedge, Leatherleaf (Carex buchananii) 'Red Rooster'	Field Container	Senesac	NY	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32383	Sedge, Cherokee (Carex cherokeensis)	Field Container	Marble	FL	2019	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
32383	Sedge, Cherokee (Carex cherokeensis)	Field Container	Neal	NC	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32383	Sedge, Cherokee (Carex cherokeensis)	Field Container	Neal	NC	2020	Broadcast	No significant injury and crop quality with 150, 300 and 600 lb per acre applied twice.
31904	Sedge, Marrow's (Carex marrowii) 'Ice Dance'	Field Container	DeFrancesco	OR	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31904	Sedge, Marrow's (Carex marrowii)	Field Container	Mathers	OH	2016	Broadcast	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31904	Sedge, Marrow's (Carex marrowii) 'Ice Dancer'	Field Container	Senesac	NY	2014	Broadcast	Slight injury after 2nd applic. with 3, 6 and 12 lb ai per acre; no significant growth reduction.
24695	Red Valerian (Centranthus ruber)	Field Container	Reding	OH	2005	Broadcast	No injury
24695	Red Valerian (Centranthus ruber) 'Coccineus'	Field Container	Treat	WA	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre)
31905	Indian Woodoats (Chasmanthium latifolium)	Field Container	Mathers	OH	2015	Broadcast	No injury with 3 and 6, minor with 12 lb ai per acre applied twice.
31905	Indian Woodoats (Chasmanthium latifolium)	Field Container	Mervosh	CT	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice.
31905	Indian Woodoats (Chasmanthium latifolium)	Field Container	Senesac	NY	2014	Broadcast	No injury or significant growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31905	Indian Woodoats (Chasmanthium latifolium)	Field Container	Wilen	CA	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
23752	Turtlehead, Snakehead (Chelone sp.) C. lyonii 'Hot Lips'	Field Container	Derr	VA	2004	Broadcast	Slight injury at 2, 4 and 8 lb ai per acre
23752	Turtlehead, Snakehead (Chelone sp.) C. lyonii 'Hot Lips'	Field Container	Neal	NC	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23752	Turtlehead, Snakehead (Chelone sp.) C. lyonii 'Hot Lips'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
23752	Turtlehead, Snakehead (Chelone sp.) C. lyonii 'Hot Lips'	Field Container	Senesac	NY	2004	Broadcast	No significant injury at 3, 6 and 12 lb ai per acre

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23753	Golden Star (<i>Chrysogonum virginianum</i>) C. virginianum 'Alan Bush'	Field Container	Derr	VA	2004	Broadcast	All rates caused slight injury
23753	Golden Star (<i>Chrysogonum virginianum</i>) C. virginianum 'Alan Bush'	Field Container	Neal	NC	2004	Broadcast	No injury at the 2 and 4 lb ai per acre rates; very slight injury at 8 lb ai per acre
23753	Golden Star (<i>Chrysogonum virginianum</i>) C. virginianum 'Alan Bush'	Field Container	Senesac	NY	2005	Broadcast	No significant injury
24822	Leather Flower (<i>Clematis</i> sp.) 'Midnight Showers'	Field Container	Mathers (OSU)	OH	2005	Broadcast	No injury
29106	Tickseed (<i>Coreopsis</i> sp.) 'Moonbeam'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
33399	Cosmos (<i>Cosmos</i> sp.)	Field In-Ground	Derr	VA	2021	Broadcast	No injury and flowering reduction with 150, 300 and 600 lb per acre applied twice.
33399	Cosmos (<i>Cosmos</i> sp.)	Field In-Ground	Miller	WA	2018	Broadcast	No significant injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
34731	Cosmos (<i>Cosmos</i> sp.)	Field In-Ground	Senesac	NY	2020	Broadcast	No injury at 2.65 lb ai per acre; minor injury with 5.3 and 10.6 lb ai per acre with recovery by 8 WAT.
25295	False Heather, Elfin Herb, Mexican Heather (<i>Cuphea hyssopifolia</i>)	Field In-Ground	Chen	LA	2005	Broadcast	No significant injury
25609	Japanese Netvein Hollyfern (<i>Cyrtomium falcatum</i>) 'Rochfordii'	Field Container	Gilliam	AL	2004	Broadcast	No significant injury but significant growth reduction at 3 and 6 lb ai per acre
25609	Japanese Netvein Hollyfern (<i>Cyrtomium falcatum</i>)	Field Container	Marble	FL	2023	Broadcast	No injury or impact on plant growth with 150, 300 and 600 lb per acre.
34895	Asian Netvein Hollyfern (<i>Cyrtomium fortunei</i>)	Field In-Ground	Marble	FL	2022	Broadcast	Negligible to minor injury 4 weeks after each of two applications at 150, 300 or 600 lb/a. Plant growth increase reduced significantly by all rates.
20150	Spanish Gold Broom (<i>Cytisus purgans</i>)	Field Container	Klett	CO	2000	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
33400	Dahlia (<i>Dahlia</i> sp.) 'Gardenetta Passion Fruit'	Field In-Ground	Senesac	NY	2018	Broadcast	Minor injury with 150, moderate with 300 and 600, lb per acre applied twice; biomass reduction with 2X and 4X.
24824	Hardy Ice Plant, Yellow Ice Plant (<i>Delosperma nubigenum</i>)	Field Container	Boydston	WA	2005	Broadcast	No visible injury; significantly lower plant width at 4 and 8 lb ai per acre but plants are saleable
24824	Hardy Ice Plant, Yellow Ice Plant (<i>Delosperma nubigenum</i>)	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
24824	Hardy Ice Plant, Yellow Ice Plant (<i>Delosperma nubigenum</i>)	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre

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31907	Tufted Hairgrass (Deschampsia caespitosa) 'Pixie Fountain'	Field Container	DeFrancesco	OR	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31907	Tufted Hairgrass (Deschampsia caespitosa)	Field Container	Klett	CO	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31907	Tufted Hairgrass (Deschampsia caespitosa)	Field Container	Neal	NC	2015	Broadcast	No injury or growth reduction with 3, moderate with 6 and 12 lb ai per acre, applied twice.
24823	Maiden Pink (Dianthus deltooides) D. sp. 'Amazon Neon Purple'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
18718	Twinspur (Diascia integrerrima) D. barbaeae	Field Container	Klett	CO	1999	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
18718	Twinspur (Diascia integrerrima) 'Coral Canyon'	Field Container	Klett	CO	2000	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24696	Foxglove (Digitalis sp.) D. thaspi 'Foxy'	Field Container	Boydston	WA	2005	Broadcast	No injury
26023	Foxglove (Digitalis sp.) 'Excelsior Mix'	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre)
11467	Foxglove (Digitalis sp.) D. purpurea	Field Container	Gilliam	AL	1996	Broadcast	No significant injury or growth reduction at 3, 6 and 12 lb ai per acre.
24696	Foxglove (Digitalis sp.) D. thaspi 'Spanish Peaks'	Field Container	Klett	CO	2005	Broadcast	No significant injury
24696	Foxglove (Digitalis sp.) D. thaspi 'Spanish Peaks'	Field Container	Klett	CO	2005	Broadcast	No significant injury
26023	Foxglove (Digitalis sp.) 'Pam's Choice'	Greenhouse	Mickelbart	IN	2006	Broadcast	No significant injury or growth reduction (2, 4 and 8 lb ai per acre)
25579	Fern, Autumn (Dryopteris erythrosora)	Field Container	Gilliam	AL	2004	Broadcast	No injury at 3 and 6 lb ai per acre
25589	Fern, Southern Wood (Dryopteris ludoviciana)	Field Container	Gilliam	AL	2004	Broadcast	No significant injury or growth reduction at 3 and 6 lb ai per acre
33403	Eastern Purple Coneflower (Echinacea purpurea) 'Magnus'	Field In-Ground	Aulakh	CT	2019	Broadcast	Minor injury and growth reduction with 150, 300 and 600 lb per acre applied twice.
33403	Eastern Purple Coneflower (Echinacea purpurea)	Field In-Ground	Derr	VA	2021	Broadcast	No injury and flowering reduction with 150, 300 and 600 lb per acre applied twice.
33403	Eastern Purple Coneflower (Echinacea purpurea)	Field In-Ground	Marble	FL	2020	Broadcast	Very slight injury occurred with 3 and 6 lb ai per acre, but not with 12 lb ai per acre.
24391	Purple Coneflower (Echinacea sp.) E. purpurea 'Magnus'	Field Container	Boydston	WA	2005	Broadcast	No injury
24391	Purple Coneflower (Echinacea sp.) E. purpurea 'Magnus'	Field Container	Derr	VA	2005	Broadcast	No injury

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24391	Purple Coneflower (Echinacea sp.) Echinacea purpurea	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences
24375	Purple Coneflower (Echinacea sp.) E. purpurea 'Magnus'	Greenhouse	Gilliam	AL	2005	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
24391	Purple Coneflower (Echinacea sp.) 'Magnus'	Field Container	Gilliam	AL	2005	Broadcast	No injury
24391	Purple Coneflower (Echinacea sp.)	Field Container	Simmons	SC	2005	Broadcast	No significant injury
23089	Alpine Willowherb (Epilobium fleischeri)	Field Container	Klett	CO	2001	Broadcast	Trial 1: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
23089	Alpine Willowherb (Epilobium fleischeri)	Field Container	Klett	CO	2001	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
23755	Epimedium (Epimedium sp.) E. x rubrum	Field Container	Ahrens/Mervosh	CT	2005	Broadcast	Slight injury at 2 lb ai per acre; the 4 and 8 lb ai per acre rates caused significant injury and reduced plant vigor
23755	Epimedium (Epimedium sp.) E. x rubrum	Field Container	Senesac	NY	2005	Broadcast	Slight injury at 2 lb ai per acre; the 4 and 8 lb ai per acre rates caused significant injury
31908	Weeping Lovegrass (Eragrostis curvula)	Field Container	Derr	VA	2014	Broadcast	Excellent crop tolerance with 3, 6 and 12 lb ai per acre applied twice.
31908	Weeping Lovegrass (Eragrostis curvula)	Field Container	Klett	CO	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31908	Weeping Lovegrass (Eragrostis curvula)	Field Container	Marble	FL	2017	Broadcast	No significant injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32032	Purple Lovegrass (Eragrostis spectabilis)	Field Container	Neal	NC	2016	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice; slight stunting, with complete recovery, with 2X and 4X.
32032	Purple Lovegrass (Eragrostis spectabilis)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre after first application, minor with 2X and 4X after second.
23756	Joe Pye Weed (Eupatorium maculatum) 'Gateway'	Field Container	Ahrens/Mervosh	CT	2005	Broadcast	No injury
23757	Common Boneset (Eupatorium perfoliatum) 'Chocolate'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
23758	Joe Pye Weed (Eupatorium purpureum) E. dubium 'Little Joe'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
23758	Joe Pye Weed (Eupatorium purpureum) 'Gateway'	Field Container	Neal	NC	2005	Broadcast	No injury
23758	Joe Pye Weed (Eupatorium purpureum)	Field Container	Senesac	NY	2004	Broadcast	No injury
23758	Joe Pye Weed (Eupatorium purpureum) E. 'Sweet Scented'	Field Container	Treat	WA	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre

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24698	Thoroughwort (Eupatorium sp.) E. rugosum 'Chocolate'	Field Container	Boydston	WA	2005	Broadcast	No injury
24698	Thoroughwort (Eupatorium sp.) E. rugosa 'Chocolate'	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury; great control of crabgrass, little control of groundsel
24698	Thoroughwort (Eupatorium sp.)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
23090	Apache Plume (Fallugia paradoxa)	Field Container	Klett	CO	2001	Broadcast	Trial 1: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
23090	Apache Plume (Fallugia paradoxa)	Field Container	Klett	CO	2001	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24385	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Pink Fountain'	Field Container	Boydston	WA	2005	Broadcast	No injury
24385	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Whirling Butterflies'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
24385	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Whirling Butterflies'	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24385	Beeblossom, Lindheimer's (Gaura lindheimeri)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
24699	Treasureflower (Gazania linearis) 'Colorado Gold'	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24699	Treasureflower (Gazania linearis) Colorado Gold	Field Container	Neal	NC	2005	Broadcast	No injury
24699	Treasureflower (Gazania linearis) Colorado Gold	Field Container	Treat	WA	2006	Broadcast	Injury (minor stunting) noted only at the 4X rate(8 lb ai per acre)
26830	Gazania (Gazania sp.) 'Daybreak Mix'	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre)
24701	Transvaal Daisy (Gerbera sp.) G. jamesonii	Field Container	Chandran	WV	2005	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24701	Transvaal Daisy (Gerbera sp.) Gerbera jamesonii	Field Container	Fraelich	GA	2006	Broadcast	Slight injury at higher rates; no growth differences; plants marketable
24701	Transvaal Daisy (Gerbera sp.) G. jamesonii 'Lambada'	Field Container	Lieth	CA	2005	Broadcast	No injury or growth suppression
24701	Transvaal Daisy (Gerbera sp.) G. jamesonii	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24701	Transvaal Daisy (Gerbera sp.)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
24701	Transvaal Daisy (Gerbera sp.) G. festival 'Dark Eye Orange'	Field Container	Treat	WA	2006	Broadcast	Injury (stunting) noted only at the 4X rate (8 lb ai per acre).
24702	Globe Amaranth (Gomphrena sp.)	Field Container	Chandran	WV	2005	Broadcast	No injury at 2, 4 and 8 lb ai per acre

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24702	Globe Amaranth (Gomphrena sp.) G. globosa	Field Container	Gilliam	AL	2005	Broadcast	No injury
24702	Globe Amaranth (Gomphrena sp.)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
24702	Globe Amaranth (Gomphrena sp.) G. globosa 'Buddy Series Purple'	Field Container	Treat	WA	2006	Broadcast	Injury (stunting) noted only at the 4X rate (8 lb ai per acre)
31911	Hakone Grass (Hakonechloa sp.) H. macra 'Aureola'	Field Container	Klett	CO	2014	Broadcast	No injury with 3, 6 and 12 lb ai per acre after 1st applic.; very slight injury at 2X and 4X after 2nd applic. attributed to sun exposure of plants.
31911	Hakone Grass (Hakonechloa sp.) H. macra 'Aureola'	Field Container	Senesac	NY	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
23759	Common Sneezeweed (Helenium autumnale)	Field Container	Klett	CO	2004	Broadcast	No injury
23759	Common Sneezeweed (Helenium autumnale)	Field Container	Klett	CO	2004	Broadcast	No injury
23759	Common Sneezeweed (Helenium autumnale)	Field Container	Lieth	CA	2004	Broadcast	No significant injury
23759	Common Sneezeweed (Helenium autumnale)	Field Container	Neal	NC	2004	Broadcast	No injury
23759	Common Sneezeweed (Helenium autumnale)	Field Container	Senesac	NY	2005	Broadcast	No injury
26846	Sneezeweed (Helenium sp.) 'Hoopes II Yellow'	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre)
24703	Frostweed (Helianthemum sp.) 'Belgravia Rose'	Field Container	Lieth	CA	2005	Broadcast	No injury
33397	Common sunflower (Helianthus annuus) 'Sonja'	Field In-Ground	Aulakh	CT	2019	Broadcast	Minor injury with 150, 300 and 600 lb per acre applied twice; moderate growth reduction at 4X.
33397	Common sunflower (Helianthus annuus) 'Sunrich Summer Provence'	Field In-Ground	Doohan	OH	2021	Broadcast	No injury at lowest rate, mild to moderate injury increasing with rate (150, 300 and 600 lb/acre rates)
33397	Common sunflower (Helianthus annuus) 'Yellow Pygmy'	Field In-Ground	Marble	FL	2020	Broadcast	Minor chlorosis was observed with 12 lb ai per acre and slight chlorosis with 3 and 6 lb ai per acre, but there was no impact on plant growth.
23760	Sunflower, Willowleaf (Helianthus salicifolius)	Field Container	Senesac	NY	2005	Broadcast	No injury
24704	Sunflower (Helianthus sp.) 'First Light'	Field Container	Mathers (OSU)	OH	2005	Broadcast	No injury
24704	Sunflower (Helianthus sp.) H. salicifolius 'First Light'	Field Container	Treat	WA	2006	Broadcast	Injury (stunting) noted only at the 4X rate (8 lb ai per acre)
23762	Smooth Oxeye (Heliopsis helianthoides)	Field Container	Boydston	WA	2005	Broadcast	No injury

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23762	Smooth Oxeye (<i>Heliopsis helianthoides</i>) H. <i>helianthoides</i> var. <i>scabra</i>	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
26029	Smooth Oxeye (<i>Heliopsis helianthoides</i>) 'Summer Nights'	Greenhouse	Mickelbart	IN	2006	Broadcast	No significant injury or growth reduction (2, 4 and 8 lb ai per acre)
23762	Smooth Oxeye (<i>Heliopsis helianthoides</i>)	Field Container	Neal	NC	2004	Broadcast	No injury
23762	Smooth Oxeye (<i>Heliopsis helianthoides</i>)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
23763	Hellebore, Black (<i>Helleborus niger</i>) H. <i>orientalis</i>	Field Container	Czarnota	GA	2004	Broadcast	No injury at 4 lb ai per acre through 4 weeks after treatment, but slight injury appeared 8 and 12 weeks after treatment.
23763	Hellebore, Black (<i>Helleborus niger</i>) H. <i>orientalis</i>	Field Container	Mathers (OSU)	OH	2004	Broadcast	Unacceptable injury (cupped leaves) at 2, 4 and 8 lb ai per acre
25790	Hellebore, Black (<i>Helleborus niger</i>)	Field Container	Senesac	NY	2005	Broadcast	No injury
24705	Coral Bells (<i>Heuchera sanguinea</i>) 'Crimson Curls'	Field Container	Boydston	WA	2005	Broadcast	No injury at 2 and 4 lb ai per acre; significant stunting at 8 lb ai per acre
24705	Coral Bells (<i>Heuchera sanguinea</i>)	Field Container	Klett	CO	2005	Broadcast	No significant injury
24705	Coral Bells (<i>Heuchera sanguinea</i>)	Field Container	Klett	CO	2005	Broadcast	No significant injury
24705	Coral Bells (<i>Heuchera sanguinea</i>) 'Firefly'	Field Container	Lieth	CA	2005	Broadcast	No injury or growth suppression
34898	Foamy Bells (<i>Heucherella</i> sp.) 'Eye Spy'	Field In-Ground	Mathers	OH	2023	Broadcast	Sun damage on all treatments confounded outcomes. However, injury and growth did not appear to be different with 2.65, 5.3 and 10.6 lb ai per acre versus nontreated plants.
25787	Rose-Of-Sharon (<i>Hibiscus syriacus</i>) 'Splash Pinot Nior'	Field Container	Senesac	NY	2005	Broadcast	No injury
32018	Sweet Grass (<i>Hierochloa odorata</i>)	Field Container	Marble	FL	2023	Broadcast	No injury or impact on plant growth with 150, 300 and 600 lb per acre.
32018	Sweet Grass (<i>Hierochloa odorata</i>)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice.
24399	Lily, Plantain (<i>Hosta fortunei</i>)	Field Container	Boydston	WA	2005	Broadcast	No injury
24399	Lily, Plantain (<i>Hosta fortunei</i>) 'Gold Standard'	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences at all rates
32526	Stoncrop, October Daphne (<i>Hylotelephium sieboldii</i>)	Field Container	Koski	CO	2019	Broadcast	No injury after 1st application with 150, 300 and 600 lb per acre, severe injury with all rates after 2nd applic.
32526	Stoncrop, October Daphne (<i>Hylotelephium sieboldii</i>) 'Variegatum'	Field Container	Senesac	NY	2021	Broadcast	Minor injury increasing with rate (2.65, 5.3, 10.6 lb ai per acre).

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
26839	Candytuft (Iberis sp.)	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24826	Candytuft (Iberis sp.) 'Snowflake'	Field Container	Lieth	CA	2005	Broadcast	No injury
31912	Common Rush (Juncus effusus) 'Spiralis'	Field Container	Hu	OH	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31912	Common Rush (Juncus effusus)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice.
31912	Common Rush (Juncus effusus)	Field Container	Wade	SC	2014	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice; all plants marketable.
23764	Poker Plant (Kniphofia sp.) 'Flamenco'	Field Container	Boydston	WA	2005	Broadcast	No injury
23764	Poker Plant (Kniphofia sp.)	Field Container	Derr	VA	2005	Broadcast	All rates caused no visible injury but reduced shoot weight
23764	Poker Plant (Kniphofia sp.)	Field Container	Gilliam	AL	2005	Broadcast	No injury
23764	Poker Plant (Kniphofia sp.) K. uvaria	Field Container	Klett	CO	2004	Broadcast	No injury
23764	Poker Plant (Kniphofia sp.) K. uvaria	Field Container	Klett	CO	2004	Broadcast	No injury
23764	Poker Plant (Kniphofia sp.) K. uvaria	Field Container	Lieth	CA	2004	Broadcast	No significant injury
23764	Poker Plant (Kniphofia sp.)	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury
23764	Poker Plant (Kniphofia sp.) 'Pfitzer's Hybrid'	Field Container	Neal	NC	2005	Broadcast	No injury
25442	Lantana (Lantana sp.) L. hybrida 'New Gold'	Field In-Ground	Chen	LA	2005	Broadcast	No injury
24679	Lantana (Lantana sp.) L. montevidensis	Field Container	Lieth	CA	2005	Broadcast	No injury or plant growth suppression
23765	Lavender, English (Lavandula angustifolia)	Field Container	Klett	CO	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23765	Lavender, English (Lavandula angustifolia)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23765	Lavender, English (Lavandula angustifolia) 'Vera'	Field Container	Lieth	CA	2004	Broadcast	No injury but some growth reduction at 2, 4 and 8 lb ai per acre
23765	Lavender, English (Lavandula angustifolia)	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23765	Lavender, English (Lavandula angustifolia) 'Munstead'	Field Container	Neal	NC	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23765	Lavender, English (Lavandula angustifolia)	Field Container	Senesac	NY	2004	Broadcast	No injury at 3, 6 and 12 lb ai per acre

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
24400	Lavender (<i>Lavandula</i> sp.) <i>L. angustifolia</i>	Field Container	Gilliam	AL	2004	Broadcast	No significant injury or growth reduction at 2, 4 and 8 lb ai per acre
24390	Max Chrysanthemum (<i>Leucanthemum maximum</i>) 'Snowcap'	Field Container	Boydston	WA	2005	Broadcast	No injury.
24390	Max Chrysanthemum (<i>Leucanthemum maximum</i>) <i>Chrysanthemum x superbum</i>	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences at all rates.
31913	Ryegrass, Sand (<i>Leymus arenarius</i>)	Field Container	Derr	VA	2015	Broadcast	No shoot weight reduction with 3, 6 and 12 lb ai per acre applied twice.
31913	Ryegrass, Sand (<i>Leymus arenarius</i>) 'Blue Dune'	Field Container	Neal	NC	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31913	Ryegrass, Sand (<i>Leymus arenarius</i>) 'Blue Dune'	Field Container	Senesac	NY	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
23766	Golden Rockets (<i>Ligularia stenocephala</i>) <i>L. dentata</i> 'Dark Leaf'	Field Container	Boydston	WA	2005	Broadcast	No injury
23766	Golden Rockets (<i>Ligularia stenocephala</i>)	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences
23766	Golden Rockets (<i>Ligularia stenocephala</i>) <i>L. dentata</i>	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury
23766	Golden Rockets (<i>Ligularia stenocephala</i>) 'The Rocket'	Field Container	Senesac	NY	2005	Broadcast	No injury
23767	Perennial Flax (<i>Linum perenne</i>)	Field Container	Klett	CO	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23767	Perennial Flax (<i>Linum perenne</i>)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23767	Perennial Flax (<i>Linum perenne</i>) 'Sapphire'	Field Container	Lieth	CA	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23767	Perennial Flax (<i>Linum perenne</i>) 'Saphyr'	Field Container	Neal	NC	2004	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23767	Perennial Flax (<i>Linum perenne</i>)	Field Container	Senesac	NY	2004	Broadcast	No injury at 3, 6 and 12 lb ai per acre
11455	Lilyturf, Big Blue (<i>Liriope muscari</i>) 'Big Blue'	Field In-Ground	Chen	LA	2005	Broadcast	No significant injury
13203	Loosestrife, Yellow; Golden Globe (<i>Lysimachia</i> sp.) <i>L. punctata</i>	Field Container	Senesac	NY	1997	Broadcast	No to very slight injury increasing with rate (1.5, 3, 6 lb ai per acre); slight reduction in dry wt at highest rate.
24388	Bee Balm, Scarlet (<i>Monarda didyma</i>) 'Cambridge Scarlet'	Field Container	Beste/Frank (ARS)	MD	2005	Broadcast	No injury
24388	Bee Balm, Scarlet (<i>Monarda didyma</i>) 'Gardeview Scarlet'	Field Container	Boydston	WA	2005	Broadcast	No injury
24388	Bee Balm, Scarlet (<i>Monarda didyma</i>)	Field Container	Simmons	SC	2005	Broadcast	Slight injury (chlorosis) but all plants marketable

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31914	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Klett	CO	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31914	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Neal	NC	2014	Broadcast	No injury, growth reduction or delayed blooming with 3, 6 and 12 lb ai per acre applied twice.
31914	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Senesac	NY	2014	Broadcast	No injury or significant growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32033	Pine Muhly (Muhlenbergia dubia)	Field Container	Marble	FL	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice; all plants marketable.
32033	Pine Muhly (Muhlenbergia dubia)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice.
32020	Bamboo Muhly (Muhlenbergia dumosa)	Field Container	Derr	VA	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32020	Bamboo Muhly (Muhlenbergia dumosa)	Field Container	Marble	FL	2016	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice; slight growth reduction with 4X; all plants marketable.
32020	Bamboo Muhly (Muhlenbergia dumosa)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3 lb ai per acre applied twice, minor injury with 6 and 12 lb after 2nd application.
12906	Bayberry, Northern (Myrica pensylvanica)	Field Container	Hart	NJ	2003	Broadcast	No injury at 2, 4 and 8 lb ai per acre; 65 WDG used
31915	Finestem Needlegrass (Nassella tenuissima)	Field Container	Cochran (IA)	IA	2014	Broadcast	Moderate injury with 3, 6 and 12 lb ai per acre applied twice; significant growth reduction with 4X.
31915	Finestem Needlegrass (Nassella tenuissima)	Field Container	Koivunen	CA	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31915	Finestem Needlegrass (Nassella tenuissima)	Field Container	Mathers	OH	2015	Broadcast	Severe injury with 3, 6, and 12 lb ai per acre after 1st applic, with 1X recovering to commercially acceptable level after 2nd applic; 2X and 4X unacceptable. Abnormally hot weather might have increased injury.
23769	Nepeta (Nepeta x faassenii) 'Walker's Low'	Field Container	Derr	VA	2004	Broadcast	Slight injury at 2, 4 and 8 lb ai per acre
23769	Nepeta (Nepeta x faassenii)	Field Container	Gilliam	AL	2004	Broadcast	No injury at 2, 4, 8 lb ai per acre.
23769	Nepeta (Nepeta x faassenii)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23769	Nepeta (Nepeta x faassenii)	Field Container	Klett	CO	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23769	Nepeta (Nepeta x faassenii) 'Dropmore'	Field Container	Lieth	CA	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23769	Nepeta (Nepeta x faassenii)	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
23769	Nepeta (Nepeta x faassenii) N. nervosa 'Blue Carpet'	Field Container	Neal	NC	2004	Broadcast	Unacceptable injury at 2, 4 and 8 lb ai per acre
23769	Nepeta (Nepeta x faassenii)	Field Container	Senesac	NY	2004	Broadcast	No injury at 3, 6 and 12 lb ai per acre

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13205	Evening Primrose; Sundrops (Oenothera sp.) O. berlandiera	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
13205	Evening Primrose; Sundrops (Oenothera sp.) O. fruticosa	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
13205	Evening Primrose; Sundrops (Oenothera sp.) O. fruticosa	Field Container	Senesac	NY	1997	Broadcast	Slight injury with quick recovery at 1.5, 3 and 6 lb ai per acre.
23770	Devil's-tongue; Eastern Prickly Pear (Opuntia humifusa) 'Lemon Form'	Field Container	Senesac	NY	2005	Broadcast	No injury
29262	Hopflower Oregano; Majoram (Origanum libanoticum)	Field Container	Klett	CO	2002	Broadcast	Trial 1: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
29262	Hopflower Oregano; Majoram (Origanum libanoticum)	Field Container	Klett	CO	2002	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24709	Hopflower Oregano; Majoram (Origanum libanoticum)	Field Container	Klett	CO	2004	Broadcast	No injury
24709	Hopflower Oregano; Majoram (Origanum libanoticum)	Field Container	Klett	CO	2004	Broadcast	No injury
24709	Hopflower Oregano; Majoram (Origanum libanoticum)	Field Container	Klett	CO	2005	Broadcast	No significant injury
24709	Hopflower Oregano; Majoram (Origanum libanoticum)	Field Container	Klett	CO	2005	Broadcast	No significant injury
23091	Little Pickles Ice Plant (Othonna capensis)	Field Container	Klett	CO	2001	Broadcast	Trial 1: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
23091	Little Pickles Ice Plant (Othonna capensis)	Field Container	Klett	CO	2001	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24396	Peony (Paeonia sp.) 'Karl Rosenfield'	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences at all rates
25209	Switch Grass (Panicum virgatum) 'Trailblazer'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
25209	Switch Grass (Panicum virgatum)	Field Container	Cochran (IA)	IA	2014	Broadcast	Minor injury with 3, 6 and 12 lb ai per acre applied twice; no significant growth reduction.
26832	Switch Grass (Panicum virgatum)	Greenhouse	Freiberger	NJ	2006	Broadcast	High injury at all rates (2, 4 and 8 lb ai per acre)
25209	Switch Grass (Panicum virgatum)	Field Container	Lieth	CA	2006	Broadcast	No injury but over 50 % growth reduction at 2, 4 and 8 lb ai per acre
25209	Switch Grass (Panicum virgatum) 'Dallas Blues'	Field Container	Mathers (OSU)	OH	2005	Broadcast	No injury

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
25209	Switch Grass (<i>Panicum virgatum</i>) 'Northwind'	Field Container	Neal	NC	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
25209	Switch Grass (<i>Panicum virgatum</i>)	Field Container	Senesac	NY	2015	Broadcast	No injury at 3, 6 and 12 lb ai per acre applied twice.
12385	Geranium (<i>Pelargonium</i> sp.) <i>P. x hortorum</i>	Field Container	Talbert	AR	1998	Broadcast	No to minor injury increasing with rate (2, 4, 8 lb ai per acre). NOTE: one plant in the 4 lb ai per acre treatment died; because other plants did not exhibit injury at the same level, some other issue might have been involved. Additional research is warr
31917	Fountaingrass (<i>Pennisetum alopecuroides</i>)	Field Container	Derr	VA	2014	Broadcast	Good crop tolerance with 3, 6 and 12 lb ai per acre applied twice.
31917	Fountaingrass (<i>Pennisetum alopecuroides</i>) 'Little Bunny'	Field Container	Marble	FL	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31917	Fountaingrass (<i>Pennisetum alopecuroides</i>)	Field Container	Senesac	NY	2014	Broadcast	Virtually no injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31918	Oriental Fountain Grass (<i>Pennisetum orientale</i>)	Field Container	Cochran (IA)	IA	2014	Broadcast	Minor injury with 3, 6 and 12 lb ai per acre applied twice; no significant growth reduction.
31918	Oriental Fountain Grass (<i>Pennisetum orientale</i>)	Field Container	Klett	CO	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice; slight growth reduction at 2X.
31918	Oriental Fountain Grass (<i>Pennisetum orientale</i>) 'Karley Rose'	Field Container	Marble	FL	2015	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31918	Oriental Fountain Grass (<i>Pennisetum orientale</i>)	Field Container	Senesac	NY	2014	Broadcast	Slight injury and no significant growth reduction with 3, 6 and 12 lb ai per acre applied twice.
24397	Beard-Tongue (<i>Penstemon</i> sp.) 'Husker Red'	Field Container	Beste/Frank (ARS)	MD	2005	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24397	Beard-Tongue (<i>Penstemon</i> sp.) <i>P. hartwegii</i> 'Scarlet Queen'	Field Container	Boydston	WA	2005	Broadcast	No injury
24397	Beard-Tongue (<i>Penstemon</i> sp.) <i>P. digitalis</i>	Field Container	Derr	VA	2005	Broadcast	No injury
24397	Beard-Tongue (<i>Penstemon</i> sp.) <i>P. x mexicali</i> 'Red Rocks'	Field Container	Lieth	CA	2005	Broadcast	No injury or plant growth suppression
24397	Beard-Tongue (<i>Penstemon</i> sp.) 'Husker Red'	Field Container	Neal	NC	2004	Broadcast	No injury
24397	Beard-Tongue (<i>Penstemon</i> sp.)	Field Container	Simmons	SC	2005	Broadcast	No injury
26835	Pentas (<i>Pentas</i> sp.) 'New Look Pink'	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre)
12388	Sage, Russian (<i>Perovskia</i> sp.) <i>P. atriplicifolia</i>	Field Container	Senesac	NY	1997	Broadcast	No significant injury at 1.5, 3 and 6 lb ai per acre, but dry weight decreased significantly with increasing rate.
24485	Phlox, Fall (<i>Phlox paniculata</i>) 'Bright Eyes'	Field Container	Boydston	WA	2005	Broadcast	All rates caused brittle stems susceptible to wind damage

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24487	Phlox, Fall (Phlox paniculata) 'Laura'	Field In-Ground	Senesac	NY	2018	Broadcast	Severe injury with 150, 300 and 600 lb per acre applied twice; biomass reduction at all rates.
24398	Phlox, Moss (Phlox subulata) 'Emerald Cushion Pink'	Field Container	Beste/Frank (ARS)	MD	2005	Broadcast	Slight injury but all marketable
24398	Phlox, Moss (Phlox subulata) 'Emerald Blue'	Field Container	Boydston	WA	2005	Broadcast	No injury
24430	Phlox, Moss (Phlox subulata) 'Candy Strip'	Field In-Ground	Chen	LA	2005	Broadcast	No injury
24398	Phlox, Moss (Phlox subulata)	Field Container	Simmons	SC	2005	Broadcast	Slight injury but all plants marketable
24713	Flax, New Zealand (Phormium tenax) P. colinsoi	Field Container	Lieth	CA	2005	Broadcast	No injury; significant increase in plant growth at 4 and 8 lb ai per acre
12389	False Dragon Head; Lion's Heart (Physostegia sp.) P. virginiana 'Vivid'	Field Container	Senesac	NY	1997	Broadcast	No significant injury at 1.5, 3.0 and 6.0 lb ai per acre.
23771	Jacob's Ladder (Polemonium sp.) P. boreale 'Heavenly Habit'	Field Container	Boydston	WA	2005	Broadcast	Single application at all rates had no impact, but second application did cause minor stunting.
23771	Jacob's Ladder (Polemonium sp.) P. reptans	Field Container	Fraelich	GA	2006	Broadcast	Slight to moderate injury and severe stunting
23771	Jacob's Ladder (Polemonium sp.) P. reptans 'Stairway to Heaven'	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
23771	Jacob's Ladder (Polemonium sp.) P. boreale	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury
23771	Jacob's Ladder (Polemonium sp.)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
23771	Jacob's Ladder (Polemonium sp.) 'Caeruleum Blue'	Field Container	Treat	WA	2006	Broadcast	Data unreliable because of crop failure
25599	Korean Tasselfen (Polystichum polyblepharum)	Field Container	Gilliam	AL	2004	Broadcast	No significant injury but significant growth reduction at 3 and 6 lb ai per acre
24715	Primrose, Fairy (Primula malacoides)	Field Container	Lieth	CA	2005	Broadcast	No injury but there was some plant growth suppression
24715	Primrose, Fairy (Primula malacoides) P. malacoides 'Fairy Prima Carmine Rose'	Field Container	Treat	WA	2006	Broadcast	Trial abandoned due to crop failure
24714	Lungwort (Pulmonaria sp.)	Field Container	Mathers	OH	2023	Broadcast	Severe injury and a reduction in growth with 2.65, 5.3 and 10.6 lb ai per acre.
20152	Buckthorn (Rhamnus sp.) R. smithii	Field Container	Klett	CO	2000	Broadcast	No injury or growth reduction at 2 and 4 lb ai per acre.

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20152	Buckthorn (Rhamnus sp.) R. Smithii	Field Container	Klett	CO	2001	Broadcast	No injury at 2 and 4 lb ai per acre; good weed control at 4 lb ai per acre.
32523	Stoncrop, Gray (Rhodiola pachyclados)	Field Container	Koski	CO	2019	Broadcast	No injury after 1st application with 150, 300 and 600 lb per acre, moderate injury at 4X after 2nd applic; high growth reduction with 4X.
32523	Stoncrop, Gray (Rhodiola pachyclados)	Field Container	Marble	FL	2019	Broadcast	Moderate injury with 150, 300 and 600 lb per acre applied twice; no growth reduction.
32523	Stoncrop, Gray (Rhodiola pachyclados)	Field Container	Senesac	NY	2016	Broadcast	Moderate to severe injury with 3 and 6 and 12 lb ai per acre applied twice.
33404	Black-Eyed Susan (Rudbeckia hirta) 'Indian Summer'	Field In-Ground	Doohan	OH	2021	Broadcast	No injury when applied at 150, 300 and 600 lb/acre rates twice, six weeks apart.
33404	Black-Eyed Susan (Rudbeckia hirta) 'Cherry Brandy'	Field In-Ground	Marble	FL	2020	Broadcast	Very slight injury occurred with all rates (3, 6, 12 lb ai per acre).
33404	Black-Eyed Susan (Rudbeckia hirta) 'Prairie Sun'	Field In-Ground	Senesac	NY	2018	Broadcast	Minor to moderate injury with 150, 300 and 600 lb per acre applied twice; biomass reduction with all rates.
25303	Carolina Wild Petunia (Ruellia caroliniensis) R. brittoniana 'Katie'	Field In-Ground	Chen	LA	2005	Broadcast	No significant injury
36043	Coral Plant, Fountain (Russelia equisetiformis) 'Yellow Candlelight'	Field Container	Neal	NC	2023	Broadcast	Slight injury with 150 lb product per acre.
32027	Plumegrass; Sugarcane (Saccharum sp.) E. ravennae	Field Container	Derr	VA	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32027	Plumegrass; Sugarcane (Saccharum sp.) S. ravennae	Field Container	Marble	FL	2018	Broadcast	No injury or growth reduction with 2.6, 5.3 and 10.6 lb ai per acre applied twice.
32027	Plumegrass; Sugarcane (Saccharum sp.)	Field Container	Senesac	NY	2016	Broadcast	No injury with 3, 6 and 12 lb ai per acre applied twice.
22949	Sage (Salvia daghestanica)	Field Container	Klett	CO	2002	Broadcast	Trial 1: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
22949	Sage (Salvia daghestanica)	Field Container	Klett	CO	2002	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
24387	Woodland Sage (Salvia x sylvestris) 'Marcus'	Field Container	Boydston	WA	2005	Broadcast	No injury
24717	Lavender Cotton (Santolina chamaecyparissus)	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
24717	Lavender Cotton (Santolina chamaecyparissus) 'Compacta'	Field Container	Lieth	CA	2005	Broadcast	No injury; significant increase in plant growth
24488	Pincushions (Scabiosa sp.) 'Butterfly Blue'	Field Container	Boydston	WA	2005	Broadcast	No injury

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24488	Pincushions (Scabiosa sp.) 'Pink Mist'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
24488	Pincushions (Scabiosa sp.) S. columbaria 'Butterfly Blue'	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24489	Pincushions (Scabiosa sp.) 'Blue Diamonds'	Greenhouse	Mickelbart	IN	2006	Broadcast	No significant injury or growth reduction (2, 4 and 8 lb ai per acre)
24488	Pincushions (Scabiosa sp.) 'Butterfly Blue'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
24488	Pincushions (Scabiosa sp.)	Field Container	Reding	OH	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre); all plants marketable
24488	Pincushions (Scabiosa sp.) S. 'Butterfly Blue'	Field Container	Treat	WA	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre).
31919	Little Bluestem (Schizachyrium scoparium)	Field Container	Cochran (IA)	IA	2014	Broadcast	Moderate initial injury, with complete recovery, with 3, 6 and 12 lb ai per acre applied twice; no significant growth reduction.
31919	Little Bluestem (Schizachyrium scoparium)	Field Container	Derr	VA	2014	Broadcast	Good crop tolerance with 3, 6 and 12 lb ai per acre applied twice.
31919	Little Bluestem (Schizachyrium scoparium)	Field Container	Neal	NC	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31919	Little Bluestem (Schizachyrium scoparium)	Field Container	Senesac	NY	2014	Broadcast	Slight injury after 2nd applic. with 3, 6 and 12 lb ai per acre; no significant growth reduction.
22950	South American Skullcap (Scutellaria racemosa) S. resinosa	Field Container	Klett	CO	2002	Broadcast	Trial 1: Insufficient crop safety data collected due to crop failure; good weed control.
22950	South American Skullcap (Scutellaria racemosa) S. resinosa	Field Container	Klett	CO	2002	Broadcast	Trial 2: No injury or growth reduction at 2 and 4 lb ai per acre; good weed control.
32520	Stoncrop, Moss (Sedum acre) 'Aurea'	Field Container	Cochran	MD	2020	Broadcast	No injury after the first application, minor to moderate after 2nd, increasing with rates (150, 300 and 600 lb per acre).
32520	Stoncrop, Moss (Sedum acre)	Field Container	Marble	FL	2019	Broadcast	No injury or growth reduction with 150, 300 and 600 lb per acre applied twice.
32520	Stoncrop, Moss (Sedum acre) 'Aurea'	Field Container	Neal	NC	2018	Broadcast	Moderate injury and growth reduction with 150 lb per acre applied twice.
32520	Stoncrop, Moss (Sedum acre)	Field Container	Senesac	NY	2016	Broadcast	Minor injury with 3, 6 and 12 lb ai per acre applied twice.
32521	Sedum Hybrids (Sedum hybridum)	Field Container	Koski	CO	2019	Broadcast	No injury after 1st application with 150, 300 and 600 lb per acre, severe injury at 4X after 2nd applic; moderate and high growth reduction with 2X and 4X.
32521	Sedum Hybrids (Sedum hybridum) Sedum × Graptosedum 'Golden Glow'	Field Container	Marble	FL	2019	Broadcast	No to minor injury with 150, 300 and 600 lb per acre applied twice; no significant growth reduction.
32521	Sedum Hybrids (Sedum hybridum) 'Czar's Gold'	Field Container	Neal	NC	2019	Broadcast	Moderate injury and growth reduction with 150 per acre applied twice.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
32521	Sedum Hybrids (Sedum hybridum)	Field Container	Senesac	NY	2016	Broadcast	Minor injury with 3 and 6, moderate with 12 lb ai per acre applied twice.
32522	Stonecrop, Kamchatka (Sedum kamtschaticus)	Field Container	Mathers	OH	2016	Broadcast	No significant injury with 0.5 and 1, moderate with 2 lb ai per acre applied twice; moderate to severe growth reduction.
32522	Stonecrop, Kamchatka (Sedum kamtschaticus) 'Weihestephaner Gold'	Field Container	Neal	NC	2019	Broadcast	Moderate injury and growth reduction with 150 per acre applied twice.
32522	Stonecrop, Kamchatka (Sedum kamtschaticus)	Field Container	Seefeldt	WA	2020	Broadcast	No injury with 2.65, 5.3 or 10.6 lb ai per acre.
32522	Stonecrop, Kamchatka (Sedum kamtschaticus)	Field Container	Senesac	NY	2017	Broadcast	Minor injury early with complete recovery with 3, 6 and 12 lb per acre applied twice.
32524	Stonecrop, Jenny's (Sedum rupestre) 'Angelina'	Field Container	Nackley	OR	2018	Broadcast	No injury or growth reduction with 2.65, 5.3 and 10.6 lb ai per acre applied twice.
32524	Stonecrop, Jenny's (Sedum rupestre) 'Angelina'	Field Container	Neal	NC	2018	Broadcast	Severe injury and growth reduction with 200, 400 and 800 lb per acre applied twice.
32524	Stonecrop, Jenny's (Sedum rupestre)	Field Container	Senesac	NY	2016	Broadcast	Very minimal injury with 3 and 6 and 12 lb ai per acre applied twice.
32525	Stonecrop, Tasteless (Sedum sexamgulare)	Field Container	Koski	CO	2019	Broadcast	No injury after 1st application with 150, 300 and 600 lb per acre, moderate to severe injury from 1x to 4x after 2nd applic.
32525	Stonecrop, Tasteless (Sedum sexamgulare)	Field Container	Marble	FL	2019	Broadcast	Minor injury with 150, 300 and 600 lb per acre applied twice; no growth reduction.
32525	Stonecrop, Tasteless (Sedum sexamgulare)	Field Container	Senesac	NY	2016	Broadcast	Minor injury with 3, moderate with 6 and 12 lb ai per acre applied twice.
24389	Stonecrop (Sedum sp.) 'Autumn Joy'	Field Container	Boydston	WA	2005	Broadcast	No injury
24389	Stonecrop (Sedum sp.) 'Autumn Joy'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
24389	Stonecrop (Sedum sp.)	Field Container	Simmons	SC	2005	Broadcast	No significant injury
32527	Stonecrop, Two-Row/Caucasian (Sedum spurium) 'Fireglow'	Field Container	Derr	VA	2017	Broadcast	No to minor injury with 150, 300 and 600 lb per acre applied twice; low to moderate growth reduction.
32527	Stonecrop, Two-Row/Caucasian (Sedum spurium)	Field Container	Seefeldt	WA	2020	Broadcast	No injury with 2.65, 5.3 or 10.6 lb ai per acre.
32527	Stonecrop, Two-Row/Caucasian (Sedum spurium) Sedum spurium 'John Creech'	Field Container	Senesac	NY	2017	Broadcast	Minor injury early with complete recovery with 3, 6 and 12 lb per acre applied twice.
23774	Houseleek, Cobweb (Sempervivum arachnoideum) 'Cobweb'	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
23774	Houseleek, Cobweb (Sempervivum arachnoideum)	Field Container	Senesac	NY	2004	Broadcast	No injury
23773	Houseleek, Common (Sempervivum tectorum) 'Cobweb'	Field Container	Ahrens/Mervosh	CT	2005	Broadcast	No significant injury
23773	Houseleek, Common (Sempervivum tectorum)	Field Container	Klett	CO	2004	Broadcast	No injury
23773	Houseleek, Common (Sempervivum tectorum)	Field Container	Klett	CO	2004	Broadcast	No injury
23773	Houseleek, Common (Sempervivum tectorum)	Field Container	Lieth	CA	2004	Broadcast	No significant injury
23773	Houseleek, Common (Sempervivum tectorum)	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury
23776	Goldenrod, Wreath; Goldenrod, Blue Stem (Solidago caesia)	Field Container	Marble	FL	2023	Broadcast	No injury or impact on plant growth with 150, 300 and 600 lb per acre.
23776	Goldenrod, Wreath; Goldenrod, Blue Stem (Solidago caesia)	Field Container	Mathers	OH	2023	Broadcast	No injury with 2.65, 5.3 and 10.6 lb ai per acre.
23777	Goldenrod, Wrinkleleaf (Solidago rugosa)	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences at all rates
23777	Goldenrod, Wrinkleleaf (Solidago rugosa)	Field Container	Lieth	CA	2004	Broadcast	No significant injury
23777	Goldenrod, Wrinkleleaf (Solidago rugosa)	Field Container	Neal	NC	2004	Broadcast	No injury
23777	Goldenrod, Wrinkleleaf (Solidago rugosa)	Field Container	Reding	OH	2005	Broadcast	No injury
23778	Goldenrod, Seaside (Solidago sempervirens)	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences at all rates
23778	Goldenrod, Seaside (Solidago sempervirens)	Field Container	Fraelich	GA	2006	Broadcast	No injury or growth differences at all rates
23778	Goldenrod, Seaside (Solidago sempervirens)	Field Container	Senesac	NY	2004	Broadcast	No injury
33402	Goldenrod (Solidago sp.) 'Fireworks'	Field In-Ground	Aulakh	CT	2019	Broadcast	No injury and growth reduction with 150, 300 and 600 lb per acre applied twice.
24718	Goldenrod (Solidago sp.) S. speciosa	Field Container	Fraelich	GA	2006	Broadcast	No injury or growth differences at all rates
24718	Goldenrod (Solidago sp.) S. sempervirens	Field Container	Linderman	OR	2006	Broadcast	No injury at 2, 4 and 8 lb ai per acre
33402	Goldenrod (Solidago sp.)	Field In-Ground	Marble	FL	2021	Broadcast	Minor leaf injury at 150, 300, and 600 lb product per acre; plants were marketable throughout the experiment.
33402	Goldenrod (Solidago sp.) 'Little Lemon'	Field In-Ground	Senesac	NY	2018	Broadcast	Minor injury with 150 300 and 600 lb per acre applied twice; minor biomass reduction with all rates.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
24718	Goldenrod (Solidago sp.) S. cabadensis 'Crown of Rays'	Field Container	Treat	WA	2006	Broadcast	No injury or growth reduction at all rates (2, 4 and 8 lb ai per acre)
23779	Goldenrod, Showy (Solidago speciosa)	Field Container	Klett	CO	2004	Broadcast	No injury
23779	Goldenrod, Showy (Solidago speciosa)	Field Container	Klett	CO	2004	Broadcast	No injury
23775	Goldenrod, Autumn (Solidago sphacelata)	Field Container	Marble	FL	2023	Broadcast	No injury or impact on plant growth with 150, 300 and 600 lb per acre.
23775	Goldenrod, Autumn (Solidago sphacelata) 'Golden Fleece'	Field Container	Mathers	OH	2023	Broadcast	Very slight transient injury and no impact on growth with 2.65, 5.3 and 10.6 lb ai per acre.
32028	Indian Grass (Sorghastrum nutans)	Field Container	Derr	VA	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
32028	Indian Grass (Sorghastrum nutans) 'Indian Steel'	Field Container	Marble	FL	2016	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice; all plants marketable.
32028	Indian Grass (Sorghastrum nutans)	Field Container	Senesac	NY	2015	Broadcast	No injury with 3, 6 and 12 lb ai per acre after first application, minor injury with some recovery after the second.
31920	Prairie Dropseed (Sporobolus heterolepis)	Field Container	Cochran (IA)	IA	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
31920	Prairie Dropseed (Sporobolus heterolepis)	Field Container	Derr	VA	2015	Broadcast	No shoot weight reduction with 3, 6 and 12 lb ai per acre applied twice.
31920	Prairie Dropseed (Sporobolus heterolepis)	Field Container	Senesac	NY	2014	Broadcast	No injury or growth reduction with 3, 6 and 12 lb ai per acre applied twice.
29104	Lamb's Ears (Stachys byzantina) 'Silver Carpet'	Field Container	Neal	NC	2008	Broadcast	No injury at 3 and 6 lb ai per acre.
24692	Aster, White Heath (Symphyotrichum ericoides) 'Wood's Light Blue'	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at all rates
24692	Aster, White Heath (Symphyotrichum ericoides) 'Snow Flurry'	Field Container	Chandran	WV	2005	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24393	Aster, New York (Symphyotrichum novi-belgii) 'Sailor Boy'	Field Container	Beste/Frank (ARS)	MD	2005	Broadcast	No injury at 2, 4 and 8 lb ai per acre
24393	Aster, New York (Symphyotrichum novi-belgii) 'Professor Anton Kippenberg'	Field Container	Boydston	WA	2005	Broadcast	No injury
24393	Aster, New York (Symphyotrichum novi-belgii)	Field Container	Fraelich	GA	2005	Broadcast	No injury or growth differences at all rates
24393	Aster, New York (Symphyotrichum novi-belgii)	Field Container	Simmons	SC	2005	Broadcast	No significant injury

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
24828	Thyme (Non-Bearing) (Thymus sp.) T. serpyllum	Field Container	Cochran	MD	2023	Broadcast	No injury or impact on growth with 2.65, 5.3 and 10.6 lb ai per acre.
23780	Foamflower, Heartleaf (Tiarella cordifolia)	Field Container	Klett	CO	2004	Broadcast	No injury
23780	Foamflower, Heartleaf (Tiarella cordifolia)	Field Container	Klett	CO	2004	Broadcast	No injury
23780	Foamflower, Heartleaf (Tiarella cordifolia)	Field Container	Mathers (OSU)	OH	2004	Broadcast	No injury
23780	Foamflower, Heartleaf (Tiarella cordifolia)	Field Container	Senesac	NY	2005	Broadcast	Injury apparent after second application; 4 and 8 lb ai per acre rates exhibited moderate injury
25781	Foamflower; False Miterwort (Tiarella sp.) T. wherryi	Field Container	Neal	NC	2004	Broadcast	All rates caused significant injury
26845	Spiderwort (Tradescantia sp.)	Greenhouse	Freiberger	NJ	2006	Broadcast	No injury at all rates (2, 4 and 8 lb ai per acre)
24721	Virginia Spiderwort; Spider Lily (Tradescantia virginiana) Spiderwort 'Osprey'	Field Container	Boydston	WA	2005	Broadcast	No injury
24721	Virginia Spiderwort; Spider Lily (Tradescantia virginiana)	Field Container	Boydston	WA	2006	Broadcast	No injury or growth reduction at 2, 4 and 8 lb ai per acre
24720	Spiderwort (Tradescantia x andersoniana)	Field Container	Derr	VA	2005	Broadcast	No injury
24720	Spiderwort (Tradescantia x andersoniana) 'Sweet Kate'	Field Container	Mathers (OSU)	OH	2005	Broadcast	No injury
25308	Vervain (Verbena sp.) V. canadensis 'Homestead Purple'	Field In-Ground	Chen	LA	2005	Broadcast	No significant injury
24685	Vervain (Verbena sp.) V. canadensis 'Homestead Purple'	Field Container	Neal	NC	2005	Broadcast	No injury
23781	Ironweed, New York (Vernonia noveboracensis)	Field Container	Neal	NC	2004	Broadcast	No injury
23781	Ironweed, New York (Vernonia noveboracensis)	Field Container	Senesac	NY	2004	Broadcast	No injury
24722	Turkish Veronica (Veronica liwanensis)	Field Container	Boydston	WA	2005	Broadcast	All rates caused no injury but reduced plant width; all treated plants were saleable
24722	Turkish Veronica (Veronica liwanensis)	Field Container	Boydston	WA	2006	Broadcast	No injury after first application, but moderate injury and reduced plant width at all rates after 2nd application.
24722	Turkish Veronica (Veronica liwanensis) Veronica repens 'Big Blue'	Field Container	Lieth	CA	2006	Broadcast	Unacceptable injury at 2, 4 and 8 lb ai per acre and growth reduction at 2X and 4X rates

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
11460	Violet (Viola sp.) V. tricolor 'Majestic GT Yellow'	Field Container	Beste (ARS)	MD	1994	Broadcast	No significant injury or growth reduction at 1, 2 and 4 lb ai per acre; good weed control.
33398	Zinnia (Zinnia sp.)	Field In-Ground	Derr	VA	2021	Broadcast	No injury and flowering reduction with 150, 300 and 600 lb per acre applied twice.
33398	Zinnia (Zinnia sp.) 'Magellan Orange'	Field In-Ground	Senesac	NY	2018	Broadcast	Moderate injury with 150 300 and 600 lb per acre applied twice; biomass reduction with all rates.

Table 15. Detailed Summary of Crop Safety Testing with Pendulum Aqua Cap (Pendimethalin).

Notes: Table entries are sorted by crop Latin name. Only those reports received before 4/10/2019 are included

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
29261	Fern, Lady (<i>Athyrium nipponicum</i>)	Field Container	Czarnota	GA	2002	Over the top	No injury at 2, 4 and 8 lb ai per acre; all plants marketable; excellent control of large crabgrass.
19594	Moonbeam, Tickseed (<i>Coreopsis verticillata</i>)	Field Container	Czarnota	GA	2002	Over the top	No injury at 2, 4 and 8 lb ai per acre; all plants marketable; excellent control of morning glory and large crabgrass.
29263	Daylily (<i>Hemerocallis</i> sp.)	Field Container	Czarnota	GA	2002	Over the top	No injury with 2, 4, 8 lb ai per acre; excellent control of morningglory and large crabgrass.
19479	Shrub Verbena (<i>Lantana</i> sp.) <i>L. camara</i>	Field Container	Czarnota	GA	2002	Over the top	No injury at 2, 4 and 8 lb ai per acre; all plants marketable; excellent control of morning glory and large crab grass.

Table 16. Detailed Summary of Crop Safety Testing with Pendulum WDG (Pendimethalin).

Notes: Table entries are sorted by crop Latin name. Only those reports received before 4/10/2019 are included.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
28431	Fir, Fraser (<i>Abies fraseri</i>)	Field In-Ground	Ahrens	CT	1986	Over the top	No injury with 4 lb ai per acre.
10994	Yarrow (<i>Achillea millefolium</i>)	Field In-Ground	Elmore	CA	1993	Over the top	No injury at 3.3 and 6.6 lb ai per acre; excellent weed control at 3.3 lb ai per acre, but anomaly occurred with higher rate exhibiting poor control.
11005	Yarrow (<i>Achillea millefolium</i>)	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
10994	Yarrow (<i>Achillea millefolium</i>) 'Cerise Queen'	Field In-Ground	Senesac	NY	1987	Over the top	No significant injury at 2 and 4 lb ai per acre; excellent control of broadleaf and grassy weeds.
11454	Basket-Of-Gold, Rock Madwort, <i>Aurinia saxatilis</i> (<i>Alyssum saxatile</i>) A. saxatilis	Field In-Ground	Buriff	OH	1998	Over the top	Results unreliable due to poor growing conditions.
10996	Madwort (<i>Alyssum</i> sp.) 'Basket of Gold'	Field In-Ground	Senesac	NY	1987	Over the top	No significant injury at 2 and 4 lb ai per acre; great control of broadleaf and grassy weeds.
12383	Bluestar (<i>Amsonia</i> sp.) <i>A. ciliata</i>	Field Container	Buriff	OH	1998	Over the top	No injury at 2, 4 and 8 lb ai per acre after 1st application, unreliable data after 2nd application.
11165	Columbine (<i>Aquilegia</i> sp.) <i>A. hybrida</i> 'Music'	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
11590	Western sage (<i>Artemisia ludoviciana</i>) <i>A. ludoviciana</i> 'Valerie Finnis'	Field Container	Buriff	OH	1998	Over the top	No injury at 2, 4 and 8 lb ai per acre.
28433	False Spirea (<i>Astilbe</i> sp.) <i>A. chinensis</i>	Field Container	Buriff	OH	1998	Over the top	Slight injury at 2, moderate at 4 and 8 lb ai per acre.
11589	Fern, Japanese Painted (<i>Athyrium goeringianum</i>)	Field Container	Senesac	NY	1995	Over the top	Minor injury increasing with rate at 2, 4, and 8 lb ai per acre with 2 higher rates causing slight stunting.
19428	Begonia (<i>Begonia</i> sp.) 'Derby'	Field Container	Senesac	NY	1989	Over the top	Moderate injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
19428	Begonia (<i>Begonia</i> sp.) 'Gin'	Field Container	Senesac	NY	1989	Over the top	Moderate injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
10059	Blue clips (<i>Campanula carpatica</i>) 'Canterbury Bells'	Field In-Ground	Senesac	NY	1987	Over the top	No injury at 2 lb ai per acre, slight reduction in vigor at 4 lb ai per acre; great control of broadleaf and grassy weeds.
10999	Canterbury-Bells (<i>Campanula medium</i>) <i>C. persicifolia</i>	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
12881	White Fringetree (<i>Chionanthus retusus</i>)	Field Container	Buriff	OH	1998	Over the top	No injury at 2, 4 and 8 lb ai per acre.
13444	Palm, Areca (<i>Chrysalidocarpus lutescens</i>)	Field Container	Broschat	FL	1998	Over the top	Trial 1: No significant injury with 3.9 and 7.8 lb ai per acre; excellent weed control through 2 months.
13444	Palm, Areca (<i>Chrysalidocarpus lutescens</i>)	Field Container	Broschat	FL	1998	Over the top	Trial 2: No significant injury with 3.9 and 7.8 lb ai per acre; excellent weed control through 2 months.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
11003	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) C. maximum x superbum 'Silver Princess'	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
11003	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) Chrysanthemum maximum x superbum	Field Container	Senesac	NY	1994	Over the top	No significant injury at 3.3, 6.6 and 13.2 lb ai per acre.
10992	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) Chrysanthemum maximum 'Alaska'	Field In-Ground	Senesac	NY	1987	Over the top	No significant injury at 2 and 4 lb ai per acre; great control of broadleaf and grassy weeds.
10992	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) R. hirta	Field In-Ground	Talbert	AR	1993	Over the top	Slight injury at 3.3 and 6.6 lb ai per acre, excellent weed control.
11006	Tickseed (Coreopsis sp.) C. lanceolata	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
10995	Tickseed (Coreopsis sp.) C. lanceolata 'Sunray'	Field In-Ground	Senesac	NY	1987	Over the top	No significant injury at 2 and 4 lb ai per acre; great control of broadleaf and grassy weeds.
11021	Cypress, Leyland (Cupressocyparis leylandii)	Field Container	Glaze	GA	1992	Over the top	No injury or growth reduction at 2 and 4 lb ai per acre, and all plants marketable; excellent weed control.
11021	Cypress, Leyland (Cupressocyparis leylandii)	Field Container	Glaze	GA	1993	Over the top	No injury at 3.3 and 6.6 lb ai per acre; very good weed control except for black willow.
11591	Fern, Hayscented (Dennstaedtia punctilobula)	Field Container	Senesac	NY	1995	Over the top	No significant injury at 2 and 4, slight with almost complete recovery at 8 lb ai per acre.
11161	Foxglove (Digitalis sp.) D. grandiflora	Field Container	Ferree	IL	1995	Over the top	No significant injury at 3.3, 6.6 and 13.2 lb ai per acre; excellent weed control.
29237	Foxglove (Digitalis sp.) D. purpurea	Greenhouse	Talbert	AR	1998	Over the top	No to very minor injury at 2, 4, and 8 lb ai per acre.
11161	Foxglove (Digitalis sp.) D. purpurea 'Excelsior Hybrids'	Field Container	Senesac	NY	1987	Over the top	No to slight injury increasing with rate (1.5 and 3 lb ai per acre).
11161	Foxglove (Digitalis sp.) D. x mertonensis	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
29239	Leopards-Bane (Doronicum sp.) D. cordatum	Field Container	Senesac	NY	1987	Over the top	No significant injury at 1.5 and 3 lb ai per acre.
11345	Purple Coneflower (Echinacea sp.) E. purpurea	Field Container	Derr	VA	1993	Over the top	No injury or growth reduction at 3.3 and 6.6 lb ai per acre; excellent control of spotted spurge and yellow woodsorrel.
11345	Purple Coneflower (Echinacea sp.) E. purpurea 'Gloriosa Daisy'	Field Container	Senesac	NY	1987	Over the top	No injury at 2 and 4 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11020	Eucalypt, Australian Gum (Eucalyptus sp.) E. cinerea	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
28435	Golden Bells (Forsythia sp.) F. x intermedia 'Lynwood Gold'	Field In-Ground	Ahrens	CT	1996	Over the top	No injury with 4 lb ai per acre.
12885	Witch Alder (Fothergilla gardenii)	Field Container	Buriff	OH	1998	Over the top	No injury at 2, 4 and 8 lb ai per acre.
11163	Blanket Flower (Gaillardia sp.) G. aristata	Field Container	Derr	VA	1992	Over the top	No injury at 2 and 4 lb ai per acre.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
11162	Blanket Flower (Gaillardia sp.) G. aristata	Field In-Ground	Derr	VA	1994	Over the top	Slight injury at 3.3, 6.6 and 13.2 lb ai per acre; excellent control of carpetweed and fall panicum at all rates, but excellent control of cutleaf evening primrose only at high rate.
11163	Blanket Flower (Gaillardia sp.) G. aristata 'Goblin'	Field Container	Senesac	NY	1987	Over the top	No injury at 1.5 and 3.0 lb ai per acre.
11163	Blanket Flower (Gaillardia sp.) G. grandiflora 'Baby Cole'	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
11163	Blanket Flower (Gaillardia sp.) G. pulchella	Field Container	Talbert	AR	1992	Over the top	No injury at 2 and 4 lb ai per acre.
11162	Blanket Flower (Gaillardia sp.) G. pulchella	Field In-Ground	Talbert	AR	1992	Over the top	No significant injury at 2 lb ai per acre and slight transient injury at 4 lb ai per acre.
11168	Treasure Flower (Gazania sp.)	Field In-Ground	Senesac	NY	1987	Over the top	Slight reduction in crop quality increasing with rate (2, 4 lb ai per acre).
10989	Avens (Geum sp.)	Field In-Ground	Elmore	CA	1993	Over the top	No significant injury at 3.3 and 6.6 lb ai per acre; excellent control of chickweed, poor control of annual bluegrass.
10989	Avens (Geum sp.) G. quellyon 'Lady Strathedon'	Field In-Ground	Senesac	NY	1987	Over the top	No injury at 2 and 4 lb ai per acre; great to excellent control of broadleaved and grassy weeds.
10989	Avens (Geum sp.) G. quellyon 'Mrs. Bradshaw'	Field In-Ground	Senesac	NY	1987	Over the top	No significant injury at 2 and 4 lb ai per acre; great to excellent control of broadleaved and grassy weeds.
11000	Avens (Geum sp.) G. triflorum	Field Container	Buriff	OH	1998	Over the top	Slight injury at 2 and 4 lb ai per acre, moderate yellowing and stunting at 8 lb ai per acre.
11000	Avens (Geum sp.) 'Lady Stradhelen'	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
13240	German Statice (Goniolimon tataricum)	Field In-Ground	Elmore	CA	1993	Over the top	No significant injury at 3.3 and 6.6 lb ai per acre; satisfactory weed control.
10058	Baby's Breath (Gypsophila paniculata) G. paniculata	Field In-Ground	Elmore	CA	1994	Over the top	No significant injury at 3.3 and 6.6 lb ai per acre; excellent control of annual bluegrass and rough pigweed, poor for shepherds purse.
10998	Baby's Breath (Gypsophila paniculata) G. paniculata	Field Container	Senesac	NY	1987	Over the top	No injury at 1.5 and 3.0 lb ai per acre.
10058	Baby's Breath (Gypsophila paniculata) G. paniculata 'Bristol Fairy'	Field In-Ground	Senesac	NY	1987	Over the top	No injury at 2 and 4 lb ai per acre; great to excellent control of broadleaved and grassy weeds.
19435	Daylily (Hemerocallis sp.) 'Sammy Russell'	Field Container	Fare	TN	1996	Over the top	No injury or growth reduction at 2, 4 and 8 lb ai per acre, and all plants marketable; good control of spurge.
12890	Hydrangea, Oakleaf (Hydrangea quercifolia)	Field Container	Hart	NJ	2003	Over the top	Slight, moderate, and severe stunting at 2, 4 and 8 lb ai per acre, respectively
11010	Balsam (Impatiens sp.) 'Accent D. Pink'	Field In-Ground	Senesac	NY	1989	Over the top	Moderate to significant injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11010	Balsam (Impatiens sp.) 'Accent Salmon'	Field In-Ground	Senesac	NY	1989	Over the top	Moderate to significant injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11592	Japanese Iris (Iris kaempferi)	Field Container	Senesac	NY	1995	Over the top	No significant injury at 2, 4 and 8 lb ai per acre.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
11594	Blazing-Star, Gayfeather (<i>Liatris</i> sp.) <i>L. pycnostachya</i> 'Purple'	Field Container	Senesac	NY	1995	Over the top	No injury at 2, 4 and 8 lb ai per acre.
11169	Statice (<i>Limonium</i> sp.)	Field In-Ground	Senesac	NY	1987	Over the top	No injury at 2 and 4 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11169	Statice (<i>Limonium</i> sp.) <i>L. latifolia</i>	Field In-Ground	Ferree	IL	1992	Over the top	No significant injury at 2 and 4 lb ai per acre; excellent weed control.
11169	Statice (<i>Limonium</i> sp.) <i>L. sinuatum</i>	Field In-Ground	Elmore	CA	1993	Over the top	No significant injury at 3.3 and 6.6 lb ai per acre but some vigor reduction at 6.6 lb; good weed control.
11014	Petunia (<i>Petunia</i> sp.) <i>P. x hybrida</i>	Field In-Ground	Talbert	AR	1994	Over the top	Applied 8 days after transplanting. Moderate injury to mortality increasing with rate (1.5, 3.0, 6.0 lb ai per acre); excellent control of goosegrass, crabgrass, common purslane, and giant foxtail.
11014	Petunia (<i>Petunia</i> sp.) 'Pink Flush'	Field In-Ground	Senesac	NY	1989	Over the top	Applied 2 days after transplanting. Moderate to significant injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11014	Petunia (<i>Petunia</i> sp.) 'Salmon Flush'	Field In-Ground	Senesac	NY	1989	Over the top	Applied 2 days after transplanting. Moderate injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
19622	Palm, Pygmy Date (<i>Phoenix roebelinii</i>)	Field Container	Broschat	FL	1998	Over the top	Trial 1: No significant injury with 3.9 and 7.8 lb ai per acre; excellent weed control through 2 months.
19622	Palm, Pygmy Date (<i>Phoenix roebelinii</i>)	Field Container	Broschat	FL	1998	Over the top	Trial 2: No significant injury with 3.9 and 7.8 lb ai per acre; excellent weed control through 2 months.
19622	Palm, Pygmy Date (<i>Phoenix roebelinii</i>)	Field Container	Broschat	FL	1998	Over the top	Trial 2: No significant injury with 3.9 and 7.8 lb ai per acre; excellent weed control through 2 months.
29238	False Dragon Head, Lion's Heart (<i>Physostegia</i> sp.) <i>P. virginiana</i>	Field Container	Buriff	OH	1998	Over the top	High injury at 2, 4 and 8 lb ai per acre.
11595	Fern, Christmas (<i>Polystichum acrostichoides</i>)	Field Container	Senesac	NY	1995	Over the top	Slight injury and growth reduction at 2, 4 and 8 lb ai per acre.
12390	Rodgersia (<i>Rodgersia</i> sp.) <i>R. henricii</i>	Field Container	Buriff	OH	1998	Over the top	No injury at 2, 4 and 8 lb ai per acre.
10991	Coneflower (<i>Rudbeckia</i> sp.) <i>R. hirta</i>	Field In-Ground	Talbert	AR	1993	Over the top	Slight injury at 3.3 and 6.6 lb ai per acre; good control of goosegrass.
10990	Stonecrop (<i>Sedum</i> sp.) <i>S. spurium</i> cv <i>coccineum</i> 'Dragons Blood'	Field In-Ground	Senesac	NY	1987	Over the top	No to Very slight injury increasing with rate (2, 4 lb ai per acre); great to excellent control of broadleaf and grassy weeds.
11001	Stonecrop (<i>Sedum</i> sp.) <i>S. spurium</i> 'Dragon's Blood'	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
11004	Lamb's-Ears (<i>Stachys byzantina</i>)	Field Container	Fare	TN	1994	Over the top	Moderate injury at 3.3, 6.6 and 13.2 lb ai per acre with complete recovery at 1X, but 2X and 4X plants smaller and unmarketable; excellent weed control.
11004	Lamb's-Ears (<i>Stachys byzantina</i>)	Field Container	Fare	TN	1995	Over the top	Moderate to slight injury at 2 and 4, moderate at 8 lb ai per acre; 4X plants smaller and unmarketable; excellent crabgrass and marestalk control.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
11004	Lamb's-Ears (<i>Stachys byzantina</i>)	Field Container	Fare	TN	1996	Over the top	Moderate initial injury with complete recovery at 2, 4 and 8 lb ai per acre; all plants marketable; excellent weed control.
10993	Lamb's-Ears (<i>Stachys byzantina</i>) S. lanata	Field In-Ground	Senesac	NY	1987	Over the top	No significant injury with 2 and 4 lb ai per acre; great to excellent broadleaf and grassy weed control.
10993	Lamb's-Ears (<i>Stachys byzantina</i>) 'Silver Carpet'	Field In-Ground	Ferree	IL	1993	Over the top	All treatments including untreated were not marketable at conclusion of study, however there was a trend toward higher phytotoxicity with increasing rate (3.3, 6.6 lb ai per acre); excellent weed control.
10997	Stokes Aster (<i>Stokesia</i> sp.) 'Cyanea Blue'	Field In-Ground	Senesac	NY	1987	Over the top	No injury at 2 and 4 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
10997	Stokes Aster (<i>Stokesia</i> sp.) S. laevis 'Blue Danube'	Field In-Ground	Ferree	IL	1993	Over the top	No injury at 3.3 and 6.6 lb ai per acre.
11011	Marigold (<i>Tagetes</i> sp.) 'Bonanza Yellow'	Field In-Ground	Senesac	NY	1989	Over the top	Moderate injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11022	Elm, Winged (<i>Ulmus alata</i>)	Field Container	Schreiber	OH	1992	Over the top	No injury at 2 and 4 lb ai per acre.
11015	Periwinkle (<i>Vinca</i> sp.) 'Little Pinkie'	Field In-Ground	Senesac	NY	1987	Over the top	Applied 2 days after transplanting. Slight injury with 1.5 and 3.0 lb ai per acre; great to excellent control of broadleaf and grassy weeds.
11013	Pansy (<i>Viola</i> sp.) V. tricolor	Field In-Ground	Talbert	AR	1994	Over the top	Severe injury at 3.3, 6.6 and 13.2 lb ai per acre; excellent control of large crabgrass, goosegrass, common purslane, smooth pigweed, giant foxtail, common lambsquarters.
19623	Palm, Mexican Fan (<i>Washingtonia robusta</i>)	Field Container	Broschat	FL	1998	Over the top	Trial 1: Significant injury with 3.9 and 7.8 lb ai per acre; excellent weed control through 2 months.
20151	California Fuschia (<i>Zauschneria californica</i>)	Field Container	Klett	CO	1999	Over the top	No injury with 2 and 4 lb ai per acre; good weed control; 2G used
20151	California Fuschia (<i>Zauschneria californica</i>)	Field Container	Klett	CO	2000	Over the top	No injury or growth reduction at 2 and 4 lb ai per acre; good weed control; 2G used

Table 17. Detailed Summary of Crop Safety Testing with Pendulum 3.3 EC (Pendimethalin).

Notes: Table entries are sorted by crop Latin name. Only those reports received before 5/23/2024 are included.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
35362	Hubricht's Bluestar, Arkansas Amsonia (<i>Amsonia hubrichtii</i>)	Field Container	Neal	NC	2022	Over the top	Moderate to severe injury from 3 lb ai/a after each of two applications. Significant reduction in plant quality, marketable plants and plant height
35363	Daisy, Shasta (<i>Leucanthemum x superbum</i>) 'Becky'	Field Container	Neal	NC	2022	Over the top	No injury after first application at 3 lb ai/a and negligible injury after second application.

Table 18. Detailed Summary of Crop Safety Testing with Prowl 4E (Pendimethalin).

Notes: Table entries are sorted by crop Latin name. Only those reports received before 4/10/2019 are included.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
09407	Fir, Fraser (<i>Abies fraseri</i>)	Field In-Ground	Ahrens	CT	1984	Over the top	No injury at 2, 4 and 8 lb ai per acre.
09407	Fir, Fraser (<i>Abies fraseri</i>)	Field In-Ground	Ahrens	CT	1985	Over the top	No injury at 2 and 4 lb ai per acre and very slight at 8 lb ai per acre.
09407	Fir, Fraser (<i>Abies fraseri</i>)	Field In-Ground	Ahrens	CT	1986	Over the top	No injury at 2, 4 and 8 lb ai per acre.
28402	Maple (<i>Acer sp.</i>)	Field Container	Skroch	NC	1984	Over the top	Virtually no injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
12876	Birch, River (<i>Betula nigra</i>)	Field Container	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre.
12876	Birch, River (<i>Betula nigra</i>)	Field Container	Skroch	NC	1985	Over the top	Very slight injury with 4 lb ai per acre, followed with oxyfluorfen.
09404	Golden Bells (<i>Forsythia sp.</i>) F. intermedia 'Lynwood Gold'	Field In-Ground	Ahrens	CT	1984	Over the top	No injury with 2, 4, and 8 lb ai per acre
09404	Golden Bells (<i>Forsythia sp.</i>) F. intermedia 'Lynwood Gold'	Field In-Ground	Ahrens	CT	1985	Over the top	No injury at 2 and 4 lb ai per acre and very slight at 8 lb ai per acre.
09404	Golden Bells (<i>Forsythia sp.</i>) F. intermedia 'Lynwood Gold'	Field In-Ground	Ahrens	CT	1986	Over the top	No injury with 2, 4, and 8 lb ai per acre.
12886	Ash (<i>Fraxinus sp.</i>) F. pennsylvanica	Field In-Ground	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre.
12886	Ash (<i>Fraxinus sp.</i>) F. pennsylvanica	Field In-Ground	Skroch	NC	1985	Over the top	No injury with 4 lb ai per acre; followed with oxyfluorfen.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
28402	Holly, Chinese (Ilex cornuta) 'Bufordii Nana'	Field Container	Skroch	NC	1984	Over the top	Virtually no injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
28407	Holly, Japanese (Ilex crenata) 'Helleri'	Field Container	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
28434	Juniper (Juniperus sp.) J. horizontalis	Field In-Ground	Ahrens	CT	1984	Over the top	No injury with 2, 4, and 8 lb ai per acre.
28434	Juniper (Juniperus sp.) J. horizontalis	Field In-Ground	Ahrens	CT	1985	Over the top	No injury at 2 and 4 lb ai per acre and very slight at 8 lb ai per acre.
28405	Juniper (Juniperus sp.) J. horizontalis 'Youngstown'	Field Container	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
12898	Crape Myrtle (Lagerstroemia indica)	Field In-Ground	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre.
12898	Crape Myrtle (Lagerstroemia indica)	Field In-Ground	Skroch	NC	1985	Over the top	No injury with 4 lb ai per acre, followed by oxyfluorfen.
28406	Lilyturf, Big Blue;Giant (Liriope muscari) 'Variegata'	Field Container	Skroch	NC	1984	Over the top	Very slight injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
28402	Lilyturf, Creeping (Liriope sp.) L. spicata	Field Container	Skroch	NC	1984	Over the top	Very slight injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
06062	Peony (Paeonia sp.) 'Felix Crousse'	Field In-Ground	Hauser	PA	1981	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Felix Crousse'	Field In-Ground	Hauser	PA	1982	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Felix Crousse'	Field In-Ground	Hauser	PA	1983	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Festiva Maxima'	Field In-Ground	Hauser	PA	1981	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Festiva Maxima'	Field In-Ground	Hauser	PA	1982	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Festiva Maxima'	Field In-Ground	Hauser	PA	1983	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Mons. Julius Elie'	Field In-Ground	Hauser	PA	1981	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Mons. Julius Elie'	Field In-Ground	Hauser	PA	1982	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Mons. Julius Elie'	Field In-Ground	Hauser	PA	1983	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Richard Carvel'	Field In-Ground	Hauser	PA	1981	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Richard Carvel'	Field In-Ground	Hauser	PA	1982	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
06062	Peony (Paeonia sp.) 'Richard Carvel'	Field In-Ground	Hauser	PA	1983	Soil	No injury with 0.75, 1.5, 3.0 and 6.0 lb ai per acre, when applied prior to shoot emergence.
28403	Photinia (Photinia sp.) P. fraseri	Field Container	Skroch	NC	1984	Over the top	Virtually no injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.

PR#	Crop	Production Site	Researcher	Trial State	Trial Year	Application Type	Results
19484	Spruce (<i>Picea</i> sp.) <i>P. pungens</i>	Field In-Ground	Ahrens	CT	1985	Over the top	Virtually no injury at 6 lb ai per acre.
19484	Spruce (<i>Picea</i> sp.) <i>P. pungens</i>	Field In-Ground	Ahrens	CT	1986	Over the top	No injury at 6 lb per acre prior to fall application of either imazapyr or sulfometuron; injury did occur after these fall applications.
09408	Pine (<i>Pinus</i> sp.) <i>P. strobus</i>	Field In-Ground	Ahrens	CT	1985	Over the top	No injury at 6 lb ai per acre.
09408	Pine (<i>Pinus</i> sp.) <i>P. strobus</i>	Field In-Ground	Ahrens	CT	1986	Over the top	No injury at 6 lb per acre prior to fall application of either imazapyr or sulfometuron; injury did occur after these fall applications.
09408	Pine (<i>Pinus</i> sp.) <i>P. strobus</i>	Field In-Ground	Skroch	NC	1984	Over the top	Minor injury with 4 lb ai per acre.
09408	Pine (<i>Pinus</i> sp.) <i>P. strobus</i>	Field In-Ground	Skroch	NC	1985	Over the top	Minor injury with 4 lb ai per acre, followed with oxyflourfen.
09408	Pine (<i>Pinus</i> sp.) <i>P. taeda</i>	Field In-Ground	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre.
09408	Pine (<i>Pinus</i> sp.) <i>P. taeda</i>	Field In-Ground	Skroch	NC	1985	Over the top	No injury with 4 lb ai per acre, followed with oxyflourfen.
29238	Oak (<i>Quercus</i> sp.) <i>Q. nigra</i>	Field In-Ground	Skroch	NC	1984	Over the top	No injury with 4 lb ai per acre.
29238	Oak (<i>Quercus</i> sp.) <i>Q. nigra</i>	Field In-Ground	Skroch	NC	1985	Over the top	No injury with 4 lb ai per acre, followed with oxyflourfen.
28404	Azalea (<i>Rhododendron</i> sp.) <i>R. x obtusum</i> 'Sunglo'	Field Container	Skroch	NC	1984	Over the top	Slight injury with 4 lb ai per acre; good control of oxalis and excellent control of spotted spurge.
09413	Yew (<i>Taxus</i> sp.) <i>T. cuspidata</i>	Field In-Ground	Ahrens	CT	1984	Over the top	No injury at 2, 4, and 8 lb ai per acre.
09413	Yew (<i>Taxus</i> sp.) <i>T. cuspidata</i>	Field In-Ground	Ahrens	CT	1985	Over the top	Moderate injury at 2, 4, and 8 lb ai per acre on freshly pruned trees.
09413	Yew (<i>Taxus</i> sp.) <i>T. cuspidata</i>	Field In-Ground	Ahrens	CT	1986	Over the top	Slight stunting at 2, 4 and 8 lb ai per acre; Prowl 4E used
28430	Arborvitae (<i>Thuja</i> sp.) <i>T. occidentalis</i>	Field In-Ground	Ahrens	CT	1984	Over the top	No injury at 2, 4 and 8 lb ai per acre.
28430	Arborvitae (<i>Thuja</i> sp.) <i>T. occidentalis</i>	Field In-Ground	Ahrens	CT	1985	Over the top	No injury at 2 and 4 lb ai per acre and very slight at 8 lb ai per acre on freshly pruned trees.
09406	Hemlock, Canada (<i>Tsuga canadensis</i>)	Field In-Ground	Ahrens	CT	1984	Over the top	No injury at 2, 4, and 8 lb ai per acre.
09406	Hemlock, Canada (<i>Tsuga canadensis</i>)	Field In-Ground	Ahrens	CT	1984	Over the top	No injury at 2, 4, and 8 lb ai per acre.
09406	Hemlock, Canada (<i>Tsuga canadensis</i>)	Field In-Ground	Ahrens	CT	1985	Over the top	Minor injury increasing with rate (2, 4, 8 lb ai per acre).
09406	Hemlock, Canada (<i>Tsuga canadensis</i>)	Field In-Ground	Ahrens	CT	1986	Over the top	No injury at 2, slight and moderate stunting at 4 and 8 lb ai per acre.

Label Suggestions

It is suggested that the following 23 genera or species exhibiting no injury in these experiments be added to the Pendulum 2G label.

Athyrium nipponicum
Calamagrostis acutiflora
Chasmanthium latifolium
Chrysogonum virginianum
Cosmos sp.
Digitalis thaspi
Eragrostis curvula
Gazania linearis
Juncus effusus
Kniphofia sp.
Leymus arenarius
Muhlenbergia capillaris

Muhlenbergia dumosa
Nepeta x faassenii
Pennisetum alopecuroides
Pennisetum orientale
Penstemon sp.
Saccharum sp.
Scabiosa sp.
Schizachyrium scoparium
Sedum sp.
Sorghastrum nutans
Sporobolus heterolepis

IR-4 has very limited data for following list of 14 plants. However, if other available data demonstrate no or minimal transient injury for these crops, IR-4 supports placing these on the Pendulum AquaCap label also.

Alyssum sp.
Amsonia ciliata
Athyrium nipponicum
Chionanthus retusus
Coreopsis verticillata
Cyrtomium falcatum
Digitalis grandiflora

Digitalis x mertonensis
Dryopteris ludoviciana
Lantana camara
Myrica pensylvanica
Polystichum polyblepharum
Stachys lanata
Stokesia sp.

It is suggested that *Paeonia* sp., exhibiting no injury in these experiments, be added to the Pendulum 3.3EC label.

IR-4 has very limited data for *Acer* sp. However, many species under this genus are already on the Pendulum 3.3EC label so if other available data demonstrate no or minimal transient injury, IR-4 supports placing *Acer* sp. on the label also.

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