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IR-4 Ornamental Horticulture Program Dithiopyr Crop Safety

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Acknowledgements

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Abstract

Dimension was initially registered in 1992 for ornamental horticulture uses. This initial label contained an extensive list of ornamental horticulture plants in landscapes where Dimension could be used without causing phytotoxicity. From 1992 through 2004, IR-4 conducted 68 trials on 42 species / genera, including several different fern species grown in field containers, to contribute crop safety data for dithiopyr formulations. In 2006, the new Dimension 2EW label contained registered uses for field container and in ground nursery production, the first dithiopyr product to have these use sites. A revised label was published in 2015 adding more crop species to the label. This current label recommends directed spray as the application method for almost all crops. During 2014 to 2017, IR-4 conducted 239 trials with Dimension 2EW formulation applied as over-the-top spray on 111 species / genera, including ornamental grasses to further expand the treatable plant list in the current label. Of the researched crops and Dimension formulations, 11 crops (*Berberis thunbergii*, *Eragrostis curvula*, *Hemerocallis* sp., *Ilex crenata*, *Juncus effusus*, *Leymus arenarius*, *Muhlenbergia capillaris*, *Narcissus* sp., *Pennisetum alopecuroides*, *Pseudotsuga mensiezii*, and *Thuja occidentalis*) can be added for over-the-top spray at this time based on the data provided here. It is recommended the trials conducted using emulsifiable concentrate formulations be repeated with Dimension 2EW.

Introduction

Dimension was initially registered in 1992 for ornamental horticulture uses. This initial label contained an extensive list of ornamental horticulture plants in landscapes where Dimension could be used without causing phytotoxicity. From 1992 through 2004, IR-4 conducted 68 trials on 42 species / genera, including several different fern species grown in field containers, to contribute crop safety data for dithiopyr formulations. In 2006, the new Dimension 2EW label contained registered uses for field container and in ground nursery production, the first dithiopyr product to have these use sites. A revised label was published in 2015 adding more crop species to the label. This current label recommends directed spray as the application method for almost all crops. During 2014 to 2017, IR-4 conducted 239 trials with Dimension 2EW formulation applied as over-the-top spray on 111 species / genera, including ornamental grasses to further expand the treatable plant list in the current label.

Materials and Methods

Several different protocols were used between 1992 and 2004 to test Dimension formulations applied as over the top spray for crop safety evaluation. In the early work, a single application of 0.25, 0.5 and 1.0 lb ai per acre were used. In the later research, two applications were made approximately 30 days apart using 0.5, 1.0, and 2.0 lb ai per acre, plus a water treated control. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. In the more recent research, phytotoxicity was recorded on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill) at 1, 2, 4, 8, and 12 weeks after initial application, but in the earlier research other scales were utilized. Some researchers also included readings 3 to 4 days after the initial and second applications. In the protocols from 2014 to 2017 the Dimension 2EW formulation was applied at 0.5, 1.0 and 2.0 lb ai per acre applied over the top twice at approximately 6 weeks apart. To view the more detailed materials and methods in these protocols (14-009, 14-010, 15-009, 15-010, 16-010, 16-011 and 17-010), please visit <http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm> to view and download these protocols.

Dimension formulations were supplied to researchers (See list of researchers in Appendix 1) by Dow AgroSciences.

Results and Summary

Phytotoxicity

Based on the type and nature of injury seen with dithiopyr applications in this research, tested plant species were placed into four categories: 1) no significant phytotoxicity or growth differences from the untreated check or any injury was transitory, 2) no or minimal transitory injury seen at the 1X rate, but the 2X and/or 4X rates did cause significant phytotoxicity, 3) significant injury sufficient to recommend growers not utilize this product, and 4) more data is needed to make informed recommendations.

Dimension 1EC, 2EC, and 2EW

In testing from 1992 through 2017, emulsifiable concentrates and emulsifiable in water formulations exhibited no or minimal negative impact with over the top applications on 13 plant species / genera (Table 1). Of these two have already been placed on the Dimension 2EW label.

Some minimal injury may be acceptable for growers if applications are made several weeks to months in advance of crop sale particularly for woody ornamental crops. Twenty-one crop species / genera exhibited no or little injury at 0.5 lb ai per acre applied over-the-top, but significant phytotoxicity occurred at 1.0 or 2.0 lb ai per acre (Table 2). One of these (*Echinacea purpurea*) was tested with the 1EC formulation.

There were 25 crop species / genera in the testing that exhibited damage sufficient to recommend growers not utilize Dimension EC formulations as an over-the-top treatment for pre-emergent weed control (Table 3). Tests with the 2EW formulation showed 17 crop species / genera exhibiting damage sufficient to recommend growers not utilize Dimension 2EW formulation as an over-the-top treatment.

With 80 species / genera, IR-4 has not generated sufficient information to categorize crop response to Dimension 2EW over-the-top applications. It is recommended additional trials be conducted with those crops not already labeled to clarify their response (Table 4).

Please see Table 5 for a list of research on Dimension EC formulations conducted since 1992 and the summary of results received.

Table 1. List of Dimension 1EC, 2EC, and 2EW treated crops with no or minimal transitory injury.

<i>Berberis thunbergii</i>	<i>Narcissus</i> sp.
<i>Eragrostis curvula</i> (see Klett)	<i>Pennisetum alopecuroides</i>
<i>Hemerocallis</i> sp.	<i>Pseudotsuga mensiezii</i>
<i>Ilex crenata</i>	<i>Rosa</i> sp 'Knockout' ¹
<i>Juncus effusus</i>	<i>Taxus cuspidata</i> ¹
<i>Leymus arenarius</i>	<i>Thuja occidentalis</i>
<i>Muhlenbergia capillaris</i>	

¹ Already registered.

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

<i>Andropogon virginicus</i>	<i>Hydrangea quercifolia</i>
<i>Chasmanthium latifolium</i>	<i>Ilex x meserveae</i>
<i>Cornus sericea</i>	<i>Myrica cerifera</i>
<i>Cortaderia selloana</i>	<i>Paeonia</i> sp.
<i>Deschampsia caespitosa</i>	<i>Pennisetum orientale</i>
<i>Echinacea purpurea</i> ¹	<i>Portulaca grandiflora</i>
<i>Enkianthus campanulatus</i>	<i>Sporobolus heterolepis</i>
<i>Festuca glauca</i>	<i>Syringia</i> sp.
<i>Gaura lindheimeri</i>	<i>Syringia vulgaris</i>
<i>Hydrangea macrophylla</i>	<i>Tulipa</i> sp.
<i>Hydrangea paniculata</i>	

¹ Data solely with 1EC formulation; recommend further testing with the 2EW formulation.

Table 3. List of Dimension 1EC, 2EC, and 2EW treated crops exhibiting significant injury at 1X.

<i>Begonia</i> spp.	<i>Phedimus pachyclados</i> (<i>Sedum pachyclados</i>)
<i>Chrysanthemum/Dendranthemum grandiflorum</i> ¹	<i>Phedimus rupestre</i> (<i>Sedum rupestre</i> / <i>reflexum</i>)
<i>Cornus florida</i>	<i>Phedimus sexangulare</i> (<i>Sedum sexangulare</i>)
<i>Cornus racemosa</i>	<i>Phedimus spurium</i> (<i>Sedum spurium</i>)
<i>Festuca ovina</i>	<i>Phlox paniculata</i> ¹
<i>Impatiens wallerana</i> ¹	<i>Physocarpus capitatus</i>
<i>Lantana camara</i>	<i>Physocarpus opulifolius</i>
<i>Lysimachia punctata</i> ¹	<i>Physostegia virginiana</i> ¹
<i>Muhlenbergia dubia</i>	<i>Pieris japonica</i>
<i>Phedimus acre</i> (<i>Sedum acre</i>)	<i>Polemonium caeruleum</i> ¹
<i>Phedimus hybridus</i> (<i>Sedum hybridum</i>)	<i>Prunus serotina</i>
<i>Phedimus kamtschaticum</i> (<i>Sedum kamtschaticum</i>)	<i>Spiraea japonica</i>
	<i>Viola</i> sp. ¹

¹ Data solely with 1EC formulation; recommend further testing with the 2EW formulation.

Table 4. List of Dimension 1EC, 2EC, and 2EW treated crops where more research is needed to clarify response.

<i>Abies fraseri</i>	<i>Distylium</i> sp.	<i>Panicum virgatum</i>
<i>Acer platanoides</i> ¹	<i>Eragrostis spectabilis</i> ¹	<i>Perovskia atriplicifolia</i> ²
<i>Acer saccharinum</i> ¹	<i>Erygium planum</i>	<i>Picea abies</i>
<i>Achillea millefolium</i> ^{1,2}	<i>Eucalyptus cinerea</i> ¹	<i>Picea glauca</i> ¹
<i>Acorus</i> sp. ¹	<i>Eucalyptus deglupta</i> ¹	<i>Pinus eldarica</i> ¹
<i>Ammophila breviligulata</i> ¹	<i>Eucalyptus</i> sp. ¹	<i>Pinus nigra</i> ¹
<i>Amsonia ciliata</i>	<i>Euonymus alatus</i>	<i>Pinus strobus</i> ¹
<i>Amsonia hubrichtii</i>	<i>Euonymus fortunei</i>	<i>Pinus taeda</i> ¹
<i>Andropogon gerardii</i> ¹	<i>Festuca cinerea</i>	<i>Platanus acerifolia</i> ¹
<i>Aronia melanocarpa</i>	<i>Gaillardia pulchella</i>	<i>Platanus occidentalis</i> ¹
<i>Asparagus densiflorus</i> ¹	<i>Hakonechloa</i> sp.	<i>Prunus maritima</i> ²
<i>Aster dumosus</i> x <i>Aster novibelgii</i> ²	<i>Helleborus orientalis</i>	<i>Quercus</i> spp.
<i>Aster novi-belgii</i> ²	<i>Hibiscus</i> sp.	<i>Rhamnus</i> sp. ¹
<i>Athyrium</i> sp. ²	<i>Hibiscus syriacus</i>	<i>Rhododendron</i> spp. (azalea)
<i>Bougainvillea</i> sp. ¹	<i>Hosta</i> sp.	<i>Rodgersia henricii</i> ²
<i>Brassica oleracea</i> ²	<i>Hydrangea</i> sp. ¹	<i>Rosa rugosa alba</i> ¹
<i>Calamagrostis acutiflora</i> ¹	<i>Ilex x attenuata</i>	<i>Rosa</i> sp.
<i>Carex buchanani</i> ¹	<i>Ilex cornuta</i>	<i>Salvia splendens</i> ²
<i>Carex morrowii</i>	<i>Iris reticulata</i> ¹	<i>Salvia sylvestris</i> ²
<i>Cercis canadensis</i>	<i>Iris</i> sp.	<i>Schizachyrium scoparium</i>
<i>Chrysanthemum/Dendranthemum X morifolium</i>	<i>Juniperus chinensis</i>	<i>Solanum jasminoides</i> ¹
<i>Coreopsis lanceolata</i>	<i>Juniperus sabina</i> ^{1,2}	<i>Syringia meyeri</i> ¹
<i>Cotoneaster apiculatus</i>	<i>Juniperus virginiana</i>	<i>Taxodium distichum</i> ¹
<i>Crataegus</i> sp. ¹	<i>Leucanthemum maximum</i>	<i>Ulmus parvifolia</i> ¹
<i>Delosperma</i> sp. ¹	<i>Liatris spicata</i>	<i>Veronica prostrata</i> ²
<i>Dicentra spectabilis</i> ²	<i>Ligustrum sinense</i> ¹	<i>Washingtonia robusta</i> ¹
	<i>Lobelia cardinalis</i> ²	
	<i>Nassella tenuissima</i>	

¹For these plants, the one or two trials presented here indicate no phytotoxicity or slight, transient injury, but these findings need to be confirmed.

² Data solely with 1EC formulation; recommend further testing with the 2EW formulation.

Dimension 1G

In testing from 1992 through 1997, Dimension G exhibited no injury with over the top applications on *Asparagus virgatus*, *Juniperus chinensis*, *Ruscus aculeatus*, and *Taxus cuspidata* (Table 6). However only *Taxus cuspidata* has enough trials demonstrating no injury to place this on the label. Significant injury was observed on *Rumhora adiantiformis* with 2 and 4 lb ai per acre applied 4 times over 2 years.

Please see Table 6 for a list of research on Dimension 1G research conducted since 1992 and the summary of results received.

Dimension WSP

In testing from 1992 through 2003, Dimension WSP exhibited no injury with over the top applications on *Aspidistra elatior*, *Boltonia asteroides*, *Hemerocallis* sp., *Hydrangea macrophylla*, *Juniperus squamata*, and *Rhododendron* spp. (Table 7). However only *Boltonia asteroides* has enough trials demonstrating no injury to place this on the label. Slight but transient injury was observed with *Veronica americana*, while severe injury occurred with *Brassica* spp.

Please see Table 7 for a list of research on Dimension WSP research conducted since 1992 and the summary of results received.

Table 5. Detailed Summary Crop Safety Testing with Dimension 1EC, 2EC, and 2EW.

Note: Table entries are sorted by crop Latin name. Only those reports received by 1/06/2018 are included.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
12306	Dimension 1EC (Dithiopyr)	Yarrow, Common (<i>Achillea millefolium</i>) A. <i>filipendulina</i> 'Parkers'	Field Container	Linderman	OR	1999	Directed	No injury after single application of 1, 2, and 4 qt per 100 gal per acre on actively blooming plants.
12307	Dimension 1EC (Dithiopyr)	Bluestar (<i>Amsonia</i> sp.) A. <i>ciliata</i>	Field Container	Buriff	OH	1998	Over the top	No apparent injury at 0.5, 1.0, 2.0 lb ai per acre after single application on actively growing plants.
12307	Dimension 1EC (Dithiopyr)	Bluestar (<i>Amsonia</i> sp.) A. <i>hubrichtii</i>	Field Container	Senesac	NY	1998	Over the top	Slight to moderate injury increasing with rate (0.5, 1.0, and 2.0 lb ai per acre) after single application on plants breaking dormancy.
18608	Dimension 1EC (Dithiopyr)	Aster, Michaelmas (<i>Aster dumosus</i> x <i>Aster novi belgii</i>) 'Jenny'	Field Container	Senesac	NY	1998	Over the top	Moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with single application on actively growing rooted cuttings.
17262	Dimension 1EC (Dithiopyr)	Ladyfern (<i>Athyrium</i> sp.) 'Uncrested'	Field Container	Senesac	NY	1999	Over the top	Slight to moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with single application over actively growing plants.
23159	Dimension 1EC (Dithiopyr)	Begonia (<i>Begonia</i> sp.) B. x <i>semperflorens-cultorum</i> 'Gin'	Field Container	Knight	MS	2000	Over the top	Slight to moderate injury with single application of 0.25, 0.5, and 1.0 lb ai per acre on actively growing plants.
13284	Dimension 1EC (Dithiopyr)	Ornamental Cabbage/Kale (<i>Brassica oleracea</i>) B. <i>oleracea</i> 'Dynasty Red'	Field Container	Senesac	NY	1998	Over the top	Significant injury at all rates (0.5, 1.0, 2.0 lb ai per acre) after single application on actively growing rooted cuttings.
13282	Dimension 1EC (Dithiopyr)	Chrysanthemum, Garden (<i>Chrysanthemum/Dendranthema</i> sp.) D. x <i>grandiflorum</i> 'Jennifer'	Field Container	Senesac	NY	1998	Over the top	Significant injury at all rates (0.5, 1.0, 2.0 lb ai per acre) after single application on actively growing rooted cuttings.
13282	Dimension 1EC (Dithiopyr)	Chrysanthemum, Garden (<i>Chrysanthemum/Dendranthema</i> sp.) D. x <i>grandiflorum</i> 'Linda'	Field Container	Senesac	NY	1998	Over the top	Significant injury at all rates (0.5, 1.0, 2.0 lb ai per acre) after single application on actively growing rooted cuttings.
13282	Dimension 1EC (Dithiopyr)	Chrysanthemum, Garden (<i>Chrysanthemum/Dendranthema</i> sp.) D. x <i>grandiflorum</i> 'Lisa'	Field Container	Senesac	NY	1998	Over the top	Significant injury at all rates (0.5, 1.0, 2.0 lb ai per acre) after single application on actively growing rooted cuttings.
13286	Dimension 1EC (Dithiopyr)	Bleeding Heart (<i>Dicentra</i> sp.) D. <i>spectabilis</i>	Field Container	Senesac	NY	1998	Over the top	No initial injury but moderate 30 day after application with 0.5, 1.0, and 2.0 lb ai per acre on plants emerging from dormancy.
17265	Dimension 1EC (Dithiopyr)	Purple Coneflower (<i>Echinacea</i> sp.) E. <i>purpurea</i>	Field Container	Knight	MS	2000	Over the top	Moderate injury (0.25, 0.5, 1.0 lb ai per acre) using single application on actively growing plants.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
17265	Dimension 1EC (Dithiopyr)	Purple Coneflower (Echinacea sp.) E. purpurea	Field Container	Senesac	NY	1999	Over the top	Slight to moderate injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) using single application on actively growing transplants.
13287	Dimension 1EC (Dithiopyr)	Seaside Eryngo, Sea Holly (Eryngium maritimum) E. planum	Field Container	Senesac	NY	1998	Over the top	No significant injury at 0.5, 1.0, and 2.0 lb ai per acre with single application on plants emerging from dormancy.
13287	Dimension 1EC (Dithiopyr)	Seaside Eryngo, Sea Holly (Eryngium maritimum) E. planum	Field Container	Senesac	NY	1999	Over the top	No injury at 0.25, 0.5 and 1.0 lb ai per acre with single application on actively growing transplants.
17266	Dimension 1EC (Dithiopyr)	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Siskiyou Pink'	Field Container	Senesac	NY	1999	Over the top	Very slight injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) after single application on actively growing transplants.
28033	Dimension 1EC (Dithiopyr)	Hellebore, Black (Helleborus niger) H. orientalis	Field Container	Czarnota	GA	2004	Over the top	No injury at 0.437 lb ai per acre through 4 weeks after treatment, but very slight injury appeared 8 and 12 weeks after treatment.
28020	Dimension 1EC (Dithiopyr)	Daylily (Hemerocallis sp.)	Field Container	Knight	MS	2000	Over the top	No significant injury at 0.25, 0.5, and 1.0 lb ai per acre with single application on actively growing plants.
23160	Dimension 1EC (Dithiopyr)	Impatiens/Touch-me-not (Impatiens sp.) I. wallerana 'Accent White'	Field Container	Knight	MS	2000	Over the top	Moderate injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) using single application on actively growing plants; plants unsaleable.
11335	Dimension 1EC (Dithiopyr)	Juniper (Juniperus sp.) J. chinensis 'Hetzii glauca'	Field In-Ground	Derr	VA	1995	Over the top	No injury at 0.25, 0.5 and 1.0 lb ai per acre after single application on actively growing plants; poor control of pigweed, but good to excellent control of comon lambsquarters, yellow foxtail, and carpetweed.
11335	Dimension 1EC (Dithiopyr)	Juniper (Juniperus sp.) J. sabina 'Broadmoor'	Field In-Ground	Buriff	OH	1996	Over the top	No injury at 0.5, 1.0 and 2.0 lb ai per acre after single application on actively growing plants.
13288	Dimension 1EC (Dithiopyr)	Blazing-Star (Liatrix sp.) L. spicata	Field Container	Senesac	NY	1998	Over the top	No significant injury with single application of 0.5, 1.0, and 2.0 lb ai per acre on plants emerging from dormancy.
12310	Dimension 1EC (Dithiopyr)	Cardinal Flower (Lobelia cardinalis)	Field Container	Buriff	OH	1998	Over the top	Very slight injury (distorted leaves, stunted growth) at 0.5 and 1.0 lb ai per acre, but moderate injury at 2.0 lb ai per acre; plants outgrew this and were salable by the end of the season.
12310	Dimension 1EC (Dithiopyr)	Cardinal Flower (Lobelia cardinalis)	Field Container	Linderman	OR	1999	Directed	No injury at 0.5, 1.0, and 2.0 lb ai per acre with single application on actively growing plants.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
12310	Dimension 1EC (Dithiopyr)	Cardinal Flower (<i>Lobelia cardinalis</i>)	Field Container	Senesac	NY	1998	Over the top	Moderate to severe injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) after single application on plants emerging from dormancy.
13289	Dimension 1EC (Dithiopyr)	Loosestrife, Yellow; Golden Globe (<i>Lysimachia</i> sp.) <i>L. punctata</i>	Field Container	Senesac	NY	1998	Over the top	Moderate to severe injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with single application on plants emerging from dormancy.
13289	Dimension 1EC (Dithiopyr)	Loosestrife, Yellow; Golden Globe (<i>Lysimachia</i> sp.) <i>L. punctata</i>	Field Container	Senesac	NY	1999	Over the top	Moderate to severe injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) with single application on actively growing transplants.
12312	Dimension 1EC (Dithiopyr)	Sage, Russian (<i>Perovskia</i> sp.) <i>P. atriplicifolia</i>	Field Container	Linderman	OR	1999	Directed	No injury at 0.5, 1.0, 2.0 lb ai per acre with single directed application on actively growing plants.
12312	Dimension 1EC (Dithiopyr)	Sage, Russian (<i>Perovskia</i> sp.) <i>P. atriplicifolia</i>	Field Container	Senesac	NY	1998	Over the top	Moderate injury at all rates (0.5, 1.0, 2.0 lb ai per acre) with single application on plants emerging from dormancy.
13290	Dimension 1EC (Dithiopyr)	Phlox (<i>Phlox</i> sp.) <i>P. paniculata</i> 'David'	Field Container	Senesac	NY	1998	Over the top	Significant injury and mortality at all rates (0.5, 1.0, 2.0 lb ai per acre) with single application on plants emerging from dormancy.
12313	Dimension 1EC (Dithiopyr)	False Dragon Head, Lion's Heart (<i>Physostegia</i> sp.) <i>P. virginiana</i>	Field Container	Buriff	OH	1998	Over the top	Significant injury and mortality of new growth at all rates (0.5, 1.0, 2.0 lb ai per acre) with single application; plants did not die but were not saleable.
17268	Dimension 1EC (Dithiopyr)	Jacob's Ladder (<i>Polemonium</i> sp.) <i>P. caeruleum</i>	Field Container	Senesac	NY	1999	Over the top	Moderate to significant injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) using single application on actively growing plants.
19736	Dimension 1EC (Dithiopyr)	Beach Plum (<i>Prunus maritima</i>) <i>P. maritima</i>	Field Container	Senesac	NY	1999	Over the top	No injury at 0.25, 0.5, and 1.0 lb ai per acre with single application on actively growing plants.
12314	Dimension 1EC (Dithiopyr)	Rodgersia (<i>Rodgersia</i> sp.) <i>R. henricii</i>	Field Container	Buriff	OH	1998	Over the top	No injury with 0.5, 1.0, and 2.0 lb ai per acre with single application on actively growing plants.
12315	Dimension 1EC (Dithiopyr)	Scarlet Sage (<i>Salvia splendens</i>)	Field Container	Knight	MS	2000	Over the top	Severe injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) with single application on actively growing plants.
12315	Dimension 1EC (Dithiopyr)	Scarlet Sage (<i>Salvia splendens</i>) 'Coral Nymph'	Field Container	Linderman	OR	1999	Directed	No injury at 0.5, 1.0 and 2.0 lb ai per acre with single directed application.
13291	Dimension 1EC (Dithiopyr)	Woodland Sage (<i>Salvia x sylvestris</i>) 'Rose Queen'	Field Container	Senesac	NY	1998	Over the top	Slight to moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with single application on plants emerging from dormancy.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
18609	Dimension 1EC (Dithiopyr)	Aster, New York (Symphyotrichum novi-belgii) 'Celeste'	Field Container	Senesac	NY	1998	Over the top	Moderate injury increasing with rate (0.5, 1.0, 2.0 lb ai per acre) with single application on actively growing rooted cuttings.
11336	Dimension 1EC (Dithiopyr)	Yew (Taxus sp.) T. cuspidata	Field In-Ground	Ahrens	CT	1994	Over the top	No injury with two applications of 0.25, 0.5 or 1.0 lb ai per acre.
11336	Dimension 1EC (Dithiopyr)	Yew (Taxus sp.) T. cuspidata	Field In-Ground	Ahrens	CT	1995	Over the top	No injury with two applications of 0.25, 0.5 or 1.0 lb ai per acre; same plant treated with same rates in 1994.
11336	Dimension 1EC (Dithiopyr)	Yew (Taxus sp.) T. cuspidata	Field In-Ground	Ahrens	CT	1996	Over the top	No injury with two applications of 0.25, 0.5 or 1.0 lb ai per acre; same plant treated with same rates in 1994 and 1995.
11336	Dimension 1EC (Dithiopyr)	Yew (Taxus sp.) T. cuspidata	Field In-Ground	Ahrens	CT	1997	Over the top	No injury with two applications of 0.25, 0.5 or 1.0 lb ai per acre; same plant treated with same rates in 1994, 1995 and 1996.
17269	Dimension 1EC (Dithiopyr)	Speedwell, Brooklime (Veronica sp.) V. prostrata 'Georgia Blue'	Field Container	Senesac	NY	1999	Over the top	Very slight to moderate injury increasing with rate (0.25, 0.5, 1.0 lb ai per acre) with single application on actively growing plants.
13285	Dimension 1EC (Dithiopyr)	Pansy (Viola sp.) 'Bingo Blue with Blotch'	Field Container	Senesac	NY	1998	Over the top	Moderate injury at all rates (0.5, 1.0, 2.0 lb ai per acre) with single application.
13285	Dimension 1EC (Dithiopyr)	Pansy (Viola sp.) 'Crystal Bowl Yellow'	Field Container	Senesac	NY	1998	Over the top	Moderate injury at all rates (0.5, 1.0, 2.0 lb ai per acre) with single application.
17260	Dimension 2EC (Dithiopyr)	Tickseed (Coreopsis sp.) C. lanceolata	Field In-Ground	Norcini	FL	1999	Over the top	No injury at 0.5 or 1.0 lb ai per acre with single application post bloom.
17261	Dimension 2EC (Dithiopyr)	Blanket Flower (Gaillardia sp.) G. pulchella	Field In-Ground	Norcini	FL	1999	Over the top	Very slight impact on flowering of treated plants at 1.0 lb ai per acre after single treatment, but there was no other apparent injury; no impact at 0.5 lb ai per acre.
31799	Dimension 2EW (Dithiopyr)	Fir, Fraser (Abies fraseri)	Field Container	Boydston	WA	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all treated plants marketable.
31799	Dimension 2EW (Dithiopyr)	Fir, Fraser (Abies fraseri)	Field Container	Siefer	OH	2015	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31799	Dimension 2EW (Dithiopyr)	Fir, Fraser (Abies fraseri)	Field Container	Witcher	TN	2017	Over the top	No injury or growth reduction with 2, 4 and 8 pt per acre applied twice.
31814	Dimension 2EW (Dithiopyr)	Maple, Norway (Acer platanoides)	Field Container	Siefer	OH	2015	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31815	Dimension 2EW (Dithiopyr)	Maple, Silver (Acer saccharinum)	Field Container	Siefer	OH	2015	Over the top	No significant injury with 0.5 and 1, very minor with 2 lb ai per acre applied twice; no significant growth reduction.
31829	Dimension 2EW (Dithiopyr)	Sweet Flag (Acorus sp.) a gramineus 'Ogon'	Field Container	Mansue	NJ	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31829	Dimension 2EW (Dithiopyr)	Sweet Flag (Acorus sp.) A. gramineus	Field Container	Mervosh	CT	2015	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31829	Dimension 2EW (Dithiopyr)	Sweet Flag (Acorus sp.) A. variegatus	Field Container	Wilén	CA	2015	Over the top	Slight to moderate but acceptable injury with 0.5, 1 and 2 lb ai per acre applied twice; no significant growth reduction.
31830	Dimension 2EW (Dithiopyr)	American beachgrass (Ammophila breviligulata)	Field Container	Klett	CO	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31830	Dimension 2EW (Dithiopyr)	American beachgrass (Ammophila breviligulata)	Field Container	Senesac	NY	2016	Over the top	Minor injury with 0.5, 1 and 2 lb ai per acre applied twice.
31830	Dimension 2EW (Dithiopyr)	American beachgrass (Ammophila breviligulata) 'Van Pines'	Field Container	Mathers	OH	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate to severe growth reduction.
31959	Dimension 2EW (Dithiopyr)	Big Blue Stem (Andropogon gerardii)	Field Container	Mathers	OH	2016	Over the top	No to minor injury with 0.5 and 1, moderate with 2 lb ai per acre applied twice; no significant growth reduction.
31959	Dimension 2EW (Dithiopyr)	Big Blue Stem (Andropogon gerardii)	Field Container	Senesac	NY	2015	Over the top	No injury with 0.5 and 1.0 lb ai per acre applied twice, moderate with 2 lb after 2nd application.
31959	Dimension 2EW (Dithiopyr)	Big Blue Stem (Andropogon gerardii)	Field Container	Wade	SC	2014	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31960	Dimension 2EW (Dithiopyr)	Broom Sedge Bluestem (Andropogon virginicus)	Field Container	Derr	VA	2015	Over the top	No shoot weight reduction with 0.5, moderate with 1 and 2 lb ai per acre, applied twice.
31960	Dimension 2EW (Dithiopyr)	Broom Sedge Bluestem (Andropogon virginicus)	Field Container	Senesac	NY	2015	Over the top	Minor injury with 0.5 and 1 lb ai per acre applied twice, moderate after 2nd application with 2 lb.
31960	Dimension 2EW (Dithiopyr)	Broom Sedge Bluestem (Andropogon virginicus)	Field Container	Wilén	CA	2015	Over the top	Slight injury with 0.5 and 1, unacceptable with 2 lb ai per acre applied twice; stunting at 2 lb.
32595	Dimension 2EW (Dithiopyr)	Black Chokeberry (Aronia melanocarpa)	Field Container	Cochran	IA	2016	Over the top	Slight to moderate injury with complete recovery with 0.5, 1 and 2 lb ai per acre applied twice; no growth reduction.
31797	Dimension 2EW (Dithiopyr)	Sprenger's Asparagus Fern (Asparagus densiflorus)	Field Container	Koivunen	CA	2015	Over the top	No injury with 0.5 and 1, slight with 2 lb ai per acre, applied twice; no growth reduction.
31797	Dimension 2EW (Dithiopyr)	Sprenger's Asparagus Fern (Asparagus densiflorus)	Field Container	Mansue	NJ	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31797	Dimension 2EW (Dithiopyr)	Sprenger's Asparagus Fern (Asparagus densiflorus)	Field Container	Rivera	PR	2014	Over the top	Minor initial injury with quick recovery at 0.5, 1 and 2 lb ai per acre applied twice; no growth reduction.
31782	Dimension 2EW (Dithiopyr)	Begonia (Begonia sp.)	Field Container	Harvey	WA	2015	Over the top	Slight injury and no growth reduction with 0.5 and 1.0, slight to moderate injury and slight growth reduction with 2.0 lb ai per acre, applied twice.
31782	Dimension 2EW (Dithiopyr)	Begonia (Begonia sp.) B. semperflorens	Field Container	Gilliam	AL	2015	Over the top	Severe injury and death with 2, 4 and 6 pt per acre applied twice.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31782	Dimension 2EW (Dithiopyr)	Begonia (Begonia sp.) 'Tuberous Go-Go Rose'	Field Container	Senesac	NY	2014	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
31781	Dimension 2EW (Dithiopyr)	Japanese Barberry (Berberis thunbergii)	Field Container	Uber	CA	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31781	Dimension 2EW (Dithiopyr)	Japanese Barberry (Berberis thunbergii) 'Concord'	Field Container	Mathers	OH	2015	Over the top	No significant injury with 0.5, 1 and 2 lb ai per acre applied twice.
31781	Dimension 2EW (Dithiopyr)	Japanese Barberry (Berberis thunbergii) 'Crimson Pigmy'	Field Container	Gilliam	AL	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight and moderate, but acceptable, growth reduction with 2X and 4X; all plants marketable.
31781	Dimension 2EW (Dithiopyr)	Japanese Barberry (Berberis thunbergii) 'Rose Glow'	Field Container	Hu	OH	2016	Over the top	Slight injury (leaf tip necrosis) with 0.5 and 1, moderate with 2 lb ai per acre applied twice; moderate growth reduction with 2X and 4X.
31783	Dimension 2EW (Dithiopyr)	Bougainvillea (Bougainvillea sp.)	Field Container	Wade	SC	2015	Over the top	No injury but slight growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31831	Dimension 2EW (Dithiopyr)	Feather Reed Grass (Calamagrostis acutiflora)	Field Container	Derr	VA	2014	Over the top	Good crop tolerance with 0.5 and 1 lb ai per acre applied twice, marginal with 2 lb ai.
31831	Dimension 2EW (Dithiopyr)	Feather Reed Grass (Calamagrostis acutiflora)	Field Container	Wade	SC	2014	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31831	Dimension 2EW (Dithiopyr)	Feather Reed Grass (Calamagrostis acutiflora) 'Karl Foerster'	Field Container	Boydston	WA	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31832	Dimension 2EW (Dithiopyr)	Leatherleaf Sedge (Carex buchananii)	Field Container	Boydston	WA	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic., slight injury (stunting) with 2X rate after 2nd applic; all plants marketable.
31832	Dimension 2EW (Dithiopyr)	Leatherleaf Sedge (Carex buchananii) 'Red Rooster'	Field Container	Senesac	NY	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31833	Dimension 2EW (Dithiopyr)	Carex morrowii (Carex morrowii) 'Ice Dancer'	Field Container	Boydston	WA	2014	Over the top	No injury with 0.5 and 1 lb ai per acre applied twice; slight injury (stunting), with good recovery, with 2 lb ai; all plants marketable.
31833	Dimension 2EW (Dithiopyr)	Carex morrowii (Carex morrowii) 'Ice Dancer'	Field Container	Senesac	NY	2014	Over the top	Slight injury after 2nd applic. with 0.5, 1 and 2 lb ai per acre; moderate growth reduction with 4X.
32107	Dimension 2EW (Dithiopyr)	Red Bud, Eastern (Cercis canadensis)	Seedbed	Beste	MD	2014	Over the top	Moderate injury and stunting with 0.5, 1 and 2 lb ai per acre applied twice; slight reduction in marketability.
31834	Dimension 2EW (Dithiopyr)	Indian Woodoats (Chasmanthium latifolium)	Field Container	Boydston	WA	2014	Over the top	No injury with 0.5 and 1 lb ai per acre applied twice; slight injury with 2 lb ai; no growth reduction; virtually all plants marketable.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31834	Dimension 2EW (Dithiopyr)	Indian Woodoats (Chasmanthium latifolium)	Field Container	Cochran	IA	2014	Over the top	Moderate initial injury, becoming minor at end of trial, with 0.5, 1 and 2 lb ai per acre applied twice; no significant growth reduction.
31834	Dimension 2EW (Dithiopyr)	Indian Woodoats (Chasmanthium latifolium)	Field Container	Derr	VA	2014	Over the top	Good crop tolerance with 0.5, 1 and 2 lb ai per acre applied twice.
31834	Dimension 2EW (Dithiopyr)	Indian Woodoats (Chasmanthium latifolium)	Field Container	Wilén	CA	2014	Over the top	Slight injury with 0.5 lb ai per acre applied twice, moderate and high with 1 and 2 lb; no growth reduction.
31884	Dimension 2EW (Dithiopyr)	Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) C./D. x morifolium	Field Container	Derr	VA	2013	Over the top	Minor injury but no flower rating reduction with 0.5 lb ai per acre applied twice.
31788	Dimension 2EW (Dithiopyr)	Dogwood, Flowering (Cornus florida)	Field Container	Mathers	OH	2015	Over the top	Severe injury (stunting and leaf spotting) with 0.5, 1 and 2 lb ai per acre applied twice.
31788	Dimension 2EW (Dithiopyr)	Dogwood, Flowering (Cornus florida)	Field Container	Siefer	OH	2015	Over the top	No significant injury with 0.5 and 1, minor with 2 lb ai per acre applied twice; moderate plant width reduction at 4X.
32104	Dimension 2EW (Dithiopyr)	Dogwood, Gray (Cornus racemosa)	Seedbed	Beste	MD	2014	Over the top	Moderate to severe injury and growth reduction increasing with rates (0.5, 1 and 2 lb ai per acre) applied twice.
31789	Dimension 2EW (Dithiopyr)	Dogwood, Red Osier (Cornus sericea)	Field Container	Harvey	WA	2015	Over the top	Slight injury with 0.5 and 1.0, moderate with 2.0 lb ai per acre, applied twice; slight and moderate growth reduction with 2X and 4X.
31789	Dimension 2EW (Dithiopyr)	Dogwood, Red Osier (Cornus sericea)	Field Container	Persad	OH	2014	Over the top	No significant injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate to high plant width reduction.
31835	Dimension 2EW (Dithiopyr)	Pampas Grass, Uruguayan (Cortaderia selloana)	Field Container	Senesac	NY	2015	Over the top	No injury with 0.5, minor with 1.0, and moderate with 2.0 lb ai per acre applied twice
31786	Dimension 2EW (Dithiopyr)	Cotoneaster, Cranberry (Cotoneaster apiculatus)	Field Container	Mervosh	CT	2015	Over the top	Minor injury with 0.5, moderate with 1 and 2 lb ai per acre applied twice. Horsweed control excellent at 4X.
31786	Dimension 2EW (Dithiopyr)	Cotoneaster, Cranberry (Cotoneaster apiculatus)	Field Container	Siefer	OH	2015	Over the top	No significant injury with 0.5, 1 and 2 lb ai per acre applied twice; slight to moderate plant width reduction.
31801	Dimension 2EW (Dithiopyr)	Hawthorn (Crataegus sp.)	Field Container	Siefer	OH	2015	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31882	Dimension 2EW (Dithiopyr)	Delosperma (Delosperma sp.) D. cooperi	Field Container	Derr	VA	2013	Over the top	No injury with 0.5 lb ai per acre applied twice; slight flower count reduction.
31882	Dimension 2EW (Dithiopyr)	Delosperma (Delosperma sp.) 'Fire Spinner'	Field Container	Derr	VA	2013	Over the top	No injury with 0.5 lb ai per acre applied twice.
31836	Dimension 2EW (Dithiopyr)	Tufted Hairgrass (Deschampsia caespitosa)	Field Container	Klett	CO	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight to moderate growth reduction at 2X and 4X.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31836	Dimension 2EW (Dithiopyr)	Tufted Hairgrass (<i>Deschampsia caespitosa</i>)	Field Container	Senesac	NY	2014	Over the top	Slight injury with 0.5, 1 and 2 lb ai per acre applied twice; severe growth reduction with 2X and 4X.
31836	Dimension 2EW (Dithiopyr)	Tufted Hairgrass (<i>Deschampsia caespitosa</i>) 'Northern Lights'	Field Container	Boydston	WA	2014	Over the top	Slight injury (stunting) with 0.5 and 1 lb ai per acre applied twice, slight to moderate injury with 2 lb ai; all 1X- and 2X-treated plants marketable.
32601	Dimension 2EW (Dithiopyr)	<i>Distylium</i> (<i>Distylium</i> sp.)	Field Container	Neal	NC	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic.; moderate to severe, increasing with rates, after 2nd application; slight to high growth reduction.
32602	Dimension 2EW (Dithiopyr)	<i>Enkianthus</i> (<i>Enkianthus</i> sp.) <i>E. campanulatus</i>	Field Container	Neal	NC	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic.; moderate to severe, after 2nd application; moderate growth reduction. High incidence of <i>Phytophthora</i> root rot in plants in this study.
32602	Dimension 2EW (Dithiopyr)	<i>Enkianthus</i> (<i>Enkianthus</i> sp.) <i>E. campanulatus</i> 'Showy Lantern'	Field Container	Nackley	OR	2017	Over the top	Slight to moderate injury increasing with rates (0.5, 1 and 2 lb ai per acre) after 1st applic, with almost complete recovery after 2nd applic; no significant growth reduction.
31837	Dimension 2EW (Dithiopyr)	Weeping Lovegrass (<i>Eragrostis curvula</i>)	Field Container	Derr	VA	2014	Over the top	Good crop tolerance with 0.5, 1 and 2 lb ai per acre applied twice.
31837	Dimension 2EW (Dithiopyr)	Weeping Lovegrass (<i>Eragrostis curvula</i>)	Field Container	Klett	CO	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate growth reduction at 4X.
31837	Dimension 2EW (Dithiopyr)	Weeping Lovegrass (<i>Eragrostis curvula</i>)	Field Container	Marble	FL	2017	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31837	Dimension 2EW (Dithiopyr)	Weeping Lovegrass (<i>Eragrostis curvula</i>)	Field Container	Witcher	TN	2017	Over the top	No injury or growth reduction with 2, 4 and 8 pt per acre applied twice.
31961	Dimension 2EW (Dithiopyr)	Purple Lovegrass (<i>Eragrostis spectabilis</i>)	Field Container	Neal	NC	2016	Over the top	No significant injury with 0.5, 1 and 2 lb ai per acre applied twice.
31961	Dimension 2EW (Dithiopyr)	Purple Lovegrass (<i>Eragrostis spectabilis</i>)	Field Container	Senesac	NY	2015	Over the top	No injury with 0.5, 1.0 and 2 lb ai per acre applied twice.
31792	Dimension 2EW (Dithiopyr)	Gum (<i>Eucalyptus</i> sp.)	Field Container	Gilliam	AL	2016	Over the top	No significant injury or stunting with 0.5, 1 and 1.5 lb ai per acre applied twice.
31792	Dimension 2EW (Dithiopyr)	Gum (<i>Eucalyptus</i> sp.) <i>E. cinerea</i>	Field Container	Wade	SC	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; 11% stunting at 4X; all plants marketable.
31792	Dimension 2EW (Dithiopyr)	Gum (<i>Eucalyptus</i> sp.) <i>E. deglupta</i>	Field Container	Marble	FL	2016	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31793	Dimension 2EW (Dithiopyr)	Burning Bush (<i>Euonymus alatus</i>)	Field Container	Miller	WA	2016	Over the top	Significant injury with 2, 4 and 8 pt per acre applied twice, with complete recovery by 3 months after 2nd applic; moderate stunting at 2X and 4X.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31793	Dimension 2EW (Dithiopyr)	Burning Bush (Euonymus alatus) 'Compacta'	Field Container	Nackley	OR	2017	Over the top	No injury or significant growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31793	Dimension 2EW (Dithiopyr)	Burning Bush (Euonymus alatus) 'Compactus'	Field Container	Mervosh	CT	2015	Over the top	Minor injury with 0.5, 1 and 2 lb ai per acre applied twice. Horseweed control excellent at 4X.
31793	Dimension 2EW (Dithiopyr)	Burning Bush (Euonymus alatus) 'Compactus'	Field Container	Wade	SC	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; 20% stunting at 4X; all plants marketable.
31794	Dimension 2EW (Dithiopyr)	Wintercreeper (Euonymus fortunei) 'Coloratus'	Field Container	Boydston	WA	2014	Over the top	No injury with 0.5 and 1 lb ai per acre applied twice, slight injury (leaf cupping and stunting) with 2 lb ai; all plants marketable.
31794	Dimension 2EW (Dithiopyr)	Wintercreeper (Euonymus fortunei) 'Emerald 'n Gold'	Field Container	DeFrancesco	OR	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate growth reduction at all rates.
31794	Dimension 2EW (Dithiopyr)	Wintercreeper (Euonymus fortunei) 'Ivory Jade'	Field Container	Beste	MD	2014	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; no reduction in marketability.
31838	Dimension 2EW (Dithiopyr)	Blue Fescue (Festuca cinerea) 'Elijah Blue'	Field Container	Boydston	WA	2014	Over the top	No injury with 0.5 and 1 lb ai per acre applied twice, slight to moderate injury (stunting) with 2 lb ai; all 1X- and 2X-treated plants marketable.
31838	Dimension 2EW (Dithiopyr)	Blue Fescue (Festuca cinerea) F. ovina 'Elija Blue'	Field Container	Wilén	CA	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31839	Dimension 2EW (Dithiopyr)	Field Fescue (Festuca glauca) 'Boulder Blue'	Field Container	Wade	SC	2014	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31839	Dimension 2EW (Dithiopyr)	Field Fescue (Festuca glauca) 'Elijah Blue'	Field Container	Klett	CO	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight to moderate growth reduction at 2X and 4X.
31839	Dimension 2EW (Dithiopyr)	Field Fescue (Festuca glauca) 'Elijah Blue'	Field Container	Senesac	NY	2014	Over the top	No injury or growth reduction with 0.5, severe with 1 and 2 lb ai per acre, applied twice.
31839	Dimension 2EW (Dithiopyr)	Field Fescue (Festuca glauca) 'Elijah Blue'	Field Container	Wilén	CA	2016	Over the top	Slight injury at 0.5, moderate at 1 and 2 lb ai per acre applied twice.
31840	Dimension 2EW (Dithiopyr)	Sheep Fescue (Festuca ovina)	Field Container	Cochran	IA	2014	Over the top	Severe injury and death of treated plants with 0.5, 1 and 2 lb ai per acre applied twice.
31840	Dimension 2EW (Dithiopyr)	Sheep Fescue (Festuca ovina)	Field Container	Cochran	IA	2015	Over the top	Severe injury and death of treated plants with 0.5, 1 and 2 lb ai per acre applied twice.
31800	Dimension 2EW (Dithiopyr)	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Belleza White Evolution'	Field Container	Klett	CO	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate growth reduction increasing with rates.
31800	Dimension 2EW (Dithiopyr)	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Siskiyou Pink'	Field Container	Neal	NC	2014	Over the top	Moderate injury with good recovery at 0.5 and 1 lb ai per acre 6 weeks after the 2nd application, but not with 2 lb ai; significant delay in blooming at all rates.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31800	Dimension 2EW (Dithiopyr)	Beeblossom, Lindheimer's (Gaura lindheimeri) 'Whirling Butterflies'	Field Container	Boydston	WA	2014	Over the top	No injury or growth reduction with 0.5 and 1 lb ai per acre applied twice, slight to moderate stunting with good recovery at 2 lb ai; all treated plants marketable.
31841	Dimension 2EW (Dithiopyr)	Hakone Grass (Hakonechloa sp.)	Field Container	Neal	NC	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic., slight to moderate injury with 2X and 4X after 2nd application.
31841	Dimension 2EW (Dithiopyr)	Hakone Grass (Hakonechloa sp.) H. macra 'Aureola'	Field Container	Klett	CO	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic.; slight to moderate injury at 2X and 4X after 2nd applic. attributed to sun exposure of plants.
31841	Dimension 2EW (Dithiopyr)	Hakone Grass (Hakonechloa sp.) H. macra 'Aureola'	Field Container	Senesac	NY	2014	Over the top	No injury or significant growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31787	Dimension 2EW (Dithiopyr)	Daylily (Hemerocallis sp.)	Field Container	Rivera	PR	2014	Over the top	Minor initial injury with quick recovery at 0.5, 1 and 2 lb ai per acre applied twice.
31787	Dimension 2EW (Dithiopyr)	Daylily (Hemerocallis sp.)	Field Container	Uber	CA	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31787	Dimension 2EW (Dithiopyr)	Daylily (Hemerocallis sp.) 'Chicago Apache'	Field Container	Mansue	NJ	2014	Over the top	Slight injury, no significant growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31787	Dimension 2EW (Dithiopyr)	Daylily (Hemerocallis sp.) 'Green Flutter'	Field Container	Senesac	NY	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31802	Dimension 2EW (Dithiopyr)	Rosemallow (Hibiscus sp.)	Field Container	Rivera	PR	2014	Over the top	Minor initial injury with some recovery at 0.5, 1 and 2 lb ai per acre applied twice.
31802	Dimension 2EW (Dithiopyr)	Rosemallow (Hibiscus sp.) H. syriacus 'Minfren'	Field Container	DeFrancesco	OR	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31802	Dimension 2EW (Dithiopyr)	Rosemallow (Hibiscus sp.) H. x moscheutos 'Lady Baltimore'	Field Container	Senesac	NY	2014	Over the top	Moderate injury with 0.5, 1 and 2 lb ai per acre applied twice.
31802	Dimension 2EW (Dithiopyr)	Rosemallow (Hibiscus sp.) 'Plum Crazy'	Field Container	Mathers	OH	2015	Over the top	Severe initial injury with 0.5, 1 and 2 lb ai per acre after 1st applic, with 1X and 2X recovering to commercially acceptable level after 2nd applic; 4X unacceptable.
31803	Dimension 2EW (Dithiopyr)	Rose-Of-Sharon (Hibiscus syriacus)	Field Container	Marble	FL	2015	Over the top	No significant injury with 0.5 and 1 lb ai per acre, slight and commercially acceptable at 2 lb ai per acre, applied twice; no growth reduction.
31803	Dimension 2EW (Dithiopyr)	Rose-Of-Sharon (Hibiscus syriacus)	Field Container	Wade	SC	2015	Over the top	No injury but slight growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31803	Dimension 2EW (Dithiopyr)	Rose-Of-Sharon (Hibiscus syriacus) 'Aphrodite'	Field Container	Senesac	NY	2014	Over the top	Slight injury with 0.5, 1 and 2 lb ai per acre applied twice.
31809	Dimension 2EW (Dithiopyr)	Plantain Lily (Hosta sp.)	Field Container	Boydston	WA	2014	Over the top	Slight injury with good recovery with 0.5, 1 and 2 lb ai per acre applied twice; no significant growth reduction; all treated plants marketable.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31809	Dimension 2EW (Dithiopyr)	Plantain Lily (Hosta sp.) H. fortunei 'Gold Standard'	Field Container	Senesac	NY	2014	Over the top	Slight injury with 0.5, 1 and 2 lb ai per acre applied twice.
31809	Dimension 2EW (Dithiopyr)	Plantain Lily (Hosta sp.) H. lancifolia	Field Container	Gilliam	AL	2015	Over the top	No significant injury with 2 and 4, moderate with 6 pt per acre applied twice; slight to moderate growth reduction.
31810	Dimension 2EW (Dithiopyr)	Hydrangea (Hydrangea sp.)	Field Container	Rivera	PR	2014	Over the top	Minor injury with 0.5, 1 and 2 lb ai per acre applied twice; no growth reduction.
31810	Dimension 2EW (Dithiopyr)	Hydrangea (Hydrangea sp.) H. macrophylla 'Endless Summer'	Field Container	Hu	OH	2016	Over the top	Slight to moderate moderate injury (chlorosis) and growth reduction increasing with rates (0.5, 1 and 2 lb ai per acre) applied twice.
31810	Dimension 2EW (Dithiopyr)	Hydrangea (Hydrangea sp.) H. paniculata 'Grandiflora'	Field Container	Beste	MD	2014	Over the top	Acceptable injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate growth reduction at 4X. Reduced flower production at all rates would cause reduced marketability.
31810	Dimension 2EW (Dithiopyr)	Hydrangea (Hydrangea sp.) H. quercifolia 'Alice'	Field Container	Gilliam	AL	2014	Over the top	No significant injury or growth reduction with 0.5, moderate to severe with 1 and 2, lb ai per acre applied twice.
31806	Dimension 2EW (Dithiopyr)	Holly, Chinese (Ilex cornuta) 'Burfordii Nana'	Field Container	Beste	MD	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31806	Dimension 2EW (Dithiopyr)	Holly, Chinese (Ilex cornuta) 'Dwarf Burford'	Field Container	Gilliam	AL	2014	Over the top	No injury or growth reduction with 0.5, slight with 1, and moderate with 2 lb ai per acre applied twice; 4X rate considered unacceptable.
31807	Dimension 2EW (Dithiopyr)	Holly, Japanese (Ilex crenata) 'Helleri'	Field Container	Gilliam	AL	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight growth reduction with 4X; all plants marketable.
31807	Dimension 2EW (Dithiopyr)	Holly, Japanese (Ilex crenata) 'Sky Pencil'	Field Container	Beste	MD	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31807	Dimension 2EW (Dithiopyr)	Holly, Japanese (Ilex crenata) 'Steeds'	Field Container	Senesac	NY	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31804	Dimension 2EW (Dithiopyr)	Holly, Topal (Ilex x attenuata) 'Eagleson'	Field Container	Beste	MD	2014	Over the top	Acceptable injury with 0.5, 1 and 2 lb ai per acre applied twice; slight reduction in growth and marketability at 4X.
31804	Dimension 2EW (Dithiopyr)	Holly, Topal (Ilex x attenuata) 'Fosteri'	Field Container	Gilliam	AL	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate, but acceptable, growth reduction with 4X; all plants considered marketable.
31805	Dimension 2EW (Dithiopyr)	Holly, Blue (Ilex x meserveae) 'Blue Prince'	Field Container	Beste	MD	2014	Over the top	Slight injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate reduction in growth and marketability at 4X.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31805	Dimension 2EW (Dithiopyr)	Holly, Blue (Ilex x meserveae) 'Blue Stallion'	Field Container	Mathers	OH	2015	Over the top	Moderate injury with 0.5, 1 and 2 lb ai per acre after 1st applic, with 1X and 2X recovering to commercially acceptable level after 2nd applic; 4X unacceptable.
31805	Dimension 2EW (Dithiopyr)	Holly, Blue (Ilex x meserveae) 'Castle Spire'	Field Container	DeFrancesco	OR	2015	Over the top	No injury with 0.5, 1 and 2 lb ai per acre, but moderate growth reduction with 0.5 and 2 lb, applied twice.
31805	Dimension 2EW (Dithiopyr)	Holly, Blue (Ilex x meserveae) 'Mesog' (China Girl)	Field Container	Senesac	NY	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31895	Dimension 2EW (Dithiopyr)	Iris (Iris sp.)	Field In-Ground	Senesac	NY	2014	Over the top	Trial not completed due to crop failure; will be repeated in 2015.
31895	Dimension 2EW (Dithiopyr)	Iris (Iris sp.) 'Blue Diamond'	Field In-Ground	Miller	WA	2015	Over the top	No injury with 0.25, slight (less flowers, shorter stem length) with 0.5, 0.75 and 2.0 lb ai per acre applied twice; slight to moderate reduction of bulb weight increasing with rates.
31895	Dimension 2EW (Dithiopyr)	Iris (Iris sp.) 'Blue Diamond'	Field In-Ground	Miller	WA	2016	Over the top	No injury or growth reduction with 2, 4 and 8 pt per acre applied twice; slight reduction of total bulb weight at 4X.
31895	Dimension 2EW (Dithiopyr)	Iris (Iris sp.) I. reticulata	Field In-Ground	Senesac	NY	2015	Over the top	No injury with 0.5 and 1 and 2 lb ai per acre applied twice.
31842	Dimension 2EW (Dithiopyr)	Common Rush (Juncus effusus)	Field Container	Senesac	NY	2015	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31842	Dimension 2EW (Dithiopyr)	Common Rush (Juncus effusus)	Field Container	Wade	SC	2014	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31842	Dimension 2EW (Dithiopyr)	Common Rush (Juncus effusus) 'Spiralis'	Field Container	Hu	OH	2016	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31784	Dimension 2EW (Dithiopyr)	Cedar, Eastern Red (Juniperus virginiana)	Field Container	Beste	MD	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight reduction in growth and marketability at 4X.
31784	Dimension 2EW (Dithiopyr)	Cedar, Eastern Red (Juniperus virginiana)	Field Container	Siefer	OH	2015	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
26977	Dimension 2EW (Dithiopyr)	Lantana (Lantana sp.) L. camara 'Liberty Bell'	Field Container	Freiberger	NJ	2007	Over the top	Moderate injury at 0.5 and 1, severe at 2 lb ai per acre
31883	Dimension 2EW (Dithiopyr)	Max Chrysanthemum (Leucanthemum maximum) 'Alaska'	Field Container	Derr	VA	2013	Over the top	Minor injury with 0.5 lb ai per acre applied twice.
31843	Dimension 2EW (Dithiopyr)	Ryegrass, Sand (Leymus arenarius)	Field Container	Derr	VA	2015	Over the top	No shoot weight reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31843	Dimension 2EW (Dithiopyr)	Ryegrass, Sand (Leymus arenarius)	Field Container	Mathers	OH	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31843	Dimension 2EW (Dithiopyr)	Ryegrass, Sand (Leymus arenarius) 'Blue Dune'	Field Container	Senesac	NY	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31824	Dimension 2EW (Dithiopyr)	Privet, Glossy (Ligustrum lucidum) L. sinense 'Variegatum'	Field Container	Fraelich	GA	2015	Over the top	No injury or difference in plant growth and marketability with 2, 4 and 8 pt per acre applied twice.
31844	Dimension 2EW (Dithiopyr)	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Klett	CO	2015	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight growth reduction at 4X.
31844	Dimension 2EW (Dithiopyr)	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Neal	NC	2014	Over the top	No injury, growth reduction or delayed blooming with 0.5, 1 and 2 lb ai per acre applied twice.
31844	Dimension 2EW (Dithiopyr)	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Wade	SC	2014	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31962	Dimension 2EW (Dithiopyr)	Pine Muhly (Muhlenbergia dubia)	Field Container	Marble	FL	2016	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; minor growth reduction with 4X; all plants marketable.
31962	Dimension 2EW (Dithiopyr)	Pine Muhly (Muhlenbergia dubia)	Field Container	Senesac	NY	2015	Over the top	Moderate injury with 0.5 and 1.0 lb ai per acre after 2nd application, severe with 2 lb.
31818	Dimension 2EW (Dithiopyr)	Wax Myrtle (Myrica cerifera)	Field Container	Gilliam	AL	2014	Over the top	No injury and slight growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31818	Dimension 2EW (Dithiopyr)	Wax Myrtle (Myrica cerifera)	Field Container	Wade	SC	2015	Over the top	No injury or growth reduction with 0.5, moderate with 1 and 2, lb ai per acre applied twice; only 1X-treated plants marketable.
31896	Dimension 2EW (Dithiopyr)	Daffodil (Narcissus sp.)	Field In-Ground	Senesac	NY	2014	Over the top	Trial not completed due to crop failure; will be repeated in 2015.
31896	Dimension 2EW (Dithiopyr)	Daffodil (Narcissus sp.) 'Flower Carpet'	Field In-Ground	Miller	WA	2015	Over the top	No injury with 0.25, 0.5, 0.75 and 2.0 lb ai per acre applied twice; slight reduction of bulb number with 0.75 and 2 lb.
31896	Dimension 2EW (Dithiopyr)	Daffodil (Narcissus sp.) 'Flower Carpet'	Field In-Ground	Miller	WA	2016	Over the top	No injury or reduction of growth and yield with 2, 4 and 8 pt per acre applied twice.
31896	Dimension 2EW (Dithiopyr)	Daffodil (Narcissus sp.) 'Golden Echo'	Field In-Ground	Senesac	NY	2015	Over the top	No injury with 0.5 and 1, slight with complete recovery at 2 lb ai per acre applied twice.
31845	Dimension 2EW (Dithiopyr)	Finestem Needlegrass (Nassella tenuissima)	Field Container	Cochran	IA	2015	Over the top	No significant injury with 0.5, moderate with 1 and 2 lb ai per acre applied twice; no growth reduction.
31845	Dimension 2EW (Dithiopyr)	Finestem Needlegrass (Nassella tenuissima)	Field Container	Derr	VA	2015	Over the top	No shoot weight reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31845	Dimension 2EW (Dithiopyr)	Finestem Needlegrass (Nassella tenuissima)	Field Container	Wade	SC	2014	Over the top	No injury with 1, 2 and 4 lb ai per acre applied twice; all plants marketable.
31931	Dimension 2EW (Dithiopyr)	Peony (Paeonia sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2015	Over the top	Slight foliar injury with 0.5 and 1.0, moderate with 2 lb ai per acre applied twice.
31931	Dimension 2EW (Dithiopyr)	Peony (Paeonia sp.) 'President Roosevelt'	Field In-Ground	Miller	WA	2016	Over the top	Moderate to severe injury increasing with rates (2, 4 and 8 pt per acre) applied twice.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31846	Dimension 2EW (Dithiopyr)	Switch Grass (<i>Panicum virgatum</i>)	Field Container	Cochran	IA	2014	Over the top	Minor injury with 0.5, 1 and 2 lb ai per acre applied twice; no significant growth reduction.
31846	Dimension 2EW (Dithiopyr)	Switch Grass (<i>Panicum virgatum</i>)	Field Container	Derr	VA	2014	Over the top	Excellent crop tolerance with 0.5, 1 and 2 lb ai per acre applied twice.
31846	Dimension 2EW (Dithiopyr)	Switch Grass (<i>Panicum virgatum</i>) 'Prairie Sky'	Field Container	Marble	FL	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31847	Dimension 2EW (Dithiopyr)	Fountaingrass (<i>Pennisetum alopecuroides</i>)	Field Container	Derr	VA	2014	Over the top	Excellent crop tolerance with 0.5, 1 and 2 lb ai per acre applied twice.
31847	Dimension 2EW (Dithiopyr)	Fountaingrass (<i>Pennisetum alopecuroides</i>)	Field Container	Senesac	NY	2014	Over the top	Virtually no injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31847	Dimension 2EW (Dithiopyr)	Fountaingrass (<i>Pennisetum alopecuroides</i>) 'Little Honey'	Field Container	Klett	CO	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31850	Dimension 2EW (Dithiopyr)	Oriental Fountain Grass (<i>Pennisetum orientale</i>)	Field Container	Klett	CO	2015	Over the top	No injury, but moderate to severe growth reduction, with with 0.5, 1 and 2 lb ai per acre applied twice.
31850	Dimension 2EW (Dithiopyr)	Oriental Fountain Grass (<i>Pennisetum orientale</i>)	Field Container	Senesac	NY	2014	Over the top	Slight injury after 2nd applic. with 0.5, 1 and 2 lb ai per acre; moderate growth reduction with 4X.
31850	Dimension 2EW (Dithiopyr)	Oriental Fountain Grass (<i>Pennisetum orientale</i>) 'Karley Rose'	Field Container	Marble	FL	2015	Over the top	No injury or significant growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
32513	Dimension 2EW (Dithiopyr)	<i>Sedum hybridum</i> (<i>Phedimus hybridus</i>)	Field Container	Senesac	NY	2016	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
32514	Dimension 2EW (Dithiopyr)	Stonecrop, Kamchatka (<i>Phedimus kantschaticum</i>)	Field Container	Marble	FL	2016	Over the top	Slight injury with 0.5 and 1, moderate with 2 lb ai per acre applied twice; no growth reduction; 4X treated plants not marketable.
32514	Dimension 2EW (Dithiopyr)	Stonecrop, Kamchatka (<i>Phedimus kantschaticum</i>)	Field Container	Mathers	OH	2016	Over the top	Moderate to severe injury and growth reduction increasing with rate (0.5, 1 and 2 lb ai per acre) applied twice.
32514	Dimension 2EW (Dithiopyr)	Stonecrop, Kamchatka (<i>Phedimus kantschaticum</i>) <i>S. floriferum</i> 'Weihenstephaner Gold'	Field Container	Senesac	NY	2016	Over the top	Moderate to severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
32519	Dimension 2EW (Dithiopyr)	Stonecrop, Two-Row/Caucasian (<i>Phedimus spurius</i>)	Field Container	Witcher	TN	2017	Over the top	Moderate to severe injury with 2, 4 and 8 pt per acre applied twice.
32519	Dimension 2EW (Dithiopyr)	Stonecrop, Two-Row/Caucasian (<i>Phedimus spurius</i>) <i>Sedum spurium</i> 'John Creech'	Field Container	Senesac	NY	2017	Over the top	Moderate injury at 0.5, severe at 1 and 2 lb ai per acre applied twice.
32519	Dimension 2EW (Dithiopyr)	Stonecrop, Two-Row/Caucasian (<i>Phedimus spurius</i>)	Field Container	Derr	VA	2017	Over the top	Moderate injury with 0.5, 1 and 2 lb ai per acre applied twice.
31821	Dimension 2EW (Dithiopyr)	Ninebark (<i>Physocarpus</i> sp.) <i>P. capitatus</i>	Field Container	Nackley	OR	2017	Over the top	Moderate to severe injury and growth reduction with 0.5, 1 and 2 lb ai per acre after 2nd application.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31821	Dimension 2EW (Dithiopyr)	Ninebark (Physocarpus sp.) P. opulifolius	Field Container	Siefer	OH	2015	Over the top	No significant injury or growth reduction with 0.5 and 1, moderate with 2 lb ai per acre applied twice.
31821	Dimension 2EW (Dithiopyr)	Ninebark (Physocarpus sp.) P. opulifolius 'Coopertina'	Field Container	Senesac	NY	2016	Over the top	Moderate injury with 0.5, 1 and 2 lb ai per acre applied twice.
31827	Dimension 2EW (Dithiopyr)	Spruce, Norway (Picea abies)	Field Container	Boydston	WA	2014	Over the top	Slight to moderate injury (growth reduction) with 0.5, 1 and 2 lb ai per acre applied twice; all 1X- and 2X- treated plants marketable.
31827	Dimension 2EW (Dithiopyr)	Spruce, Norway (Picea abies)	Field Container	Persad	OH	2014	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31827	Dimension 2EW (Dithiopyr)	Spruce, Norway (Picea abies) 'Pendula'	Field Container	Hu	OH	2016	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31828	Dimension 2EW (Dithiopyr)	Spruce, White; Cat (Picea glauca)	Field Container	Persad	OH	2014	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31828	Dimension 2EW (Dithiopyr)	Spruce, White; Cat (Picea glauca) 'Conica'	Field Container	Hu	OH	2016	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31828	Dimension 2EW (Dithiopyr)	Spruce, White; Cat (Picea glauca) 'Black Hills'	Field Container	Boydston	WA	2014	Over the top	No injury with 0.5 and 1 lb ai per acre applied twice; moderate injury and growth reduction with 2 lb ai; all 1X- and 2X-treated plants marketable.
31822	Dimension 2EW (Dithiopyr)	Japanese Andromeda, Japanese Pieris (Pieris japonica) 'Red Mill'	Field Container	Mathers	OH	2015	Over the top	Moderate to severe injury increasing with rates (0.5, 1 and 2 lb ai per acre) applied twice.
31823	Dimension 2EW (Dithiopyr)	Pine (Pinus sp.)	Field Container	Fraelich	GA	2015	Over the top	No injury or difference in plant growth and marketability with 2, 4 and 8 pt per acre applied twice.
31823	Dimension 2EW (Dithiopyr)	Pine (Pinus sp.) P. nigra	Field Container	DeFrancesco	OR	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31823	Dimension 2EW (Dithiopyr)	Pine (Pinus sp.) P. strobus	Field Container	Beste	MD	2016	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31823	Dimension 2EW (Dithiopyr)	Pine (Pinus sp.) P. strobus	Field Container	Persad	OH	2014	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31823	Dimension 2EW (Dithiopyr)	Pine (Pinus sp.) Pinus eldarica	Field Container	Uber	CA	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
32106	Dimension 2EW (Dithiopyr)	Pine, Loblolly (Pinus taeda)	Seedbed	Beste	MD	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; no reduction in marketability.
32108	Dimension 2EW (Dithiopyr)	Plane Tree, Sycamore (Platanus sp.) P. occidentalis	Seedbed	Beste	MD	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
32108	Dimension 2EW (Dithiopyr)	Plane Tree, Sycamore (Platanus sp.) P. occidentalis	Seedbed	Marble	FL	2017	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
33132	Dimension 2EW (Dithiopyr)	Plane Tree, Sycamore (Platanus sp.) P. x acerifolia 'Columbia'	Field Container	Nackley	OR	2017	Over the top	Minor injury with 0.5, 1 and 2 lb ai per acre after 2nd application; no growth reduction.

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31817	Dimension 2EW (Dithiopyr)	Rose Moss (Portulaca grandiflora)	Field Container	Fraelich	GA	2015	Over the top	No injury or difference in plant growth and marketability with 2, 4 and 8 pt per acre applied twice.
31817	Dimension 2EW (Dithiopyr)	Rose Moss (Portulaca grandiflora)	Field Container	Harvey	WA	2015	Over the top	Slight injury and growth reduction with 0.5 and 1.0, moderate injury and growth reduction with 2.0 lb ai per acre, applied twice.
31817	Dimension 2EW (Dithiopyr)	Rose Moss (Portulaca grandiflora) 'Happy Hour Orange'	Field Container	Senesac	NY	2014	Over the top	Slight injury with 0.5, 1 and 2 lb ai per acre applied twice.
31817	Dimension 2EW (Dithiopyr)	Rose Moss (Portulaca grandiflora) 'SundialPeach'	Field Container	Wilen	CA	2015	Over the top	Slight to moderate injury, but severe stunting with 0.5, 1 and 2 lb ai per acre applied twice.
32105	Dimension 2EW (Dithiopyr)	Cherry, Black (Non-Bearing) (Prunus serotina)	Seedbed	Beste	MD	2014	Over the top	Severe injury and stunting with 0.5, 1 and 2 lb ai per acre applied twice.
31790	Dimension 2EW (Dithiopyr)	Fir, Douglas (Pseudotsuga menziesii)	Field Container	Boydston	WA	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all treated plants marketable.
31790	Dimension 2EW (Dithiopyr)	Fir, Douglas (Pseudotsuga menziesii)	Field Container	DeFrancesco	OR	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31790	Dimension 2EW (Dithiopyr)	Fir, Douglas (Pseudotsuga menziesii)	Field Container	Persad	OH	2014	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31790	Dimension 2EW (Dithiopyr)	Fir, Douglas (Pseudotsuga menziesii) 'Glauca'	Field Container	Beste	MD	2016	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31825	Dimension 2EW (Dithiopyr)	Oak (Quercus sp.) Q. acutissima	Field Container	Gilliam	AL	2015	Over the top	No to slight injury with 2, 4 and 6 pt per acre after 1st application; moderate to severe after 2nd.
31825	Dimension 2EW (Dithiopyr)	Oak (Quercus sp.) Q. macrocarpa	Field Container	DeFrancesco	OR	2015	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31825	Dimension 2EW (Dithiopyr)	Oak (Quercus sp.) Q. roburfastigiata	Field Container	Persad	OH	2014	Over the top	Slight to moderate injury with complete recovery at 0.5, 1 and 2 lb ai per acre applied twice; no significant growth reduction.
31785	Dimension 2EW (Dithiopyr)	Buckthorn (Rhamnus sp.)	Field Container	Witcher	TN	2017	Over the top	No injury or growth reduction with 2, 4 and 8 pt per acre applied twice.
31780	Dimension 2EW (Dithiopyr)	Azalea (Rhododendron sp.) 'Delaware Valley White'	Field Container	Mansue	NJ	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice; slight growth reduction.
31780	Dimension 2EW (Dithiopyr)	Azalea (Rhododendron sp.) 'Karen'	Field Container	Hu	OH	2016	Over the top	No injury with 0.5, moderate injury (chlorosis) and growth reduction with 1 and 2 lb ai per acre applied twice.
31780	Dimension 2EW (Dithiopyr)	Azalea (Rhododendron sp.) 'Purple Gem'	Field Container	DeFrancesco	OR	2014	Over the top	No injury with 0.5, 1 and 2 lb ai per acre after 1st applic., slight with 1 and 2 lb after 2nd; moderate growth reduction at all rates.
26978	Dimension 2EW (Dithiopyr)	Rose (Rosa sp.) a hybrid tea	Field Container	Freiberger	NJ	2007	Over the top	No injury in early evaluations at 0.5, 1 and 2 lb ai per acre; later evaluations inaccurate because of severe black spot infection

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26978	Dimension 2EW (Dithiopyr)	Rose (Rosa sp.) 'Knockout'	Field Container	Freiberger	NJ	2007	Over the top	Slight injury at 0.5, 1 and 2 lb ai per acre at last two evaluations
26978	Dimension 2EW (Dithiopyr)	Rose (Rosa sp.) R. rugosa alba	Field Container	Freiberger	NJ	2007	Over the top	No injury at 0.5, 1 and 2 lb ai per acre
31848	Dimension 2EW (Dithiopyr)	Little Bluestem (Schizachyrium scoparium)	Field Container	Cochran	IA	2014	Over the top	Minor initial injury, with complete recovery, with 0.5, 1 and 2 lb ai per acre applied twice; no significant growth reduction.
31848	Dimension 2EW (Dithiopyr)	Little Bluestem (Schizachyrium scoparium)	Field Container	Derr	VA	2014	Over the top	Good crop tolerance with 0.5, 1 and 2 lb ai per acre applied twice.
31848	Dimension 2EW (Dithiopyr)	Little Bluestem (Schizachyrium scoparium)	Field Container	Neal	NC	2014	Over the top	No visual injury with 0.5, 1 and 2 lb ai per acre applied twice; moderate reduction of brace roots with 2X and 4X.
31848	Dimension 2EW (Dithiopyr)	Little Bluestem (Schizachyrium scoparium)	Field Container	Senesac	NY	2014	Over the top	Slight injury after 2nd applic. with 0.5, 1 and 2 lb ai per acre; moderate growth reduction with 4X.
32512	Dimension 2EW (Dithiopyr)	Stonecrop, Moss (Sedum acre)	Field Container	Senesac	NY	2016	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
32515	Dimension 2EW (Dithiopyr)	Stonecrop, Gray (Sedum pachyclados)	Field Container	Senesac	NY	2016	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
32516	Dimension 2EW (Dithiopyr)	Stonecrop, Jenny's (Sedum reflexum)	Field Container	Senesac	NY	2016	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
32517	Dimension 2EW (Dithiopyr)	Stonecrop, Tasteless (Sedum sexangulare)	Field Container	Senesac	NY	2016	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice.
31811	Dimension 2EW (Dithiopyr)	Nightshade (Solanum sp.) S. jasminoides 'Variegata'	Field Container	Senesac	NY	2017	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31826	Dimension 2EW (Dithiopyr)	Japanese Meadowsweet (Spiraea japonica) 'Anthony Waterer'	Field Container	Uber	CA	2015	Over the top	Severe injury with 0.5, 1 and 2 lb ai per acre applied twice
31826	Dimension 2EW (Dithiopyr)	Japanese Meadowsweet (Spiraea japonica) 'Firelight'	Field Container	Hu	OH	2016	Over the top	Slight injury (leaf tip necrosis) and growth reduction with 0.5 and 1, moderate with 2 lb ai per acre applied twice.
31826	Dimension 2EW (Dithiopyr)	Japanese Meadowsweet (Spiraea japonica) 'Little Princess'	Field Container	Gilliam	AL	2014	Over the top	No significant injury or growth reduction with 0.5, moderate with 1 and 2, lb ai per acre applied twice; treated plants marketable at 1X and 4X.
31826	Dimension 2EW (Dithiopyr)	Japanese Meadowsweet (Spiraea japonica) 'Tor'	Field Container	Mathers	OH	2015	Over the top	Moderate injury with 0.5 and 1, severe with 2 lb ai per acre applied twice.
31849	Dimension 2EW (Dithiopyr)	Prairie Dropseed (Sporobolus heterolepis)	Field Container	Cochran	IA	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31849	Dimension 2EW (Dithiopyr)	Prairie Dropseed (Sporobolus heterolepis)	Field Container	Derr	VA	2015	Over the top	Moderate to severe shoot weight reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31849	Dimension 2EW (Dithiopyr)	Prairie Dropseed (Sporobolus heterolepis)	Field Container	Senesac	NY	2014	Over the top	Slight injury after 2nd applic. with 0.5, 1 and 2 lb ai per acre; slight to moderate growth reduction increasing with rates.

PR#	Product (Active Ingredients)	Crop	ProductionSite	Researcher	State	Year	ApplicationType	Results
31813	Dimension 2EW (Dithiopyr)	Lilac (Syringa sp.) 'Bloomerang'	Field Container	Hu	OH	2016	Over the top	Slight injury (leaf tip necrosis) with 0.5, moderate with 1 and 2 lb ai per acre applied twice; slight and high growth reduction with 2X and 4X.
31813	Dimension 2EW (Dithiopyr)	Lilac (Syringa sp.) S. meyeri 'Palibin'	Field Container	Mansue	NJ	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31813	Dimension 2EW (Dithiopyr)	Lilac (Syringa sp.) S. vulgaris	Field Container	Nackley	OR	2017	Over the top	Slight injury with 0.5 and 1, moderate with 2 lb ai per acre applied twice; moderate growth reduction with 2X and 4X.
32103	Dimension 2EW (Dithiopyr)	Bald Cypress (Taxodium distichum)	Seedbed	Beste	MD	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice; all plants marketable.
31779	Dimension 2EW (Dithiopyr)	Arborvitae, American (Thuja occidentalis) 'Emerald Green'	Field Container	Miller	WA	2016	Over the top	No injury or growth reduction with 2, 4 and 8 pt per acre applied twice.
31779	Dimension 2EW (Dithiopyr)	Arborvitae, American (Thuja occidentalis) 'Holmstrup'	Field Container	Mathers	OH	2015	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31779	Dimension 2EW (Dithiopyr)	Arborvitae, American (Thuja occidentalis) 'Little Gem'	Field Container	Gilliam	AL	2014	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31779	Dimension 2EW (Dithiopyr)	Arborvitae, American (Thuja occidentalis) 'Smaragd'	Field Container	Hu	OH	2016	Over the top	No injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31897	Dimension 2EW (Dithiopyr)	Tulip (Tulipa sp.)	Field In-Ground	Senesac	NY	2014	Over the top	Trial not completed due to crop failure; will be repeated in 2015.
31897	Dimension 2EW (Dithiopyr)	Tulip (Tulipa sp.) 'Ile de France'	Field In-Ground	Miller	WA	2015	Over the top	No injury with 0.25, moderate with 0.5, 0.75 and 2.0 lb ai per acre applied twice.
31897	Dimension 2EW (Dithiopyr)	Tulip (Tulipa sp.) 'Flair'	Field In-Ground	Senesac	NY	2015	Over the top	No injury with 0.5, 1 and 2 lb ai per acre applied twice.
31897	Dimension 2EW (Dithiopyr)	Tulip (Tulipa sp.) 'Ile de France'	Field In-Ground	Miller	WA	2016	Over the top	Minor injury but no reduction of growth and yield with 2, 4 and 8 pt per acre applied twice.
31791	Dimension 2EW (Dithiopyr)	Elm, Chinese (Ulmus parvifolia) 'Elsmo'	Field Container	Siefer	OH	2015	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.
31796	Dimension 2EW (Dithiopyr)	Washington Fan Palm (Washingtonia robusta)	Field Container	Rivera	PR	2014	Over the top	No significant injury or growth reduction with 0.5, 1 and 2 lb ai per acre applied twice.

Table 6. Detailed Summary Crop Safety Testing with Dimension 1G.

Notes: Table entries are sorted by crop Latin name. Only those reports received by 8/11/2008 are included.

PR#	Product	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary
		Common Name	Latin Name	Cultivar					
11270	Dimension 1G	Fern, Tree	<i>Asparagus virgatus</i>		Field In-Ground	Stamps	1992	Broadcast	No injury and excellent weed control with 4 applications over 2 years at 2 and 4 lb ai per acre.
11386	Dimension 1G	Juniper	<i>Juniperus sp.</i>	J. chinensis 'Hetzii glauca'	Field In-Ground	Derr	1995	Over the top	No injury with 0.25, 0.5, and 1.0 lb ai per acre using single application on actively growing plants.
11880	Dimension 1G	Fern, Leatherleaf	<i>Rumohra adiantiformis</i>		Greenhouse	Stamps	1992	Over the top	Significant injury and frond reduction at 2 and 4 lb ai per acre with 4 applications over 2 years.
12030	Dimension 1G	Butchers Broom, Israeli Ruscus	<i>Ruscus aculeatus</i>		Greenhouse	Stamps	1992	Over the top	No visible injury occurred with 2 and 4 lb ai per acre with 4 applications over 2 years, but the number of stems was reduced.
11387	Dimension 1G	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1994	Over the top	No injury with single application of 0.25, 0.5 or 1.0 lb ai per acre.
11387	Dimension 1G	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1995	Over the top	No injury with single application of 0.25, 0.5 or 1.0 lb ai per acre; same plants treated with same rates in 1994.
11387	Dimension 1G	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1996	Over the top	No injury with two applications of 0.25, 0.5 or 1.0 lb ai per acre; same plant treated with same rates in 1994 and 1995.
11387	Dimension 1G	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1997	Over the top	No injury with two applications of 0.25, 0.5 or 1.0 lb ai per acre; same plant treated with same rates in 1994, 1995 and 1996.

Table 7. Detailed Summary Crop Safety Testing with Dimension WSP.

Notes: Table entries are sorted by crop Latin name. Only those reports received by 8/11/2008 are included.

PR#	Product	Crop			Production Site	Researcher(s)	Year	Application Type	Results Summary
		Crommon Name	Latin Name	Cultivar					
11269	Dimension WSP	Cast-Iron Plant, Ker-Gawl	<i>Aspidistra elatior</i>		Field In-Ground	Stamps	1992	Broadcast	Excellent weed control but significant reduction in yield at 2 and 4 lb ai per acre with 4 applications over 2 years.
12308	Dimension WSP	Aster, Bolton	<i>Boltonia sp.</i>	B. asteroides 'Pink Beauty'	Field Container	Linderman	1999	Directed spray	No injury with 0.25, 0.5, 1.0 lb ai per acre after single application.
12308	Dimension WSP	Aster, Bolton	<i>Boltonia sp.</i>	B. asteroides 'Snowbank'	Field Container	Senesac	1998	Over the top	No significant injury with 0.25, 0.5, 1.0 lb ai per acre after single application on plants breaking dormancy.
12308	Dimension WSP	Aster, Bolton	<i>Boltonia sp.</i>	B. asteroides.	Field Container	Senesac	1999	Over the top	No injury with 0.25, 0.5, 1.0 lb ai per acre after single application over actively growing plants.
13283	Dimension WSP	Ornamental Cabbage, Ornamental Kale (Brassica sp.) 'Dynasty Red'	<i>Brassica sp.</i>	'Dynasty Red'	Field Container	Senesac	1998	Broadcast	Severe injury at 0.5, 1 and 2 lb ai per acre.
23158	Dimension WSP	Daylily	<i>Hemerocallis sp.</i>		Field Container	Knight	2000	Over the top	Slight injury at 0.25, none at 0.5 and 1 lb ai per acre.
23158	Dimension WSP	Daylily	<i>Hemerocallis sp.</i>		Field Container	Fraelich	2003	Broadcast	No injury
23635	Dimension WSP	Hydrangea	<i>Hydrangea sp.</i>	H. macrophylla 'Nikko Blue'	Field Container	Fraelich	2003	Broadcast	No injury
23601	Dimension WSP	Juniper	<i>Juniperus sp.</i>	J. squamata parsoni	Field Container	Fraelich	2003	Broadcast	No injury
23603	Dimension WSP	Azalea, & Rhododendron	<i>Rhododendron sp.</i>	Fashion	Field Container	Fraelich	2003	Broadcast	No injury
18512	Dimension WSP	Speedwell, Brooklime	<i>Veronica sp.</i>	V. americana	Field Container	Boydston	2003	Over the top	Slight but transient injury (delayed bloom, stunted growth) increasing with rate (0.25, 0.5, 1.0 lb ai per acre) after single application; plants saleable.

Label Suggestions

We recommend that the crops *Berberis thunbergii*, *Eragrostis curvula*, *Hemerocallis* sp., *Ilex crenata*, *Juncus effusus*, *Leymus arenarius*, *Muhlenbergia capillaris*, *Narcissus* sp., *Pennisetum alopecuroides*, *Pseudotsuga mensiezii* and *Thuja occidentalis* which exhibited no injury with over-the-top spray application in these experiments be added to the Dimension 2EW label.

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