http://ir4.rutgers.edu/Ornamental/ornamentalSummaryReports.cfm

IR-4 Ornamental Horticulture Program
Halosulfuron Crop Safety

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Table of Contents

Table of Tables

Abstract

Since 1995 IR-4 has completed 373 trials with products containing halosulfuron (Sedgehammer, Manage) on 132 crops. The data contained in this report was generated to expand the current SedgeHammer label to include both directed and over the top applications on certain plant species along with adding nursery production sites. The halosulfuron rates in the 2006 and 2007 testing program were 0.045, 0.09 and 0.18 pounds active ingredient per acre (lb ai per A) as the 1X, 2X and 4X rates. In 2008, 2009, 2010 halosulfuron rates were 0.031, 0.063, and 0.125 lb ai per acre; the lowest registered rate is 0.031 lb ai per acre.

Of the 132 in-ground or container grown plant genera or species examined, 36 crops exhibited no or minimal transient injury after application at all three rates. Eleven crops exhibited no phytotoxicity at 0.045 lb ai per acre but did have some injury at the higher rates. Twenty four crops exhibited phytotoxicity at even the lowest rate.

Introduction

Postemergence control of broadleaved weeds and sedges in the production of woody and herbaceous perennials can be problematic because nurseries grow many different types of plants and not all genera or species are listed on labels. These weeds can also be difficult to control in landscape settings for the same reason. Three herbicides, SedgeHammer, Sulfentrazone, and V-10142 75WDG were chosen for 2006 research activities on crop safety. Additional research was conducted with Sedgehammer from 2007 to 2010. This report covers the results from SedgeHammer on 132 crop genera/species from 1996 through 2010.

SedgeHammer is the same formulation as Manage. This formulation was transferred to Gowan from Dow. While research was conducted under both names and Table 9 contains both names, the report text uses the trade name SedgeHammer throughout.

Materials and Methods

In 2008 to 2010 the post-emergence application rates were 0.031, 0.061, 0.125 lb ai per acre. In the 2006 protocol, slightly higher rates were tested including 0.045, 0.09, and 0.18 lb ai per acre. All protocols called for two applications of SedgeHammer made approximately 30 days apart. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. Phytotoxicity was recorded on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill) at 1, 2, 4, 8, and 12 weeks after initial application. Some researchers also included readings 3 to 4 days after the initial and second applications. For more detailed materials and methods and available protocols from previous years' research activities, please go to http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm.

SedgeHammer and Manage were supplied to researchers (See list of researchers in Appendix 1) by Gowan and Dow AgroSciences, respectively.

Results and Summary

Efficacy

There are several reports of efficacy throughout the researcher reports. However, the main impetus to the research contained here was crop safety and the efficacy results cannot be considered exhaustive. Please see Table 9 for details on efficacy.

Phytotoxicity

Field research conducted since 1995 involved both in-ground crops and crops grown in containers. Data has been separated by in-ground (Tables 1-4) or container crops (Tables 5-8) based on the type and nature of injury seen with SedgeHammer applications. Tested plant species were placed into three 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 trials are needed to clarify response.

For in-ground field trials, SedgeHammer exhibited no or minimal negative impact on a wide range of plant species (Table 1). Nineteen plant genera or species fell into this category. 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. For 10 crop species, there was no or little injury exhibited at the lowest tested rates, but significant phytotoxicity occurred at the higher rates (Table 2). Seventeen crops exhibited damage sufficient to recommend growers not utilize SedgeHammer as an over-the-top treatment (Table 3). Table 4 contains a list of plants where either only one trial was conducted or there were sufficiently divergent results among researchers to recommend additional testing.

For trials involving container crops in field production, SedgeHammer exhibited no or minimal negative impact on a wide range of plant species (Table 5). Seventeen plant genera or species fell into this category. 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. One crop exhibited little or no injury at the lowest tested rates but significant phytotoxicity occurred at the higher rates (Table 6). Ten crops exhibited damage sufficient to recommend growers not utilize SedgeHammer as an over-the-top treatment (Table 7). Table 8 contains a list of plants where either only one trial was conducted or there were sufficiently divergent results among researchers to recommend additional testing.

The level of safety for field in-ground crops versus container grown crops may differ as herbicides may dissipate more rapidly in soilless media commonly used by container nurseries compared to field soils (Neal, J. 2011 Horticulture Science Research Station Outcomes and Impacts, Part 2).

Please see Table 9 for a list of research on SedgeHammer and the summary of the results.

Table 1. List of Halosulfuron treated crops grown in-ground with no or minimal transitory injury.

Cupressus sp.
Euonymus radicans[1]
Hemerocallis sp.
Ilex cornuta
Ilex rotunda
Ilex verticillata
Ilex vomitoria 'nana'
Juglans nigra
Juniperus chinensis
Juniperus horizontalis
Lagerstroemia indica
Loropetalum sp.
Magnolia sp.
Picea abies (see Beste & Frank)
Pinus strobus (see Beste & Frank)
Quercus alba
Quercus rubra
Thuja occidentales
Vinca minor (see Lieth)

[1]Other species may be added based on container data (see tables 5 and 9)

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

Acer rubrum
Acer saccharum
Betula sp.
Hosta fortunei
Metasequoia sp.
Myrica pensylvanica
Pinus taeda
Quercus acutissima
Quercus velutina
Rhodoendron catawbiense

Table 3. List of Halosulfuron treated in-ground crops exhibiting significant injury.

Buddleia davidii
Chamaecyparis thyoides
Chrysanthemum (garden mum)
Cornus florida
Iris xiphium
Juniperus virginiana
Ligustrum sp.
Myrica pensylvanica
Plantanus occidentalis
Prunus serótina
Prunus americana
Prunus avium
Pseudotsuga menziesii[1]
Robinia pseudoacacia
Rhododendron catawbiense
Taxus sp.
Viburnum sp.

[1]No injury to dormant trees; more study needed on actively growing trees.

Table 4. List of Halosulfuron treated in-ground crops where more information is needed.

Abies sp.[3]
Amelanchier sp.
Aronia melanocarpa
Betula sp.
Buxus sp.
Callistemon sp.
Carya sp.
Cercis canadensis
Cornus sp.
Cryptomeria japonica
Elaeocarpus decipiens
Forsythia sp.
Fraxinus pensylvanica
Gardenia augusta[1]
Gleditsia triacanthos
Hydrangea sp.[1]
Illicium parviflora
Itea virginica
Juglans nigra
Laurus nobilus
Liquidambar styraciflua
Lirodendron tulipfera
Lonicera japonica
Lonicera sempervirens
Malus baccata
Nandina domestica
Olea wilsonii
Penstemon sp.
Phlox sp.
Picea glauca
Pinus nigra
Pinus resinosa
Prunus caroliniana
Quercus acutissima
Quercus ilex
Quercus nuttali
Quercus prinus
Quercus virginiana
Rhaphiolepis indica
Rhus lancea
Rosa sp. [2]
Rudbeckia fulgida
Spirea prunifolia
Taxodium distichum
Trachycarpus fortunei
Tradescantia x andersoniana
Tsuga canadensis
Vinca minor[1]

[1]Other species may be added based on container data (see tables 5 and 9)
[2] Response varied by cultivar

Table 5. List of Halosulfuron treated container grown crops with no or minimal transitory injury.

Euonymus fortunei
Euonymus alatus
Gardenia augusta
Helleborus niger
Hemerocallis sp. (see Gilliam)
Hosta sp.
Ilex cornuta
Ilex crenata
Ilex x meserveae
Ilex vomitoria 'nana'
Juniperus conferta
Juniperus horizontalis
Lagerstroemia indica
Liriope muscari (See Neal 2006)
Rhododendron sp.
Spirea bumalda (see Ahrens & Mervosh)
Trachelospermum asiaticum (See Lieth 2006)

Table 6. List of Halosulfuron treated container grown crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity

Delosperma sp.

Table 7. List of Halosulfuron treated container grown crops exhibiting significant injury.

Abelia x grandiflora
Abies balsamea
Acer rubrum
Chamaebatiaria sp.
Cotoneaster dammeri
Cotoneaster horizontalis
Gypsophila elegans
Hedera helix
Salvia sylvestris
Viburnum sp.

Table 8. List of Halosulfuron treated container grown crops where more information is needed.

Berberis sp.
Betula sp.
Buddleia daviddi
Buxus sp.(see Gilliam)
Canna sp.
Cuphea hyssopifolia
Delosperma sp.
Dichanthelium clandestinum
Echinacea sp.
Fragaria sp.
Gypsophila sp.
Hemerocallis sp.
Hierochloe odorata
Hydrangea sp.
Lamiastrum galeobdolon
Lantana sp.
Leymus arenarius
Ligustrum sp.
Lilium longiflorum
Liriodendron tulipifera
Mahonia aquifolium
Mazus reptans
Nandina domestica
Nepeta cataria
Ophiopogon japonicus
Pentas sp.
Phlox subulata
Picea abies (seedlings)
Pseudotsuga menziesii
Rosa sp.[1]
Rudbeckia fulgida
Sorghastrum nutans
Spirea japónica
Spirea decumbens
Taxus sp.
Thuja occidentalis
Thymus praecox
Vinca minor

[1] Response varied by cultivar.

Table 9. Detailed Summary of Crop Safety Testing with Halosulfuron

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 6/1/11 are listed below. Table entries with blank results have been received but not yet cataloged in the database.

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
13670	SedgeHammer (Halosulfuron)	Abelia sp. A. x grandiflora 'John Creech'	Abelia	Field Container	Neal	2006	Over the top	Moderate to significant injury increasing with rate (0.047, 0.094, 0.188 lb ai per acre).	20070212b.pdf
13670	SedgeHammer (Halosulfuron)	Abelia sp. A. x grandiflora 'Little Richard'	Abelia	Field Container	Gilliam	2006	Over the top	Slight to moderate injury increasing with rate and time (0.047, 0.094, 0.188 lb ai per acre).	20070212a.pdf
25474	SedgeHammer (Halosulfuron)	Abies fraseri	Fir, Fraser	Field In-Ground	Ahrens & Mervosh	2006	Over the top	No injury to dormant trees, unacceptable injury to actively growing trees at all rates (0.047, 0.094 and 0.188 lb ai per acre with NIS)	20070418e.pdf
25474	SedgeHammer (Halosulfuron)	Abies fraseri	Fir, Fraser	Field In-Ground	Beste & Frank	2009	Over the top	Data unreliable due to high temperatures; crop appears to be tolerant with 0.31, 0.063 and 0.125 lb ai per acre; researchers recommend repeating trial.	20100209a.pdf
26165	SedgeHammer (Halosulfuron)	Abies fraseri	Fir, Fraser	Field Container	Freiberger	2006	Over the top	No to very slight injury at 0.045 lb ai per acre, slight to moderate at higher rates; no growth reduction	20070405.pdf
26165	SedgeHammer (Halosulfuron)	Abies fraseri	Fir, Fraser	Field Container	Lieth	2007	Over the top	Moderate injury and growth reduction at 0.047, 0.094 and 0.188 lb ai per acre.	20080110a.pdf
13668	Manage (Halosulfuron)	Abies sp. A. balsamea	Fir	Field In-Ground	Ahrens & Mervosh	2001	Over the top	Moderate injury (chlorosis and necrosis) at all rates (0.045, 0.09, 0.18 lb ai per acre); poor control of Asiatic dayflower.	20070221a.pdf
13668	Manage (Halosulfuron)	Abies sp. A. lasiocarpa 'Arizonica'	Fir	Field In-Ground	Beste & Frank	2009	Over the top	Data not reliable. No significant injury at 0.031, 0.063 and 0.125 lb ai per acre early in the season.	20100126q.pdf
25476	SedgeHammer (Halosulfuron)	Acer rubrum	Maple, Red	Field Container	Altland	2006	Over the top	Significant injury with single application at all rates (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf
27864	SedgeHammer (Halosulfuron)	Acer rubrum	Maple, Red	Field In-Ground	Beste & Frank	2009	Over the top	Significant early season injury with complete recovery at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126a.pdf
27864	SedgeHammer (Halosulfuron)	Acer rubrum	Maple, Red	Field In-Ground	Derr	2008	Directed spray	Slight injury and growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
27864	SedgeHammer (Halosulfuron)	Acer rubrum	Maple, Red	Field In-Ground	Derr	2008	Over the top	Slight injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
25476	SedgeHammer (Halosulfuron)	Acer rubrum	Maple, Red	Field Container	Freiberger	2006	Over the top	High injury at all rates (0.045, 0.09, 0.18 lb ai per acre)	20070405.pdf
25476	SedgeHammer (Halosulfuron)	Acer rubrum 'Red Sunset'	Maple, Red	Field Container	Williams	2007	Over the top	Virtually no injury at 0.047, 0.094 and 0.188 lb ai per acre	20080530a.pdf
12457	SedgeHammer (Halosulfuron)	Acer sp. A. saccharinum	Maple	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
12457	SedgeHammer (Halosulfuron)	Acer sp. A.saccharum	Maple	Field In-Ground	Beste & Frank	2009	Over the top	Significant early season injury with complete recovery at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100120a.pdf
12457	SedgeHammer (Halosulfuron)	Acer sp. R. rubrum 'Red Sunset'	Maple	Field In-Ground	Kuhns	2003	Directed spray	No injury at 0.045, 0.09, and 0.18 lb ai per acre; good weed control at 4 weeks after treatment, but not at 9 weeks after treatment.	20070221h.pdf
13672	SedgeHammer (Halosulfuron)	Amelanchier sp. Shadblow serviceberry	Serviceberry	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
21436	SedgeHammer (Halosulfuron)	Arenaria sp. A. montana	Sandwort	Field Container	Senesac	2001	Over the top	Minor to moderate phytotoxicity at all rates, with only the lowest rate recovering by 6 weeks after treatment (0.045, 0.09, 0.18 lb ai per acre).	20070220j.pdf
13673	SedgeHammer (Halosulfuron)	Aronia sp. A. melanocarpa	Chokeberry	Field In-Ground	Czarnota	2010	Over the top	Moderate (but likely acceptable) crop injury with two applications at 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
13674	SedgeHammer (Halosulfuron)	Berberis sp. B. thunbergii 'Rosy Glow'	Barberry	Field Container	Derr	2002	Over the top	Moderate to significant injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20070221b.pdf
13710	SedgeHammer (Halosulfuron)	Betula sp.	Birch	Field In-Ground	Beste & Frank	2005	Over the top	Moderate but transient injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060524b6.pdf
25349	SedgeHammer (Halosulfuron)	Betula sp. B. nigrens 'Heritage'	Birch	Field Container	Williams	2007	Over the top	Virtually no injury at 0.047, slight at 0.094 and 0.188 lb ai per acre	20080530a.pdf
13710	SedgeHammer (Halosulfuron)	Betula sp. B.nigra	Birch	Field In-Ground	Beste & Frank	2009	Over the top	Significant injury with some recovery at 0.031, 0.063 and 0.125 lb ai per acre.	20100126r.pdf
13710	SedgeHammer (Halosulfuron)	Betula sp. 'Heritage' and 'Duratree'	Birch	Field In-Ground	Kuhns	2003	Directed spray	No injury at 0.045, 0.09, and 0.18 lb ai per acre; good weed control at 4 weeks after treatment, but not at 9 weeks after treatment.	20070221h.pdf
13675	SedgeHammer (Halosulfuron)	Buddleia davidii	Butterfly Bush	Field In-Ground	Derr	2008	Directed spray	Unacceptable injury and growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
13675	SedgeHammer (Halosulfuron)	Buddleia davidii	Butterfly Bush	Field In-Ground	Derr	2008	Over the top	Unacceptable injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
25002	Manage (Halosulfuron)	Buddleia davidii 'Black Knight'	Butterfly Bush	Field Container	Derr	2005	Over the top	Very low injury at 0.045 lb ai per acre, low at 0.09 and 0.18 lb ai per acre.	20060217p.pdf
13675	SedgeHammer (Halosulfuron)	Buddleia davidii 'Nanho White'	Butterfly Bush	Field In-Ground	Derr	2009	Over the top	No significant injury but reduced growth and flowering at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
21443	Manage (Halosulfuron)	Buxus sp.	Boxwood	Field Container	Derr	2005	Over the top	No injury at 0.045, 0.09, 0.18 lb ai per acre	20060217p.pdf
27858	SedgeHammer (Halosulfuron)	Buxus sp. B. 'Green Mountain'	Boxwood	Field In-Ground	Mathers	2010	Over the top	Zelenka: in- ground, significant injury especially with second application 0.031, .063, 0.125 lb aia.	20101011a.pdf
27858	SedgeHammer (Halosulfuron)	Buxus sp. B. macrophylla 'Winter Green'	Boxwood	Field In-Ground	Gilliam	2010	Over the top	No differences in phytotoxicity or reduction in growth with one or two applications at 0.67, 1.33, 2.66 oz/A at any time during the 10 month evaluation period.	20110301a.pdf
21443	Manage (Halosulfuron)	Buxus sp. B. microphylla 'Green Velvet'	Boxwood	Field Container	Senesac	2001	Over the top	Slight, transient injury increasing with rate (0.031, 0.062, 0.124 lb ai per acre).	20070220k.pdf
21443	Manage (Halosulfuron)	Buxus sp. B. microphylla var japonica	Boxwood	Field Container	Derr	2002	Over the top	Slight injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre) and with reduction of fresh weight at highest rate; poor pre-emergent control of large crabgrass and spotted spurge.	20070221c.pdf
21443	Manage (Halosulfuron)	Buxus sp. B. microphylla var koreana	Boxwood	Field Container	Gilliam	2006	Over the top	No injury until 4 weeks after initial treatment when pronounced chlorosis appeared at all rates (0.047, 0.094, 0.188 lb ai per acre) and plants were significantly stunted.	20070212a.pdf
13688	SedgeHammer (Halosulfuron)	Callistemon sp. C. violac	Bottlebrush	Field In-Ground	Derr	2009	Over the top	No injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
25350	SedgeHammer (Halosulfuron)	Canna sp. 'Cherry'	Canna	Field Container	Fraelich	2006	Over the top	Slight, moderate and high injury at 0.045, 0.09, 0.18 lb ai per acre with NIS.	20061212s.pdf
25928	SedgeHammer (Halosulfuron)	Carya sp. Pecan	Hickory	Field In-Ground	Beste & Frank	2006	Over the top	Slight injury only at 4X rate but unacceptable growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20070412b.pdf
13713	SedgeHammer (Halosulfuron)	Cercis canadensis	Red Bud, Eastern	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726h.pdf
13713	SedgeHammer (Halosulfuron)	Cercis canadensis	Red Bud, Eastern	Field In-Ground	Beste & Frank	2009	Over the top	Slight injury at 0.031 and 0.063, moderate at 0.125 lb ai per acre.	20100120b.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25344	SedgeHammer (Halosulfuron)	Chamaebatiaria sp.	Fernbush	Field Container	Klett	2006	Over the top	Experiment A: Slight to moderate injury at 0.047 lb ai per acre with Capsil surfactant, high at 0.094 and 0.188 lb ai	20070108a.pdf
25344	SedgeHammer (Halosulfuron)	Chamaebatiaria sp.	Fernbush	Field Container	Klett	2006	Over the top	Experiment B: Severe injury at all rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant)	20070108a.pdf
25344	SedgeHammer (Halosulfuron)	Chamaebatiaria sp.	Fernbush	Field Container	Klett	2006	Over the top	Experiment C: Moderate to high injury at all rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant)	20070108a.pdf
21445	SedgeHammer (Halosulfuron)	Chamaecyparis obtusa C. pisifera 'Filifera Aurea'	False cypress	Field Container	Senesac	2001	Over the top	No injury at 0.031, 0.062, and 0.124 lb ai per acre.	20070220l.pdf
13664	SedgeHammer (Halosulfuron)	Chamaecyparis obtusa C. thyoides	False cypress	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060628a.pdf
13664	SedgeHammer (Halosulfuron)	Chamaecyparis obtusa C. thyoides 'White Cedar'	False cypress	Field In-Ground	Beste & Frank	2006	Over the top	Unacceptable injury and growth reduction at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS)	20070411i.pdf
13736	SedgeHammer (Halosulfuron)	Chrysanthemum/Dendranthema sp.	Chrysanthemum, Garden	Field In-Ground	Derr	2008	Directed spray	Unacceptable injury and growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13736	SedgeHammer (Halosulfuron)	Chrysanthemum/Dendranthema sp.	Chrysanthemum, Garden	Field In-Ground	Derr	2008	Over the top	Unacceptable injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13681	SedgeHammer (Halosulfuron)	Cornus florida	Dogwood, Flowering	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726g.pdf
13655	SedgeHammer (Halosulfuron)	Cotoneaster sp. C. dammeri 'Skolgshomen'	Cotoneaster	Field Container	Beste & Frank	2006	Over the top	Significant but transient injury with all rates (0.047, 0.094, 0.188) and plants were stunted in comparison to the untreated ones.	20070112g.pdf
13655	SedgeHammer (Halosulfuron)	Cotoneaster sp. C. horizontalis	Cotoneaster	Field Container	Neal	2006	Over the top	Moderate to significant injury increasing with rate (0.047, 0.094, 0.188 lb ai per acre).	20070212b.pdf
13666	SedgeHammer (Halosulfuron)	Cryptomeria japonica	Japanese Cedar	Field In-Ground	Czarnota	2010	Over the top	Minor crop injury with two applications at 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
25346	SedgeHammer (Halosulfuron)	Cuphea hyssopifolia C. allyson	Mexican Heather, False Heather, Elfin Herb	Field Container	Derr	2006	Over the top	Slight injury at all rates with complete recovery at the lower rates (0.045, 0.09, 0.18 lb ai per acre).	20061110l.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25346	SedgeHammer (Halosulfuron)	Cuphea hyssopifolia 'Itsy Bitsy White'	Mexican Heather, False Heather, Elfin Herb	Field Container	Lieth	2006	Over the top	High injury and growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061123a.pdf
27987	SedgeHammer (Halosulfuron)	Cupressus sempervirens	Italian Cypress	Field In-Ground	Czarnota	2010	Over the top	Minor crop injury with two applications at 0.031, 0.063, or 0.125 lb ai per acre.	20110401a.pdf
27987	SedgeHammer (Halosulfuron)	Cupressus sempervirens	Italian Cypress	Field In-Ground	Uber	2008	Over the top	No injury at 0.031, 0.063 and 0.125 lb ai per acre; significant growth reduction at 4X	20081202c.pdf
13665	SedgeHammer (Halosulfuron)	Cupressus sp.	Cypress	Field In-Ground	Czarnota	2010	Over the top	Minor crop injury with two applications at 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
13665	SedgeHammer (Halosulfuron)	Cupressus sp.	Cypress	Field In-Ground	Gilliam	2008	Over the top	Slight injury with quick recovery after the 2nd application at 0.031, 0.063 and 0.125 lb ai per acre; no growth reduction	20081202b.pdf
25342	SedgeHammer (Halosulfuron)	Delosperma sp. 'Kelaidis'	Delosperma sp.	Field Container	Klett	2006	Over the top	Experiment A: Moderate to high injury with increasing rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant)	20070108a.pdf
25342	SedgeHammer (Halosulfuron)	Delosperma sp. 'Kelaidis'	Delosperma sp.	Field Container	Klett	2006	Over the top	Experiment B: Significant injury with almost complete recovery at end of trial at all rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant)	20070108a.pdf
25342	SedgeHammer (Halosulfuron)	Delosperma sp. 'Kelaidis'	Delosperma sp.	Field Container	Klett	2006	Over the top	Experiment C: Slight injury at 0.047 lb ai per acre with Capsil surfactant, moderate at 0.094 and 0.188 lb ai	20070108a.pdf
23738	Manage (Halosulfuron)	Dichanthelium clandestinum	Deertongue	Field Container	Senesac	2003	Over the top	No injury at 0.045 lb ai per acre; slight injury at 0.090 and 0.18 lb ai per acre.	20080623a.pdf
25351	SedgeHammer (Halosulfuron)	Echinacea sp.	Purple Coneflower	Field Container	Klett	2006	Over the top	Experiment A: Severe injury at all rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant)	20070108a.pdf
25351	SedgeHammer (Halosulfuron)	Echinacea sp.	Purple Coneflower	Field Container	Klett	2006	Over the top	Experiment B: Significant injury with complete recovery at 0.047 lb ai per acre with Capsil surfactant, high at 0.094 and 0.188 lb ai	20070108a.pdf
25351	SedgeHammer (Halosulfuron)	Echinacea sp.	Purple Coneflower	Field Container	Klett	2006	Over the top	Experiment C: No significant injury at 0.047 lb ai per acre with Capsil surfactant, high at 0.094 and 0.188 lb ai	20070108a.pdf
25351	SedgeHammer (Halosulfuron)	Echinacea sp. E. purpurea magnus	Purple Coneflower	Field Container	Fraelich	2006	Over the top	Very slight injury with complete recovery at higher rates; no growth reduction (0.045, 0.09, 0.18 lb ai per acre with NIS).	20061212t.pdf
25351	SedgeHammer (Halosulfuron)	Echinacea sp. E. purpurea 'Magnus'	Purple Coneflower	Field Container	Boydston	2006	Over the top	Severe injury after one application (0.045, 0.09, 0.18 lb ai per acre).	20061008z.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
27991	SedgeHammer (Halosulfuron)	Elaeocarpus decipiens	Japanese blueberry tree	Field In-Ground	Uber	2008	Over the top	Significant but commercially acceptable injury at 0.031 and 0.063, marginal at 0.125 lb ai per acre; no significant growth reduction	20081202c.pdf
13657	SedgeHammer (Halosulfuron)	Euonymus radicans E. fortunei	Purpleleaf Wintercreeper	Field In-Ground	Gilliam	2005	Foliar	No injury (0.045, 0.09, 0.18 lb ai per acre).	20060202i1.pdf
13657	SedgeHammer (Halosulfuron)	Euonymus radicans E. 'Prurpleaf Wintercreeper	Purpleleaf Wintercreeper	Field In-Ground	Gilliam	2010	Over the top	No crop injury or reduction in growth with one or two applications at 0.67, 1.33, 2.66 oz/A during 10 month evaluation period.	20110301a.pdf
25006	SedgeHammer (Halosulfuron)	Euonymus sp. E. alatus ‘Compacta’	Euonymus	Field Container	Williams	2007	Over the top	Virtually no injury at 0.047 and 0.094, very slight at 0.188 lb ai per acre	20080530a.pdf
25006	SedgeHammer (Halosulfuron)	Euonymus sp. E. fortunei	Euonymus	Field Container	Derr	2005	Over the top	Very slight injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060217p.pdf
25006	SedgeHammer (Halosulfuron)	Euonymus sp. E. fortunei ‘Coloratus’	Euonymus	Field Container	Williams	2007	Over the top	Virtually no injury at 0.047, 0.094 and 0.188 lb ai per acre	20080530a.pdf
13687	SedgeHammer (Halosulfuron)	Forsythia sp. F. intermedia 'Golden Bells'	Golden Bells	Field In-Ground	Gilliam	2010	Over the top	Very slight injury at 2WAT decreasing with time from one to two applications at 0.67, 1.33, 2.66 oz/A. Untreated plants and 4X were larger than 1X and 2X treated plants.	20110301a.pdf
13687	SedgeHammer (Halosulfuron)	Forsythia sp. 'Lynwood Gold'	Golden Bells	Field In-Ground	Derr	2009	Over the top	Slight injury and moderate growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
21437	SedgeHammer (Halosulfuron)	Fragaria sp. F. x ananassa 'Pink Panda'	Strawberry (Non-Bearing)	Field Container	Senesac	2001	Over the top	Moderate injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20070220m.pdf
13232	SedgeHammer (Halosulfuron)	Fraxinus pennsylvanica	Ash, Green	Field In-Ground	Beste & Frank	2005	Over the top	Low to moderate injury and reduced plant growth increasing with rate (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060322d.pdf
13232	SedgeHammer (Halosulfuron)	Fraxinus pennsylvanica	Ash, Green	Field In-Ground	Beste & Frank	2009	Over the top	Significant early season injury which lasted seasonlong at 0.031, 0.063, and 0.125 lb ai per acre; plants not marketable.	20100120c.pdf
25352	SedgeHammer (Halosulfuron)	Gardenia augusta 'Radicans'	Cape Jasmine, Radicans	Field Container	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
25352	SedgeHammer (Halosulfuron)	Gardenia augusta 'Radicans'	Cape Jasmine, Radicans	Field Container	Derr	2006	Over the top	No injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061110l.pdf
25352	SedgeHammer (Halosulfuron)	Gardenia augusta 'Radicans' 'Radicans'	Cape Jasmine, Radicans	Field Container	Fraelich	2006	Over the top	No injury or growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20061212u.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
27859	SedgeHammer (Halosulfuron)	Gardenia sp. 'August Beauty'	Jasmine, Cape, Common Gardenia	Field In-Ground	Derr	2009	Over the top	No injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
13722	SedgeHammer (Halosulfuron)	Gleditsia sp. G. triacanthos var inermis 'Skyline'	Honey Locust	Field In-Ground	Kuhns	2003	Directed spray	No injury at 0.045, 0.09, and 0.18 lb ai per acre; good weed control at 4 weeks after treatment, but not at 9 weeks after treatment.	20070221h.pdf
25673	SedgeHammer (Halosulfuron)	Gypsophila elegans	Baby's Breath	Field Container	Senesac	2006	Over the top	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20061108e.pdf
26038	SedgeHammer (Halosulfuron)	Gypsophila paniculata 'Festival Star'	Baby's Breath	Field Container	Lieth	2006	Over the top	Unacceptable injury and growth reduction at 0.047, 0.094 and 0.188 lb ai per acre	20070717b.pdf
25004	SedgeHammer (Halosulfuron)	Hedera helix L. ssp. Helix	English Ivy	Field Container	Boydston	2006	Over the top	Severe injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061108x.pdf
25004	SedgeHammer (Halosulfuron)	Hedera helix L. ssp. Helix	English Ivy	Field Container	Derr	2005	Over the top	Significant injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20060217p.pdf
25004	SedgeHammer (Halosulfuron)	Hedera helix L. ssp. Helix 'Glacier Ivy'	English Ivy	Field Container	Fraelich	2006	Over the top	Moderate injury at 0.045 and 0.09 lb ai per acre with NIS, severe at 0.018 lb ai per acre; severe stunting at all rates	20061212p.pdf
25345	SedgeHammer (Halosulfuron)	Helleborus niger	Hellebore, Christmas rose, Lenten Rose	Field Container	Klett	2006	Over the top	Experiment A: No significant injury after 1st application at all rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant), significant after 2nd application at 4X	20070108a.pdf
25345	SedgeHammer (Halosulfuron)	Helleborus niger	Hellebore, Christmas rose, Lenten Rose	Field Container	Klett	2006	Over the top	Experiment B: No significant injury after 1st application at all rates (0.047, 0.094 and 0.188 lb ai per acre with Capsil surfactant), significant after 2nd application at 4X	20070108a.pdf
25345	SedgeHammer (Halosulfuron)	Helleborus niger	Hellebore, Christmas rose, Lenten Rose	Field Container	Klett	2006	Over the top	Experiment C: Slight injury at 0.047 and 0.094 lb ai per acre with Capsil surfactant, moderate at 0.188 lb ai	20070108a.pdf
25345	SedgeHammer (Halosulfuron)	Helleborus niger 'Pink Lady'	Hellebore, Christmas rose, Lenten Rose	Field Container	Boydston	2006	Over the top	Virtually no injury at 0.047, 0.094 and 0.188 lb ai per acre; most plants did not survive severe winter	20071017g.pdf
11772	Manage (Halosulfuron)	Hemerocallis sp.	Daylily	Field Container	Fraelich	1996	Broadcast	Very slight injury at 0.062 and 0.125 lb ai per acre with no injury at 0.031 lb ai per acre; good to excellent nutsedge control increasing with rate.	20070219b.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
11772	Manage (Halosulfuron)	Hemerocallis sp.	Daylily	Field Container	Gilliam	2005	Foliar	No injury (0.045, 0.09, 0.18 lb ai per acre).	20060202i6.pdf
11772	Manage (Halosulfuron)	Hemerocallis sp.	Daylily	Field Container	Neal	2001	Over the top	Minor to moderate injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20070221d.pdf
27865	SedgeHammer (Halosulfuron)	Hemerocallis sp.	Daylily	Field In-Ground	Derr	2008	Directed spray	Slight injury and growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
27865	SedgeHammer (Halosulfuron)	Hemerocallis sp.	Daylily	Field In-Ground	Derr	2008	Over the top	Slight injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
11772	Manage (Halosulfuron)	Hemerocallis sp. 'Happy Returns'	Daylily	Field Container	Senesac	2001	Over the top	Slight injury 6 weeks after treatment with all rates (0.045, 0.09, 0.18 lb ai per acre).	20070220n.pdf
27865	SedgeHammer (Halosulfuron)	Hemerocallis sp. 'Lavender'	Daylily	Field In-Ground	Derr	2009	Over the top	No significant injury at 0.031, 0.063, 0.125 lb ai per acre after 1st, slight at 1X and 2X, moderate at 4X after 2nd application; growth reduction at all rates.	20091123a.pdf
11772	Manage (Halosulfuron)	Hemerocallis sp. 'Little Red Hot'	Daylily	Field Container	Gilliam	1996	Over the top	Significant visible injury and growth reduction increasing with rate (0.063, 0.126, 0.252 lb ai per acre).	20070219a.pdf
27865	SedgeHammer (Halosulfuron)	Hemerocallis sp. 'Stella'	Daylily	Field In-Ground	Freiberger	2009	Broadcast soil surface	Very minor injury, comparable to untreated, at 2.67 oz per acre (rate unclear: approx .125-.28 lb ai per acre)	20101104e.pdf
11772	Manage (Halosulfuron)	Hemerocallis sp. 'Stella D'Oro'	Daylily	Field Container	Derr	2001	Over the top	Slight, transient injury at all rates with only the highest reducing shoot fresh weight (0.045, 0.09, 0.18 lb ai per acre); fair to good pre-emergent oxalis control.	20070220o.pdf
23504	Manage (Halosulfuron)	Hierochloe odorata	Indian Grass	Field Container	Senesac	2003	Over the top	No injury at 0.045, 0.090 and 0.018 lb ai per acre.	20080623a.pdf
13740	SedgeHammer (Halosulfuron)	Hosta fortunei	Lily, Plantain	Field In-Ground	Czarnota	2010	Over the top	Minor to moderate crop injury with two applications at 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
13740	SedgeHammer (Halosulfuron)	Hosta fortunei 'Fragrant Blue'	Lily, Plantain	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, slight to moderate at 0.063, 0.125 lb ai per acre.	20091123a.pdf
25008	SedgeHammer (Halosulfuron)	Hosta sp.	Hosta	Field Container	Gilliam	2005	Over the top	No visible injury at any rate; increased growth observed with 0.18 lb ai per acre	20060202i8.pdf
25008	SedgeHammer (Halosulfuron)	Hosta sp. 'Francee'	Hosta	Field Container	Derr	2001	Over the top	Minor visible injury with significant fresh weight reduction at all rates (0.045, 0.09, 0.18 lb ai per acre); poor to great spotted spurge control.	20070220p.pdf
25008	SedgeHammer (Halosulfuron)	Hosta sp. 'Gold Standard'	Hosta	Field Container	Fraelich	2006	Over the top	Slight injury at 0.045 and 0.09 lb ai per acre with NIS, moderate at 0.18 lb ai per acre; growth reduction at all rates	20061212q.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25008	SedgeHammer (Halosulfuron)	Hosta sp. 'Golden Tiara'	Hosta	Field Container	Mathers	2006	Over the top	No injury after first application with only very slight injury occurring at the highest rate after the second application (0.047, 0.094, 0.188 lb ai per acre).	20070110l.pdf
25008	SedgeHammer (Halosulfuron)	Hosta sp. H. plantaginea 'Royal Standard'	Hosta	Field Container	Gilliam	2006	Over the top	Slight transient injury increasing with rate (0.047, 0.094, 0.188 lb ai per acre) with a slight reduction in plant size.	20070212a.pdf
25008	SedgeHammer (Halosulfuron)	Hosta sp. 'Halcyon'	Hosta	Field Container	Derr	2005	Over the top	Very slight injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060217p.pdf
25010	SedgeHammer (Halosulfuron)	Hydrangea sp.	Hydrangea	Field Container	Derr	2005	Over the top	Very low injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060217p.pdf
25010	SedgeHammer (Halosulfuron)	Hydrangea sp. H. paniculata 'Pink Diamond'	Hydrangea	Field Container	Norcini	2005	Over the top	No phytotoxicity at 0.045 lb ai per acre and 0.09 and 0.18 lb ai per acre plants recovered by 12 WAT	20060217q.pdf
13690	SedgeHammer (Halosulfuron)	Hydrangea sp. oakleaf hydrangea	Hydrangea	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, significant at 0.063 and 0.125 lb ai per acre.	20091123a.pdf
27862	SedgeHammer (Halosulfuron)	Ilex cornuta	Holly, Chinese	Field In-Ground	Czarnota	2010	Over the top	No crop injury with two applications of 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
27862	SedgeHammer (Halosulfuron)	Ilex cornuta	Holly, Chinese	Field In-Ground	Gilliam	2010	Over the top	No crop injury with one or two applications at 0.031, 0.063, 0.125 lb ai per acre. All treated plants were smaller compared to the untreated at 10 months after application.	20110301a.pdf
27862	SedgeHammer (Halosulfuron)	Ilex cornuta 'Buford Nana'	Holly, Chinese	Field In-Ground	Gilliam	2008	Over the top	No injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre	20081202b.pdf
27863	SedgeHammer (Halosulfuron)	Ilex rotunda	Holly, Round Leaf	Field In-Ground	Czarnota	2010	Over the top	No crop injury with two applications of 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
11773	Manage (Halosulfuron)	Ilex sp.	Holly	Field Container	Fraelich	1996	Broadcast	Very slight injury at 0.062 and 0.125 lb ai per acre with no injury at 0.031 lb ai per acre; good to excellent control of nutsedge and oxalis increasing with rate.	20070219d.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. cornuta 'bufordii nana'	Holly	Field Container	Neal	2006	Over the top	No significant injury at 0.047, 0.094, and 0.188 lb ai per acre.	20070212b.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. crenata 'Chesapeake'	Holly	Field Container	Beste	2003	Over the top	Slight to moderate injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20070221k.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. crenata 'Compacta'	Holly	Field Container	Derr	2002	Over the top	Virtually no injury at all rates (0.045, 0.09, 0.18 lb ai per acre); poor pre-emergent control of large crabgrass and spotted spurge.	20070221e.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. crenata 'Green Lustre'	Holly	Field Container	Norcini	2005	Over the top	Very slight injury decreasing over time at all rates (0.045, 0.09, 0.18 lb ai per acre); Virtually no control of spurge, woodsorrel, crabgrass and coreopsis.	20060217q.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
11773	Manage (Halosulfuron)	Ilex sp. I. crenata 'Helleri'	Holly	Field Container	Beste	2003	Over the top	Slight chlorosis increasing with rate which decreased over time (0.045, 0.09, 0.18 lb ai per acre).	20070221l.pdf
11764	Manage (Halosulfuron)	Ilex sp. I. crenata 'Rotundifolia'	Holly	Field In-Ground	Beste	1997	Over the top	No significant injury or reduction in growth at any rate (0.031, 0.062, 0.125 lb ai per acre); good to excellent control of yellow nutsedge, but little control of morningglory or henbit.	20070219p.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. meserveae	Holly	Field Container	Gilliam	2005	Over the top	No injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060202i3.pdf
11764	Manage (Halosulfuron)	Ilex sp. I. rotunda	Holly	Field In-Ground	Czarnota	2005	Over the top	Very slight injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
11764	Manage (Halosulfuron)	Ilex sp. I. rotunda	Holly	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
11764	Manage (Halosulfuron)	Ilex sp. I. verticillata	Holly	Field In-Ground	Beste & Frank	2005	Over the top	No injury after single application but slight injury after second application, increasing with rate with no impact marketability at end of experiment (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726a.pdf
11764	Manage (Halosulfuron)	Ilex sp. I. verticillata	Holly	Field In-Ground	Beste & Frank	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126l.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. x meserveae 'Blue Princess'	Holly	Field Container	Altland	2006	Over the top	No injury at any rate (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf
11773	Manage (Halosulfuron)	Ilex sp. I. x meserveae 'China Girl'	Holly	Field Container	Gilliam	1996	Over the top	No significant visible injury or difference in growth indices with 0.063, 0.126, and 0.252 lb ai per acre.	20070219c.pdf
25426	SedgeHammer (Halosulfuron)	Ilex vomitoria ‘nana’	Holly, Dwarf Yaupon	Field Container	Gilliam	2006	Over the top	No visible injury and no impact on plant size with any rate (0.047, 0.094, 0.188 lb ai per acre).	20070212a.pdf
27860	SedgeHammer (Halosulfuron)	Ilex vomitoria ‘nana’	Holly, Dwarf Yaupon	Field In-Ground	Gilliam	2008	Over the top	No injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre	20081202b.pdf
25426	SedgeHammer (Halosulfuron)	Ilex vomitoria ‘nana’	Holly, Dwarf Yaupon	Field Container	Neal	2006	Over the top	No significant injury at 0.047, 0.94 and 1.88 lb ai per acre.	20070212b.pdf
26580	SedgeHammer (Halosulfuron)	Illicium sp. I. parviflorum	Anise Tree	Field In-Ground	Czarnota	2005	Over the top	Very slight injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
26580	SedgeHammer (Halosulfuron)	Illicium sp. I. parviflorum	Anise Tree	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
13741	SedgeHammer (Halosulfuron)	Iris xiphium 'Louisiana Purple'	Bulbous Iris	Field In-Ground	Derr	2009	Over the top	Severe injury and significant growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
13692	SedgeHammer (Halosulfuron)	Itea virginica	Virginia Sweetspire	Field In-Ground	Czarnota	2010	Over the top	Little to no crop injury with two applications at 0.031, 0.063, 0.125 lb ai per acre.	20110401a.pdf
13222	SedgeHammer (Halosulfuron)	Juglans nigra	Walnut, Black (Non-Bearing)	Field In-Ground	Beste & Frank	2005	Foliar	Slight to moderate injury increasing with rate and dissipating with time (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060818b.pdf
13222	SedgeHammer (Halosulfuron)	Juglans nigra	Walnut, Black (Non-Bearing)	Field In-Ground	Beste & Frank	2005	Ground Broadcast	Slight to minor injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre), but by end of season no apparent injury except a reduction in height in the highest rate.	20060818b.pdf
13222	SedgeHammer (Halosulfuron)	Juglans nigra	Walnut, Black (Non-Bearing)	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury and growth reduction with complete recovery at trial's end at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS)	20070411m.pdf
13222	SedgeHammer (Halosulfuron)	Juglans nigra	Walnut, Black (Non-Bearing)	Field In-Ground	Beste & Frank	2009	Over the top	A soil or seed borne disease caused severe early season injury and death of seedlings; trial has to be repeated.	20100126s.pdf
11769	Manage (Halosulfuron)	Juniperus sp.	Juniper	Field Container	Fraelich	1996	Broadcast	No injury at 0.031, 0.062, and 0.125 lb ai per acre; good to excellent control of nutsedge increasing with rate.	20070219g.pdf
27857	SedgeHammer (Halosulfuron)	Juniperus sp. J. chinensis	Juniper	Field In-Ground	Freiberger	2009	Broadcast soil surface	No injury at 2.67 oz per acre	20101104e.pdf
27857	SedgeHammer (Halosulfuron)	Juniperus sp. J. chinensis 'Parsonii'	Juniper	Field In-Ground	Gilliam	2008	Over the top	No injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre	20081202b.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. chinensis procumbens	Juniper	Field Container	Gilliam	1996	Over the top	No injury at 0.063, 0.126, and 0.252 lb ai per acre.	20070219e.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. conferta 'Blue Pacific'	Juniper	Field Container	Gilliam	2005	Over the top	No injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060202i2.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. conferta 'Blue Pacific'	Juniper	Field Container	Gilliam	2006	Over the top	No significant visible injury at any rate (0.047, 0.094, 0.188 lb ai per acre) but there was a reduction in plant size.	20070212a.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. conferta 'Blue Pacific'	Juniper	Field Container	Senesac	2001	Over the top	Slight injury at all rates (0.031, 0.062, 0.124 lb ai per acre).	20070220r.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Bar Harbor'	Juniper	Field Container	Derr	2005	Over the top	No injury at 0.045, 0.09, 0.18 lb ai per acre.	20060217p.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Bar Harbor'	Juniper	Field Container	Senesac	2001	Over the top	No injury at any rate (0.031, 0.063, 0.0124 lb ai per acre).	20070220q.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
11760	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Plumosa Compacta'	Juniper	Field In-Ground	Ahrens	1996	Broadcast	No injury at 0.031, 0.063, and 0.125 lb ai per acre with second-year applications to the same plants; excellent control of annual sedges and horseweed, moderate to good control of prostrate spurge, and poor control of carpet weed.	20070219q.pdf
11760	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Plumosa Compacta'	Juniper	Field In-Ground	Ahrens & Mervosh	1995	Broadcast foliar	No injury at 0.031, 0.063, and 0.125 lb ai per acre; moderate control of crabgrass and moderate to good control of annual sedges increasing with rate.	20070219f.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Wiltonii'	Juniper	Field Container	Gilliam	2005	Over the top	No injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060202i4.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Wiltonii'	Juniper	Field Container	Neal	2001	Over the top	Slight tip chlorosis and necrosis at all rates with recovery over time (0.045, 0.09, 0.18 lb ai per acre).	20070221f.pdf
11769	Manage (Halosulfuron)	Juniperus sp. J. horizontalis 'Wiltonii'	Juniper	Field Container	Norcini	2005	Over the top	No injury at all rates (0.045, 0.09, 0.18 lb ai per acre); No control of spurge, woodsorrel, eclipta, hawkweed, and coreopsis.	20060217q.pdf
27857	SedgeHammer (Halosulfuron)	Juniperus sp. J. virginiana	Juniper	Field In-Ground	Beste & Frank	0000	Over the top	Phytotoxicity observed in this juniper species.	
13216	SedgeHammer (Halosulfuron)	Juniperus virginiana	Cedar, Red	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060623b.pdf
13694	SedgeHammer (Halosulfuron)	Lagerstroemia indica	Crape Myrtle	Field In-Ground	Czarnota	2005	Over the top	No injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
13694	SedgeHammer (Halosulfuron)	Lagerstroemia indica	Crape Myrtle	Field In-Ground	Czarnota	2005	Over the top	No injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
13694	SedgeHammer (Halosulfuron)	Lagerstroemia indica	Crape Myrtle	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
13694	SedgeHammer (Halosulfuron)	Lagerstroemia indica	Crape Myrtle	Field In-Ground	Derr	2008	Directed spray	Very slight injury with quick recovery at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13694	SedgeHammer (Halosulfuron)	Lagerstroemia indica	Crape Myrtle	Field In-Ground	Derr	2008	Over the top	Very slight injury with quick recovery at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13694	SedgeHammer (Halosulfuron)	Lagerstroemia indica	Crape Myrtle	Field In-Ground	Gilliam	2008	Over the top	Slight injury after the 2nd application at 0.031, 0.063 and 0.125 lb ai per acre; no growth reduction	20081202b.pdf
24989	Manage (Halosulfuron)	Lagerstroemia indica 'Acoma'	Crape Myrtle	Field Container	Gilliam	2005	Foliar	No injury at 0.045, 0.09, 0.18 lb ai per acre.	20060202i5.pdf
24989	Manage (Halosulfuron)	Lagerstroemia indica 'Cheyenne'	Crape Myrtle	Field Container	Norcini	2005	Over the top	Very low injury at all rates (0.045, 0.09, 0.18 lb ai per acre); Virtually no control of spurge, woodsorrel and crabgrass.	20060217q.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
24989	Manage (Halosulfuron)	Lagerstroemia indica L. x Tuscarora	Crape Myrtle	Field Container	Neal	2006	Over the top	No significant injury at 0.047, 0.094, and 0.188 lb ai per acre.	20070212b.pdf
21438	SedgeHammer (Halosulfuron)	Lamiastrum galeobdolon 'Herman's Pride'	Yellow Archangel	Field Container	Senesac	2001	Over the top	Slight to moderate transient injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20070220s.pdf
25353	SedgeHammer (Halosulfuron)	Lantana sp.	Shrub Verbena	Field Container	Derr	2006	Over the top	Slight injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061110l.pdf
25353	SedgeHammer (Halosulfuron)	Lantana sp.	Shrub Verbena	Field Container	Williams	2007	Over the top	No injury at 0.047, slight at 0.094 and 0.188 lb ai per acre	20080530a.pdf
27992	SedgeHammer (Halosulfuron)	Laurus nobilis	Bay Laurel	Field In-Ground	Uber	2008	Over the top	Significant but commercially acceptable injury at 0.031, 0.063 and 0.125 lb ai per acre; no growth reduction	20081202c.pdf
21439	SedgeHammer (Halosulfuron)	Leymus arenarius 'Blue Dune'	Blue Lyme Grass	Field Container	Senesac	2001	Over the top	Very slight injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20070220t.pdf
13695	SedgeHammer (Halosulfuron)	Ligustrum sp.	Privet	Field In-Ground	Derr	2008	Directed spray	Unacceptable injury and growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13695	SedgeHammer (Halosulfuron)	Ligustrum sp.	Privet	Field In-Ground	Derr	2008	Over the top	Unacceptable injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13695	SedgeHammer (Halosulfuron)	Ligustrum sp.	Privet	Field In-Ground	Gilliam	2008	Over the top	Moderate injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre	20081202b.pdf
25013	Manage (Halosulfuron)	Ligustrum sp. 'Chinense'	Privet	Field Container	Derr	2005	Over the top	Low injury at 0.045 and 0.09 lb ai per acre, moderate at 0.18 lb ai per acre.	20060217p.pdf
25343	SedgeHammer (Halosulfuron)	Lilium longiflorum 'Nellie White'	Lily, Easter	Field Container	Lieth	2006	Over the top	Unacceptable injury and growth reduction at 0.047, 0.094 and 0.188 lb ai per acre	20070717f.pdf
13235	SedgeHammer (Halosulfuron)	Liquidambar sp. L. styraciflua	Sweetgum	Field In-Ground	Beste & Frank	2009	Over the top	No significant injury but slight height reduction at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126t.pdf
13235	SedgeHammer (Halosulfuron)	Liquidambar sp. L. styraciflua	Sweetgum	Field In-Ground	Beste & Frank	2010	Over the top	Two applications made 6 weeks apart at 0.031., 0.063, 0.125 lb ai per acre resulted in sever crop injury at 2x and 4x with reduced height.	20110323a.pdf
13230	SedgeHammer (Halosulfuron)	Liriodendron tulipifera	Tulip Tree	Field In-Ground	Beste & Frank	2005	Foliar	Low injury and plants marketable at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726f.pdf
25670	SedgeHammer (Halosulfuron)	Liriope muscari	Lilyturf, Big Blue;Giant	Field Container	Gilliam	2005	Over the top	No visible injury, but plant growth was significantly suppressed at 0.09 lb ai per acre	20060202i10.pdf
25670	SedgeHammer (Halosulfuron)	Liriope muscari	Lilyturf, Big Blue;Giant	Field Container	Williams	2007	Over the top	No injury at 0.047, very slight at 0.094 and 0.188 lb ai per acre	20080530a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25011	SedgeHammer (Halosulfuron)	Liriope sp. L. muscari variegata	Lilyturf, Creeping	Field Container	Derr	2005	Over the top	No injury 44 DAT with all rates (0.045, 0.09, 0.18 lb ai per acre).	20060217po.pdf
25011	SedgeHammer (Halosulfuron)	Liriope sp. L. muscari variegata	Lilyturf, Creeping	Field Container	Neal	2006	Over the top	Significant injury at all rates (0.047, 0.098, 0.188 lb ai per acre)	20070212b.pdf
25011	SedgeHammer (Halosulfuron)	Liriope sp. L. muscari variegata 'Aztec'	Lilyturf, Creeping	Field Container	Derr	2006	Over the top	No to slight injury but shoot weight decreased significantly as rate increased (0.045, 0.09, 0.18 lb ai per acre).	20061110l.pdf
13684	SedgeHammer (Halosulfuron)	Lonicera sp. L. japonica	Honeysuckle	Field In-Ground	Gilliam	2010	Over the top	Crop injury first observed 2WAT with 0.031, 0.063, 0.125 lb ai per acre. By 4WAT all plants including untreated began to decline and no additional injury ratings taken. Some differences in growth among treatments.	20110301a.pdf
13684	SedgeHammer (Halosulfuron)	Lonicera sp. L. sempervirens	Honeysuckle	Field In-Ground	Derr	2009	Over the top	Slight to moderate injury at 0.031, 0.063, 0.125 lb ai per acre; no growth reduction.	20091123a.pdf
28142	SedgeHammer (Halosulfuron)	Loropetalum sp.	Loropetalum	Field In-Ground	Derr	2008	Directed spray	No significant injury or growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
28142	SedgeHammer (Halosulfuron)	Loropetalum sp.	Loropetalum	Field In-Ground	Derr	2008	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
28142	SedgeHammer (Halosulfuron)	Loropetalum sp. Burgundy loropetalum	Loropetalum	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
13659	SedgeHammer (Halosulfuron)	Magnolia sp.	Magnolia	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
13659	SedgeHammer (Halosulfuron)	Magnolia sp.	Magnolia	Field In-Ground	Gilliam	2008	Over the top	Slight injury at 0.031, moderate at 0.063 and 0.125 lb ai per acre; growth reduction at 2X and 4X	20081202b.pdf
13659	SedgeHammer (Halosulfuron)	Magnolia sp. M. grandiflora	Magnolia	Field In-Ground	Czarnota	2005	Over the top	No injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
20871	SedgeHammer (Halosulfuron)	Magnolia stellata 'Pinkie'	Magnolia, Star	Field Container	Senesac	2001	Over the top	No injury with 0.031, 0.062 and 0.124 lb ai per acre.	20070220u.pdf
21448	SedgeHammer (Halosulfuron)	Mahonia aquifolium M. repens	Oregon Grape	Field Container	Senesac	2001	Over the top	Slight to moderate injury increasing with rate (0.031, 0.062, 0.124 lb ai per acre).	20070220v.pdf
12459	SedgeHammer (Halosulfuron)	Malus sp. M. baccata	Apple & Crabapple (Non-Bearing)	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060623a.pdf
12459	SedgeHammer (Halosulfuron)	Malus sp. Sargent crabapple	Apple & Crabapple (Non-Bearing)	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
21440	SedgeHammer (Halosulfuron)	Mazus reptans	Mazus	Field Container	Senesac	2001	Over the top	Slight to moderate injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre) abating slightly with time.	20070220w.pdf
13669	SedgeHammer (Halosulfuron)	Metasequoia sp. M. glyptostroboides	Dawn Redwood	Field In-Ground	Beste & Frank	2009	Over the top	Severe injury at 0.031, 0.063 and 0.125 lb ai per acre.	20091230l.pdf
13698	SedgeHammer (Halosulfuron)	Myrica pensylvanica	Bayberry	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060524b5.pdf
13698	SedgeHammer (Halosulfuron)	Myrica pensylvanica	Bayberry	Field In-Ground	Beste & Frank	2009	Over the top	Significant injury and high growth reduction at 0.031, 0.063 and 0.125 lb ai per acre.	20100126u.pdf
25779	SedgeHammer (Halosulfuron)	Nandina domestica 'Nana'	Heavenly Bamboo	Field Container	Gilliam	2005	Foliar	No injury at 0.045, 0.09, 0.18 lb ai per acre.	20060202i7.pdf
21441	SedgeHammer (Halosulfuron)	Nepeta cataria N. x faassenii 'Walker's Low'	Catnip	Field Container	Senesac	2001	Over the top	No injury at 0.045 lb ai per acre and minor injury at 0.09 and 0.18 lb ai per acre.	20070220x.pdf
27985	SedgeHammer (Halosulfuron)	Olea wilsonii	Olive, Fruitless	Field In-Ground	Uber	2008	Over the top	Significant but commercially acceptable injury at 0.031, 0.063 and 0.125 lb ai per acre; no significant growth reduction	20081202c.pdf
25463	SedgeHammer (Halosulfuron)	Ophiopogon sp. O. japonicus variegate	Mondo Grass, Lilyturf, Ker-Gawl	Field Container	Derr	2006	Over the top	No injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061110l.pdf
20868	SedgeHammer (Halosulfuron)	Penstemon sp. 'Husker Red'	Beard-Tongue	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
25354	SedgeHammer (Halosulfuron)	Pentas sp.	Pentas	Field Container	Williams	2007	Over the top	No injury at 0.047, slight at 0.094 and moderate at 0.188 lb ai per acre	20080530a.pdf
25354	SedgeHammer (Halosulfuron)	Pentas sp. 'Ruby Red'	Pentas	Field Container	Derr	2006	Over the top	Slight injury 0.045 and 0.09 lb ai per acre and moderate at 0.18 lb ai per acre.	20061110l.pdf
13743	SedgeHammer (Halosulfuron)	Phlox sp. 'Emerald Blue'	Phlox	Field In-Ground	Derr	2005	Over the top	Significant injury 9 DAT, but plants grew out of it by 44 DAT.	20060217p.pdf
25012	Manage (Halosulfuron)	Phlox sp. P. subulata 'Emerald Blue'	Phlox	Field Container	Derr	2005	Over the top	Low injury at 0.045, 0.09, 0.18 lb ai per acre; good to excellent control of bittercress and common groundsel	20060217p.pdf
25347	SedgeHammer (Halosulfuron)	Picea abies	Spruce, Norway	Field Container	Altland	2006	Over the top	Slight injury after 2nd application only at 2X, rates (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf
13213	SedgeHammer (Halosulfuron)	Picea abies	Spruce, Norway	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060818d.pdf
13213	SedgeHammer (Halosulfuron)	Picea abies	Spruce, Norway	Field In-Ground	Beste & Frank	2009	Over the top	Moderate injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre.	20100126b.pdf
25347	SedgeHammer (Halosulfuron)	Picea abies	Spruce, Norway	Field Container	Freiberger	2006	Over the top	Very slight injury and no growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre)	20070405.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
13213	SedgeHammer (Halosulfuron)	Picea abies	Spruce, Norway	Field In-Ground	Garrett	1998	Over the top	Slight injury on seedlings at all rates (0.031, 0.062, 0.125 lb ai per acre); poor control of heavily infested nutsedge.	20070219r.pdf
13214	SedgeHammer (Halosulfuron)	Picea glauca	Spruce, White; Cat	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726d.pdf
13214	SedgeHammer (Halosulfuron)	Picea glauca	Spruce, White; Cat	Field In-Ground	Beste & Frank	2009	Over the top	Moderate injury at 0.031, 0.063 and 0.125 lb ai per acre.	20100126h.pdf
13214	SedgeHammer (Halosulfuron)	Picea glauca	Spruce, White; Cat	Field In-Ground	Garrett	1998	Over the top	No significant injury at 0.031, 0.062, and 0.125 lb ai per acre; some control of nutsedge increasing with rate.	20070219s.pdf
13211	SedgeHammer (Halosulfuron)	Pinus nigra	Pine, Austrian	Field In-Ground	Beste & Frank	2005	Ground, broadcast, foliar	No significant injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060501a.pdf
13211	SedgeHammer (Halosulfuron)	Pinus nigra	Pine, Austrian	Field In-Ground	Beste & Frank	2006	Over the top	No significant injury and growth reduction at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS); no reduction in seedling marketability	20070412a.pdf
13210	SedgeHammer (Halosulfuron)	Pinus resinosa	Pine, Red	Field In-Ground	Beste & Frank	2005	Over the top	No injury at 0.045 and 0.09 lb ai per acre; significant at 0.18 lb ai per acre but plants recovered	20060524b3.pdf
13210	SedgeHammer (Halosulfuron)	Pinus resinosa	Pine, Red	Field In-Ground	Beste & Frank	2006	Over the top	No significant injury at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS); slight stunting but no reduced market value	20070411h.pdf
13209	SedgeHammer (Halosulfuron)	Pinus strobus	Pine, White	Field In-Ground	Beste & Frank	2005	Over the top	No injury at 0.045 lb ai per acre with NIS; significant at 0.09 and 0.18 lb ai per acre but plants recovered.	20060524b2.pdf
13209	SedgeHammer (Halosulfuron)	Pinus strobus	Pine, White	Field In-Ground	Beste & Frank	2006	Over the top	Significant but transient injury at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS); no reduction in growth or seedling marketability	20070411l.pdf
13209	SedgeHammer (Halosulfuron)	Pinus strobus	Pine, White	Field In-Ground	Beste & Frank	2009		No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre.	20100209a.pdf
13209	SedgeHammer (Halosulfuron)	Pinus strobus	Pine, White	Field In-Ground	Beste & Frank	2009	Over the top	Slight injury at 0.031, moderate at 0.063 and 0.125 lb ai per acre; 2X and 4X treated plants with reduced value.	20100126m.pdf
13209	SedgeHammer (Halosulfuron)	Pinus strobus	Pine, White	Field In-Ground	Garrett	1998	Over the top	No injury at any rate (0.031, 0.062, 0.125 lb ai per acre); poor to good control increasing with rate.	20070219t.pdf
12173	SedgeHammer (Halosulfuron)	Pinus taeda	Pine, Loblolly	Field In-Ground	Beste & Frank	2005	Over the top	Significant injury; plants recovered and marketable at 0.09 and 0.018 lb ai per acre rates	20060524b1.pdf
12173	SedgeHammer (Halosulfuron)	Pinus taeda	Pine, Loblolly	Field In-Ground	Beste & Frank	2009	Over the top	Slight injury and significant stunting at 0.031, 0.063 and 0.125 lb ai per acre.	20100209a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
12173	SedgeHammer (Halosulfuron)	Pinus taeda	Pine, Loblolly	Field In-Ground	Garrett	1998	Over the top	No significant visible injury, but plants at the 0.063 and 0.125 lb ai per acre rates were stunted; moderate to excellent control of nutsedge increasing with rate.	20070219u.pdf
13727	SedgeHammer (Halosulfuron)	Platanus sp.	Plane Tree, Sycamore	Field In-Ground	Beste & Frank	2005	Over the top	Moderate to significant injury at 0.045, 0.09 and 0.18 lb ai per acre with abatement by season's end, but all rates caused stunting.	20060818c.pdf
13727	SedgeHammer (Halosulfuron)	Platanus sp. P. occidentalis	Plane Tree, Sycamore	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060818c.pdf
13727	SedgeHammer (Halosulfuron)	Platanus sp. P. occidentalis	Plane Tree, Sycamore	Field In-Ground	Beste & Frank	2009	Over the top	Unacceptable injury at 0.031, 0.063 and 0.125 lb ai per acre after one application.	20100126c.pdf
27986	SedgeHammer (Halosulfuron)	Prunus caroliniana compacta	Cherry Laurel	Field In-Ground	Uber	2008	Over the top	Significant but commercially acceptable injury at 0.031, 0.063 and 0.125 lb ai per acre; no significant growth reduction	20081202c.pdf
29228	SedgeHammer (Halosulfuron)	Prunus serotina	Cherry, Black (Non-Bearing)	Field In-Ground	Beste & Frank	2009	Over the top	Moderate to high injury and growth reduction at 0.031, 0.063 and 0.125 lb ai per acre.	20100126v.pdf
13229	SedgeHammer (Halosulfuron)	Prunus sp. P. americana	Cherry (Non-Bearing)	Field In-Ground	Beste & Frank	2005	Over the top	Significant, persistent injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060628b.pdf
13735	SedgeHammer (Halosulfuron)	Prunus sp. P. avium	Cherry (Non-Bearing)	Field Container	Altland	2006	Over the top	Significant injury with single application at all rates (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf
13229	SedgeHammer (Halosulfuron)	Prunus sp. P. serotina	Cherry (Non-Bearing)	Field In-Ground	Beste & Frank	2005	Over the top	Significant, persistent injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060623d.pdf
13215	SedgeHammer (Halosulfuron)	Pseudotsuga menziesii	Fir, Douglas	Field In-Ground	Ahrens & Mervosh	2006	Over the top	No injury to dormant trees, slight to moderate injury to actively growing trees at all rates (0.047, 0.094 and 0.188 lb ai per acre with NIS)	20070418d.pdf
13215	SedgeHammer (Halosulfuron)	Pseudotsuga menziesii	Fir, Douglas	Field In-Ground	Garrett	1998		All rates caused significant damage to actively growing seedlings (0.031, 0.062, and 0.125 lb ai per acre).	20070219v.pdf
26166	SedgeHammer (Halosulfuron)	Pseudotsuga menziesii	Fir, Douglas	Field Container	Lieth	2007	Over the top	Significant injury and growth reduction at 0.047, 0.094 and 0.188 lb ai per acre.	20080110a.pdf
26166	SedgeHammer (Halosulfuron)	Pseudotsuga menziesii P. menziesii glauca	Fir, Douglas	Field Container	Freiberger	2006	Over the top	Very slight injury after 1st, high after 2nd application at all rates (0.045, 0.09, 0.18 lb ai per acre)	20070405.pdf
13220	SedgeHammer (Halosulfuron)	Quercus acutissima	Oak, Sawtooth	Field In-Ground	Beste & Frank	2005	Foliar	Low to moderate injury at all rates (0.045, 0.09, and 0.18 lb ai per acre with NIS); plants marketable.	20060726e.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
13220	SedgeHammer (Halosulfuron)	Quercus acutissima	Oak, Sawtooth	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury and growth reduction at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS); no reduction in seedling marketability	20070411k.pdf
13220	SedgeHammer (Halosulfuron)	Quercus acutissima	Oak, Sawtooth	Field In-Ground	Beste & Frank	2009	Over the top	Significant early injury with complete recovery at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126d.pdf
13217	SedgeHammer (Halosulfuron)	Quercus alba	Oak, White	Field In-Ground	Beste & Frank	2005	Over the top	Acceptable injury and plants marketable at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726i.pdf
13217	SedgeHammer (Halosulfuron)	Quercus alba	Oak, White	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury with complete recovery at all rates (0.045, 0.09 and 0.18 lb ai per acre + NIS); growth reduction at 2X and 4X rates; no reduction in seedling marketability	20070412c.pdf
13217	SedgeHammer (Halosulfuron)	Quercus alba	Oak, White	Field In-Ground	Beste & Frank	2009	Over the top	Significant injury with complete recovery at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126n.pdf
27988	SedgeHammer (Halosulfuron)	Quercus ilex	Oak, Holly	Field In-Ground	Uber	2008	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202c.pdf
25459	SedgeHammer (Halosulfuron)	Quercus rubra	Oak, Northern Red	Field Container	Altland	2006	Over the top	Virtually no injury at any rate (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf
13219	SedgeHammer (Halosulfuron)	Quercus rubra	Oak, Northern Red	Field In-Ground	Beste & Frank	2005	Over the top	Moderate but transient injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060623c.pdf
13219	SedgeHammer (Halosulfuron)	Quercus rubra	Oak, Northern Red	Field In-Ground	Beste & Frank	2006	Over the top	Moderate but transient injury and height reduction at all rates (0.047, 0.094, and 0.18 lb ai per acre with NIS)	20070307g.pdf
25459	SedgeHammer (Halosulfuron)	Quercus rubra	Oak, Northern Red	Field Container	Fraelich	2006	Over the top	No injury at 0.045 lb ai per acre with NIS, very slight at 0.09 and 0.18 lb ai per acre; no growth reduction	20061212v.pdf
25459	SedgeHammer (Halosulfuron)	Quercus rubra	Oak, Northern Red	Field Container	Freiberger	2006	Over the top	Very slight injury and no growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre)	20070405.pdf
12458	SedgeHammer (Halosulfuron)	Quercus sp. Q. bicolor	Oak	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury but no growth reduction at all rates (0.045, 0.09 and 0.18 lb ai per acre with NIS); no reduction in seedling marketability	20070411j.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
12458	SedgeHammer (Halosulfuron)	Quercus sp. Q. nuttalli	Oak	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury with complete recovery, growth reduction at all rates (0.047, 0.094 and 0.188 lb ai per acre + NIS); no reduction in seedling market value	20070412h.pdf
12458	SedgeHammer (Halosulfuron)	Quercus sp. Q. prinus	Oak	Field In-Ground	Beste & Frank	2005	Foliar	Acceptable injury; plants marketable at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726b.pdf
12458	SedgeHammer (Halosulfuron)	Quercus sp. Q. prinus	Oak	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury after first application at 0.047, 0.094 and 0.188 lb ai per acre with NIS; plants recovered and were marketable at end of trial.	20070307e.pdf
12458	SedgeHammer (Halosulfuron)	Quercus sp. Q. rubra	Oak	Field In-Ground	Beste & Frank	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126o.pdf
13221	SedgeHammer (Halosulfuron)	Quercus velutina	Oak, Black	Field In-Ground	Beste & Frank	2005	Foliar	Low injury and plants marketable at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060818a.pdf
13221	SedgeHammer (Halosulfuron)	Quercus velutina	Oak, Black	Field In-Ground	Beste & Frank	2006	Over the top	Significant injury and growth reduction at 0.047, 0.094 and 0.188 lb ai per acre with NIS; plants recovered and were marketable at end of trial	20070307.pdf
13221	SedgeHammer (Halosulfuron)	Quercus velutina	Oak, Black	Field In-Ground	Beste & Frank	2009	Over the top	No significant injury at 0.031, 0.063 and 0.125 lb ai per acre; all treated plants marketable.	20100126e.pdf
27989	SedgeHammer (Halosulfuron)	Quercus virginiana	Oak, Southern Live	Field In-Ground	Uber	2008	Over the top	No injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre	20081202c.pdf
28143	SedgeHammer (Halosulfuron)	Raphiolepis indica	Indian Hawthorn	Field In-Ground	Derr	2008	Directed spray	Slight injury but no growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
28143	SedgeHammer (Halosulfuron)	Raphiolepis indica	Indian Hawthorn	Field In-Ground	Derr	2008	Over the top	Slight injury but no growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
11770	Manage (Halosulfuron)	Rhododendron sp.	Azalea	Field Container	Fraelich	1996	Broadcast	No injury at 0.031 and 0.062 lb ai per acre and very slight injury at 0.125 lb ai per acre; moderate to excellent control of nutsedge increasing with rate.	20070219k.pdf
27856	SedgeHammer (Halosulfuron)	Rhododendron sp.	Azalea	Field In-Ground	Derr	2008	Directed spray	No significant injury or growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
27856	SedgeHammer (Halosulfuron)	Rhododendron sp.	Azalea	Field In-Ground	Derr	2008	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
27856	SedgeHammer (Halosulfuron)	Rhododendron sp.	Azalea	Field In-Ground	Gilliam	2008	Over the top	Slight injury with complete recovery at 0.031, 0.063 and 0.125 lb ai per acre; no growth reduction	20081202b.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Congo'	Azalea	Field Container	Gilliam	2006	Over the top	No injury at any rate until 8 weeks after treatment when slight purpling of leaves was exhibited increasing with rate (0.047, 0.094, 0.188 lb ai per acre) and plants were slightly stunted.	20070212a.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Fashion'	Azalea	Field Container	Gilliam	1996	Over the top	No significant injury at 0.063 and 0.126 lb ai per acre and slight injury at 0.252 lb ai per acre, but no differences occurred in growth indices.	20070219h.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Fashion'	Azalea	Field Container	Norcini	2005	Over the top	Slight to moderate injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20060217q.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Formosa'	Azalea	Field Container	Derr	2002	Over the top	Slight injury increasing with rates and reduction of fresh weight (0.045, 0.09, 0.18 lb ai per acre).	20070221g.pdf
11761	Manage (Halosulfuron)	Rhododendron sp. 'Formosa'	Azalea	Field In-Ground	Derr	2005	Over the top	No injury at 0.045, 0.09, 0.18 lb ai per acre.	20060217p.pdf
11774	Manage (Halosulfuron)	Rhododendron sp. 'Formosa'	Rhododendron	Field Container	Derr	2005	Over the top	Very slight, but transient injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20060217p.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Midnight Flare'	Azalea	Field Container	Gilliam	2005	Over the top	No visible injury (0.045, 0.09, 0.18 lb ai per acre).	20060202i11.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Nuccio's Wild Cherry'	Azalea	Field Container	Wilen	2006	Over the top	Acceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061201i.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. 'Pink Gumpo'	Azalea	Field Container	Neal	2006	Over the top	No significant injury at 0.047, 0.094 and 0.188 lb ai per acre.	20070212b.pdf
11774	Manage (Halosulfuron)	Rhododendron sp. 'R. catawbiense 'Nova Zembla'	Rhododendron	Field Container	Gilliam	1996	Over the top	No injury at 0.063 lb ai per acre, but 0.126 and 0.252 lb ai per acre exhibited minor but transient injury.	20070219j.pdf
11766	Manage (Halosulfuron)	Rhododendron sp. R. catawbiense 'Roseum Elegans'	Rhododendron	Field In-Ground	Ahrens	1996	Broadcast	Moderate injury increasing with rate with second-year applications on same plants (0.031, 0.063, 0.125 lb ai per acre); excellent control of annual sedge and horseweed, moderate to great control of prostrate spurge, and poor to good control of carpetweed.	20070219i.pdf
11766	Manage (Halosulfuron)	Rhododendron sp. R. catawbiense 'Roseum elegans'	Rhododendron	Field In-Ground	Ahrens	1997	Over the top	Unacceptable injury at 0.031, 0.062 and 0.125 lb ai per acre.	20070219w.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
11766	Manage (Halosulfuron)	Rhododendron sp. R. catawbiense 'Roseum Elegans'	Rhododendron	Field In-Ground	Ahrens & Mervosh	1995	Broadcast Foliar	Minor but transient injury at 0.031, 0.063, and 0.125 lb ai per acre; moderate control of crabgrass and moderate to good control of annual sedges increasing with rate.	20070219i.pdf
11766	Manage (Halosulfuron)	Rhododendron sp. R. catawbiense 'Roseum Elegans'	Rhododendron	Field In-Ground	Beste	1997	Over the top	Slight transient injury at all rates (0.031, 0.062, 0.125 lb ai per acre) with the highest rate exhibiting stunting; excellent control of yellow nutsedge at all rates.	20070219x.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. R. obtusum 'Delaware Valley White'	Azalea	Field Container	Beste	1998	Over the top	Slight to moderate transient chlorosis increasing with rate (0.031, 0.063, 0.125 lb ai per acre) with only the 0.125 lb ai per acre treatment causing growth reduction.	20070220a.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. R. obtusum 'Hershey Red'	Azalea	Field Container	Beste	1998	Over the top	Slight to moderate transient chlorosis increasing with rate (0.031, 0.063, 0.125 lb ai per acre) with growth reduction in the 0.063 and 0.125 lb ai per acre treatments.	20070220b.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. R. obtusum 'Hershey Red'	Azalea	Field Container	Beste	2003	Over the top	Slight chlorosis increasing with rate which disappeared within 2 weeks after treatment (0.045, 0.09, 0.18 lb ai per acre).	20070221i.pdf
11761	Manage (Halosulfuron)	Rhododendron sp. R. obtusum 'Hino Crimson'	Azalea	Field In-Ground	Beste	1997	Over the top	Slight transient visible injury at all rates (0.031, 0.062, 0.125 lb ai per acre) with reduction in growth exhibited at all rates.	20070219y.pdf
11770	Manage (Halosulfuron)	Rhododendron sp. R. obtusum 'Hinocrimson'	Azalea	Field Container	Beste	2003	Over the top	Slight to moderate chlorosis increasing with rate which disappeared within 2 weeks after treatment (0.045, 0.09, 0.18 lb ai per acre).	20070221j.pdf
11761	Manage (Halosulfuron)	Rhododendron sp. R. obtusum 'Kaempo'	Azalea	Field In-Ground	Beste	1997	Over the top	No visible injury or growth reduction at any rate (0.031, 0.062, 0.125 lb ai per acre); no control of Pennsylvania smartweed, reduction of eclipta and yellownutsedge.	20070219z.pdf
11774	Manage (Halosulfuron)	Rhododendron sp. 'Tradition'	Rhododendron	Field Container	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
27990	SedgeHammer (Halosulfuron)	Rhus lancea	Sumac, African	Field In-Ground	Uber	2008	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre	20081202c.pdf
12460	SedgeHammer (Halosulfuron)	Robinia pseudoacacia	Black Locust	Field In-Ground	Beste & Frank	2005	Foliar	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060726c.pdf
12460	SedgeHammer (Halosulfuron)	Robinia pseudoacacia	Black Locust	Field In-Ground	Beste & Frank	2009	Over the top	Moderate to severe injury at 0.031, 0.063 and 0.125 lb ai per acre.	20100126i.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25340	SedgeHammer (Halosulfuron)	Rosa sp. 'Beloved'	Rose	Field Container	Gilliam	2006	Over the top	No visible injury and no significant impact on plant size (0.047, 0.094, 0.188 lb ai per acre).	20070212a.pdf
13702	SedgeHammer (Halosulfuron)	Rosa sp. 'Black Cherry'	Rose	Field In-Ground	Derr	2009	Over the top	Slight to moderate injury and reduced growth and flowering at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
13702	SedgeHammer (Halosulfuron)	Rosa sp. 'Knockout'	Rose	Field In-Ground	Gilliam	2005	Foliar	No injury (0.045, 0.09, 0.18 lb ai per acre).	20060202i9.pdf
25340	SedgeHammer (Halosulfuron)	Rosa sp. 'Moonshadow'	Rose	Field Container	Gilliam	2006	Over the top	No visible injury and no impact on plant size with any rate (0.047, 0.094, 0.188 lb ai per acre).	20070212a.pdf
13702	SedgeHammer (Halosulfuron)	Rosa sp. 'Nearly Wild'	Rose	Field In-Ground	Freiberger	2009	Broadcast soil surface	No injury at 2.67 oz per acre	20101104e.pdf
25340	SedgeHammer (Halosulfuron)	Rosa sp. 'Nearly Wild'	Rose	Field Container	Lieth	2006	Over the top	High injury and growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre); plants unmarketable	20061123b.pdf
25340	SedgeHammer (Halosulfuron)	Rosa sp. 'Oranges & Lemons'	Rose	Field Container	Mathers	2006	Over the top	Moderate injury at all rates (0.047, 0.094, 0.188 lb ai per acre).	20070110l.pdf
25340	SedgeHammer (Halosulfuron)	Rosa sp. R. multiflora	Rose	Field Container	Freiberger	2006	Over the top	High injury at all rates (0.045, 0.09, 0.18 lb ai per acre)	20070405.pdf
25340	SedgeHammer (Halosulfuron)	Rosa sp. 'Sea Foam'	Rose	Field Container	Senesac	2006	Over the top	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20061108e.pdf
25340	SedgeHammer (Halosulfuron)	Rosa sp. 'Solstice'	Rose	Field Container	Gilliam	2006	Over the top	No visible injury and no impact on plant size with any rate (0.047, 0.094, 0.188 lb ai per acre).	20070212a.pdf
20860	SedgeHammer (Halosulfuron)	Rudbeckia fulgida speciosa	Coneflower, Orange	Field Container	Williams	2007	Over the top	Slight injury at 0.047, moderate at 0.094 and 0.188 lb ai per acre	20080530a.pdf
20860	SedgeHammer (Halosulfuron)	Rudbeckia fulgida speciosa 'Becky'	Coneflower, Orange	Field Container	Derr	2006	Over the top	No significant injury at 0.045 and 0.09 lb ai per acre, moderate at 0.18 lb ai per acre.	20061110l.pdf
25348	SedgeHammer (Halosulfuron)	Salvia sylvestris S. elegans 'Tangerine'	Sage, Ramona	Field Container	Derr	2006	Over the top	Slight, moderate and unacceptable injury as rate increased (0.045, 0.09, 0.18 lb ai per acre).	20061110l.pdf
25348	SedgeHammer (Halosulfuron)	Salvia sylvestris S. nemorosa 'May Night'	Sage, Ramona	Field Container	Lieth	2006	Over the top	Significant injury and growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061123c.pdf
25348	SedgeHammer (Halosulfuron)	Salvia sylvestris S. nemorosa 'Snow Hill'	Sage, Ramona	Field Container	Boydston	2006	Over the top	Severe injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061108y.pdf
23508	Manage (Halosulfuron)	Sorghastrum sp. S. nutans	Indian Grass, Wood Grass	Field Container	Senesac	2003	Over the top	No injury at 0.045, 0.090 and 0.018 lb ai per acre.	20080623a.pdf
25341	SedgeHammer (Halosulfuron)	Spiraea sp. 'Goldflame'	Bridal-Wreath	Field Container	Ahrens & Mervosh	2006	Over the top	Severe injury and stunting at all rates (0.047, 0.094 and 0.188 lb ai per acre)	20070418a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25341	SedgeHammer (Halosulfuron)	Spiraea sp. S. bumaida 'Anthony Waterer'	Bridal-Wreath	Field Container	Beste & Frank	2006	Over the top	No injury or growth reduction at all rates (0.047, 0.094 and 0.188 lb ai per acre with NIS) by trial's end; all plants marketable	20070112e.pdf
25341	SedgeHammer (Halosulfuron)	Spiraea sp. S. decumbens	Bridal-Wreath	Field Container	Senesac	2006	Over the top	Virtually no injury at 0.045 lb ai per acre with NIS, slight with complete recovery at 0.09 and 0.18 lb ai per acre	20061108e.pdf
25341	SedgeHammer (Halosulfuron)	Spiraea sp. S. japonica 'Little Princess'	Bridal-Wreath	Field Container	Neal	2006	Over the top	Slight transient injury at 0.047 and 0.094 lb ai per acre and moderate unacceptable injury at 0.188 lb ai per acre.	20070212b.pdf
12462	SedgeHammer (Halosulfuron)	Spiraea sp. S. prunifolia	Bridal-Wreath	Field In-Ground	Freiberger	2009	Broadcast soil surface	Very minor injury, comparable to untreated, at 2.67 oz per acre	20101104e.pdf
25341	SedgeHammer (Halosulfuron)	Spiraea sp. S. x bumalda 'Gold Mound'	Bridal-Wreath	Field Container	Derr	2006	Over the top	No significant injury at 0.045 and 0.09 lb ai per acre; unacceptable at 0.18 lb ai per acre.	20061110l.pdf
25341	SedgeHammer (Halosulfuron)	Spiraea sp. S. x bumalda 'Goldmound'	Bridal-Wreath	Field Container	Mathers	2006	Over the top	Slight to moderate injury increasing with time and second application (0.047, 0.94, 0.188 lb ai per acre).	20070110l.pdf
13233	SedgeHammer (Halosulfuron)	Taxodium distichum	Bald Cypress	Field In-Ground	Beste & Frank	2005	Over the top	Unacceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20060524b4.pdf
13233	SedgeHammer (Halosulfuron)	Taxodium distichum	Bald Cypress	Field In-Ground	Beste & Frank	2009	Over the top	Severe injury at 0.031, 0.063 and 0.125 lb ai per acre.	20100209a.pdf
13233	SedgeHammer (Halosulfuron)	Taxodium distichum	Bald Cypress	Field In-Ground	Czarnota	2005	Over the top	No injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
13233	SedgeHammer (Halosulfuron)	Taxodium distichum	Bald Cypress	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
11759	Manage (Halosulfuron)	Taxus sp. T. cuspidata	Yew	Field In-Ground	Ahrens	1996	Broadcast	Moderate damage increasing with rate (0.031, 0.063, 0.125 lb ai per acre) with second year applications to same plants; excellent control of annual sedges and horseweed, moderate to good control of prostrate spurge, and poor to good control of carpetweed.	20070220c.pdf
11759	Manage (Halosulfuron)	Taxus sp. T. cuspidata	Yew	Field In-Ground	Ahrens & Mervosh	1995	Broadcast foliar	Moderate damage increasing with rate (0.031, 0.063, 0.125 lb ai per acre) and plants were not marketable.	20070219l.pdf
11768	Manage (Halosulfuron)	Taxus sp. T. cuspidata	Yew	Field Container	Fraelich	2006	Over the top	No injury or growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20061212o.pdf
11759	Manage (Halosulfuron)	Taxus sp. T. cuspidata capitata	Yew	Field In-Ground	Ahrens	1996	Over the top	No injury at 0.031 lb ai per acre, but commercially unacceptable damage occurred at 0.063 and 0.125 lb ai per acre; poor to good control of horseweed and annual bluegrass.	20070220d.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
11759	Manage (Halosulfuron)	Taxus sp. T. cuspidata capitata	Yew	Field In-Ground	Ahrens & Mervosh	1997	Over the top	Moderate, commercially unacceptable damage at all rates (0.031, 0.063, 0.125 lb ai per acre); no control of annual bluegrass, poor control of horseweed at 0.031 lb ai per acre with excellent at the two higher rates, and excellent control of hawksbeard at all rates.	20070220e.pdf
11768	Manage (Halosulfuron)	Taxus sp. T. media 'Fairview'	Yew	Field Container	Lieth	2006	Over the top	No injury but reduced plant growth at 0.047, 0.94 and 0.188 lb ai per acre.	20070517a.pdf
11768	Manage (Halosulfuron)	Taxus sp. T. x media 'Fairview'	Yew	Field Container	Senesac	2001	Over the top	Slight to moderate injury increasing with rate (0.031, 0.062, 0.124) and applications at end of season.	20070220y.pdf
11765	Manage (Halosulfuron)	Thuja sp. T. occidentalis	Arborvitae	Field In-Ground	Ahrens	1996	Over the top	Minor to moderate injury at all rates (0.031, 0.063, 0.125 lb ai per acre); excellent control of annual sedges and horseweed, moderate to great control of prostrate spurge and poor to good control of carpetweed.	20070220g.pdf
11765	Manage (Halosulfuron)	Thuja sp. T. occidentalis	Arborvitae	Field In-Ground	Ahrens & Mervosh	1995	Broadcast foliar	Minor injury decreasing over time at all rates (0.031, 0.063, 0.125 lb ai per acre).	20070219n.pdf
11765	Manage (Halosulfuron)	Thuja sp. T. occidentalis	Arborvitae	Field In-Ground	Czarnota	2005	Over the top	Very slight injury at 0.0675, 0.135, and 0.27 lb ai per acre.	20061219a.pdf
11765	Manage (Halosulfuron)	Thuja sp. T. occidentalis	Arborvitae	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
11775	Manage (Halosulfuron)	Thuja sp. T. occidentalis 'Elegantissima'	Arborvitae	Field Container	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
11765	Manage (Halosulfuron)	Thuja sp. T. occidentalis globosa	Arborvitae	Field In-Ground	Ahrens	1996	Over the top	Moderate injury at all rates (0.031, 0.063, 0.125 lb ai per acre); poor control of quackgrass and horseweed.	20070220f.pdf
11765	Manage (Halosulfuron)	Thuja sp. T. occidentalis globosa	Arborvitae	Field In-Ground	Ahrens & Mervosh	1997	Over the top	Moderate injury at all rates (0.031, 0.063, 0.125 lb ai per acre) with the second-year application to plants; poor control of quackgrass and moderate to good control of hawksbeard and horseweed.	20070220h.pdf
11775	Manage (Halosulfuron)	Thuja sp. T. occidentalis nigra	Arborvitae	Field Container	Gilliam	1996	Over the top	No injury or differences in growth indices at all rates (0.063, 0.126, 0.262 lb ai per acre).	20070219m.pdf
21442	SedgeHammer (Halosulfuron)	Thymus praecox 'Albiflorus'	Thyme, Creeping	Field Container	Senesac	2001	Over the top	No injury at 0.045 and 0.09 lb ai per acre, but slight injury occurred at 0.18 lb ai per acre.	20070220z.pdf
25339	SedgeHammer (Halosulfuron)	Trachelospermum asiaticum	Jasmine, Asian	Field Container	Gilliam	2006	Over the top	No visible injury and no impact on plant size with any rate (0.047, 0.094, 0.188 lb ai per acre).	20070212a.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
25339	SedgeHammer (Halosulfuron)	Trachelospermum asiaticum	Jasmine, Asian	Field Container	Lieth	2006	Over the top	High injury and growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre); plants unmarketable	20061123d.pdf
25339	SedgeHammer (Halosulfuron)	Trachelospermum asiaticum 'Green'	Jasmine, Asian	Field Container	Fraelich	2006	Over the top	No injury or growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre with NIS).	20061212r.pdf
26462	SedgeHammer (Halosulfuron)	Trachelospermum jasminoides	Jasmine, Star;Confederate	Field Container	Wilen	2006	Over the top	Acceptable injury at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061201i/pdf
26574	SedgeHammer (Halosulfuron)	Trachycarpus fortunei	Palm, Windmill	Field In-Ground	Czarnota	2005	Over the top	Slight injury at 0.0675, 0.135, and 0.27 lb ai per acre, increasing with rate and second application.	20061219a.pdf
26574	SedgeHammer (Halosulfuron)	Trachycarpus fortunei	Palm, Windmill	Field In-Ground	Czarnota	2006	Over the top	No injury at 0.042 lb ai per acre.	20070225c.pdf
20866	SedgeHammer (Halosulfuron)	Tradescantia x andersoniana 'Sweet Kate'	Spiderwort	Field In-Ground	Derr	2009	Over the top	No significant injury or growth reduction at 0.031, 0.063, 0.125 lb ai per acre.	20091123a.pdf
11762	Manage (Halosulfuron)	Tsuga sp. T. canadensis	Hemlock	Field In-Ground	Ahrens	1996	Over the top	No significant injury at any rate (0.031, 0.063, 0.125 lb ai per acre)' excellent control of annual sedge and horseweed, moderate to good control of prostrate spurge and poor to good control of carpetweed.	20070220i.pdf
11762	Manage (Halosulfuron)	Tsuga sp. T. canadensis	Hemlock	Field In-Ground	Ahrens & Mervosh	1995	Broadcast foliar	No significant injury at any rate (0.031, 0.063, 0.125 lb ai per acre).	20070219o.pdf
25015	SedgeHammer (Halosulfuron)	Viburnum dentatum	Viburnum, arrowwood	Field Container	Freiberger	2006	Over the top	High injury and growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre)	20070405.pdf
25015	SedgeHammer (Halosulfuron)	Viburnum dentatum 'Autumn Jazz'	Viburnum, arrowwood	Field Container	Altland	2006	Over the top	Significant injury with single application at all rates (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf
25015	SedgeHammer (Halosulfuron)	Viburnum dentatum 'Chicago Lustre'	Viburnum, arrowwood	Field Container	Beste & Frank	2006	Over the top	Unacceptable injury and growth reduction at all rates (0.047, 0.094 and 0.188 lb ai per acre with NIS)	20070112f.pdf
25015	SedgeHammer (Halosulfuron)	Viburnum dentatum 'Mirrorleaf'	Viburnum, arrowwood	Field Container	Derr	2005	Over the top	Very little to minor injury increasing with rate (0.045, 0.09, 0.18 lb ai per acre).	20060217p.pdf
12461	SedgeHammer (Halosulfuron)	Viburnum sp.	Arrowwood	Field In-Ground	Derr	2008	Directed spray	Unacceptable injury at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
12461	SedgeHammer (Halosulfuron)	Viburnum sp.	Arrowwood	Field In-Ground	Derr	2008	Over the top	Unacceptable injury at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
26502	SedgeHammer (Halosulfuron)	Viburnum sp. V. carlesii	Arrowwood	Field Container	Atland	2006	Over the top	Significant injury with single application at all rates (0.047, 0.094 and 0.188 lb ai per acre)	20070110p.pdf

PR#	Product	Crop Name		Production Site	Researcher	Year	Application Type	Results	File Name
		Latin	Common						
26502	SedgeHammer (Halosulfuron)	Viburnum sp. V. tinus compacta	Arrowwood	Field Container	Neal	2006	Over the top	Moderate unacceptable injury at all rates (0.125, 0.25, 0.5 lb ai per acre).	20070212b.pdf
13706	SedgeHammer (Halosulfuron)	Vinca sp.	Periwinkle	Field In-Ground	Derr	2008	Directed spray	No significant injury or growth reduction at 0.063 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
13706	SedgeHammer (Halosulfuron)	Vinca sp.	Periwinkle	Field In-Ground	Derr	2008	Over the top	No significant injury or growth reduction at 0.031, 0.063 and 0.125 lb ai per acre; complete yellow nutsedge control	20081202a.pdf
25017	SedgeHammer (Halosulfuron)	Vinca sp. V. minor 'Bowles'	Periwinkle	Field Container	Lieth	2006	Over the top	Virtually no injury but significant growth reduction at all rates (0.045, 0.09, 0.18 lb ai per acre).	20061123e.pdf

Label Suggestions

It is recommended that in addition to the directed uses on established ornamental plantings in landscapes, certain over-the-top uses be added to the label as well as use in ornamental landscape and production nurseries. The following listed species can be added to the label as being tolerant to over-the-top applications of SedgeHammer:

Crop	In-ground Landscape/Nursery	Field Container Production
Cupressus sp.	4	--
Euonymus sp.	2	3
Gardenia agusta	1	3
Helleborus niger	--	4
Hemerocallis sp.	4	6
Hosta sp.	2	5
Hydrangea sp.	1	2
Ilex crenata	1	4
Ilex cornuta	3	1
Ilex meserveae	--	3
Ilex rotunda	3	--
Ilex verticillata	2	--
Ilex vomitoria 'Nana'	1	2
Juglans nigra	4	--
Juniperus chinensis	2	1
Juniperus conferta	--	3
Juniperus horizontalis	2	5
Lagerstroemia indica	6	3
Liriope muscari (see Neal 2006)	--	5
Loropetalum sp.	3	--
Magnolia sp.	3	1
Picea abies (see Beste & Frank)	3	2
Pinus strobus	5	--
Quercus alba	3	--
Quercus rubra	3	3
Rhododendron sp.	13	6
Spirea bumalda (see Ahrens & Mervosh)	--	4
Thuja occidentales	6	2
Trachelospermum asiaticum (see Lieth 2006)	--	4
Vinca minor (see Lieth)	2	1

If these label changes are made, it is highly recommended that the following species be listed as not tolerant to over-the-top SedgeHammer applications:

Abelia x grandiflora
Buddleia davidii
Chamaebatiaria sp.
Chamaecyparis thyoides
Chrysanthemum (garden mum)
Cornus florida
Cotoneaster dammeri
Cotoneaster horizontalis
Gypsophila elegans
Hedera helix
Iris xiphium
Juniperus virginiana
Ligustrum sp.
Myrica pensylvanica
Plantanus occidentalis
Prunus americana
Prunus avium
Prunus serótina
Robinia pseudoacacia
Rhododendron catawbiense
Salvia sylvestris
Taxus sp.
Viburnum sp.

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Appendix 2: Submitted Data

Researcher reports are included in the printed copy of this report and are those received by 6/1/11. Reports on following pages are in alphanumeric order of author PR number.