

**Project Name:** Post Emergent Herbicide Crop Safety

<b>New</b>	<b>Ongoing</b>	X	<b>Completed</b>		<b>Duration if ongoing or completed:</b>	2018-2023
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**Project Description:**

The Post-Emergent Herbicide Crop Safety Project began in 2016 and has continued through 2023. While specific crops and herbicides have changed, the intent of this research has been to screen over-the-top applications of pre-emergent herbicides as plants are breaking dormancy, or beginning new growth, and then 4 to 6 weeks later once foliage is more mature.

**Research Project Abstract (if available):**

***Abstract from 2014 Acetic Acid Crop Safety Summary***

From 2010 to 2013, IR-4 completed 38 trials on WeedPharm (acetic acid). The data contained in this report was generated to register uses of active ingredient on and around ornamental horticulture plants with broadcast applications, including over the top of established plants. The WeedPharm rates in this testing program were at 5 and 10 % active ingredient as the 1X and 2X rates. It had been applied to 18 plant genera or species. Results showed WeedPharm causing no injury when applied to these crops in the dormant stage of growth. Of these genera and species, none exhibited no or minimal transient injury after the second application at both rates. Eight (8) crops showed significant injury after the second application. Of the ten (10) crops that still need additional information, there are three (3) genera or species in which one or two trials did not show significant injury at 1X and 2X rates, and three (3) genera/species showing variable response at the 1X rate.

***Abstract from 2014 Ammonium nonanoate Crop Safety Summary***

From 2010 to 2013, IR-4 completed 24 trials on Racer (Ammonium nonanoate). The data contained in this report was generated to register uses of active ingredient on and around ornamental horticulture plants with broadcast applications, including over the top of established plants. The Racer rates in this testing program were at 3 and 6 % v/v as the 1X and 2X rates. It had been applied to 16 plant genera or species. Results showed Racer causing no injury when applied to these crops in the dormant stage of growth. Of these genera and species, none exhibited no or minimal transient injury after the second application at both rates. Four (4) crops showed significant injury after the second application. Of the twelve (12) crops that still need additional information, there are six (6) genera or species in which one or two trials did not show significant injury at 1X and 2X rates.

***Abstract from 2022 Bentazon Crop Safety Summary***

Basagran T/O has been registered for several years as a directed application and as an over-the-top application on limited plant species. However, growers have expressed the need to have additional plants added for over-the-top applications. Data collected throughout the history of the IR-4 Environmental Horticulture Program are presented here to support specific Basagran T/O applications over the top of certain ornamental horticulture plants. The rates chosen for this research were 1.0, 2.0 and 4.0 pounds active ingredient per acre (lb ai per A) as the 1X, 2X and 4X rates. In addition, early studies compared single versus two consecutive applications of 1.0 lb ai per A or 2.0 lb ai per A followed with 1 lb ai per A. Throughout the years, 104 different crop species/genera were examined for over the top applications. Of these, Seventeen exhibited no or minimal transient injury after application at all three rates. Thirty-five crops require further research because of unclear results. Fifteen crops exhibited no phytotoxicity at 1.0 lb ai per acre but did have some injury at the higher rates or with repeat applications. Thirty-six species exhibited phytotoxicity at even the 1.0 lb ai per acre rate.

***Abstract from 2022 Clopyralid Crop Safety Summary***

Lontrel (clopyralid) was initially registered in 1998 for environmental horticulture uses. This initial label contained an extensive list of environmental horticulture plants where Lontrel could be used without causing

phytotoxicity. From 1985 to 2021, IR-4 examined 71 environmental plant species for phytotoxicity related to Lontrel applications. Of the researched crops, the following twelve can be added to the label at this time based on the data provided here: *Abies balsame*, *Acer rubrum*, *Acorus* sp., *Carex* sp., *Hemerocallis* sp., *Ilex cornuta*, *Juncus effusus*, *Juniperus horizontalis*, *Picea pungens*, *Pinus mugo* ssp., *Pinus strobus*, *Pseudotsuga menziesii*. The remaining seven crops that showed minimal or no injury are currently in the label. Forty-nine other species or genera treated with over the top applications exhibited minimal or no injury in the limited number of trials (one or two) for each crop. Ten species or genera exhibited moderate to severe negative impacts, one of which is currently in the product label.

**Abstract from 2014 d-limonene Crop Safety Summary**

From 2012 to 2013, IR-4 completed 19 trials on Avenger Ag (d-limonene). The data contained in this report was generated to register uses of active ingredient on and around ornamental horticulture plants with broadcast applications, including over the top of established plants. The Avenger Ag rates in this testing program were at 14 and 28 % v/v as the 1X and 2X rates. It had been applied to 11 plant genera or species. Results showed Avenger Ag causing no injury when applied to these crops in the dormant stage of growth. Of these genera and species, none exhibited no or minimal transient injury after the second application at both rates. Six (6) crops showed significant injury after the second application. Of the six (6) crops that still need additional information, there is one (1) species in which one trial did not show significant injury at 1X and 2X rates.

**Abstract from 2012 Halosulfuron Crop Safety Summary**

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 and 2011, 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.

**Abstract from 2021 Iron HEDTA Crop Safety Summary**

Fiesta (Iron HEDTA) is a new herbicide currently labeled for post emergence broadleaf weed control on lawns (use on rights of way or non-crop areas), turf, golf courses, parks, playgrounds, cemeteries and athletic fields. Neudorff is interested in adding environmental horticulture crops to their label. The IR-4 Project completed 166 crop safety trials on 83 environmental horticulture plant species or genera during 2016 to 2021. In these trials, Fiesta (Iron HEDTA) exhibited no or minimal negative impact on 7 plant species / genera (*Buxus* sp., *Calamagrostis acutiflora*, *Carex cherokeensis*, *Festuca glauca*, *Juniperus* spp., *Muhlenbergia capillaris* and *Taxus x media*) when applied to either dormant or actively growing plants. Eight species / genera (*Cotoneaster apiculatus*, *Cotoneaster* sp., *Heuchera* spp., *Hemerocallis* sp., *Hibiscus* sp., *Lagerstroemia indica*, *Ophiopogon* sp. and *Teucrium chamaedrys*), where Fiesta was applied to actively growing plants, exhibited no phytotoxicity at 1X but did have some injury at 2X and 4X rates. Twenty-one species / genera exhibited significant phytotoxicity at even the lowest rate such that it is recommend that growers not use Fiesta (Iron HEDTA); in ten of these crops, Fiesta was applied to dormant plants. For 46 genera / species, more information is needed either because only 1 or 2 trials were conducted or because consistent results were not achieved across research sites.

**Abstract from 2014 Oregano Oil Safety Summary**

From 2010 to 2013, IR-4 completed 28 trials on Bryophyter (Oregano oil). The data contained in this report was generated to register uses of active ingredient on and around ornamental horticulture plants with broadcast applications, including over the top of established plants. The Bryophyter rates in this testing program were at 1 and 2 % active ingredient as the 1X and 2X rates. It had been applied to 21 plant genera or species. Results showed Bryophyter causing no injury when applied to these crops in the dormant stage of growth. Of these genera and species, none exhibited no or minimal transient injury after the second application at both rates. Seven (7) crops showed significant injury after the second application. Of the fourteen (14) crops that still need additional information, there are eight (8) genera or species in which one trial did not show significant injury at 1X and 2X rates, and two (2) genera/species showing variable response at the 1X rate.

**Abstract from 2014 Pelargonic acid Safety Summary**

From 2010 to 2013, IR-4 completed 14 trials on Scythe (Pelargonic acid). The data contained in this report was generated to register uses of active ingredient on and around ornamental horticulture plants with broadcast applications, including over the top of established plants. The Scythe rates in this testing program were at 3 and 6 % v/v as the 1X and 2X rates. It had been applied to 12 plant genera or species. Results showed Scythe causing no injury when applied to these crops in the dormant stage of growth. Of these genera and species, none exhibited no or minimal transient injury after the second application at both rates. Four (4) crops showed significant injury after the second application. Of the eight (8) crops that still need additional information, there are two (2) genera or species in which one or two trials do not show significant injury at 1X and 2X rates, and one (1) genera/species showing variable response at the 1X rate.

**Target Species (Phytotoxicity, or common and Latin name of arthropod, pathogen, weed):**

Crop Safety

**Target Crops (list tested crops if ongoing or completed project)**

See "IR-4 Crop Safety to Date" below

**Target Product(s)(list tested products or numbered compounds if ongoing or completed project)**

2,4-D amine	Dismiss	Racer
Avenger Ag	Emery Agro	Razor Pro
Basagran	Fiesta	Scythe
Bryophyter	Harmony,	Sedgehammer
CleanSlate	Lontrel	WeedPharm

**Product Registration and Research Status**

**Registration Status**

Labeled & Commercialized	
Wide range of ornamental horticulture crops listed	
Labeled & Commercialized	
Opportunity to add additional ornamental horticulture crops	
Labeled But NOT Commercialized	
Not yet registered or labeled	
No longer available for development	
* IR-4 Data contributed to registration decision – either adding pest to label or not pursuing further research	
1 At least one crop species screened fully	
2 Product not available for production ornamentals	



## Environmental Horticulture Program Research Project Sheet

<https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-extension-resources/>

PROS	CONS
Glyphosate replacement needed	Where does Flumioxazin & Pyroxasulfone, direct application, registration stand for ornamental crops. Valent will review & advise
	Is there a Glyphosate alternative (mix or replace)?
	Efficacy on perennials is lacking

### IR-4 Crop Safety Trials to Date

Average rating on a scale of 1 – 5 with 1 = 0 to about no injury and 5 = severe injury and mortality; minimum to maximum rating; number of trials. A rating of 3 or higher is considered commercially unacceptable (*red text*). A rating of 1 or 2 is considered commercially acceptable and those with more than 3 trials are complete (*green text*). 'Labeled' indicates that IR-4 generated data in at least one trial and that this crop is listed on the label. For crop/product combinations that are blank, IR-4 has not screened this combination.

**Table 1. PostHerbicide Product Crop Safety**

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Abelia sp.</i>				
<i>Abies fraseri</i>	3.0 (3 - 3) n1			
<i>Abies sp.</i>				
<i>Acer negundo var. negundo</i>				
<i>Acer platanoides</i>				
<i>Acer rubrum</i>				
<i>Acer saccharinum</i>				
<i>Acer sp.</i>				
<i>Achillea sp.</i>				
<i>Acorus sp.</i>				
<i>Aesculus glabra</i>				
<i>Aesculus sp.</i>				
<i>Agapanthus sp.</i>				
<i>Agastache rupestris</i>				
<i>Agave sp.</i>				
<i>Alchemilla sp.</i>		4.0 (4 - 4) n1		3.0 (3 - 3) n1
<i>Allamanda cathartica</i>				
<i>Allamanda sp.</i>				
<i>Alnus sp.</i>				
<i>Aloe sp.</i>				
<i>Amelanchier canadensis</i>				
<i>Ammophila breviligulata</i>				
<i>Amsonia hubrichtii</i>				
<i>Andropogon gerardii</i>				
<i>Andropogon virginicus</i>				
<i>Aquilegia sp.</i>				
<i>Arachis sp</i>				
<i>Araucaria heterophylla</i>				
<i>Archontophoenix cunninghamiana</i>				
<i>Arctostaphylos sp.</i>				
<i>Arctotheca calendula</i>				
<i>Aronia melanocarpa</i>				
<i>Asarum canadense</i>				
<i>Asclepias sp.</i>				
<i>Asparagus densiflorus</i>				
<i>Aster sp.</i>				
<i>Astilbe sp.</i>			4.3 (4 - 5) n3	
<i>Athyrium nipponicum</i>				
<i>Aucuba sp.</i>				
<i>Aurinia saxatilis</i>				
<i>Baptisia sp.</i>				
<i>Begonia sp.</i>				
<i>Berberis sp.</i>				

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Berberis thunbergii</i>				
<i>Berlandiera lyrata</i>				
<i>Betula nigra</i>				
<i>Betula papyrifera</i>				
<i>Betula sp.</i>				
<i>Bougainvillea sp.</i>				
<i>Buxus microphylla</i>				
<i>Buxus sp.</i>				
Cactaceae				
<i>Caladium sp.</i>			2.0 (1 - 3) n2	
<i>Calamagrostis acutiflora</i>			1.7 (1 - 3) n3	
<i>Calamagrostis arundinacea</i>				
<i>Callistemon sp.</i>				
<i>Calluna sp.</i>				
<i>Calycanthus sp.</i>				
<i>Campanula sp.</i>				
<i>Canna x generalis</i>			4.0 (4 - 4) n1	
<i>Carex buchananii</i>				
<i>Carex cherokeensis</i>				
<i>Carex morrowii</i>				
<i>Carex sp.</i>				
<i>Carya illinoensis</i>				
<i>Cassia sp.</i>				
<i>Castanea sativa</i>				
<i>Catharanthus roseus</i>				
<i>Ceanothus x pallida</i>				
<i>Cedrus atlantica</i>				
<i>Cercis canadensis</i>				
<i>Cercis occidentalis</i>				
<i>Chamaecyparis obtusa</i>				
<i>Chamaecyparis pisifera</i>				
<i>Chamaecyparis sp.</i>				
<i>Chasmanthium latifolium</i>			2.5 (1 - 4) n2	
<i>Chelone sp.</i>				
<i>Chrysanthemum x rubellum</i>				
<i>Chrysanthemum/Dendranthema sp.</i>				
<i>Chrysanthemum/Dendranthema x morifolium</i>				
<i>Chrysogonum virginianum</i>				
<i>Citrus sp.</i>				
<i>Clematis sp.</i>				
<i>Cleyera japonica</i>				
<i>Cocos sp.</i>				
<i>Coreopsis sp.</i>				
<i>Cornus alternifolia</i>				

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Cornus florida</i>				
<i>Cornus kousa</i>				
<i>Cornus racemosa</i>				
<i>Cornus sericea</i>				
<i>Cornus sp.</i>				
<i>Cortaderia selloana</i>			2.0 (1 - 3) n2	
<i>Cortaderia sp.</i>				
<i>Cosmos sp.</i>				
<i>Cotoneaster apiculatus</i>				
<i>Cotoneaster sp.</i>				
<i>Crassula sp.</i>				
<i>Crataegus sp.</i>				
<i>Crocus sp.</i>				
<i>Crocus tommasinianus</i>				
<i>Cryptomeria japonica</i>				
<i>Cupressus sempervirens</i>				
<i>Cupressus sp.</i>				
<i>Cuprocyparis leylandii</i>				
<i>Cycas revoluta</i>				
<i>Cyperus sp.</i>				
<i>Cyrtomium fortunei</i>				
<i>Cytisus sp.</i>				
<i>Dahlia sp.</i>				
<i>Delosperma cooperi</i>				
<i>Delosperma sp.</i>				
<i>Deschampsia caespitosa</i>				
<i>Dianthus deltoides</i>			4.0 (4 - 4) n2	
<i>Dianthus gratianopolitanus</i>				
<i>Digitalis grandiflora</i>				
<i>Digitalis sp.</i>				
<i>Distylium sp.</i>				
<i>Dryopteris cycadina</i>				
<i>Dryopteris erythrosora</i>				
<i>Dryopteris ludoviciana</i>				
<i>Dryopteris sp.</i>				
<i>Duranta erecta</i>				
<i>Dyopsis lutescens</i>				
<i>Echeveria sp.</i>				
<i>Echinacea purpurea</i>			4.3 (4 - 5) n3	
<i>Echinacea sp.</i>				
<i>Echinocactus grusonii</i>				
<i>Elaeagnus angustifolia</i>				
<i>Enkianthus sp.</i>				
<i>Equisetum hyemale</i>				
<i>Eragrostis curvula</i>				

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Eragrostis spectabilis</i>				
<i>Erythronium americanum</i>				
<i>Eucalyptus sp.</i>				
<i>Euonymus alatus</i>				
<i>Euonymus fortunei</i>				
<i>Euonymus japonicus</i>				
<i>Euonymus sp.</i>				
<i>Eupatorium maculatum</i>				
<i>Eupatorium sp.</i>				
<i>Euphorbia sp.</i>				
<i>Fagus sp.</i>				
<i>Festuca cinerea</i>				
<i>Festuca glauca</i>			1.7 (1 - 3) n3	
<i>Festuca ovina</i>				
<i>Forsythia sp.</i>				
<i>Fothergilla gardenii</i>				
<i>Fraxinus sp.</i>				
<i>Fritillaria meleagris</i>				
<i>Gaillardia sp.</i>				
<i>Gardenia sp.</i>				
<i>Gaura lindheimeri</i>				
<i>Ginkgo biloba</i>				
<i>Gladiolus sp.</i>			4.0 (4 - 4) n3	
<i>Gomphrena sp.</i>				
<i>Gymnocalycium baldianum</i>				
<i>Hakonechloa sp.</i>				
<i>Hamelia patens</i>				
<i>Hedera helix</i>				
<i>Helianthemum sp.</i>				
<i>Helianthus annuus</i>				
<i>Helictotrichon sp.</i>				
<i>Hemerocallis sp.</i>				
<i>Heuchera sanguinea</i>				
<i>Heuchera sp.</i>				
<i>Heucherella sp.</i>				
<i>Hibiscus rosa-sinensis</i>			4.0 (4 - 4) n1	
<i>Hibiscus sp.</i>				
<i>Hibiscus syriacus</i>				
<i>Hierochloe odorata</i>				
<i>Hosta sp.</i>		4.0 (4 - 4) n1	3.0 (3 - 3) n1	3.0 (3 - 3) n1
<i>Hyacinthus orientalis</i>				
<i>Hyacinthus sp.</i>				
<i>Hydrangea macrophylla</i>				
<i>Hydrangea paniculata</i>				
<i>Hydrangea quercifolia</i>				



Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Hydrangea sp.</i>			4.3 (4 - 5) n3	
<i>Hylotelephium sieboldii</i>			4.0 (4 - 4) n1	
<i>Hylotelephium telephium</i>			4.0 (4 - 4) n2	
<i>Hypericum sp.</i>				
<i>Iberis sp.</i>				
<i>Ilex cornuta</i>				
<i>Ilex crenata</i>				
<i>Ilex glabra</i>				
<i>Ilex sp.</i>				
<i>Ilex verticillata</i>				
<i>Ilex x attenuata</i>				
<i>Ilex x meserveae</i>				
<i>Iris sp.</i>				
<i>Itea virginica</i>				
<i>Jasminum sp.</i>				
<i>Juglans nigra</i>				
<i>Juglans sp.</i>				
<i>Juncus effusus</i>				
<i>Juniperus chinensis</i>				
<i>Juniperus communis</i>				
<i>Juniperus horizontalis</i>				
<i>Juniperus sp.</i>				
<i>Juniperus virginiana</i>				
<i>Juniperus x media</i>				
<i>Kalmia sp.</i>				
<i>Kerria japonica</i>				
<i>Lagerstroemia indica</i>				
<i>Larix sp.</i>				
<i>Lavandula sp.</i>				
<i>Leucanthemum maximum</i>				
<i>Leucanthemum x superbum</i>				
<i>Leucothoe sp.</i>				
<i>Leymus arenarius</i>				
<i>Ligustrum lucidum</i>				
<i>Ligustrum sp.</i>				
<i>Lilium Asiatic Hybrids</i>				
<i>Lilium sp.</i>			3.0 (2 - 4) n3	
<i>Liriope muscari</i>				
<i>Liriope sp.</i>				
<i>Liriope spicata</i>				
<i>Lonicera sp.</i>				
<i>Magnolia grandiflora</i>				
<i>Magnolia sp.</i>				
<i>Mahonia aquifolium</i>				
<i>Malus sp.</i>				

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Mammillaria sp.</i>				
<i>Miscanthus sinensis</i>			2.0 (1 - 3) n2	
<i>Miscanthus sp.</i>				
<i>Muhlenbergia capillaris</i>			2.0 (1 - 3) n2	
<i>Muhlenbergia dubia</i>				
<i>Muhlenbergia dumosa</i>				
<i>Muhlenbergia rigens</i>				
<i>Myrica cerifera</i>				
<i>Myrica pensylvanica</i>				
<i>Narcissus sp.</i>			1.3 (1 - 2) n3	
<i>Nassella tenuissima</i>				
<i>Nepeta x faassenii</i>				
<i>Nerium oleander</i>				
<i>Ophiopogon jaburan</i>				
<i>Ophiopogon sp.</i>		4.0 (4 - 4) n2	4.0 (4 - 4) n1	1.0 (1 - 1) n1
<i>Osmanthus heterophyllus</i>				
<i>Osmunda regalis</i>		4.0 (4 - 4) n1		4.0 (4 - 4) n1
<i>Osteospermum sp.</i>				
<i>Oxydendrum arboreum</i>				
<i>Pachysandra terminalis</i>				
<i>Paeonia lactiflora</i>				
<i>Paeonia sp.</i>				
<i>Panicum virgatum</i>			1.7 (1 - 3) n3	
<i>Pelargonium x domesticum</i>				
<i>Pennisetum alopecuroides</i>				
<i>Pennisetum orientale</i>				
<i>Pennisetum setaceum</i>			2.7 (1 - 4) n3	
<i>Pennisetum sp.</i>				
<i>Penstemon sp.</i>				
<i>Perovskia atriplicifolia</i>				
<i>Philadelphus sp.</i>				
<i>Phlox paniculata</i>				
<i>Phlox stolonifera</i>				
<i>Phoenix roebelinii</i>				
<i>Photinia sp.</i>				
<i>Physocarpus opulifolius</i>				
<i>Physocarpus sp.</i>				
<i>Picea abies</i>				
<i>Picea glauca</i>				
<i>Picea glauca 'Conica'</i>				
<i>Picea omorika</i>				
<i>Picea sp.</i>				
<i>Pieris japonica</i>				
<i>Pinus nigra</i>				
<i>Pinus sp.</i>				

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Pinus strobus</i>				
<i>Pinus sylvestris</i>				
<i>Pinus taeda</i>				
<i>Platanus sp.</i>				
<i>Platycodon grandiflorus</i>				
<i>Polygonatum odoratum</i>				
<i>Populus sp.</i>				
<i>Portulaca grandiflora</i>				
<i>Portulacaria sp.</i>				
<i>Prunus laurocerasus</i>				
<i>Prunus serotina</i>				
<i>Prunus sp.</i>				
<i>Pseudotsuga menziesii</i>				
<i>Pulmonaria sp.</i>				
<i>Pyracantha sp.</i>				
<i>Pyrus communis</i>				
<i>Quercus acutissima</i>				
<i>Quercus nuttallii</i>				
<i>Quercus palustris</i>				
<i>Quercus rubra</i>				
<i>Quercus shumardii</i>				
<i>Quercus sp.</i>				
<i>Quercus virginiana</i>				
<i>Rhamnus sp.</i>				
<i>Rhaphiolepis indica</i>				
<i>Rhodiola pachyclados</i>				
<i>Rhododendron sp.</i>				
<i>Rosa sp.</i>				
<i>Rosmarinus officinalis</i>				
<i>Rubus calycinooides</i>				
<i>Rudbeckia fulgida var. speciosa</i>				
<i>Rudbeckia hirta</i>			4.7 (4 - 5) n3	
<i>Rudbeckia sp.</i>				
<i>Rumohra adiantiformis</i>				
<i>Sabal minor</i>				
<i>Saccharum ravennae</i>				
<i>Saccharum sp.</i>				
<i>Salix sp.</i>				
<i>Salvia nemorosa</i>				
<i>Salvia sp.</i>				
<i>Sambucus sp.</i>				
<i>Santolina chamaecyparissus</i>				
<i>Schizachyrium scoparium</i>			2.5 (1 - 4) n2	
<i>Sedum acre</i>			3.7 (3 - 4) n3	
<i>Sedum album</i>			4.0 (4 - 4) n2	

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Sedum hybridum</i>				
<i>Sedum kamtschaticus</i>			3.7 (3 - 4) n3	
<i>Sedum rupestre</i>			4.0 (4 - 4) n4	
<i>Sedum sexangulare</i>			4.0 (4 - 4) n1	
<i>Sedum sp.</i>		4.0 (4 - 4) n1		2.0 (2 - 2) n1
<i>Sedum spathulifolium</i>				
<i>Sedum spurium</i>			3.5 (2 - 4) n4	
<i>Sempervivum sp.</i>				
<i>Solanum sp.</i>				
<i>Solidago caesia</i>				
<i>Solidago sp.</i>				
<i>Solidago speciosa</i>				
<i>Sorghastrum nutans</i>				
<i>Spiraea japonica</i>				
<i>Spiraea sp.</i>			3.0 (2 - 4) n3	
<i>Sporobolus heterolepis</i>				
<i>Stachys byzantina</i>				
<i>Stipa sp.</i>				
<i>Stokesia sp.</i>				
<i>Stromanthe sp.</i>				
<i>Syringa sp.</i>				
<i>Tagetes erecta</i>				
<i>Taxodium distichum</i>				
<i>Taxus cuspidata</i>				
<i>Taxus sp.</i>				
<i>Taxus X media</i>				
<i>Teucrium chamaedrys</i>				
<i>Thuja occidentalis</i>				
<i>Thuja sp.</i>				
<i>Thymus serpyllum</i>				
<i>Trachelospermum asiaticum</i>				
<i>Trachelospermum jasminoides</i>				
<i>Trachycarpus fortunei</i>				
<i>Tsuga canadensis</i>				
<i>Tsuga sp.</i>				
<i>Tulbaghia violacea</i>				
<i>Tulipa sp.</i>			2.3 (1 - 3) n3	
<i>Ulmus parvifolia</i>				
<i>Ulmus sp.</i>				
<i>Vernonia noveboracensis</i>				
<i>Viburnum sp.</i>				
<i>Vinca major</i>				
<i>Vinca minor</i>				
<i>Vinca sp.</i>				
<i>Washingtonia robusta</i>				



# Environmental Horticulture Program Research Project Sheet

<https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-extension-resources/>

Crop	2,4-D (Amine) (2,4-D (AMINE))	Avenger Ag (d-limonene)	Basagran T&O Herbicide (Bentazon)	Bryophyter (Oregano oil)
<i>Wisteria sp.</i>				
<i>Wodyetia bifurcata</i>				
<i>Zelkova serrata</i>				
<i>Zephyranthes sp.</i>				
<i>Zinnia angustifolia</i>				
<i>Zinnia sp.</i>				

**Table 2. PostHerbicide Product Crop Safety**

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Abelia sp.</i>			
<i>Abies fraseri</i>			
<i>Abies sp.</i>			
<i>Acer negundo var. negundo</i>			
<i>Acer platanoides</i>			
<i>Acer rubrum</i>			
<i>Acer saccharinum</i>			
<i>Acer sp.</i>			
<i>Achillea sp.</i>			
<i>Acorus sp.</i>	<b>1.0 (1 - 1) n1</b>		
<i>Aesculus glabra</i>			
<i>Aesculus sp.</i>			
<i>Agapanthus sp.</i>			
<i>Agastache rupestris</i>			
<i>Agave sp.</i>			
<i>Alchemilla sp.</i>			<b>3.0 (3 - 3) n1</b>
<i>Allamanda cathartica</i>			
<i>Allamanda sp.</i>			
<i>Alnus sp.</i>			
<i>Aloe sp.</i>			
<i>Amelanchier canadensis</i>			
<i>Ammophila breviligulata</i>			
<i>Amsonia hubrichtii</i>			
<i>Andropogon gerardii</i>			
<i>Andropogon virginicus</i>			
<i>Aquilegia sp.</i>			
<i>Arachis sp</i>			
<i>Araucaria heterophylla</i>			
<i>Archontophoenix cunninghamiana</i>			
<i>Arctostaphylos sp.</i>			
<i>Arctotheca calendula</i>			
<i>Aronia melanocarpa</i>			
<i>Asarum canadense</i>			
<i>Asclepias sp.</i>			
<i>Asparagus densiflorus</i>			
<i>Aster sp.</i>			
<i>Astilbe sp.</i>			
<i>Athyrium nipponicum</i>			
<i>Aucuba sp.</i>			
<i>Aurinia saxatilis</i>			
<i>Baptisia sp.</i>			
<i>Begonia sp.</i>			
<i>Berberis sp.</i>			

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Berberis thunbergii</i>			
<i>Berlandiera lyrata</i>			
<i>Betula nigra</i>			
<i>Betula papyrifera</i>			
<i>Betula sp.</i>			
<i>Bougainvillea sp.</i>			
<i>Buxus microphylla</i>			
<i>Buxus sp.</i>			
Cactaceae			
<i>Caladium sp.</i>			
<i>Calamagrostis acutiflora</i>		1.0 (1 - 1) n1	
<i>Calamagrostis arundinacea</i>			
<i>Callistemon sp.</i>			
<i>Calluna sp.</i>			
<i>Calycanthus sp.</i>			
<i>Campanula sp.</i>			
<i>Canna x generalis</i>			
<i>Carex buechananii</i>			
<i>Carex cherokeensis</i>			
<i>Carex morrowii</i>			
<i>Carex sp.</i>	3.0 (3 - 3) n1		
<i>Carya illinoensis</i>			
<i>Cassia sp.</i>			
<i>Castanea sativa</i>			
<i>Catharanthus roseus</i>			
<i>Ceanothus x pallida</i>			
<i>Cedrus atlantica</i>			
<i>Cercis canadensis</i>			
<i>Cercis occidentalis</i>			
<i>Chamaecyparis obtusa</i>			
<i>Chamaecyparis pisifera</i>			
<i>Chamaecyparis sp.</i>			
<i>Chasmanthium latifolium</i>		4.0 (4 - 4) n1	
<i>Chelone sp.</i>			
<i>Chrysanthemum x rubellum</i>			
<i>Chrysanthemum/Dendranthema sp.</i>			
<i>Chrysanthemum/Dendranthema x morifolium</i>			
<i>Chrysogonum virginianum</i>			
<i>Citrus sp.</i>			
<i>Clematis sp.</i>			
<i>Cleyera japonica</i>			
<i>Cocos sp.</i>			
<i>Coreopsis sp.</i>			
<i>Cornus alternifolia</i>			

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Cornus florida</i>			
<i>Cornus kousa</i>			
<i>Cornus racemosa</i>			
<i>Cornus sericea</i>			
<i>Cornus sp.</i>			
<i>Cortaderia selloana</i>			
<i>Cortaderia sp.</i>		4.0 (4 - 4) n1	
<i>Cosmos sp.</i>			
<i>Cotoneaster apiculatus</i>			
<i>Cotoneaster sp.</i>			
<i>Crassula sp.</i>			
<i>Crataegus sp.</i>			
<i>Crocus sp.</i>			
<i>Crocus tommasinianus</i>			
<i>Cryptomeria japonica</i>			
<i>Cupressus sempervirens</i>			
<i>Cupressus sp.</i>			
<i>Cuprocyparis leylandii</i>			
<i>Cycas revoluta</i>			
<i>Cyperus sp.</i>			
<i>Cyrtomium fortunei</i>			
<i>Cytisus sp.</i>			
<i>Dahlia sp.</i>			
<i>Delosperma cooperi</i>			
<i>Delosperma sp.</i>			
<i>Deschampsia caespitosa</i>			
<i>Dianthus deltoides</i>			
<i>Dianthus gratianopolitanus</i>			
<i>Digitalis grandiflora</i>			
<i>Digitalis sp.</i>			
<i>Distylium sp.</i>			
<i>Dryopteris cycadina</i>			
<i>Dryopteris erythrosora</i>			
<i>Dryopteris ludoviciana</i>			
<i>Dryopteris sp.</i>			
<i>Duranta erecta</i>			
<i>Dyopsis lutescens</i>			
<i>Echeveria sp.</i>			
<i>Echinacea purpurea</i>			
<i>Echinacea sp.</i>			
<i>Echinocactus grusonii</i>			
<i>Elaeagnus angustifolia</i>			
<i>Enkianthus sp.</i>			
<i>Equisetum hyemale</i>			
<i>Eragrostis curvula</i>			



Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Eragrostis spectabilis</i>			
<i>Erythronium americanum</i>			
<i>Eucalyptus sp.</i>			
<i>Euonymus alatus</i>			
<i>Euonymus fortunei</i>			
<i>Euonymus japonicus</i>			
<i>Euonymus sp.</i>			
<i>Eupatorium maculatum</i>			
<i>Eupatorium sp.</i>			
<i>Euphorbia sp.</i>			
<i>Fagus sp.</i>			
<i>Festuca cinerea</i>			
<i>Festuca glauca</i>		2.7 (1 - 4) n3	
<i>Festuca ovina</i>			
<i>Forsythia sp.</i>			
<i>Fothergilla gardenii</i>			
<i>Fraxinus sp.</i>			
<i>Fritillaria meleagris</i>			
<i>Gaillardia sp.</i>			
<i>Gardenia sp.</i>			
<i>Gaura lindheimeri</i>			
<i>Ginkgo biloba</i>			
<i>Gladiolus sp.</i>			
<i>Gomphrena sp.</i>			
<i>Gymnocalycium baldianum</i>			
<i>Hakonechloa sp.</i>			
<i>Hamelia patens</i>			
<i>Hedera helix</i>			
<i>Helianthemum sp.</i>			
<i>Helianthus annuus</i>			
<i>Helictotrichon sp.</i>			
<i>Hemerocallis sp.</i>			
<i>Heuchera sanguinea</i>			
<i>Heuchera sp.</i>			
<i>Heucherella sp.</i>			
<i>Hibiscus rosa-sinensis</i>			
<i>Hibiscus sp.</i>			
<i>Hibiscus syriacus</i>			
<i>Hierochloe odorata</i>			
<i>Hosta sp.</i>			
<i>Hyacinthus orientalis</i>			
<i>Hyacinthus sp.</i>			
<i>Hydrangea macrophylla</i>			
<i>Hydrangea paniculata</i>			
<i>Hydrangea quercifolia</i>			

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Hydrangea sp.</i>			
<i>Hylotelephium sieboldii</i>			
<i>Hylotelephium telephium</i>			
<i>Hypericum sp.</i>			
<i>Iberis sp.</i>			
<i>Ilex cornuta</i>			
<i>Ilex crenata</i>			
<i>Ilex glabra</i>			
<i>Ilex sp.</i>			
<i>Ilex verticillata</i>			
<i>Ilex x attenuata</i>			
<i>Ilex x meserveae</i>			
<i>Iris sp.</i>			
<i>Itea virginica</i>			
<i>Jasminum sp.</i>			
<i>Juglans nigra</i>			
<i>Juglans sp.</i>			
<i>Juncus effusus</i>	<b>1.0 (1 - 1) n1</b>		
<i>Juniperus chinensis</i>			
<i>Juniperus communis</i>			
<i>Juniperus horizontalis</i>			
<i>Juniperus sp.</i>			
<i>Juniperus virginiana</i>			
<i>Juniperus x media</i>			
<i>Kalmia sp.</i>			
<i>Kerria japonica</i>			
<i>Lagerstroemia indica</i>			
<i>Larix sp.</i>			
<i>Lavandula sp.</i>			
<i>Leucanthemum maximum</i>			
<i>Leucanthemum x superbum</i>			
<i>Leucothoe sp.</i>			
<i>Leymus arenarius</i>			
<i>Ligustrum lucidum</i>			
<i>Ligustrum sp.</i>			
<i>Lilium Asiatic Hybrids</i>			
<i>Lilium sp.</i>			
<i>Liriope muscari</i>			
<i>Liriope sp.</i>			
<i>Liriope spicata</i>			
<i>Lonicera sp.</i>			
<i>Magnolia grandiflora</i>			
<i>Magnolia sp.</i>			
<i>Mahonia aquifolium</i>			
<i>Malus sp.</i>			

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Mammillaria sp.</i>			
<i>Miscanthus sinensis</i>			
<i>Miscanthus sp.</i>		1.0 (1 - 1) n1	
<i>Muhlenbergia capillaris</i>		3.0 (3 - 3) n2	
<i>Muhlenbergia dubia</i>			
<i>Muhlenbergia dumosa</i>			
<i>Muhlenbergia rigens</i>			
<i>Myrica cerifera</i>			
<i>Myrica pensylvanica</i>			
<i>Narcissus sp.</i>			
<i>Nassella tenuissima</i>			
<i>Nepeta x faassenii</i>			
<i>Nerium oleander</i>			
<i>Ophiopogon jaburan</i>			
<i>Ophiopogon sp.</i>		4.0 (4 - 4) n1	3.0 (3 - 3) n2
<i>Osmanthus heterophyllus</i>			
<i>Osmunda regalis</i>			4.0 (4 - 4) n1
<i>Osteospermum sp.</i>			
<i>Oxydendrum arboreum</i>			
<i>Pachysandra terminalis</i>			
<i>Paeonia lactiflora</i>			
<i>Paeonia sp.</i>			
<i>Panicum virgatum</i>			
<i>Pelargonium x domesticum</i>			
<i>Pennisetum alopecuroides</i>			
<i>Pennisetum orientale</i>			
<i>Pennisetum setaceum</i>			
<i>Pennisetum sp.</i>			
<i>Penstemon sp.</i>			
<i>Perovskia atriplicifolia</i>			
<i>Philadelphus sp.</i>			
<i>Phlox paniculata</i>			
<i>Phlox stolonifera</i>			
<i>Phoenix roebelinii</i>			
<i>Photinia sp.</i>			
<i>Physocarpus opulifolius</i>			
<i>Physocarpus sp.</i>			
<i>Picea abies</i>		3.0 (3 - 3) n1	
<i>Picea glauca</i>			
<i>Picea glauca 'Conica'</i>			
<i>Picea omorika</i>			
<i>Picea sp.</i>		2.5 (1 - 4) n2	
<i>Pieris japonica</i>			
<i>Pinus nigra</i>			
<i>Pinus sp.</i>		2.5 (1 - 4) n2	

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Pinus strobus</i>			
<i>Pinus sylvestris</i>			
<i>Pinus taeda</i>			
<i>Platanus sp.</i>			
<i>Platycodon grandiflorus</i>			
<i>Polygonatum odoratum</i>			
<i>Populus sp.</i>			
<i>Portulaca grandiflora</i>			
<i>Portulacaria sp.</i>			
<i>Prunus laurocerasus</i>			
<i>Prunus serotina</i>			
<i>Prunus sp.</i>			
<i>Pseudotsuga menziesii</i>			
<i>Pulmonaria sp.</i>			
<i>Pyracantha sp.</i>			
<i>Pyrus communis</i>			
<i>Quercus acutissima</i>			
<i>Quercus nuttallii</i>			
<i>Quercus palustris</i>			
<i>Quercus rubra</i>			
<i>Quercus shumardii</i>			
<i>Quercus sp.</i>			
<i>Quercus virginiana</i>			
<i>Rhamnus sp.</i>			
<i>Rhaphiolepis indica</i>			
<i>Rhodiola pachyclados</i>			
<i>Rhododendron sp.</i>			
<i>Rosa sp.</i>			
<i>Rosmarinus officinalis</i>			
<i>Rubus calycinooides</i>			
<i>Rudbeckia fulgida var. speciosa</i>			
<i>Rudbeckia hirta</i>			
<i>Rudbeckia sp.</i>			
<i>Rumohra adiantiformis</i>			
<i>Sabal minor</i>			
<i>Saccharum ravennae</i>			
<i>Saccharum sp.</i>			
<i>Salix sp.</i>			
<i>Salvia nemorosa</i>			
<i>Salvia sp.</i>			
<i>Sambucus sp.</i>			
<i>Santolina chamaecyparissus</i>			
<i>Schizachyrium scoparium</i>			
<i>Sedum acre</i>			
<i>Sedum album</i>			

Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Sedum hybridum</i>			
<i>Sedum kamtschaticus</i>			
<i>Sedum rupestre</i>			
<i>Sedum sexangulare</i>			
<i>Sedum sp.</i>			2.0 (2 - 2) n1
<i>Sedum spathulifolium</i>			
<i>Sedum spurium</i>			
<i>Sempervivum sp.</i>			
<i>Solanum sp.</i>			
<i>Solidago caesia</i>			
<i>Solidago sp.</i>			
<i>Solidago speciosa</i>			
<i>Sorghastrum nutans</i>			
<i>Spiraea japonica</i>			
<i>Spiraea sp.</i>			
<i>Sporobolus heterolepis</i>			
<i>Stachys byzantina</i>			
<i>Stipa sp.</i>			
<i>Stokesia sp.</i>			
<i>Stromanthe sp.</i>			
<i>Syringa sp.</i>			
<i>Tagetes erecta</i>			
<i>Taxodium distichum</i>			
<i>Taxus cuspidata</i>			
<i>Taxus sp.</i>			
<i>Taxus X media</i>		2.0 (1 - 3) n2	
<i>Teucrium chamaedrys</i>			
<i>Thuja occidentalis</i>			
<i>Thuja sp.</i>			
<i>Thymus serpyllum</i>			
<i>Trachelospermum asiaticum</i>			
<i>Trachelospermum jasminoides</i>			
<i>Trachycarpus fortunei</i>			
<i>Tsuga canadensis</i>			
<i>Tsuga sp.</i>		3.0 (2 - 4) n3	
<i>Tulbaghia violacea</i>	4.0 (4 - 4) n1		
<i>Tulipa sp.</i>			
<i>Ulmus parvifolia</i>			
<i>Ulmus sp.</i>			
<i>Vernonia noveboracensis</i>			
<i>Viburnum sp.</i>			
<i>Vinca major</i>			
<i>Vinca minor</i>			
<i>Vinca sp.</i>			
<i>Washingtonia robusta</i>			



## Environmental Horticulture Program Research Project Sheet

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Crop	Clean Slate (Clopyralid)	Dismiss 4F (Sulfentrazone)	Emery Agro 7000 Concentrate (Ammonium nonanoate)
<i>Wisteria sp.</i>			
<i>Wodyetia bifurcata</i>			
<i>Zelkova serrata</i>			
<i>Zephyranthes sp.</i>	3.0 (3 - 3) n1		
<i>Zinnia angustifolia</i>			
<i>Zinnia sp.</i>			

**Table 3. PostHerbicide Product Crop Safety**

<b>Crop</b>	<b>Fiesta Herbicide (Iron HEDTA)</b>	<b>Harmony (thifensulfuron)</b>	<b>Lontrel T&amp;O (Clopyralid)</b>
<i>Abelia sp.</i>			
<i>Abies fraseri</i>		<b>1.0 (1 - 1) n1</b>	
<i>Abies sp.</i>	<b>1.0 (1 - 1) n2</b>		
<i>Acer negundo var. negundo</i>			
<i>Acer platanoides</i>			
<i>Acer rubrum</i>	<b>2.0 (2 - 2) n1</b>		
<i>Acer saccharinum</i>			
<i>Acer sp.</i>			
<i>Achillea sp.</i>			
<i>Acorus sp.</i>			<b>1.0 (1 - 1) n3</b>
<i>Aesculus glabra</i>			
<i>Aesculus sp.</i>			
<i>Agapanthus sp.</i>	<b>3.0 (3 - 3) n1</b>		
<i>Agastache rupestris</i>			
<i>Agave sp.</i>			
<i>Alchemilla sp.</i>			
<i>Allamanda cathartica</i>			
<i>Allamanda sp.</i>			
<i>Alnus sp.</i>			
<i>Aloe sp.</i>			
<i>Amelanchier canadensis</i>			
<i>Ammophila breviligulata</i>	<b>1.0 (1 - 1) n2</b>		
<i>Amsonia hubrichtii</i>			
<i>Andropogon gerardii</i>	<b>2.0 (1 - 3) n3</b>		
<i>Andropogon virginicus</i>			
<i>Aquilegia sp.</i>			
<i>Arachis sp</i>			
<i>Araucaria heterophylla</i>			
<i>Archontophoenix cunninghamiana</i>			
<i>Arctostaphylos sp.</i>			
<i>Arctotheca calendula</i>			
<i>Aronia melanocarpa</i>			
<i>Asarum canadense</i>			
<i>Asclepias sp.</i>			
<i>Asparagus densiflorus</i>			
<i>Aster sp.</i>			
<i>Astilbe sp.</i>			
<i>Athyrium nipponicum</i>			
<i>Aucuba sp.</i>			
<i>Aurinia saxatilis</i>			
<i>Baptisia sp.</i>			
<i>Begonia sp.</i>			
<i>Berberis sp.</i>			
<i>Berberis thunbergii</i>			

Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Berlandiera lyrata</i>			
<i>Betula nigra</i>			
<i>Betula papyrifera</i>			
<i>Betula sp.</i>			
<i>Bougainvillea sp.</i>			
<i>Buxus microphylla</i>			
<i>Buxus sp.</i>	1.0 (1 - 1) n4		
Cactaceae			
<i>Caladium sp.</i>	3.0 (3 - 3) n1		
<i>Calamagrostis acutiflora</i>	1.3 (1 - 2) n3		
<i>Calamagrostis arundinacea</i>			
<i>Callistemon sp.</i>			
<i>Calluna sp.</i>			
<i>Calycanthus sp.</i>			
<i>Campanula sp.</i>			
<i>Canna x generalis</i>			
<i>Carex buchananii</i>			
<i>Carex cherokeensis</i>	2.7 (1 - 4) n3		
<i>Carex morrowii</i>			
<i>Carex sp.</i>	3.0 (3 - 3) n3		1.0 (1 - 1) n2
<i>Carya illinoensis</i>			
<i>Cassia sp.</i>			
<i>Castanea sativa</i>			
<i>Catharanthus roseus</i>			
<i>Ceanothus x pallida</i>			
<i>Cedrus atlantica</i>			
<i>Cercis canadensis</i>			
<i>Cercis occidentalis</i>			
<i>Chamaecyparis obtusa</i>			
<i>Chamaecyparis pisifera</i>			
<i>Chamaecyparis sp.</i>	3.0 (1 - 4) n3		
<i>Chasmanthium latifolium</i>	1.5 (1 - 2) n2		
<i>Chelone sp.</i>			
<i>Chrysanthemum x rubellum</i>			
<i>Chrysanthemum/Dendranthema sp.</i>			
<i>Chrysanthemum/Dendranthema x morifolium</i>			
<i>Chrysogonum virginianum</i>			
<i>Citrus sp.</i>			
<i>Clematis sp.</i>			
<i>Cleyera japonica</i>			
<i>Cocos sp.</i>			
<i>Coreopsis sp.</i>			
<i>Cornus alternifolia</i>			
<i>Cornus florida</i>			
<i>Cornus kousa</i>			



Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Cornus racemosa</i>			
<i>Cornus sericea</i>			
<i>Cornus sp.</i>			
<i>Cortaderia selloana</i>			
<i>Cortaderia sp.</i>	<b>2.0 (1 - 3) n2</b>		
<i>Cosmos sp.</i>			
<i>Cotoneaster apiculatus</i>			
<i>Cotoneaster sp.</i>	<b>3.0 (2 - 4) n3</b>		
<i>Crassula sp.</i>			
<i>Crataegus sp.</i>			
<i>Crocus sp.</i>			
<i>Crocus tommasinianus</i>			
<i>Cryptomeria japonica</i>	<b>3.0 (1 - 4) n3</b>		
<i>Cupressus sempervirens</i>			
<i>Cupressus sp.</i>			
<i>Cuprocyparis leylandii</i>			
<i>Cycas revoluta</i>			
<i>Cyperus sp.</i>			<b>1.0 (1 - 1) n2</b>
<i>Cyrtomium fortunei</i>			
<i>Cytisus sp.</i>			
<i>Dahlia sp.</i>			
<i>Delosperma cooperi</i>			
<i>Delosperma sp.</i>			
<i>Deschampsia caespitosa</i>			
<i>Dianthus deltoides</i>			
<i>Dianthus gratianopolitanus</i>			
<i>Digitalis grandiflora</i>			
<i>Digitalis sp.</i>			
<i>Distylium sp.</i>			
<i>Dryopteris cycadina</i>			
<i>Dryopteris erythrosora</i>			
<i>Dryopteris ludoviciana</i>			
<i>Dryopteris sp.</i>			
<i>Duranta erecta</i>			
<i>Dypsis lutescens</i>			
<i>Echeveria sp.</i>			
<i>Echinacea purpurea</i>	<b>5.0 (5 - 5) n1</b>		
<i>Echinacea sp.</i>			
<i>Echinocactus grusonii</i>			
<i>Elaeagnus angustifolia</i>			
<i>Enkianthus sp.</i>			
<i>Equisetum hyemale</i>			<b>2.0 (2 - 2) n1</b>
<i>Eragrostis curvula</i>			
<i>Eragrostis spectabilis</i>			
<i>Erythronium americanum</i>			
<i>Eucalyptus sp.</i>			

Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Euonymus alatus</i>	3.0 (3 - 3) n2		
<i>Euonymus fortunei</i>	1.0 (1 - 1) n2		
<i>Euonymus japonicus</i>			
<i>Euonymus sp.</i>			
<i>Eupatorium maculatum</i>			
<i>Eupatorium sp.</i>			
<i>Euphorbia sp.</i>	4.0 (4 - 4) n3		
<i>Fagus sp.</i>			
<i>Festuca cinerea</i>			
<i>Festuca glauca</i>	1.3 (1 - 2) n4		
<i>Festuca ovina</i>			
<i>Forsythia sp.</i>			
<i>Fothergilla gardenii</i>	4.0 (4 - 4) n1		
<i>Fraxinus sp.</i>			
<i>Fritillaria meleagris</i>			
<i>Gaillardia sp.</i>			
<i>Gardenia sp.</i>	3.0 (2 - 4) n2		
<i>Gaura lindheimeri</i>			
<i>Ginkgo biloba</i>			
<i>Gladiolus sp.</i>			
<i>Gomphrena sp.</i>			
<i>Gymnocalycium baldianum</i>			
<i>Hakonechloa sp.</i>			
<i>Hamelia patens</i>			
<i>Hedera helix</i>			
<i>Helianthemum sp.</i>			
<i>Helianthus annuus</i>			
<i>Helictotrichon sp.</i>			3.0 (3 - 3) n1
<i>Hemerocallis sp.</i>	1.7 (1 - 2) n3		
<i>Heuchera sanguinea</i>			
<i>Heuchera sp.</i>	3.5 (3 - 4) n2		
<i>Heucherella sp.</i>			
<i>Hibiscus rosa-sinensis</i>			
<i>Hibiscus sp.</i>	3.5 (3 - 4) n2		
<i>Hibiscus syriacus</i>			
<i>Hierochloe odorata</i>			
<i>Hosta sp.</i>	3.3 (3 - 4) n3		
<i>Hyacinthus orientalis</i>			
<i>Hyacinthus sp.</i>			
<i>Hydrangea macrophylla</i>			
<i>Hydrangea paniculata</i>			
<i>Hydrangea quercifolia</i>			
<i>Hydrangea sp.</i>	3.3 (2 - 4) n3		
<i>Hylotelephium sieboldii</i>			
<i>Hylotelephium telephium</i>	2.5 (2 - 3) n2		
<i>Hypericum sp.</i>			

Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Iberis sp.</i>			
<i>Ilex cornuta</i>	1.5 (1 - 2) n2		
<i>Ilex crenata</i>	1.7 (1 - 3) n3		
<i>Ilex glabra</i>			
<i>Ilex sp.</i>			
<i>Ilex verticillata</i>			
<i>Ilex x attenuata</i>			
<i>Ilex x meserveae</i>	3.5 (3 - 4) n2		
<i>Iris sp.</i>			
<i>Itea virginica</i>			
<i>Jasminum sp.</i>			
<i>Juglans nigra</i>			
<i>Juglans sp.</i>			
<i>Juncus effusus</i>			1.3 (1 - 2) n3
<i>Juniperus chinensis</i>			
<i>Juniperus communis</i>			
<i>Juniperus horizontalis</i>			
<i>Juniperus sp.</i>	2.0 (1 - 4) n8		
<i>Juniperus virginiana</i>			
<i>Juniperus x media</i>			
<i>Kalmia sp.</i>			
<i>Kerria japonica</i>	4.0 (4 - 4) n1		
<i>Lagerstroemia indica</i>	3.7 (3 - 4) n3		
<i>Larix sp.</i>			
<i>Lavandula sp.</i>	4.0 (4 - 4) n3		
<i>Leucanthemum maximum</i>			
<i>Leucanthemum x superbum</i>			
<i>Leucothoe sp.</i>			
<i>Leymus arenarius</i>			
<i>Ligustrum lucidum</i>			
<i>Ligustrum sp.</i>	2.3 (2 - 3) n3		
<i>Lilium Asiatic Hybrids</i>			
<i>Lilium sp.</i>			
<i>Liriope muscari</i>			
<i>Liriope sp.</i>	3.0 (2 - 4) n4		
<i>Liriope spicata</i>			
<i>Lonicera sp.</i>			
<i>Magnolia grandiflora</i>			
<i>Magnolia sp.</i>			
<i>Mahonia aquifolium</i>			
<i>Malus sp.</i>			
<i>Mammillaria sp.</i>			
<i>Miscanthus sinensis</i>			
<i>Miscanthus sp.</i>	1.5 (1 - 2) n2		
<i>Muhlenbergia capillaris</i>	1.0 (1 - 1) n3		1.5 (1 - 2) n2
<i>Muhlenbergia dubia</i>			

Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Muhlenbergia dumosa</i>			
<i>Muhlenbergia rigens</i>			
<i>Myrica cerifera</i>			
<i>Myrica pensylvanica</i>			
<i>Narcissus sp.</i>			
<i>Nassella tenuissima</i>			
<i>Nepeta x faassenii</i>			
<i>Nerium oleander</i>	3.0 (2 - 4) n2		
<i>Ophiopogon jaburan</i>			
<i>Ophiopogon sp.</i>	2.0 (1 - 3) n2		
<i>Osmanthus heterophyllus</i>			
<i>Osmunda regalis</i>			
<i>Osteospermum sp.</i>			
<i>Oxydendrum arboreum</i>			
<i>Pachysandra terminalis</i>	3.0 (2 - 4) n2		
<i>Paeonia lactiflora</i>			
<i>Paeonia sp.</i>			
<i>Panicum virgatum</i>	2.0 (1 - 3) n3		2.0 (2 - 2) n1
<i>Pelargonium x domesticum</i>			
<i>Pennisetum alopecuroides</i>	1.7 (1 - 3) n3		
<i>Pennisetum orientale</i>			
<i>Pennisetum setaceum</i>	4.0 (4 - 4) n1		
<i>Pennisetum sp.</i>			
<i>Penstemon sp.</i>			
<i>Perovskia atriplicifolia</i>			
<i>Philadelphus sp.</i>			
<i>Phlox paniculata</i>			
<i>Phlox stolonifera</i>			
<i>Phoenix roebelinii</i>			
<i>Photinia sp.</i>			
<i>Physocarpus opulifolius</i>	4.0 (4 - 4) n1		
<i>Physocarpus sp.</i>			
<i>Picea abies</i>			
<i>Picea glauca</i>			
<i>Picea glauca 'Conica'</i>			
<i>Picea omorika</i>			
<i>Picea sp.</i>	1.5 (1 - 3) n4		
<i>Pieris japonica</i>			
<i>Pinus nigra</i>			
<i>Pinus sp.</i>	1.3 (1 - 2) n3		
<i>Pinus strobus</i>			
<i>Pinus sylvestris</i>			
<i>Pinus taeda</i>	3.5 (2 - 5) n2		
<i>Platanus sp.</i>			
<i>Platycodon grandiflorus</i>			
<i>Polygonatum odoratum</i>			

Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Populus sp.</i>			
<i>Portulaca grandiflora</i>			
<i>Portulacaria sp.</i>			
<i>Prunus laurocerasus</i>	2.3 (1 - 4) n3		
<i>Prunus serotina</i>			
<i>Prunus sp.</i>			
<i>Pseudotsuga menziesii</i>	1.0 (1 - 1) n1		
<i>Pulmonaria sp.</i>			
<i>Pyracantha sp.</i>			
<i>Pyrus communis</i>			
<i>Quercus acutissima</i>			
<i>Quercus nuttallii</i>			
<i>Quercus palustris</i>			
<i>Quercus rubra</i>			
<i>Quercus shumardii</i>			
<i>Quercus sp.</i>			
<i>Quercus virginiana</i>			
<i>Rhamnus sp.</i>			
<i>Rhaphiolepis indica</i>			
<i>Rhodiola pachyclados</i>			
<i>Rhododendron sp.</i>	2.3 (1 - 3) n3		
<i>Rosa sp.</i>	4.0 (4 - 4) n2		
<i>Rosmarinus officinalis</i>	3.0 (2 - 4) n2		
<i>Rubus calycinooides</i>			
<i>Rudbeckia fulgida var. speciosa</i>			
<i>Rudbeckia hirta</i>	5.0 (5 - 5) n1		
<i>Rudbeckia sp.</i>			
<i>Rumohra adiantiformis</i>			
<i>Sabal minor</i>			
<i>Saccharum ravennae</i>	1.5 (1 - 2) n2		
<i>Saccharum sp.</i>			
<i>Salix sp.</i>			
<i>Salvia nemorosa</i>			
<i>Salvia sp.</i>			
<i>Sambucus sp.</i>			
<i>Santolina chamaecyparissus</i>			
<i>Schizachyrium scoparium</i>	1.3 (1 - 2) n3		
<i>Sedum acre</i>	4.0 (4 - 4) n1		
<i>Sedum album</i>	3.0 (1 - 5) n2		
<i>Sedum hybridum</i>			
<i>Sedum kamtschaticus</i>	4.0 (4 - 4) n2		
<i>Sedum rupestre</i>	4.0 (4 - 4) n2		
<i>Sedum sexamgulare</i>			
<i>Sedum sp.</i>	4.0 (4 - 4) n2		
<i>Sedum spathulifolium</i>	4.0 (4 - 4) n1		
<i>Sedum spurium</i>	4.0 (4 - 4) n1		

Crop	Fiesta Herbicide (Iron HEDTA)	Harmony (thifensulfuron)	Lontrel T&O (Clopyralid)
<i>Sempervivum sp.</i>	3.0 (2 - 4) n2		
<i>Solanum sp.</i>			
<i>Solidago caesia</i>			
<i>Solidago sp.</i>			
<i>Solidago speciosa</i>			
<i>Sorghastrum nutans</i>			
<i>Spiraea japonica</i>			
<i>Spiraea sp.</i>	1.7 (1 - 2) n3		
<i>Sporobolus heterolepis</i>			
<i>Stachys byzantina</i>			
<i>Stipa sp.</i>			
<i>Stokesia sp.</i>			
<i>Stromanthe sp.</i>			
<i>Syringa sp.</i>			
<i>Tagetes erecta</i>			
<i>Taxodium distichum</i>			
<i>Taxus cuspidata</i>			
<i>Taxus sp.</i>	1.0 (1 - 1) n1		
<i>Taxus X media</i>	1.0 (1 - 1) n2		
<i>Teucrium chamaedrys</i>	4.0 (4 - 4) n1		
<i>Thuja occidentalis</i>	2.0 (1 - 4) n3		
<i>Thuja sp.</i>			
<i>Thymus serpyllum</i>			
<i>Trachelospermum asiaticum</i>			
<i>Trachelospermum jasminoides</i>			
<i>Trachycarpus fortunei</i>			
<i>Tsuga canadensis</i>			
<i>Tsuga sp.</i>	1.0 (1 - 1) n2		
<i>Tulbaghia violacea</i>			4.0 (4 - 4) n1
<i>Tulipa sp.</i>			
<i>Ulmus parvifolia</i>			
<i>Ulmus sp.</i>			
<i>Vernonia noveboracensis</i>			
<i>Viburnum sp.</i>	2.7 (2 - 4) n3		
<i>Vinca major</i>			
<i>Vinca minor</i>			
<i>Vinca sp.</i>			
<i>Washingtonia robusta</i>			
<i>Wisteria sp.</i>			
<i>Wodyetia bifurcata</i>			
<i>Zelkova serrata</i>			
<i>Zephyranthes sp.</i>			2.0 (2 - 2) n1
<i>Zinnia angustifolia</i>			
<i>Zinnia sp.</i>			

**Table 4. PostHerbicide Product Crop Safety**

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Abelia sp.</i>				
<i>Abies fraseri</i>		1.7 (1 - 2) n3		
<i>Abies sp.</i>				
<i>Acer negundo var. negundo</i>				
<i>Acer platanoides</i>				
<i>Acer rubrum</i>				
<i>Acer saccharinum</i>				
<i>Acer sp.</i>				
<i>Achillea sp.</i>				
<i>Acorus sp.</i>				
<i>Aesculus glabra</i>				
<i>Aesculus sp.</i>				
<i>Agapanthus sp.</i>				
<i>Agastache rupestris</i>				
<i>Agave sp.</i>				
<i>Alchemilla sp.</i>				
<i>Allamanda cathartica</i>				
<i>Allamanda sp.</i>				
<i>Alnus sp.</i>				
<i>Aloe sp.</i>				
<i>Amelanchier canadensis</i>				
<i>Ammophila breviligulata</i>				
<i>Amsonia hubrichtii</i>				
<i>Andropogon gerardii</i>				
<i>Andropogon virginicus</i>				
<i>Aquilegia sp.</i>				
<i>Arachis sp</i>				
<i>Araucaria heterophylla</i>				
<i>Archontophoenix cunninghamiana</i>				
<i>Arctostaphylos sp.</i>				
<i>Arctotheca calendula</i>				
<i>Aronia melanocarpa</i>				
<i>Asarum canadense</i>				
<i>Asclepias sp.</i>				
<i>Asparagus densiflorus</i>				
<i>Aster sp.</i>				
<i>Astilbe sp.</i>				
<i>Athyrium nipponicum</i>				
<i>Aucuba sp.</i>				
<i>Aurinia saxatilis</i>				
<i>Baptisia sp.</i>				
<i>Begonia sp.</i>				
<i>Berberis sp.</i>				

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Berberis thunbergii</i>				
<i>Berlandiera lyrata</i>				
<i>Betula nigra</i>				
<i>Betula papyrifera</i>				
<i>Betula sp.</i>				
<i>Bougainvillea sp.</i>				
<i>Buxus microphylla</i>				
<i>Buxus sp.</i>				
Cactaceae				
<i>Caladium sp.</i>				3.0 (3 - 3) n1
<i>Calamagrostis acutiflora</i>				
<i>Calamagrostis arundinacea</i>				
<i>Callistemon sp.</i>				
<i>Calluna sp.</i>				
<i>Calycanthus sp.</i>				
<i>Campanula sp.</i>				
<i>Canna x generalis</i>				
<i>Carex buchananii</i>				
<i>Carex cherokeensis</i>				
<i>Carex morrowii</i>				
<i>Carex sp.</i>				
<i>Carya illinoensis</i>				
<i>Cassia sp.</i>				
<i>Castanea sativa</i>				
<i>Catharanthus roseus</i>				
<i>Ceanothus x pallida</i>				
<i>Cedrus atlantica</i>				
<i>Cercis canadensis</i>				
<i>Cercis occidentalis</i>				
<i>Chamaecyparis obtusa</i>				
<i>Chamaecyparis pisifera</i>				
<i>Chamaecyparis sp.</i>				
<i>Chasmanthium latifolium</i>				
<i>Chelone sp.</i>				
<i>Chrysanthemum x rubellum</i>				
<i>Chrysanthemum/Dendranthema sp.</i>				
<i>Chrysanthemum/Dendranthema x morifolium</i>				
<i>Chrysogonum virginianum</i>				
<i>Citrus sp.</i>				
<i>Clematis sp.</i>				
<i>Cleyera japonica</i>				
<i>Cocos sp.</i>				
<i>Coreopsis sp.</i>				
<i>Cornus alternifolia</i>				



Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Cornus florida</i>				
<i>Cornus kousa</i>				
<i>Cornus racemosa</i>				
<i>Cornus sericea</i>				
<i>Cornus sp.</i>				
<i>Cortaderia selloana</i>				
<i>Cortaderia sp.</i>				
<i>Cosmos sp.</i>				
<i>Cotoneaster apiculatus</i>				
<i>Cotoneaster sp.</i>				
<i>Crassula sp.</i>				
<i>Crataegus sp.</i>				
<i>Crocus sp.</i>				
<i>Crocus tommasinianus</i>				
<i>Cryptomeria japonica</i>				
<i>Cupressus sempervirens</i>				
<i>Cupressus sp.</i>				
<i>Cuprocyparis leylandii</i>				
<i>Cycas revoluta</i>				
<i>Cyperus sp.</i>				
<i>Cyrtomium fortunei</i>				
<i>Cytisus sp.</i>				
<i>Dahlia sp.</i>				
<i>Delosperma cooperi</i>				
<i>Delosperma sp.</i>				
<i>Deschampsia caespitosa</i>				
<i>Dianthus deltoides</i>				
<i>Dianthus gratianopolitanus</i>				
<i>Digitalis grandiflora</i>				
<i>Digitalis sp.</i>				
<i>Distylium sp.</i>				
<i>Dryopteris cycadina</i>				
<i>Dryopteris erythrosora</i>				
<i>Dryopteris ludoviciana</i>				
<i>Dryopteris sp.</i>				
<i>Duranta erecta</i>				
<i>Dyopsis lutescens</i>				
<i>Echeveria sp.</i>				
<i>Echinacea purpurea</i>				
<i>Echinacea sp.</i>				3.0 (3 - 3) n1
<i>Echinocactus grusonii</i>				
<i>Elaeagnus angustifolia</i>				
<i>Enkianthus sp.</i>				
<i>Equisetum hyemale</i>				
<i>Eragrostis curvula</i>				

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Eragrostis spectabilis</i>				
<i>Erythronium americanum</i>				
<i>Eucalyptus sp.</i>				
<i>Euonymus alatus</i>				
<i>Euonymus fortunei</i>				
<i>Euonymus japonicus</i>				
<i>Euonymus sp.</i>				
<i>Eupatorium maculatum</i>				
<i>Eupatorium sp.</i>				
<i>Euphorbia sp.</i>				
<i>Fagus sp.</i>				
<i>Festuca cinerea</i>				
<i>Festuca glauca</i>				
<i>Festuca ovina</i>				
<i>Forsythia sp.</i>				
<i>Fothergilla gardenii</i>				
<i>Fraxinus sp.</i>				
<i>Fritillaria meleagris</i>				
<i>Gaillardia sp.</i>				
<i>Gardenia sp.</i>				
<i>Gaura lindheimeri</i>				
<i>Ginkgo biloba</i>				
<i>Gladiolus sp.</i>				
<i>Gomphrena sp.</i>				
<i>Gymnocalycium baldianum</i>				
<i>Hakonechloa sp.</i>				
<i>Hamelia patens</i>				
<i>Hedera helix</i>				
<i>Helianthemum sp.</i>				
<i>Helianthus annuus</i>				
<i>Helictotrichon sp.</i>				
<i>Hemerocallis sp.</i>				
<i>Heuchera sanguinea</i>				
<i>Heuchera sp.</i>				
<i>Heucherella sp.</i>				
<i>Hibiscus rosa-sinensis</i>				
<i>Hibiscus sp.</i>				
<i>Hibiscus syriacus</i>				
<i>Hierochloe odorata</i>				
<i>Hosta sp.</i>	3.0 (3 - 3) n1		3.0 (3 - 3) n1	2.0 (2 - 2) n1
<i>Hyacinthus orientalis</i>				
<i>Hyacinthus sp.</i>				
<i>Hydrangea macrophylla</i>				
<i>Hydrangea paniculata</i>				
<i>Hydrangea quercifolia</i>				

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Hydrangea sp.</i>				
<i>Hylotelephium sieboldii</i>				
<i>Hylotelephium telephium</i>				<b>2.0 (2 - 2) n2</b>
<i>Hypericum sp.</i>				
<i>Iberis sp.</i>				
<i>Ilex cornuta</i>				
<i>Ilex crenata</i>				
<i>Ilex glabra</i>				
<i>Ilex sp.</i>				
<i>Ilex verticillata</i>				
<i>Ilex x attenuata</i>				
<i>Ilex x meserveae</i>				
<i>Iris sp.</i>				
<i>Itea virginica</i>				
<i>Jasminum sp.</i>				
<i>Juglans nigra</i>				
<i>Juglans sp.</i>				
<i>Juncus effusus</i>				
<i>Juniperus chinensis</i>				
<i>Juniperus communis</i>				
<i>Juniperus horizontalis</i>				
<i>Juniperus sp.</i>				
<i>Juniperus virginiana</i>				
<i>Juniperus x media</i>				
<i>Kalmia sp.</i>				
<i>Kerria japonica</i>				
<i>Lagerstroemia indica</i>				
<i>Larix sp.</i>				
<i>Lavandula sp.</i>				
<i>Leucanthemum maximum</i>				
<i>Leucanthemum x superbum</i>				
<i>Leucothoe sp.</i>				
<i>Leymus arenarius</i>				
<i>Ligustrum lucidum</i>				
<i>Ligustrum sp.</i>				
<i>Lilium Asiatic Hybrids</i>				
<i>Lilium sp.</i>				
<i>Liriope muscari</i>				
<i>Liriope sp.</i>				
<i>Liriope spicata</i>				
<i>Lonicera sp.</i>				
<i>Magnolia grandiflora</i>				
<i>Magnolia sp.</i>				
<i>Mahonia aquifolium</i>				
<i>Malus sp.</i>				

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Mammillaria sp.</i>				
<i>Miscanthus sinensis</i>				
<i>Miscanthus sp.</i>				
<i>Muhlenbergia capillaris</i>				
<i>Muhlenbergia dubia</i>				
<i>Muhlenbergia dumosa</i>				
<i>Muhlenbergia rigens</i>				
<i>Myrica cerifera</i>				
<i>Myrica pensylvanica</i>				
<i>Narcissus sp.</i>				<b>2.0 (2 - 2) n1</b>
<i>Nassella tenuissima</i>				
<i>Nepeta x faassenii</i>				
<i>Nerium oleander</i>				
<i>Ophiopogon jaburan</i>				
<i>Ophiopogon sp.</i>				
<i>Osmanthus heterophyllus</i>				
<i>Osmunda regalis</i>			4.0 (4 - 4) n1	
<i>Osteospermum sp.</i>				
<i>Oxydendrum arboreum</i>				
<i>Pachysandra terminalis</i>				
<i>Paeonia lactiflora</i>				
<i>Paeonia sp.</i>				
<i>Panicum virgatum</i>				
<i>Pelargonium x domesticum</i>				
<i>Pennisetum alopecuroides</i>				
<i>Pennisetum orientale</i>				
<i>Pennisetum setaceum</i>				
<i>Pennisetum sp.</i>				
<i>Penstemon sp.</i>				
<i>Perovskia atriplicifolia</i>				
<i>Philadelphus sp.</i>				
<i>Phlox paniculata</i>				
<i>Phlox stolonifera</i>				
<i>Phoenix roebelinii</i>				
<i>Photinia sp.</i>				
<i>Physocarpus opulifolius</i>				
<i>Physocarpus sp.</i>				
<i>Picea abies</i>				
<i>Picea glauca</i>				
<i>Picea glauca 'Conica'</i>				
<i>Picea omorika</i>				
<i>Picea sp.</i>				
<i>Pieris japonica</i>				
<i>Pinus nigra</i>				
<i>Pinus sp.</i>				

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Pinus strobus</i>				
<i>Pinus sylvestris</i>				
<i>Pinus taeda</i>				
<i>Platanus sp.</i>				
<i>Platycodon grandiflorus</i>				
<i>Polygonatum odoratum</i>				
<i>Populus sp.</i>				
<i>Portulaca grandiflora</i>				
<i>Portulacaria sp.</i>				
<i>Prunus laurocerasus</i>				
<i>Prunus serotina</i>				
<i>Prunus sp.</i>				
<i>Pseudotsuga menziesii</i>				
<i>Pulmonaria sp.</i>				
<i>Pyracantha sp.</i>				
<i>Pyrus communis</i>				
<i>Quercus acutissima</i>				
<i>Quercus nuttallii</i>				
<i>Quercus palustris</i>				
<i>Quercus rubra</i>				
<i>Quercus shumardii</i>				
<i>Quercus sp.</i>				
<i>Quercus virginiana</i>				
<i>Rhamnus sp.</i>				
<i>Rhaphiolepis indica</i>				
<i>Rhodiola pachyclados</i>				
<i>Rhododendron sp.</i>				
<i>Rosa sp.</i>				
<i>Rosmarinus officinalis</i>				
<i>Rubus calycinooides</i>				
<i>Rudbeckia fulgida var. speciosa</i>				
<i>Rudbeckia hirta</i>				3.0 (3 - 3) n1
<i>Rudbeckia sp.</i>				
<i>Rumohra adiantiformis</i>				
<i>Sabal minor</i>				
<i>Saccharum ravennae</i>				
<i>Saccharum sp.</i>				
<i>Salix sp.</i>				
<i>Salvia nemorosa</i>				
<i>Salvia sp.</i>				
<i>Sambucus sp.</i>				
<i>Santolina chamaecyparissus</i>				
<i>Schizachyrium scoparium</i>				
<i>Sedum acre</i>				
<i>Sedum album</i>				

Crop	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Sedum hybridum</i>				
<i>Sedum kamtschaticus</i>				
<i>Sedum rupestre</i>				
<i>Sedum sexangulare</i>				
<i>Sedum sp.</i>				
<i>Sedum spathulifolium</i>				
<i>Sedum spurium</i>				
<i>Sempervivum sp.</i>				
<i>Solanum sp.</i>				
<i>Solidago caesia</i>				
<i>Solidago sp.</i>				
<i>Solidago speciosa</i>				
<i>Sorghastrum nutans</i>				
<i>Spiraea japonica</i>				
<i>Spiraea sp.</i>				
<i>Sporobolus heterolepis</i>				
<i>Stachys byzantina</i>				
<i>Stipa sp.</i>				
<i>Stokesia sp.</i>				
<i>Stromanthe sp.</i>				
<i>Syringa sp.</i>				
<i>Tagetes erecta</i>				
<i>Taxodium distichum</i>				
<i>Taxus cuspidata</i>				
<i>Taxus sp.</i>				
<i>Taxus X media</i>				
<i>Teucrium chamaedrys</i>				
<i>Thuja occidentalis</i>				
<i>Thuja sp.</i>				
<i>Thymus serpyllum</i>				
<i>Trachelospermum asiaticum</i>				
<i>Trachelospermum jasminoides</i>				
<i>Trachycarpus fortunei</i>				
<i>Tsuga canadensis</i>				
<i>Tsuga sp.</i>				
<i>Tulbaghia violacea</i>				
<i>Tulipa sp.</i>				
<i>Ulmus parvifolia</i>				
<i>Ulmus sp.</i>				
<i>Vernonia noveboracensis</i>				
<i>Viburnum sp.</i>				
<i>Vinca major</i>				
<i>Vinca minor</i>				
<i>Vinca sp.</i>				
<i>Washingtonia robusta</i>				

<b>Crop</b>	Racer Herbicide (Ammonium nonanoate)	Razor Pro (glyphosate)	Scythe (Pelargonic acid)	SedgeHammer (Halosulfuron)
<i>Wisteria sp.</i>				
<i>Wodyetia bifurcata</i>				
<i>Zelkova serrata</i>				
<i>Zephyranthes sp.</i>				
<i>Zinnia angustifolia</i>				
<i>Zinnia sp.</i>				

**Table 5. PostHerbicide Product Crop Safety**

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Abelia sp.</i>			
<i>Abies fraseri</i>	<b>2.0 (1 - 3) n2</b>	<b>3.0 (3 - 3) n1</b>	
<i>Abies sp.</i>			
<i>Acer negundo var. negundo</i>			
<i>Acer platanoides</i>			
<i>Acer rubrum</i>			
<i>Acer saccharinum</i>			
<i>Acer sp.</i>			
<i>Achillea sp.</i>			
<i>Acorus sp.</i>			
<i>Aesculus glabra</i>			
<i>Aesculus sp.</i>			
<i>Agapanthus sp.</i>			
<i>Agastache rupestris</i>			
<i>Agave sp.</i>			
<i>Alchemilla sp.</i>			
<i>Allamanda cathartica</i>			
<i>Allamanda sp.</i>			
<i>Alnus sp.</i>			
<i>Aloe sp.</i>			
<i>Amelanchier canadensis</i>			
<i>Ammophila breviligulata</i>			
<i>Amsonia hubrichtii</i>			
<i>Andropogon gerardii</i>			
<i>Andropogon virginicus</i>			
<i>Aquilegia sp.</i>			
<i>Arachis sp</i>			
<i>Araucaria heterophylla</i>			
<i>Archontophoenix cunninghamiana</i>			
<i>Arctostaphylos sp.</i>			
<i>Arctotheca calendula</i>			
<i>Aronia melanocarpa</i>			
<i>Asarum canadense</i>			
<i>Asclepias sp.</i>			
<i>Asparagus densiflorus</i>			
<i>Aster sp.</i>			
<i>Astilbe sp.</i>			
<i>Athyrium nipponicum</i>			
<i>Aucuba sp.</i>			
<i>Aurinia saxatilis</i>			
<i>Baptisia sp.</i>			
<i>Begonia sp.</i>			
<i>Berberis sp.</i>			



Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Berberis thunbergii</i>			4.0 (4 - 4) n1
<i>Berlandiera lyrata</i>			
<i>Betula nigra</i>			
<i>Betula papyrifera</i>			
<i>Betula sp.</i>			
<i>Bougainvillea sp.</i>			
<i>Buxus microphylla</i>			4.0 (4 - 4) n1
<i>Buxus sp.</i>			
<i>Cactaceae</i>			
<i>Caladium sp.</i>			
<i>Calamagrostis acutiflora</i>			
<i>Calamagrostis arundinacea</i>			
<i>Callistemon sp.</i>			
<i>Calluna sp.</i>			
<i>Calycanthus sp.</i>			
<i>Campanula sp.</i>			
<i>Canna x generalis</i>			
<i>Carex buchananii</i>			
<i>Carex cherokeensis</i>			
<i>Carex morrowii</i>			
<i>Carex sp.</i>			
<i>Carya illinoensis</i>			
<i>Cassia sp.</i>			
<i>Castanea sativa</i>			
<i>Catharanthus roseus</i>			
<i>Ceanothus x pallida</i>			
<i>Cedrus atlantica</i>			
<i>Cercis canadensis</i>			
<i>Cercis occidentalis</i>			
<i>Chamaecyparis obtusa</i>			
<i>Chamaecyparis pisifera</i>			
<i>Chamaecyparis sp.</i>			
<i>Chasmanthium latifolium</i>			
<i>Chelone sp.</i>			
<i>Chrysanthemum x rubellum</i>			
<i>Chrysanthemum/Dendranthema sp.</i>			
<i>Chrysanthemum/Dendranthema x morifolium</i>			
<i>Chrysogonum virginianum</i>			
<i>Citrus sp.</i>			
<i>Clematis sp.</i>			
<i>Cleyera japonica</i>			
<i>Cocos sp.</i>			
<i>Coreopsis sp.</i>			
<i>Cornus alternifolia</i>			

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Cornus florida</i>			
<i>Cornus kousa</i>			
<i>Cornus racemosa</i>			
<i>Cornus sericea</i>			
<i>Cornus sp.</i>			
<i>Cortaderia selloana</i>			
<i>Cortaderia sp.</i>			
<i>Cosmos sp.</i>			
<i>Cotoneaster apiculatus</i>			
<i>Cotoneaster sp.</i>			
<i>Crassula sp.</i>			
<i>Crataegus sp.</i>			
<i>Crocus sp.</i>			
<i>Crocus tommasinianus</i>			
<i>Cryptomeria japonica</i>			
<i>Cupressus sempervirens</i>			
<i>Cupressus sp.</i>			
<i>Cuprocyparis leylandii</i>			
<i>Cycas revoluta</i>			
<i>Cyperus sp.</i>			
<i>Cyrtomium fortunei</i>			
<i>Cytisus sp.</i>			
<i>Dahlia sp.</i>			
<i>Delosperma cooperi</i>			
<i>Delosperma sp.</i>			
<i>Deschampsia caespitosa</i>			
<i>Dianthus deltoides</i>			
<i>Dianthus gratianopolitanus</i>			
<i>Digitalis grandiflora</i>			
<i>Digitalis sp.</i>			
<i>Distylium sp.</i>			
<i>Dryopteris cycadina</i>			
<i>Dryopteris erythrosora</i>			
<i>Dryopteris ludoviciana</i>			
<i>Dryopteris sp.</i>			
<i>Duranta erecta</i>			
<i>Dyopsis lutescens</i>			
<i>Echeveria sp.</i>			
<i>Echinacea purpurea</i>			
<i>Echinacea sp.</i>			
<i>Echinocactus grusonii</i>			
<i>Elaeagnus angustifolia</i>			
<i>Enkianthus sp.</i>			
<i>Equisetum hyemale</i>			
<i>Eragrostis curvula</i>			

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Eragrostis spectabilis</i>			
<i>Erythronium americanum</i>			
<i>Eucalyptus sp.</i>			
<i>Euonymus alatus</i>			
<i>Euonymus fortunei</i>			
<i>Euonymus japonicus</i>			
<i>Euonymus sp.</i>			
<i>Eupatorium maculatum</i>			
<i>Eupatorium sp.</i>			
<i>Euphorbia sp.</i>			
<i>Fagus sp.</i>			
<i>Festuca cinerea</i>			
<i>Festuca glauca</i>			
<i>Festuca ovina</i>			
<i>Forsythia sp.</i>			3.0 (3 - 3) n1
<i>Fothergilla gardenii</i>			
<i>Fraxinus sp.</i>			
<i>Fritillaria meleagris</i>			
<i>Gaillardia sp.</i>			
<i>Gardenia sp.</i>			
<i>Gaura lindheimeri</i>			
<i>Ginkgo biloba</i>			
<i>Gladiolus sp.</i>			
<i>Gomphrena sp.</i>			
<i>Gymnocalycium baldianum</i>			
<i>Hakonechloa sp.</i>			
<i>Hamelia patens</i>			
<i>Hedera helix</i>			
<i>Helianthemum sp.</i>			
<i>Helianthus annuus</i>			
<i>Helictotrichon sp.</i>			
<i>Hemerocallis sp.</i>			
<i>Heuchera sanguinea</i>			
<i>Heuchera sp.</i>			
<i>Heucherella sp.</i>			
<i>Hibiscus rosa-sinensis</i>			
<i>Hibiscus sp.</i>			3.0 (3 - 3) n1
<i>Hibiscus syriacus</i>			
<i>Hierochloe odorata</i>			
<i>Hosta sp.</i>			2.0 (2 - 2) n1
<i>Hyacinthus orientalis</i>			
<i>Hyacinthus sp.</i>			
<i>Hydrangea macrophylla</i>			
<i>Hydrangea paniculata</i>			
<i>Hydrangea quercifolia</i>			

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Hydrangea sp.</i>			3.0 (3 - 3) n2
<i>Hylotelephium sieboldii</i>			
<i>Hylotelephium telephium</i>			
<i>Hypericum sp.</i>			
<i>Iberis sp.</i>			
<i>Ilex cornuta</i>			
<i>Ilex crenata</i>			
<i>Ilex glabra</i>			
<i>Ilex sp.</i>			
<i>Ilex verticillata</i>			
<i>Ilex x attenuata</i>			
<i>Ilex x meserveae</i>			
<i>Iris sp.</i>			
<i>Itea virginica</i>			
<i>Jasminum sp.</i>			
<i>Juglans nigra</i>			
<i>Juglans sp.</i>			
<i>Juncus effusus</i>			
<i>Juniperus chinensis</i>			
<i>Juniperus communis</i>			
<i>Juniperus horizontalis</i>			
<i>Juniperus sp.</i>			
<i>Juniperus virginiana</i>			
<i>Juniperus x media</i>			
<i>Kalmia sp.</i>			
<i>Kerria japonica</i>			
<i>Lagerstroemia indica</i>			
<i>Larix sp.</i>			
<i>Lavandula sp.</i>			
<i>Leucanthemum maximum</i>			
<i>Leucanthemum x superbum</i>			
<i>Leucothoe sp.</i>			
<i>Leymus arenarius</i>			
<i>Ligustrum lucidum</i>			
<i>Ligustrum sp.</i>			
<i>Lilium Asiatic Hybrids</i>			
<i>Lilium sp.</i>			
<i>Liriope muscari</i>			
<i>Liriope sp.</i>			
<i>Liriope spicata</i>			
<i>Lonicera sp.</i>			
<i>Magnolia grandiflora</i>			
<i>Magnolia sp.</i>			
<i>Mahonia aquifolium</i>			
<i>Malus sp.</i>			

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Mammillaria sp.</i>			
<i>Miscanthus sinensis</i>			
<i>Miscanthus sp.</i>			
<i>Muhlenbergia capillaris</i>			
<i>Muhlenbergia dubia</i>			
<i>Muhlenbergia dumosa</i>			
<i>Muhlenbergia rigens</i>			
<i>Myrica cerifera</i>			
<i>Myrica pensylvanica</i>			
<i>Narcissus sp.</i>			
<i>Nassella tenuissima</i>			
<i>Nepeta x faassenii</i>			
<i>Nerium oleander</i>			
<i>Ophiopogon jaburan</i>			
<i>Ophiopogon sp.</i>			
<i>Osmanthus heterophyllus</i>			
<i>Osmunda regalis</i>			2.0 (2 - 2) n1
<i>Osteospermum sp.</i>			
<i>Oxydendrum arboreum</i>			
<i>Pachysandra terminalis</i>			
<i>Paeonia lactiflora</i>			
<i>Paeonia sp.</i>			
<i>Panicum virgatum</i>			
<i>Pelargonium x domesticum</i>			
<i>Pennisetum alopecuroides</i>			
<i>Pennisetum orientale</i>			
<i>Pennisetum setaceum</i>			
<i>Pennisetum sp.</i>			
<i>Penstemon sp.</i>			
<i>Perovskia atriplicifolia</i>			
<i>Philadelphus sp.</i>			
<i>Phlox paniculata</i>			
<i>Phlox stolonifera</i>			
<i>Phoenix roebelinii</i>			
<i>Photinia sp.</i>			
<i>Physocarpus opulifolius</i>			
<i>Physocarpus sp.</i>			
<i>Picea abies</i>			
<i>Picea glauca</i>			
<i>Picea glauca 'Conica'</i>			
<i>Picea omorika</i>			
<i>Picea sp.</i>			
<i>Pieris japonica</i>			
<i>Pinus nigra</i>			
<i>Pinus sp.</i>			

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Pinus strobus</i>			
<i>Pinus sylvestris</i>			
<i>Pinus taeda</i>			
<i>Platanus sp.</i>			
<i>Platycodon grandiflorus</i>			
<i>Polygonatum odoratum</i>			
<i>Populus sp.</i>			
<i>Portulaca grandiflora</i>			
<i>Portulacaria sp.</i>			
<i>Prunus laurocerasus</i>			
<i>Prunus serotina</i>			
<i>Prunus sp.</i>			
<i>Pseudotsuga menziesii</i>			
<i>Pulmonaria sp.</i>			
<i>Pyracantha sp.</i>			
<i>Pyrus communis</i>			
<i>Quercus acutissima</i>			
<i>Quercus nuttallii</i>			
<i>Quercus palustris</i>			
<i>Quercus rubra</i>			
<i>Quercus shumardii</i>			
<i>Quercus sp.</i>			
<i>Quercus virginiana</i>			
<i>Rhamnus sp.</i>			
<i>Rhaphiolepis indica</i>			
<i>Rhodiola pachyclados</i>			
<i>Rhododendron sp.</i>			
<i>Rosa sp.</i>			
<i>Rosmarinus officinalis</i>			
<i>Rubus calycinooides</i>			
<i>Rudbeckia fulgida var. speciosa</i>			
<i>Rudbeckia hirta</i>			
<i>Rudbeckia sp.</i>			
<i>Rumohra adiantiformis</i>			
<i>Sabal minor</i>			
<i>Saccharum ravennae</i>			
<i>Saccharum sp.</i>			
<i>Salix sp.</i>			
<i>Salvia nemorosa</i>			
<i>Salvia sp.</i>			
<i>Sambucus sp.</i>			
<i>Santolina chamaecyparissus</i>			
<i>Schizachyrium scoparium</i>			
<i>Sedum acre</i>			
<i>Sedum album</i>			

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Sedum hybridum</i>			
<i>Sedum kamtschaticus</i>			
<i>Sedum rupestre</i>			
<i>Sedum sexangulare</i>			
<i>Sedum sp.</i>			
<i>Sedum spathulifolium</i>			
<i>Sedum spurium</i>			
<i>Sempervivum sp.</i>			
<i>Solanum sp.</i>			
<i>Solidago caesia</i>			
<i>Solidago sp.</i>			
<i>Solidago speciosa</i>			
<i>Sorghastrum nutans</i>			
<i>Spiraea japonica</i>			
<i>Spiraea sp.</i>			
<i>Sporobolus heterolepis</i>			
<i>Stachys byzantina</i>			
<i>Stipa sp.</i>			
<i>Stokesia sp.</i>			
<i>Stromanthe sp.</i>			
<i>Syringa sp.</i>			
<i>Tagetes erecta</i>			
<i>Taxodium distichum</i>			
<i>Taxus cuspidata</i>			
<i>Taxus sp.</i>			
<i>Taxus X media</i>			
<i>Teucrium chamaedrys</i>			
<i>Thuja occidentalis</i>			
<i>Thuja sp.</i>			
<i>Thymus serpyllum</i>			
<i>Trachelospermum asiaticum</i>			
<i>Trachelospermum jasminoides</i>			
<i>Trachycarpus fortunei</i>			
<i>Tsuga canadensis</i>			
<i>Tsuga sp.</i>			
<i>Tulbaghia violacea</i>			
<i>Tulipa sp.</i>			
<i>Ulmus parvifolia</i>			
<i>Ulmus sp.</i>			
<i>Vernonia noveboracensis</i>			
<i>Viburnum sp.</i>			3.0 (3 - 3) n1
<i>Vinca major</i>			
<i>Vinca minor</i>			
<i>Vinca sp.</i>			
<i>Washingtonia robusta</i>			



## Environmental Horticulture Program Research Project Sheet

<https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-extension-resources/>

Crop	Tank Mix: Razor Pro + FirstRate (glyphosate + cloran)	Tank Mix: Razor Pro + Harmony (glyphosate + thifensu)	Weed Pharm (Acetic acid)
<i>Wisteria sp.</i>			
<i>Wodyetia bifurcata</i>			
<i>Zelkova serrata</i>			
<i>Zephyranthes sp.</i>			
<i>Zinnia angustifolia</i>			
<i>Zinnia sp.</i>			