



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

**IR-4 Ornamental Horticulture Program
Pelargonic acid Crop Safety**

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Acknowledgements

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Abstract

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.

Introduction

Control of broadleaved weeds and sedges in the production of woody and herbaceous perennials can be problematic because nurseries grow many different types of plants and not all genera or species are listed on labels. These weeds can also be difficult to control in landscape settings for the same reason. Five herbicides, acetic acid (WeedPharm), d-limonene (Avenger Ag), oregano oil (Bryophyter), pelargonic acid (Scythe), and ammonium nonanoate (Emery Agro / Racer), were chosen for research activities into level of crop safety with over the top applications.

Materials and Methods

In the 2010 protocol, two applications of Scythe were made approximately 4 weeks apart. In the 2012 and 2013 protocols, two applications of Scythe were made approximately 8 weeks apart, with the first made under winter conditions and the second application when crop demonstrated active growth. In some trials (CA and VA), applications were made when plants were already growing. The application rates were 3 and 6 % v/v, plus a water treated control. A minimum of four plants (replicate treatments) were required with many researchers exceeding this minimum. Phytotoxicity was recorded on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill) at 1, 2, and 4 weeks after each application. Some researchers also included readings at 8 weeks after the initial and second applications. For more detailed materials and methods, please see protocols at <http://ir4.rutgers.edu/Ornamental/Ornamentals.cfm>.

Scythe was supplied to researchers (See list of researchers in Appendix 1) by Gowan Co.

Results and Summary

Phytotoxicity

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

Scythe caused sufficient injury on four genera/species to recommend growers not utilize Scythe as an over-the-top treatment on actively growing plants for liverwort control (Table 3). For eight genera/species, more information is needed because only 1 or 2 trials were conducted to date (Table 4). Of these eight (8) crops that still need additional information, there are two (2) genera or species in which one trial did not show significant injury at 1X and 2X rates, and one (1) genera/species showing variable response at the 1X rate.

Please see Table 5 for a list of individual trial summaries on Scythe.

Table 1. List of Scythe treated crops with no or minimal transitory injury.

None

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

None

Table 3. List of Scythe treated crops exhibiting significant injury.

Berberis thunbergii
Buxus microphylla

Hydrangea sp.
Syringa sp.

Table 4. List of Scythe treated crops where more information is needed.

*Delosperma sp.*²
Dryopteris erythrosora
*Hemerocallis sp.*¹
Heuchera sp.

*Hosta sp.*¹
Ilex x meserveae
Osmunda regalis
Thuja occidentalis

¹ Little to no injury observed in one container trial.

² Variable response observed with crops exhibiting little to no injury at 1X in some trials but exhibiting moderate injury at 1X in others.

Table 5. Detailed Summary of Crop Safety Testing with Scythe (pelargonic acid)

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 8/01/14 are listed below. Table entries with blank results have been received but not yet cataloged in the database.

| PR# | Product (Active Ingredients) | Crop | ProductionSite | Researcher | State | Year | ApplicationType | Results |
|-------|------------------------------|---|----------------|------------|-------|------|-----------------|---|
| 30123 | Scythe (Pelargonic acid) | Japanese Barberry (Berberis thunbergii) B. 'Crimson Pygmy' | Greenhouse | Mathers | MI | 2010 | Over the top | Severe injury 2 WAT leading to mortality with 10% v/v. |
| 30122 | Scythe (Pelargonic acid) | Boxwood, Japanese (Buxus microphylla) B. 'Green Velvet' | Greenhouse | Mathers | MI | 2010 | Over the top | Severe crop injury (70%) 2 WAT decreasing to moderate but unacceptable (40-53%) injury for the remainder of the trial with 10% v/v. |
| 30793 | Scythe (Pelargonic acid) | Delosperma sp. (Delosperma sp.) 'Cooper's Ice' | Greenhouse | Wilen | CA | 2012 | Over the top | Significant injury with 3 and 6 % v/v; great liverwort control. |
| 30793 | Scythe (Pelargonic acid) | Delosperma sp. (Delosperma sp.) D. cooperi 'Fire Spinner' | Greenhouse | Derr | VA | 2012 | Over the top | Minor injury with 3 and 6 % v/v w/ irrigation; unacceptable initial injury only with both rates w/o irrig, but plants quickly outgrew injury. Best overall liverwort control and limited injury with both rates rate w/o irrig. |
| 30793 | Scythe (Pelargonic acid) | Delosperma sp. (Delosperma sp.) D. nubigenum 'Basutoland' | Greenhouse | Senesac | NY | 2012 | Over the top | Low injury at 3 % w/ irrig. after 2nd applic.; severe at 3% w/o, and 6 % v/v w/ or w/o irrig.; fair to excellent liverwort control with 2 applications. |
| 31048 | Scythe (Pelargonic acid) | Fern, Autumn & Wood (Dryopteris sp.) D. erythrosora | Greenhouse | Senesac | NY | 2012 | Over the top | Slight to moderate injury of evergreen/past season foliage with 3 % and 6 % applied twice, no injury of new growth; fair to excellent liverwort control with 2 applications. |
| 30796 | Scythe (Pelargonic acid) | Daylily (Hemerocallis sp.) 'Mini Pearl' | Greenhouse | Senesac | NY | 2012 | Over the top | Low injury at 3 % and 6 % v/v with irrigation after 2nd applic., moderate w/o irrig.; fair to excellent liverwort control with 2 applications. |
| 30797 | Scythe (Pelargonic acid) | Coral Bells, Alumroot (Heuchera sanguinea) H. villosa 'Caramel' | Greenhouse | Senesac | NY | 2012 | Over the top | Low injury with 3 % v/v w/ irrig., moderate to severe w/o, and at 6 %; fair to excellent liverwort control with 2 applications. |
| 30798 | Scythe (Pelargonic acid) | Hosta (Hosta sp.) 'Blue Hawaii' | Greenhouse | Derr | VA | 2013 | Over the top | Low injury and high liverwort control with 3 % v/v w/ or w/o irrigation and 6 % w/ irrig. |
| 30121 | Scythe (Pelargonic acid) | Hydrangea (Hydrangea sp.) H. 'Invincibelleamorences' | Greenhouse | Mathers | MI | 2010 | Over the top | Severe crop injury with second application (1 WAT2) and for remainder of trial with 10% v/v. No evaluations were taken in first and second WAT due to dormancy. |
| 30124 | Scythe (Pelargonic acid) | Holly, Blue (Ilex x meserveae) I. 'China Girl' | Greenhouse | Mathers | MI | 2010 | Over the top | Moderate crop injury with at 2 WAT and continuing throughout trial (20-45%) with 10% v/v. |

| | | | | | | | | |
|-------|--------------------------------|--|------------|---------|----|------|--------------|--|
| 31876 | Scythe (Pelargonic acid) | Fern, Royal (<i>Osmunda regalis</i>) | Greenhouse | Derr | VA | 2013 | Over the top | Low injury and good liverwort control only with 3 % v/v w/ irrigation; unacceptable injury at 3 % w/o, and 6 % w/ or w/o, irrig. |
| 30120 | Scythe (Pelargonic acid) | Lilac (<i>Syringa</i> sp.) S. 'Paliban' | Greenhouse | Mathers | MI | 2010 | Over the top | Significant (45%) crop injury 4 WAT increasing to mortality with 10% v/v. No ratings taken in first two weeks due to dormancy. |
| 30125 | Scythe (Pelargonic acid) | Arborvitae, American (<i>Thuja occidentalis</i>) T. 'Techny' | Greenhouse | Mathers | MI | 2010 | Over the top | Little crop injury with one application of 10% v/v. Second application caused significant (40%) continuing to end of trial. |

Label Suggestions

For Scythe, data suggest no change in its current label recommendations to avoid contact with desirable plants.

Appendix 1: Contributing Researchers

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|--------------------|---|
| Dr. Jeffrey Derr | Hampton Roads Ag. Exp. Station 1222 Diamond Springs Road, Virginia Beach, VA 23244 |
| Dr. Hannah Mathers | The Ohio State University Dept. Hort. and Crop Science 2001 Fyffe Ct. Columbus, OH 23210 |
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