Environment Horticulture Program Research Summaries

IR-4 Ornamental Horticulture Program
SP1770 Liquid Crop Safety

Authors: Ely Vea and Cristi L. Palmer
Date: December 19, 2018

Acknowledgements
Susan Bierbrunner

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2015-34383-23710 with substantial cooperation and support from the State Agricultural Experiment Stations and USDA-ARS.

Table of Contents

Table of Tables

Abstract

SP1770 Liquid is a new herbicide being developed by SePro. The IR-4 Project completed 27 crop safety trials on 19 environmental horticulture plant species or genera during 2016 to 2018. In these trials, 16 of the 19 species or genera tested exhibited significant injury in the limited number of trials (one or two) for each crop.

Introduction

SP1770 Liquid is a new herbicide being developed by SePro. The IR-4 Project completed 27 crop safety trials on 19 ornamental horticulture plant species or genera during 2016 to 2018.

Materials and Methods

SP1770 Liquid was applied as foliar treatment typically 3 times at approximately 14 days intervals. The application rates were 67, 100 and 200 oz per 100 gal, plus a water treated control. A minimum of ten plants (replicate treatments) were required. Phytotoxicity was planned to be recorded on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill). Phytotoxicity was rated weekly up to 6 weeks after initial application. For IR-4 testing, the following protocols were used: 16-010, 17-010 and 18-012. For more detailed materials and methods, including application rates for various products, please visit http://ir4.rutgers.edu/ornamental/OrnamentalDrafts.cfm to view and download these protocols.

SP1770 Liquid was supplied to researchers (See list of researchers in Appendix 1) by SePro.

Results and Summary

Based on the type and nature of injury seen with pesticide applications, tested plant species were placed into four categories: 1) no significant phytotoxicity or growth differences from the untreated check or any injury was transitory, 2) no or minimal transitory injury seen at the 1X rate, but the 2X and/or 4X rates did cause significant phytotoxicity, 3) significant injury at the 1X rate sufficient to recommend growers not utilize SP1770 Liquid, and 4) more data are needed to make informed recommendations.

Phytotoxicity

Across all crops tested with SP1770 Liquid, no crop that exhibited no or minimal negative impact had the minimum number of 3 tests for definitive conclusion of crop safety. Two species exhibited significant injury at higher rates even though little or no injury was observed at the lower rate (Table 2). Six species or genera tested exhibited damage sufficient to recommend growers not utilize SP1770 Liquid (Table 3). There were 11 species or genera where less than 3 trials were conducted so there is not enough information available at this time; only 4 of these crops showed no or minimal injury (Table 4).

Please see Table 5 for a summary of the individual trial results.

Table 1. List of SP1770 Liquid treated crops with no or minimal transitory injury.

None

Table 2. List of SP1770 Liquid treated crops with no injury at 1X but significant injury at 2X or 4X.

Magnolia grandiflora
Magnolia tripelata

Table 3. List of SP1770 Liquid treated crops with significant injury at 1X.

Cornus sericea
Festuca glauca
Forsythia x courtasol
Hibiscus spp.
Itea virginica
Osmunda regalis

Table 4. List of SP1770 Liquid treated crops where more information may be needed.

Cornus nuttali [1]
Cornus sp.
Forsythia x intermedia [1]
Gardenia jasminoides [2]
Gardenia sp.
Ilex cornuta
Pinus contorta
Pinus mugo
Quercus. garryana
Quercus macrocarpa x Q. robur [1]
Quercus rubra

[1] No or minimal injury in 1 trial
[2] No injury in 2 trials

Table 5 Detailed Summary of Crop Safety Testing with SP1770 Liquid.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 11/29/2018are listed below.

PR#	Crop	Production Site	Researcher	State	Trial Year	Application Type	Results
32193	Dogwood (Cornus sp.) Cornus sericea	Field Container	Miller	WA	2018	Over the top	Moderate to severe injury and growth reduction increasing with rates (9.6, 19.2 and 38.4 fl oz per acre) applied twice.
32193	Dogwood (Cornus sp.) 'Arctic Fire'	Field Container	Aulakh	CT	2015	Over the top	Slight to severe injury (leaf necrosis and chlorosis) and growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice; treated plants commercially unacceptable.
32193	Dogwood (Cornus sp.) Cornus nuttali	Field Container	Siefer	OH	2017	Over the top	No significant injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32635	Field Fescue (Festuca glauca) 'Elijah Blue’	Field Container	Wilen	CA	2016	Over the top	Moderate to severe injury increasing with rates (9, 19 and 38 fl oz per acre) applied twice.
32188	Forsythia (Forsythia sp.)	Field Container	Miller	WA	2017	Over the top	Minor injury with 9.6, 19.2 and 28.4 fl oz per acre applied twice; minor growth reduction 4X.
32188	Forsythia (Forsythia sp.) 'Courtasol' Gold Tide	Field Container	Mathers	OH	2016	Over the top	Moderate to severe injury and growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32188	Forsythia (Forsythia sp.) F. x intermedia 'Lynwood Gold'	Field Container	Gilliam	AL	2017	Over the top	No injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32190	Gardenia (Gardenia sp.)	Field Container	Witcher	TN	2017	Over the top	Moderate to severe injury increasing with rates (9.6, 19.2 and 38.4 fl oz per acre) applied twice.
32190	Gardenia (Gardenia sp.) G jasminoides 'August Beauty'	Field Container	Gilliam	AL	2017	Over the top	No injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32190	Gardenia (Gardenia sp.) G. jasminoides	Field Container	Uber	CA	2017	Over the top	No significant injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32185	Rosemallow (Hibiscus sp.)	Field Container	DeFrancesco	OR	2016	Over the top	Slight injury with 9.6, moderate with 19.2 and 38.4, fl oz per acre; moderate growth reduction at 1X, high at 2X and 4X.
32185	Rosemallow (Hibiscus sp.) H. moscheutos	Field Container	Persad	OH	2016	Over the top	Moderate to severe injury increasing with rates (9.6, 19.2 and 38.4 fl oz per acre) applied twice.
32185	Rosemallow (Hibiscus sp.) H. moscheutos 'Robert Fleming'	Field Container	Beste	MD	2017	Over the top	Moderate injury with 9.6, 19.2 and 38.4 fl oz per acre after 1st applic, severe after 2nd applic.
32185	Rosemallow (Hibiscus sp.) 'Luna Red'	Field Container	Mathers	OH	2016	Over the top	Moderate to severe injury with 9.6, 19.2 and 38.4 fl oz per acre applied twice; slight growth reduction at 2X and 4X.
32186	Holly, Chinese (Ilex cornuta) 'Burfordii nana'	Field Container	Beste	MD	2017	Over the top	No significant injury with 9.6, 19.2 and 38.4 fl oz per acre after 1st applic, moderate with good recovery after 2nd applic; moderate growth reduction, though not significant, at all rates.
32186	Holly, Chinese (Ilex cornuta) 'Needlepoint'	Field Container	Gilliam	AL	2017	Over the top	No injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.

PR#	Crop	Production Site	Researcher	State	Trial Year	Application Type	Results
32192	Virginia Sweetspire (Itea virginica) 'Henry Garnet'	Field Container	Aulakh	CT	2015	Over the top	Moderate to severe injury (leaf necrosis and chlorosis) with 9.6, 19.2 and 38.4 fl oz per acre applied twice; treated plants commercially unacceptable.
32192	Virginia Sweetspire (Itea virginica) 'Henry's Garnet'	Field Container	Siefer	OH	2017	Over the top	Moderate injury with 9.6, 19.2 and 38.4 fl oz per acre applied twice; no significant growth reduction.
32194	Magnolia (Magnolia sp.) M. grandiflora	Field Container	Marble	FL	2017	Over the top	Minor to moderate injury at 9.6 and 19.2, severe injury and growth reduction at 38.4 fl oz per acre applied twice.
32194	Magnolia (Magnolia sp.) M. tripetala	Field Container	Siefer	OH	2017	Over the top	Minor injury with 9.6, moderate with 19.2 and 38.4 fl oz per acre applied twice; no significant growth reduction.
32191	Fern, Royal (Osmunda regalis)	Field Container	Derr	VA	2017	Over the top	Minor injury (bleaching) with 9.6, moderate and unacceptable with 19.2 and 38.4 fl oz per acre.
32191	Fern, Royal (Osmunda regalis) 'Royal'	Field Container	Senesac	NY	2016	Over the top	Moderate injury with 0.15 and 0.30, severe with 0.60 lb ai per acre applied twice.
32187	Pine (Pinus sp.) P. contorta	Field Container	Miller	WA	2016	Over the top	Some injury, though not statistically significant, with 9.6, 19.2 and 38.4 fl oz per acre applied twice; no growth reduction.
32187	Pine (Pinus sp.) P. mugo 'Slow Mound'	Field Container	Mathers	OH	2016	Over the top	No injury with 9.6, 19.2 and 38.4 fl oz per acre applied twice; moderate and severe growth reduction at 2X and 4X.
32189	Oak (Quercus sp.) Q. garryana	Field Container	Miller	WA	2017	Over the top	No injury with 9.6, 19.2 and 38.4 fl oz per acre after 1st, moderate with 4X after 2nd applic; no growth reduction.
32189	Oak (Quercus sp.) Q. macrocarpa x Q. robur	Field Container	Siefer	OH	2017	Over the top	Minor injury with 9.6, 19.2 and 38.4 fl oz per acre applied twice; no significant growth reduction.
32189	Oak (Quercus sp.) Q. rubra	Field Container	Beste	MD	2017	Over the top	Moderate injury with good recovery at 9.6, 19.2 and 38.4 fl oz per acre after 1st applic, moderate to severe after 2nd applic; no growth reduction.

Appendix 1: Contributing Researchers

Dr. Jatinder S Aulakh	Connecticut Agricultural Experiment Station Valley Laboratory 143 Cook Hill Road, P.O. Box 228 Windsor, CT
Dr. Ed Beste	University of Maryland LESREC – Salisbury Facility 27664 Nanticoke Road Salisbury, MD 21801
Mr. Joe DeFrancesco *(retired)*	Oregon State University 2057 Cordley Hall Corvallis OR 97331-2915
Dr. Jeffrey Derr	Hampton Roads Ag. Exp. Station 1444 Diamond Springs Road Virginia Beach, VA 23455
Dr. Charles Gilliam *(retired)*	Auburn University Department of Horticulture 101 Funchess Hall Auburn, AL 36849
Dr. Chris Marble	University of Florida Mid-Florida Research and Education Center 2725 S. Binion Rd. Apopka, FL 32703
Dr. Hannah Mathers	Mathers Environmental Science Services, LLC Gahanna, OH 43230
Dr. Tim Miller	Washington State University 16650 State Route 536 Mount Vernon, WA 98273-9761
Dr. Anand Persad	The Davey Institute 1500 Mantua St Kent, OH 44240
Dr. Andy Senesac	Long Island Horticultural Research Center Cornell University 3059 Sound Avenue Riverhead, NY 11901
Dr. John Siefer *(past affiliate)*	The Davey Institute 1500 Mantua St Kent, OH 44240

Mr. Buzz Uber	Crop Inspection Service 31130 Hilltop Drive Valley Center, CA 92082
Dr. Anthony Witcher	Tennessee State University Otis L. Floyd Nursery Research Center 472 Cadillac Lane McMinnville,TN 37110