



[Environment Horticulture Program Research Summaries](#)

IR-4 Environmental Horticulture Program SP1770 Crop Safety

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Acknowledgements

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Abstract

SP1770 was a new herbicide being developed by SePro. The IR-4 Project completed 41 crop safety trials on 29 environmental horticulture plant species or genera during 2016 to 2019. In these trials, 16 of the 29 species or genera tested exhibited significant injury in the limited number of trials (one or two) for each crop.

Introduction

SP1770 was a new herbicide being developed by SePro. The IR-4 Project completed 41 crop safety trials on 29 environmental horticulture plant species or genera during 2016 to 2019.

Materials and Methods

SP1770 Liquid was applied twice over the top as plants broke dormancy and approximately 6 weeks later. SP1770 Granular was applied as a broadcast application at similar times.. 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, 18-012, and 19-012. For more detailed materials and methods, including application rates for various products, please visit <https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-researcher-resources/#Protocols> to view and download these protocols.

SP1770 Liquid and Granular 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 and SP1770 Granular, no crop species 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 of SP1770 Liquid even though little or no injury was observed at the lower rate (Table 3). Six species or genera tested exhibited damage sufficient to recommend growers not utilize SP1770 Liquid (Table 4). There were two species where results were inconsistent (Table 5). 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 6). SP1770 Granular did not have sufficient numbers of trials on any crop for definitive conclusions, but most had no to minimal injury in 1 or 2 trials (Table 7).

Please see Table 8 for a summary of the individual trial results.

Table 1. Overview of Crop Safety Outcomes with Over the Top applications of SP1770 Formulations.

Crop Latin Name	SP1770 Granular	SP1770 Liquid-
<i>Andropogon gerardii</i>	1.0 (1 - 1) n1	
<i>Carex morrowii</i>	3.0 (3 - 3) n1	4.0 (4 - 4) n1
<i>Cornus sp.</i>		3.0 (1 - 4) n3
<i>Eragrostis spectabilis</i>	1.0 (1 - 1) n1	
<i>Festuca glauca</i>		4.7 (4 - 5) n3
<i>Forsythia sp.</i>		2.3 (1 - 4) n3
<i>Gardenia sp.</i>		2.0 (1 - 4) n3
<i>Hibiscus sp.</i>		4.0 (4 - 4) n4
<i>Ilex cornuta</i>		1.7 (1 - 3) n3
<i>Itea virginica</i>		3.5 (3 - 4) n2
<i>Juncus effusus</i>	1.0 (1 - 1) n1	
<i>Magnolia sp.</i>		3.5 (3 - 4) n2
<i>Muhlenbergia capillaris</i>	3.0 (3 - 3) n1	
<i>Nassella tenuissima</i>	2.0 (2 - 2) n1	
<i>Osmunda regalis</i>		3.5 (3 - 4) n2
<i>Panicum virgatum</i>	1.0 (1 - 1) n1	
<i>Pennisetum orientale</i>	2.0 (2 - 2) n2	
<i>Pinus sp.</i>		1.0 (1 - 1) n3
<i>Quercus sp.</i>		3.0 (2 - 4) n3

Table 2. List of SP1770 Liquid treated crops with no or minimal transitory injury.

None

Table 3. List of SP1770 Liquid treated crops with no injury at 1X but significant injury at 2X or 4X.

Magnolia grandiflora
Magnolia tripelata

Table 4. List of SP1770 Liquid treated crops with significant injury at 1X.

<i>Carex morrowii</i>	<i>Hibiscus spp.</i>
<i>Cornus sericea</i>	<i>Itea virginica</i>
<i>Festuca glauca</i>	<i>Osmunda regalis</i>

Table 5. List of SP1770 Liquid treated crops where more information may be needed.

Forsythia sp. *Gardenia jasminoides*²

Table 6. List of SP1770 Liquid treated crops with less than 3 trials.

<i>Cornus nuttali</i> ¹	<i>Pinus contorta</i>	<i>Quercus rubra</i>
<i>Cornus sp.</i>	<i>Pinus mugo</i> ¹	.
<i>Forsythia x intermedia</i> ¹	<i>Pinus taeda</i> ¹	.
<i>Ilex befidi</i> ¹	<i>Quercus. garryana</i>	.
<i>Ilex cornuta</i> ¹	<i>Quercus macrocarpa x Q. robur</i> ¹	.

Table 7. List of SP1770 Granular treated crops with less than 3 trials.

<i>Andropogon gerardii</i> ¹	<i>Juncus effusus</i> ¹	<i>Panicum virgatum</i> ¹
<i>Carex morrowii</i> ¹	<i>Muhlenbergia capillaris</i>	<i>Pennisetum orientale</i> ¹
<i>Eragrostis spectabilis</i>	<i>Nassella tenuissima</i>	.

¹ No or minimal injury in 1 trial

² No injury in 2 trials

Table 8. Detailed Summary of Crop Safety Testing with SP1770.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 3/12/2021 are listed below.

PR#	Product (Active Ingredients)	Crop	Production Site	Researcher	State	Trial Year	Application Type	Results
32177	SP1770 Granular (SP1770)	Big Blue Stem (Andropogon gerardii)	Field Container	Senesac	NY	2019	Over the top	No injury or stunting with 100, 200 and 400 lb per acre applied twice.
33828	SP1770 Granular (SP1770)	Sedge, Marrow's (Carex morrowii) 'Ice Dance'	Field Container	Senesac	NY	2019	Over the top	Minor to moderate injury with 100, 200 and 400 lb per acre applied twice; moderate stunting.
32179	SP1770 Granular (SP1770)	Purple Lovegrass (Eragrostis spectabilis)	Field Container	Senesac	NY	2019	Over the top	No injury or stunting with 100, 200 and 400 lb per acre applied twice.
32180	SP1770 Granular (SP1770)	Common Rush (Juncus effusus)	Field Container	Senesac	NY	2019	Over the top	No injury or stunting with 100, 200 and 400 lb per acre applied twice.
32181	SP1770 Granular (SP1770)	Muhly, Hairyawn (Muhlenbergia capillaris)	Field Container	Senesac	NY	2019	Over the top	Minor to moderate injury with 100, 200 and 400 lb per acre applied twice.
32182	SP1770 Granular (SP1770)	Finestem Needlegrass (Nassella tenuissima)	Field Container	Senesac	NY	2019	Over the top	Minor injury with 100, 200 and 400 lb per acre applied twice.
32183	SP1770 Granular (SP1770)	Switch Grass (Panicum virgatum)	Field Container	Senesac	NY	2019	Over the top	No injury or stunting with 100, 200 and 400 lb per acre applied twice.
32184	SP1770 Granular (SP1770)	Oriental Fountain Grass (Pennisetum orientale)	Field Container	Cochran (IA)	IA	2019	Over the top	No significant injury with 100, 200 and 400 lb per acre applied twice; minor growth reduction.
32184	SP1770 Granular (SP1770)	Oriental Fountain Grass (Pennisetum orientale)	Field Container	Senesac	NY	2019	Over the top	No injury with 100 and 200, very minor with 400 lb per acre applied twice; no stunting.
32178	SP1770 Liquid (SP1770)	Sedge, Marrow's (Carex morrowii) 'Ice Dance'	Field Container	Mathers	OH	2018	Over the top	Severe injury with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32193	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	Dogwood (Cornus sp.) C. 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	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	Field Fescue (Festuca glauca)	Field Container	Cochran (IA)	IA	2018	Over the top	Severe injury and plant death with 9.6, 19.2 and 38.4 oz per acre applied twice.
32635	SP1770 Liquid (SP1770)	Field Fescue (Festuca glauca) 'Elijah Blue'	Field Container	Mathers	OH	2018	Over the top	Severe injury with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32635	SP1770 Liquid (SP1770)	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.

PR#	Product (Active Ingredients)	Crop	Production Site	Researcher	State	Trial Year	Application Type	Results
32188	SP1770 Liquid (SP1770)	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.
32188	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	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.
32190	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	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.
32190	SP1770 Liquid (SP1770)	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.
32185	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	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.
32185	SP1770 Liquid (SP1770)	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.
32186	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	Holly, Chinese (Ilex cornuta) I. berfidi	Field Container	Fraelich	GA	2017	Over the top	No injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32186	SP1770 Liquid (SP1770)	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.
32192	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	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	SP1770 Liquid (SP1770)	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.

PR#	Product (Active Ingredients)	Crop	Production Site	Researcher	State	Trial Year	Application Type	Results
32194	SP1770 Liquid (SP1770)	Magnolia (Magnolia sp.) <i>M. tripetala</i>	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	SP1770 Liquid (SP1770)	Fern, Royal (<i>Osmunda regalis</i>)	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	SP1770 Liquid (SP1770)	Fern, Royal (<i>Osmunda regalis</i>) '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	SP1770 Liquid (SP1770)	Pine (<i>Pinus</i> sp.) <i>P. taeda</i>	Field Container	Fraelich	GA	2017	Over the top	No injury or growth reduction with 9.6, 19.2 and 38.4 fl oz per acre applied twice.
32187	SP1770 Liquid (SP1770)	Pine (<i>Pinus</i> sp.) <i>P. mugo</i> '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.
32187	SP1770 Liquid (SP1770)	Pine (<i>Pinus</i> sp.) <i>P. contorta</i>	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.
32189	SP1770 Liquid (SP1770)	Oak (<i>Quercus</i> sp.) <i>Q. rubra</i>	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.
32189	SP1770 Liquid (SP1770)	Oak (<i>Quercus</i> sp.) <i>Q. garryana</i>	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	SP1770 Liquid (SP1770)	Oak (<i>Quercus</i> sp.) <i>Q. macrocarpa</i> x <i>Q. robur</i>	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.

Appendix 1: Contributing Researchers

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