



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

IR-4 Ornamental Horticulture Program Heritage (Azoxystrobin) Crop Safety

**Authors: Ely Vea and Cristi L. Palmer
Date: June 18, 2009**

Acknowledgements

**Lori Harrison
J. Ray Frank**

Table of Contents

Table of Contents	2
Table of Tables	3
Abstract	4
Introduction.....	5
Materials and Methods.....	5
Results and Summary	5
Phytotoxicity of Heritage	5
Label Suggestions	13
Appendix 1: Available Protocol.....	14
Appendix 2: Contributing Researchers	17
Appendix 3: Submitted Data.....	18

Table of Tables

Table 1.	List of Heritage 50WG treated crops with no or minimal transitory injury.	6
Table 2.	Detailed Summary of Crop Safety Testing with Heritage 50WG	7

Abstract

Azoxystrobin was registered as Heritage in the United States in 1997 as a turf fungicide. In April 2003, this label was updated to include applications for certain diseases on ornamental crops. The label contains an extensive list of ornamental horticulture plants where Heritage can be used without causing phytotoxicity. From 1999 to 2002, the IR-4 Project conducted 100 trials on 75 ornamental plant species examining phytotoxicity related to Heritage applications. In these trials, only 2 crops (*Pseudotsuga menziesii* and *Tsuga heterophylla*) exhibited noticeable, significant injury and that was a slight height reduction and stem swelling at the 2X and 4X rates applied as drench to emerged seedlings. Based on this information, it is recommended that 53 plants in the IR-4 trials be added to the list of tolerant plants with the precautionary statements in the Plant Safety and Tolerant Ornamentals Plant sections of the current Heritage 50WG label.

Introduction

Azoxystrobin was registered as Heritage in the United States in 1997 as a turf fungicide. In April 2003, this label was updated to include applications for certain diseases on ornamental crops. From 1999 to 2002, the IR-4 Project conducted 100 trials primarily examining phytotoxicity related to Heritage applications.

Materials and Methods

Heritage was tested applied as foliar treatment typically twice at approximately 14 days interval. The application rates were typically 1, 2 and 4 oz of 50WG per acre or per 100 gal, plus a water treated control, although one researcher used 8, 16 and 32 oz per acre in 36 1999-2000 trials. In 2 trials, Heritage was applied as drench to emerged seedlings. A minimum of three plants (replicate treatments) were required with most researchers exceeding this minimum. Phytotoxicity was recorded on a scale of 0 to 10 (0 = No phytotoxicity; 10 = Complete kill) one to four times from 1 to 8 weeks after initial application. For more detailed materials and methods, please see Appendix 1: Protocols.

Heritage was supplied to researchers (See list of researchers in Appendix 2) by Syngenta.

Results and Summary

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

Phytotoxicity of Heritage

Across all plant species tested, Heritage exhibited no or minimal negative impact (Table 1). Seventy five plant genera or species fell into this category.

Please see Table 2 for a summary of the individual trial results.

Table 1. List of Heritage 50WG treated crops with no or minimal transitory injury.

<i>Abies fraseri</i> ¹	<i>Ligustrum</i> sp.
<i>Abies procera</i>	<i>Lilium</i> sp.
<i>Acer saccharum</i> ¹	<i>Lobelia cardinalis</i>
<i>Anemone pulsatilla</i>	<i>Lonicera xylosteum</i>
<i>Aurinia saxatilis</i>	<i>Monarda x hybrida</i>
<i>Betula nigra</i> ¹	<i>Nepeta cataria</i>
<i>Centaurea dealbata</i>	<i>Penstemon barbatus</i>
<i>Chrysanthemum x hybrida</i>	<i>Perovskia atriplicifolia</i>
<i>Chrysanthemum</i> sp. ¹	<i>Phlox</i> sp. ¹
<i>Chrysanthemum x superbum</i>	<i>Pieris japonica</i> ¹
<i>Clematis</i> sp.	<i>Populus deltoids</i>
<i>Coreopsis</i> sp.	<i>Populus nigra</i>
<i>Cornus florida</i> ¹	<i>Potentilla</i> sp. ¹
<i>Crocasmia x crocosmiflora</i>	<i>Primula</i> sp. ¹
<i>Cotoneaster</i> sp.	<i>Pseudotsuga menziesii</i>
<i>Dahlia</i> sp.	<i>Quercus palustris</i> ¹
<i>Delphinium</i> sp. ¹	<i>Rhododendron</i> sp. ¹
<i>Dianthus chinensis</i>	<i>Rosa</i> sp. ¹
<i>Digitalis mertonensis</i>	<i>Rudbeckia hirta</i> ¹
<i>Euonymus alatus</i> ¹	<i>Salvia splendens</i>
<i>Forsythia</i> sp.	<i>Schizachyrium scoparium</i>
<i>Gaillardia grandiflora</i>	<i>Solidago canadensis</i>
<i>Galium odoratum</i>	<i>Syringa reflexa</i>
<i>Geranium magniflorum</i>	<i>Syringa</i> sp.
<i>Gladiolus</i> sp.	<i>Taxus x media</i>
<i>Gleditsia tricanthos</i>	<i>Teucrium chamaedris</i>
<i>Hedera helix</i> ¹	<i>Thuja plicata</i>
<i>Heliopsis helianthoides</i>	<i>Thuja</i> sp.
<i>Hibiscus althea</i>	<i>Thymus vulgaris</i>
<i>Hosta fortunei</i>	<i>Tsuga canadensis</i>
<i>Ilex cornuta</i>	<i>Tsuga heterophylla</i>
<i>Iris xiphium</i>	<i>Verbena</i> sp. ¹
<i>Juniperus</i> sp. ¹	<i>Verbena x hybrida</i>
<i>Lagerstroemia indica</i> ¹	<i>Veronica</i> sp.
<i>Lathyrus odoratus</i>	<i>Viola cornuta</i>
<i>Lavandula angustifolia</i>	<i>Weigela</i> sp.

¹ Already registered

Table 2. Detailed Summary of Crop Safety Testing with Heritage 50WG

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 5/4/09 are listed below.

PR #	Crop			Use Site	Researcher	Year	Application Method	Results	File Name
	Common Name	Latin Name	Cultivar						
13778	Fir	Abies sp.	A. fraseri	Field Container	Benson	2002	Drench	No injury at 1, 2 and 4 oz product per 100 gal	20021001a.pdf
13778	Fir	Abies sp.	A. procera	Field Container	Linderman	2001	Foliar	No injury at 4, 8 and 16 oz product per acre	20021001d.pdf
13781	Maple	Acer sp.	A. saccharum	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901a.pdf
13883	Windflower, Lily-Of-The-Field	Anemone sp.	A. pulsatilla	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001a.pdf
13892	Basket-Of-Gold	Aurinia saxatilis		Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901c.pdf
14165	Basket-Of-Gold	Aurinia saxatilis		Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901d.pdf
13787	Birch	Betula sp.	B. nigra	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901f.pdf
13899	Batchelor's Button	Centaurea sp.	C. dealbata	Field Container	Linderman	2000	Foliar	No injury at 8, 16 and 32 oz product per acre	20001001b.pdf
13843	Clematis	Clematis sp.	'Elsa Spaeth'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901k.pdf
13906	Tickseed	Coreopsis sp.	'Early Sunrise'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001c.pdf
14179	Tickseed	Coreopsis sp.	'Early Sunrise'	Field In-Ground	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001d.pdf
13795	Dogwood, Flowering	Cornus florida		Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	199909011.pdf
13746	Cotoneaster	Cotoneaster sp.	'Variegated Rockspray'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901m.pdf
13907	Montbretia	Crococsmia x crocosmiflora	'Lucifer'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901n.pdf
13908	Dahlia	Dahlia sp.	'Diana's Memory'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001f.pdf
14181	Dahlia	Dahlia sp.	'Sunny Yellow'	Field In-Ground	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001e.pdf
13910	Larkspur	Delphinium sp.	'Double Special Imperial Giant Mixture'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901o.pdf

PR #	Crop			Use Site	Researcher	Year	Application Method	Results	File Name
	Common Name	Latin Name	Cultivar						
13903	Chrysanthemum	Dendranthema sp.	Chrysanthemum cv 'Raquel'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990903l.pdf
13903	Chrysanthemum	Dendranthema sp.	Chrysanthemum x hybrida 'Snowland'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901g.pdf
13903	Chrysanthemum	Dendranthema sp.	Chrysanthemum x superbum 'Snowland'	Field Container	Linderman	2001	Foliar	No trial report posted	
13912	Pinks	Dianthus sp.	D. chinensis 'Carpet Crimson'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901q.pdf
14185	Pinks	Dianthus sp.	D. chinensis 'Carpet Crimson'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901p.pdf
13914	Foxglove	Digitalis sp.	D. x mertonensis 'Strawberry'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901r.pdf
13803	Winged Burning Bush	Euonymus alatus	'Compacta'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901s.pdf
13805	Golden Bells	Forsythia sp.	'Lynwood Gold'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901t.pdf
14078	Golden Bells	Forsythia sp.	'Lynwood Gold'	Field In-Ground	Englander	1999	Foliar	No injury at 1, 2 and 4 oz product per 100 gal	19990903n.pdf
13927	Strawberry (Non-Bearing)	Fragaria sp.	Totem	Field Container	Linderman	1999		Wrong PR # - Trial report is for PR # 13928 already summarized	19990901v.pdf
13928	Blanket Flower	Gaillardia sp.	G. grandiflora 'Goblin'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901v.pdf
14201	Blanket Flower	Gaillardia sp.	G. grandiflora 'Goblin'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901w.pdf
13929	Sweet Woodruff	Galium odoratum		Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901x.pdf
14202	Sweet Woodruff	Galium odoratum		Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901y.pdf
14202	Sweet Woodruff	Galium odoratum		Field In-Ground	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001g.pdf
13931	Geranium	Geranium magniflorum	'Dynamo Deep Scarlet'	Field Container	Locke	1999	Foliar	No injury at 1, slight marginal floral necrosis at 2 and 4 oz product per acre	19990901z.pdf
13931	Geranium	Geranium magniflorum	'Maverick Red'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902a.pdf
13933	Corn Flag, Sword Lily	Gladiolus sp.	'Nova Lux'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902b.pdf

PR #	Crop			Use Site	Researcher	Year	Application Method	Results	File Name
	Common Name	Latin Name	Cultivar						
13857	Honey Locust	Gleditsia sp.	G. tricanthos 'Inermis'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001h.pdf
13844	English Ivy	Hedera helix L. ssp. Helix		Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990903o.pdf
13937	False Sunflower, Smooth Oxeye	Heliopsis helianthoides	'Summer Sun'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902c.pdf
14055	Rose-Of-Sharon, Althaea	Hibiscus syriacus	H. althea 'Arden's Blue'	Field In-Ground	Englander	1999	Foliar	No injury at 1, 2 and 4 oz product per 100 gal	19990903p.pdf
13942	Lily, Plantain	Hosta fortunei	'Gold Standard'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902d.pdf
13749	Holly	Ilex sp.	I. cornuta 'Dwarf Burfordi'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902e.pdf
14218	Bulbous Iris	Iris xiphium		Field In-Ground	Chastagner	2001	Foliar	No injury at 1, 2 and 4 oz product per acre	20021001e.pdf
14218	Bulbous Iris	Iris xiphium	'Blue Diamond'	Field In-Ground	Chastagner	2002	Foliar	No trial report posted	
13944	Bulbous Iris	Iris xiphium	I. sibirica 'Blue King'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001i.pdf
13766	Juniper	Juniperus sp.	J. chinensis 'Spartan'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902f.pdf
14039	Juniper	Juniperus sp.	'Pfitzerana'	Field In-Ground	Englander	1999	Foliar	No injury at 1, 2 and 4 oz product per 100 gal	19990903q.pdf
13816	Crape Myrtle	Lagerstroemia indica		Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990903r.pdf
13949	Sweet Pea	Lathyrus odoratus	'Explorer Mixed'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902g.pdf
13950	Lavender	Lavandula sp.	L. angustifolia 'Munstead'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001j.pdf
13951	Shasta Daisy	Leucanthemum maximum	Chrysanthemum x superbum 'Snowland'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901h.pdf
13951	Shasta Daisy	Leucanthemum maximum	Chrysanthemum x superbum 'Little Miss Muffet'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990903m.pdf
14225	Shasta Daisy	Leucanthemum maximum	Chrysanthemum x superbum 'Little Miss Muffet'	Field In-Ground	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901i.pdf
13817	Privet	Ligustrum sp.		Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902h.pdf

PR #	Crop			Use Site	Researcher	Year	Application Method	Results	File Name
	Common Name	Latin Name	Cultivar						
14228	Lily	Lilium sp.	'Jolanda'	Field In-Ground	Chastagner	2002	Band in-furrow before hilling	No injury at 8, 14.6, 26 and 52 oz product per acre	20021001f.pdf
13954	Lily	Lilium sp.	'Paramount'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001k.pdf
13954	Lily	Lilium sp.	'Pixie Pink'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902j.pdf
14228	Lily	Lilium sp.	'Pixie Pink'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902i.pdf
13956	Cardinal Flower, Indian Pink	Lobelia cardinalis		Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902k.pdf
13800	Honeysuckle	Lonicera sp.	L. xylosteum 'Emerald Mound'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001m.pdf
13961	Bee Balm	Monarda didyma	M. x hybrida 'Lambada'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902l.pdf
14235	Bee Balm	Monarda didyma	M. x hybrida 'Lambada'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902m.pdf
13962	Catnip	Nepeta cataria		Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902n.pdf
14241	Beard-Tongue	Penstemon sp.	P. barbatus 'Rondo'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902p.pdf
13968	Sage, Russian;Blue Spire	Perovskia sp.	P. atriplicifolia	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902q.pdf
13971	Phlox	Phlox sp.	'Dolly'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001i.pdf
13754	Japanese Andromeda	Pieris japonica	'Mountain Fire'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902r.pdf
17244	Aspen, Poplar	Populus sp.	P. deltoides	Field In-Ground	Chastagner	2002	Foliar	No significant injury at 2 oz product per 100 gal	20021001g.pdf
17244	Aspen, Poplar	Populus sp.	P. nigra 'Lombardy'	Field In-Ground	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902s.pdf
13826	Cinquefoil	Potentilla sp.	'Goldfinger'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990901j.pdf
14250	Primrose	Primula sp.	'Ducat Scarlet'	Field In-Ground	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902t.pdf
13772	Fir, Douglas	Pseudotsuga menziesii		Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902u.pdf

PR #	Crop			Use Site	Researcher	Year	Application Method	Results	File Name
	Common Name	Latin Name	Cultivar						
20252	Fir, Douglas	<i>Pseudotsuga menziesii</i>		Greenhouse	Lambe	2002	Drench	No injury at 1, slight at 2 and 4 oz product per 100 gal	20021001b.pdf
13866	Oak	<i>Quercus</i> sp.	Q. palustris	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902v.pdf
13758	Azalea, & Rhododendron	<i>Rhododendron</i> sp.	'Catawbiense'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902w.pdf
14030	Azalea, & Rhododendron	<i>Rhododendron</i> sp.	'Gibraltar'	Field In-Ground	Englander	1999	Foliar	No injury at 1, 2 and 4 oz product per 100 gal	19990903s.pdf
13757	Azalea, & Rhododendron	<i>Rhododendron</i> sp.	Glacier	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990901e.pdf
13829	Rose	<i>Rosa</i> sp.	'Queen Elizabeth'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902x.pdf
13829	Rose	<i>Rosa</i> sp.	'Queen Elizabeth'	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990902x.pdf
13916	Coneflower	<i>Rudbeckia</i> sp.	R. hirta 'Indian Summer'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902y.pdf
13980	Sage, Ramona	<i>Salvia sylvestris</i>	S. splendens 'Scarlet Bicolor'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990902z.pdf
14014	Blue Stem	<i>Schizachyrium</i> sp.	S. scoparium	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903a.pdf
13984	Goldenrod	<i>Solidago</i> sp.	S. canadensis 'Crown of Rays'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903b.pdf
13833	Lilac	<i>Syringa</i> sp.		Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990903c.pdf
13833	Lilac	<i>Syringa</i> sp.	S. reflexa	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001o.pdf
14106	Lilac	<i>Syringa</i> sp.	S. reflexa	Field In-Ground	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001p.pdf
14047	Yew	<i>Taxus</i> sp.	T. x media 'Densiflora'	Field In-Ground	Englander	1999	Foliar	No injury at 1, 2 and 4 oz product per 100 gal	19990903t.pdf
13989	Wall Germander	<i>Teucrium</i> sp.	T. chamaedris	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903d.pdf
20257	Cedar, Western Red	<i>Thuja plicata</i>		Greenhouse	Lambe	2002		Wrong trial (Douglas fir) posted for this project	20021001i.pdf
20257	Cedar, Western Red	<i>Thuja plicata</i>		Greenhouse	Linderman	2001	Foliar	No injury at 4, 8 and 16 oz product per acre	20021001h.pdf
14048	Arborvitae	<i>Thuja</i> sp.	'Techni'	Field In-Ground	Englander	1999	Foliar	No significant injury at 1, 2 and 4 oz product per 100 gal	19990903u.pdf
13991	Thyme (Non-Bearing)	<i>Thymus</i> sp.	T. vulgaris	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903e.pdf
20253	Hemlock, Western	<i>Tsuga heterophylla</i>		Greenhouse	Lambe	2002	Drench	No injury at 1, slight at 2 and 4 oz product per 100 gal	20021001c.pdf

PR #	Crop			Use Site	Researcher	Year	Application Method	Results	File Name
	Common Name	Latin Name	Cultivar						
13777	Hemlock	Tsuga sp.	T. canadensis	Field Container	Locke	1999	Foliar	No injury at 1, 2 and 4 oz product per acre	19990903f.pdf
13995	Vervain	Verbena sp.	'Romance Scarlet'	Field Container	Locke	1999	Foliar	No injury at 1, slight marginal floral necrosis at 2 and 4 ai per acre	19990903g.pdf
13995	Vervain	Verbena sp.	V. x hybrida 'Pink Parfait'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903h.pdf
14269	Vervain	Verbena sp.	V. x hybrida 'Pink Parfait'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903i.pdf
13996	Speedwell, Brooklime	Veronica sp.	'Pink Shades'	Field Container	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903j.pdf
14270	Speedwell, Brooklime	Veronica sp.	'Pink Shades'	Field In-Ground	Linderman	1999	Foliar	No injury at 8, 16 and 32 oz product per acre	19990903k.pdf
13997	Pansy	Viola sp.	V. cornuta 'Sorbet Blueberry Cream'	Field Container	Linderman	2000	Foliar	No injury at 1, 2 and 4 oz product per acre	20001001r.pdf
14112	Weigela	Weigela sp.	'White Knight'	Field In-Ground	Englander	1999	Foliar	No injury at 1, 2 and 4 oz product per 100 gal	19990903v.pdf

Label Suggestions

Typically, IR-4 bases label suggestions on a minimum of three trials on any given plant species. However, given the lack of phytotoxicity across so many different plant species and genera, it is suggested that the following 53 plants in the IR-4 trials be added to the list of tolerant plants with the current precautionary statements in the Plant Safety and Tolerant Ornamentals Plant sections of the Heritage 50WG label.

Abies procera
Anemone pulsatilla
Aurinia saxatilis
Centaurea dealbata
Chrysanthemum x hybrida
Chrysanthemum x superbum
Clematis sp.
Coreopsis sp.
Cotoneaster sp.
Crococsmia x crocosmiflora
Dahlia sp.
Dianthus chinensis
Digitalis mertonensis
Forsythia sp.
Gaillardia grandiflora
Galium odoratum
Geranium magniflorum
Gladiolus sp.
Gleditsia tricanthos
Heliopsis helianthoides
Hibiscus althea
Hosta fortunei
Ilex cornuta
Iris xiphium
Lathyrus odoratus
Lavandula angustifolia
Ligustrum sp.

Lilium sp.
Lobelia cardinalis
Lonicera xylosteum
Monarda x hybrida
Nepeta cataria
Penstemon barbatus
Perovskia atriplicifolia
Populus deltoids
Populus nigra
Pseudotsuga menziesii
Salvia splendens
Schizachyrium scopalarium
Solidago canadensis
Syringa reflexa
Syringa sp.
Taxus x media
Teucrium chamaedris
Thuja plicata
Thuja sp.
Thymus vulgaris
Tsuga canadensis
Tsuga heterophylla
Verbena x hybrida
Veronica sp.
Viola cornuta
Weigela sp.

Appendix 1: Available Protocol

CONTROL OF ORNAMENTAL DISEASES WITH DRENCH
APPLICATIONS OF AZOXYSTROBIN (HERITAGE)

Date: 10/04

Ornamental Protocol Number: 664

General label directions: Refer to product label or Technical Bulletin.

Research program:

Pest(s)/Plants – Plant pathogens other than labeled species.

Pesticide (common name and trade name): Refer to treatment list shown below.

For label, material & if needed, spray surfactant contact:

Syngenta Crop Protection, Dave Ross, 336-632-6411, dave.ross@syngenta.com

Experimental design:

Plot size (must be adequate to reflect actual use condition)

Replicates Minimum of 4 Treatment Units

Controls (untreated controls to be included in all experiments)

Application: **HERITAGE 50**

<u>Dosages</u> - 1/2x	0.1 oz. product/100 gal.
1x	0.2 oz. product/100 gal.
2x	0.4 oz. product/100 gal.

Active Ingredient: Azoxystrobin (HERITAGE).

Volume - Minimum of 100 gal/A for liquid applications.

Timing - 2 Applications, 7-day interval. Record initial infestation, then efficacy and crop safety at 7 (then 2nd appl), 14, 28 and 42 DAT.

Reports:

Method of application: Treatments should be applied according to product label instructions. application equipment consistent with conventional commercial equipment. Report completely on experimental design and method of application. Report plant size height x width before treatment and throughout the experiment.

Weather – Maintain temperature and precipitation (including irrigation) data.

Soil type – Identify soil type used in experimental area.

Product – When submitting data, include EPA registration number of product used.

Efficacy – Data should include percent control as well as an indication that infestation was light, heavy, etc.

Record all application and evaluation dates.

Phytotoxicity – Record phytotoxicity data at all rates. Use a 0-10 scale. 0 = No Phytotoxicity 10 = complete kill.

Please direct questions to: Ely Vea, 308 Aston Forest Lane, Crownsville, MD 21032, Phone & FAX#: 410-923-488, E-mail: evvea@comcast.net.

CONTROL OF ORNAMENTAL DISEASES WITH FOLIAR
APPLICATIONS OF AZOXYSTROBIN (HERITAGE)

Date: 10/04

Ornamental Protocol Number: 664

General label directions: Refer to product label or Technical Bulletin.

Research program:

Pests(s)/Plants – Plant pathogens other than labeled species.

Pesticide (common name and trade name): Refer to treatment list shown below.

For label, material & if needed, spray surfactant contact:

Syngenta Crop Protection, Dave Ross, 336-632-6411, dave.ross@syngenta.com

Experimental design:

Plot size (must be adequate to reflect actual use condition)

Replicates Minimum of 4 Treatment Units

Controls (untreated controls to be included in all experiments)

Application: **HERITAGE 50**

Dosages - 1/2x 0.05 oz. product/100 gal.

1x 1.0 oz. product/100 gal.

2x 2.0 oz. product/100 gal.

Active Ingredient: Azoxystrobin (HERITAGE).

Volume - Minimum of 100 gal/A for liquid applications.

Timing - 2 Applications, 7-day interval. Record initial infestation, then efficacy and crop safety at 7 (then 2nd appl.), 14, 28 and 42 DAT.

Reports:

Method of application: Treatments should be applied according to product label instructions. application equipment consistent with conventional commercial equipment. Report completely on experimental design and method of application. Report plant size height x width before treatment and throughout the experiment.

Weather – Maintain temperature and precipitation (including irrigation) data.

Soil type – Identify soil type used in experimental area.

Product – When submitting data, include EPA registration number of product used.

Efficacy – Data should include percent control as well as an indication that infestation was light, heavy, etc.

Record all application and evaluation dates.

Phytotoxicity – Record phytotoxicity data at all rates. Use a 0-10 scale. 0 = No Phytotoxicity 10 = complete kill.

Please direct questions to: Ely Vea, 308 Aston Forest Lane, Crownsville, MD 21032, Phone & FAX#: 410-923-488, E-mail: evvea@comcast.net.

Appendix 2: Contributing Researchers

Dr. Mike Benson	North Carolina State University Department of Plant Pathology 840 Method Rd. – Unit 3 Raleigh, NC 27695 919-515-3966
Dr. Gary Chastagner	Washington State University Research and Extension Center 7612 Pioneer Way East Puyallup, WA 98371 253-445-4528
Dr. L. Englander	University of Rhode Island Department of Plant Sciences Kingston, RI 02881 401-874-2993
Dr. Robert C. Lambe	Port Ludlow, WA 98365 253-445-4528
Dr. Bob Linderman (retired)	USDA-ARS Horticultural Crops Research Lab 3420 NW Orchard Avenue Corvallis, OR 97330 541-738-4062
Dr. James Locke	USDA-ARS Greenhouse Production Research Group 2801 W. Bancroft Street Mail Stop 604 Toledo, OH 43606 419-530-1595

Appendix 3: Submitted Data

Researcher reports included in the printed copy of this report are only those received prior to 5/04/09. Reports on following pages are in order by the last name of the researchers for grouped reports and then by PRNumber for those reported on individually.