



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

IR-4 Ornamental Horticulture Program Simazine Crop Safety

**Authors: Kathleen Hester and Cristi L. Palmer
Date: August 20, 2010**

Acknowledgements

**Lori Harrison
Karen Sims
Ely Vea**

Table of Contents

Table of Contents	2
Table of Tables	3
Abstract	4
Introduction	5
Materials and Methods	5
Results and Summary	5
Phytotoxicity: Field Container and In-Ground	5
Phytotoxicity: Greenhouse Unregistered Uses	8
Efficacy	8
Label Suggestions	29
Appendix 1: Protocols	30
Appendix 2: Contributing Researchers	32
Appendix 3: Submitted Data	35

Table of Tables

Table 1.	List of Caliber 90DG and Princep 80WP treated crops with no or minimal transitory injury.....	6
Table 2.	List of Caliber 90DG and Princep 80WP treated crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity.	6
Table 3.	List of Caliber 90DG and Princep 80WP treated crops where enough damage warrants not using the product.....	7
Table 4.	List of Caliber 90DG and Princep 80WP treated crops where more study is needed.	7
Table 5.	List of Princep 4G treated crops with no or minimal transitory injury.....	7
Table 6.	List of Princep 4G treated crops where more study is needed.....	8
Table 7.	List of crops not injured after 48 hours exposure to fumes from Simazine applied under greenhouse benches.....	8
Table 8.	Weeds where partial to excellent weed control was achieved in limited trials. ¹	8
Table 9.	Detailed Summary of Crop Safety and Efficacy Testing with Simazine Formulations	9

Abstract

Princep 80W, 90W, 4G, 4L and Caliber 90 DG were tested on 54 plant genera or species over a sixteen year period (1973- 1989). Data in this report were generated to expand registered uses of simazine on ornamental species. Simazine rates in trials included 2, 4, and 8 lb ai/A as the 1X, 2X, and 4X rates. Fifteen genera or species in the trials conducted have successfully been added to the Princep label, as well as, six weed species, based partially on IR-4 research. Studies showed satisfactory crop safety on additional genera/species not currently registered. Seven crops offer potential for label expansion (*Acer rubrum*, *Acer saccharum*, *Buxus microphylla* var. *koreana*, *Leucothoe* sp, *Lilium longiflorum*, *Photinia* sp, and *Pyracantha* sp.). Two crops demonstrated little to no injury at the 1X rate but the 2X or 4X rate did cause significant injury (*Forsythia* and *Rhododendron*). Enough damage was found on two ornamental crops to warrant not using this product: *Arctostaphylos*, and *Euonymus radicans*. Five weed species appeared to be susceptible to simazine treatments and merit further evaluation prior to label expansion including horseweed, London Rocket, oxalis, spotted spurge, and wild strawberry. IR-4 research previously supported adding 10 weeds to simazine labels.

Introduction

Residual control of broadleaved weeds and grasses in the landscape and in nursery production of woody and herbaceous perennials has been a challenge for many years. This report summarizes crop safety trials involving Princep 80W, 90W, 4G, 4L, and Caliber 90DG conducted between 1973 and 1989. Crop safety was evaluated on 54 plant genera or species. Field trial summaries for these products are listed in Table 1 through Table 6. A summary of greenhouse trials is listed in Table 7. Efficacy for weeds not yet placed on simazine labels is summarized in Table 8.

Materials and Methods

The protocol for these trials included three rates of simazine (2, 4, and 8 lb ai/A) at 1x, 2x, and 4x, plus an untreated control replicated a minimum of four treatment units. In most cases only one application was made using only EPA registered product made over the top using application equipment consistent with conventional commercial equipment. In most cases plants were grown in the field unless “Field Container” is noted. Four trials were conducted in the greenhouse under benches.

Phytotoxicity data was recorded at all rates using a 0 to 10 scale. 0 = no phytotoxicity, 10 = complete kill. Efficacy data as well as indications regarding marketability were given in some cases but not all.

Caliber 90WDG, Princep 4L, Princep 80WP, and Princep 4G were provided to researchers by the manufacturer Syngenta, formerly CIBA Geigy.

Results and Summary

Crop safety and efficacy for weeds is summarized below separated by field container and in ground crop safety, crop safety with under the bench applications, and efficacy for weeds not yet listed on labels. The detailed results for each trial are contained in Table 9.

Phytotoxicity: Field Container and In-Ground

Based on the type and nature of injury seen with simazine 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 and/or 4X rates did cause significant phytotoxicity.
3. Significant injury sufficient to recommend growers not utilize this product
4. More data is needed to make informed recommendations.

Caliber 90DG and Princep 80WP exhibited no or minimal negative impact on 14 plant genera or species (Table 1). Some minimal injury may be acceptable for growers if applications are made several weeks to months in advance of crop sale particularly for woody ornamental crops.

For two crop genera, there was no or little injury exhibited at the lower rate(s) tested, but significant phytotoxicity occurred at higher rate(s) (Table 2). It may be prudent to either conduct additional trials or place language on the label indicating applications of simazine do not cause injury at lower rates but higher rates may cause unacceptable injury.

Two crops in this report exhibited damage sufficient to recommend growers not utilize simazine as an over-the-top treatment (Table 3).

For 21 genera/species included in trials, more information is needed either because only 1 or 2 trials were conducted or because consistent results were not achieved among the research sites (Table 4).

Princep 4G was tested on 11 crops. Of these, there were only enough trials on *Leucothoe* to demonstrate little impact with granular broadcast applications (Table 5 and Table 6)

Table 1. List of Caliber 90DG and Princep 80WP treated crops with no or minimal transitory injury.

<i>Abies sp.</i> (container and in ground) ¹	<i>Photinia sp.</i> (in ground) ²
<i>Acer rubrum</i> (in ground) ¹	<i>Pinus sp.</i> (container and in ground) ¹
<i>Acer saccharum</i> (container and in ground) ¹	<i>Pyracantha sp.</i> (in containers) ²
<i>Buxus microphylla</i> (container and in ground) ²	<i>Taxus cuspidata</i> (in ground) ^{1,2 *}
<i>Cotoneaster sp.</i> (container and in ground) ^{1,2}	<i>Taxus media</i> (container and in ground) ^{1 *}
<i>Ilex crenata</i> (container and in ground – see Haramaki) ^{1,2}	<i>Thuja sp.</i> (container and in ground) ^{1,2 *}
<i>Lilium longiflorum</i> (in ground) ²	<i>Tsuga sp.</i> (in ground) ¹

¹Directed spray application

² Over the top, broadcast, or foliar applications

* Already registered

Table 2. List of Caliber 90DG and Princep 80WP treated crops with no or minimal transitory injury seen at the 1X rate, but the 2X or 4X rate did cause significant phytotoxicity.

<i>Forsythia sp.</i> (in ground) ²	<i>Rhododendron sp.</i> (in field & containers) ^{1,2}
---	--

¹Directed spray application

² Over the top, broadcast, or foliar applications

* Already registered

Table 3. List of Caliber 90DG and Princep 80WP treated crops where enough damage warrants not using the product.

Arctostaphylos sp (in ground) ²
Euonymus radicans (container) ²

¹Directed spray application

² Over the top, broadcast, or foliar applications

* Already registered

Table 4. List of Caliber 90DG and Princep 80WP treated crops where more study is needed.

<i>Acer saccharum</i> (in ground) ^{1,2}	<i>Gleditsia triacanthos</i> (in ground) *
<i>Betula sp.</i> (container and in ground) ^{1,2}	<i>Iris sp.</i> (in ground) ³
<i>Buxus sempervirens</i> (in ground)	<i>Juniperus sp.</i> (container and in ground) ^{3*}
<i>Calluna sp.</i> (in ground) ¹	<i>Leucothoe axillaris</i>
<i>Ceratonia siliqua</i> (in ground) ¹	<i>Nandina domestica</i> (container) ²
<i>Chamaecyparis pisifera</i> (container and in ground) ^{1,2}	<i>Pachysandra sp.</i> (container and in ground) ²
<i>Cupressus sp</i> (container) ²	<i>Pittosporum undulatum</i> (in ground) ¹
<i>Eucalyptus sp.</i> (in ground) ^{1*}	<i>Quercus sp</i> (in ground) ^{1*}
<i>Euonymus fortunei.</i> (in ground) ²	<i>Rosa sp</i> (in ground)
<i>Forsythia sp.</i> (in-ground) ^{1,2}	<i>Taxodium distichum</i> (container) ²
	<i>Xylosoma</i> (in ground) ¹

¹Directed spray application

² Over the top, broadcast, or foliar applications

³ There may be cultivar differences because of a wide variety of responses with over the top applications.

* Already registered

Table 5. List of Princep 4G treated crops with no or minimal transitory injury.

Leucothoe sp. (container)

Table 6. List of Princep 4G treated crops where more study is needed.

<i>Ilex crenata</i> (container)	<i>Rhododendron sp</i> (container)
<i>Juniperus sp.</i> (container)	<i>Rosa sp</i> (in ground)
<i>Nandina domestica</i> (container)	<i>Rumohra adiantiformis</i> (in ground)
<i>Pieris japonica</i> (container) *	<i>Taxus cuspidata</i> (in ground)
<i>Pinus sp.</i> (in ground)	<i>Tsuga sp</i> (in ground)

* Already registered

Phytotoxicity: Greenhouse Unregistered Uses

Although greenhouse trials were limited, simazine showed effective long term weed control under benches. Ticknor conducted five trials involving Princep 80 W under benches in enclosed greenhouses between 1978 and 1979. Containerized *Azalea sp.*, *Chrysanthemum coccineum*, *Tagetes sp.* and *Rosa sp.* demonstrated tolerance to fumes from 32 lb ai/A simazine applied under the greenhouse bench for forty eight hours. However, not enough data is available to determine crop safety or merit labeling high liability greenhouse crops. (Table 7).

Efficacy

In a series of trials over time, simazine is efficacious against eleven weeds including carpetweed, crabgrass, goosegrass, groundsel, henbit, lambsquarters, pigweed, quackgrass, ragweed, puncturevine and sowthistle; IR-4 trials supported the label expansion for ten of these weeds. In limited trials, simazine appears to have an effect on crimson clover, fescue, horseweed, London rocket, oxalis, spotted spurge, and wild strawberry which are not currently listed on the label. Additional testing is needed to clarify the responses (Table 8).

Table 7. List of crops not injured after 48 hours exposure to fumes from Simazine applied under greenhouse benches

<i>Azalea sp.</i>	<i>Tagetes sp.</i>
<i>Chrysanthemum coccinea</i>	<i>Rosa sp.</i>

Table 8. Weeds where partial to excellent weed control was achieved in limited trials.¹

<i>Crimson Clover</i>	<i>Oxalis</i>
<i>Fescue</i>	<i>Spotted Spurge</i>
<i>Horseweed</i>	<i>Wild Strawberry</i>
<i>London Rocket</i>	

¹not currently listed on simazine label

Table 9. Detailed Summary of Crop Safety and Efficacy Testing with Simazine Formulations

Notes: Table entries are sorted by product and then crop Latin name. Only those trials with research reports received by 3/15/2010 are listed below.

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29837	Caliber 90DG	Maple, Sugar	<i>Acer saccharum</i>	A. saccharum	Field In-Ground	Derr	1985	Over the top	Excellent control of common lambsquarters with 1, 2, 4 lb ai/A with no injury to maple.	20100522j.pdf	N
29828	Caliber 90DG	Birch	<i>Betula sp.</i>	B. pendula Roth	Field In-Ground	Ahrens	1988	Over the top	No phytotoxicity with 1.6 lb ai or 3.2 lb ai/A. Poor to fair control of crabgrass	20100522u.pdf	N
29827	Caliber 90DG	Cypress, Boulevard	<i>Chamaecyparis pisifera</i>		Field Container	Krause	1989	Over the top	No phytotoxicity with 2 or 4 lb ai/A. Weed control ratings not complete.	20100522v.pdf	N
29829	Caliber 90DG	Euonymus	<i>Euonymus sp.</i>	E. fortunei	Field In-Ground	Carpenter	1985	Foliar	Unacceptable crop injury at 4 lb ai/A. Minor injury at 1, 2 lb ai/A. Good to excellent weed control.	20100522x.pdf	N
29829	Caliber 90DG	Euonymus	<i>Euonymus sp.</i>	Euonymus sp.	Field In-Ground	Carpenter	1985	Broadcast	Unacceptable injury at 4 lb ai/A. Good to excellent weed control with 1, 2, and 4 lb ai/A.	20100522p.pdf	N
29830	Caliber 90DG	Heavenly Bamboo	<i>Nandina domestica</i>	N. domestica thunb.	Field Container	Talbert	1987	Over the top	Simazine at 1, 2, and 4 lb ai/A gave excellent control of crabgrass. No phytotoxicity.	20100523c.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29831	Caliber 90DG	Bald Cypress	<i>Taxodium distichum</i>		Field Container	Glaze	1988	Over the top	No significant phytotoxicity was observed with simazine at 2, 4, and 8 lb ai/A. Growth of plants was reduced with 4 and 8 lb treatments but remained marketable. Excellent weed control with all rates.	20100523d.pdf	N
29841	Princep 4G	Holly	<i>Ilex sp.</i>	I. crenata 'Green Luster'	Field Container	Gilliam	1986	Broadcast	No crop injury with 2, 4, lb ai/A. Excellent weed control.	20100523f.pdf	Y
29832	Princep 4G	Juniper, Creeping or Trailing	<i>Juniperus horizontalis</i>		Field In-Ground	Ahrens	1971	Soil surface	Good vigor ratings in '73 related to good weed control rather than phytotoxicity. Good weed control.	20100520r.pdf	Y
6948	Princep 4G	Juniper	<i>Juniperus sp.</i>	J. wiltonii	Field Container	Ahrens	1976	Broadcast	No phytotoxicity at 1.25 and 2.5 lb ai per acre; 1.25 lb ai/a gave good weed control for 1 month and fair for 2 months except for crabgrass and bittercress.	20100520v.pdf	Y
29764	Princep 4G	Leucothoe axillaris	<i>Leucothoe axillaris</i>		Field Container	Ahrens	1976	Broadcast	No phytotoxicity at 1.25 and 2.5 lb ai per acre; 1.25 lb ai/A gave good weed control for 1 month and fair control for 2 months. Crabgrass was resistant and bittercress only partially controlled for 2 months.	20100520v.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29764	Princep 4G	Leucothoe axillaris	<i>Leucothoe axillaris</i>	L. fontanesiana	Field Container	Haramaki	1977	Broadcast	Satisfactory weed control at 1, 2 and 4 lb ai/A. No phytotoxicity.		N
29764	Princep 4G	Leucothoe axillaris	<i>Leucothoe axillaris</i>	L. fontanesiana	Field Container	Haramaki	1977	Broadcast	Satisfactory weed control with 1 and 2 lb ai/A. No phytotoxicity.		N
29763	Princep 4G	Heavenly Bamboo	<i>Nandina domestica</i>	N. domestica	Field Container	Elmore	1977	Broadcast	No phyto at 1.6 and 8.3 lb ai/A. Very Good to excellent control of spotted spurge one month after applic with 1.6 lb ai/A. Acceptable control of crabgrass 1-2 month after applic.	20100520x.pdf	N
29775	Princep 4G	Japanese Andromeda	<i>Pieris japonica</i>		Field Container	Ahrens	1976	Broadcast	Little to no phytotoxicity with 1.25 and 2.5 lb ai/a. Good weed control with 1.25 lb ai/a for one month and fair control at 2 months. Crabgrass was resistant and bittercress was only partially controlled at 2 months.	20100520v.pdf	Y
814	Princep 4G	Pine	<i>Pinus sp.</i>		Field In-Ground	Ahrens	1970	Broadcast	No injury at 3lb ai/A.	20100520r.pdf	Y
814	Princep 4G	Pine	<i>Pinus sp.</i>	P. strobus	Field In-Ground	Cohen	1975		No visible injury at 1 and 2 lb ai per acre.	19800112b.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29776	Princep 4G	Rhododendron	<i>Rhododendron sp.</i>	R. chionoides	Field Container	Ahrens	1976	Broadcast	No phytotoxicity at 1.25 and 2.5 lb ai/A. Good weed control achieved at 1.25 lb ai at 1 month and fair control at 2 months. Crabgrass was resistant and bittercress only partially controlled at 2 month rating.	20100520v.pdf	N
29776	Princep 4G	Rhododendron	<i>Rhododendron sp.</i>	R. sp. 'PMJ'	Field Container	Ahrens	1976	Broadcast	No phytotoxicity at 1.25 and 2.5 lb ai/A. Good weed control achieved at 1.25 lb ai at 1 month and fair control at 2 months. Crabgrass was resistant and bittercress only partially controlled at 2 month rating.	20100520v.pdf	N
5570	Princep 4G	Rose	<i>Rosa sp.</i>		Field In-Ground	Ahrens	1970	Broadcast	No injury.	20100520r.pdf	N
29838	Princep 4G	Fern, Leatherleaf	<i>Rumohra adiantiformis</i>		Field In-Ground	Stamps	1980	Broadcast	Injury at 5.0 and 9.0 kg/ha. Safe on leatherleaf fern only at 2.2 kg/ha at 4 month intervals or longer. Fair weed control.	20100522q.pdf	N
5968	Princep 4G	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1970	Broadcast	No injury at 3 lb ai/A.	20100520r.pdf	Y
29728	Princep 4G	Hemlock	<i>Tsuga sp.</i>	T.caroliniana and canadensis	Field In-Ground	Cohen	1975	Ground broadcast	Little to no control of annual nutgrass and dogfennel with 1.5 to 3.0 lb ai/A preemergent. Some injury noted.	20100520n.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29746	Princep 4L	Pine, Scotch	<i>Pinus sylvestris</i>		Field In-Ground	Elmore	1975	Ground spray	Poor to moderate control of "weeds" with 4 lb ai/A and little to no injury on Christmas trees in 1976 and 1977.	20100520g.pdf	Y
29742	Princep 4L	Fir, Douglas	<i>Pseudotsuga menziesii</i>		Field In-Ground	Elmore	1976	Ground spray	Poor to moderate control of weeds at the 4 lb ai/a rate with no injury to Fraser fir.	20100520h.pdf	Y
29810	Princep 4L	Yew	<i>Taxus sp.</i>		Field In-Ground	Derr	1989	Over the top	No apparent phytotoxicity at 2, 4 and 8 lb ai per acre. Good to excellent control of crabgrass and carpetweed at 2, 4 and 8 lb ai/A.	20100523e.pdf	Y
975	Princep 80WP	Fir	<i>Abies sp.</i>	A. balsamea	Field Container	Flanagan	1978	Directed spray	No crop injury at 1, 2, 4, 8 lb ai per acre.	20100521b.pdf	Y
5355	Princep 80WP	Fir	<i>Abies sp.</i>	A. balsamea	Field In-Ground	Flanagan	1978	Directed spray	Preliminary rating showed no injury to Balsam fir. Efficacy rating to be done in 1979.	20100520s.pdf	Y
5355	Princep 80WP	Fir	<i>Abies sp.</i>	A. fraseri	Field In-Ground	Cohen	1975	Ground spray	Little to no injury. Princep 80WP at 2 lb ai/A preemergent applications provided zero control to orchardgrass, quackgrass and briars while it gave very good control of wild strawberry and fescue.	20100520o.pdf	Y
12015	Princep 80WP	Maple, Red	<i>Acer rubrum</i>		Field In-Ground	Haramaki	1978	Directed spray	Good to excellent residual control was obtained with 1, 2 and 4 lb ai/A alone & w/ glyphosate. No reduction in growth.		N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
12015	Princep 80WP	Maple, Red	<i>Acer rubrum</i>	'Red Sunset'	Field In-Ground	Kuhns	2003	Directed spray	No injury at 2, 4 and 8 lb ai per acre.	19750102t.pdf	N
12962	Princep 80WP	Maple, Sugar	<i>Acer saccharum</i>		Field Container	Flanagan	1978	Directed spray	Very good to excellent weed control with 1, 2, 4 and 8 lb ai/a. Final phyto and performance evaluations in 1979.	20100520z.pdf	N
12016	Princep 80WP	Maple, Sugar	<i>Acer saccharum</i>		Field In-Ground	Flanagan	1978	Directed spray	Preliminary rating showed no injury at 1, 2, 4 and 8 lb ai/A of simazine. Efficacy to rated in '79.	20100520d.pdf	N
12016	Princep 80WP	Maple, Sugar	<i>Acer saccharum</i>		Field In-Ground	Haramaki	1978	Directed spray	Good to excellent residual control was obtained with 1, 2 and 4 lb ai/A of simazine alone & w/ glyphos. No significant difference in plant growth for those trees treated with simazine compared to control.	20100521k.pdf	N
146	Princep 80WP	Maple	<i>Acer sp.</i>		Field In-Ground	Bing	1985	Over the top	Acceptable tolerance at 1 and 2 lb ai/A. Moderate crop injury at 4 lb ai/A. Good weed control with all rates.		N
29808	Princep 80WP	Bearberry	<i>Arctostaphylos sp.</i>	A. sp (Bearberry)	Field In-Ground	Haramaki	1977	Broadcast	Satisfactory weed control at 1, 2 and 4 lb ai/A. Injury to Red Bearberry at all three rates.		N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
878	Princep 80WP	Birch	<i>Betula sp.</i>		Field In-Ground	Flanagan	1978	Directed spray	Preliminary ratings showed no injury two months after application. Final phytotoxicity/efficacy rating to be done in 1979.	20100520c.pdf	N
854	Princep 80WP	Birch	<i>Betula sp.</i>	B. alba varrucose	Field Container	Linderman	1986	Foliar	Phytotoxicity evident at 1, 2, 4 lb ai/A 20 DAT.	20100522m.pdf	N
854	Princep 80WP	Birch	<i>Betula sp.</i>	B. alleghaniensis	Field Container	Flanagan	1978	Directed spray	Initial transplant failed due to irrigation failure June '78. Replanted 8/78. Phyto and efficacy ratings in early '79.	20100520u.pdf	N
6921	Princep 80WP	Boxwood	<i>Buxus sp.</i>	B. microphylla	Field Container	Elmore	1975	Broadcast	No phytotoxicity with 0.8 lb ai/A. Excellent control of groundsel and lesser seeded bittercress.	20100520b.pdf	N
6940	Princep 80WP	Boxwood	<i>Buxus sp.</i>	B. microphylla var koreana	Field In-Ground	Gilliam	1981	Foliar	No crop injury with 2 lb ai/A. Better tolerance than previously indicated. Good weed control.		N
6940	Princep 80WP	Boxwood	<i>Buxus sp.</i>	B. microphylla var koreana	Field In-Ground	Gilliam	1982	Foliar	No crop injury with 2 lb ai/A. Better tolerance than previously indicated. Good weed control.		N
6940	Princep 80WP	Boxwood	<i>Buxus sp.</i>	B. microphylla var koreana	Field In-Ground	Gilliam	1983	Foliar	No crop injury with 2 lb ai/A. Better tolerance than previously indicated. Good weed control.		N
6940	Princep 80WP	Boxwood	<i>Buxus sp.</i>	B. sempervirens	Field In-Ground	Cohen	1975		Excellent control of goosegrass and carpetweed; no injury at 1 and 2 lb ai per acre.	19800112a.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29740	Princep 80WP	Carob, St.Johns-Bread	<i>Ceratonia siliqua</i>	C. siliqua	Field In-Ground	Elmore	1971	Ground spray	Little to no injury with 0.5 lb ai/A. Moderate control of Sow thistle and Prostrate Pigweed.		Y
29799	Princep 80WP	False cypress	<i>Chamaecyparis obtusa</i>	C. pisifer (Goldplume)	Field In-Ground	Haramaki	1976	Directed spray	Little to no injury to established plants treated (directed spray) with glyphosate (0.5 - 2.0 lb ai/a) plus simazine (2 lb ai/A). Good to excellent weed control.	20100521d.pdf	N
29779	Princep 80WP	Pyrethum, Painted Daisy	<i>Chrysanthemum coccineum</i>	C. 'Always Pink'	Greenhouse	Ticknor	1979	Ground spray	No crop injury observed 48 hours after exposure to fumes from 32 lb ai/A simazine applied under greenhouse benches.	20100521q.pdf	N
29739	Princep 80WP	Cotoneaster	<i>Cotoneaster sp.</i>	C. apiculatus	Field In-Ground	Haramaki	1983	Broadcast	Some injury at 4 lb ai/A, none at 1 and 2 lb. Excellent weed control at 2 lb of grasses and broadleaves.	20100522w.pdf	Y
7761	Princep 80WP	Cotoneaster	<i>Cotoneaster sp.</i>	C. arizonica (Glabra)	Field Container	Badiei	1983	Over the top	No phytotoxicity with 0.5, 1, 2 and 4 lb ai/A.		Y
7761	Princep 80WP	Cotoneaster	<i>Cotoneaster sp.</i>	C. congestus	Field Container	Badiei	1983	Over the top	No phytotoxicity with 0.5, 1, 2, 4, lb ai/A.	20100521z.pdf	Y
29739	Princep 80WP	Cotoneaster	<i>Cotoneaster sp.</i>	C. parneyi	Field In-Ground	Elmore	1971	Ground spray	No injury with 0.5 lb ai/A. Moderate control of Sow thistle and Prostrate Pigweed.		Y
7758	Princep 80WP	Cypress	<i>Cupressus sp.</i>	C. arizonica 'Glabra'	Field Container	Badiei	1983	Over the top	No crop injury observed with 0.5, 1, 2, and 4 lb ai/A 47 DAT.	20100522a.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
7758	Princep 80WP	Cypress	<i>Cupressus sp.</i>	C. sempervirens (Glauca)	Field Container	Linderman	1986	Foliar	No crop injury at 1, 2 and 4 lb ai/A.	20100522n.pdf	N
29737	Princep 80WP	Eucalypt, Australian Gum	<i>Eucalyptus sp.</i>		Field In-Ground	Elmore	1971	Ground, spray	No injury with 0.5 lb ai/A. Moderate control of Sow thistle and Prostrate Pigweed.		Y
7412	Princep 80WP	Purpleleaf Wintercreeper	<i>Euonymus radicans</i>		Field Container	Bing	1984	Over the top	Good to excellent weed control with 1, 2, 4 lb ai/A. Minor crop injury.	20100522b.pdf	N
7412	Princep 80WP	Purpleleaf Wintercreeper	<i>Euonymus radicans</i>		Field Container	Linderman	1986	Foliar	Significant injury at 1, 3 and 4 lb ai/A.	20100522o.pdf	N
29726	Princep 80WP	Golden Bells	<i>Forsythia sp.</i>	F. intermedia 'Lynwood Gold'	Field In-Ground	Ahrens	1976	Broadcast	Early injury causing reduced growth. Very good initial weed control with 1.5 lb ai/A.	20100520p.pdf	N
12019	Princep 80WP	Honey Locust	<i>Gleditsia sp.</i>	G. triacanthos L.	Field In-Ground	Haramaki	1978	Directed spray	Good to excellent residual control was obtained with 1, 2 and 4 lb ai/A alone and in combination with glyphosate. No reduction in growth.		Y
5340	Princep 80WP	Holly	<i>Ilex sp.</i>	I. cornuta 'Bufordi'	Field In-Ground	Cohen	1975		No visible injury at 1 and 2 lb ai per acre.	19800112b.pdf	Y
5340	Princep 80WP	Holly	<i>Ilex sp.</i>	I. crenata (convexa)	Field In-Ground	Frank	1979	Directed spray	No injury with 2 lb ai/A.	20100521i.pdf	Y
5340	Princep 80WP	Holly	<i>Ilex sp.</i>	I. crenata (Convexa)	Field In-Ground	Frank	1980	Directed spray	No crop phytotoxicity with 2 lb ai/A. Significantly lower weed coverage than control plot 40 DAT.	20100521j.pdf	Y
2492	Princep 80WP	Holly	<i>Ilex sp.</i>	I. crenata compacta	Field Container	Linderman	1986	Foliar	No crop injury with 1, 2, 4 lb ai/a.	20100522t.pdf	Y
5340	Princep 80WP	Holly	<i>Ilex sp.</i>	I. crenata 'convexa'	Field In-Ground	Cohen	1975		Excellent control of goosegrass and carpetweed at 1 and 2 lb ai per acre; no injury observed.	19800112a.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
5340	Princep 80WP	Holly	<i>Ilex sp.</i>	I. crenata convexa Tunb.	Field In-Ground	Haramaki	1977	Broadcast	Satisfactory weed control at 1, 2 and 4 lb ai/A. Phytotoxicity at all three rates.		Y
7762	Princep 80WP	Flag	<i>Iris sp.</i>		Field In-Ground	Bing	1983	Over the top	No crop injury at 1, 2 lb ai/A. Very effective weed control.	20100522e.pdf	N
7762	Princep 80WP	Flag	<i>Iris sp.</i>		Field In-Ground	Carpenter	1982	Foliar	Satisfactory weed control with 2 and 4 lb ai/A. Growth rate of iris treated with 1, 2, and 4 lb ai/A equal to or better than check.	20100522f.pdf	N
7762	Princep 80WP	Flag	<i>Iris sp.</i>		Field In-Ground	Carpenter	1986	Foliar	Trial 1: Unacceptable early season injury at 1, 2, lb ai/A. Effective weed control with 1, 2 and 4 lb ai/A.	20100523a.pdf	N
7762	Princep 80WP	Flag	<i>Iris sp.</i>		Field In-Ground	Carpenter	1986	Foliar	Trial 2: Unacceptable injury at 1, 2 and 4 lb ai/a. Effective weed control with 1, 2 and 4 lb ai/A.		N
7762	Princep 80WP	Flag	<i>Iris sp.</i>		Field In-Ground	Talbert	1985	Over the top	No significant injury to established field grown iris at 2, 4 lb ai/A. Good control of horseweed.		N
7762	Princep 80WP	Flag	<i>Iris sp.</i>	Iris sp.	Field In-Ground	Carpenter	1984	Foliar	No phytotoxicity with 1, 2 and 4 lb ai/A. Effective weed control with 4 lb ai/A.	20100522g.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
7762	Princep 80WP	Flag	<i>Iris sp.</i>	'Stepping Out'	Field In-Ground	Regan	1985	Over the top	Good to excellent weed control with 1.6, 3.2, 6.4 lb/A. Slight injury with low rate. Severe injury at high rate and significant reduction in rhizome fresh weight.		N
7756	Princep 80WP	Juniper	<i>Juniperus sp.</i>		Field Container	Bing	1983	Over the top	No crop injury with 1, 2 and 4 lb ai/a. Effective weed control.	20100522h.pdf	Y
7756	Princep 80WP	Juniper	<i>Juniperus sp.</i>		Field Container	Talbert	1982	Over the top	Significant injury with 2.5 and 5.0 lb simazine 20 DAT and 38 DAT lessening greatly by 71 DAT.	20100521u.pdf	Y
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	C. pisifer 'Goldplume'	Field In-Ground	Haramaki	1976	Directed spray	Little to no injury to established plants treated (directed spray) with glyphosate (0.5 - 2.0 lb ai/a) plus simazine (2 lb ai/A). Good to excellent weed control.	20100521d.pdf	Y
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis andorra compacta	Field In-Ground	Smith	1977	Ground spray	No injury at 3.0 and 7.5 lb ai/A. Applications at 15, 30 and 60 lb ai/A. caused unacceptable crop injury. Four months after application high rates gave acceptable weed control.	20100520e.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizonatalis plumosa	Field In-Ground	Frank	1980	Directed spray	No crop phytotoxicity with 2 lb ai/A. Significantly lower weed coverage than control plot 40 DAT.	20100521m.pdf	Y
7756	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis	Field Container	Badiei	1983	Foliar	No crop injury with 0.5, 1, 2 and 4, lb ai/A.	20100522i.pdf	Y
7756	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis andorra compacta	Field Container	Smith	1977	Broadcast	Juniper were injured beyond commercial acceptance at 15 lb ai/a. Excellent weed control after 4 months in all plots (7.5 15, 30 lb ai/A) except the 3 lb ai/A	20100520e.pdf	Y
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis plumosa	Field In-Ground	Frank	1979	Directed spray	No injury with 2 lb ai/A.	20100521i.pdf	Y
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis plumosa compacta	Field In-Ground	Ahrens	1976	Broadcast	No injury at 1.5 lb ai/A. Good to excellent control of carpetweed, crabgrass and pigweed.	20100520p.pdf	Y
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis plumosampacta	Field In-Ground	Ahrens	1977	Broadcast	Results of second year application show no injury at 1.5 lb ai/A. Good control of weeds.	20100520p.pdf	Y
2748	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. horizontalis wiltoni	Field In-Ground	Haramaki	1977	Broadcast	No phytotoxicity. Satisfactory weed control with 1 and 2 lb ai/A.	20100521g.pdf	Y
7756	Princep 80WP	Juniper	<i>Juniperus sp.</i>	J. procumbens nara	Field Container	Ahrens	1981	Over the top	No injury at 1 and 2 lb ai per acre.	19800128w.pdf	Y
29901	Princep 80WP	Leucothoe axillaris	<i>Leucothoe axillaris</i>		Field Container	Ahrens	1981	Over the top	No crop injury from 1, 2 lb ai/A. Good to excellent control of oxalis and bittercress.	20100521t.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
7763	Princep 80WP	Lily, Easter	<i>Lilium longiflorum</i>	L. longiflorum (Easter Lily)	Field In-Ground	Williams	1981	Broadcast	Simazine at 4 lb ai/A controlled most weeds. (pre & post to lilies, simazine alone and simazine plus paraquat). No visible symptoms or measurable differences in yield in field trials although bulb wt. reduced in growth chamber with 8 lb ai/A rate.	20100521h.pdf	N
7763	Princep 80WP	Lily, Easter	<i>Lilium longiflorum</i>	L. longiflorum (Nellie White)	Field In-Ground	Williams	1983	Over the top	Acceptable tolerance to 2 and 4 lb ai/A. No significant reduction in scale weight. Good to excellent weed control initially. Treatments broke down by 7 or 8 months after application.		N
7763	Princep 80WP	Lily, Easter	<i>Lilium longiflorum</i>	Lilium longiflorum (Easter Lily)	Field In-Ground	Williams	1981	Broadcast	Good to excellent weed control with 4, 8 and 16 lb ai/A. Adequate tolerance to these treatments. Researcher believes 0.8 to 1.6 lbs ai/A advisable but not to exceed 3.2 lb ai/A.		N
7413	Princep 80WP	Heavenly Bamboo	<i>Nandina domestica</i>	N. domestica	Field Container	Linderman	1986	Foliar	No crop injury with 1, 2 and 4 lb ai/A	20100522s.pdf	N
29777	Princep 80WP	None	<i>None</i>		Greenhouse	Ticknor	1978	Ground spray	Excellent weed control with 32 lb ai/A 148 DAT and acceptable control 1 yr after trt.	20100521r.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29777	Princep 80WP	None	<i>None</i>		Greenhouse	Ticknor	1979	Soil surface	Applications of 16 and 32 lb ai/A with/without glyphosate (4 lb) effectively controlled common groundsel under greenhouse benches 48 DAT and 303 DAT.	20100521s.pdf	N
29843	Princep 80WP	Japanese Spurge	<i>Pachysandra terminalis</i>	P. coccinea (Fiery Cascade)	Field Container	Linderman	1986	Foliar	No crop injury at 1, 2 and 4 lb ai/A		N
29842	Princep 80WP	Japanese Spurge	<i>Pachysandra terminalis</i>	P. terminalis (Japanese)	Field In-Ground	Haramaki	1983	Over the top	Pachysandra treated with 1, 2, 4 lb ai/a demonstrated slight crinkling on new growth but otherwise good, dense vegetative growth. Simazine at 2 and 4 lb ai/a gave good to excellent control of grasses and broadleaf weeds.	20100523h.pdf	N
29840	Princep 80WP	Photinia	<i>Photinia sp.</i>		Field In-Ground	Gilliam	1981	Foliar	No crop injury with 2 lb ai/A. Good weed control.		N
29840	Princep 80WP	Photinia	<i>Photinia sp.</i>		Field In-Ground	Gilliam	1982	Foliar	No crop injury with 2 lb ai/A. Good weed control.		N
29840	Princep 80WP	Photinia	<i>Photinia sp.</i>		Field In-Ground	Gilliam	1983	Foliar	No crop injury with 2 lb ai/A. Good weed control.		N
6925	Princep 80WP	Pine	<i>Pinus sp.</i>		Field Container	Elmore	1978	Broadcast	No significant injury at 2 and 4 lb ai per acre.	19800113x.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29727	Princep 80WP	Pine	<i>Pinus sp.</i>	P. sp. (Monterey pine)	Field In-Ground	Elmore	1977	Ground spray	No injury at 1 lb ai/A. Very good to excellent control of London rocket, puncturevine, henbit, and crabgrass one to two months after application.	20100520a.pdf	Y
29727	Princep 80WP	Pine	<i>Pinus sp.</i>	P. strobus	Field In-Ground	Ahrens	1976	Ground spray	Good control of weeds with 1.5 lb ai/A. No injury with the wettable powder whereas residual ratings taken 1 yr after second application showed long term injury to white pine with granular simazine combinations.	20100520p.pdf	Y
29727	Princep 80WP	Pine	<i>Pinus sp.</i>	P. strobus	Field In-Ground	Cohen	1975	Ground spray	Good to excellent control of goosegrass and pigweed. No visual injury to crop with 1-2 lb ai/a.		Y
29727	Princep 80WP	Pine	<i>Pinus sp.</i>	P. strobus	Field In-Ground	Cohen	1976	Ground spray	Good control of fescue, quackgrass and crimson clover	20100520k.pdf	Y
6925	Princep 80WP	Pine	<i>Pinus sp.</i>	P. sylvestris	Field Container	Flanagan	1978	Directed spray	No crop injury at 1, 2, 4, 8 lb ai/A.	20100521c.pdf	Y
29727	Princep 80WP	Pine	<i>Pinus sp.</i>	P. sylvestris	Field In-Ground	Flanagan	1978	Directed spray	Preliminary ratings showed no injury at 1, 2, 3, 4, and 8 lb ai/A. Efficacy ratings to be done in early 1979.	20100520t.pdf	Y
29738	Princep 80WP	Pittosporum	<i>Pittosporum sp.</i>	P. undulatum	Field In-Ground	Elmore	1971	Ground, spray	Little to no injury to with 0.5 lb ai/A. Moderate control of Sow thistle and Prostrate Pigweed.		N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
7760	Princep 80WP	Firethorn	<i>Pyracantha sp.</i>		Field Container	Badiei	1983	Foliar	No phytotoxicity at 0.5, 1, 2, 4 lb ai/A.	20100522c.pdf	N
7760	Princep 80WP	Firethorn	<i>Pyracantha sp.</i>		Field Container	Bing	1984	Over the top	No crop injury at 1, 2, 4, lb ai/A. Very Good to excellent weed control.	20100522d.pdf	N
7760	Princep 80WP	Firethorn	<i>Pyracantha sp.</i>	P. coccinea 'Fiery Cascade'	Field Container	Linderman	1986	Over the top	No crop injury with 1, 2, 4, lb ai/a at 60 DAT. Good to excellent weed control.	20100523i.pdf	N
5577	Princep 80WP	Firethorn	<i>Pyracantha sp.</i>	P. coccineum	Field Container	Elmore	1972	Broadcast	Some growth delay at 4 lbs ai/a at 3 month rating but none observed at 6 months. Acceptable oxalis control with 2 and 4 lb ai/A at 5 months but lack of control with 2 lb ai/a at 6 month rating.	20100520w.pdf	N
147	Princep 80WP	Oak	<i>Quercus sp.</i>	Q. palustris	Field In-Ground	Haramaki	1978	Directed spray	Good to excellent residual control was obtained with 1, 2 and 4 lb ai/A alone and in combination with glyphosate. No reduction in growth.		N
147	Princep 80WP	Oak	<i>Quercus sp.</i>	Q. rubra	Field In-Ground	Haramaki	1978	Directed spray	Good to excellent residual control was obtained with 1, 2 and 4 lb ai/A alone & w/ glyphosate. No reduction in growth.		N
7759	Princep 80WP	Rhododendron	<i>Rhododendron sp.</i>		Field Container	Bing	1983		No crop injury with simazine 1, 2 and 4 lb ai/A. Effective weed control with all three rates.		N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
29894	Princep 80WP	Azalea	<i>Rhododendron sp.</i>	R. Azalea 'Red Wing'	Greenhouse	Ticknor	1978	Broadcast	No crop injury observed after exposure to 48 or 72 hours of simazine fumes in closed system.	20100521a.pdf	N
5338	Princep 80WP	Azalea	<i>Rhododendron sp.</i>	R. azalea (Hershey Red)	Field In-Ground	Frank	1980	Directed spray	No crop phytotoxicity with 2 lb ai/A. Significantly lower weed coverage than control plot 40 DAT.	20100521f.pdf	N
5338	Princep 80WP	Azalea	<i>Rhododendron sp.</i>	R. poukhanense (Korean Azalea)	Field In-Ground	Haramaki	1973	Directed spray	Some Phytotoxicity at 4 lb ai/A rate but not at 1 and 2 lb ai/A. The 4 lb rate gave commercially acceptable weed control.	20100521n.pdf	N
7759	Princep 80WP	Rhododendron	<i>Rhododendron sp.</i>	R. poukhanensis 'Karen'	Field Container	Ahrens	1980	Over the top	No injury at 1 lb ai/A, slight injury at 2 lb ai per acre.	19800128w.pdf	N
7759	Princep 80WP	Rhododendron	<i>Rhododendron sp.</i>	R. poukhanensis 'Karen'	Field Container	Ahrens	1981	Over the top	Mild injury to A. poukhanensis with 2 lb ai/A. Effective weed control with 1-2 lb ai/A.	20100521t.pdf	N
7759	Princep 80WP	Rhododendron	<i>Rhododendron sp.</i>	R. 'Purple Gem'	Field Container	Ahrens	1981	Over the top	No crop injury with 1, 2, lb ai/A. Effective weed control with 1-2 lb ai/A.		N
7759	Princep 80WP	Rhododendron	<i>Rhododendron sp.</i>	R. 'Roseum Elegans	Field Container	Bing	1982	Over the top	Severe crop injury from 1, 2, 4, lb ai/A at 49 DAT.	20100521v.pdf	N
5338	Princep 80WP	Azalea	<i>Rhododendron sp.</i>	R. sp. (Hershey Red Azalea)	Field In-Ground	Frank	1979	Directed spray	No phytotoxicity observed with 2.2 kg/ha. Effective weed control.	20100521e.pdf	N
7759	Princep 80WP	Rhododendron	<i>Rhododendron sp.</i>	R. sp. (Vulcan)	Field Container	Badiei	1983	Over the top	No crop injury from 0.5, 1, 2, and 4 lb ai/A	20100522k.pdf	N

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
375	Princep 80WP	Rose	<i>Rosa sp.</i>		Greenhouse	Ticknor	1979	Broadcast	No injury to crop 48 hours after exposure to fumes from 32 lb ai per acre applied under greenhouse benches.	20100521a.pdf	N
29757	Princep 80WP	Rose	<i>Rosa sp.</i>	Rosa sp.	Field In-Ground	Menges	1977	Soil Incorporation	Minor injury to Rosa sp. with 2, 4, 8 lb ai. Good to Very good initial weed control 2 months after application dropping to fair to moderate control 6 months after application on field sandbur, lg crabgrass, knotgrass, Colorado grass, purple nutsedge and p	20100520f.pdf	N
29778	Princep 80WP	Marigold	<i>Tagetes sp.</i>		Greenhouse	Ticknor	1979	Ground spray	No crop injury observed after 48 hrs of exposure to fumes from 32 lb ai/A applied under greenhouse benches.	20100521a.pdf	N
29725	Princep 80WP	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1975	Broadcast	No injury with 1.5 lb ai/A. Good to excellent control of carpetweed, crabgrass, and pigweed.	20100520p.pdf	Y
29725	Princep 80WP	Yew	<i>Taxus sp.</i>	T. cuspidata	Field In-Ground	Ahrens	1976	Broadcast	No injury with 1.5 lb ai/a. Good weed control.	20100520p.pdf	Y
29725	Princep 80WP	Yew	<i>Taxus sp.</i>	T. cuspidata (compacta)	Field In-Ground	Frank	1979	Directed spray	No injury with 2 lb ai/A.	20100521o.pdf	Y
29725	Princep 80WP	Yew	<i>Taxus sp.</i>	T. cuspidata (compacta)	Field In-Ground	Frank	1980	Directed spray	No crop phytotoxicity with 2 lb ai/A. Significantly lower weed coverage than control plot 40 DAT.	20100521p.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
51	Princep 80WP	Yew	<i>Taxus sp.</i>	T. media	Field Container	Smith	1977	Ground spray	Acceptable injury (20100520e.pdf	Y
29725	Princep 80WP	Yew	<i>Taxus sp.</i>	T. media	Field In-Ground	Smith	1977	Ground spray	No injury except with highest rate of 60 lb ai/A. Good to excellent control of weeds at 3,7,5, 15, 30, 60 lb ai/A four months after application.	20100520e.pdf	Y
7757	Princep 80WP	Arborvitae	<i>Thuja sp.</i>	Arborvitea sp.	Field Container	Bing	1983	Over the top	No phytotoxicity at 1, 2, or 4 lb ai/A. Very effective weed control.	20100521w.pdf	Y
5969	Princep 80WP	Arborvitae	<i>Thuja sp.</i>	T. occidentalis 'Pyramidalis'	Field In-Ground	Smith	1977	Ground spray	Unacceptable injury with 30 and 60 lb ai/A. Excellent weed control with 3, 7.5, 15, 30 and 60 lb ai/A four months after application.	20100520e.pdf	Y
7757	Princep 80WP	Arborvitae	<i>Thuja sp.</i>	T. occidentalis 'Pyramidalis'	Field Container	Smith	1977	Ground spray	Significant crop injury at 3, 7.5, 15, 30, 60 lb ai/A. Excellent weed control four months after application.	20100520e.pdf	Y
5969	Princep 80WP	Arborvitae	<i>Thuja sp.</i>	T. occidentalis "Wares"	Field In-Ground	Haramaki	1976	Directed spray	No injury to mature established arborvitae with directed sprays of simazine alone at 2 lb ai/A or in combination with glyphosate (0.5, 1, 2 lb ai/A). Good to excellent control of weeds obtained with directed sprays of glyphosate (0.5 to 2 lb ai/a) plus simazine	20100521d.pdf	Y

PR#	Product	Crop Common Name	Crop Latin Name	Crop Cultivar	Production Site	Researcher	Year	Application	Results	File Name	Reg ? Y/N
7757	Princep 80WP	Arborvitae	<i>Thuja sp.</i>	T. orientalis (Blue Cone)	Field Container	Badiei	1983	Foliar	No crop injury with 0.5, 1, 2, 4 lb ai/A	20100521x.pdf	Y
7757	Princep 80WP	Arborvitae	<i>Thuja sp.</i>	T. sp.	Field Container	Bing	1984	Over the top	No phytotoxicity with 1, 2 and 4 lb ai/A. Very effective weed control.	20100521y.pdf	Y
28117	Princep 80WP	Hemlock	<i>Tsuga sp.</i>		Field In-Ground	Cohen	1975	Ground, spray	Excellent control of goosegrass and carpetweed at 1-2 lb ai/A in newly transplanted liners. No crop injury.		N
28117	Princep 80WP	Hemlock	<i>Tsuga sp.</i>		Field In-Ground	Cohen	1975		No visible injury at 1 and 2 lb ai per acre.	19800112b.pdf	N
28117	Princep 80WP	Hemlock	<i>Tsuga sp.</i>	T. canadensis	Field In-Ground	Cohen	1975		Excellent control of goosegrass and carpetweed; no injury at 1 and 2 lb ai per acre.	19800112a.pdf	N
28117	Princep 80WP	Hemlock	<i>Tsuga sp.</i>	T. canadensis	Field In-Ground	Cohen	1976	Ground spray	Very good to excellent control of Giant Ragweed with 2.5 and 4.0 lb ai/A with no injury to T. canadensis	20100520j.pdf	N
29741	Princep 80WP	Xylosma	<i>Xylosma sp.</i>		Field In-Ground	Elmore	1971	Ground spray	Little to no injury with 0.5 lb ai/A. Moderate control of Sow thistle and Prostrate Pigweed.		N
29839	Princep 90W	Heather	<i>Calluna sp.</i>		Field In-Ground	Bing	1985	Over the top	No crop injury with 1, 2 and 4, lb ai/A. Moderate weed control.	20100522r.pdf	N

Label Suggestions

For simazine, it is suggested that the labels remain quite restrictive with over-the-top applications along with fully listing those species exhibiting sensitivity to treatment. The following field grown species should be considered for label expansion to the label for Princep 80W and 90DG based on the lack of significant injury after application.

Buxus microphylla var. koreana

Lilium longiflorum

Photinia sp.

Pyracantha sp.

The following species should be considered for label expansion to the Princep 4G label:

Leucothoe sp.

The following species may be added to the Princep 80 WP label as directed spray applications only.

Acer saccharum

Acer rubrum

Several species demonstrated good tolerance in a limited number of trials (≤ 2) and are worthy of further testing with a good likelihood of being added to the labels:

Buxus sempervirens

Chamaecyparis sp.

Nandina sp.

Pachysandra terminalis

Quercus palustris

Taxodium

Appendix 1: Protocols

PHYTOTOXICITY PROTOCOL FOR CLEARING SIMAZINE ON ORNAMENTALS

Date: 10/04

Ornamental Protocol Number: 544

General label directions: Refer to Product Label

Research program:

Site (species, variety, etc.) - As Attached

Pests(s) - As Attached

Pesticide (common name and trade name) - Simazine (PRINCEP 4L)

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

Syngenta, Dave Ross, (336) 632-6411, FAX# 336-632-2653; e-mail: david.ross@syngenta.com

Formulation- Use only EPA registered product

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:

Dosages - 1x 2 lb.ai/A

2x 4 lb.ai/A

4x 8 lb.ai/A

Volume - 25 to 50 gallons of water

Timing - One application per year (Interval)

Number Applications: 1

Reports:

Method of application: (treatments should be made over the top of the plants using application equipment consistent with conventional commercial equipment).

Report completely on experimental design and method of application.

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 both actual counts and 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.

If appropriate also include a rating for: Chlorosis. Percent of Defoliation (0-10 scale) and stunting (0-10). Indicate if marketable or not.

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

Appendix 2: Contributing Researchers

Dr. John Ahrens
Connecticut Agricultural Experiment Station
Valley Laboratory
153 Cook Hill Road, P.O. Box 248
Windsor, CT

Dr. A. A. Badiei
retired
Oregon State University
3320 Orchard St.
Corvallis, OR 97330

Dr. Arthur Bing
retired
Cornell University
Long Island Horticulture Research Laboratory
39 Sound Ave
Riverhead, NY 11901

Dr. P. L. Carpenter
retired
Purdue University
Dept. of Horticulture
W. Lafayette, IN 47907

Dr. M. Cohen
retired
N.C. State University
Raleigh, NC

Dr. Jeffrey Derr
Hampton Roads Ag. Exp. Station
1444 Diamond Springs Road,
Virginia Beach, VA 23455

Dr. Clyde Elmore
retired
University of California
Botany Department
Davis, CA 95616

Dr. T. R. Flanagan
retired
University of Vermont
Dept of Plant and Soil Science,
Burlington, VT 05405

Mr. Ray Frank
6916 Boyers Mill Road
New Market, MD 21774

Dr. Charles Gilliam
Auburn University
Department of Horticulture
101 Funchess Hall
Auburn, AL 36849 Dr. Carpenter

Dr. Norman C. Glaze	USDA-ARS Coastal Plain Experimental Station PO Box 748 Tifton, GA 31793
Dr. Chiko Haramaki <i>retired</i>	Penn State University 103 Tyson Bldg. Dept. of Horticulture University Park, PA 16802
Dr. C. R. Krause	USDA-ARS 359 Main Rd Delaware, OH 43015
Dr. Larry J. Kuhns	Penn State University 304 Tyson Building University Park, PA 16802
Dr. R. G. Linderman <i>retired</i>	USDA-ARS Horticultural Crops Research Laboratory 3420 N. W. Orchard Corvallis, OR 97330
Dr. Robert M. Menges <i>retired</i>	USDA-ARS PO Box 267 Weslaco, TX 78596
Dr. Rich Regan	Oregon State University North Willamette Res. & Ext. Ctr. 15210 NE Miley Rd. Aurora, OR 97002
Dr. Bob Stamps	University of Florida, IFAS Ag. Research and Educ. Center 2807 Binion Rd. Apopka, FL 32703
Dr. Elton Smith <i>retired</i>	The Ohio State University 248 Howlett Hall 2001 Fyffe Court Columbus, OH 43210
Dr. Talbert <i>retired</i>	Univ. of Arkansas Alzheimer Lab RR 11, Box 83 Fayetteville, AR 72701

Dr. Robert L. Ticknor
retired

Oregon State University
N. Willamette Experiment Station
Rt. 2. Box 600
Aurora, OR 97002

Dr. Ray D. Williams
retired

Oregon State University
Dept. of Horticulture
Corvallis, OR 97331

Appendix 3: Submitted Data

Researcher reports included in the printed copy of this report are those received by 3/15/2010. Reports on following pages are in alphanumeric order of author then PR number.