

Project Name: Insecticide Crop Safety – New Products

New	Ongoing	X	Completed		Duration if ongoing or completed:	2010-2015
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Project Description:

While it is fairly common for ornamental horticulture labels to allow the use of insecticides and miticides on crops generally, developing crop safety data is still critical to support these ‘open’ labels. Many labels list the tested crops along with the plant type as well as any crops that might be injured after application. From 2010 through 2013, IR-4 has tested several new insecticides for thrips management to verify and expand the screened crops.

Research Project Abstract (if available):

Abstract from 2015 Pyrifluquinazon Crop Safety Summary

Pyrifluquinazon was registered for use on greenhouse ornamental horticulture crops as foliar sprays in the United States in 2013 to manage whiteflies, aphids, leafhoppers, chilli thrips, and mealybugs. The label contains a list of crops tested for tolerance. From 2010 to 2014, the IR-4 Project conducted 92 trials on 24 ornamental plant species examining phytotoxicity related to pyrifluquinazon applications. No tested crops exhibited significant injury or growth reduction during these experiments. It is recommended that *Bacopa* sp. be added to the list of tolerant crops.

Abstract from 2015 Spirotetramat Crop Safety Summary

Spirotetramat was registered as Kontos for use on ornamentals applied foliar or drench in the United States in 2008. The label recommends use on ornamental horticulture plants except a few species or genera specified in the label. From 2007 to 2013, the IR-4 Project conducted 225 trials on 49 ornamental plant species examining phytotoxicity related to Kontos applications. In these trials, only 6 crops (*Begonia* sp., *Coleus x hybridus*, *Petunia* sp., *Pelargonium* sp., *Vinca* sp., and *Viola* sp.) exhibited noticeable, significant injury and that was a slight height reduction, leaf curling, bleaching of flowers or plant death at the 2X and 4X rates applied as drench. One species (*Verbena hybrida*) exhibited significant flower discoloration at all rates applied as drench in one trial. Based on this information, it is recommended that the label prohibits drench application on *Begonia* sp., *Coleus x hybridus*, *Petunia* sp., *Pelargonium* sp., *Verbena hybrida*, *Vinca* sp., and *Viola* sp. The current label does not recommend use of Kontos on *Pelargonium* spp. Foliar application on these species may be recommended with the precautionary statements in the CROP TOLERANCE section of the current Kontos label.

Abstract from 2013 Tolfenpyrad Crop Safety Summary

Tolfenpyrad was first registered as Hachi-Hachi 15 EC in the United States on July 28, 2010 for the control of aphids, leafhoppers, scales, thrips, whiteflies, and early instar lepidopteran larvae on ornamental horticulture crops grown in greenhouses. An expansion of this label for outdoor uses is planned. The IR-4 Project completed 160 trials on 24 ornamental plant species from 2010 through 2014 examining phytotoxicity related to foliar applications of Hachi-Hachi 15EC or Hachi-Hachi SC. In this report, 11 species or genera exhibited minimal or no injury after foliar treatments of Hachi-Hachi 15EC (tolfenpyrad) at 21, 48 and 84 fl oz per 100 gal. All can be added to the label as crops tested for tolerance: (*Alyssum* sp., *Angelonia* sp., *Antirrhinum* sp., *Begonia* sp., *Chrysanthemum/Dendranthemum* sp., *Dahlia* sp., *Petunia* sp., *Tagetes* sp., *Verbena* sp., *Viola* sp. and *Zinnia* sp.). For Hachi-Hachi SC, 12 crops can be listed on the label as crops tested for tolerance (*Alyssum* sp., *Angelonia* sp., *Antirrhinum* sp., *Bacopa* sp., *Begonia* sp., *Dahlia* sp., *Gerbera* sp., *Petunia* sp., *Tagetes* sp., *Verbena* sp., *Viola* sp. and *Zinnia* sp.), and two crops should be included in listing of crops where treatments are not recommended: *Impatiens* sp. and *Impatiens*, New Guinea Hybrids.

Please note: Hachi Hachi SC is the only formulation currently marketed for ornamental horticulture.



Ornamental Horticulture Program Research Project Sheet

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

Target Species (Phytotoxicity, or common and Latin name of arthropod, pathogen, weed):
Crop Safety

Target Crops (list tested crops if ongoing or completed project)
See "IR-4 Crop Safety to Date" below

Target Product(s) (list tested products or numbered compounds if ongoing or completed project)		
BAS 440 00i BYI-2960 200SL Hachi Hachi EC	Hachi Hachi EC Kontos Rycar	Sultan Xxpire 40WDG

Product Registration and Research Status	
	Registration Status
Labeled & Commercialized Wide range of ornamental horticulture crops listed	Kontos
Labeled & Commercialized Opportunity to add additional ornamental horticulture crops	Hachi Hachi SC* Rycar * Sultan Xxpire 40WDG *
Labeled But NOT Commercialized Not yet registered or labeled	BAS 440 00i BYI-2960 200 SL
No longer available for development	Hachi Hachi EC *
* IR-4 Data contributed to registration decision – either adding pest to label or not pursuing further research	

Other:
This project arose from the Thrips Efficacy Project but has since become screening new active ingredients and newly registered insecticides and miticides.

Project Pros	Project Cons
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IR-4 Crop Safety Trials to Date
Average rating on a scale of 1 – 5 with 1 = 0 to about no injury and 5 = severe injury and mortality; minimum to maximum rating; number of trials. A rating of 3 or higher is considered commercially unacceptable (<i>red text</i>). A rating of 1 or 2 is considered commercially acceptable and those with more than 3 trials are complete (<i>green text</i>). 'Labeled' indicates that IR-4 generated data in at least one trial and that this crop is listed on the label. For crop/product combinations that are blank, IR-4 has not screened this combination.

Plant Group	Crop	Hachi-Hachi EC (Tolfenpyrad)	Hachi-Hachi SC (Tolfenpyrad)	Kontos (BYI 8330 240SC) (Spirotetramat)	Rycar (SP3009/NNI-0101) (Pyrifluquinazon)	Sultan (Cyflumetofen)
Broadleaf Evergreen Tree/ Shrub	Jasmine, Cape, Common Gardenia (Gardenia sp.)	MFG Hold	1.0 (1 - 1) n1	1.0 (1 - 1) n1	1.0 (1 - 1) n1	
Broadleaf Evergreen/ Deciduous Tree/Shrub	Magnolia (Magnolia sp.)			Labeled		
Bulbs & Corms	Dahlia (Dahlia sp.)	MFG Hold	1.0 (1 - 1) n4	1.0 (1 - 1) n4	Labeled	1.0 (1 - 1) n2
	Lily (Lilium sp.)			1.0 (1 - 1) n6		
Deciduous Tree/ Shrub/Vine	Hydrangea (Hydrangea sp.)			Labeled		1.0 (1 - 1) n2
	Rose (Rosa sp.)			Labeled	Labeled	
	Arrowwood (Viburnum sp.)			Labeled		
Hardy Ground Cover Foliage	Shrub Verbena (Lantana sp.)			Labeled		
	Periwinkle (Vinca sp.)			Labeled		
Herbaceous Flowering Plant	Angelonia (Angelonia angustifolia)	MFG Hold	1.0 (1 - 1) n3	1.0 (1 - 1) n3	Labeled	1.0 (1 - 1) n1
	Flamingo-lily (Anthurium andraeanum)			1.0 (1 - 1) n4		
	Dendrobium Orchid (Dendrobium densiflorum)			1.0 (1 - 1) n2		
	Mallow, Rose Mallow (Hibiscus sp.)					1.0 (1 - 1) n1
	Sweet Alyssum (Lobularia maritima)	MFG Hold	1.0 (1 - 1) n1	3.0 (3 - 3) n1	1.0 (1 - 1) n1	
	Orchid, Dancing Lady (Oncidium sp.)			1.0 (1 - 1) n2		
	Sage, common (Salvia officinalis)		Labeled	Labeled	1.0 (1 - 1) n2	1.0 (1 - 1) n2
Herbaceous Flowering Plant - Annual	Snapdragon (Antirrhinum majus)	MFG Hold	1.0 (1 - 1) n4	1.0 (1 - 1) n5	Labeled	1.0 (1 - 1) n3
	Water Hyssop (Bacopa sp.)	MFG Hold	1.0 (1 - 1) n3	1.0 (1 - 1) n4	1.0 (1 - 1) n5	
	Begonia (Begonia sp.)	2.5 (2 - 3) n2	1.0 (1 - 1) n4	Labeled	Labeled	
	Calibrachoa (Calibrachoa sp.)		1.0 (1 - 1) n1		1.0 (1 - 1) n1	1.0 (1 - 1) n1
	Poinsettia (Euphorbia pulcherrima)			Labeled		
	Fuschia, Ladies-Eardrops (Fuschia sp.)		1.0 (1 - 1) n2		1.0 (1 - 1) n1	1.0 (1 - 1) n1
	Transvaal Daisy (Gerbera sp.)	Labeled	Labeled	Labeled	Labeled	1.0 (1 - 1) n1
	New Guinea Impatiens (Impatiens hawkeri)	Labeled	Labeled	1.0 (1 - 1) n4	Labeled	
	Balsam (Impatiens sp.)	Labeled	Labeled	Labeled	Labeled	1.0 (1 - 1) n2
	Geranium (Pelargonium sp.)			Labeled		MFG Hold
	Geranium, Zonal (Pelargonium x hortorum)	MFG Hold	Labeled		Labeled	
	Petunia (Petunia sp.)	Labeled	Labeled	Labeled	Labeled	
Marigold (Tagetes sp.)	Labeled	Labeled	Labeled	Labeled		

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	Wishbone Flower (<i>Torenia</i> sp.)			Labeled		
	Pansy (<i>Viola</i> sp.)	Labeled	Labeled	Labeled	Labeled	1.0 (1 - 1) n3
	Zinnia (<i>Zinnia</i> sp.)	1.1 (1 - 2) n7	1.0 (1 - 1) n6	Labeled	Labeled	
Herbaceous Flowering Plant - Perennial	Madwort (<i>Alyssum</i> sp.)	MFG Hold	1.0 (1 - 1) n4	1.7 (1 - 3) n3	Labeled	1.0 (1 - 1) n4
	Rose Periwinkle (<i>Catharanthus roseus</i>)			1.0 (1 - 1) n3		
	Chrysanthemum, Garden (<i>Chrysanthemum/Dendranthema</i> sp.)	MFG Hold	Labeled	Labeled	Labeled	
	Hardy Mum (<i>Chrysanthemum/Dendranthema</i> x <i>morifolium</i>)					1.0 (1 - 1) n1
	Tickseed (<i>Coreopsis</i> sp.)		1.0 (1 - 1) n1		1.0 (1 - 1) n1	
	Carnation (<i>Dianthus caryophyllus</i>)			Labeled		
	Pinks (<i>Dianthus</i> sp.)	MFG Hold	1.0 (1 - 1) n2		Labeled	
	Vervain (<i>Verbena</i> sp.)	Labeled	Labeled	Labeled	Labeled	
Palm	Palm, Sentry (<i>Howea forsteriana</i>)			1.0 (1 - 1) n2		
	Neoregalia sp. (<i>Neoregalia</i> sp.)			1.5 (1 - 2) n2		
	Large Lady Palm (<i>Rhapis excelsa</i>)			1.0 (1 - 1) n2		
Tropical Foliage Plant	Croton, Variegated Laurel (<i>Codiaeum variegatum</i>)			Labeled		
	Coleus, Flamenettle (<i>Coleus</i> sp.)			Labeled		
	Dracaena deremensis (<i>Dracaena deremensis</i>)			Labeled		
	Dracaena marginata (<i>Dracaena marginata</i>)			Labeled		
	Dracaena (<i>Dracaena</i> sp.)		1.0 (1 - 1) n1		1.0 (1 - 1) n1	1.0 (1 - 1) n1