



Environmental Horticulture Program Research Project Sheet

<https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-extension-resources/>

Project Name: Insecticide & Miticide Crop Safety – New Products

New	Ongoing	X	Completed		Duration if ongoing or completed:	2010-2021
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Project Description:

While it is fairly common for environmental 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 tested several new insecticides for thrips management to verify and expand the screened crops. Since then, IR-4 screened new insecticides for pest management.

Research Project Abstract (if available):

INSECTICIDES –

Abstract from 2019 Afidopyropen Crop Safety Summary

Ventiga (BAS 440i) (afidopyropen) is a new insecticide recently registered by BASF for the control of piercing and sucking insect pests such as aphids, whiteflies, psyllids, scales and leafhoppers. The IR-4 Project completed 106 crop safety trials on 42 environmental horticulture plant species or genera from 2015 through 2019. In these trials, 24 genera or species exhibited minimal or no injury after foliar applications in a minimum of 3 trials for each crop; these can be added to a list of tolerant plants in the new label for this active ingredient. All trials for 18 other species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop with the exception of dahlia which had moderate injury in one trial.

Abstract from 2020 Cyclaniliprole + Flonicamid Crop Safety Summary

Pradia (cyclaniliprole + flonicamid) is a new insecticide combination recently registered for environmental horticultural crops for the control of a wide variety of insects including aphids, leafminers, scales and mealybugs, foliage feeding beetles and caterpillars, thrips, and whiteflies. In 2019, the IR-4 Project completed 16 crop safety trials on 9 ornamental plant genera or species. In these trials, 2 exhibited minimal or no injury after foliar applications. For the remaining 7 crops, sufficient information has not yet been generated. However, all tested crops are not sensitive to foliar applications up to 4X the proposed high label rate.

Abstract from 2021 ISM555 Crop Safety Summary

ISM-555 is a new insecticide being developed by Syngenta for management of scale, mealybugs, thrips, beetles and other pests on environmental horticulture crops. The IR-4 Project completed 22 crop safety trials on 16 environmental horticulture plant species or genera during 2018 to 2021. In these trials, all 12 species or genera exhibited minimal or no injury. Three species (*Impatiens walleriana*, *Petunia x hybrida*, and *Tagetes erecta*) exhibited minimal or no injury in at least 3 trials and 9 additional species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop.

Abstract from 2022 Neem Oil + Azadirachtin Crop Safety Summary

ANEEM (neem oil + azadirachtin) is an extract from the neem plant which has insecticidal, miticidal and some nematocidal and fungicidal properties. The IR-4 Project completed 23 crop safety trials on seven environmental horticulture plant species or genera during 2020, 2021 and 2022. Overall, no or minimal transitory phytotoxicity was observed on all crops except *Anthirrhinum majus* where minor to moderate injury symptoms were detected with increasing application rates. More information should be generated on this species to better understand the phytotoxicity risks that may come from repeated applications of ANEEM.

Abstract from 2019 Pyridalyl Crop Safety Summary

Pyridalyl was registered as Overture for use on environmental horticulture plants in greenhouses with foliar applications in the United States in 2008. The label recommends use on horticulture plants with testing by the grower. From 2010 to 2015, the IR-4 Project conducted 51 trials on 12 ornamental plant species or genera examining phytotoxicity related to Overture applications. In these trials, no injury was noted.

Abstract from 2019 Pyrifluquinazon Safety Summary

Pyrifluquinazon was registered for use on greenhouse environmental 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 2016, the IR-4 Project conducted 131 trials on 29 ornamental plant species / genera examining phytotoxicity related to pyrifluquinazon applications. In these trials, 23 species or genera exhibited minimal or no injury after foliar applications in a minimum of 3 trials for each crop. Nineteen of these are already in the current Rycar label; the other four can be added to the label. All trials for six other species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop and two of these are already registered.

Abstract from 2021 SP3014 Crop Safety Summary

SP3014 is a new insecticide being developed by SePro for the control of scales, mealybugs and other insects on environmental horticulture crops. The IR-4 Project completed 22 crop safety trials on 16 environmental horticulture plant species or genera during 2018 to 2021. In these trials, all 16 species or genera exhibited minimal or no injury. One species (*Impatiens walleriana*) exhibited minimal or no injury in 3 trials (Table 1) and 15 species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop (Table 4). When first registered, it may be possible to include these in the list of crops with no known adverse impact.

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 2019 Tolfenpyrad Safety Summary

Tolfenpyrad was first registered in the United States as Hachi-Hachi 15 EC on July 28, 2010 for the control of aphids, leafhoppers, scales, thrips, whiteflies, and early instar lepidopteran larvae on environmental horticulture crops grown in greenhouses. A new formulation Hachi-Hachi 15 SC was registered on March 30, 2015, then on June 11, 2018. An expansion of this label for outdoor uses is planned. The IR-4 Project completed 194 trials on 29 ornamental plant species from 2010 through 2016 examining phytotoxicity related to foliar applications of Hachi-Hachi 15EC or Hachi-Hachi SC. In this report, 11 species or genera exhibited no or minimal injury after foliar treatments of Hachi-Hachi 15EC (tolfenpyrad) at 21, 48 and 84 fl oz per 100 gal. Three of these crops are already in the current label as crops tested for tolerance: *Chrysanthemum*/*Dendranthemum* sp., *Petunia* sp., and *Tagetes* sp. The rest can be added to the label: (*Alyssum* sp., *Angelonia* sp., *Antirrhinum* sp., *Begonia* sp., *Dahlia* sp., *Verbena* sp., *Viola* sp. and *Zinnia* sp.). For Hachi-Hachi SC, 20 species or genera

exhibited no or minimal injury; 5 of these crops are already in the current label as crops tested for tolerance. Fifteen crops can be listed on the label (Angelonia sp., Bacopa sp., Begonia sp., Calibrachoa sp., Dracaena sp., Dahlia sp., Fuschia sp., Hydrangea sp., Lobularia maritima, Pelargonium x hortorum, Petunia sp., Rosa sp., Tagetes sp., Verbena sp. and Viola sp.).

Abstract from 2021 V-10433 Crop Safety Summary

V-10433 is a new insecticide being developed by Valent for the control of scales, mealybugs thrips and other insect infesting environmental horticulture crops. The IR-4 Project completed 24 crop safety trials on 16 environmental horticulture plant species or genera during 2018 to 2021. In these trials, V-10433 exhibited no or minimal negative impact on 12 plant species or genera. Four species (Antirrhinum majus, Impatiens walleriana, Solenostemon sp. and Tagetes sp.) exhibited minimal or no injury in 3 trials and 8 species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop.

MITICIDE –

Abstract from 2019 Cyflumetofen Crop Safety Summary

Sultan (cyflumetofen) was registered for use on greenhouse environmental horticulture crops as foliar spray in the United States on May 9, 2014 to manage mites. The label does not contain a list of crops tested for tolerance. During 2014 to 2018, the IR-4 Project conducted 92 trials on 25 environmental horticulture plant species or genera examining phytotoxicity related to Sultan applications. Sixteen species or genera exhibited no injury in a minimum of 3 trials, and eight species or genera exhibited no or minimal injury in the limited number of trials (one or two) for each crop. BASF can consider adding these to the label. Only one crop (Impatiens walleriana) exhibited significant injury or growth reduction during these experiments.

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)

Altus	Rycar
ANEEM	Sarissa
BCS991	SP3014Sultan
Hachi-Hachi	TetraCURB Concentrate
ISM-555	TetraCURB Max
Kontos	TetraCURB Organic
Overture	V10433
Pradia	Velifer
PyClear	Ventigra

Product Registration and Research Status

	Registration Status
Labeled & Commercialized Wide range of ornamental horticulture crops listed	Altus Sarissa Pradia Sultan PyClear Velifer Rycar Ventigra
Labeled & Commercialized Opportunity to add additional ornamental horticulture crops	
Labeled But NOT Commercialized	
Not yet registered or labeled	ANEEM



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	BCS991 ISM-555 SP3014 TetraCURB V-10433
No longer available for development	
* 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
1	1

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 (*red text*). A rating of 1 or 2 is considered commercially acceptable and those with more than 3 trials are complete (*green text*). '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.

Table 1. Insecticide Product Crop Safety

Crop	Altus (Flupyradifurone)	ANEEM (Neem oil + azadirachtin)	BCS991 (BCS991)	Hachi-Hachi EC (Tolfenpyrad)	Hachi-Hachi SC (Tolfenpyrad)
<i>Alnus sp.</i>					
<i>Alyssum sp.</i>				1.0 (1 - 1) n2	1.0 (1 - 1) n3
<i>Angelonia angustifolia</i>				1.0 (1 - 1) n1	1.0 (1 - 1) n1
<i>Angelonia sp.</i>					
<i>Antirrhinum majus</i>		2.3 (1 - 3) n3		1.0 (1 - 1) n2	1.0 (1 - 1) n2
<i>Aquilegia sp.</i>					
<i>Aster sp.</i>					
<i>Astilbe sp.</i>					
<i>Bacopa sp.</i>				1.8 (1 - 3) n5	1.0 (1 - 1) n3
<i>Begonia semperflorens</i>					
<i>Begonia sp.</i>					
<i>Brassica oleracea</i>					
<i>Calibrachoa sp.</i>	1.0 (1 - 1) n1				1.0 (1 - 1) n5
<i>Camellia sp.</i>					
<i>Chrysanthemum x rubellum</i>					
<i>Chrysanthemum/Dendranthema sp.</i>					1.0 (1 - 1) n1
<i>Chrysanthemum/Dendranthema x morifolium</i>					
<i>Codiaeum variegatum</i>					
<i>Coleus sp.</i>					
<i>Coreopsis sp.</i>					1.0 (1 - 1) n1
<i>Coreopsis tinctoria</i>					
<i>Cornus sp.</i>					
<i>Cotoneaster sp.</i>					
<i>Crassula ovata</i>					
<i>Crataegus sp.</i>					
<i>Dahlia sp.</i>	1.0 (1 - 1) n1	1.5 (1 - 2) n2		1.7 (1 - 3) n3	1.0 (1 - 1) n3
<i>Delphinium sp.</i>					
<i>Dendrobium densiflorum</i>					1.0 (1 - 1) n2
<i>Dianthus sp.</i>				2.0 (2 - 2) n1	1.0 (1 - 1) n2
<i>Digitalis purpurea</i>					
<i>Dracaena sp.</i>					1.0 (1 - 1) n4

Crop	Altus (Flupyradifurone)	ANEEM (Neem oil + azadirachtin)	BCS991 (BCS991)	Hachi-Hachi EC (Tolfenpyrad)	Hachi-Hachi SC (Tolfenpyrad)
<i>Echinacea sp.</i>					
<i>Euonymus sp.</i>					
<i>Euphorbia pulcherrima</i>			1.0 (1 - 1) n1		
<i>Fraxinus sp.</i>					
<i>Fuschia sp.</i>			1.0 (1 - 1) n2		1.4 (1 - 3) n5
<i>Gardenia sp.</i>				1.0 (1 - 1) n1	1.0 (1 - 1) n1
<i>Gerbera jamesonii</i>					
<i>Gerbera sp.</i>			1.0 (1 - 1) n3	1.0 (1 - 1) n1	1.0 (1 - 1) n1
<i>Hedera sp.</i>					
<i>Helichrysum sp.</i>					
<i>Heucherella sp.</i>					
<i>Hibiscus sp.</i>					1.0 (1 - 1) n1
<i>Hibiscus syriacus</i>			1.0 (1 - 1) n2		
<i>Hydrangea sp.</i>			1.0 (1 - 1) n3		1.4 (1 - 3) n7
<i>Impatiens hawkeri</i>	1.0 (1 - 1) n1	1.5 (1 - 3) n4			
<i>Impatiens sp.</i>					
<i>Impatiens walleriana</i>					
<i>Lagerstroemia indica</i>					
<i>Leucanthemum x superbum</i>					
<i>Ligustrum sp.</i>					
<i>Lobelia sp.</i>	1.0 (1 - 1) n1				
<i>Lobularia maritima</i>				3.0 (3 - 3) n1	1.0 (1 - 1) n4
<i>Malus sp.</i>					
<i>Monarda didyma</i>					
<i>Nerium oleander</i>					
<i>Paeonia sp.</i>					
<i>Papaver orientale</i>					
<i>Pelargonium sp.</i>					
<i>Pelargonium x domesticum</i>		1.7 (1 - 2) n3			
<i>Pelargonium x hortorum</i>		1.5 (1 - 2) n4		3.0 (3 - 3) n1	1.0 (1 - 1) n3
<i>Petunia sp.</i>	1.0 (1 - 1) n1				
<i>Petunia x hybrida</i>					
<i>Picea sp.</i>					
<i>Platanus sp.</i>					

Crop	Altus (Flupyradifurone)	ANEEM (Neem oil + azadirachtin)	BCS991 (BCS991)	Hachi-Hachi EC (Tolfenpyrad)	Hachi-Hachi SC (Tolfenpyrad)
<i>Portulaca grandiflora</i>					
<i>Pyrus calleryana</i>					
<i>Rhododendron sp.</i>					
<i>Rosa sp.</i>			1.0 (1 - 1) n2		1.3 (1 - 2) n6
<i>Salix sp.</i>					
<i>Salvia nemorosa</i>					
<i>Salvia officinalis</i>					1.8 (1 - 4) n4
<i>Salvia splendens</i>			1.0 (1 - 1) n1		
<i>Sedum sp.</i>					
<i>Solenostemon sp.</i>		1.0 (1 - 1) n4			
<i>Solidago sp.</i>					
<i>Tagetes erecta</i>					
<i>Tagetes patula</i>					
<i>Tagetes sp.</i>					1.0 (1 - 1) n2
<i>Taxus sp.</i>					
<i>Verbena sp.</i>					1.0 (1 - 1) n2
<i>Veronica sp.</i>					
<i>Viburnum sp.</i>					
<i>Viola sp.</i>					
<i>Viola X wittrockiana</i>		1.5 (1 - 2) n4			
<i>Zinnia elegans</i>					
<i>Zinnia sp.</i>					

Table 2. Insecticide Product Crop Safety

Crop	ISM-555 (ISM-555, A21377X)	Kontos 240SC (Spirotetramat)	Overture 35WP (Pyridalyl)	Pradia (Cyclaniliprole + Flonicamid)	Rycar (Pyrifluquinazon)
<i>Alnus sp.</i>					
<i>Alyssum sp.</i>		1.0 (1 - 1) n2			1.0 (1 - 1) n2
<i>Angelonia angustifolia</i>		1.0 (1 - 1) n1	1.0 (1 - 1) n1		1.0 (1 - 1) n1
<i>Angelonia sp.</i>					
<i>Antirrhinum majus</i>		1.0 (1 - 1) n2			1.0 (1 - 1) n2
<i>Aquilegia sp.</i>					
<i>Aster sp.</i>					
<i>Astilbe sp.</i>					
<i>Bacopa sp.</i>	1.0 (1 - 1) n1	1.0 (1 - 1) n5			1.0 (1 - 1) n5
<i>Begonia semperflorens</i>					
<i>Begonia sp.</i>				1.7 (1 - 2) n6	1.0 (1 - 1) n2
<i>Brassica oleracea</i>					
<i>Calibrachoa sp.</i>					1.0 (1 - 1) n7
<i>Camellia sp.</i>					
<i>Chrysanthemum x rubellum</i>					
<i>Chrysanthemum/Dendranthema sp.</i>	1.0 (1 - 1) n1				1.0 (1 - 1) n1
<i>Chrysanthemum/Dendranthema x morifolium</i>					
<i>Codiaeum variegatum</i>					
<i>Coleus sp.</i>					
<i>Coreopsis sp.</i>					1.0 (1 - 1) n1
<i>Coreopsis tinctoria</i>					
<i>Cornus sp.</i>					
<i>Cotoneaster sp.</i>					
<i>Crassula ovata</i>	1.0 (1 - 1) n1				
<i>Crataegus sp.</i>					
<i>Dahlia sp.</i>		1.0 (1 - 1) n3			1.0 (1 - 1) n3
<i>Delphinium sp.</i>					
<i>Dendrobium densiflorum</i>					
<i>Dianthus sp.</i>			1.0 (1 - 1) n1		1.7 (1 - 3) n3
<i>Digitalis purpurea</i>					

Crop	ISM-555 (ISM-555, A21377X)	Kontos 240SC (Spirotetramat)	Overture 35WP (Pyridalyl)	Pradia (Cyclaniliprole + Flonicamid)	Rycar (Pyrifluquinazon)
<i>Dracaena sp.</i>					1.0 (1 - 1) n4
<i>Echinacea sp.</i>					
<i>Euonymus sp.</i>					
<i>Euphorbia pulcherrima</i>	1.0 (1 - 1) n3				
<i>Fraxinus sp.</i>					
<i>Fuschia sp.</i>			1.0 (1 - 1) n1		1.0 (1 - 1) n4
<i>Gardenia sp.</i>		1.0 (1 - 1) n1			1.0 (1 - 1) n1
<i>Gerbera jamesonii</i>				1.0 (1 - 1) n2	
<i>Gerbera sp.</i>	1.0 (1 - 1) n3				
<i>Hedera sp.</i>					1.0 (1 - 1) n5
<i>Helichrysum sp.</i>					
<i>Heucherella sp.</i>					
<i>Hibiscus sp.</i>					1.0 (1 - 1) n1
<i>Hibiscus syriacus</i>					
<i>Hydrangea sp.</i>					1.0 (1 - 1) n2
<i>Impatiens hawkeri</i>				1.0 (1 - 1) n2	1.0 (1 - 1) n4
<i>Impatiens sp.</i>					1.0 (1 - 1) n1
<i>Impatiens walleriana</i>	1.0 (1 - 1) n5			1.5 (1 - 2) n4	
<i>Lagerstroemia indica</i>					
<i>Leucanthemum x superbum</i>					
<i>Ligustrum sp.</i>					
<i>Lobelia sp.</i>					
<i>Lobularia maritima</i>		3.0 (3 - 3) n1			1.0 (1 - 1) n3
<i>Malus sp.</i>					
<i>Monarda didyma</i>					
<i>Nerium oleander</i>					
<i>Paeonia sp.</i>					
<i>Papaver orientale</i>					
<i>Pelargonium sp.</i>					
<i>Pelargonium x domesticum</i>					
<i>Pelargonium x hortorum</i>	1.5 (1 - 2) n2			1.3 (1 - 2) n3	1.0 (1 - 1) n3
<i>Petunia sp.</i>					1.0 (1 - 1) n1
<i>Petunia x hybrida</i>	1.0 (1 - 1) n3			1.0 (1 - 1) n2	

Crop	ISM-555 (ISM-555, A21377X)	Kontos 240SC (Spirotetramat)	Overture 35WP (Pyridalyl)	Pradia (Cyclaniliprole + Flonicamid)	Rycar (Pyrifluquinazon)
<i>Picea sp.</i>					
<i>Platanus sp.</i>					
<i>Portulaca grandiflora</i>					
<i>Pyrus calleryana</i>					
<i>Rhododendron sp.</i>	1.0 (1 - 1) n1				
<i>Rosa sp.</i>	2.0 (1 - 3) n2				1.0 (1 - 1) n3
<i>Salix sp.</i>					
<i>Salvia nemorosa</i>				1.0 (1 - 1) n4	
<i>Salvia officinalis</i>					
<i>Salvia splendens</i>					1.8 (1 - 3) n5
<i>Sedum sp.</i>					
<i>Solenostemon sp.</i>					
<i>Solidago sp.</i>					
<i>Tagetes erecta</i>	1.0 (1 - 1) n3			1.0 (1 - 1) n2	
<i>Tagetes patula</i>	1.0 (1 - 1) n2			1.0 (1 - 1) n4	
<i>Tagetes sp.</i>					
<i>Taxus sp.</i>					
<i>Verbena sp.</i>	1.0 (1 - 1) n2				1.7 (1 - 3) n3
<i>Veronica sp.</i>					
<i>Viburnum sp.</i>	1.0 (1 - 1) n2				
<i>Viola sp.</i>					1.3 (1 - 2) n3
<i>Viola X wittrockiana</i>	1.0 (1 - 1) n1			1.0 (1 - 1) n3	
<i>Zinnia elegans</i>					
<i>Zinnia sp.</i>					

Table 3. Insecticide Product Crop Safety

Crop	Sarisa 50SL (Cyclaniliprole)	SP3014 (SP3014)	TetraCURB Concentrate (Rosemary Oil)	TetraCURB Max (castor oil + rosemary oil + clove o	TetraCURB Organic (Rosemary Oil)
<i>Alnus sp.</i>					
<i>Alyssum sp.</i>					
<i>Angelonia angustifolia</i>					
<i>Angelonia sp.</i>					
<i>Antirrhinum majus</i>					
<i>Aquilegia sp.</i>					
<i>Aster sp.</i>					
<i>Astilbe sp.</i>					
<i>Bacopa sp.</i>					
<i>Begonia semperflorens</i>		1.0 (1 - 1) n1			
<i>Begonia sp.</i>	1.0 (1 - 1) n1				
<i>Brassica oleracea</i>				1.0 (1 - 1) n1	
<i>Calibrachoa sp.</i>					
<i>Camellia sp.</i>					
<i>Chrysanthemum x rubellum</i>					
<i>Chrysanthemum/Dendranthema sp.</i>		1.5 (1 - 2) n2			
<i>Chrysanthemum/Dendranthema x morifolium</i>					
<i>Codiaeum variegatum</i>					
<i>Coleus sp.</i>					
<i>Coreopsis sp.</i>					
<i>Coreopsis tinctoria</i>					
<i>Cornus sp.</i>					
<i>Cotoneaster sp.</i>					
<i>Crassula ovata</i>					
<i>Crataegus sp.</i>					
<i>Dahlia sp.</i>					
<i>Delphinium sp.</i>					
<i>Dendrobium densiflorum</i>					

Crop	Sarisa 50SL (Cyclaniliprole)	SP3014 (SP3014)	TetraCURB Concentrate (Rosemary Oil)	TetraCURB Max (castor oil + rosemary oil + clove o	TetraCURB Organic (Rosemary Oil)
<i>Dianthus sp.</i>					
<i>Digitalis purpurea</i>					
<i>Dracaena sp.</i>		1.0 (1 - 1) n2			
<i>Echinacea sp.</i>					
<i>Euonymus sp.</i>					
<i>Euphorbia pulcherrima</i>					
<i>Fraxinus sp.</i>					
<i>Fuschia sp.</i>		1.0 (1 - 1) n1			
<i>Gardenia sp.</i>					
<i>Gerbera jamesonii</i>					
<i>Gerbera sp.</i>					
<i>Hedera sp.</i>					
<i>Helichrysum sp.</i>					
<i>Heucherella sp.</i>					
<i>Hibiscus sp.</i>					
<i>Hibiscus syriacus</i>					
<i>Hydrangea sp.</i>		1.0 (1 - 1) n3			
<i>Impatiens hawkeri</i>	1.0 (1 - 1) n1	1.0 (1 - 1) n2			
<i>Impatiens sp.</i>					
<i>Impatiens walleriana</i>		1.0 (1 - 1) n3			
<i>Lagerstroemia indica</i>					
<i>Leucanthemum x superbum</i>					
<i>Ligustrum sp.</i>					
<i>Lobelia sp.</i>					
<i>Lobularia maritima</i>					
<i>Malus sp.</i>					
<i>Monarda didyma</i>					
<i>Nerium oleander</i>					
<i>Paeonia sp.</i>					
<i>Papaver orientale</i>					
<i>Pelargonium sp.</i>					

Crop	Sarisa 50SL (Cyclaniliprole)	SP3014 (SP3014)	TetraCURB Concentrate (Rosemary Oil)	TetraCURB Max (castor oil + rosemary oil + clove o	TetraCURB Organic (Rosemary Oil)
<i>Pelargonium x domesticum</i>					
<i>Pelargonium x hortorum</i>	1.0 (1 - 1) n1	1.0 (1 - 1) n3			
<i>Petunia sp.</i>	1.0 (1 - 1) n1	1.0 (1 - 1) n3		1.0 (1 - 1) n1	
<i>Petunia x hybrida</i>			3.0 (3 - 3) n1		2.0 (2 - 2) n1
<i>Picea sp.</i>					
<i>Platanus sp.</i>					
<i>Portulaca grandiflora</i>					
<i>Pyrus calleryana</i>					
<i>Rhododendron sp.</i>					
<i>Rosa sp.</i>		1.7 (1 - 3) n3			
<i>Salix sp.</i>					
<i>Salvia nemorosa</i>					
<i>Salvia officinalis</i>					
<i>Salvia splendens</i>					
<i>Sedum sp.</i>					
<i>Solenostemon sp.</i>					
<i>Solidago sp.</i>					
<i>Tagetes erecta</i>					
<i>Tagetes patula</i>					
<i>Tagetes sp.</i>		1.0 (1 - 1) n3			
<i>Taxus sp.</i>					
<i>Verbena sp.</i>		1.0 (1 - 1) n3			
<i>Veronica sp.</i>					
<i>Viburnum sp.</i>					
<i>Viola sp.</i>		1.0 (1 - 1) n3			
<i>Viola X wittrockiana</i>		1.0 (1 - 1) n1	1.5 (1 - 2) n4	1.0 (1 - 1) n1	1.8 (1 - 2) n4
<i>Zinnia elegans</i>					
<i>Zinnia sp.</i>					

Table 4. Insecticide & Miticide Product Crop Safety

Crop	V-10433 (V-10433)	Velifer (Beauveria bassiana Strain PPRI 5339)	Ventigra Insecticide (Afidopyropen)	Miticide Sultan (Cyflumetofen)
<i>Alnus sp.</i>			1.0 (1 - 1) n1	
<i>Alyssum sp.</i>				1.0 (1 - 1) n6
<i>Angelonia angustifolia</i>			1.0 (1 - 1) n2	1.0 (1 - 1) n3
<i>Angelonia sp.</i>	1.0 (1 - 1) n1			
<i>Antirrhinum majus</i>	1.0 (1 - 1) n3			1.0 (1 - 1) n3
<i>Aquilegia sp.</i>			2.5 (1 - 4) n2	
<i>Aster sp.</i>			1.0 (1 - 1) n4	
<i>Astilbe sp.</i>			1.0 (1 - 1) n3	
<i>Bacopa sp.</i>				
<i>Begonia semperflorens</i>	1.0 (1 - 1) n1			
<i>Begonia sp.</i>			1.0 (1 - 1) n3	
<i>Brassica oleracea</i>				
<i>Calibrachoa sp.</i>		1.0 (1 - 1) n2		1.0 (1 - 1) n5
<i>Camellia sp.</i>			1.0 (1 - 1) n3	
<i>Chrysanthemum x rubellum</i>			1.0 (1 - 1) n1	
<i>Chrysanthemum/Dendranthema sp.</i>			1.0 (1 - 1) n3	
<i>Chrysanthemum/Dendranthema x morifolium</i>				1.0 (1 - 1) n3
<i>Codiaeum variegatum</i>		1.0 (1 - 1) n2		
<i>Coleus sp.</i>			1.0 (1 - 1) n4	
<i>Coreopsis sp.</i>				1.0 (1 - 1) n2
<i>Coreopsis tinctoria</i>			1.0 (1 - 1) n3	
<i>Cornus sp.</i>			1.0 (1 - 1) n3	
<i>Cotoneaster sp.</i>			1.3 (1 - 2) n3	
<i>Crassula ovata</i>				
<i>Crataegus sp.</i>			1.0 (1 - 1) n1	
<i>Dahlia sp.</i>			2.3 (1 - 5) n3	1.0 (1 - 1) n11
<i>Delphinium sp.</i>			1.0 (1 - 1) n3	
<i>Dendrobium densiflorum</i>				
<i>Dianthus sp.</i>	1.0 (1 - 1) n2		1.0 (1 - 1) n3	1.0 (1 - 1) n3

Crop	V-10433 (V-10433)	Velifer (Beauveria bassiana Strain PPRI 5339)	Ventigra Insecticide (Afidopyropen)	Miticide Sultan (Cyflumetofen)
<i>Digitalis purpurea</i>			1.0 (1 - 1) n3	
<i>Dracaena sp.</i>				1.0 (1 - 1) n4
<i>Echinacea sp.</i>			1.0 (1 - 1) n4	
<i>Euonymus sp.</i>			1.7 (1 - 3) n3	
<i>Euphorbia pulcherrima</i>			1.7 (1 - 3) n3	
<i>Fraxinus sp.</i>			1.0 (1 - 1) n1	
<i>Fuschia sp.</i>				1.0 (1 - 1) n7
<i>Gardenia sp.</i>				
<i>Gerbera jamesonii</i>				
<i>Gerbera sp.</i>	1.0 (1 - 1) n2		1.0 (1 - 1) n2	1.0 (1 - 1) n5
<i>Hedera sp.</i>			1.0 (1 - 1) n3	1.0 (1 - 1) n4
<i>Helichrysum sp.</i>			1.0 (1 - 1) n2	
<i>Heucherella sp.</i>				1.0 (1 - 1) n2
<i>Hibiscus sp.</i>			1.3 (1 - 2) n3	1.0 (1 - 1) n3
<i>Hibiscus syriacus</i>				
<i>Hydrangea sp.</i>			1.3 (1 - 2) n4	1.0 (1 - 1) n4
<i>Impatiens hawkeri</i>	1.0 (1 - 1) n2			1.0 (1 - 1) n5
<i>Impatiens sp.</i>				2.0 (1 - 3) n4
<i>Impatiens walleriana</i>	1.0 (1 - 1) n3			1.0 (1 - 1) n1
<i>Lagerstroemia indica</i>			1.3 (1 - 2) n3	
<i>Leucanthemum x superbum</i>			1.0 (1 - 1) n2	
<i>Ligustrum sp.</i>			1.0 (1 - 1) n2	
<i>Lobelia sp.</i>				
<i>Lobularia maritima</i>				1.0 (1 - 1) n3
<i>Malus sp.</i>			1.0 (1 - 1) n1	
<i>Monarda didyma</i>			1.0 (1 - 1) n3	
<i>Nerium oleander</i>			1.3 (1 - 2) n3	
<i>Paeonia sp.</i>			1.0 (1 - 1) n2	
<i>Papaver orientale</i>			1.5 (1 - 2) n2	
<i>Pelargonium sp.</i>				1.0 (1 - 1) n2
<i>Pelargonium x domesticum</i>				
<i>Pelargonium x hortorum</i>	1.5 (1 - 2) n2			

Crop	V-10433 (V-10433)	Velifer (Beauveria bassiana Strain PPRI 5339)	Ventigra Insecticide (Afidopyropen)	Miticide Sultan (Cyflumetofen)
<i>Petunia sp.</i>				
<i>Petunia x hybrida</i>	1.5 (1 - 2) n2			
<i>Picea sp.</i>			1.0 (1 - 1) n1	
<i>Platanus sp.</i>			2.0 (2 - 2) n1	
<i>Portulaca grandiflora</i>		1.0 (1 - 1) n2		
<i>Pyrus calleryana</i>			1.0 (1 - 1) n1	
<i>Rhododendron sp.</i>			1.0 (1 - 1) n1	
<i>Rosa sp.</i>			1.5 (1 - 2) n2	1.0 (1 - 1) n2
<i>Salix sp.</i>			1.0 (1 - 1) n3	
<i>Salvia nemorosa</i>				
<i>Salvia officinalis</i>				
<i>Salvia splendens</i>				1.0 (1 - 1) n4
<i>Sedum sp.</i>			1.0 (1 - 1) n3	
<i>Solenostemon sp.</i>	1.0 (1 - 1) n3			
<i>Solidago sp.</i>			1.0 (1 - 1) n3	
<i>Tagetes erecta</i>				
<i>Tagetes patula</i>				
<i>Tagetes sp.</i>	1.0 (1 - 1) n3			
<i>Taxus sp.</i>			1.0 (1 - 1) n3	
<i>Verbena sp.</i>				
<i>Veronica sp.</i>			1.0 (1 - 1) n3	
<i>Viburnum sp.</i>			1.0 (1 - 1) n3	
<i>Viola sp.</i>				1.0 (1 - 1) n7
<i>Viola X wittrockiana</i>				
<i>Zinnia elegans</i>	1.0 (1 - 1) n3			
<i>Zinnia sp.</i>			2.0 (1 - 5) n4	