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New Tools for Disease & Pest Management

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Outline

- What is IR-4 in 3 slides
- Disease Management Products
- Pest Management Products



Acknowledgements

- NIFA IR-4 Grant 2015-34383-23710
- USDA-ARS
- State Agricultural Experiment Stations
- Donations from the Crop Protection Industy
- APHIS Cooperative agreements from 2011 through 2018
- NIFA SCRI Grant 2016-51181-25399 "Protecting Pollinators with Economically Feasible and Environmentally Sound Ornamental Horticulture"



What is IR-4?

The IR-4 Project (or Inter-Regional project number 4) was created in 1963 to facilitate



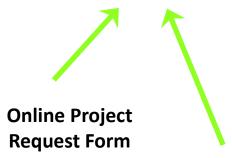
registration of sustainable pest management technology for specialty crops and minor uses



Photo by Cristi Palmer

How are research projects selected?

Stakeholder Input balanced with







Paper or Online Biennial Survey

IR-4	2016/2	017 IR-4 Ornamental	н	ort	icu	ltu	re	Sur	rve	y		2	
ridgety	Thank you i	or your participation in the	ús	RU	rve	v.							
greenhouse, nursery, landscap research plan at our Ornament	c, Christmas tree all Hosticulture W	agente helps provide safe and eff and forestry producers. Every a forkishap. We invite you to help which impact your business.	the	ry	er,	wep	rior	EIN	the	nex	119	1-70	
Please check our affiliation: Giover (Greenbaue undue Nursery) Landscape Cate Protostenda Landscape Cate Protostenda University of USDA ASS Researcher Cooperative Estimoso Federal State, on Local Government D Allied Industry Member		2. Please check all types of	fo	per	atio	ns a	nd	pest	ma	gun	cmi	not.	
		strategies relevant to you Greenhouse O Nirsery - Container Nirsery - Field-grown D Lambeape D Rossinerscape Christmus Tree Farm O Sod Farm	Biological Control Chemical Control IPM Organic Standard Workly/Monthly Program										
3. Please check all plant ma Bodding Plants Cut Flowers Christmas Trees Feliage Plants	0 0 0	to your business: Harbacous Perennials Orannenial Grasses Palms Sepsenal Poted Plants (in Painsenia)						heat ices iarf					
Consider the plant materials you grow or maintain.		Type of Plant Materials											
Then consider situations over the last year where you had difficulty managing diseases, pests, or weeds.			SOUTH PARTS	Dat Flowers	Christmus Trens	Fellago Plants	Horbacostas	Decamandal Grass	Palms	Scancol Petrol Plants	Shribs	Frees	
For all three areas, list the too three situations where	Diseases (including bacteria, forgi, nematodos)												
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"Rhizectonia wilt on	2.		ĕ	ĕ	-	-	-	-	0	ä	0	0	
impations scotlings".												0	
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each type of plant material		w to no available tools		n	n	n	n		-				
Then put a 'v' or 'X' for each type of plant material where this issue occurs in your operation.	1.		0 0	0.0	0 0	0 0	0 0	0 0	0 0	0 0	0.0	0.0	

Researcher & Registrant Input

Project Criteria

- Availability & effectiveness of current options
- Damage potential of target
- Performance and crop safety of proposed products
- Compatibility with IPM, resistance management programs
- Economics
- Geographic distribution
- Registrant interest in labeling product(s)
- Other



What does this mean for Environmental Horticulture?

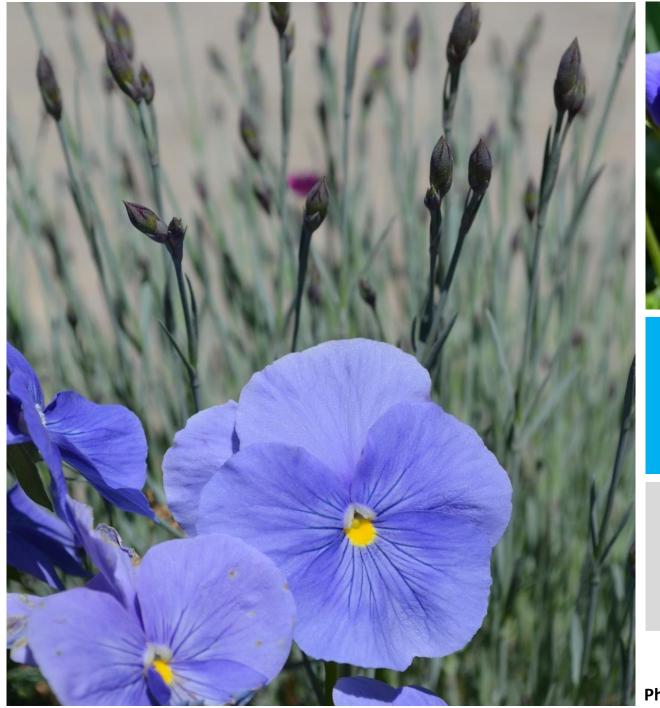
Since the EnvironHort Program was added in 1977,

- more than 840 products & numbered active ingredients have been screened for performance
 - over 34,500 trials have been conducted



 and more than 38,000 crop uses are now available for growers and landscape managers







Registration Support Research

New and Coming Products for Diseases



New Products for Disease Management

- Recently registered
 - Broadform (fluopyram + trifloxystrobin) FRAC 7 + FRAC 11
 - Mural (azoxystrobin + benzovindiflupyr) FRAC 4 + FRAC 7
 - Orkestra (fluxapyroxad + pyraclostrobin) FRAC 7 + FRAC 11
 - Plentrix (azoxystrobin + mefenoxam) FRAC 4 + FRAC 11
 - Segovis (oxathiapiprolin) FRAC 49
- In IR-4 testing
 - Astun (isofentamid) FRAC 7
 - BAS 750 (mefentrifluconazole) FRAC 3
 - Botector (Aureobasidium pullulans strains DSM 14940 and DSM 14941)
 - BW165N (Ulocladium oudemansii strain U3)

- EcoSwing (Swinglea glutinosa)
- Gatten (flutianil) FRAC U13
- IKF-309
- Indemnify (fluopyram) FRAC 7
- MBI 110
- MBI 304
- MBI 305
- MBI 601
- Picatina (pydiflumetofen) FRAC 7
- Picatina Flora (pydiflumetofen + fludioxonil) FRAC
 7 + FRAC 12
- S2200 (mandestrobin) FRAC 11
- SP2480



Broadform

- Active Ingredients: Fluopyram + Trifloxystrobin
- FRAC: 7 + 11
- Use Sites: production ornamentals, greenhouse and nursery
- Known Disease Spectrum: Blackspot, Botrytis, Downy Mildew, Leaf spots, aerial Phytophthora, Powdery Mildew, aerial Rhizoctonia
- Activity: Locally systemic/translaminar
- Applications: Foliar



Mural WDG

- Active Ingredients: Azoxystrobin + Benzovindiflupyr
- FRAC: 4 + 7
- Use Sites: Production ornamentals, greenhouse and nursery; some edibles
- Known Disease Spectrum: Foliar blights, leaf spots, anthracnose, powdery mildew, rust, flower blights, Botrytis, Phytophthora aerial blight, Rhizoctonia, Sclerotium, Fusarium
- Activity: Systemic
- Applications: foliar, soil drench



Orkestra Intrinsic

- Active Ingredients: Fluxapyroxad + Pyraclostrobin
- FRAC: 7 + 11
- Use Sites: Greenhouses, lathhouses, and shadehouses; Outdoor nurseries
 (including container, bench, flat, plug, bed-grown or field-grown ornamentals);
 Forest and conifer nurseries, and plantations; Retail nurseries; Ornamentals
 found in interiorscapes, golf courses, recreational landscapes, and residential and
 commercial landscapes
- Known Disease Spectrum: anthracnose, flower & petal blight (Botrytis), leaf spots, powdery mildew, rust, scab, downy mildew, Phytophthora, Pyrthium, Rhizoctonia, Sclerotium, Fusarium, stem & twig diebacks
- Activity: Systemic
- Applications: foliar, soil drench



Plentrix

- Active Ingredients: Azoxystrobin + Mefenoxam
- FRAC: 4 + 11
- Use Sites: greenhouses and nurseries (including field- and containergrown plants grown outdoors and in shade houses, lath houses and other ornamental production structures), conifer and forest nurseries, forestry production, retail nurseries, residential and commercial landscapes, and interior plantscapes; some edibles for transplant only
- Known Disease Spectrum: Phytophthora, Rhizoctonia, Sclerotium, Fusarium, Pythium, Downy mildew
- Activity: Systemic
- Applications: foliar, soil drench



Segovis

- Active Ingredients: Oxathiapiprolin
- FRAC: 49
- Use Sites: greenhouses, outdoor growing structures (including shade houses, lath houses and other outdoor growing structures), nurseries and commercial landscapes
- Known Disease Spectrum: Phytophthora, Downy mildew
- Activity: Systemic
- Applications: foliar, soil drench



Gatten

- Active Ingredients: Flutianil
- FRAC: U13
- Use Sites: testing for production uses
- Known Disease Spectrum: powdery mildew
- Applications: foliar



Indemnify

- Active Ingredients: Fluopyram
- FRAC: 7
- Use Sites: Turf, but being testing for production uses
- Known Disease Spectrum: Sting, Ring, Anguina pacificae, Root knot, stubby root, stunt nematodes; promising results on foliar and burrowing nematodes
- Activity: acropetally systemic
- Applications: drench, foliar



New Products for Pest Management

- Recently registered
 - Altus (flupyradifuron) IRAC 4D
 - Sultan (cyflumetofen) IRAC 25
- In IR-4 testing
 - Altus (flupyradifuron) IRAC 4D
 - Ancora (Isaria fumosorosea Apopka Strain 97)
 - BotaniGard MAXX (pyrethrins + Beauveria bassiana Strain GHA) IRAC 3 +
 - IKI-3106 (cyclaniliprole) IRAC 28
 - IKI-3326 (cyclaniliprole +) IRAC 28 +
 - Pyridium (beta-cyfluthrin) IRAC 3
 - V-10433
 - Ventigra (afidopyropen) IRAC 9D



Altus

- Active Ingredients: Flupyradifuron
- IRAC: 4D
- Use Sites: landscape and production ornamental plants, greenhouse vegetables and transplants fruits, and nut trees
- Known Pest Spectrum: aphids, mealybugs, scales, thrips, whiteflies, psyllids, leafhoppers and more
- Activity: systemic



Sultan

- Active Ingredients: Cyflumetofen
- IRAC: 25
- Use Sites: landscape and production ornamental plants
- Known Pest Spectrum: two spotted spider mite, carmine mite, citrus red mite, glover mite, spruce spider mite, pacific spider mite
- Activity: contact



IKI-3106

- Active Ingredients: Cyclaniliprole
- IRAC: 28
- Use Sites: production uses
- Known Pest Spectrum: Lepidopterans, Dipterans, Hemipterans, Thysanopterans, and Coleopterans
- Activity: Translaminar



Ventigra

- Active Ingredients: Afidopyropen
- IRAC: 9D
- Use Sites: production uses
- Known Pest Spectrum: aphids, whiteflies, leafhoppers; potential for scale & mealybug
- Activity: Systemic



Take Home Message

- There are several new fungicide products in late stage development or soon after commercial launch
 - Three are FRAC 7, so be careful with rotational programs
 - Several biofungicides/biobactericides are in development but their full spectrum is not yet known
- Fewer insecticides/miticides have been released recently
 - There are several new products in development and close to registration/commercialization
 - IR-4 is exploring wider spectrums for a couple biopesticides and has begun screening and new soft product V-10433





Photo by Cristi Palmer

Thank you!