

The logo for Cultivate '18, featuring a small green leaf icon above the word "Cultivate" and the year "'18" in a large, bold, green font.

CultivateTM'18

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

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- USDA-ARS
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What is IR-4?

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



Photo by Cristi Palmer

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

How are research projects selected?

Stakeholder Input *balanced with*

Researcher & Registrant Input



Online Project Request Form

The screenshot shows the IR-4 Project website with a navigation menu (Home, Food, Ornamentals, etc.) and a form titled 'IR-4 Ornamental Horticulture Project Request Form'. The form includes sections for '1. REQUESTER' (Name, Address, City, State, Zip, Phone Number, Email), '2. SELECT PROJECT TYPE' (with radio button options for various pest management scenarios), '3. ORNAMENTAL HORTICULTURE CROPS' (with dropdown menus for Plant Group, Common Name, Scientific Name, Plant Stage, and Application), and '4. PRODUCT' (with dropdown menus for Trade Name, Active Ingredient, and Rate Per Application).

Paper or Online Biennial Survey

The screenshot shows a survey form titled '2016/2017 IR-4 Ornamental Horticulture Survey'. It includes a 'Thank you for your participation in this survey.' message and four numbered sections: '1. Please check our affiliation' (with checkboxes for Grower, Landscaper, etc.), '2. Please check all types of operations and pest management strategies relevant to your business' (with checkboxes for Biological Control, Chemical Control, etc.), '3. Please check all plant materials relevant to your business' (with checkboxes for Bulb Plants, Cut Flowers, etc.), and '4. Consider the plant materials you grow or maintain' (with a table for recording pest/disease occurrences).

Diseases (including how to find examples with five to six available words)	Type of Plant Materials									
	Bulb Plants	Cut Flowers	Flowering Plants	Houseplants	Indoor Plants	Outdoor Plants	Shrub	Tree	Turf	Other
1. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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



Photo by Cristi Palmer

Program statistics as of Jan 2017



Registration Support Research

New and Coming Products for
Diseases

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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, Pycnidium, 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 container-grown 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



Ventiga

- 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





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Thank you !