Title: Pesticide efficacy and non-target effect field trials for registration in ornamentals.

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Background:

The IR-4 Environmental Horticulture (EH) program assists in the registration of new pest management products for ornamental, nursery, and landscape plants, by evaluating such chemistries for efficacy and phytotoxicity. The Pesticide Registration Field Research program based at Oregon State University (OSU) conducts such field trials in important local commodities; the data derived from these trials is then compiled by IR-4 headquarters, and submitted to the Environmental Protection Agency (EPA), which uses these reports to establish tolerances and issue new product registrations.

The IR-4 EH program runs in a biennial cycle: every two years at the IR-4 EH workshop, nation-wide nominated projects for specific pesticides are evaluated and ranked. Once the top priorities are selected, protocols are developed, and field trials are assigned to various researchers around the country. In 2025, the IR-4 EH workshop will take place on Oct 7-8 2025, therefore it is not possible to know beforehand exactly which products/pests/plants will be prioritized for field trials. An example of a trial selected in the 2023 IR-4 EH workshop is an evaluation of the efficacy of multiple products against thrips, such as CapSil, A16901B, BAS 310 KT I, and TetraCURB MAX, among others (https://ir4.cals.ncsu.edu/EHC/RegSupport/Protocols/25-001_ThripsEfficacy.pdf). This proposal will be updated after the 2025 IR-4 EH workshop to specify the products, insect pests, and host plants to be used in these experiments. The results of this project will help provide ornamental growers with additional registered pest management products, that can be used in rotations to mitigate resistance.

In addition to testing efficacy and phytotoxicity in IR-4 project trials, we are also interested in evaluating the residual effects of such pesticides on beneficial biocontrol agents (BCA) commonly used in greenhouses or ornamental plantings, such as predatory mites, rove beetles, or parasitoid wasps. By incorporating non-target effect trials to complement efficacy trials, we can assess the best ways to integrate chemical and biological control, and give recommendations on when to apply biocontrol agents after chemical applications.

Project objectives and outcomes:

1) To determine efficacy of new active ingredient formulations or new biopesticides for managing insect pests infesting environmental horticulture plants. *Outcome: the registration of new pesticide products for ornamental plants.*
2) To determine residual lethal non-target effects of these pesticides on commonly used biocontrol beneficial insects. *Outcome: recommendations on timing for the integration of biocontrol agents after chemical applications.*

Methods:

a) *Efficacy:* The protocols for testing efficacy against insect pests will be specified by the IR-4 EH program. Briefly, pesticide applications will be done at the recommended rates on infested plants (6-12 replicates per product) kept in greenhouse or outdoor environments. Evaluations of insect pest population levels will be done prior to application (day 0), after 3d, 7d, and then every 7 days after treatment.

b) *Non-target effects:* To evaluate how pesticide residues may impact biocontrol agents (BCA), we will follow the EPA protocol OCSPP 850.3030 (Honey bee toxicity of residues in foliage; https://www.regulations.gov/document/EPA-HQ-OPPT-2009-0154-0017). In summary, leaf samples from treated plants (from IR-4 efficacy trials) will be collected at various time intervals after the last application (3h, 8h, 24h, 48h, 72h, 7d, 14d, 21d), and the test BCA will be caged on the treated leaves for 48 hours under laboratory conditions (approximately 70°F, and 14L:10D light cycle). Mortality of BCA will be recorded after 48h.

The specific insect pest, biocontrol agent, and host plant will be determined after the IR-4 EH workshop, when the specific efficacy projects have been selected and assigned.

Timeline:

Tasks	Feb-Mar 2026	Apr-May 2026	Jun-Jul 2026	Aug-Sep 2026	Oct-Nov 2026
Organize greenhouse space, acquire plants and insects, test substance	**X**				
Run efficacy and non-target effect trials		**X**	**X**	**X**	
Data analysis, write and communicate results					**X**

Budget:

The IR-4 Project and the Oregon Department of Agriculture cover approximately 70% of the operating costs of our program (salaries, supplies, space fees, travel). The rest is funded through the various local specialty crops commissions. We request the following support from OAN:

Item	Details	Total
Wages	Salary + Benefits (PI, Rendon at 0.05 FTE) Salary + Benefits (FRA, Rasmussen at 0.05 FTE)	$6,386 $4,921
Space fees	NWREC greenhouse bays (x2)	$820
Plants, insects, greenhouse consumables	Plants in containers for trials, biocontrol agents, parts for irrigation and backpack sprayer maintenance	$250
Lab supplies	Cages for insects, lab tools, trays, brushes, hand microscopes.	$200
	Total	$12,577