

IR-4 Ornamental Trials Conducted by USDA-ARS in Ohio: 2003

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Summary

The Interregional Research Project No. 4 (IR-4) is a program that addresses the shortage of pest-control products registered for minor-use crops. Growers of ornamental crops should be aware of how they can benefit from this program.

IR-4 is a federally sponsored program developed to facilitate registration of new products and expand labels for effective products for minor crops. IR-4 receives funding from the U.S. Congress through the United States Department of Agriculture (USDA) which is administered by the Cooperative State Research, Education, and Extension Service (CSREES) and the Agricultural Research Service (ARS).

Individual growers, grower organizations, university researchers, and extension personnel initiate project requests. Each year a list of more than 4,000 researchable ornamental projects is compiled that includes trials of insecticides, fungicides, nematicides, bactericides, and herbicides.

Data collected from selected trials is sent to IR-4 Headquarters for review and coordination with the company making the product, and submission is made to the EPA for registration approval.

Introduction

Each year the USDA/ARS Application Technology Research Unit (ATRU) in Wooster, Ohio, receives funding from USDA/ARS to conduct IR-4 testing on The Ohio State University's Ohio Agricultural Research and Development Center (OARDC) campus in Wooster and in Ohio nurseries. Selected greenhouse, field- and container-grown ornamental plant projects are conducted in Wooster.

OARDC provides field and greenhouse space and a hoop house in Secrest Arboretum where most of the field-container testing takes place. Most of the data needed for product registration is for phytotoxicity, but the IR-4 program has determined that efficacy data is also a main concern.

For the past three years, ATRU has prioritized testing of new insecticide chemistries and collection of efficacy data on the European chafer and oriental beetle. These non-native insect species are emerging nursery pests in field-grown and container stock.

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Methods and Materials

Each test included untreated control plants and three pesticide treatment rates — 1X (the rate recommended by the manufacturer), 2X, and 4X. The tests had either four or six replications.

Field container test plants were transplanted into two-gallon containers using an amended pine-bark medium and set up in an outdoor nursery in a randomized complete block design. Field test herbaceous perennials, trees, and shrubs were planted in rows separated by rows of grass in a completely randomized design. Greenhouse plants were planted in one-gallon containers and placed on benches in a greenhouse. Plants were rated for phytotoxicity four times during the growing season, after the first treatment.

Efficacy data was requested for insecticide trials using thiamethoxam (Flagship) relative to potential regulation for control of oriental beetle larvae (*Anomala orientalis*). For this efficacy test, container test plants (*Spiraea* sp. 'Little Princess') were caged and infested with adult oriental beetles. Each plant cage received three pairs of adult beetles. The plants remained caged until no signs of living adults were found on the plants (30 days). Sixty days after the initial infestation of adults, the plant root balls were examined for grubs.

Results

Most trials showed no phytotoxicity, although the herbicide Dithiopyr (Dimension Ultra WSP) caused severe stunting on two plant species, *Impatiens* sp. and *Veronica* sp. along with necrosis on *Veronica*.

Phytotoxicity results are listed in Table 1.

Efficacy data were obtained for the fungicide test using *Bacillus licheniformis* SB 3086 for control of *Phytophthora* root rot on *Aster x Frikartii* in the greenhouse. The control plants became yellow with brown discoloration at the base of stems.

A plant was submitted to Ohio State University's C. Wayne Ellett Plant and Pest Diagnostic Clinic to determine the presence or absence of *Phytophthora* spp. disease organisms. The plant tested positive for *Phytophthora* stem and root rot. During the course of the test, all control plants died from these symptoms while all treated plants remained healthy.

Data was also obtained from a container test using the insecticide thiamethoxam (Flagship) for control of oriental beetle (OB) larvae (*Anomala orientalis*). Containerized spiraea plants were caged and infested with three pairs of adult oriental beetles. Sufficient time was needed for females to lay eggs in the potting soil, for the eggs to hatch, and the larvae to feed and mature to second or third instar grubs.

Sixty days after the initial infestation of adults, the plants were individually dumped, and the soil and root balls searched for grubs. The untreated plants were heavily infested (mean 22.5); the plants treated with the recommended rate had a significant reduction of grubs (86.7%); and the plants with the 2X and 4X rates had no surviving grubs.

Efficacy results are listed in Table 2.

Note

Drs. Klein and Krause of Wooster, Ohio, and Dr. James C. Locke, USDA, ARS, ATRU, Research Plant Pathologist, Toledo, Ohio, serve as Liaison Representatives for the USDA, ARS, IR-4 Program and all of

Table 1. Phytotoxicity Results From 50 Tests Conducted by USDA-ARS in Wooster, Ohio During 2003.

Pesticide	Crop	Site	Phytotoxicity
INSECTICIDES			
Thiamethoxam (Flagship25WG) To control white grubs, Japanese beetle larvae, and European chafer larvae.	Althea	Field	0
	Black-Eyed Susan	Field	0
	Black-Eyed Susan	Field Container	0
	Butterfly bush	Field Container	0
	Dogwood, flowering	Field Container	0
	Lilac	Field	0
	Lilac	Field Container	0
	Dianthus	Field Container	0
	Spiraea	Field	0
	Spiraea	Field Container	0
	Stonecrop	Field Container	0
	Tickseed	Field Container	0
	Buprofezin (Applaud 70WP) To control leaf hoppers, scales, pod gall.	Viburnum, Arrowwood	Field Container
Crabapple		Field Container	0
Honeylocust		Field Container	0
Maple		Field	0
Oak		Field Container	0
FUNGICIDES			
Acibenzolar (Actigard50WP) For <i>Pseudomonas</i> and <i>Xanthomonas</i> pathogens.	Crabapple	Field	0
	Maple, Norway	Field	0
	Lilac	Field	0
	Spruce, Colorado	Field	0
<i>Bacillus licheniformis</i> SB 3086 (Novo-guard) For root rots	Ageratum	Greenhouse	0
	Ageratum	Field Container	0
	Aster 'Frakarti'	Greenhouse	0
	Aster 'Frakarti'	Field Container	0
	Impatiens	Greenhouse	0
	Impatiens	Field Container	0
	Beard-tongue	Greenhouse	0
	Beard-tongue	Field Container	0
	Columbine	Greenhouse	0
	Columbine	Field Container	0
	Dahlia	Greenhouse	0
	Dahlia	Field Container	0
	English ivy	Field Container	0
	Juniper	Field Container	0

Table 1. Phytotoxicity Results From 50 Tests Conducted by USDA-ARS in Wooster, Ohio During 2003.

Pesticide	Crop	Site	Phytotoxicity
FUNGICIDES (continued)			
	Pansy	Field Container	0
	Verbena	Greenhouse	0
	Zinnia	Greenhouse	0
HERBICIDES			
Isoxaben (Gallery 75 DF) For weeds, broadleaf & annual grasses and liverwort.	Bayberry	Field Container	0
	Crabapple	Field Container	0
	Holly, American	Field Container	0
	Dogwood, Kousa	Field Container	0
	Maple, Red	Field Container	0
Halosulfuron (Manage 75 WDG) For Nutsedge	Boxwood	Field Container	0
	Crabapple	Field Container	0
	Hemlock	Field Container	0
	Dawn Redwood	Field	0
Dithiopyr (Dimension ultra WSP) For weeds, broadleaf & annual grasses and liverwort.	Veronica	Field Container	*1x, 2x, 4x
	Purple coneflower	Field Container	0
	Impatiens	Field Container	*1x, 2x, 4x
* Phytotoxicity was noted on some or all of the plants with these treatment rates. 0 = None of the test plants showed phytotoxicity.			

Table 2. Results of Thiamethoxam Trial Against Oriental Beetle Larvae (*Anomala Orientalis*) in Containerized Spiraea 'Little Princess' Plants.

Treatment	Rate / 100 Gal.	Mean OB Larvae Per Pot
Untreated control		22.5a
Flagship 25 WG (1x)	4 oz	3.0b
Flagship 25 WG (2x)	8 oz	0.0b
Flagship 25 WG (4x)	16 oz	0.0b
Means in columns followed by the same letter are not significantly different (Tukey's HSD multiple range test, alpha = 0.05).		

the authors participate in the National IR-4 Ornamentals Workshops.

Nursery growers should let their pest-control needs be known by submitting a request electronically from the IR-4 web site at:

<http://ir4.rutgers.edu/>

or by calling or e-mailing Betsy Anderson, USDA / ARS, 330-263-3898 or anderson.523@osu.edu.

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