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IR-4 Ornamental Trials Conducted by USDA-ARS in Ohio: 2002

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Summary

A shortage of pest control products registered for use on ornamental crops is an ongoing problem. Interregional Research Project No. 4 (IR-4) is a government- and university-sponsored program developed to facilitate registration of new products and expand labels for effective products for minor crops. IR-4 receives funding from the United States Department of Agriculture (USDA), through 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 the 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 Application Technology Research Unit (ATRU), USDA/ARS, in Wooster, receives funding to conduct some 60 IR-4 trials on The Ohio State University's Ohio Agricultural Research and Development Center (OARDC) campus and in Ohio nurseries.

Selected greenhouse, field, and container-grown ornamental plant projects are conducted on OARDC's Wooster campus. OARDC provides field and greenhouse space and a hoop house in Secrest Arboretum where most of the container tests are performed. Most of the data needed for product registration is for phytotoxicity, but sometimes efficacy data is also required.

For the past two years, we have also conducted insecticide trials in Lake County, Ohio, to collect efficacy data on two non-native insect species that are located in isolated areas of northeastern Ohio.

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 four, six, or 10 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 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 the insecticide trials — Thiamethoxam (Flagship) for control of white grubs, Japanese beetle larvae (*Popillia japonica*), and European chafer larvae (*Rhizotrogus majalis*), and trichlorfon (e.g., Dylox) for control of oriental beetle larvae (*Anomala orientalis*).

In an effort to get the needed data, the container tests were infested with eggs of European chafer and oriental beetle. Two field tests were conducted on rhododendrons in a nursery known to have problems with European chafer in field-grown nursery stock, and a third was conducted in a field of hemlocks that was naturally infested with third-instar larvae of European chafer.

Results

Phytotoxicity results are shown in Table 1. Most trials showed no phytotoxicity, although both formulations of the herbicide flumioxazin caused chlorosis and necrosis on the two plant species, *Deutzia gracilis* and *Phalaris arundinacea* (Ribbon-grass). The fungicide *Bacillus subtilis* caused necrotic leaf margins and spotting on *Verbena canadensis* and *Impatiens hawkeri*. Acibenzolar, a plant protectant, reduced flowering after the third and fourth treatments on *Impatiens balsamina*.

Efficacy data was not obtained in the insecticide container tests or the rhododendron field tests due to poor survival of grubs in control plants. The naturally infested field of hemlocks showed stunting from European chafer larval feeding and yielded efficacy data for the trichlorfon (e.g., Dylox) drench applications. The three Dylox treatment rates all had significantly fewer grub numbers than the untreated trees (the average number of grubs was 3.2 and 1.1 in the untreated controls and 1X rate of Dylox, respectively).

Note

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

www.cook.rutgers.edu/~ir4

or by calling Betsy Anderson, USDA/ARS, at 330-263-3898 or by e-mailing

anderson. 523@osu.edu.

Acknowledgements

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Disclaimer

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Table 1. These 64 Tests Were Conducted by USDA-ARS in Wooster and Lake County, Ohio During 2002.

Pesticide	Crop	Site	Phytotoxicity
Insecticides			
Thiamethoxam (Flagship25WG) To control white grubs, Japanese beetle larvae, and European chafer larvae.	Arborvitae	Field Container	0
	Arborvitae	Field	0
	Butterfly Bush	Field	0
	Euonymus	Field Container	0
	Pine, Austrian	Field Container	0
	Pine, Mugo	Field	0
	Pine, Scotch	Field Container	0
	Pine, White	Field Container	0
	Rhododendron	Field	0
	Spruce, Colorado	Field Container	0
	Spruce, Serbian	Field Container	0
	Spruce, White	Field Container	0
Trichlorfon (Dylox80SP) To control oriental beetle larvae.	Andromeda	Field Container	0
	Azalea	Field Container	0
	Hemlock	Field	0
	Juniper	Field Container	0
	Rhododendron	Field Container	0
	Rhododendron	Field	0
Fungicides			
Acibenzolar (Actigard50WP) For *Pseudomonas* and *Xanthomonas* pathogens.	Balsam	Greenhouse	*1x, 2x, 4x
	Chrysanthemum	Greenhouse	0
	Geranium	Greenhouse	0
	Snapdragon	Greenhouse	0
Bacillus subtilis (Rhapsody AS) For powdery and downy mildews, *Botrytis, Xanthomonas,* and leafspots.	Andromeda	Greenhouse	0
	Balsam	Greenhouse	0
	Chrysanthemum	Greenhouse	0
	New Guinea Impatiens	Greenhouse	*2x, 4x
	Vervain	Greenhouse	*2x, 4x
Trifloxystrobin (Compass50W) For *Cladosporium, Botryosphaeria, Mycosphaerella, Alternaria, Septoria, Colletotrichum, Rhizoctonia*, and *Sphaerotheca*.	Balloon Flower	Field Container	0
	Batchelor's Button	Field Container	0
	Beard-tongue	Field Container	0
	Beautyberry	Field Container	0
	Bee Balm	Field Container	0
	Bellflower	Field Container	0

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* = Phytotoxicity was noted on some or all of the plants with these treatment rates.

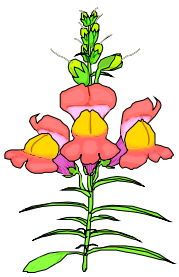
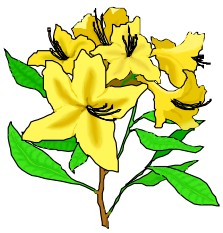


Table 1 (continued). These 64 Tests Were Conducted by USDA-ARS in Wooster and Lake County, Ohio, During 2002.

Pesticide	Crop	Site	Phytotoxicity
Trifloxystrobin (Compass50W) (continued)	Blazing Star	Field Container	0
	Heather	Field Container	0
	Hemlock	Field Container	0
	Hollyhock	Field Container	0
	Honeysuckle	Field Container	0
	Maidenhair Tree	Field Container	0
	Pincushion Flower	Field Container	0
	Speedwell, Brooklime	Field Container	0
	Spiderwort	Field Container	0
	Stokes Aster	Field Container	0
	Sweet Woodruff	Field Container	0
Herbicides			
Flumioxazin (Broadstar 0.17G) For weeds, broadleaf & annual grasses, and liverwort.	Boxwood	Field	0
	Bridal-wreath Spirea	Field	0
	Candytuft	Field Container	0
	Cherry	Field	0
	Douglas fir	Field Container	0
	Flowering Dogwood	Field Container	0
	Fountain Grass	Field	0
	Maple, Japanese	Field	0
	Mondo Grass	Field Container	0
	Potentilla	Field Container	0
	Ribbon-grass	Field Container	*1x, 2x, 4x
	Yew	Field Container	0
	Yew	Field	0
Flumioxazin (Valor WDG) For weeds, broadleaf & annual grasses, and liverwort.	Azalea	Field Container	0
	Butterflybush	Field	0
	Deutzia	Field Container	*1x, 2x, 4x
	Ribbon-grass	Field Container	*1x, 2x, 4x
	Rosemary	Field Container	0
	Smoketree	Field Container	0
	Vervain	Field Container	0

* Phytotoxicity was noted on some or all of the plants with these treatment rates.
\- None of the test plants showed phytotoxicity.