

Helping pests meet their match

IR-4, a federal research program, runs trials so that effective tools can be used against emerging pests



DAVID R. LANCE, USDA APHIS PRO

The brown marmorated stink bug is an emerging pest in the West. It was first detected last year. The IR-4 program allows for testing of existing chemicals against new threats so that growers will have more weapons for use against them.

By Joe DeFrancesco

It is no secret that Oregon's nursery and greenhouse industries are important and viable enterprises that contribute to the state's economy.

For much of the first decade of the 21st century, the farm-gate value of these crops approached \$1 billion annually, though the numbers have dropped

due to the recent financial and housing crises. In 2006, nursery crops alone became the number-one commodity in Oregon, surpassing cattle for the first time.

For the nursery and greenhouse industries to remain profitable and viable, growers must have access to effective methods for controlling insect, disease, and weed pests.

The Interregional Research Project No. 4, commonly known as IR-4, is a federally funded program that assists growers of ornamental horticulture crops in obtaining safe and effective pest management tools.

The national IR-4 Ornamental



The IR-4 program at the North Willamette Research and Extension Center has conducted trials to test the efficacy of various herbicides in controlling liverworts and other weeds.

Horticulture Program, which is headquartered at Rutgers University, was started in 1977 to address the insect, disease, weed management, and plant growth regulator needs of growers. Over time, this program has expanded to cover not only ornamental horticulture — plants grown in greenhouses and nurseries — but also landscape plantings, Christmas trees, sod farms and interiorscapes.

Private agrochemical companies that register pest control products can generate the efficacy and crop safety data necessary to get a crop added to a pesticide label, but oftentimes their needs and priorities do not coincide with the needs and priorities of Oregon growers. Hence, the IR-4 Program comes to the rescue with funds and expertise to conduct the trials that gen-

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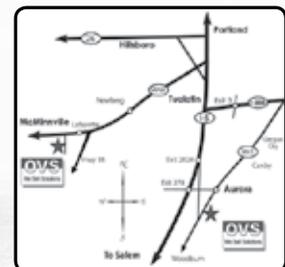
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erate the necessary data.

The IR-4 Program is a unique partnership between the U.S. Department of Agriculture and land grant universities, such as Oregon State University.

Research activities start with identifying a need, perhaps where current management tools are not registered, such as for a newly introduced pest, or for crops where little phytotoxicity (crop safety) information is available. The IR-4 Program then solicits researchers to conduct greenhouse and field research trials to address a particular pest management need, and determine which pest control products are the most effective.

Once efficacy is determined, crop safety evaluations are conducted on a wide variety of plants so those crop species can be added to a pesticide label (conventional, biological and organic products) and used with confidence and safety.

The result provides growers with new, effective, and safe pest management options that enable them to remain economically viable and competitive in the national and international marketplace.

Trials at NWREC

The North Willamette Research and Extension Center (NWREC), located near Aurora, Ore., in the northern part of the Willamette Valley, is one of OSU's eight agricultural experiment stations located throughout the state that are devoted to terrestrial, non-livestock agriculture.

The research and extension focus at NWREC includes ornamentals, berries and vegetables. The IR-4 Program at NWREC, in cooperation with the national IR-4 Program, conducts efficacy and phytotoxicity trials on ornamental crops that are important to Oregon growers.

Other OSU personnel at different stations also conduct efficacy and phytotoxicity trials for the national IR-4 Ornamentals Program, in cooperation



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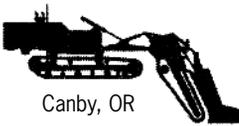
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In recent years, the fungi that cause downy mildew have been a high priority for the pesticide efficacy research done through the IR-4 program.

with the national program.

In general, the main focus of the IR-4 ornamentals program at NWREC has been on generating crop safety information and adding new crops to pesticide labels. We have conducted trials to determine crop safety for herbicides, such as BroadStar/SureGuard (flumioxazin), Callisto (mesotrione), Freehand (dimethenamid-p + pendimethalin), Gallery (isoxaben), Gentry (quinoclamine), Snapshot (trifluralin + isoxaben), Sulfentrazone, and Tower (dimethenamid-p) for a wide variety of crops not currently on those labels. These crops include alder, arborvitae, azalea, barberry, birch, boxwood, bugbane, crabapple, dogwood, Douglas-fir, feathergrass, holly, hosta, hydrangea, iris, juniper, lilac, maple, pine, rhododendron, serviceberry, silver grass, spruce, viburnum, and yew.

Crop safety trials for fungicides, such as Tourney (metconazole) and Trinity (triticonazole), have been determined on such crops as azalea, camellia, maple, rose, rhododendron, and sage; and for insecticides, such as Konos (spirotetramat), on coleus, hydrangea and rose.

However, starting in the mid-2000s, generating efficacy data for critical pest management issues has become a major endeavor for the national program. Our program at NWREC has conducted trials to determine efficacy of various herbicides for control of bittercress, liverwort, oxalis, and spurge; and fungicides for control of *Phytophthora citricola*, *P. syringae* and *Pseudomonas syringae*.

Setting priorities

It is important for us at NWREC to be aware of the pest management issues and needs that are critical to Oregon growers so we can relay those needs to IR-4 and get such projects onto the national IR-4 docket.

IR-4 has limited time, money and personnel to conduct all the studies that are needed for ornamental crops throughout the United States. Advocating for projects that are important to Oregon growers helps those needs get met.

One way to let your needs be known is to contact us directly. A more formal way to register needs is by participating in the National IR-4 Ornamental Horticulture Program

Survey, which can be found online (<http://ir4.rutgers.edu/Ornamental/Survey/index.cfm>).

In addition, IR-4 also hosts an annual workshop where university personnel, crop consultants, agrochemical company representatives and growers meet to discuss proposed projects and prioritize them for funding for the following year.

The definition of a high priority project is one where a number of growers from various regions around the U.S. have clear needs, and the tools are available but have not yet been registered for those needs. Some examples of high priority projects are: 1) a newly introduced pest where little is known about management; 2) a pest exhibiting tolerance to commonly used pesticides; and 3) new horticulture crops where crop safety to various management tools is not yet known.

In recent years, high priorities for efficacy research have included control of fungal pathogens such as downy mildew, *Pythium* and *Phytophthora*, and bacterial diseases. Insects, such as scale, thrips and coleopteran pests, have also been a top priority. Researchers have

also been looking at pre- and post-emergent herbicides for sedge, liverwort and many different broadleaf weeds.

In addition to crop safety and efficacy trials, IR-4 continues to explore efficacy of reduced-risk chemicals and biological materials where no effective alternatives exist; the integration of different chemical classes in a pest management program; shortening restricted entry intervals (RED); and the impact of pesticides on biological control agents.

With the emergence of the brown marmorated stink bug (BMSB) in the West last year, common susceptible horticultural crops, such as dogwood, lilac, and maple, are at risk. From experience in the eastern United States, we know that the BMSB can cause severe losses in fruit and vegetable crops. In ornamental crops, they feed on leaves and stems and have the potential to cause significant economic loss.

IR-4 is testing a wide range of insecticides against the BMSB to find a control option before further economic losses are incurred. Dinotefuran and etofenprox are leading candidates among those chemicals being tested.

The IR-4 Ornamentals Program at NWREC exists to help Oregon growers address their pest management needs by conveying those needs to the national IR-4 Program and by conducting the research trials that generate the data necessary for a pesticide to be registered for crops important to Oregon growers.

The success of our program is dependent on the input the Oregon ornamentals industry provides us; we have had a successful and productive working relationship in the past and I am confident it will continue in the future. ☺

Joe DeFrancesco has worked at OSU for the past 26 years doing pest management research and extension education in food, fiber and ornamentals crops. He is currently the project leader for the IR-4 Ornamentals Program at NWREC, and the IR-4 State Liaison Representative for Oregon. He can be reached at defrancj@science.oregonstate.edu.



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