

GROWING KNOWLEDGE

Series content is coordinated by Dr. Jay Pscheidt, professor of botany and plant pathology at Oregon State University in Corvallis, Oregon.



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The liverwort, *Marchantia polymorpha*, is a difficult pest in nursery production in Oregon. PHOTO COURTESY OF WIKIMEDIA.

Pest management tools for minor crops

How IR-4 and OSU are working for you

BY DANI LIGHTLE

WITH A 2018 FARM gate value just shy of \$1 billion, it is no secret that the ornamental plant industries in Oregon (nursery and greenhouse) are important and viable enterprises that contribute greatly to the state's economy. Controlling insect, disease, and weed pests is an important part of keeping these industries viable and profitable.

However, private agrochemical companies that register pest control products — while capable of generating the efficacy and crop safety data necessary to get a crop added to a pesticide label — often have different needs and priorities that do not overlap with those of Oregon growers.

This problem, known as the “minor use problem,” was recognized in the late 1950s and early 1960s. Funding was approved to start a project known as the Inter-regional Research Project #4, more commonly known as IR-4.

IR-4 began with a focus on pesticides for food use. One of the program's first big successes was conserving use of 38 pesticides on 129 crops when the U.S. Environmental Protection Agency (EPA) proposed to cancel a substantial number of registrations. To date, the Food Use program has provided data to EPA on over 16,000 uses for specialty crops.

The Environmental Horticulture program was added in 1977 to directly address the needs of the ornamental plant industry. 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.

The Environmental Horticulture program develops data on crop safety and efficacy to support the addition of new ornamental species or pests to existing product registrations. Since 

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1977, the Environmental Horticulture program has developed data to support 44,000 crop uses.

IR-4 partners with land grant universities, such as Oregon State University (OSU), and private research contractors nationwide to conduct the research required to support new uses of pesticides.

For several decades, IR-4 has worked with the North Willamette Research and Extension Center (NWREC) and other OSU researchers to conduct efficacy, crop safety, and magnitude of residue trials. Currently, the Food Use program is directed by Dr. Dani Lightle, and the Environmental Horticulture research leader is Dr. Lloyd Nackley. Other OSU scientists involved with IR-4 food use or horticulture research include Dr. Luisa Santamaria, Dr. Ed Peachey, Dr. Kristie Buckland and Dr. Marcelo Moretti.

The OSU IR-4 research program receives funding from U.S. Department of Agriculture (USDA), Oregon Department of Agriculture (ODA) and a wide range of commodity funding groups. The end 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.

Needs-driven research

IR-4's continued relevance and success is because the prioritization of research is directly influenced by specialty crop producers. One long-running project that directly benefits Oregon producers is control of the liverwort, *Marchantia polymorpha*, which was regarded as the Number 1 container nursery weed problem in 2007.

Liverwort has several qualities which make it difficult to control. Asexual reproduction of small clones may be water-splashed to a new location, encouraging spread of the weed. Similarly, fragments of the liverwort may survive and establish when broken away from the mother plant.

Cultural controls, including hand weeding or mulches, are expensive and don't provide long-lasting control. As a nationwide pest with few control options, liverworts made an ideal candidate for research by the IR-4 program.

At national IR-4 workshops, post-emergent liverwort control was prioritized in 2004 and 2009, which provided funding for efficacy trials across the U.S. Thirteen researchers tested 28 diverse products, and documented efficacy in at least three trials from Champ DP (copper hydroxide), GreenMatch (d-limonene),

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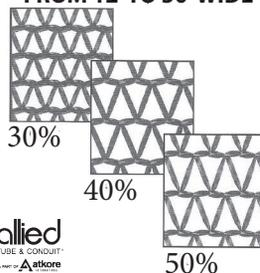
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Continued concerns with liverwort management led to additional prioritization of liverwort efficacy research in 2017 and 2019. Ongoing efficacy research, led by Dr. Marcelo Moretti, is screening additional materials including the different formulations of the preemergent herbicides Pendulum (pendimethalin) and Marengo (indaziflam) and the postemergent herbicides Basagran (bentazon) and a numbered compound, BW133.

Crop safety projects are also an important component of the Environmental Horticulture program. From 2016 to 2019, IR-4 ran 146 crop safety trials on 83 plant genera or species to determine phytotoxicity of Fiesta (iron HEDTA) at 1-time, 2-times or 4-times rates during over the top applications. Phytotoxicity trials of Fiesta conducted in Oregon by Dr. Moretti include boxwood (*Buxus* sp.), *Cotoneaster* sp., Fountaingrass (*Pennisetum alopecuroides*), and *Hydrangea* sp.

Producer involvement with IR-4

IR-4 has limited time, money and personnel to conduct studies for all the needs throughout the United States, so advocating for projects that are important to Oregon growers helps ensure the most pressing pest management problems get met.

The definition of a high priority project is one where a number of growers from various regions around the nation have clear needs, and the tools are available but have not yet been registered for those needs.

Prioritization for the Environmental Horticulture program is done at a national workshop conducted on a biennial basis. It is important for us at OSU to be aware of your critical pest management issues and needs so we can relay those needs to IR-4 and get such projects onto the national IR-4 docket.

For specific project requests, you can contact the Western Region assistant >>

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Pest management tools for minor crops

Pete Sturman applies a fungicide to basil in a magnitude of residue study.

PHOTO COURTESY OF OREGON STATE UNIVERSITY



coordinator, Mika Tolson (mptolson@ucdavis.edu). A more formal way to register needs is by participating in the National IR-4 Ornamental Horticulture Program Survey, which can be found online www.ir4project.org/ehc/ (scroll down to the bottom of the page and select 'Grower Needs' to access the survey).

In the Food Use program, project requests are submitted on an on-going basis and prioritized annually at a national prioritization workshop, typically held in September. All that is needed to begin a project request is a crop + pest + desired pesticide combination. If your industry has an unmet pest management need, you can reach out to Dr. Lightle to discuss how IR-4 can help and begin the request process. ©

Dani Lightle is the pesticide registration research leader at Oregon State University. She can be reached at danielle.lightle@oregonstate.edu.