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# Bring on the BUTTERFLY BUSH:

Improving Invasive Plant Laws

Story and photos by Ben Davis



Butterfly bush is in such high demand that consumers at nurseries request it by name. That high demand makes it an important crop for Oregon’s leading agricultural sector: the nursery and greenhouse industry—the first ag industry in Oregon to surpass \$1 billion in annual farmgate value.

There’s just one problem. Butterfly bush is listed as an invasive species and banned by the Oregon Department of Agriculture (ODA).

The full ban was in effect until ten years ago, when modern plant breeding changed the game. Ornamental plant breeders started producing low-fertility cultivars of butterfly bush, and in 2011, ODA amended the ban to include exemptions. These exemptions allow the production and sale of cultivars that generate less than two percent viable seeds, along with any interspecific hybrid cultivars. It was a huge win all around for the nursery industry, consumers, and the environment. But there remains just one problem.

“I call it a loophole,” says Ryan Contreras, referring to the interspecific exemption. Contreras is a professor of ornamental plant breeding in the College of Agricultural Sciences’ Department of Horticulture. He further explains that interspecific hybrids can still be fertile, adding that the two percent designation is also flawed because it doesn’t have a clear point of reference. “Two percent of what? The most fertile cultivar? The median of the most fertile cultivars? It’s unclear.”



His current research aims to refine these exemptions to be more clear and more effective. As they stand, the exemptions could lead to “escape”—fertile invasive cultivars accidentally being released into the environment and overtaking native plants—which could potentially cause ODA to revert back to the full ban and be a huge blow to the industry.

“We need to rightsize the regulation so that it’s lenient enough that growers are able to produce and sell the cultivars that present little to no ecological threat. But it needs to be stringent enough that we’re preventing the flow and sale of cultivars that might present an ecological threat. Until now, none of these cultivars have been scientifically evaluated in Oregon.”

Butterfly bush gets its name from its appeal to butterflies and other pollinators, which forage on its pollen and nectar—another aspect of the study.

Cara Still is a graduate student in Contreras’ ornamental breeding program, working toward a master’s in horticulture with an emphasis in plant breeding and genetics. She is collecting data that will help examine the impact on pollinator populations, as well as relative fecundity of the cultivars in the study.

Once per week, Still visits the research site at OSU’s Lewis Brown Farm for pollinator observations on 34 different cultivars. They include the old-school fully-fertile invasive cultivars, low-fertility cultivars, and interspecific hybrids—some of which are currently available for sale in Oregon, and

others that aren’t approved yet. For five minutes at each plant, Still counts all pollinators that visit (namely honey bees, bumble bees, syrphid flies, butterflies, and moths) and identifies their morphological structure. This will help to gauge which cultivars are attracting more pollinators, and which are attracting a greater diversity of pollinators.

The research team is also doing a pollen index, measuring relative production of pollen and nectar volume across all the cultivars. Pollinators don’t always go for pollen and nectar on the same plant—sometimes they forage for one or the other—so Still wants to gauge how those resources are treated by pollinators in various cultivars.

Ultimately the research aims to assess whether pollinators are attracted equally to low-fertility and high-fertility cultivars, and if having low fertility creates a reduction in resources available to pollinators.

Still clarified that although “fertility” is the commonly used term, the team is actually measuring fecundity. The difference is that fertility refers to how many seeds the plant produces, but fecundity is how many sprouting seedlings will actually grow and take root. It’s the total reproductive potential of the plant.

“It’s a small difference but very important in the conversation about invasive species,” said Still. “We’re aiming to provide a clearer picture about the fecundity of cultivars, and more importantly how to measure it, which has implications for other invasive plant species as well. Hopefully our findings can be used to help craft more nuanced legislation

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**Above left:** Professor Ryan Contreras in the Department of Horticulture and graduate student Cara Still walk their research site at Lewis Brown farm, examining varieties of butterfly bush plants they are studying for fecundity.

**Above:** Overhead drone shot of butterfly bush at the Lewis Brown farm.

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The final step of this research will be using the cultivar data to create models that predict ecological impact. John Lambrinos is a landscape ecologist and horticulture professor working on the project. He will take the real-world data compiled by Still and put it into ecological population models that build upon known records of invasive butterfly bush spread areas.

This will allow the team to see how these new cultivars will spread in the environment in the case of escape, based on the established data of actual population growth of the old-school fully-fertile cultivars that have spread in some riparian areas across Oregon. “I think we’re tackling this problem in a comprehensive way that will provide data to land managers, ecologists, growers, the industry, and homeowners,” Contreras said.

The research is funded by the Horticultural Research Institute, a national entity, and the research arm of AmericanHort.

“We’re proud to have this national funding to address this issue. One of the major problems with invasive plants is that there is no national policy,” said Contreras. “Which is partly a good thing because invasiveness and weediness is very regional. For example, there are many plants in the South that wouldn’t be an issue here because they’d freeze and wouldn’t flower. So it’s important to allow regional rules, but the overall system needs more coordination. We’re working with other states

and regions to improve the system. We’re not trying to develop a one-size-fits-all approach for how to regulate a specific plant, but rather a framework for how we approach the data that is submitted, and some criteria for how experiments are performed. We want to provide that to ODA, which could then be used by other states as well. Eighty-five percent of what we grow is shipped out of state. We want to establish a framework for how the data is generated and evaluated by each state.”

Although this research has the potential for far-reaching impact on invasive plant laws across the nation, to Contreras the project carries a deeper meaning.

“As a plant breeder and plant enthusiast—I consider myself a hardcore plant geek—this project is just really fun. It’s amazing to see the insane level of diversity among cultivars that have been in the industry for decades compared to modern breeding. It’s fun to walk the fields, smell the plants, see the beautiful flowers, and observe their various traits. It gives me a lot of pride in the breeding community. This field has done amazing things in creating plants with high economic value and low environmental risk.” 

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 Watch the Video Online: [beav.es/wMW](https://beav.es/wMW)