Oregon Department of Agriculture and Oregon Association of Nurseries

Nursery Research Grant Proposal 2026

DATE: September 1, 2025

TITLE: Basal Applications of NAA for Sucker Management in Ornamentals

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Project Background: Total sales for the U.S. ornamental horticultural industry in 2019 were $13.8 billion. Field-grown ornamentals such as shade trees, evergreen shrubs, flowering trees, and perennial nursery stock account for a substantial share of that total. However, field grown ornamental plant production is labor-intensive. Activities such as planting, pruning, and staking require manual labor. Labor can account for 30–50% of total production costs in ornamental nurseries. The labor demand is driven by the need to produce plants with desirable aesthetic quality, a key determinant of market value. Plants must be uniform, healthy, and visually appealing, with strong form, symmetry, and vigor. Poor appearance can significantly reduce the commercial value of the crop. Sucker and water sprout removal is an important aspect of tree training. Sucker and water sprout is vigorous. These unwanted shoots emerge from the root system (sucker) or the lower portion of the trunk or stem (water sprout), often below the graft union. Suckers disrupt the tree's form, reduce the growth of the main trunk, contribute to weaker branching patterns that are prone to breakage and interfere with digging, transport, and transplanting. The *Malus* spp. is a prolific suckering species cultivated in ornamental nurseries. Currently, hand pruning is the only sucker removal method practiced in commercial nurseries in Oregon. Based on personal observation, we estimate that sucker removal for one acre of *Malus* would require more than 30 h (E. Herrera personal communication). This practice is done three to four times per growing season in young crops. Current constraints to farm labor supply and increased hourly labor costs increase the urgency of identifying more efficient practices to substitute for hand labor.

Preliminary Work

In 2025, we conducted a preliminary study in a *Malus* 'Columbia' rootstock field near Dayton, OR in collaboration with a commercial nursery. Trees had been planted the previous season, budded in the fall, rootstock shoots removed by hand once, scion shoots selected and trained into main stake with plants averaging 2 ft in height (Fig 1). Treatments were band-sprayed to cover the lower 1 ft of the plants or were applied in latex paint. The banded applications of postemergence herbicide tiafenacil at 25 and 75 g

Figure 1. Overview of the field on May 28, 2025 when treatments were applied.

ai ha, or naphthaleneacetic acid (NAA) at 0.25%, 0.5%, and 1%, were moderately effective for 14 days, followed by quick regrowth of new shoots. The painted treatments were first de-suckered by hand and later received one generous coat of interior latex paint, or latex paint mixed with NAA at 0.5% or 1%. A single application of NAA with paint, regardless of the rate, nearly eliminated suckers until the final evaluation at 60 days after treatment (Fig. 2). The grower then removed any suckers to produce commercial-grade trees. At 90 DAT, only the NAA-painted trees lacked suckers. Importantly, the NAA application methods tested are on-label for ornamentals, and the spray method has been tested previously by industry collaborators on this project. The only injury observed with the NAA-paint treatment in this study occurred when paint was applied to a short scion shoot that had not been stapled. In another study, hazelnut studies trees died at high rates from the same treatment. We expect that the response to NAA will be species- and cultivar-specific (Objective 1), application method and rate (Objective 2). Because of the promising results observe in the 2025 pilot study, we are collaborating with nurseries and the manufacturer to develop and refine a safe and cost-effective sucker management method that is supported by the manufacturer and readily adoptable by nurseries. This project will improve the economic sustainability of Oregon's high-value ornamental crops and allow growers to remain competitive and access the global market.

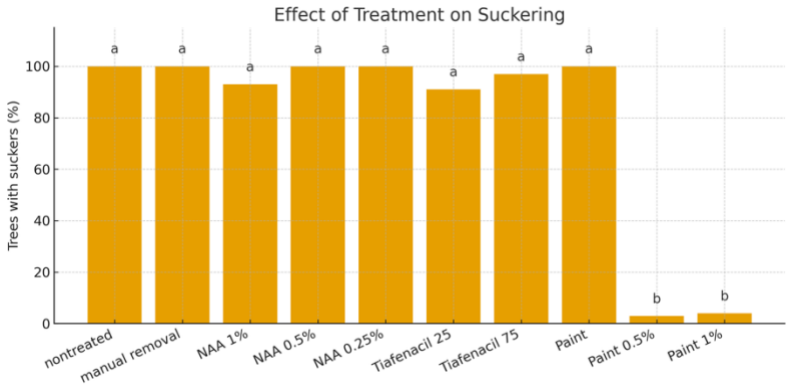

Figure 2. Malus 'Columbia' response to sucker treatments 60 days after treatment

Project objectives:

1) **Malus scion response to NAA paint**. A *Malus* field of approximately 650 field-grown trees will be budded with 25 different cultivars in the fall of 2025, resulting in 26 trees of each scion. Growers will manage trees following standard practices. The study will begin in the spring of 2026 after the scion shoots are at least 6 inches in length and have been stapled twice. Suckers will be removed before the paint application. Trees will be separated into 3 treatments, and each tree will be treated as a replicate (n=8). Treatments will be NAA at 0%, 0.5%, and 1% mixed with interior latex paint and applied once to the lower 2 ft of the trunk. Application will be made using a backpack sprayer with one flat-fan nozzle to improve trunk coverage. Paint will be mixed with an equal amount of water to reduce solution viscosity. We will record the volume of spray delivered per plant as g ai per tree. Assessments will include budding efficiency (trees with viable buds), sucker presence (trees with suckers), bud and sucker length, a visual estimate of sucker control (0-100%), and the number of times the plants were de-suckered by hand after treatment.

2) **NAA delivery methods.** In a separate study, we will evaluate whether latex paint is necessary. Treatments will include NAA plus 1% latex paint, as standard, NAA at the same rate per tree applied with water only, or NAA plus water with an adjuvant sticker at two rates (BondMax 0.25% and 1% v/v). A nontreated control will be included. Treatments will be repeated four times, and the study will be conducted twice.

The benefit to the Nursery Industry:
The adoption of new, labor-saving methods for sucker removal in ornamental crop production represents a transformative opportunity for the nursery industry. By increasing stakeholder awareness of emerging tools and their potential benefits, growers will be better equipped to make informed decisions to improve production efficiency and plant quality. Oregon nurseries are highly diverse—each operation is unique in size, crop type, and management style. Thus, we do not expect a one-size-fits-all solution. Instead, our goal is to evaluate and document the advantages and limitations of each approach, enabling growers to choose the strategies that best align with their specific needs and preferences. Farmer-to-farmer exchanges will play a critical role in sharing experience, building confidence, and encouraging broader adoption across the grower community. Reducing the labor demands of sucker management promotes more sustainable and consistent production of crabapple and other ornamental species while improving worker well-being by minimizing repetitive and ergonomically challenging tasks. These innovations can contribute to more cost-effective production and increase the competitiveness of nursery products in the marketplace. They will support the development of a more resilient, sustainable and economically viable ornamental nursery.

Timeline

Activity 2026	**Winter**	**Spring**	**Summer**	**Fall**
Grafting	X			
Initiate treatments		**X**		
Assessments		**X**	**X**	**X**
Data collection		**X**	**X**	**X**
Reporting				**X**

Budget summary:

	Description	Requested
Personnel		
Faculty Research Assistant	0.23 FTE ($61,992/ year)	$ 14,300
Employee benefits (OPE)	71%	$ 10,150
Travel		
Mileage 12 trips at 180 miles/round trip	$1,500 ($0.7/mile)	$ 1,500
Materials		
Personnel protective equipment, stakes, sprayer consumables, etc.	$1,050	$ 1,050
TOTAL REQUEST		$27,000

A proposal focused on sucker control in ornamentals was submitted to HRI for the 2026 fiscal year. There are no finds form private companies for this project (AMVAC or OHP) .