Significance to the Horticulture Industry

Beach Leaf Disease

Exploring Novel Management Methods for Beech Leaf Disease, an Emerging Threat to Forests and Landscapes. Andrew L. Loyd, Richard S. Cowles, Matthew A. Borden, James A. LaMondia, Nathaniel Mitkowski, Heather Faubert, David Burke, Constance Hausman, Daniel Volk, Caitlin Littlejohn, Amber Stiller, Chad M. Rigsby, Beth Brantley, and Kelby Fite. *Journal of Environmental Horticulture* 42(1): 1–13

Beech leaf disease (BLD), caused by an emerging and presumably introduced foliar nematode, threatens the health and future horticultural marketability of all beech species. Prior to this work, no effective treatments had been published. Damage to leaves occurs in developing buds before leaf expansion. Therefore, treatments that kill nematodes cannot improve aesthetic appearance in the year of treatment but can protect the next year's foliage if they suppress nematodes prior to them migrating and entering overwintering buds. Fluopyram, already registered for use on ornamental landscape, nursery, and beech nut (Fagus grandifolia) plantings as a fungicide, is an effective nematicide that kills BLD nematodes present in infected leaves.

Based on this research, applying fluopyram as a foliar spray to infected trees just prior to the nematode dispersal period (late summer during high leaf-wetness events) when they migrate from leaves to developing buds can be an effective management tactic. It is also possible that other application timings could prove effective (e.g., shortly after full leaf expansion), but need validation. Measures to delay nematicide resistance to fluopyram may include application early in the season, when nematode populations are lowest, combining fluopyram with a conazole fungicide to inhibit metabolic detoxification, and rotation or combined treatments with other nematicidal chemistries representing alternative modes of action. The need for treatment can be assessed by monitoring foliage for characteristic symptoms (e.g., dark interveinal bands or distortion) and by extracting nematodes from dormant buds during the autumn, winter, or early spring.

Dahlia Production

Nitrogen Management and Virus Incidence on Cut Flower Production of Dahlia. Frank Oliver, Melanie Stock, and Claudia Nischwitz. *Journal of Environmental Horticulture* 42(1):14–22

Across the U.S., locally-grown cut flowers are becoming an economically important crop for small farms. In the U.S. Intermountain West, dahlia is the top specialty cut flower for farmers to grow, as well as the top cut flower sourced by state florists. Demand for dahlias, namely dinnerplate cultivars (i.e., those with a minimum bloom diameter of 15.2 cm (6 in), Stock et al. 2023), however, is much greater than supply, which florists cite as the top barrier to increasing purchases from local farms. However, production of dahlia cut flowers is challenging because of a lack of soil fertility recommendations for dinnerplate dahlias, as well as widespread virus presence. This study determined a rate of 168 kg nitrogen·ha^{-1} (150 lb nitrogen·A^{-1}) was the most economically efficient for a dinnerplate variety, while six viruses, including three strains of dahlia mosaic virus (DMV), warranted routine testing. Nutrient management recommendations are presented to avoid over-application, highlight soil sustainability needs for small farms, and identify extensive virus infection effects on production. More research is recommended for other dahlia types, as well as to increase the availability of clean-stock options for growers.

Horticulture Customers

Growing the Next Generation of Horticulture Customers and Stakeholders through Industry and Extension Outreach Collaborations. N. Bumgarner, A. Rihn, J. Campbell, S. Dorn, and H. Kirk-Ballard. *Journal of Environmental Horticulture* 42(1):23–30

As generational change occurs in the horticulture customer base, younger and more diverse consumers are increasingly economically important. Understanding these new and potential customers will be essential for horticulture businesses. This study was conducted to survey participants and non-participants in plant-related activities to better understand what drives this participation and what the horticulture industry can do to increase participation. We found that knowledge and success were key challenges to participation. This study also found that education and practical hands-on engagement with plants can be a route to increase knowledge and expand the level of engagement with current gardeners as well as potentially lay the foundation to reach current non-participants. An added focus on educational efforts could place a strain on small and mid-scale horticulture growers and retailers already operating at capacity. So, we suggest that synergistic collaborations could be developed between Extension educators and local horticulture retailers.

Marketing messages

Assessing the Relationship between Plant Types Purchased and Consideration of Future Consequences to Generate Marketing Messages for Ornamental Plants. Alicia L. Rihn, Melinda J. Knuth, Bridget K. Behe, and Charles R. Hall. *Journal of Environmental Horticulture* 42(1):31–39

Research documents the benefits to humans of being around plants, including reduced stress and improved well-being. This study addressed how different plant types (i.e., annuals, perennials, woody plants, and indoor plants) relate to customers' consideration of future consequences, mental health, and plant purchasing behavior with the intent of better aligning promotional campaign information with

what resonates with customers. There was a positive relationship between considering future consequences and improved mental health, indicating people with one of these attributes often exhibited the other attribute. This is important given that both are demonstrating an interest in future outcomes. Additional differences were observed across the different plant types. There was a positive relationship between purchasing indoor plants and people who viewed the impacts of their actions on future outcomes (i.e., had high consideration of future consequences ratings). Plant retailers could use promotions highlighting sustainable production practices or initiatives and how indoor plants improve mental health to resonate better with these customers.

Soil Surfactants

Evaluation of Two Soil Surfactants for Soil Water Management of Creeping Bentgrass on a Wettable Clay Loam Rootzone During an Imposed Dry-down Period. Gary Nolan and Michael Fidanza. *Journal of Environmental Horticulture* 42(1):40–45

Soil surfactants, or more commonly known as "wetting agents" in the ornamental horticulture industry, have become an important and heavily relied-upon tool for water conservation with managed amenity and sports turfgrass ecosystems. In a field study on a wettable clay loam rootzone, two soil surfactants (OARS HS or PBS150; both from AquaAid Solutions, Rocky Mount, NC) were applied as sequential monthly applications to fairway-height creeping bentgrass (*Agrostis stolonifera* L. 'L-93') test plots. During an imposed 63-day dry-down period, test plots were irrigated based on a specific soil volumetric water content target. Turfgrass plots treated with OARS HS required 39.5% less irrigation water needed versus irrigating untreated turfgrass plots. PBS150-treated turfgrass required 35.6% less irrigation water versus untreated plots. For example, as extrapolated from this field study, 10 ha (25 acres) of creeping bentgrass fairways would require 15,383,853 L (4,063,984 gal) water for irrigating untreated turfgrass during that 63-day period. Turfgrass treated with OARS HS would use 9,307,231 L (2,458,710 gal) or achieve 6,076,621 L (1,605,274 gal) in water savings, and turfgrass treated with PBS150 would use 9,907,201 L (2,617,206 gal) or achieve 5,476,652 L (1,446,778 gal) in water savings. The economic benefit of reduced electrical energy consumption associated with a reduced need for operating the irrigation system was not determined. This study represents the first replicated field research investigation of turfgrass to quantify both a reduction in the amount of irrigation water inputs and a reduction in the number of irrigation events that may be accomplished with the use of soil surfactants. This study also illustrates the effectiveness of evaluating soil surfactant treatments and applications utilizing an imposed dry-down method.