Significance to the Horticulture Industry

Display Complexicity

Display Complexity Affects Visual Processing of Horticultural Plant Retail Displays. Bridget K. Behe, Aaron Staples, Patricia Huddleston, and Trey Malone. *Journal of Environmental Horticulture 40*(1):1-9

With more than 70% of all buying selections made at the point of purchase (Ståhlberg and Malia 2007), firms participating in the study invested approximately $18 billion each year on in-store marketing (Nelson and Ellison 2005). As most live plants are sold in the retail environment and not online (Behe et al. 2008), a well-organized display in the retail setting can improve sales dramatically while poorly designed displays can have customers not even pausing for a glimpse. We investigated how increasing the number of genera in a display as well as horizontal versus vertical merchandising affected visual attention and product choice. Results suggest that with increased number of genera, display complexity increased, and participants ignored a larger percentage of the products likely because they could not "read" the display like lines in a book. To reduce the cognitive burden consumers may have in "reading" a display, retailers should merchandise plants horizontally, not vertically. Additionally, greater plant diversification increased the likelihood that a consumer would find a product they would like to purchase.

Gardening Motivations

Gardening Motivations of U.S. Plant Purchasers During the COVID-19 Pandemic. **Bridget K. Behe, Patricia T. Huddleston, and Charles R. Hall.** *Journal of Environmental Horticulture 40*(1):10-17

Motivations are reasons for taking an action; they literally drive behavior. Some government mandated restrictions for individuals to quarantine in place due to the COVID-19 pandemic motivated homeowners to enhance their interior and exterior environments, thus influencing the shopping behaviors and purchases of horticultural products. Many horticultural companies reported favorable sales in 2020 despite government-mandated restrictions to quarantine in place. Understanding what drove consumers to make plant purchases can help producers, wholesalers, and retailers learn more about behavioral drivers and utilize that information in future marketing programs. Researchers compared three age cohorts to understand which plant benefits they derived from their plant purchases. Of these benefits (economic, environmental, health/wellbeing, and social), Millennials obtained the most from social benefits, but these social benefits were derived during the pandemic isolation, so the benefit was most likely nearly all online. For horticultural businesses, this finding points to the increasing importance of using social media to connect with consumers. Social media can provide a platform to communicate other plant benefits to consumers, ultimately increasing their knowledge, awareness of, and appreciation for numerous plant-related benefits. Boredom proneness was experienced more by Gen Z and retailers may seek to utilize messages that promote a change of pace by encouraging consumers to try a new plant to alleviate boredom. Food security was another motivational factor in plant purchases, with individuals who purchased herbs or food-producing plants experiencing greater food security compared to individuals who purchased only flowering plants or no plants. Findings suggest including information about food security, boredom relief, and social connections to promote plant purchases could be effectively incorporated into consumer communications.

Nickel Deficiency

Supplemental Nickel Corrects Mouse Ear Disorder of Bitternut Hickory. Brandon M. Miller and Nina L. Bassuk. *Journal of Environmental Horticulture 40*(1):18-21

Between the 1970s and early 2000s, mouse-ear disorder limited the production of river birch (*Betula nigra* L.) (Ruter 2005). The discovery that nickel deficiency causes the disorder identified the core issue and prompted the development of a commercial product to correct the problem. Nickel has since been recognized as an essential element for plant growth and the understanding of nickel requirements of different taxa continues to grow. As species diversity of managed landscapes becomes a principal issue in the green industry, growers are looking for new crops to produce. Bitternut hickory is a species gaining the attention of growers, horticulturists, and urban foresters for its horticultural merit. The introduction of this taxon as a nursery crop requires new techniques to enhance production and availability to consumers. Because nickel is a heavy metal, careful recommendations of its application in the nursery are substantiated to maintain safe, sustainable, and efficient production. Growers interested in adopting bitternut hickory into production should anticipate the occurrence of mouse ear disorder when cultivated with soilless substrates. Nickel can be adequately supplemented with Nickel Plus® applied as either a foliar spray or substrate drench shortly after bud break and in accordance with label-recommended rates for pecan.

Nitrogen Content Measurement

Whole-Plant Tissue Nitrogen Content Measurement Using Image Analyses in Floriculture Crops. Ranjeeta Adhikari and Krishna Nemali. *Journal of Environmental Horticulture 40*(1):22-32

Plant N status is one of the major determinants affecting growth, development, and quality of floriculture crops. Commonly used methods to measure plant N status are either destructive/ labor-intensive (e.g. laboratory analysis) or expensive (e.g. chlorophyll meters). Although image-based techniques for estimating plant N status are studied extensively in agronomic crops, research on floriculture crops is limited. Our research provides preliminary information on the efficacy of an image analysis technique in general and low-cost image sensors for estimating whole-plant N content in floriculture crops. The information from this research can be used to further develop IoT (internet of things) technologies for measuring whole-plant N status in the future. Such technologies can enable easy measurement of plant N status and timely decisions about fertilizer application in the floriculture industry. This can result in improved crop growth and quality of floriculture crops due to proper N management during production. Further, the technology can result in increased income from reduced wastage of fertilizer and crop losses. In addition, proper fertilizer management can reduce environmental pollution by minimizing fertilizer leaching and runoff from over-fertilizing plants.

Sweet Potato Transplant Production

Decreasing Phosphorus Fertility to Reduce Sweetpotato Root Growth During Container-grown Transplant Production. L. Rouse, J. Beasley, D. LaBonte, and J. Kuehny. *Journal of Environmental Horticulture 40*(1):33-38

The expanding home garden market has led to greater consumer demand for edible ornamental crops such as sweet-

potato [*Ipomoea batatas*]. Many homeowners purchase transplants from local nurseries rather than planting stem cuttings, which are used in production horticulture. This has led to anecdotal concerns of fertilized sweetpotato transplants quickly developing elongated roots that reach container walls, becoming root bound. Excess container root mass reduces transplant vigor and quality, shortening the period of salability. Common mechanical or chemical methods implemented on many ornamental species to counter or prevent excess root mass are not appropriate for edible root crops. An alternative method to slow sweetpotato rooting during transplant production may be reducing phosphorus (P) fertility. Lowering P fertility modified sweetpotato root architecture, i.e., reduced length and more branching, in greenhouse studies (Villordon, Personal Communication 2021). Sweetpotato shoot and root growth were evaluated over a six-week transplant production cycle. Reducing P fertility from 31 (0.0040 oz $P \cdot gal^{-1}$) to 5 $mg \cdot L^{-1}$ (0.0007 oz $P \cdot gal^{-1}$) did not sufficiently slow transplant rooting to prevent root bound conditions and thus did not extend the period of salability beyond 4 weeks. Alternative practices such as reducing N fertility or periodic manual defoliation should be examined to slow transplant rooting to increase the duration of salability.

Horticultural Research Institute
2130 Stella Court, Columbus, OH 43215
p. 614-487-1117 | f. 614-487-1216 | hriresearch.org