

Project: Water Management for Horticultural Operations

Project Leader: Amanda Bayer

Project Overview

Improving water and resource management is of increasing importance in horticultural operations. A growing global population and changes in water availability will mean that less water will be available for ornamental plant production and maintenance. There are also a growing number of federal and state regulations regarding water use and runoff from production areas. Better irrigation and fertilization management practices will help to limit the environmental impact of container plant production by limiting the runoff of water and nutrients from nurseries. Growers require assistance in meeting regulations which will serve to improve water quality in local ecosystems. Landscape companies are also needing to improve the sustainability of their practices in order to adjust to changing resource availability, consumer pressures, and to be more environmentally friendly.

To help growers improve irrigation practices, the current state of nursery production in New England must be assessed in order to identify key areas for improvement. Disseminating educational materials for nursery growers will also create opportunities to help direct future research on identified irrigation management issues. Sustainable production techniques will be shared with the next cohort of nursery producers so that they can help implement sustainable practices as they move out into the industry. A better understanding of plant needs during and after landscape establishment is needed to help improve the sustainability of landscape practices.

The ultimate goal of this program will be to improve resource use and management in Massachusetts and New England nurseries and landscapes. More efficient irrigation will result in less waste of water and recued inputs for production. The range of possible environmental benefits include less runoff from production areas which will decrease the nutrient, pesticides, and fungicides that enter local ecosystems. I will also be investigating ways to improve water and nutrient management in the landscape and ways to improve plant survival in the landscape.

Activity Summary – 2020

- Arrange/Attend meetings and field days on plant production and landscaping. (2)
- Answer emails and phone calls from growers and landscapers on various production and landscape topics. (45)

- Consultations with nursery growers and landscapers in Massachusetts and New England on sustainable practices. (5)
- Contribute relevant articles to HortNotes, Garden Clippings, the Landscape Message, and MNLA Pro Grow News (6)
- Develop Extension Publications on water management, irrigation, and other relevant topics (3)
- Applied research on Improving Landscape Plant Establishment Practices (1)

Educational contacts

	Adult Contacts	Youth Contacts
In Person	230	
Indirect Contacts (Print, Web, etc...)	2045	

Narrative Summary - 2020

The first area that was addressed was improving sustainability of landscapes. This is being done through research and outreach regarding plant establishment, plant selection and installation, and landscape maintenance. Ongoing research in this area is looking at the impact of rootball preparation technique on establishment (root growth and shoot growth), stress, and survival of plants. This research benefits landscape professionals, nursery and garden centers, and homeowners.

The second areas that was addressed was improving production practices for container grown ornamental plants. Research has specifically looked at the impact of fertilization and irrigation practices and how they can be altered to still produce good quality salable plants. Research has also looked at the use of additives to improve water holding capacity of substrates which can potentially reduce irrigation frequency and plant stress. The research benefits nursery producers.

Research projects completed include: a study looking at the impact of reduced irrigation and fertilization on flowering and growth of penstemon; a study looking at the impact of substrate type on effectiveness of substrate additives to improve water holding capacity; a study looking at the impact of container type on the effectiveness of substrates additives to improve water holding capacity; multiple studies looking at effect of substrate water holding additives on time to dry down (wilt); a study looking at the effectiveness of additives when substrates are maintained at different water holding capacities; a study looking at the salt tolerance of various Ilex species. Ongoing research is looking at the effect of rootball preparation technique on plant establishment, survival, and growth.

Outreach has included presentations on research fertilization rate research, improving irrigation applications, and irrigation technology. Publications on completed research (3 articles published in 2020), a trade magazine article on irrigation technology, and multiple extension related articles/fact sheets.

The most important result from the production practice research was that irrigation and fertilization practices can be reduced while still producing salable plants. The extent that reduced irrigation and fertilization impact plant growth is variable between species but reductions were possible for all plants studied. It was also found that visually plants grown with the most water were generally less appealing while plants grown with reduced irrigation were most visually appealing. Results of the water holding capacity additives were mixed, indicating that they need to be assessed for different species and substrates.

Preliminary data from the establishment study is showing that rootball preparation technique has not made a difference in terms of plant survival (even with drought conditions in 2020). There does seem to

be a species specific effect on the impact on plant growth that may reflect difference in root systems or drought tolerance. The study will be concluded in 2021.

Collaborating Organizations

- **(AG) Massachusetts Flower Growers Association**
- **(AG) Massachusetts Nursery and Landscape Association**
- **(AG) New England Nursery Association**

