Significance to the Horticulture Industry

Blueberry Propagation

Asexual Propagation by Stem Cuttings of Half-high and Low-bush Blueberries in Soilless Substrates. Jacob D. Schwab, Kimberly A. Williams, and Jason J. Griffin. *Journal of Environmental Horticulture* 39(2):47-52

Blueberries (*Vaccinium* spp.) are a high-value crop that have cultural requirements of low soil pH and salt loads. Therefore, production using soilless production systems - where the root medium is inert and plant nutrients are supplied solely from fertilizer application - may offer improved management options for producers in regions where soil conditions do not meet these requirements. For easiest establishment in soilless systems, blueberry plants should be propagated in like substrates. Varieties of *Vaccinium* spp. were selected for evaluation because of potential for use in controlled environments or high tunnels. The half-highbush blueberry 'Northland' (*Vaccinium corymbosum* L. X *angustifolium* Aiton 'Northland') is regarded for its compact stature and relatively high fruit yield. The lowbush blueberry 'Brunswick' (*V. angustifolium* L. 'Brunswick') is noted for its high fruit weight and vigor. This research provides new information for propagators who desire to root blueberries in soilless substrates of rockwool or coco coir.

Greenhouse Gas Emissions

Effects of Growth Substrate on Greenhouse Gas Emissions from Three Annual Species. Anna-Marie Murphy, G. Brett Runion, Stephen A. Prior. Allen Torbert, Jeff Sibley, Glenn B. Fain, and Jeremy M. Pickens. *Journal of Environmental Horticulture* 39(2):53-61

As an important part of the agricultural industry as a whole, the ornamental plant production industry could impact global climate change and may reap economic benefits from potential changes in legislation or tax incentives aimed at reducing GHG emissions. In previous work, these authors have evaluated GHG emissions in the nursery container production of several woody and herbaceous perennial species as a factor of container size, irrigation delivery method (overhead vs drip), fertilizer application method (incorporated vs dibble vs topdressed), and light intensity level (sun vs shade). Previous work has focused on plants grown in a bark-based substrate, while the current study evaluated three annual species grown in a standard peat:perlite greenhouse media and two alternative substrates with varying percentages of high wood fiber. No differences were observed for the main effects of species or media for N_2O and CH_4 emissions. Results for cumulative CO_2 efflux indicated that substrates amended with up to 20% of a high wood fiber (effectively replacing perlite) had similar CO_2 emissions to that of a standard peat:perlite blend. This is promising for growers looking to identify a more sustainable substrate alternative to perlite without increasing GHG emissions.

Growth Regulators

Plant Growth Regulator Impacts on Vegetative Cutting Production of Moroccan Pincushion (*Pterocephalus depressus*) Plants. Sean J. Markovic and James E. Klett. *Journal of Environmental Horticulture* 39(2):62-67

Moroccan pincushion (*Pterocephalus depressus*) is one of several perennials being evaluated as part of the Plant Select® landscape plants program at Colorado State University. As a drought-tolerant perennial ground cover, moroccan pincushion can provide a new option for drought affected areas in the western United States. The compact growth is ideal for use in smaller residential landscapes. The primary obstacle to further adoption of moroccan pincushion by producers thus far has been the lack of propagation success. Colorado State University researchers are developing production protocols for Plant Select® varieties, but these need to be proven successful before deployment to producers. Vegetative propagation is the most widely used method of propagation of moroccan pincushion. However, success with vegetative propagation has been variable. Stock plant quality has a large impact on the success of cuttings taken from moroccan pincushion. The use of gibberellic acid (GA_3), benzyladenine, ethephon, or indole-3-butyric acid (IBA) may improve stock plant production and cutting fresh weight an indicator of cutting quality. We found that 0.025 $g{\cdot}L^{-1}$ (25 ppm) gibberellic acid (GA_3) in combination with 0.25 $g{\cdot}L^{-1}$ (250 ppm) benzyladenine was the best combination for increasing stock plant growth which produced a greater number of vegetative cuttings. Also, 0.25 $g{\cdot}L^{-1}$ (250 ppm) indole-3-butyric acid (IBA) can have a positive effect on rooting success.

Herbicide Injury

Field response of green ash (*Fraxinus pennsylvanica*) and honey locust (*Gleditsia triacanthos*) to aminocyclopyrachlor. Philip Westra, Curtis Hildebrandt, Hudson K. Takano, Todd A. Gaines, and Franck E. Dayan. *Journal of Environmental Horticulture* 39(2):68-76

Aminocyclopryachlor (ACP) was developed and originally marketed as a significant new lawn care herbicide for the control of dandelions (*Taraxacum* sp.), ground ivy (*Glechoma hederacea*), wild violet (*Viola* sp.), and other troublesome weeds in turf. Its broad spectrum of control of annual and perennial weeds was well studied and characterized. This study was conducted in a large stand of established green ash (*F. pennsylvanica*) and honey locust (*G. triacanthos*) trees planted in a pattern in a stand of Kentucky bluegrass (*Poa pratensis*) sod. Green ash exhibited excellent ACP tolerance while honey locust required 13 m (43 ft) distance from treated sod to exhibit clear tolerance. This large study demonstrated that different tree species can exhibit huge differences in tolerance to ACP, showing that tree response in targeted treatment areas should be carefully evaluated prior to treating large areas with ACP. Recovery from honey locust injury was modest at best and would not satisfy the concerns of tree owners. Tree response was from soil uptake of ACP as no ACP was applied to any part of tested trees. Care should be taken in applying ACP in the proximity of desirable trees that may be sensitive to this herbicide.

Trade Flows

Trade Flows within the United States Nursery Industry in 2018. Melinda J. Knuth, Hayk Khachatryan, Charles R. Hall, Marco A. Palma, Alan W. Hodges, Ariana P. Torres, and Robin G. Brumfield. *Journal of Environmental Horticulture* 39(2):77-90

After the slow recovery from the Great Recession in 2008, the green industry has been experiencing a stronger recovery in recent years (Hall et al. 2020). With an ever changing and evolving business environment, up to date information regarding general economic trends, regional trade, marketing channels, consumer preferences, real estate markets, and production issues (i.e., proper

product mix, irrigation technology, integrated pest management, etc.) is critical for nursery managers and business owners to adjust business strategies and effectively manage production risks. This current report provides information regarding the inter-regional and intra-regional trade flows and provides a 5-year and 10-year comparative analysis of inter-regional trade in the U.S. green industry. This information may help inform industry members of the geographical trends of demand and assist in developing strategic decisions about emerging (or evolving) markets.

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The Journal of Environmental Horticulture (ISSN 0738-2898) is published online quarterly in March, June, September, and December.