Abstracts of the ASHS Northeast Region Annual Meeting

University of Delaware, Newark 8–10 January 2009

Papers

Cross-hybrid Compatibility of Inkberry with Meserve Holly and Common Winterberry

Youping Sun, Donglin Zhang, and Lijuan Han, Department of Plant, Soil and Environmental Sciences, University of Maine, Orono, ME 04469*

Inkberry [*Ilex glabra* (L.) A. Gray)] is a native evergreen shrub with dark green foliage, which brings much more attention for nursery growers in the northern landscapes in the US. Inkberry was hybridized with cold-hardy male meserve hybrid hollies [*Ilex* x*meserveae* S.Y. Hu] and common winterberry [*Ilex verticillata* (L.) A. Gray]. Cross-pollination of *Ilex glabra* and its five cultivars with both above male plants was carried out in greenhouse to test their compatibility during their blooming season. Cross-compatibility of *Ilex* x*meserveae* and *Ilex verticillata* significantly differed among *Ilex glabra* and its cultivars. Inkberry and its cultivar 'Chamzin' and 'Densa' had higher compatibility with either *Ilex* x*meserveae* or *Ilex verticillata*. Their fruit sets were 55.1%–68.7% and 43.6%–86.0%, respectively. However, 'Compacta' and 'Nigra' had less compatibility and their fruit sets were 14.0%–32.1% for *Ilex* x*meserveae* and 21.0%–38.0% for *Ilex verticillata*. 'Shamrock' was almost incompatible with neither of them; only lower than 3.7% fruit set was observed. Most of their fruit sets were aborted and the fully developed seeds were less than 54.2% (*Ilex* x*meserveae*) and 32.4% (*Ilex verticillata*). The pollen germination in situ observed with fluorescence microscope also supported the above results. Therefore, reproduction isolation barriers such as inhibition of pollen germination, lack of fertilization, endosperm failure and/or embryo abortion should be avoided through selecting a suitable female *Ilex glabra* cultivar.

Lijuan Han is a visiting professor from Changchun Normal University in China.

Zinc Uptake of *Sedum* spp. in Various Ratios of Crumb Rubber-amended Green Roof Substrate

S. Lorelly Solano[1], Andrew G. Ristvey[2], John D. Lea-Cox[1], and Steven M. Cohan[1]. [1]University of Maryland, Department of Plant Sciences and Landscape Architecture, College Park, MD 20742; [2]University of Maryland, Wye Research and Education Center, Queenstown, MD 21601*

Extensive green roof systems are designed primarily to mitigate storm water runoff from impervious surfaces in dense urban areas. Expanded shales, slates and clays are inorganic materials typically used as substrate. In addition to the high embodied energy from production, these materials can impose restrictions for retrofitting existing structures due to weight. The use of crumb rubber, a recycled tire material, may reduce substrate loads, reduce the use of energy during substrate production and improve the porosity and longevity of many green roof substrates. However, zinc is released from crumb rubber in potentially toxic levels for ornamental plants. This study investigates the tolerance of *Sedum* species grown in the green roof substrate, rooflite™, amended with one of six volumetric proportions of crumb rubber (0%, 6%, 12%, 18%, 24%, and 30%). Three *Sedum* species: *S. album* L, *S. reflexum* L., and *S. kamtschaticum* Fisch., were grown in 10-cm (4 inch) pots in an incomplete randomized block design. After 5 months of growth under greenhouse conditions, the plants were harvested and the dry mass was determined. The foliar zinc content was determined by ICP analysis at the University of Delaware Soil Testing Laboratory, Newark, DE. Significantly reduced dry mass and insignificant differences in zinc content were a product of higher zinc concentrations in the tissues of plants grown with crumb rubber. The results were highly variable imposing restrictions for inference on *Sedum* spp. response to crumb rubber zinc. These results suggest the use of crumb rubber should be limited to small proportions in substrates having high zinc adsorption capability, planted with zinc tolerant species. However, more rigorous testing is needed to determine zinc tolerance levels of *Sedum* spp.

Effect of Iron Source on Plant Quality of Geranium (*Pelargonium* x*hortorum*)

Sara Anthony, Stephanie Petrucci, Karen Kackley, and William Brown, Department of Biology, Kutztown University of Pennsylvania, Kutztown, PA 19530*

This study was conducted to determine the effect of four iron sources on overall plant quality of geranium (*Pelargonium* x*hortorum*) cultivars grown at low pH levels. The iron sources included three chelates (iron—EDTA, EDDHA, and DTPA) and iron sulfate as a non-chelate control. The geranium cultivars included 'Blue Wonder', 'Stardom Bright Pink', and 'Stardom Deep Lavender'. A 17–4–17 custom fertilizer with a complete complement of micronutrients, except iron, was prepared and divided into four 500-g batches. One of the three chelate treatments was added to each of three batches and iron sulfate was added to the fourth to act as the non-chelate control. Plants were arranged in four replicate randomized complete blocks and received a 250-ppm nitrogen continuous liquid feed with one of the four fertilizers for the first 4 weeks. Fertilizer concentrations were increased to 350 ppm nitrogen for the remaining 9 weeks. At the completion of the experiment, each of the geraniums was assigned a rating from 0 to 5 to indicate overall quality. Plants that were treated with the fertilizer containing iron sulfate, the non-chelate control, exhibited much higher quality ratings than those plants treated with fertilizer containing iron EDTA, DTPA, or EDDHA. The plants treated with iron EDDHA and DTPA had higher quality ratings than those treated with iron EDTA. Our findings indicate that iron chelate fertilizers may not be the most optimal for growing geraniums. We suspect that sulfur may play a key role in maintaining geranium plant quality and intend to explore the effect of sulfur in subsequent research.

Effect of Iron Source on Plant and Floral Biomass of Geranium (*Pelargonium* x*hortorum*)

Stephanie Petrucci, Sara Anthony, Karen Kackley, and William Brown, Department of Biology, Kutztown University of Pennsylvania, Kutztown, PA 19530*

This study was conducted to examine the effect of three iron chelates (iron EDTA, iron EDDHA, and iron DTPA) and iron sulfate, on the development of micronutrient toxicity in geranium (*Pelargonium* x*hortorum*) cultivars grown in low pH media. Geranium cultivars included 'Blue Wonder', 'Stardom Bright Pink', and 'Stardom Deep Lavender'. A 17–4–17 custom fertilizer with a complete complement of micronutrients except for iron was made and split into four equal aliquots. One of three iron chelate sources was added to each of three aliquots and iron sulfate was added to the fourth to act as the control. Plants were arranged in four replicate randomized complete blocks and received continuous liquid feed (CLF) with a 250-ppm nitrogen complete fertilizer solution containing one of the four iron sources for the first 4 weeks. Fertilizer concentrations were increased to 350 ppm nitrogen for the remaining 9 weeks. The plant and floral biomass