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31. Seed propagation of chokecherry. Rowley, L. and Black, B. L. HortScience 42(4):943-944. 2007.

kets has proven to be an emerging industry with high value crops. In addition, aquatic plants can be an important means of nutrient uptake. Therefore, the concept of integrating aquatic plants for aquaculture effluent management has potential to increase farm income through diversification and help aquaculture producers manage fish effluent. Research was conducted during the active growing season in 2006 (April–September) for all three production systems. Each University had one of the three aquaculture systems; trout flow-through raceway (West Virginia), striped bass recirculating tank (Maryland), and a baitfish pond (Delaware). Data collected included: total plant biomass production and total nitrogen and phosphorus percentages. Results indicated that nutrient uptake from the raceway and pond was negligible. However, plant growth was significant in the recirculating and pond systems. These results indicate that ornamental crop production may be viable for added income and limited effluent nutrient uptake.

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(378) Effect of Plant-Growth Retardants on Growth and Reproductive Yield of *Zea mays*

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Controlled-environment crop-production systems are an aspect of horticulture that have great promise for the future. One developing use is to produce pharmaceuticals within transgenic plants grown in chambers in isolated locations. However, previous experiments have revealed two key issues with *Zea mays* growing in controlled environments. The first issue is the excessive height that develops from the favorable controlled environment, and the second is a leaf-development abnormality termed "rat-tailing" that inhibits tasseling and pollen shed. Plant-growth retardants (PGR's) are known to control height of many ornamental species, but many also have potential to induce abnormal leaf expansion, possibly leading to "rat-tailed" leaves in maize. Five PGR's tested on corn included Cycocel, A-rest, B-Nine, Bonzi, and Sumagic. Foliar spray and soil-drench treatments were compared for Pioneer Bt hybrid 34M95 to evaluate the most effective PGR, concentration, and application method. Each PGR was tested with an initial concentration based on the mean value recommended for floriculture and nursery crops. Drench applications were applied at a rate of one-third the spray concentration. Selection of the best PGR was determined by effectiveness for height control, damage to plants such as rat-tailing, influence on reproductive timing, and final seed yield. In the second phase of the study, growth was followed through physiological maturity, when the grain is dry and dented, and yield was measured. The optimal PGR concentration was determined by reduction of plant height and total seed yield. These two parameters were considered equal factors for overall evaluation of each PGR.

(379) Gas Exchange and Photosystem II Responses of Two Spinach Cultivars with Contrasting Morphology to Moderate Salt Stress

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Salinity is an increasingly important abiotic stress limiting crop productivity in diverse agroecosystems worldwide. An experiment was conducted to investigate gas exchange and photosystem II responses of two spinach cultivars with contrasting morphology to mild (4 dS m-1) and moderate (8 dS m-1) salt stress, in growth chamber. Bloomsdale, the cultivar with broader leaves and longer petioles produced greater biomass, fresh weight and leaf area, but lower leaf specific mass than Hybrid Tyee. Fresh weight and leaf area decreased, and leaf specific mass increased, but biomass remained the same under salt stress in both cultivars. Net photosynthesis was the same in both cultivars at all salt levels. However, stomatal conductance and transpiration dropped under salt stress up to 40% and 32% in Bloomsdale, and 23% and 20% in Tyee, respectively. Water use efficiency increased, under stress, up to 55% in Bloomsdale and 28% in Tyee. Photosystem II efficiency, Fv/Fm, remained unaffected in Bloomsdale, but increased up to 2% in Tyee under stress. Electron transport rate between photosystem II and I increased up to 7% in Bloomsdale and 2% in Tyee, and rubisco carboxylation rate increased up to 31% in Bloomsdale but remained unchanged in Tyee under salt stress. In both cultivars, stomatal conductance is a more sensitive indicator of salt stress than net photosynthesis. Furthermore, nonstomatal (up)regulation of assimilation appears to be crucial in salt stress tolerance in spinach.

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(380) Influence of Plant Growth Regulators on Tart Cherry Fruit Quality

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Foliar applications of the plant growth regulator ethephon [(2-chloroethyl) phosphonic acid] are widely used on tart cherries (*Prunus cerasus* L.) to promote fruit abscission as an aid in mechanical harvesting. In regions where temperatures routinely exceed 90 °C during late fruit ripening, growers may use reduced rate applications to avoid excessive fruit softening. We tested the effects of ethephon alone and in combination with other plant growth regulators (PGRs) to determine effects on fruit loosening and subsequent fruit quality. Ethephon was applied at 21 d before harvest (DBH) or 7 DBH at either the full label rate of 1 pint per acre (120 ppm, dilute spray) or one half the label rate (60 ppm). PGR combination treatments included full rate of ethephon 21 DBH followed by ReTain® (50 ppm, Avglycine HCl, AVG), or ProGibb® (120 ppm, Gibberellin A3, GA) applied 21 DBH followed by a full rate ethephon application at 7 DBH. Each treatment was applied to four replicate trees in a randomized complete block design. Treatments were compared for fruit removal force (FRF), soluble solid content and softening. There were no statistically significant differences among ethephon treatments. The GA treatment significantly delayed fruit abscission and softening, and visibly delayed color development. AVG applied after ethephon did not improve fruit firmness, and appeared to accelerate ripening.

Specified source(s) of funding for the work presented in this abstract: Department, College, State and/or HATCH

(381) Seed Propagation of Chokecherry

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Chokecherries (*Prunus virginiana* L.) are native to North America and widely distributed. Plants are propagated and grown for revegetation projects. The fruit is desirable for home processing and is commonly collected from wild populations, but the fruit is not commercially produced. Little is known about optimum conditions for seed propagation. Seeds collected from a wild stand in southeastern Idaho were cleaned and then subjected to one of 12 treatments. Each treatment consisted of four replicate plates of 50 seeds. Treatments included chilling at 3oC for a single chilling period of 0, 4, 8, 12, 16, 20, or 24 weeks. Additional treatments included exposure to the growth regulator GA3 followed by 12 weeks of chilling, or two chilling cycles interrupted by 4 weeks at room temperature. None of the seeds chilled for 4 weeks or less germinated after 12 weeks at room temperature. Those seeds chilled for 8 weeks showed germination of 4.5%, compared to 41.0% germination for seeds

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chilled for 12 weeks. GA_3 at 0.3 mM increased germination to 45.5%, with seedlings showing increased internode elongation. Treatment with 0.03 mM GA_3 had no significant effect on germination or internode length.

Specified source(s) of funding for the work presented in this abstract: Department, College, State and/or HATCH

(383) Postharvest Changes in Antioxidant Concentrations in Tomato Fruit Grown Hydroponically at Different Electrical Conductivities

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Phytochemical reactions in response to environmental conditions of harvested fruits or vegetables during the period between harvesting and consumption may change the level of biological and medicinal activities of particular compounds. Therefore, quantification of such reactions is a critical point in designing nutritional value studies and in assessing techniques used to enhance nutritional values of fruits and vegetables. Our previous research has shown that moderate salt stress (4.5 dS/m versus 2.6 dS/m electrical conductivity, EC) enhanced both lycopene and total soluble solid concentrations (TSS) of tomatoes. The purpose of this research was to study the effect of storage temperature and duration on the nutrient content of tomatoes grown under two EC levels. Ninety tomatoes from each EC treatment were harvested at red ripeness stage and randomly divided into groups to be stored for 0, 3, 7, or 10 days at 4, 12, or 20 °C in dark storage chambers. Lycopene and TSS concentrations were measured in triplicate for fresh tomato samples. The remaining samples were freeze-dried and used for vitamin C and phenolics extractions. TSS increased slightly over time under high EC treatment, and the difference in TSS was maintained regardless of the storage conditions. Vitamin C showed sensitivity to storage temperature, but the difference was maintained between EC levels. Total phenolics were unaffected by the storage conditions. Lycopene increased with increasing temperature; however, high EC maintained a higher concentration of lycopene at the same temperature. Thus, successfully utilizing salt stress as a technique to enhance nutritional value of tomato requires careful attention to postharvest storage conditions.

(384) Evaluation of Spent Mushroom Substrate as a Soil Additive for the Improvement of Tomato Yield

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The mushroom industry produces a large quantity of spent mushroom substrate (SBS) annually. Most of this material is considered a by-product that the companies must dispose of on a regular interval. This material however may be of great value to crop production by improving soil structure and nutrient availability. To test this hypothesis we have initiated a multi-year trial to evaluate the affect of differing levels of SBS on plant growth and development. We evaluated 4 different treatments of SBS using two varieties of tomato's. Each treatment was calculated based on nitrogen requirement of tomato. Yield and visual rating will be presented.

Specified source(s) of funding for the work presented in this abstract: Department, College, State and/or HATCH

(385) Effect of Light Intensity on the Translocation of Two Systemic Insecticides in Poinsettia (*Euphorbia pulcherrima*) and Their Subsequent Efficacy for Sweet Potato Whitefly (*Bemisia argentifolii*) Control

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Whiteflies are a major insect pest of greenhouse crops, including poinsettia (*Euphorbia pulcherrima*). Systemic insecticides are typically used to control this phytophagous pest. However, minimal information is available on the impact of light intensity as it relates to the movement of systemic insecticides through plants, which may influence their efficacy against whiteflies. This study, which was conducted from Sept. to Oct. in Manhattan, Kans., consisted of inoculating poinsettia plants with a population of sweet potato whitefly B-biotype (*Bemisia argentifolii*) and then applying, as a drench, two neonicotinoid-based insecticides with distinctly different water solubilities: imidacloprid (Marathon; water solubility of 0.5 $g \cdot L^{-1}$) and dinotefuran (Safari; water solubility of 39.8 $g \cdot L^{-1}$). The test plants were then grown under either ambient (165 $\mu mol \cdot m^{-2} \cdot s^{-1}$) or low (72 $\mu mol \cdot m^{-2} \cdot s^{-1}$) light intensities. At one week intervals for three weeks, the numbers of live and dead whitefly nymphs were counted on each plant to assess how rapidly the two systemic insecticides killed nymphs. The two light intensities had no effect on the results. However, dinotefuran killed a significantly higher percentage of whitefly nymphs over the three-week period (79, 92, and 89%) than imidacloprid (7, 26, and 36%).

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Poster Session 12: Human Issues in Horticulture

Tuesday, July 17 **12:00–12:45 pm**

(068) A Community Healing Garden— A Multi-generational, Multi-discipline Approach

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Silver Sky is the first non profit assisted living housing development for low income senior citizens in Nevada. Since its inception, a community healing garden has been integral to its mission. This garden was planned to be not only a space where a select number of residents could grow produce, but also where other residents, as well as staff and visitors would find respite. To make this garden as successful as possible, both creativity and consumer input in design were critical. Students from UNLV's American Society for Landscape Architecture volunteered to participate in a charrette where they would produce plans for the garden. Ten students met with Silver Sky residents to ascertain which elements were the most pressing. After meeting, the students gathered into small groups. Each produced a set of drawings. These drawings were then examined by UNCE and UNLV faculty, as well as Silver Sky staff, to determine which elements could be incorporated into a final design. The final design became the template for the community healing garden.

Specified source(s) of funding for the work presented in this abstract: Department, College, State and/or HATCH