



Subirrigation in the Greenhouse Industry

Subirrigation promotes high-quality plant production with minimal environmental impact since it reuses the nutrient solution. Most subirrigation systems apply the water to waterproof ebb-and-flow benches or specially designed greenhouse floors, allowing the substrate to absorb the water through capillary action. Fertilization rates can be lower for subirrigated plants than for overhead- or drip-irrigated plants, resulting in fertilizer savings. Subirrigation systems facilitate automation and can reduce labor costs. High initial capital costs and the potential spread of pathogens are known disadvantages. **Ferrarezi et al.** (p. 262) review the history, advantages, challenges, and future prospects of subirrigation in the greenhouse industry.

Impact of Organic Fertilizer Source on Blackberry Varieties

Four blackberry varieties grown for fresh market at a certified organic grower collaborator site in Oregon were evaluated for their response to fertilization with either a liquid fish and molasses blend, pelletized soy meal, or processed poultry litter over 2 years. **Fernandez-Salvador et al.** (p. 277) observed that while varieties differed in yield, fruiting season, and fruit quality, there were relatively few effects of fertilizer source. However, the cost of nitrogen ranged widely from \$2.54–\$8.16 per pound, depending on fertilizer source.

Abscisic Acid Increases Grapevine Bud Freezing Tolerance

Cold injury is a major production constraint for wine grapes. New cultural practices that increase freezing tolerance are needed to mitigate economic loss from cold weather events. In a multi-location field study by **Dami et al.** (p. 293), a spray application of abscisic acid to the vine canopy during berry ripening was found to increase bud-freezing tolerance during autumn cold acclimation. Foliar application of abscisic acid could be used as an adaptive cultural practice to reduce the risk of bud cold injury during cold weather events in early autumn.

Dikegulac Sodium versus Pruning of Bigleaf Hydrangea

Sun et al. (p. 306) evaluated efficiency of dikegulac sodium foliar application on lateral branching of ‘Merritt’s Supreme’ bigleaf hydrangea at two locations, Texas and Mississippi. They found that dikegulac sodium at all application rates caused phytotoxicity initially. However, phytotoxicity symptoms became less obvious over time and disappeared completely 6 weeks after application. The efficacy of dikegulac sodium varied with location. In Mississippi,

dikegulac sodium at 1600 mg·L⁻¹ increased the number of branches and flowers greatly. In Texas, the magnitude of increasing in the number of branches and flowers was much smaller.

Field-tested Portable Frost Protection System

The damaging effects of frost can be felt in small spaces, such as residential gardens, or in hard to reach areas of commercial operations. **McCartney and Lefsrud** (p. 313) developed an automated frost-protection system that was tested on tomato and sweet orange at McGill University. The portable 20-gallon pressurized system uses detachable air tanks and misting lines. When the system was active, the flesh of the targeted tomatoes remained on average 3.4 °C warmer than ambient sub-zero temperatures. The system was also shown to be effective in protecting sweet orange fruit from the onset of frost.

Irrigating Mixed Turf and Shrub Landscapes in Humid Environments

Use of reference evapotranspiration (ET_o) data in landscape water conservation needs further development. **Pannkuk** (p. 322) used local ET_o data and actual plant water use to calculate plant factors (PFs) for three model landscapes comprised of mixtures of turfgrass and shrubs. Turfgrass/shrub vegetative cover ratios were 80:20, 50:50, and 20:80. After 2 years, the PF of 20:80 and 50:50 turfgrass/shrub combinations were greater than the PF of the 80:20 combination. PFs for the 80:20, 50:50, and 20:80 turfgrass/shrub combinations were 0.68, 0.97, and 1.01, respectively. There were no seasonal differences in PFs.

Optimum Plant Spacing for Eastern U.S. Broccoli Production

Eastern U.S. growers must maximize broccoli yields to make regional production of this vegetable profitable and competitive. **Ward et al.** (p. 330) tested contemporary hybrids ‘Emerald Crown’ and ‘Durapak 19’ in three environments, evaluating the effects of 4, 6, and 8-inch within-row spacing (using a conventional double-row system) on yield components and head quality. Marketable yields were highest (up to almost 20,000 kg·ha⁻¹) with 4-inch spacing, but head quality attributes in this most-dense spacing treatment were sometimes lower. Marketable yield (e.g., up to 18,000 kg·ha⁻¹) and head quality can be optimized using 6-inch within-row spacing.

Straw Mulch and Atrazine for Weed Control in Potato

Field experiments were conducted for 3 years to evaluate weed control in potato using atrazine or straw mulch applied alone or in combination. **Bhullar et al.** (p. 335) concluded that atrazine applied alone was ineffective (0% to 78% control). Straw mulch applied alone at any rate provided ≥ 90% control of toothed dock, but control of other weed species was variable. A combination of atrazine and straw mulch at any rate usually resulted in >90% weed control. Potato tuber weight and yield was higher in all treatments compared with untreated control without difference among them.

Internal Necrosis in ‘Covington’ Sweetpotato

North Carolina produces nearly 50% of the U.S. sweetpotato crop. ‘Covington’ comprises the majority of the state’s acreage, but is susceptible to the storage root disorder, internal necrosis,

which has resulted in significant monetary loss. Based on a 2-year commercial survey, **Jiang et al. (p. 340)** documented the incidence and severity of internal necrosis. They also identified that pre-harvest ethephon treatment can induce the symptoms, which can be first seen 6 days after harvest while sweetpotato roots are being cured. Post-curing storage conditions had little impact on the occurrence and progress of this disorder.

1-MCP Not Recommended for Mangoes With Hot Water Treatment

Osuna-García et al. (p. 349) evaluated the efficacy of aqueous 1-methylcyclopropene (1-MCP) in delaying ripening and for quality maintenance of ‘Kent’ mango fruit with or without quarantine hot water treatment (QHWT). Aqueous 1-MCP retarded fruit ripening as shown by maintenance of firmness, attenuation of flesh color development, and delayed increase of total soluble solids. However, it had a negative interaction with QHWT, causing surface spots and lenticel blackening during shipping and market simulation. By contrast, ripening of fruit treated with 1-MCP without QHWT was delayed without affecting external appearance. Therefore, 1-MCP may be more useful for markets without mandatory QHWT.

Stimulating Branching of Red Firespike

Red firespike has potential to become a popular flowering potted plant. **Rezazadeh et al. (p. 358)** evaluated the effects of foliar spray applications of dikegulac sodium and benzyladenine or hand pinching on branching and quality of red firespike. Branching was greatest using benzyladenine at 600 to 1750 ppm or dikegulac sodium at 1600 to 2400 ppm. Pinching did not increase the number of branches. Phytotoxicity when using high concentrations of dikegulac sodium reduced marketability. Benzyladenine at 600 ppm was most effective at producing a uniform and marketable plant.

Growth Regulators Defoliate Raisin Grapevines and Enhance Drying

Dry-on-vine raisins, made by severing grapevine canes bearing ripe fruit, dry relatively slowly, partly because desiccated leaves remain attached to the shoots of severed canes, shading the fruit. **Da Costa et al. (p. 363)** found that treating the fruiting canes of vines with a solution containing 2000 ppm ethephon and 1000 ppm 1-aminocyclopropane carboxylic acid 2 weeks before cane severance caused the leaves to senesce and abscise, increasing the sun exposure of the clusters. Increased exposure may improve raisin drying, especially in years when drying conditions are suboptimal.

Managing Nursery Crops With Species-Specific Fertilizer Rates

Applying controlled-release fertilizer (CRF) is a common practice in containerized nursery crop production. In a temperate climate, **Clark and Zheng (p. 370)** found species-specific CRF rates and ranges of rates (kg·m⁻³ nitrogen) were optimal from 1.05 to 1.35 for rose of Sharon, 0.75 to 1.05 for ‘Magic Carpet’ spirea, 0.75 to 1.35 for bigleaf hydrangea and ‘Green Velvet’ boxwood, and at 0.75 for ‘Palace Purple’ coral bells. Optimal CRF applications may save production time, reduce fertilizer costs, prevent nutrient disorders, and reduce negative environmental impacts of nutrient leaching.

Importance of Hand Hygiene When Harvesting Strawberries

Shaw et al. (p. 380) found that human hands could be a vector to transfer bacteria to strawberries during harvesting. In this study,

E. coli O157:H7 was shown to transfer from contaminated hands to up to 100 strawberries, with a transfer rate of 71% (1 berry) to 45% (100 berries) of *E. coli*. Additionally, in a simulation study, contaminated hands with “bacteria” was shown to be transfer to the worker’s clothing, shoes, picked strawberries, strawberry plants, weeds, and straw mulch within the field (average spread of 50.25 ft from starting point).

Managing Bitter Pit in ‘Honeycrisp’ Apples With Foliar Calcium

Although ‘Honeycrisp’ apples are very popular with consumers, they are prone bitter pit, a physiological disorder that results in unmarketable fruit and which has long been associated with low fruit calcium. **Biggs and Peck (p. 385)** conducted three separate experiments in the mid-Atlantic U.S. to test standard calcium chloride salt rates and several new formulations of calcium for amelioration of bitter pit. While some newer liquid calcium formulations showed promise, full season calcium chloride treatments and higher rates (up to 23.5 lb/acre per season of elemental calcium) were needed to significantly reduce bitter pit incidence in ‘Honeycrisp’.

Control of Bermudagrass Stolon Elongation

Some hormonal compounds, herbicides, and fungicides have the potential to suppress vertical growth of turfgrass species, but little is known about their effect on horizontal stems and what application rate is effective for inducing stolon growth suppression. **Volterrani et al. (p. 397)** assessed the effects of trinexapac-ethyl, chlormequat chloride, propiconazole, diquat, flazasulfuron, glyphosate, ethephon, and gibberellic acid under a wide range of application rates on ‘Patriot’ hybrid bermudagrass. They found that the application of 2.0 kg·ha⁻¹ trinexapac-ethyl or 1.0 kg·ha⁻¹ paclobutrazol effectively reduced stolon and internode length without causing a reduction in stolon number or turf quality.

Potential Impact of Laurel Wilt on Avocado Prices

Due to a deadly fungus in the Florida avocado production area, production of Florida green-skin avocados could be reduced considerably if a cost-effective treatment is not discovered shortly. **Evans and Ballen (p. 405)** developed an econometric model that assesses the impact on grower’s prices resulting from various percentage reductions in production. They found that because of increased imports of green-skin avocados from the Dominican Republic, prices are not likely to rise substantially in response to any decline in domestic production. A 30% reduction in local production is likely to cause prices to rise by only 16.5%.

Sweetpotato Varieties for the Northeastern U.S.

Sideman (p. 412) evaluated eight sweetpotato varieties in New Hampshire. Several varieties produced yields similar to or greater than national averages, with B94-14 Beauregard and Covington showing consistently high yields. Other varieties, such as Vardaman and Georgia Jet, performed poorly or inconsistently, with low marketable yields. In addition to good agronomic performance, favorable storage characteristics and nutritional value of sweetpotato make this an attractive alternative crop for growers in northern climates.