Spotlight

Limitations to Organic Apple Production in Kentucky

The growth and yield of three apple-scab-resistant varieties in a certified organic, high-density orchard in Lexington, KY, was studied for 6 years **Williams et al. (p. 154)**. While tree growth was adequate, fruit damage in years 3-6 from plum curculio and codling moth were appreciable, ranging from 10% to 31% and 4% to 37% across years and varieties, respectively. The two varieties harvested at later dates also showed greater problems with powdery mildew and sooty blotch/flyspeck diseases. Final total yields were lower than desired, and insect and disease problems reduced the marketable proportion of the total yield from 29% to 73%.

Polyolefin Mulch Systems in Central Ontario

Snyder et al. (p. 162) observed that polyolefin-based mulch films insulated soil from both low and high ambient temperatures in central Ontario. Mulch films also stabilized soil moisture content, protecting soil from both overwatering by rain and from drought. As the region has a short growing season, increased average soil temperatures at the beginning and at the end of the season achieved by using mulch films may offer more crop variety to farmers in this area.

Native Shrub Tolerance to Parking Lot Conditions and Deer

Shrestha and Lubell (p. 171) evaluated eight native shrubs for adaptability to parking lots and response to white-tailed deer browsing. Sweetbells exhibited excellent performance, equivalent to invasive control plants, and was deer resistant; virginia rose and creeping sand cherry also were excellent. Plants experienced some deer browse, but regrew quickly. Some individuals of elderberry, spicebush, and round leaf dogwood performed well following deer exclusion, and may be appropriate choices for challenging sites without deer. Highbush blueberry is frequently recommended as a native alternative for winged euonymus, but performed poorly.

Nonchemical Weed Control in Spinach

Fontanelli et al. (p. 177) tested a physical weed control strategy in spinach as an alternative to the use of herbicides. A stale seedbed technique and postemergence treatments using various mechanical and thermal machines were examined. The chemical weed control strategy used was a single postemergence application of phenmedipham. Compared to the chemical system, the physical system required substantially larger labor inputs; however, neither system required hand weeding. The physical system reduced weed dry biomass at harvest by 50% and increased spinach fresh yield by 35%.

Mustard Seed Meal for Root-knot Nematode Control in Tomato

Mustard seed meals, which are byproducts of biodiesel fuel production, can be amended into soil as fertilizers and for management of soilborne pathogens, plant-parasitic nematodes, and weeds. **Meyer et al. (p. 192)** compared seed meals of indian mustard and yellow mustard, alone and mixed, for effects on tomato growth and suppression of root-knot nematode and weed populations. In the greenhouse, nematode densities were consistently lowered with mixed seed meal. Field application of seed meals supplemented with fertilizer, compared with fertilizer alone, did not affect weed populations. Tomato yields and nematode population numbers were generally similar among treatments.

Strawberry Transplant Quality Increases Early Fruit Yield

In short-day strawberry production, high quality transplants are essential for early fruit yield. Transplants of 'Florida Radiance', 'Strawberry Festival', and WinterStar™ were sorted into two initial crown-diameter size ranges and evaluated over two growing seasons. **Torres-Quezada et al. (p. 203)** found that larger crowns led to an increase of 42% in early yield and 18% in total yield. Taking into account historical weekly price data for Florida fresh fruit over the last 10 seasons, shifting to crowns with wider diameter could represent an increase in gross revenue of up to $21,813/ha for a 20-week harvest period.

Propagation of 1-Year-Old Hardwood Pecan Cuttings

Zhang et al. (p. 209) examined vegetative propagation of 1-year-old pecan by rooting hardwood cuttings. They report that cuttings planted in substrate with bottom heat and treated with 0.09% napthaleneacetic acid was the most effective treatment, with 82% rooting, 8.3 roots/cutting, and root lengths of 7.3 cm. They found that auxin and substrate/air temperature are both essential for adventitious roots formation.

Glyphosate-tolerant Perennial Ryegrass Management Strategies

With the emergence of glyphosate-tolerant perennial ryegrass varieties, growth regulation and herbicide options should be revisited to identify new management strategies. **Baldwin et al. (p. 214)** report that tank mixing glyphosate with another herbicide, a plant growth regulator, and various nitrogen sources was safe to 'Replay', a glyphosate-tolerant variety. In some cases, the addition of nitrogen and a plant growth regulator improved the color response and increased annual bluegrass control relative to glyphosate alone. Identifying these management strategies will improve perennial ryegrass safety following a glyphosate application, and will minimize the possibility of developing glyphosate-resistant annual bluegrass biotypes.

Seed Germination Reduced by Commercial Green Roof Substrates

Green roofs are an effective way of providing aesthetic and environmental benefits within a city. **Harp et al. (p. 221)** describe the physical characteristics of common green roof substrates, including weight, particle size, and porosity. Unfortunately, these traits appear to be detrimental to seed germination. Germination in green roof substrates was 25% to 30% lower than in a peat-lite substrate, with tested perennials germinating below 40% in the green roof substrates. Strong relationships also were found between seed size and germination. Based on this study, seed germination was impaired sufficiently in green roof mixes to warrant other plant establishment methods.

Early-spring Bulbs in Warm-season Lawns

Five early-season bulbs were established in a zoysiagrass lawn and evaluated over four seasons for flowering performance and persistence. **Richardson et al. (p. 228)** found that all bulbs flowered the first year after planting, but 'Ruby Giant' crocus was the only bulb that persisted and continued to flower over 4 years. The authors also found that common preemergence herbicides that are used on lawns during the spring flowering period had no negative effects on the bulbs tested. Because mowing of warm-season grasses would not be initiated for several weeks after flowering, mowing did not cause a decline in the bulbs.

6-Benzyadenine Enhances the Response of Apple to Notching

Making a horizontal cut in the bark immediately above a dormant apple bud (notching) can stimulate new shoot growth. However, responses to notching often are inconsistent. **McArtney and Obermiller (p. 233)** found that spraying a solution of 750 or 1500 ppm 6-benzyladenine (6-BA) into the notch greatly increased the percentage of buds that developed into extension shoots compared to notching alone. The optimum time to apply notching plus 6-BA was during the 2-week period beginning at bud break. The combination of notching plus 6-BA may be a useful technique to generate new fruiting scaffolds in apple trees.

Virtual Three-dimensional Apple Tree Crown Formation

In order to ensure regular fruiting and a good-quality crop, it is important to keep the tree in good shape and health. However, much time is required to learn proper tree care techniques, and trees can be inadvertently damaged in the process. **Kohek et al. (p. 238)** developed an interactive teaching tool for virtual apple tree crown formation. Tree training techniques can be applied on three-dimensional apple tree models. The tool then simulates apple tree growth for the next year in response to the performed techniques.

Real-world Group Work Improves Student Learning Experience

A hands-on hoop house construction project was successfully integrated into an undergraduate, general education, plant science course at New Mexico State University. **Uchanski et al. (p. 247)** assessed the impacts of class materials, laboratory materials, and the teaching assistants on the students' learning experience and perceptions of group work. More than 85% of the students indicated that they gained an appreciation for scientific data interpretation through this exercise, with 65% noting improved appreciation of group activities. Experiential learning group work during scheduled class time was a useful tool for engaging student learning and team building.

Virtual Maps as Study Tools for Plant Identification Courses

Virtual plant walk maps provide students opportunities to review and revisit plants presented in lecture and laboratory sessions on their own and at their convenience using a computer or mobile device. The virtual maps plot or "pin" the locations of plants covered for weekly plant lists and contain supplemental specimen photographs, correct nomenclature, and additional identification and cultural information. Instructors can create the maps without rigorous software programming and webpage design knowledge. **Wilson and Miller (p. 253)** detail the creation of virtual plant maps using a free web-application via any Internet browser.