

"On the Road with the Experiment Station Associates: Inside Connecticut's Green Industry"

by David Yih, Ph.D.

Inside the plant propagation house, thousands of new cuttings sit in their peat pots on a sturdy wire mesh with heating tubes running underneath. Fans take in air at the middle of the house and expel it at both ends, while overhead, at regular intervals, hang the misters that periodically emit a fine spray. Hearing a sudden commotion, the people in my aisle looked on in amusement as our fellows, two aisles away, got an unexpected misting. Seconds later, it was our turn. With the camaraderie of strangers who find themselves in the same predicament, I shared a chuckle with the woman standing next to me. "It's good for your skin," we both said simultaneously, and we laughed again at the coincidence.

Our group of about fifty climbed back into the bus to continue our day-long, behind-the-scenes tour of three remarkable wholesale nurseries. The trip was organized by the Experiment Station Associates (ESA), a group dedicated to supporting the work of the Connecticut Agricultural Experiment Station (CAES). The Associates showed their mettle earlier this year, when they were called upon to respond to proposed state budget cuts that would have severely curtailed the research efforts CAES has pursued since its creation in 1875, as the first such institution in the nation. By educating legislators about how CAES activities benefit state residents, they were able to make a difference that spared CAES from the funding cuts. Associates also undertake a variety of projects, such as documenting and disseminating information about the history and achievements of CAES.

So, what do CAES scientists do? Here's a sampling from the tip of the iceberg. They track and study the life cycles of the microorganisms and vectors that cause and transmit Lyme disease, West Nile virus, and eastern equine encephalitis, to increase our understanding of how these diseases are spread and how they might

best be controlled. CAES scientists were the first in North America to grow a culture of West Nile virus and have also developed a test for the presence of antibodies to the virus in horses, an important step toward vaccine development. CAES is active in investigating abiotic health threats, as well. In the 1990s, Station scientists discovered the cause of lead contamination in maple syrup and developed measures to correct the problem. In 2002, they showed that arsenic leaches into the soil from CCA pressure-treated wood, research that was instrumental in its withdrawal from the consumer market. A particularly fascinating area of research Station scientists are involved with is phytoremediation: the use of living plants to remove toxic contaminants from soil.

Every year, Station scientists test different varieties of fruits and vegetables in research plots at Lockwood Farm, in Hamden, to learn which ones do well in Connecticut. A few of the new crops CAES scientists are developing and testing are the native beach plum, a calabaza squash cultivar, and calaloo, a leafy green important in Africa and Asia. They study the causes of honeybee decline and why special habitats like our salt marshes are failing, and they closely monitor the movements of invasive species. And they provide a service fundamental to the success of any new garden or lawn - soil testing.

At their annual meeting, Experiment Station Associates have the opportunity to hear directly from Station scientists about their latest discoveries. New members with an interest in the Station's work -- whether it be horticulture, agriculture, entomology or home gardening are always welcome to join in the fun, volunteering, and learning. Once a year, members are invited on a field trip like our tour of wholesale nurseries, a special treat, because the general public would normally not have access to the inner workings of these large-scale operations.

The day began at Lockwood Farm, where we boarded a comfortable coach bus at 9:00 a.m. and settled in for the drive up to our first stop: Imperial Nurseries, in Granby. It was a perfect, sunny October morning, the sky decorated with a few

serene puffs of cloud. As we pulled onto interstate 91 the bus was a-buzz with happy chatter. Snatches of conversation from the seat behind me offered a glimpse into the preoccupations of my fellow tourists: "sandy loam . . . I don't water at all -- I don't believe in it . . . I grow heirloom tomatoes . . . yellow Italian polebeans." As we neared Granby, a plane coming in for a landing at Bradley Airport droned overhead, flying low.

Upon our arrival at Imperial Nurseries, Greg Schaan, the company's president, boarded the bus as our host and tour guide. By industry standards, Imperial is a medium-large grower. It covers 350 acres and includes 92 miles of hoop houses -- the plastic-covered growing houses that shelter the plants in winter and stretch across the farm in long parallel rows. The operation has customers in 21 U.S. states and parts of Canada. During peak season, it employs 300 workers and ships out 26,000 plants every day, for a total of over one million per year. Together with other horticultural enterprises, it makes up the state's "green industry," the biggest sector of the farming business in Connecticut. With sales of over \$1 billion a year, Connecticut's green industry is the 10th largest in the country.

At the heart of Imperial's business is a large-scale, on-site plant propagation operation. At any given time, more than one million plants are in propagation there. To ensure consistency of product, all propagation is done from cuttings rather than from seeds, which could yield variable results. Rhododendrons are a specialty of the house. Dan Demers, Imperial's propagator, walked us through the process. "First of all," he explained, "all aspects of the climate in the prop houses are computer controlled. That includes wind speed, light, humidity, and soil and air temperatures. If need be, the computer can even call me up at home, in the middle of the night, to alert me to a problem."

While Dan spoke, we watched a worker sitting in front of a pile of four-inch rhododendron cuttings. Grasping a batch in her left hand, she snipped excess leaves

off each cutting, shaved off a bit of bark at the cut ends, and dipped the stems into a chalky white rooting hormone.

"Each cutting will be inserted into its own Jiffy peat pellet," explained Dan. The "pellets" are dried, compressed discs that expand into small pots when moistened, forming the ideal medium for rooting cuttings.

"Have you looked into alternatives to peat?" asked a conscientious ESA member, mindful of the time needed to produce a resource that's being used up faster than it can regenerate.

"We're always looking for substitutes," said Greg. "Most of our peat comes from Canada. We have a test farm that is working with coconut husk material. The problem is finding something that is commercially feasible. Currently we recycle all our plastic pots, but we're also very interested in bio-degradable options."

After our damp adventure with the prop house misters, we reboarded the bus. An old-timer with untidy shocks of white hair protruding from the back of his baseball cap sat down beside me. "All this used to be tobacco farms," he remarked. As if on cue, Greg confirmed that the nursery began in 1955 when a tobacco farmer decided to experiment with converting two acres of his tobacco fields to horticultural plantings. (Tobacco still thrives in the fertile lands along the Connecticut River valley, where farmers grow the wrappers for some of the world's finest cigars.) I gazed out the window while the bus rolled gently through the acres of hoop houses, past row after row of rhododendrons, hydrangeas, Knock Out® roses, Japanese and paperbark maples, sand cherry, boxwood, hollies, and butterfly bushes. "We're one of 21 growers licensed to grow the 'Proven Winners' brand," Greg pointed out proudly, as we passed a batch of the familiar branded pots. Curious ESA members peppered Greg with questions, and at one point I chimed in with my question: "What sorts of problems do you call upon the Experiment Station for help with?" He explained that CAES staff identify plant pests and diseases and

advise nurseries of new developments in the industry. An essential service the CAES provides Imperial is the certification of plants as clean and disease-free. Without this certification, nurseries may not ship plants out of state.

After a stroll through the demo garden, which included such oddities as a living rectangle of greenery you can hang on your front door, we picked up our catered lunches and sat down to eat at picnic tables lined up in rows that echoed the motif of the long rows of hoop houses. I sat across from the old-timer, not directly opposite, but close enough to talk should we wish to. A wind picked up from across the treeless acres. "Supposed to be 35-mile-an-hour gusts today," he offered up to nearby lunchers as we clutched our cups and napkins nervously against the gale. The potato salad was excellent. After our repasts had been safely stowed away, I asked what he liked to grow. Fruit trees were his passion.

RECLAIMING SPECIMEN TREES

The next stop on our itinerary was Stonegate Gardens, also in Granby and located atop the same sandy, ancient glacial riverbed as Imperial Nurseries. The lean white-haired proprietor, Donald Ford, greeted us from under a wide-brimmed leather hat and described his operation. He stocks larger trees than are commonly available and specializes in redeeming unsold trees leftover at nurseries and unwanted ones being removed from private properties. He reshapes, and nurses them into specimen trees, favoring harder-to-find species and following his own personal preferences. Thus, in contrast to the acres of rhododendrons we had just come from, at Stonegate Gardens there are no broadleaf evergreens at all. Many trees here are one of a kind -- some of the witches' broom conifer varieties developed at the University of Connecticut by the late Sid Waxman, for example. Some others are unusual varieties of yew and crabapple, along with sassafras, Japanese larch, katsura tree, walnut, shadblow, weeping beech, and European hornbeam. Some trees are 20 feet tall and may fetch a few thousand dollars from

discriminating customers. Though most sales are within Hartford County, Stonegate serves clients as far away as the Midwest.

Stonegate uses specialized techniques such as root pruning and micro-irrigation, and the spaghetti-like tubing is visible here and there poking out of the soil, among the trees. Ford has distinct ideas of how things ought to be done and what it means to "do it the right way." For this reason, he eschews mechanical diggers in favor of a policy of careful hand digging only. In many cases, he uses big, above-ground wire-grid "baskets" to contain a tree's roots while it awaits sale. Most of the root system stays within the basket. The practice minimizes the shock of moving and allows for moving trees in seasons when digging would not be practical.

Along with apples and cider for thirsty tour-goers, Stonegate provided us with wands of cut hydrangeas in assorted colors for making impromptu arrangements to take home with us and sent us on our way.

PERRENIALS & GREEN ROOFS

"How many of you have heard of Darrell Probst?" said Marc Laviana, president of Sunny Border Nurseries, in Kensington, the last stop on the tour. There was little reaction from the crowd. "If you haven't yet, you soon will. He's going to be the next Luther Burbank." Probst is a nurseryman specializing in epimediums who has traveled to China in search of species previously unknown to science. He is also a plant breeder and for the last 12 years has been breeding new varieties of coreopsis. The up and coming coreopsis cultivars coming out of Probst's New Braintree, MA operation are the 'Big Bang' series.

Sunny Border specializes in perennials. Following Laviana's introduction, the Associates gravitated to the propagation house, where grower Jeromey Webber, who handles pest control, gave us the run-down on recent developments in Sunny Border's battle against the shore flies, thrips, white flies, spider mites, and aphids

that are the perennial grower's nemesis. He completely ceased using the "persistent insecticides" last December and his goal is 100% non-toxic pest control. To this end, he has been experimenting with a variety of biological pest control agents. Shore fly is a pest that thrives in the moist conditions of the perennial greenhouses. This season, Jeromey released 50 million nematodes every two weeks and soon wiped them out. He uses predatory mites against thrips, white fly and spider mite. And parasitoid Braconid wasps in the genus *Aphidius* have been effective at controlling aphid populations, leaving behind the telltale signs of their efficacy: the aphids' spent larval shells, or "mummies," each with a tiny exit hole left by the emerging wasp.

When the talk came back around to Darrell Probst, I asked why it was so important that the new varieties be sterile. Jeromey turned to me. "It's a dirty trick!" he said, and ESA Secretary Mira Schachne explained to me that plants bred to be sterile will generally keep flowering indefinitely, in a futile attempt to reproduce, thus extending their blooming period, a prime goal of the flower breeder.

The tour's finale was Sunny Border's modular green roof production facility, which, from its location in central Connecticut, is ideally situated for shipping to its markets in New York City and Boston. Customers include schools, hospitals, and condominiums.

Why green roofs? Green roofs provide a highly effective insulation for some types of buildings, while controlling storm water run-off, adding visual interest, and increasing urban biodiversity. They also help to reduce greenhouse gases. Modular green roofs are an assemblage of many "modules": rectangular polyethylene trays laid in rows on top of the building. Using modules allows for the relatively easy removal of any portion of the green roof should access to the material below be needed for repairs. The polyethylene modules have a lifespan of 25-30 years and are available in different depths, from 2.5" to 8." The depth selected will determine which species may be used. The sturdy workhorse of green roofing flora appears to

be stonecrop. Sunny Border uses *Sedum spurium* 'John Creech' and 'Dragon's Blood' along with various other perennials, including chives. They are also doing in-house testing to find out what plants work best. The growing medium in their modules consists of expanded shale mixed with 15-20% organic matter in the form of compost. Expanded shale is shale that has been ground into pieces and baked in a kiln, causing it to expand and form small cavities. The resulting porous, lightweight chunks absorb and slowly release water, making it a desirable medium for a variety of horticultural applications.

As the busload of Experiment Station Associates pulled out of Sunny Border Nurseries to head back to Lockwood Farm, I took a last look out the window. The leftover modules laid out on the ground looked a bit bedraggled and forlorn in the late-afternoon October light, but, like all temperate gardens, they only await spring to regain their youthful green vigor.