



Dr. Darby McGrath, Vineland's research scientist, nursery & landscape

Rooting for propagation perfection



Darby McGrath knows that all good trees start from the ground up — below ground, actually — and even before they're planted.

Problem is, the tools available to nurseries don't always enable trees to take root in the best possible way. If anything, they can set trees up for serious defects right from propagation because of flaws in the containers used in those early stages of growth.

The propagation trays commonly used in the industry make it easy for tree roots to become problematic. The walled containers force roots to drive down deep into the soil substrate, and when they reach the bottom of the pot, they start to circle around into a tangled mess of deformities that prevent them from properly absorbing water and nutrients when they're planted.

But McGrath, a Vineland Research and Innovation Centre (Vineland) nursery and landscape research scientist, is trying to nip that in the bud, not just for the sake of the trees, but for the people growing them.

"Root defects are a huge issue," she said. "Some cities are beginning to reject nursery stock because of it."

McGrath is working with A.M.A. Plastics in Kingsville, Ont., to develop a better propagation container. Together, they've created prototypes that look like a typical nursery tray except the sides are removed, giving roots the room to grow out instead of down while

minimizing contact between the substrate and the tray. In the process, roots dry out and are forced to branch out further, increasing their area and ability to absorb more water. That makes for more stable, healthier trees when they're finally planted in their permanent homes.

There are nine versions of the tray base being tested, each with different inclines and sizes of openings, to find the best candidate to foster optimal root growth during propagation. They're being tried on different species, as well, to account for different root systems.

McGrath and A.M.A., which is one of the biggest propagation tray distributors in Canada and will be the licensee for the new containers, are also developing recipes for substrate to use in them. Most nursery substrates are designed to drain moisture, but that won't help seedlings and saplings growing in trays that don't have sides to contain the water loss.

Together, they'll test different mixes, measuring the time it takes the substrate to dry out and the impact it has on seedlings.

"We ask so much of trees when we plant them into our urban landscapes which is why it is so important to get root quality right from the start," McGrath said. "We're excited to help growers tackle the challenges of producing trees that can thrive and become the future urban canopy."