

PHA's Stewartia Collection: Patience, Persistence, Pride

by Tim Boland

Silky stewartia at the entryway to the Visitor Center. This 2007 PHA accession was grown from seed collected in Chesapeake, Virginia.

Our commitment to building PHA's stewartia collection is based on our founder Polly Hill's history with the genus and our own desire to encourage the cultivation of these superb small-flowering trees in home gardens. As part of our mission of research and horticultural experimentation, we also bring a plant conservation focus to stewartias, particularly the two North American species: mountain camellia (*Stewartia ovata*) and silky stewartia (*Stewartia malacodendron*).

Partnership Leads to National Collection

In 2006 we were recognized as co-holding the national collection of stewartia together with the Arnold Arboretum of Boston, Massachusetts. Administered by the American Public Garden Association, and now called the Plant Collections Network, this cooperative program has grown stronger to become the recognized standard of excellence in plant collection management. Manager Pam Allenstein explains, "The

Network coordinates a continent-wide approach to plant-germplasm preservation among North American public gardens and promotes high standards of collections management." Accreditation as a national collection demonstrates a garden's enduring commitment to global efforts to save plants. Today, over 70 stewartia trees representing 22 taxa can be found in PHA's collections, many of them PHA's introductions.

Seed Expeditions Yield New Bounty

The two North American stewartias, mountain camellia and silky stewartia, are endangered in many parts of their natural range. In the wild we have encountered trees laden with seed and others with no seed at all. Conservationists believe the trees exhibit what is called inbreeding depression. This occurs when small populations become isolated over time. Isolation is the result of habitat fragmentation (often from deforestation for agricultural use or

development) causing ever-widening gaps between populations.

On our past trips to the southeastern United States, and my trip to Kentucky last fall, we focused on mountain camellia. From nearly 50 separate seed collections made over the last 10 years, only a small percentage of seed has germinated, and only a scant few have made it into the collections. Why? Seed propagation is difficult: the woody seeds take up to five years just to break open! And once opened, they must still overcome internal dormancy mechanisms to germinate. Polly Hill understood this lengthy process and sowed seeds directly in the ground, patiently letting nature do its work.

Despite our frustration with growing stewartia from seed, when, eventually, you meet with success, you experience "stewartia euphoria," as we did this past spring when two silky stewartia trees (grown from seed collected ten years ago) finally blossomed! We collected the seed in their natural

habitats: one comes from Winston County, Alabama, and the other from Chesapeake City, Virginia. Found at PHA's entrance, the trees are an entrancing sight when blooming in mid June.

Propagation Yields Promising Results

PHA has been working cooperatively on stewartia propagation with Heather Gladfelter, a researcher at the Warnell School of Forestry at University of Georgia in Athens. We sent Heather seed of *S. ovata* 'Red Rose' and *S. malacodendron* 'Delmarva' in 2013. She extracted the embryos and grew them in a Petri dish using plant growth regulators to encourage the formation of roots and shoots. This technical process called tissue culture has been used to propagate plants that are difficult to grow by more traditional methods like cuttings. Heather has produced dozens of plants using this procedure.

At PHA, Plant Propagator/Horticulturist Brian McGowan has been successful with growing certain stewartias from cuttings including several of Polly's Asiatic introductions. In the past we have rooted cuttings, however, the following year the small plants unfurl new leaves only to rapidly perish. We hypothesize that the cuttings do not produce enough growth to accumulate the necessary carbohydrate reserves to support growth the following season. Brian has worked hard to circumvent this through striking cuttings earlier in the season. In addition, the small trees are overwintered in the protective confines of the greenhouse.



Embryonic tissue from *Stewartia ovata* 'Red Rose' is placed in agar with plant growth hormones allowing small plants to flourish without the strong growth inhibitors typically found in the woody seeds of some stewartia. Photos by Heather Gladfelter.



Natural distribution in North America of silky stewartia (left) and the mountain camellia (right). Maps courtesy of the Flora of North America

Stewartia Serendipity

While extraordinary efforts to grow stewartias take place, sometimes you just get lucky and find a remarkable seedling with enough merit to become a new introduction. I lucked out in 2006. When weeding close to *S. ovata* 'White Satin', I discovered a foot-tall seedling that had sprouted nearby. I transplanted the tree to a full sun location in my home garden. This stewartia has dark stems and a burgundy blush to the emerging foliage that persists into late summer. Seven years later, the moment we wait for arrived: the first flowers—white ruffled petals with a stunning golden boss of stamens. A cultivar was born! I named this exquisite tree 'Inner Light' in reference to the striking gold stamens, and in deference to my wife, Laura Coit, who suggested the name. (See photo on page 1.) Propagation from cuttings has gone well. Soon this stewartia will be shared with the wider horticultural world.



PHA Designated as Registration Authority

PHA director emeritus Stephen Spongberg produced the monograph on the genus *Stewartia* in 1974. This publication served as the authoritative resource for much of our work. In 2015, then curatorial intern Victoria Stewart used Steve's monograph to develop a web-based pictorial key creating a comprehensive resource for the genus. Her work, combined with our efforts to research, collect, and grow our collection, resulted in the International Society for Horticultural Science appointing PHA as the international cultivar registration authority for the genus. This designation positions us for working with plant breeders, commercial growers, and other arboreta to further expand the availability and use of this incredibly beautiful group of trees.

Stewartia ovata 'Inner Light' as rooted cuttings in the greenhouse

