

## Butternut Decline: A Refreshing Ray of Hope

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The tree disease literature is replete with descriptions of new diseases that have appeared in the forests and landscapes of North America over the past century. But all too often those “first reports” also turn out to be end points rather than launch pads for research efforts that might actually lead to improved forest health. One notable exception is the work of my colleague Dale Bergdahl—now Professor Emeritus with the University of Vermont.

About 25 years ago, Dale became interested enough in the health of butternut trees to want to know more about why this native North American species grew where it did and—more importantly—why the species seemed to be struggling to maintain a place in northeastern U.S. forest ecosystems. The apparent decline in butternut numbers occurred despite the fact that in “good”, albeit cyclical, years butternuts produced plenty of fruit with potential to develop into future generations of trees.

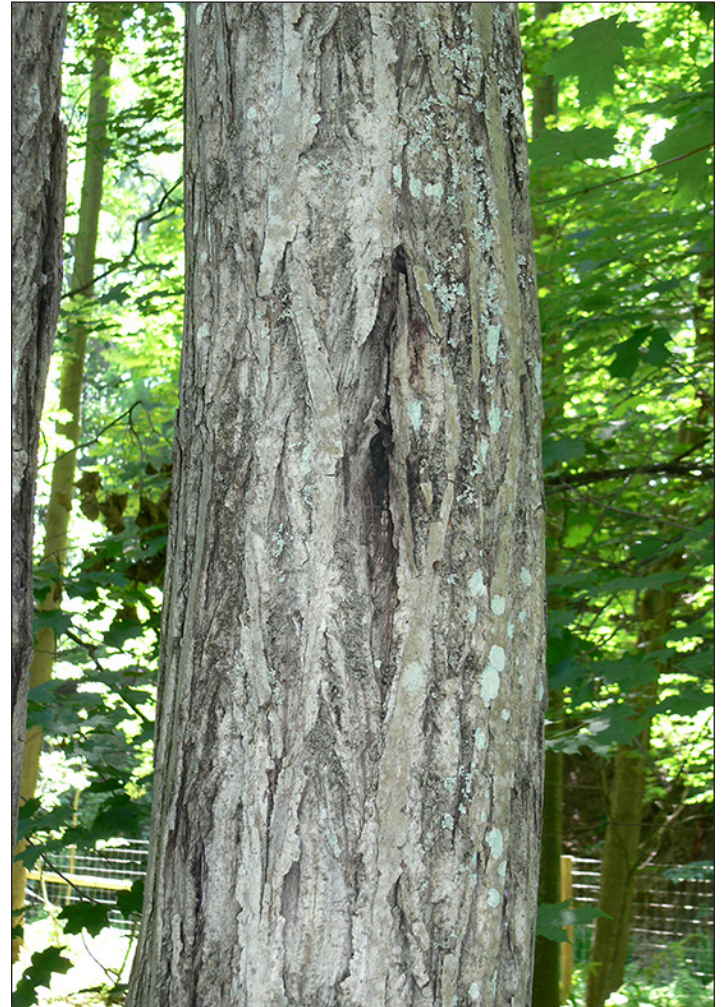
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Butternut canker, an apparently exotic disease of uncertain geographic origin, turned out to be central to the decline of the species. The causal organism was a fungus—*Sirococcus clavigignenti-juglandacearum*—and its most damaging effect was to cause girdling cankers, especially near the root flares where coalescence of numerous infection sites led to decline and death of host trees. The pathogen was also able to survive on butternut husks so that newly developing seedlings were also at immediate risk of succumbing to infection. By the time Professor Bergdahl became fully engaged in his survey and detection efforts, the future of butternut as a species in North America—especially in Vermont, his home state—was at risk with estimates that most sites would have 90%+ mortality by 2012.

Those projections haven’t changed much since they were made in 2006 but what has changed is the perception that the species or some variant of it was doomed. Through little more than painstaking observations in Northeastern forests and a careful



Dead butternut tree © George Hudler



Canker on trunk of butternut tree © George Hudler

melding of Native American cultural history with contemporary tree species distribution, Dale learned that Native Americans, through their collection and trade of the nuts, had been instrumental in concentrating the species in certain areas and, maybe, in preserving occasional disease resistant trees. In some cases, the resistant trees were suspected to be hybrids from natural crosses between native butternut and introduced Japanese heartnut. But many others have been determined—via DNA sequencing—to be true butternuts, and scions from those are now being propagated via grafting at several different nurseries in Vermont.

I guess things that impress me about this story are (1) that Dr. Bergdahl continued his efforts on this one project for nearly 35 years; long after the “easy” data (e.g. cause, effect, geographic distribution, etc.) had been collected and published and (2) he remains dedicated to what he is doing—almost with a sense of ownership of the future of the species. Thus, he continues to press on as he seeks some workable solution...not content to walk away even though he knows that that first generation of selected trees might not be seen and tested for quite some time.

One fascinating sidebar to Dale’s work is that for much of the time, he thought that he alone carried the torch for butternuts in North America. However, when his work happened to be featured in an article in the New York Times, scores of people throughout the East with their own private interests in butternut trees literally came out of the woodwork. And with this interest and a whole new community of people to draw on, Professor Bergdahl all of a sudden found himself charting challenging new courses that likely otherwise might never have been known.

Expect us to revisit this topic a year or two from now. The story has nowhere to go but up and on.



*Bark removed from cankered areas on butternut trunk. The wood underneath the bark becomes discolored ranging from brown to black. © Dawn Dailey O'Brien*



*Cankers on buttress roots of butternut tree © George Hudler*