



Crowning Achievements

Research Results on Root Severance and Tree Health

When soil near a tree in the urban environment is excavated for construction or infrastructure placement, tree roots are often damaged, leading to tree decline, reduced stability, and sometimes, tree mortality. This topic has been studied in a variety of ways, but in [“Effects of Root Severance by Excavation on Growth, Physiology and Uprooting Resistance of Two Urban Tree Species,”](#) Dr. Alessio Fini (University of Florence, Italy) wanted to specifically look at the effect of two different levels of root severing on tree growth, physiology and stability; assess the response to root damage by two species presumed to differ in tolerance to root manipulation (*Tilia x europaea* and *Aesculus hippocastanum*); and determine if root severance on one side of the tree affects leaf gas exchange over the whole canopy, or if the effect is restricted to branches attached at the severed side of the tree.

Dr. Fini’s findings provide further evidence that root protection during construction and trenching activities is critical. In his experiment, a single trench could remove 45-47% of the root system, and multiple trenches could remove as much as 75%. Interestingly, the two tree species responded similarly to the root damage, and growth reductions and altered hydraulic architecture were more severe on trees whose root system had been severed on the two opposite sides. While visible symptoms such as dieback or tree mortality may occur several years after root damage, Dr. Fini saw clear changes in tree physiology a few months after root loss, and those remained significant after 26 months.

Read more about this project and discover additional TREE Fund roots and soil studies on the [Research Archive](#) page of the TREE Fund website.

“Nature welcomes inquiry. Nature does not hide its work. Just seek, and you will find.”

- Alex L. Shigo

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Leading Thoughts

By J. Eric Smith, TREE Fund President and CEO

As I write my final “Leading Thoughts” column for 2018, we are deep into TREE Fund’s annual [year-end operating appeal](#). I’ve worked in the nonprofit sector for a long time, so I’ve come to associate these appeals with the season: there’s turkey, there’s shopping, there’s revelry, there’s resolutions, and in the midst of all that, there’s a last push to raise funds, to give donors both “feel-good” experiences and year-end tax benefits.

I wrote back in [September](#) about how changes in Federal law may impact the tax benefit of those gifts, but also how important it is that we all still “keep charity charitable,” empowering and celebrating the good work that nonprofits do in so many ways, in so many places, for so many people. That charitable intent is particularly important when it comes to the unrestricted operating funds that many year-end appeals support. They may not have pizzazz of brick and mortar giving, nor the permanence of endowments, but they are crucial to what we do.

For some folks outside of the nonprofit world, that phrase – “unrestricted operating funds” – may have unintended negative connotations: “Wait, you can do anything you want with it? Are you going to just spend it on overhead? Is that okay? Maybe I’d better give to this restricted endowment pool instead.” But all it really means is that we have the flexibility to support our “areas of greatest need” internally, and for TREE Fund, that need largely equates to *people!*

When you remove grants we pay from our operating budget, about three-quarters of the remaining expenses pay for the folks who actually do the work to fulfill our mission – and do it well, if it’s not inappropriate for me to say so. That’s Barb managing the grants, Karen communicating our research findings, Monika educating our donors, Maggie managing community engagement, including the Tour des Trees that Paul directs, Dipika keeping the books, and Russ ensuring our computer systems support it all. Plus me, often on the road, doing my best to champion tree science and the professionals who benefit from it.

Some of those folks you may know, some not. Some are employees, some are contractors, some part-time, some full. All are passionate about our mission, work hard to pursue it, and are largely supported by unrestricted operating funds, secured via appeals, partnership or events. So anytime you email, call, engage on social media, read a newsletter article, share a research finding, or see a TREE Fund team member in person giving you great service in pursuit of our shared goal, then *that’s* what “unrestricted operating funds” are all about: it’s the people who make the mission.

I hope you’ll support our team, just as I do with my own family’s gifts to TREE Fund. They earn your trust; they are good stewards of your gifts. I’m proud to work with them all.

2019 Spring Cycle Applications Open in January

Applications for the following TREE Fund grant and scholarship programs will be open January 15 through March 15, 2019:

- \$25,000 Hyland R. Johns Grant
- \$50,000 Utility Arborist Research Fund Grant
- \$5,000 Ohio Chapter ISA Education Grant
- All scholarships (\$3,000 to \$5,000)

Please note that a Letter of Inquiry is now part of the research grant application process, so we recommend applying early. Get more [details and instructions](#) on the TREE Fund website.



Lead Donors

We are grateful to the following people and organizations who contributed \$2,500+ to TREE Fund in November 2018. See the full list of 2018 Lead Donors who make our work possible on the [donor page](#) of our website. Thank you!

- Arborjet, Inc.
- Ford Motor Company
- Green Manufacturing, Inc.
- International Society of Arboriculture
- Mid-Atlantic Chapter ISA
- Utility Arborist Association

YOU Can Help Urban Trees Thrive

We need trees, and trees need our help. Urban trees require special care – provided by professional arborists, drawing on the kind of scientific research empowered by TREE Fund. Please help our urban canopy thrive with a [donation](#) to TREE Fund today. Thank you!



TREE Fund Transitions

TREE Fund would like to express its heartfelt gratitude and thanks to **Jim Barborinas** (Urban Forestry Services, Inc.), for his many years of committed service to our organization. Even before TREE Fund was established in 2002, Jim was an active volunteer and advocate for tree research and education at one of our predecessor organizations, the ISA Research Trust. In 1992 Jim rode the first Tour des Trees, and he holds the distinction as the first Liaison Committee Chair. Jim has served eleven years as a TREE Fund Trustee (2003-2007 and 2013-2018), providing a nurseryman perspective to our work. He is a member of the Research and Education Committee, and chairs the Ken Ottman Volunteer Award Committee (an honor which he himself has received). Jim and his wife, Annie, are leaving a lasting legacy to the tree community as well, establishing the Barborinas Family Fund which will begin issuing grants in 2019. Jim will step down as a TREE Fund Trustee at the end of 2018. We will miss him, and we wish him and Annie the best in all future endeavors.



TREE Fund welcomes **Jacques Brunswick** (Jacques Brunswick & Associates, LLC) to our Board of Trustees. Over the past few years, Jacques has served as a member of our Audit and Finance Committee and Development Committee, bringing his extensive background in public charities and nonprofit accounting to our organization. He and his wife, Louise Desjardins, are veteran Tour des Trees riders as well. We appreciate Jacques' many contributions and look forward to working with him in this new role.



Volunteer Spotlight

Please join us in celebrating the researchers who have presented a TREE Fund webinar in 2018. You may not realize that **Drs. Mike Arnold, Nina Bassuk, Whitney Cranshaw, Christopher Halle, Dan Herms, and Brian Kane** have *volunteered* their time to create and broadcast top-notch programs that have educated thousands in the tree care community. We are extremely grateful for their inquisitive minds, passion for trees, and willingness to share their expertise. Thank you, all!



Top: Arnold, Bassuk, Cranshaw
Bottom: Halle, Herms, Kane

The Word on Webinars

Did you know? Past TREE Fund webinars can be accessed via the [webinar page](#) of our website. Dr. Dan Herms' *Emerald Ash Borer: Strategies for Conserving Ash in the Urban Forest* has been posted, and Dr. Nina Bassuk's *Reducing Tree (and Soil!) Damage during Construction* will be available in late December.

Mark your calendar for **February 5, 2019**, at 12:00 p.m. (Mountain) for ***The Salt Dilemma: Growing Better Urban Trees in Northern Climates***. James Urban, FASLA (Urban Tree + Soil), Andrew Millward, PhD (Ryerson University), and Adam Nicklin (PUBLIC WORK) will discuss recent research on tree performance in structural soil cells, options to reduce salt damage to trees, and the role landscape architects can play in helping the urban canopy thrive. Registration will open in early January on our [webinar page](#).



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TREE Fund is a 501(c)3 nonprofit whose mission is to support scientific discovery and dissemination of new knowledge in the fields of arboriculture and urban forestry.

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PLACE
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The Science of Tree Selection

by Andrew D. Hirons, PhD

Trees have no foresight; they have a multiplicity of other assets, but are not able to predict the future. If a tree does suggest your future wife, offer advice on your next career move or give you a racing tip, it is time to find a professional psychiatrist – or at least put down the moonshine.

However, for tree selectors, this simple observation has one clear implication: it is your role to provide foresight and to anticipate future threats. Too often though, tree selection decisions are born out of our desire for an aesthetic landscape and not on the necessity of a sustainable, resilient landscape.

As a community of tree professionals we must be more focused than ever before on delivering an urban forest that performs; this means planting trees that are capable of thriving, not simply surviving.

From a biological point of view, one way to achieve this is to learn more about a species through the study of particular traits that reveal something about the tree's ecological preference, growth characteristics or environmental tolerance. As water deficits are a major source of stress for trees in urban environments, a particular focus of my research has been to look at traits that infer a degree of drought tolerance. Indeed, much of this research has been kindly supported by the Hyland R. Johns Grant, provided by TREE Fund. A particular focus has been on a trait known as the leaf turgor loss point. This is a characteristic that indicates the water potential at which the tree will not be able to recover from wilting and will no longer be able to extract water from the soil.

Together with my main research collaborator, Henrik Sjöman, we have been able to screen almost 200 tree species to help quantify how drought tolerant each species is. Combined with a range of other evidence from the scientific literature, this has helped provide more robust evidence for species recommendations, particularly for paved environments. Although we have published several academic papers on our work, perhaps the most accessible output is the freely available [Tree Selection for Green Infrastructure](#) published by the [Trees and Design Action Group](#). This digital guidance translates much of our science into a format that is suitable for a wide range of professionals engaged with the vital task of selecting trees for our urban environment.

*Dr. Andrew Hirons is a Senior Lecturer in Arboriculture at University Centre Myerscough, UK. He began his career in arboriculture as a climbing arborist and plant health care technician, gaining experience in Australia, America and the UK before joining the arboriculture department in 2004. He teaches full-time and online higher education courses, delivering modules relating to tree biology and tree management. As well as teaching, he is actively involved with research that focuses on the use of plant traits to inform species selection for urban environments. He is also the co-author of *Applied Tree Biology*, a book that aims to help arborists understand how tree biology applies to tree care practices.*



Behind the Research: Meet Dr. Andrew Hiron

There are those who know, right from the start, *exactly* what they want to be when they grow up. Dr. Andrew Hiron was not one of those persons. When I ask him what piqued his interest in trees, higher education, and research, he chuckles. “As a teen, it was clear that life in an office was not for me. Ironically, I wound up in one.”

Andrew’s pursuit of arboriculture was a matter of whittling down land-based, outdoor career options. Whilst his father managed a farm and taught agricultural sciences, he was drawn to arboriculture for the fun – an opportunity to climb trees, use chainsaws, and travel the world. As part of his Arboriculture BSc (Hons) program at Myerscough College, he spent a year climbing at ArborCo in Melbourne, Australia, servicing high-end client properties. After graduation, he still had the travel bug and took a climbing arborist job with Arboguard in Atlanta, Georgia, again working on privately-owned high-end properties, including Augusta National Golf Course.



Returning to the U.K. a year later, Andrew found a job teaching arboriculture at his alma mater and gradually got more involved in biology and research. His general area of expertise is tree biology, but he has a particular interest in tree water relations. Since receiving his PhD from Lancaster University, his research has focused on understanding drought tolerance in trees; much of this work has been done in partnership with Dr. Henrik Sjöman (Swedish University of Agricultural Science and Gothenburg Botanic Garden). By chance, the two sat next to each other at a conference dinner, began talking, and found that they not only share an interest in this topic, but they both believe that research needs to be accessible and presented in a way that is useful to tree practitioners and other green industry professionals. Their fruitful collaboration combining Henrik’s specialty in tree dendrology and ecology and Andrew’s knowledge of tree physiology has produced not only useful research but a new species selection guide, [Tree Selection for Green Infrastructure](#), based on biological traits such as drought tolerance and water logging tolerance. Some of their TREE-Fund supported work underpins recommendations in the guide. For practical reasons, the guide is limited to tree species in the U.K., but as many of those species grow in North America and Europe, it is being downloaded (for free) and used by thousands across the globe.

Andrew hopes the guide helps move decision makers towards selecting appropriate trees based on functional criteria rather than pure aesthetics or previous experience with a species, and nurserymen towards growing species for functionality, thus increasing the chances that such trees will survive in the long run. He explains, “Experience is a huge factor in tree selection, but experience has no foresight. As decision makers in the urban environment, we need to have a huge amount of foresight. Our climate is changing. We need to equip the tree by selecting appropriate species for future scenarios; rely less on experience and more on foresight.” Andrew would like to get to the point where we understand the fundamental biology of trees such that we can match them to the specific sites and functions that we want them to deliver.

While the species selection guide has been well-received, Andrew does not consider it his most significant contribution to the wider arboricultural world. He reserves that distinction for *Applied Tree Biology*, the book he wrote with Peter Thomas (Keele University, UK) when he couldn’t find exactly the right text for teaching his students. Apparently others were facing the same dilemma, as the book has sold over 1,000 copies to date.

So has Dr. Hiron found exactly what he wants to be when he grows up? It’s hard to say. But for now, he is enjoying his balance of teaching and research, and he’s excited about the possibilities of trait-based tree selection for the future of the urban canopy.

Read about Dr. Hiron’s TREE Fund supported research [HERE](#).

Watch Dr. Hiron’s webinar, “[Drought Tolerance in Trees – Improving Tree Selection for Challenging Urban Sites](#)”