



urban soil

the working-class
layer of the earth

A discussion with Jim Urban

GARETH LOVERIDGE

Urban soils quietly live beneath our buildings, sidewalks and roadways while we dig holes, fill holes and move earth from point “a” to point “b.” The soil we often call dirt gets pushed around regularly and at various scales. From the home gardener that wants to level their plant beds to the front-end loader that prepares a site for a strip mall, we are constantly reconfiguring the surface of the earth.

The surface, which is often covered with a shallow layer of “good” soil, is much more delicate than we recognize. It is in this topsoil layer that most of the plants that live on the earth find their water, their nutrients, their foundation. The plants simply depend on it.

The soil layers develop over a long period of time through complex processes, yet we are quick to demolish them and then sometimes replace them with a new, often less successful, version of soil. Our “new” soils — these scientifically blended materials — are much like a veneer that we laminate to the surface of existing soils. We essentially create two distinct soil levels, rather than one gradient.

We are prone to placing new trees into tiny holes in the new soil bound by heavily compacted existing soil. And then, more often than not, we cover that soil with impervious pavement, blocking access to air and water. Only the strongest trees survive—and then often for a short, truncated life.

Jim Urban, a landscape architect and author, is recognized for his understanding of urban soils and tree planting. Jim’s writing is based on many years of practice and scientific research, all of which he draws upon in his book *Up by Roots*. In his book, Urban develops a comprehensive understanding of how urban soils and trees live together. He is also a key developer of the DeepRoot Silva Cell, a below-grade structural system that contributes to soil environments for urban trees.

GARETH LOVERIDGE: What are some of your most critical thoughts, or concerns, regarding the state of urban soils?

JIM URBAN: A lot of my ideas have evolved in the last few years. I feel that urban soils are better than we think. The soil industry is greatly influenced by the suppliers. Existing soil, and the imported soil from off-site, often begins by getting ground up prior to replacement. This process can create drainage issues, so sand is added to improve water movement. This amendment is less than ideal, as it is relatively high in embodied energy and reduces the overall fertility of the soil. We need to recognize that urban soils are fragile when we dig them up; we need to maintain their structural integrity whenever possible. If we keep the existing soil

in larger “soil peds” (a ped is a unit of measure that describes soil particles bound together into an aggregate) and mix them with organic compost, we will maintain the structural integrity, increase fertility and minimize the energy invested in soil development.

GL Are you following the development of Biochar as a soil amendment, and do you have any thoughts regarding its urban application to benefit trees in difficult environments?

JU Biochar, or additives like it, are really more needed in soils that are dead, or dying, and typically in tropical environments. In most urban landscapes, we do not need that type of amendment. I have interest in the use of charcoal for soil planting; however, the energy to produce it, and the subsequent cost to actually install the material, does not make a lot of sense. I am concerned that we are spending too much energy developing soils for urban installations. It’s not sustainable.

GL What characteristics or components of soil make the most sense to you?

JU I prefer to specify a good compost to amend existing soils with organic content. It’s readily available and always relatively close to project sites. To paraphrase Bob Berkebile, an architect and proponent for sustainable design, there is a trend, generally, for a higher cost in construction with a higher embodied energy. In an interview with Robert Gilman, Mr. Berkebile spoke about “restorative design” and how we need to not only minimize our impact on the environment, but also restore natural processes.

GL This makes sense, if you believe that time (or energy) equals money —then you might assume that inversely, money equals energy. I believe this is an important goal. However, I feel that we must not forget about treading lightly on the earth. The less we physically impact the surface, the fewer solutions we require to mitigate the change.

JU One problem with sustainable design is that there is no simple equation that designers, planners and builders can use for measurement.

GL I think that we need to embrace the ethic of environmental standards such as the LEED program, but we should not rely solely on one tool of measurement. The benefits of holistic, environmental design can happen at various scales. We do not need an all-or-nothing approach; we simply need to think carefully before running down any path. How do you view the progress in the last few years of urban tree installation?

JU I think that we should be planting trees in the urban context that can survive without irrigation. After a two- or three-year establishment period, we should be allowing the trees to sustain themselves. The Pacific Northwest has a great amount of precipitation, and the soils tend to be good. The silt-loam soil has a high water capacity but drains well enough. With respect to size at installation, trees that are between two- and three-inch caliper (the measured diameter of the trunk at breast height) tend to be the best candidates for urban tree planting. Trees that are larger require a longer establishment period and often have a root ball that is proportionally small for the size of the canopy. Trees that are smaller than two-inch caliper can struggle in urban settings, as they are more prone to physical damage from daily activities in the public realm.

Scientific research illustrates that there is a direct relationship between tree size and soil volume. For example, a tree that has a 16-inch trunk diameter (DBH) and a canopy of 32 feet requires a soil volume of approximately 1,000 cubic feet. This requires significant consideration in urban contexts.



We must strongly reconsider the predilection to scrape away the topsoils from construction sites and dump them somewhere else, building structures on wide-open sites then importing new soils to prepare the site for planting. In this simple perspective, it sounds a bit ridiculous, doesn't it?

Our construction management and building methodologies need to change to scrutinize the opportunities to keep as much existing soil intact as possible. The remediation of existing soils that have been physically altered is more complex than simply tilling in some amendments.

If we truly wish to have successful urban trees living to their full potential, sequestering carbon and reducing heat island effect, all while providing poetic inspiration and cultural meaning — for hundreds of years, rather than a decade or two — then we must provide better soil conditions and enough soil volume. And if we do not plan to use irrigation to help the trees survive, then we must provide a means for tree roots to find water.

Change is change. Modifying existing soils alters the chemical, physical and biological properties. By changing soil properties, we change the nature of how, or if, trees and other organisms can live in them.

Think before you dig up your soil and turn it into dirt!

Jim R. Urban, FASLA, is a landscape architect and 2007 ASLA Landscape Architecture Medal of Excellence Recipient. The award recognizes significant contributions to landscape architecture policy, research, education, project planning and design. Jim has over 30 years of experience in the field of urban development and the planting of trees in challenging urban sites.

Gareth Loveridge is a designer and project manager with Swift Company LLC. Gareth has been working in Landscape Architecture in Seattle since 2000. With broad interests ranging from visual communications to developing innovative landscape solutions, Gareth brings diverse experience in complex urban design projects. He is driven by a holistic approach to deliver thoughtful, sound design solutions that enrich the human experience of the environment.



ABOVE: Failed tree planting in pavement demonstrates confined area for tree growth.

LEFT: Typical Seattle sidewalk tree-planting outgrowing its physical environment.

OPPOSITE: Exposed earth cracking in the sun.

