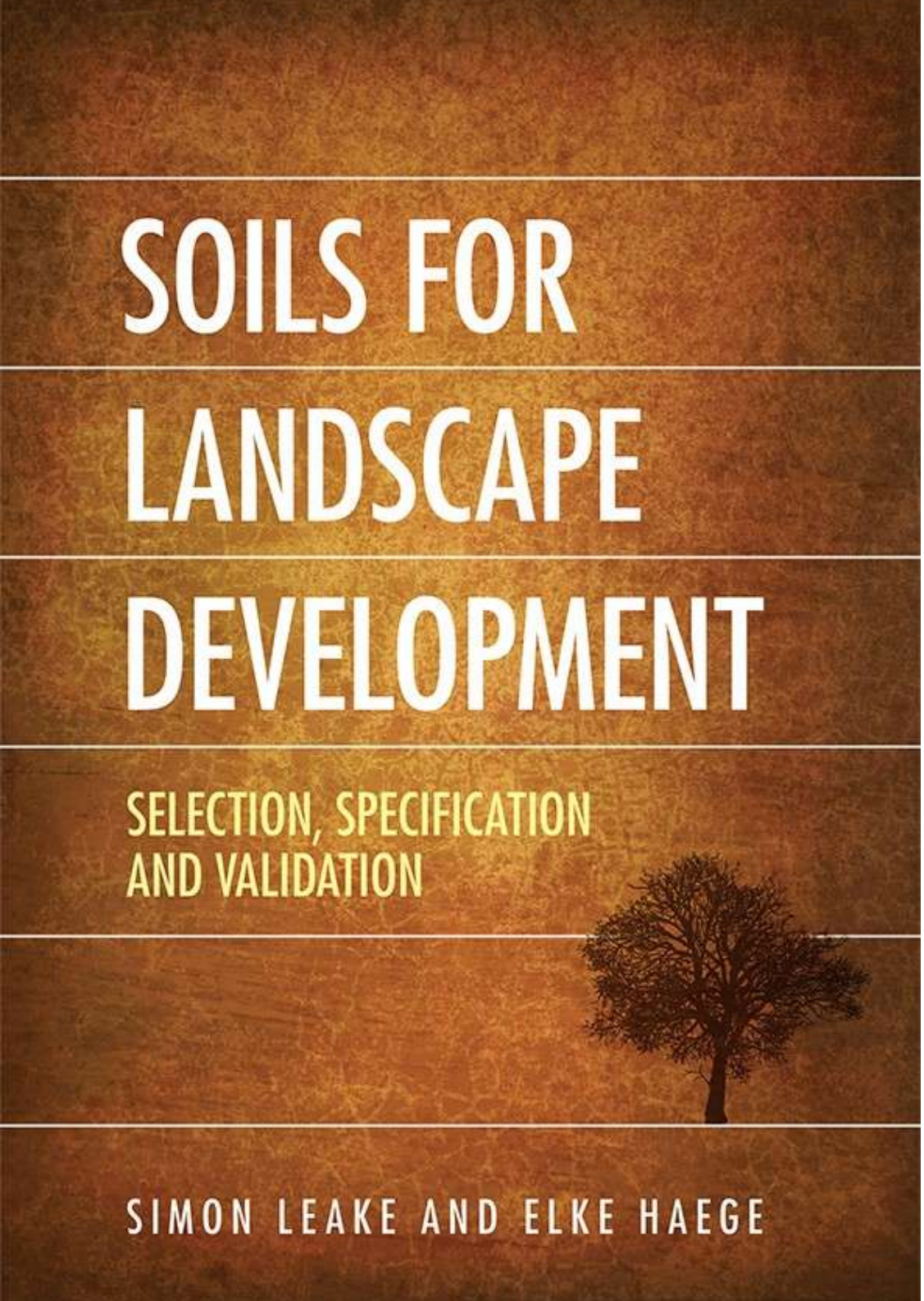

Q&A

With Industry expert:

Elke Haege

Elke Haege, Landscape Architect, Consulting Arborist, Beekeeper and not lastly, co-author of the book: Soils for Landscape Development, is an enthusiastic proponent to the development and sustainable connection to natural systems.

Elke has co-authored *"Soils for Landscape Development: Selection, Specification and Validation"* published through CSIRO with soil scientist Simon Leake, SESL Australia. The book provides:

- 13 typical soil specification examples, which can be used for most projects,
- Soil Approach Method, and,
- Soil Volume Estimator for tree planting in limited spaces.

Elke's work on landscape projects extends through the Sydney Basin, Regional NSW, and she has spent time working in China, Denmark, USA and the UK.

Aside from that, she is also a beekeeper and the secretary of the Sydney Bee Club and an executive committee member of the Amateur Beekeepers Association.

www.elkeh.com.au

What drove you to research and co-write your book with Simon Leake?

Studying soils prior to arboriculture, Simon and I discussed the need for a set of soil specifications after seeing landscapes underperform or completely fail.

I am lucky enough to have grown up with a strong connection to the land and I am keenly interested in improving the benchmark for landscape soils as I see benefits for tree and landscape longevity.

How does the book help the industry understand tree requirements? Where should we begin tackling the issue?

Installing the correct soil in landscape projects is one of the most environmentally sustainable approaches that can be implemented in an entire project because it:

- first and foremost will provide optimum health and growth to trees and landscape
  which in turn make landscapes more efficient and resilient at dealing with environmental stressors.
- Secondly, correct soil installation reduces the likelihood of tree/landscape failure and subsequent replacement of plants, soil and sometimes drainage.

You can immediately see that costs (financial and environmental costs) can be reduced upfront and straight away.

A really great component of the book is the 'Soil Approach Method', which prioritises the use of site soil and soil amelioration (another implementation that can have big project cost savings and environmental cost savings). This approach, I hope, will help the greater industry see soil as a potential site asset.

Indirectly, site soil that doesn't have to be paid to be taken off site and soil that doesn't need to be purchased can reduce environmental degradation from mining soil from creek beds and forest landscapes, which is the current practice and reduce transport and tipping costs. This cost saving will interest landscape contractors, builders and developers.

The *'Minimum Soil Volume Estimator'* is another exciting component of the soils book that prompts the *'Eight Key Factors'*, which formulate a recommended soil volume. We are hoping that having these scientifically recognised parameters will be adopted by local councils/authorities to assist the regulation of allowing sufficient space for trees on development sites as well as for street verge plantings.

On the other side, landscape architects can use these 'Eight Key Factors' and volume estimating parameters as additional information when explaining landscape requirements to clients.
(Note: *The 'Soil Volume Estimator' is available with this article as a free excel download*)

Your *'Soil Volume Estimator'* incorporates a lot of factors which influence tree growth - are they all absolutely essential?

There is discussion of the *'Minimum Soil Volume Estimator'* being used in design guidelines and other regulatory documents. However, I think the use of the *'Soil Volume Estimator'* is only needed in situations where tree rooting space is limited and possibly in disputes between authority and developer.

The key to the 'Soil Volume Estimator' is that a tree might grow in a smaller volume of soil, but the health, lifespan, environmental benefits will be greatly reduced and susceptibility to disease will not be optimum.

The key to the 'Soil Volume Estimator' is that a tree might grow in a smaller volume of soil, but the health, lifespan, environmental benefits will be greatly reduced and susceptibility to disease will not be optimum whilst the maintenance and ultimate costs (financial and environmental costs) will be much higher and a more frequent replanting/replacement of the tree..

Where a full 'estimation' of soil volume is not needed, the 'Soil Volume Estimator' and the 'Eight (8) Key Factors' can be used by the profession as a prompt when selecting and designing tree plantings.

Are there circumstances where a simpler model can be followed safely?

The *'8 Key Factors'* is the simple model to follow, and most experienced landscape architects may only need that as a prompt.

The ultimate intention however, is to design for large trees to develop in urban environments as they will store more carbon, uptake more CO2, increase canopy cover, reduce the amount of stormwater by more efficient groundwater uptake and provide better habitat than smaller trees. There are, however, spaces suitable for smaller trees, and the beauty of the 'Soil Volume Estimator' and the '8 Key Factors' is that it prompts consideration to create suitable spaces and soil volumes for trees and landscapes.

In regards to the soil specifications, we have made this as simple as possible. We've outlined 13 typical example specifications that can be used for the majority of projects. This way, soil suppliers will have a set range of mixes that they can expect to be ordered/specified. We feel this is a robust specification system that sets the benchmark to allow soil suppliers fair competition and simplified products.

What are the most common misconceptions today with regards to planting urban trees?

Probably the expectation on the lifespan of that tree or the lack of importance placed on the long term future of the city's urban forest. Both of which can be vastly improved with optimum soil volumes. In some instances, the use of structural root cells allows for other infrastructure that might otherwise compete for space, such as pavements, roads and services.

What do you think are the hindrances to the proper installation of urban trees? (Would you be able to specify more hindrances?)

Hindrances to installing urban trees correctly can sometimes be the cost of proper installation. However, this initial cost can be saved with the vastly increased lifespan of the tree and vastly reduced likelihood of failure and much lower maintenance. This cost saving is something that can be explained to the client or authority for a long term approach to be favoured. The benefits of optimum tree installation include not needing to replace the tree as frequently, reduced maintenance, reduced degradation of adjacent asphalt, reduced need for air conditioners due to a decent canopy cover (and reduced temperature extremes seen in 'heat island effects'), increased amenity and liveability of urban environments, greater habitat opportunities and diversity of habitat supported by larger trees, more established mature trees which leads to higher property values, greater and more effective carbon storage, less air borne pollutants and better air quality by having larger, mature, established trees.

It should be expected that trees in urban environments do have a shorter lifespan due to contextual environmental stressors (in comparison with trees in natural situations). However, we have the ability and design skills to provide decent tree growing conditions in urban environments and emphasis should be placed on providing as optimum conditions for trees as we can, and in turn reduced long-term costs.

Is there a hesitation in adapting new studies, such as approaches stated in your book? Why do you think that is?

There are 17 regulatory documents and 13 independent scientific studies in determining optimum soil volumes for trees that have been regarded in determining the set of 'optimum soil volumes' outlined in the book. However, we have also incorporated the '8 Key Factors' in determining soil volumes for trees in limited spaces, which also needs consideration by the designer when specifying the soil volumes. For example, one key factor is tree species.

Scientific experiments in regards to soil volumes and large trees take many decades and large costs in setting up and possibly destruction of the trees' growing environment at the end of the study.

With your experience in the industry, are local councils still adamant about using the old methods in developing urban forests even if the trees end up not as healthy as they can be? Or are councils starting to look at new ways to improve the old methods?

What is really exciting me is the positive uptake of these soil methods from local councils and authorities. I am hearing that councils are keen to have a reliable system of determining soil volumes that they can use in regulatory instruments. I understand councils are also keen to have supporting documentation to support their applications to fund public urban forests (street and park trees). In addition, councils/local authorities are very keen to see projects in their jurisdiction implement better soil approach methods as they can see environmental benefits for soil amelioration and stockpiling over importing new (not site-won) 'foreign 'soil.

What do you think are the biggest issues now in creating urban forests?

1. Diversity of species for greater bio-resilience.
2. Understanding the long-term importance of long living mature trees (safe in structure and disease free/resilient) and therefore the importance of correct tree installations.

The planning stage is critical as this is where services locations and building footprints are determined. Supporting documentation, such as the "*Soil Volumes in Limited Spaces Estimator*", will assist landscape architects and designers in strengthening their case for determining soil volumes and associated needs for optimum tree growth.

One of the biggest issues that I see now is the trend for growing small trees. Small trees, whilst appropriate in some instances, do not as much of the benefits that large trees do.

One of the biggest issues that I see is the desperate need for diversity of species for greater bio-resilience.

What are your plans from here?

We have recently had a very positive review from a leading soil scientist connected with the American Society of Landscape Architects (ASLA) who will shortly be publishing his review in the American Landscape Architecture Magazine (LAM).

We are holding a Soils Book Launch Party in February 2015 in NSW through AILA (Australian Institute of Landscape Architects) We hope to do the same for other AILA state chapters in the new year. We will let you know the exact details shortly.

On an aside, I am installing and supplying native bees (stingless hives) into landscapes and schools to help with awareness of natural systems, pollination and importance of displaced habitats (not to mention added benefits of pollination and plant health).