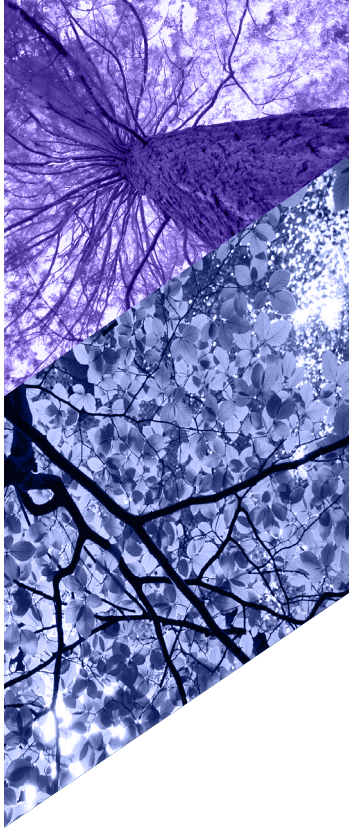

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Traditional urban tree planting strategies: time for change?

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Successfully incorporating trees into new developments is becoming increasingly difficult because of the ever-increasing pressure to build more homes in less space. Outdated tree planting strategies are failing and the prospects for future urban tree cover in the UK are bleak. Jeremy Barrell recently went to Holland, courtesy of DeepRoot Europe and Amsterdam City Council, to see how they are dealing with the 'barren landscapes time bomb' he believes is ticking away in the UK!

UK greenbelt planning policies are the envy of the world because they have been very effective at regulating urban sprawl and protecting our countryside. At the same time, the demand for new housing is almost insatiable, fuelled by people's basic need for homes and from a strong government policy to provide them. Space is at a premium, there is intense competition for every bit of it and trees rarely top the priority list! Our urban tree cover is declining under this onslaught and, unless arboriculturists can come up with creative and innovative solutions to these emerging problems quickly, treeless towns will soon be here.

Historically, trees have generally had their own space in relatively unconstrained gardens and parks, a luxury that is becoming increasingly difficult to justify in the sub-division mentality of the modern planning environment. As larger plots are redeveloped into smaller units, trees and people are being squeezed together, creating conflicts that were never an issue in the past. Above ground, dense crowns close to buildings and recreational areas can reduce light to intolerable levels. Large, spreading crowns can interfere with buildings and access, creating hazards and obstructions. Below ground, roots can disrupt services, foundations and surfacing, causing serous damage and inconvenience. The closer trees get to people, the more problems there seem to be, with one inevitable conclusion. In a straight fight, trees lose every time. The traditional approach of trees having their own space is no longer realistic and certainly not working in our modern world.

We all instinctively know that trees are good and having them around is a lot better than the concrete and tarmac alternative. We may not be very good at quantifying all the benefits but it is obvious that they make our quality of life better in many ways. Equally, we also know the need to use space efficiently cannot be ignored and trees are frequently the losers when hard choices have to be made. Incorporating new trees into high-density urban developments is obviously desirable. Is it feasible and can it be done successfully is the challenge facing modern arboriculturists.

On a practical level, a large part of our work at Barrell Tree Consultancy is providing planning advice, with a focus on identifying the best existing trees on development sites and specifying how to retain them. Although there is still a long way to go, we are making significant progress in that area and future prospects look very good. However, our overwhelming experience is that there is a big problem with new tree planting. Landscape architects seem to be obsessed with ornamental species of small size potential and short life expectancies, which dominate planting schedules. The species are frequently unable to cope with the harsh soil conditions and, if they do survive, are incompatible with the location, causing problems as they mature. Equally at fault are developers who put profit above high quality landscapes and cut corners in the below ground preparation. All of these shortcomings are compounded by councils frequently failing to request or enforce the level of quality control needed for successful tree establishment. Landscapes of flowering cherries and pretty-leaved rowans is not a legacy we relished so we set about seeing if there was another way!

Our suspicion was that there is an emerging body of evidence bucking this trend, although some of the best examples are to be found in mainland Europe rather than the UK. We knew soils and root growth were fundamental issues and the Dutch are widely recognised as pioneers in these areas. So we contacted two of the main contractors to the City of Amsterdam to see how they have approached the conflicts that arise from such close proximities. When they offered to dig up a street tree to demonstrate what they were doing, we could hardly contain our enthusiasm! A few weeks later, we were in Amsterdam, courtesy of Steve Chatwin-Grindey of DeepRoot Europe (www.deeprooteurope.com) and Henk Werner of Pius Floris tree experts (www.piusfloris.nl), to see for ourselves what Europe has to offer.

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Amsterdam is, of course, famous for its structured tree soil, made from a carefully graded mixture of sharp sand and organic components. This allows it to be compacted to bear the load of car parking and pavements, whilst retaining sufficient structure to allow tree root growth. Although it has lower concentrations of nutrients than normal soil, it is beneficial because it facilitates young trees to establish and gradually exploit any natural soil reserves in the immediate vicinity. Trees can be established where they would not normally survive after the conventional ground preparation associated with hard landscaped urban areas. This is a very effective strategy for optimising the use of space on restricted sites that are now so common in urban redevelopment. Trees in parking areas have a very low impact on numbers of spaces and a similarly low potential for causing inconvenience. These disadvantages are clearly minor when compared to the huge benefits that large trees bring to the environment.

Older tree planting in Amsterdam did not use root barriers with inevitable consequences. Distorted paving is an unacceptable trip hazard and the root pruning needed to rectify it often leads to premature tree loss.

A common feature of older planting is that maturity often results in significant disruption of paving close to the trunk by large structural roots pushing up the hard surfacing. There is little option but to address the trip hazard, which invariably leads to severe tree decline and, ultimately, premature loss. Root deflectors installed at the time of planting can dramatically reduce surface disruption close to the trunk and significantly increase the useful life expectancy of the tree. They work by encircling the rootball and deflecting root growth downwards to emerge into the surrounding soil at a lower level than normal. Typically, this is 40–80cm below ground level depending on local factors such as water table and soil type. It is unusual for the roots to grow straight upwards after growing under the root deflector, although they often reappear close to the surface several metres away. However, this is far enough from the trunk to prune the offending roots with a lower risk of destabilisation and injury than if they were cut closer in. This is another useful strategy for reducing the damage trees cause and making them more compatible with the close proximities demanded by modern high-density developments.

The 10m elm to be excavated was planted seven years ago and surrounded by permeable hard surfacing/parking, with no evidence of any damage.

Although we were aware of these strategies, they are not mainstream in the UK and we were very keen to see well-established examples in practice. Henk Werner selected a typical city tree to excavate, a roadside elm planted seven years ago as a 4m semi-mature, now about 10m in height. It was planted in structured tree soil with a 40cm deep DeepRoot deflector surrounding the root ball. There was hard surfacing formed by concrete block paving set on sand in the adjacent street right up to the root deflector. The workmen removed the paving by hand and gradually dug out the soil to expose the black plastic root deflector and, ultimately, the solid

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plug of woody roots inside. Despite plenty of thin fibrous roots beginning to colonise the soil near the surface outside the deflector, it was obvious that all the large structural roots were emerging into the surrounding soil at 40cm below ground level.

With the surfacing removed, Steve Chatwin-Grindey(centre right) explains to Barrell Tree Consultants Mark Wadey (right), Barrie Draper (left) and Dave Cashman (centre left), that the DeepRoot deflector (black ring around the rootball) was installed in four sections that slide together to encircle the rootball.

Of course, this was just one example and there will obviously be scenarios where it is inappropriate to use this combination of tree and products. However, it was a very effective demonstration of how the use of structured tree soil and root deflectors can significantly reduce the potential for damage to surrounding paving without compromising the size potential of the tree. In the right circumstances, there can be little doubt that this is an effective tree planting strategy in the context of higher housing densities. Concentrating large trees in parking areas frees up the rest of the site for high-density development, whilst still delivering a significant proportion of greenspace to the community.

Steve Chatwin-Grindey, Director of DeepRoot UK, removes one section of the deflector to reveal the solid woody roots inside in stark contrast to the absence of large surface roots outside.

Back in England, it is clear that the traditional approach of landscape architects designing tree planting based on the aesthetics of colour and texture as an afterthought in the planning process is dismally failing to deliver treescapes that meet reasonable expectations. Space is tight, conditions are hostile and the stakes are high. It is arboriculturists who have to deal with all the tree management issues as landscapes develop and who are best placed to be informing strategic structural tree planting at the design stage. It follows that arboriculturists must take the lead in identifying and promoting useful strategies for ensuring that our future treescapes are not shadows of the past but beacons for innovative thinking. The Dutch, amongst many others, are pioneering the principles and proving they work in practice. It is now up to UK arboriculturists to take the most relevant ideas and make them mainstream, or face a future of cherries and rowans. Of course, it will be pretty but it doesn't quite convey the best of British to my mind!

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With the DeepRoot deflectors completely removed, Mark Wadey points out one of the structural roots emerging from the rootball about 40cm below the surface.

Henk Werner (Pius Floris tree experts) in the fluorescent jacket describes the combination of root pruning and root deflector installation on mature trees causing surface disruption. Ideally, all the surfacing within about 7–10 times the trunk radius is removed. Any roots protruding above the surface are carefully cut and all the roots close to the surface at the outer edge are cut. The root deflector is installed (thin black line around the paved boundary) and a permeable granular finish applied with gradual undulations rather than abrupt trip hazards. With the right level of aftercare, Henk has found this a very successful strategy for prolonging the useful life expectancy of larger trees and it is mainstream practice in Amsterdam.

New tree planting in adopted surfaces is not unheard of in the UK, but it is far from common. This example at the Duchy of Cornwall's Poundbury development near Dorchester is thriving because of species selection and below ground preparation specified by Barrell Tree Consultancy.

The Europeans and especially the Dutch are celebrated for their use of formally shaped trees to provide green where it would not normally be found. Although this is relatively high maintenance, it is a very effective strategy for improving the leafy feel of an urbanised area without causing excessive inconvenience to the residents.

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Henk Werner in the fluorescent jacket explains the details of this recent street planting to Eric Van Oss, Director of DeepRoot Europe (right) and the Barrell Tree Consultancy team. Installation of the structured tree soil and DeepRoot deflectors was done in advance and 18 planes 12m in height were craned in during the night to avoid traffic congestion. The trees are in the central median and so will cause minimal inconvenience to the adjacent residents whilst providing a fantastic amenity resource for the city. This is an excellent example of a multiple use strategy ready-made for many of our UK urban developments.

A great way to fit significant trees into tight spaces is to use tall growing varieties with an upright (fastigiate) habit. We explored this in detail in our recent *essentialARB* article (Issue 13) and we believe it is so important, it warrants emphasis again. Fastigiate trees have multiple benefits; they can offer dramatic impacts without excessive shading or maintenance. Amsterdam has had a rolling programme of fastigiate tree planting for the last 30 years with individuals up to 20m in height gracing some of their narrowest streets. A visionary planting strategy, demonstrating a dramatic alternative to the cherry and rowan backdrop that is becoming the norm in too many UK scenarios.