

Introduction

Containing success

In a search for methods to produce a sustainable root system suitable for transplanting, Barcham Trees developed their Light Pot™ that was to give dramatic results.

Traditions are hard to break. From the first time I planted a containerised tree I had grave doubts over the sustainability of the root system. So often a mass of fibrous and spiralled roots is applauded, but I have always thought of them as a time bomb waiting to explode.

My first experience of this was after viewing an avenue of *Pinus nigra Austriaca* on a roadside verge in Surrey. The trees had been planted as 4 litre, 60-90cm tall plants and by the time I saw them they had grown to over 3m in height, each supported by heavy grade stakes. Within a week of the stakes being removed the trees had fallen over and on closer inspection the old 4 litre pot volume had developed into a block of wood with three or four prongs of root protruding.



Pyrus calleryana Chanticleer at Barcham in December.

Problem roots

The cause of this lack of anchorage started the moment the young pines were establishing in black pots. As their roots developed and reached the sides of the container they began to spiral randomly, forming a knotted and tangled root system. At secondary thickening the roots knitted ever closer and were never allowed to establish to form the anchorage that was necessary to sustain the weight of the plant above ground. Fatal results were inevitable.

Shrubs rarely attain sufficient weight above ground for this lack of anchorage to matter, but even here when a plant is pot bound (grown in the same container for over 12 months), the root system may not be adequate to support vigorous growth. However, any plant grown in a black pot that has the capacity for growing into a tree has a good chance of its life span being seriously impeded by poor root development.

As a nurseryman, growing trees in black pots that may well fail at a later date seemed pointless. My aim was to find a way of producing container tree stock that would thrive through to maturity after planting. Traditionally, trees have been lifted from the ground in the autumn and winter and delivered bare-rooted to a site where they were heeled-in and planted when possible. Typically a consignment of 200 trees delivered for planting at a new development would arrive on site having been lifted from a nursery field about a week earlier. The contractor may plant up to 25 large trees per day, so by the time the first 100 have been planted the balance could have been out of the ground for two weeks. The consequence of this is seen the following summer when the site is littered with either dead or dying trees.

Trees should be treated like fish out of water when they are handled bare-rooted, as they still have a demand for water with no means of getting it. Good husbandry lengthens the time a tree is able to survive out of the ground before planting, but for many varieties the period the tree is out of the ground is too long to ensure survival.

Root-balling trees keeps the roots moist when out of the ground, but still wounds the root system when they are lifted, placing the tree under stress from the outset. Commonly, only the thick roots remain within the root ball, with the water providing fibrous roots left behind in the field. For mycorrhizal specific genera such as Beech and Oak this can be particularly harmful, as the symbiotic relationship mainly exists on the outer reaches of the root system to enhance root-hair nutrient and water uptake. All this is left behind when a tree is root-balled or is dried off when the tree is lifted bare rooted. Hence the need for container stock. This offers ease of storage and handling as well as an unwounded root system for delivery to the site.

Light Pots

Our answer to solve these problems came from a horticultural trial in Australia that produced a totally unintended result. There, eucalyptus growers were finding their container stock root system being scorched by the heat build up of an unrelenting sun beating down on black plastic containers. The rationale was that one wears a white t- shirt on a hot day to keep cool so why not use white pots to reflect the heat of the sun? This worked well, the pot temperature lowered, but when they looked at the root system they noticed that the roots all grew vertically down the confines of the container instead of spiralling.

The white containers allowed a small amount of light penetration into the root zone and this triggers a phototropic and geotropic reaction, in that the roots grew away from the light and obeyed the pull of gravity. When these trees were planted out the roots were not impeded by each other's growth and were able to explore the soil effectively, allowing rapid and sustained establishment.

This was the answer to our problem at Barcham. We developed a white pot, similar to an aggregate bag that could support handles and retain its integral strength all the way to the planting site, to deliver an unwounded root system fit for sustained establishment. In 2003 we developed the white pots further. We incorporated a permeable and degradable mulch mat and root barrier into the design to aid our customers planting in paved areas. We patented the design and trademarked the containers 'Light Pots'.



A non-spiralled and viable root system produced using Barcham Light Pots.
Betula utilis Jacquemontii



The Barcham Light Pot™, patented 2003.





Shelf Life

If a tree is in the same pot for too long it doesn't matter what colour or design the container is for the root system to be no longer viable when it comes to planting. Recent research trials in Florida have shown the effects of spiralled or tangled roots and these problems have been perpetuated by potting up stock from container to container. Trees grown in this way are very susceptible to blowing over in strong winds, a regular occurrence in America, and there is now a huge backlash over there on the fallibility of nursery production methods.

At Barcham we have always containerized trees rather than container grow them. This may seem a small distinction, but it can make a huge difference to how the plant establishes long term. An outward facing radial root system is what's needed as if roots are deviated for too long they randomly knot together and as they expand with secondary thickening they girdle, leaving the tree with both poor anchorage and growth potential.

Our trees are lifted from our field unit bare rooted and then containerized into our Light Pots to re-grow a root system fit for sale some twelve months later.

Once ready for despatch, if stock remains unsold the roots continue to develop and can girdle if left for too long even though the top of the tree looks like it is still thriving. With this in mind we issue every batch of trees a bar code to monitor how long they have been in their pots and so keep track of their shelf life. It is our trick to despatch our stock before shelf life is reached but trees that go past this point are routinely culled. The shelf life is decided by genera and as far as we know we are the only nursery that manages their stock in this way.

Track record

We have been growing and selling trees in our containers for over 20 years and our stock is now planted along the length and breadth of the UK so you will never be too far away from a Barcham Tree. My six year old claims that every tree she passes is from Barcham which is rather an overstatement but if you would like a local reference for our stock we would be pleased to point you in the right direction!

Come and see for yourselves

I hope you enjoy this book of trees which are well suited for planting in the UK. You are most welcome to visit our nursery, by appointment, where we have over 125,000 trees in Light Pots on our 300 acre site near Ely, Cambridgeshire.

We have a great team of enthusiastic arborists who would be delighted to show you our range of stock.

Look forward to seeing you here!



Semi-mature *Platanus x hispanica* at Barcham in 1000 litre Light Pots.