Plastic Tree Tubes
Who needs them?

WORKSHOP REPORT | NOVEMBER | 2019

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YORKSHIRE DALES
MILLENNIUM TRUST

Opening words

DAVID SHARROD | CHIEF EXECUTIVE | YORKSHIRE DALES MILLENNIUM TRUST

YDMT has supported the planting of 1.5 million trees in the Dales over the past 20 years and David has become increasingly uncomfortable personally, with the fact that this has involved putting one and half million tree tubes into the landscape, most of which are still there. The Trustees of YDMT are keen to explore if there are alternatives but there seems to be no clear answer. The workshop has therefore come about to enable a collective decision on what should be done to address this issue.

YDMT has hosted this workshop in partnership with the United Bank of Carbon who have very kindly funded the event.

PROFESSOR PIERS FORSTER | DIRECTOR | PRIESTLEY INTERNATIONAL CENTRE FOR CLIMATE | UNIVERSITY OF LEEDS

Piers introduced one of the hosts of the workshop, the United Bank of Carbon, and how they apply academic research to support tree planting in the tropics and the UK. Piers is himself a member of the Committee for Climate Change. They are working particularly on translating the Committee on Climate Change plan to plant 30,000 to 50,000 hectares of new woodland a year, looking at what trees to plant to bring multiple benefits to biodiversity, air quality, and carbon. Quick decisions and research are needed on tree guards and collaboration will be key to getting practical solutions, so we are pleased to support this workshop.

Tree Guards

PETE STEVENS | APPLICATIONS DEVELOPMENT MANAGER | TERRAM (PART OF BERRY GLOBAL, INC)

As the representative of Tubex, the manufacturer of plastic tree tubes, we are extremely passionate about them as the evidence is that they make a huge difference to ensuring trees can be planted and last much longer and grow much quicker.

So I think the better question to ask rather than 'who needs them?' is 'why do we need them and how can we make them more sustainable?'

The idea of a plastic tree tube came about in the 1970's and the first commercial product was launched by Tubex in 1983. There has been lots of research and development since 1983 and the product range has been extended because there are a huge number of variables in terms of the sites and the types of trees. Tubex is now part of Berry Global, an organisation that both produces and recycles a range of consumer and industrial plastic products.

There are a number of benefits of tree shelters. The most significant one is that tree shelters provide a micro-climate and you get an increase in the numbers of trees that survive. At least 25% higher survival rate in the first year and in the first five years the trees are significantly taller. Protection from a variety of animals is also a significant benefit. There are a whole range of products and alternatives depending on what is required. The tree shelters are cost effective compared to fencing and controlling animals, which may be controversial.

Much higher survival rate and growth rate. There is no doubt about it that the trees get a much better start in life with the tubes.

What about sustainability?

Tubex is keen to be recycling the tubes – it's how to go about this. Recycling is widely accepted in other areas - 40 % of domestic waste is recycled so it is a matter of applying it to this industry and putting the processes in place. Tubex thinks that everyone has a role to play in this, not just the manufacturers. It's great to see so many people in the room from so many different aspects of this industry.

Trees themselves are fantastic at capturing carbon and many people are passionate about increasing the number of trees that we have. One Tubex tree guard creates 0.44KG of Carbon during production of raw materials and converting, whereas an Oak tree that lives for 100 years captures 2900KGs of Carbon. Thats 0.00015% of the Trees Carbon capture. So looking at the bigger picture, if the success rate is at least 25% more using the shelters, you quickly recover the amount of carbon that was used to produce them in the first place.

CATHERINE WALTER | OPERATIONS COORDINATOR | TUBEX (PART OF BERRY GLOBAL, INC)

Involved in the production and development of Tubex products, including trying to make the tubes more sustainable and more environmentally friendly.

At Berry we believe very heavily in working closely with our partners to ensure things are undertaken in a much more corporately responsible way.

There are a huge number of benefits to plastic compared to alternative materials particularly when comparing the carbon footprint and in the amount of water it requires to make things in a different material for the same object. We believe that education is incredibly important and that plastics themselves are not the issue but what is done to manage those plastics once they are created. They have a very valid use that needs to be managed.

There are many internal sustainability targets within the company at all levels at hundreds of sites all over the world and we want to drive change.

Typically when you make a product from an alternative material to plastic it makes two and half times more greenhouse gas. It uses up to 80% more energy in production and the product is heavier and uses more carbon to transport. The alternative paper and cardboard tubes still have to face the problem of disposal. Using paper cups as an example - 5% of the material used is plastic. It has to be coated in plastic to make it water resistant otherwise it won't do its job. For that reason many are not currently recyclable. It creates approximately 25% more carbon producing a paper cup than a plastic one.

Education is vital as although it would be great to make a bio tube it is not that simple. There are many different definitions of 'bio'. One of them is bio-sourced, in that it's coming from a natural, sustainable source, usually plant based, rather than oil.

Then there is biodegradable, where microbes degrade the material into biomass, water and carbon dioxide.

It is possible for plastics to be a combination of the two and if we could do that for the tube that would solve the problem. Unfortunately current technology and legislation on what is considered biodegradable would mean that they would only last for six months and so they wouldn't do their job

The three R's that Berry champion are:

- Trying to reduce the weight and in turn reducing our water, energy and carbon consumption.
- Recycling – recent acquisition of RPC – now own a number of recycling sites.
- Recovery – working with partners to close the loop.

We are doing this by optimising the designs, where possible using sustainable sources for materials and ensuring all products are either compostable or recyclable. Looking at reducing greenhouse gases globally by 25% against a baseline that was measured in 2016. Also looking to reduce water consumption by recycling and reusing it whenever possible and also reducing the amount of waste going to landfill.

Proudly part of Operation Clean Sweep that involves stopping plastics escaping into the environment and reducing plastic in our oceans. Berry are also partners with the Ellen MacArthur Foundation that encourage the collection and disposal of plastic in a sustainable and ethical way.

On the production sites Tubex is proud to say that they have had zero waste going to landfill in the last twelve months. Materials are segregated on site are recycled or sent for energy recovery. Tubex is trying to be innovative and use the research that is available to them from Berry. They are looking at external sources of recycled materials coming from other producers and end of life solutions for the tubes, including the use of bio-degradable materials.

Currently there are bio-degradable vole guards and this material will be taken forward into new products under development. All vole guards are made from recycled materials and Tubex is hoping to close the loop using their own recycling plants through legacy RPC sites.

Tubex is also producing a bio-polyethyline guard on a made-to-order basis. The PE comes from a plant source with the final guards being more than 90% plant based. UV stabaliser and colour make up the other materials used but this guard has not yet been field tested.

Lastly, Tubex will be looking at producing a fully bio-degradable tree tube. We believe it is vital that if a tree guard is biodegradable, then it really means that. Some products are marketed as such but require industrial compositing, so still require removal from site.

What are the options for a landowner?

ALISTAIR NASH | ESTATES MANAGER | WOODLAND TRUST

I have an overview of the 360+ sites that make up the North region from Cheshire, Derbyshire, Nottinghamshire and Lincolnshire, and everything from there northwards the Scottish border, including directly owned, leasehold and sites under shorter term licenses.

Have been with the Woodland Trust (WT) for 23 years so far and manage a team looking after our estate, consisting of nine Site Managers, a Harvesting Contracts Manager and an Assistant Site Manager

Brief today was to provide you with a landowners view of issues we face across the sector in terms of the use of tree shelters.

While I would hope many of the views I express here will be shared by other landowners, my presentation will be through the prism of my work with the Woodland Trust. I am sure the views on this matter are as varied as the tree tube / shelter market has become.

So why is the Woodland Trust interested in Woodland Creation?

Woodland creation has been at its heart since its inception in 1972, and in fact our second ever site was a field on which we created our first new woodland.

We are primarily interested in championing native trees and woods and their expansion for the primary and well known reasons given in this slide.

Woodland creation, probably more than any other activity we undertake provides both a clear public demonstration /statement of our vision for a UK rich in woods and trees but often more importantly allows members, supporters, locals, schools, corporates to get in directly involved in delivering that vision.

Our woodland creation sites are very powerful demonstration and engagement sites.

Woodland creation is also often the only way we can bring accessible woodland and experience of woodland to a community - Woods On Your Doorstep etc. It is therefore a really important part of what we do on our estate.

But increasingly we are working with and through others to help deliver woodland creation ambitions across the UK and across landowning sectors.

Our outreach work is massive – including large scale partnership schemes, farmers and landowners, schools and community packs, individual trees and tree packs through the online shop.

It will only get bigger – certainly in the North of England as the Northern Forest project progresses

So how do we see the issue?

There are clearly two sides to this.

The value of tree shelters as an aid to woodland creation – a method of woodland creation that has underpinned its development and expansion but yet now has become its Achilles heel.

Single use plastics are now at the heart of the environmental debate. Tree shelters are a highly visible use.

The ‘greater good’ argument is no longer defensible.

There are reputational risks for organisations and landowners, but more importantly for the image of tree planting itself as a positive action for environmental change, if a response isn’t found.

In looking at our own estate we are seeking to adopt the following on both new sites and on our existing sites.

This is simply a variation on the ‘agenda 21’ sustainability principles development, from some 27 years ago – we haven’t advanced much in terms of sustainable use in woodland creation in that time, until the recent rise of the climate crisis and resurgence around sustainability.

- **Replace** – plastic tree shelters with recycled and/or fully biodegradable alternative.
- **Reduce** – look to reduce the use of tree shelters through adopting different approaches to woodland creation.
- **Re-use** –look to re-use plastic tree guards thus extending their useful life and reducing the need for new products.
- **Recycle** – ensure the shelters are not made from single use plastics and when plastic guards come to the end of their useful life then look to recycle.
- **Remove** – to prevent onsite pollution and littering.

Equally this approach can be applied to any plastic items being used – from temporary fencing to signage, right down to drink cups at events.

An example is provided in one of our most recent acquisitions in England from July of this year. In its simplest terms, its 162 Hectares or 400 acres of former opencast, situated on the edge of Heanor in Derbyshire.

Sat in between Nottingham and Derby, with 700 acres of Shipley Country Park and the 180 acres of Derbyshire Wildlife Trust Reserve it forms a continuous area of almost 1300 acres of accessible greenspace, receiving a combined ½ million visitors per year.

There are 1.3million people within 20 minutes drive time and 900 schools.

Youth engagement and involvement are at the heart of this woodland creation project. We intend to deliver inclusive, high quality engagement which reaches out particularly to young people in the 10-20 age group, who may not usually have opportunities to engage positively in their wider environment or participate in social action.

Children will take part in planting events and learn about nature, teenagers will help to interpret the site in a way that is meaningful to them, and older students will have the chance to engage more deeply in designing, delivering and participating in a broad spectrum of volunteering and engagement activities.

The key target demographic is the one most vociferous in its environmental campaigning.

Construction plastics – designed to be in the ground for 25, 50+ years.

No idea as to the breakdown process.

Hidden from view and mind.

Drainage – direct access to water systems.

No idea of the recycling process – probably none for black plastics.

Few or no alternatives for some products.

But this is all part of a risk assessment process, deciding what and where plastics are justified.

Develop a simple environmental assessment process through which we can list and assess our actions.

Have a clear rationale for the decisions we take.

Be able to answer, or at least respond consistently, to the difficult questions around plastics use.

Help identify the areas of business where there needs to be more work undertaken.

While the approach we wish to adopt may be clear - ie the issue of 'replace', and we're probably in agreement as to what we want.

In terms of alternatives are we, along with other landowners, lacking the clarity of what we want from those alternatives? Which in turn doesn't help the shelter industry. Could we be clearer, more helpful to the product sector? Can we define exactly what the product requirements we want as an industry?

To collect or not collect……?

What narrative / story we want to see (eg the tubes removed at year five, composted, become the growing medium in the nursery) in terms of types of shelters is just one thing we are facing as an end user.

This slide is by no means a definitive list of other issues but simply there to show the complexity around what appears to be a simple subject.

Green credentials are key – the sourcing and impacts creating the raw materials may have – such as polylactic acids produced and sourced from overseas/ less economically developed countries, first generation feed stocks like sugarcane & maize.

Difficulties we face in getting products to recycling (UV inhibitors, dirt, breakdown started).

There has to be a clear end use – it's working from that end use back to a product that fulfils the criteria we need as tree protection.

Grant support needs to favour the sustainable options.

Woodland Trust for one would be more than willing to have test and trial areas on the estate, to help deliver new products to market.

So are there any conclusions in terms of landowners perspective – I think for us there are actually more questions than conclusions but we really do need to get this one right.

Would it be problematic to phase out plastic tree guards?

PANEL DISCUSSION

ALASTAIR BOSTON | DEER LIAISON OFFICER | THE DEER INITIATIVE

One of the biggest issues we've got if we didn't use tree guards or fences is sheep and deer. Roe deer are most common in the north of England. Approx 3500 red deer, 800,000 Roe deer, 200,000 fallow deer, nationally over 1.5 million deer. As well as deer we need to be a lot more aware of disease issues. Another issue is that the stakes used are inferior so the deer can just rub on them and knock them over and they also nibble on the cable ties.

When using tubes need to also think about the aspect of the slope and size of tube used as the deer or sheep can just walk around and nibble the tops of the trees from the upper side. Sometimes tubes can be seen used within a deer fenced area – need to ask why this is the case. Deer fencing is good for keeping out red deer, sika or fallow but difficult to fence out Roe deer that can get through an A4 sized hole.

RICHARD GILL | SALES DIRECTOR | GREEN-TECH

Green-tech are a distributer of tree guards and we see both sides. Having supplied tree guards for 25 years, probably over 200 million tree guards, and so it pains me more than anyone when I take my dog for a walk and see tree guards in the bottom of the hedgerow from over 20 years ago. It frustrates me and so I can see the problem from both sides and know that I really push for our partners to use a product that helps a young tree.

One of the tree nurseries present today told me that it takes half a kilo of carbon to make a tree guard and that tree in the first year will sequester 10 kg of carbon and about 21 kg every year after. It may well do this without the guard but we also know that the tree guard helps the tree from the start. Our British climate is difficult and we need a product that can handle this.

As a distributer we have worked with the manufacturers to explore the options and so at Green-tech we are asking why are we not recycling more? Is it the expense? Do we need to be pushing our clients harder? Do we need to push the clients, clients? Do we need to go to the Government? Do we need to go right to the top to encourage funding?

A tree tube is a good product to use but it is a temporary product, not permanent and we need to push recycling. We need to change our culture as we believe once we start taking them off we'll keep taking them off once they've served their purpose. There is no perfect option for a tree guard currently on the market. So use the polypropylene tree guard that can be recycled into another product, but do the right thing once it has served its purpose and recycle it.

PROFESSOR ALAN SIMSON | LEEDS BECKETT UNIVERSITY

Not in favour of plastic tubes and never have been for a number of reasons:

- Plastic in the environment.
- Originally invented for oak trees that struggle to get going, now everyone puts every tree in a tube, even conifers.
- There is no doubt that the trees grow quicker, but I believe this sometimes means they are weak. Trees grown outside a tube are tapered and strong. When you take a tube off a tree they are often parallel sided and weaker.
- Planting is now getting closer to towns and cities and people. People do not like the look of the tubes and I think we should listen to them.

Worked in the forestry section of a borough council and was responsible for planting trees. Ran the afforestation programme in Telford for over 11 years planting just short of 7 million trees, 138 different species. Planted species in groups and planted one meter apart without any plastic tubes. Telford New Town was the first town in the UK to get forest stewardship certificate for the work.

More importantly I was contacted to help write a proposal for Urban Forestry for the EU that was approved – setting up the first COST ACTION E12 for urban forest and trees that ran from 1997 – 2002. The EU recognised urban forestry as a specific scientific domain

separate from landscape architecture. This has continued with another five COST ACTIONS and a world forum on Urban Forestry. In Telford New Town we had a management system called 'benign neglect', that you will not find written down anywhere, accepting some failures. If gaps were created it did not matter. Self-selection process.

In 2001, KPMG looked at 64 cities across Europe and Telford came out the top place for investment. 40% of all Japanese investment in the UK was in Telford and when asked why, the quality of the environment was listed. This encouraged investment in urban tree planting.

IWAN DOWNEY | HEYWOODS AND WHITE ROSE FOREST

Having been involved in the forestry sector for the past 27 years it was the first time in March this year that I had actually physically planted a tree a with tree shelter.

There were other options in the earlier part of my career including fencing, using land management design, rides for deer, staff to manage deer populations and other mammals, and so it was never an issue. In the next stage of my career I was handing out thousands of grant agreements where nearly every single one of them required tree shelters to be used.

In current role responsible for tree planting in the urban setting and having to help and advise people about what to use, often dealing with people who this is their first tree planting at all.

There is a range of issues to address particularly around management post planting. The challenge is often after planting with the maintenance of the trees and we need to consider if tree shelters make this easier or more difficult. Also, one of the key factors that comes up, depending on where the site is, there seems to be a real requirement, either to make the trees very visible, to prevent them being mown down by accident, and others where the tree tubes would attract vandalism and be too obvious. Leeds city council are planting without with guards and hiding the trees in the long grass. Some local authorities are struggling with lack of resources and expertise and so the guards can help.

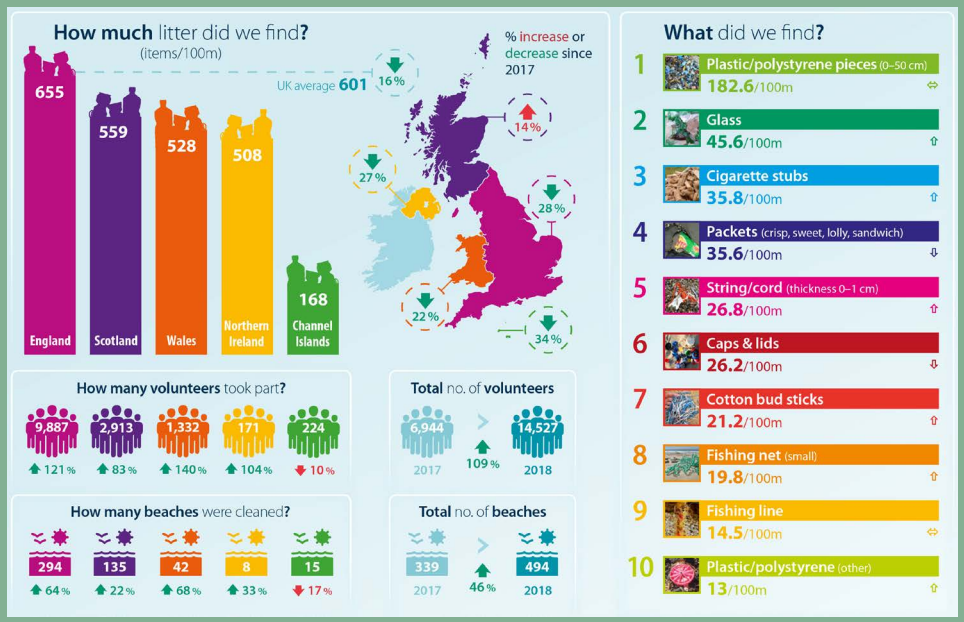
From an internet search there were only two other options that still required some form of management and removal, so no obvious alternative solutions.

Another point is that so much of the funding for planting now is done on a 'per tree' basis making every tree valuable and any loss much more high risk. Therefore, this encourages use of a tree guard and you can get funding for it. There is not currently any funding option to buy twice or three times the number of trees you need to allow for loss. The funding streams definitely need to be looked at.

We need to remember that not all plastics are bad. There are pros and cons for their use but we do need to consider alternatives. Whether it is a different type of guard or resource to manage our woodlands to help establish them.

JENNY ROBINSON | SENIOR CONSULTANT, RESOURCE FUTURES

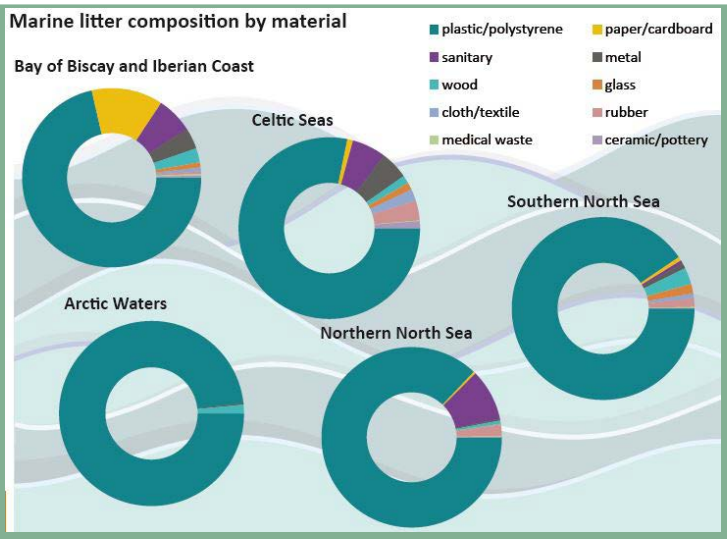
I have been involved in the waste industry for the past 30 years and about 2 or 3 years ago became very aware of the problem of plastic tree guards littering our landscape.



Source: Marine Conservation Society survey and analysis mcsuk.org/media/gbbc-2018-report.pdf

Plastics in the environment

- In the UK we are never very far from the sea (max 70 miles - Coton in the Elms, a village in Derbyshire).
- How long would plastic dropped in Leeds take to reach the North Sea? The Aire, Ouse and Humber and off it goes….
- How long does it take uprooted tree guards to reach the sea from hillsides and forests?
- Greenpeace said the concentrations of plastic waste in the Mersey were recorded at 2 million microplastics per square kilometre, making it proportionally more polluted than the Great Pacific Garbage Patch



Source: OSPAR ospar.org/work-areas/eiha/marine-litter

The teal colour shows the proportion of plastic – and shows that plastic gets everywhere …. very little else, other than wood, gets to Arctic Waters.

Plastic types – what are we talking about?!

Plastic is useful! It is effective at what it does and is durable.

- **Polyethylene Terephthalate** PET a durable thermoplastic, commonly used for making soft drink/ water bottles, salad trays, salad dressing containers, biscuit trays, rope, bean bags, and combs.
- **High-Density Polyethylene (HDPE)** is a semi flexible to hard plastic, it is resistant to chemicals, moisture, and any sort of impact but cannot withstand high temperatures. It is commonly used for milk bottles in the UK (PET is commonly used elsewhere).
- **Polyvinyl Chloride (PVC)** is durable and can withstand aggressive environmental factors. PVC-U is used for plumbing pipes and fittings, wall cladding, roof sheeting, cosmetic containers, bottles, window frames, and door frames.
- **Low Density Polyethylene (LDPE)** is soft and flexible compared with HDPE. LDPE is used in stretch wraps including plastic food wrap, rubbish bags, sandwich bags, squeeze bottles, black irrigation tubes, rubbish bins, and plastic shopping bags.
- **Polypropylene (PP)** is used to make ice cream tubs, margarine tubs, potato chip bags, straws, microwave meal trays, kettles, garden furniture and lunch boxes.

Can be very confusing what plastic is in a product but the government is working to try and make things clearer.

"Plastic" types – alternatives – what might be suitable?

- Biodegradable
- (Oxo) Degradable
- Compostable

Confusion over terms and properties? Beware what might seem better!

In a test of carrier bags two forms of biodegradable bag and conventional carrier bags - none of the bags decomposed fully in all environments after long-term exposure to the sea, air and earth.

However - the "compostable" bag appears to have fared better than the so-called biodegradable bag. The compostable bag sample had completely disappeared after three months in the marine environment - but researchers say more work is needed to establish what the breakdown products are and to consider any potential environmental consequences...the potential for fragmentation into microplastics caused additional concern.

Source: theguardian.com/environment/2019/apr/29/biodegradable-plastic-bags-survive-three-years-in-soil-and-sea

Managing "post consumer" plastic

Polypropelene is currently worth around £200 per tonne (Source: WRAP). You have to get it to market somehow, collected & transported, accepted by a MRF/recycling plant and then sold to the reprocessor. The logistics & economics are interesting. Plastics are light – can you bale them?

You might be able to use existing infrastructure – but it is the source of the waste that defines it as commercial, domestic or charitable material. Different rules/ charges may apply. And…. How much does a tree guard weigh?!

Response from floor: average tree shelter weighs 178 grams.

It would require a considerable amount of tree guards to make a tonne worth £200.

Managing "post-consumer" plastics

- Tree guards are made of a proportion of post-consumer plastic? They help with the "circular economy"?
- Plastic cannot be "mechanically" recycled indefinitely – a proportion of virgin material is usually required.
- Plastic might be able to be chemically recycled into a monomer indefinitely – but the technology and finances are not yet viable.

Managing post-consumer waste

You/we are part of the massive upsurge in realisation that something needs to be done…

Drivers:

- The EU Circular Economy Package.
- The 25 year Environment Plan.
- The Resources & Waste Strategy (R&W) and Extended Producer Responsibility (EPR).

This is moving into many different products.

The Attenborough/ Blue Planet Effect

"…the best motto to think about is not waste things, don't waste electricity, don't waste paper, don't waste food. Live the way you want to live but just don't waste. Look after the natural world, and the animals in it, and the plants in it too. This is their planet as well as ours. Don't waste them."

Sir David Attenborough

Would it be problematic to phase out plastic tree guards?

QUESTIONS AND COMMENTS TO THE PANEL

Q. The grant applications always include tubes and/or fencing. Is it possible to have a grant without having the plastic?

Alistair Nash: There are around 6,000 tubes to a tonne. They priced the collection, transportation and process of a tonne of tubes and it was around £2,500 costs for £200 back. The cost associated without tree tubes increase – an estimate of £80,000 worse off in the Youth Forest with the increase fencing costs and herbicide use.

Iwan Downey, White Rose Forest (WRF): The funders for the WRF all include money for trees and plastic shelters. There is a real need to increase funding for the quality and the long term management of woodland.

Jenny Robinson, Resource Futures: "Extended producer responsibility" is the idea that the original producer of the plastic item (food packaging at the moment) pays 100% of the end of life costs of that product. This will also change the way everything is funded and have impact.

Luke Hemming, Forestry England: Tree tubes are not the default option. It needs considering. Fencing is also an option and it can be removed. The default is a vole spiral which can be removed but the applicant has to replace any damaged trees. Luke suggested that wild deer is made more attractive as food so the numbers and be managed and used sustainability. He suggested the Woodland Trust promoted the idea. He said there is funding to manage deer (in the Higher Tier funding). New trees can get high seats for managing deer included in the grant.

Natalie, Ezeetree: She said they make biodegradable cardboard tree guards. There has been a lot of interest in them.

Richard Gill, Green Tech: they supply what the customer wants. The market wants options.

A discussion about the manufacture location of the tubes followed. Ezeetree is currently manufactured in the US. The tubes distributed by Green-tech are manufactured in the UK.

Catherine Walker, Berry: Berry have purchased a recycling plant and are looking to recycle the tree tubes. They are conducting a viability trial and the plastic produced is of good grade, but one of the key issues is the money involved in clearing the site. They are trialling getting the tree tubes to a road side location and collection. The responsibility of the site owner to get from site to road side for collection. Co-operation required.

Kevin Sunderland, Aires Rivers Trust: Please could there be a greater distinction about where the tree tubes are used. If they are used beside rivers, when the river floods they are washed out to sea. Hill side is fine. It matters where you use them.

Q. What are the panels views on the deposit and return scheme for encouraging recycling and viable partnerships. Jack Spees, Ribble Rivers Trust

Jenny Robinson, Resource Futures: Scotland has a model Deposit Return Scheme for plastic drink bottles. It is a watch and wait to see but it could be possible to mirror that scheme. It is complicated to make it viable and the costs are around 30p per bottle. The consultation has gone back to DEFRA. It might work with tree guards.

Nicola Abbatt, Tilhill: Commenting on the younger generation concerns around plastics and identifying that we have to consider increased use of herbicides and carbon impacts too. Isn't raising awareness and education important to explain the complexity of these situations and understand the true environmental impact of replacing plastic tubes?

The comment was also made that the tree bags and nursery package is a much larger issue but less well known.

Jenny Robinson, Resource Futures: Municipal waste is mostly being considered for the extend producer responsibility but it will spread to horticulture. The French are way ahead in polluter responsibility.

Phil Lyth, Farming and Wildlife Partnership: If you control the rabbit population and reduce the impact of the problem species you will have trees for free. The grazing pressure is reduced and you are working with nature.

Iwan Downey, WRF: Need to change behaviour. Landowners feel tree guards are the safest option because of the specifics of the scheme rules (re. replacement requirements). Give people practical options especially in urban areas – some shared risk.

In the North York Moors rabbit control has been tried, but a partnership bid to get funding was unsuccessful. This may be a way forward - to mange these issues on a landscape basis, not just protecting individual trees.

Q. What is the panel's view of the currency of trees and the potential conflict? Is it possible to make carbon understandable as the currency of the future to help raise money for trees? Jonathan Wild, Bettys and Taylors

Comment from Jonathan about being careful with the carbon numbers quoted. He was interested in carbon being the new currency for trees but it is complicated and it needs detail to understand the carbon impact of a scheme. The traditional currency for trees was just the value of planting and protecting it for conservation.

Alan Simson, Leeds Beckett University: We should be looking to the "next practise" not "best practise". How we communicate is so important and is often too factual. Until recently trees were all about aesthetics but now being described as critical infrastructure, rather than the traditional green/blue/grey infrastructure descriptions. We need to change, as rapid change is happening and we are not changing fast enough (e.g. sourcing seed from Bordeaux for long lived trees for successful growth in Yorkshire).

Alternative tree tube trial

ALEX MACKINNON | NEW BUSINESS MANAGER | TILHILL FORESTRY

It is important and great that we're all here today to talk about tree tubes.

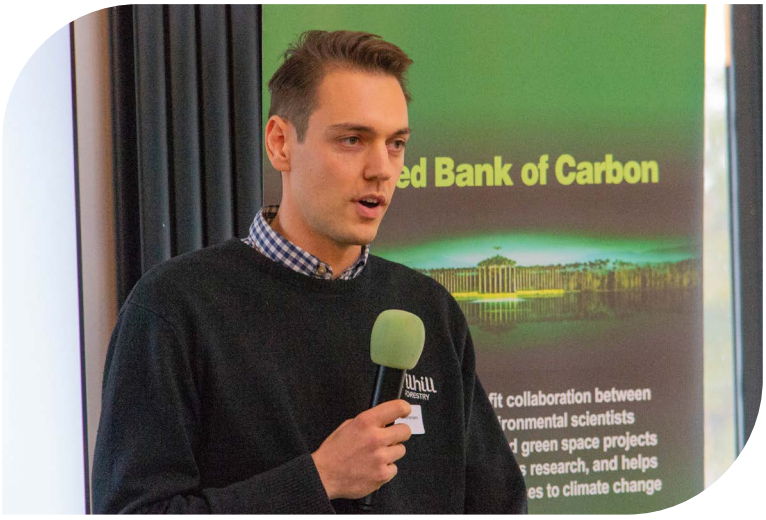
While I'm here to talk about the trials I've been carrying out looking at alternative solutions to the traditional plastic tree tube; within Tilhill Forestry we've also been spending time looking at solutions to one of the lesser seen and truly single use plastic issues, that of the tree bags which the young trees arrive in. We recycle these where possible but the wider environmental impact of their use shouldn't be ignored.

Tilhill Forestry has varying roles when it comes to the use of tree tubes. We may plant and maintain trees and be responsible for them for many years to come.

We may also carry out fixed price work where we are contracted solely to carry out the planting. In this case we may not be carrying out the maintenance and may have no responsibility and little influence over the future of the tubes.

We work with a variety of clients with differing objectives. All those I approached were very supportive of our trials.

At the end of the day, I don't know any clients that wouldn't prefer a suitable plastic-free alternative, but effectiveness, site conditions and cost implications will be considerations and these will vary for each client.



My trial came about as we started to look for environmentally friendly solutions to the use of plastics. Rightly so! We knew we needed some alternative options but were a little lost as to where to start. So I took on the challenge to carry out some trials internally and to see what the best solutions might be.

I scoured the internet for what available alternatives to plastic existed of which there were few, and was sent samples were I could find alternatives. I designed a (semi) scientific methodology to fairly compare the available options against each other and the original.

I chose five sites across southern England to test the tube alternatives on different sites and their slightly different environments.

Semi-scientific trial

- 10 x industry standard 1.2m Tubex tree shelter (Polyprop)
- 10 x no tubes
- 10 x Ezeetree 1.2m tube with Eucalyptus cane (cardboard)
- 10 x Chestnut stake 'cages'
- 10 x TreeBio 0.6 spiral with bamboo cane (Primarily Polylactic acid)

5 sites included:

- Mulched ground
- Grassland
- Clearfelled (no ground prep)
- Protecting both conifer and broadleaved trees
- Open skies and forest clearings
- Flat and sloping ground (minimal effect)

Results after 4 months

Tubex tree shelter

Pros

Still working
No degradation
Very Few loses

Cons

Eyesore & polluting

No tube/protection

Cons

Being eaten!

Ezeetree

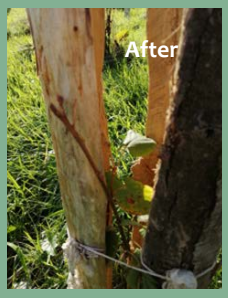
Pros

Still standing
Still protecting
(to a degree)

Cons

Sagging and slumping,
Tearing
Eyesore
Some squashing plants
1 completely collapsed

Chestnut pailing with wool deterrent



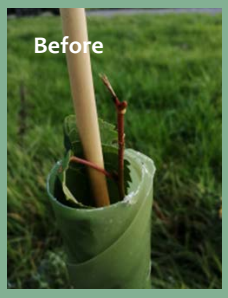
Pros

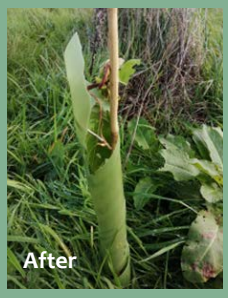
Still standing
String still intact
Wool still present

Cons

Trees falling out of 'cage'
are being Browsed
Wool doesn't seem
to be deterring deer
Can't easily spray around

TreeBio





Pros

Still there

Cons

Being over
topped by deer

Conclusions

Currently I would say Tree bio are fulfilling their purpose the best.

They will be cheap and easy to replace. But seem to be standing up well to the elements.

However the obvious downfall is the size as they are currently only available as 0.6m spirals.

I have heard that there will be a larger size in the market soon.

Manufacturers must consider all aspects of the shelters life.

- Production
- Transport
- Construction in the field
- Useful life
- End of life

Chestnut stakes as expected were the heaviest and took up the most volume to deliver. Impractical on a large scale.

I don't see a perfectly suitable alterative on the market yet, but this is very early days and I do think with a little pressure and funding we will find a much better alternative.

To conclude:

- No simple answers.
- No immediate replacement for the Tuley tube.
- Some plausible prototypes…
- To the industry looking into alternatives, please speak to all users as much as possible so we have a variety of options for different sites and schemes.
- There are now a few more alternatives under development, some look very promising.

What opportunities are there to change?

KEY THEMES ARISING FROM WORKSHOP DISCUSSIONS

- If there was move demand for alternatives, that would mean more funding becomes available for alternatives.
- Pressure and awareness needed, so the industry can adapt (eg the fast food industry adapted because there was a demand eg for no plastic straws, and compostable containers).
- The countryside stewardship scheme contract states that tubes must be removed. No regulation or enforcement, greater awareness is required.
- Lots of farmers appalled at plastic use and that they have all this plastic on the farm. The public is also very much up for reducing plastic. That's a tool we can use to pressure the industry to act differently.
- It's a hot topic with the public at the moment. Lots of interest from schools. How do we use that as a spearhead?
- Cash saving if tubes compost and don't have to remove and pay to recycle.
- Lots of European countries don't use tubes at all and just plant at a greater density.
- Changes coming to the grant schemes may provide an opportunity to promote alternatives. Current system requiring 100% survival rate means that landowners are reluctant to try alternatives due to risk factor.
- Youtube cartoon on how to plant trees.
- Scientists and academics could play a significant role.
- Tree planting is a massive thing in the media. Need education of where things are appropriate. Public perception is a big issue.
- End user not responsible for removing and recycling – this needs enforcing!
- Policing it is an issue. Most companies won't police it, even if long-term plans are in place. We're planting through a planning condition, but there's limited obligation to manage and look after the woodland.
- Scale not big enough to make recycling viable – estimated cost of recycling per tube £1 (Till Hill).
- Recycled into plastic furniture?
- Cost of recovery/recycling is the key issue. Need for legislation to ensure manufacturers are responsible for recovering and disposing of tree tubes.
- Wombling and other community initiatives to collect tree guards are becoming more and more popular, it's happening everywhere.
- New environment bill is coming. Grant aiding needs to include recovery/recycling element.
- Asking questions of government/industries about what happens to our waste. Need for more transparency.
- Factor in collection, removal as an actual cost of the product.
- What's the true cost of planting a tree? We need to make sure pledges and donations have money included for maintenance, not just the planting of a tree.
- Bulk and lightweight so recyclers are happy to take the tubes.

Next steps...

POSSIBLE ALTERNATIVES

1. Biodegradable tree tubes: Finding alternatives that are fully compostable on site and thus no need for future removal.

- What is wanted is not yet available - science isn't there yet – technology required is still 20 years away.
- Manufacturers do not know what they are innovating towards. Tree planting industry need to collaborate to create a brief – 3 to 4 criteria.
- There isn't a one-size-fits-all. Requirements will be site dependent. Need for a whole suite of options.
- Encourage Tubex and similar companies to push forward.
- When you factor in true cost of tubes & disposal some alternatives might look attractive.
- Need something that will last. There are cultural barriers / perceptions to the alternatives we need confidence and awareness in the alternatives.

2. Recyclable guards – reuse or recycle: removal and collection of redundant tubes and production of new reusable/ recyclable guards and their management.

- Costs are extortionate to remove tubes.
- Too many factors in quality to make recycling viable.
- More research needed into how we can recycle/ dispose of the existing tubes.
- Need to work together to recover and collect tree guards at multiple sites.
- There is no incentive to remove tubes – should the onus be on the tree planting contractors?
- Recyclers should be paying for raw materials.
- Manufacturing costs of recyclable products make it difficult to make commercially viable. Recycling of existing tubes is also problematic because of types of plastics/dirt etc. Most end up in landfill.
- Deposit scheme as an incentive for recycling / subsidies from government to incentivise recycling.
- There are cleaner ways of incineration and energy recovery – ceramic flues.
- Tubex research showed that incineration/energy recovery was the best option for disposal.
- Recovery is a short-term solution longer term we need a better product.

3. Planting without guards – removing the need for individual tree protection by looking at alternatives such as denser planting, fencing, control of pests/ browsers, increase herbicide use (env impact?) changes to grant aiding process.

- Changes to grants systems needed - that are based on 'new woodland creation' rather than x number of trees by year x , payment by results, new ELMS?
- Open mechanism that gives people the choice to create woodland in the way that they want.
- What about other planting methods?
- Natural regeneration takes decades.

What is required?

- Need a mechanism to share learnings? And know who is trialling what, in what way?
- Producers and users of alternatives need to talk.
- There is a need to accelerate the pace of trials.
- Need to think about how long trees need to be protected for.
- Just protect slower growing trees?
- Science and evidence for viable alternatives.
- Incentives needed to not use a tree guard.
- The scale of woodland creation is changing so there may be a need for a different model. Eg fencing and control seems far more appropriate on large sites compared to small scale tree planting where tubes may be the most cost effective.
- Scale of woodland creation is key – big sites may need an incentive or requirement to ensure alternatives are considered.
- Demonstration sites might be useful.
- Fencing and natural regeneration might be most appropriate on some sites. All sites are different. Look at the site and what are the constraints.
- Must take soil into account - if no woodland upstream, or close by, no possibility for re-seeding and regeneration. No seed bank on agricultural land (and soil releases carbon when churned up).
- Look at species that are less grazeable – generation of bramble.
- Forestry Commission has a science and innovation strategy in process. Guidance around alternatives would be helpful.
- Do nothing is a legitimate option. People need to understand the risks (eg re-planting costs, grazing pressures).
- Danger is if we emphasise recycling, plastic industry keeps going, end up with more and more plastic. Priority has to be what alternatives are we moving to.
- 25% increase in survival according to tubex. Add 25% on to planting, minus the cost of tubes – are the costs recovered? Then don't have cost of long-term plastic legacy.
- Cost is key - culturally we don't factor in costs of removal at the beginning of the process. Legislation might not get the right outcome but altering procurement policies might be a better approach.

What can individuals do within their organisation? Commitment to actions

- Industry led approach drive by everyone in the room.
- Commitment from leaders such as Woodland Trust and National Trust – not in silos.
- Education key – help people understand challenges and costs.
- Technical factsheet – how to recycle / best practice?
- Lobby forest fund managers.
- Commitment to stop / pledge to find alternative.
- Energy recovery good option.
- Collection and recycle scheme trial with 150 mile radius – cost of 6p to recycle one tube from the roadside seems to deter customers.
- Need to apply an integrated approach cause – factors – solution.

Other comments and considerations

- Woollen guards - it would be making use of a product that has little value and is plentiful in the area. The worry however, was that it wouldn't let light in.
- Suggestion that light is not essential - airflow is a more important issue.
- 'Wood chip' tubes have been suggested previously but considered quite costly.
- Other discussions for another day – grasses that sequestor carbon.
- Reusable guards!
- Biodegradable guards.
- Education of landowners.
- Enforcement of obligations.
- Forget about recycling - too much work!
- Part of standard woodland management – removal.
- Hectares not number of trees is a better way to talk about quantities.
- 2,000 hectares of guards in YDNP – legacy of plastic – many guard left at edges of woodlands.
- People who are planting are not necessarily the same as the people who manage the schemes.
- Getting something to degrade at the right time is problematic – there will always be variations.
- National Forest Company run a scheme.
- More shelters are used in other sectors that tree planting – viticulture etc.
- Plastics not the issue it's the management of them?
- Carbon is the new currency?
- A need to balance interest and drive (by many!) for more tree planting with the environmental impact.
- Should we consider carbon footprint– plant based plastics (where is the corn/maize/sugar cane grown?), use of resources in creating alternatives (water).
- Recycling - what is actually is possible/viable? We all know the issues of recycling plastics (clean, dirty, mixed plastics, UV inhibitors, plastic coatings, contaminated tree bags), incineration (energy recovery at site at Allerton Park), re-use (difficult to remove, bio-security risk on different sites).
- Education is key for all – definitions of sustainability, what do we mean/understand by bio-plastics, bio-degradable, compostable.
- Different answers for different sites – urban/rural/ required lifespan of alternatives (some trials suggest two years lifespan – not enough for upland sites?)
- Consider community engagement/volunteers in long term management of sites – tube removal.
- How much is money a barrier to development and trialling of alternatives? Impact of increasing 'producer responsibility'.
- Is a budget needed for recycling?
- Do we need to engage DEFRA and Natural England?
- Alternatives to use of plastic signage on site.
- Potential to link up existing initiatives.
- All want change – how can we influence change that is in the right direction (and what is that direction?)

"Producer responsibility will impact how producers are required to fund the recovery and recycling of plastic products in future" Jenny Robinson Resource Futures.

"Responsibility for collection and recycling should be the joint responsibility of those planting the trees and the manufacturers of the tree tubes" Catherine Waller, Tubex.

"We have a responsibility to educate younger people about the overall impact of products used to plant trees and how we plant them" Nicola Abbatt, Tilhill.

Whether because of public perception and/or reputational damage - all agreed things needs to change.

Closing words

CRISPIN THORN | AREA DIRECTOR | YORKSHIRE AND NORTH EAST | FORESTRY COMMISSION

Crispin summarised all the presentations and discussions from the day.

He explained that there was no single, simple answer but some plausible alternatives being developed. He gave recognition to the issue of scale. All wanting to increase the amount of woodland creation but this could result in a significant amount of increased plastic in the environment.

He stressed the need for taking responsibility for what we do – we all have a role to play in this discussion and can play are part in that. Collaboration and innovation are key to the future.

Next steps – share what has been generated from the day and continue to work towards solutions.

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