

Tube trials: alternatives to plastic

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Over a year ago, Tilhill decided to commence a trial to put non-plastic tree guard alternatives to the test. The company is proactively looking for ways to prevent, reuse or recycle plastic from its operations.

At the time of commencing our project, we considered ourselves to be the only members of the industry running such trials and reporting on the results, many of which were very much still in the prototype stage. To make sure the trial was fair and reliable we used ten of each alternative method or material on five different sites across the south of England. Over the course of the year we were pleased to meet others in the industry starting to develop their own alternatives and carrying out their own trials.

After one year of the various shelter options being tested out in the environment, we now have more robust results. Each shelter has been through storms, droughts and freezing temperatures. The results reflect the actual performance of the tubes in a real-life environment. The performance across each site is largely comparable with only subtle unique factors.

Trial result: Cardboard

We trialled two cardboard alternatives:

1. 'Egg box type of cardboard' (below left) This was possibly the most advanced in terms of design and manufacturing. The shelters were supplied nested inside each other but required folding into a cylinder shape and locking into place with inbuilt tabs. The tabs then doubled up to hold the shelter to a stake. The stakes supplied were very long eucalyptus poles.

These have worked well in terms of strength and durability. Being solid cardboard, these stakes were, as expected, completely opaque. This didn't appear to be a problem for the plants inside them. The shelters were relatively easy to construct and over the trial period have seemingly offered good protection from browsing animals.

A serious problem was that, over the year, the repeated wetting and drying of the shelter caused the material to lose its structural rigidity and collapse under its own weight. This happened to all shelters of this type on each site but one.

2. Thin, coated cardboard (below right) This type of cardboard shelter trialled wasn't supplied until later on in the trial, so results are only preliminary. This shelter was constructed of much thinner card coated with a plant-based film to help water resistance. Again, the shelter needed to be constructed using the inbuilt tabs, which turned out to be much trickier than the other cardboard version.

So far, this shelter has performed reasonably well, with some learning points. The stake must be level or protrude from the top of the shelter if not, the unsupported section will collapse over time. Any damage caused during construction also led to increased water ingress into the cardboard and contributed to the sagging and eventual collapse of the shelter.




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Trial result: Biodegradable plastic spiral shelter

With obvious limitations of only being a spiral rather than a full 1.2m tall, this shelter still performed as well as any other type of spiral.

It does, however, require more careful handling as the spiral is more brittle than previous standard non-degradable versions. In addition, when nested together the material needs to be kept dry and out of direct sunlight otherwise, we found that the spirals have a tendency to start melting and then stick together.

In our trial, many plants were browsed above the top of the spirals, but I understand full height variants are making their way to the market which will help alleviate this.

Trial result: Sweet Chestnut Stakes

As an alternative of our own, we developed a shelter made of several sweet chestnut stakes tied together by cotton string, so forming a simple cage around the tree sapling. In addition to this we then attached sheep wool to the outside of the cage as an additional deer deterrent. These were laborious and time consuming to deliver and construct on site but an interesting test regardless. The shelters are still present and correct and seem to be working until plants fall outside the cage, at which point they are susceptible to browsing.



Trial result: Flax Seed and Cashew Nut Resin

We were given just a few samples of a shelter made of flax seed and cashew nut resin. This shelter, although we only had very few samples has seemingly worked well so far. Very much a prototype, the shelter still requires fine tuning. Including an effective method of securing the two halves together, however, purely looking at the material, the shelter seems to stand up well to the elements and provide adequate protection to the tree.



How do alternatives compare to plastic tubes?

Finally, we incorporated ten standard plastic tubes and ten unguarded trees as controls. On inspection at almost all sites, the unprotected trees were either lost through animal browsing or rendered unidentifiable amongst other vegetation on site.

The ten protected controls in almost all cases were present and showing far improved signs of vigour when compared to all other examples. This goes to show the advantage that the current plastic tree shelters provide thus highlighting the scale of the challenge that finding a suitable alternative will be!

We look forward to more new and improved variants coming to the market soon and hold out hope that one will be a reliable alternative to replace the use of plastics.





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