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Arboriculture Research Note

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TREESHELTERS by J.Evans and C.W.Shanks

Summary
The technique of using treeshelters round recently planted broadleaeved trees is now widely practised throughout Britain. Trees inside shelters grow much taller than unprotected trees. Shelters also provide protection for mammal damage, readily identify the planting position and permit easier weeding with herbicides. A shelter life of about 5 years is desirable.

Introduction

1. Experiments on growing trees in vertical translucent or transparent plastic tubes (commonly known as tree shelters) started in 1979. These shelters which create a favourable microclimate around a tree by acting as individual greenhouses, have enhanced height growth of many species of newly planted trees.

2. Most shelters are 1.2m long to give protection against rabbits and roedeer but taller ones are needed if farm livestock, fallow or red deer are a problem. If only rabbit protection is required short (60cm) shelters may be used but any growth will be correspondingly less.

3. Control of competing weed vegetation with herbicides is easier with much less risk of damage to trees protected inside the shelters.

4. Treeshelters are now being adopted on a wide scale and it is estimated that over 6 million shelters had been used in Britain by the end of 1986.

Growth of Sessile oak (*Quercus petrae*) over 6 years

5. Sessile oak were the first trees to be planted in shelters and Figure 1. shows height development of these trees over a period of 6 years. Treeshelters accelerate early height growth but the “fertility” and yield class of a site are not changed by shelters- the trees grow more rapidly through the expensive establishment stage.

6. Figure 2 shows the effect of treeshelters on stem diameter development and stem volume over the same 6 year period. However, some recent experiments incorporating a very high standard of weed control (all weeds killed within one metre of each tree) have shown that good weeding alone can result in even better height and diameter growth.

7. A treeshelter should be left around the tree until it disintegrates naturally which should be after 5 to 10 years. Premature removal before adequate stem thickening has taken place may lead to stem snap or the need for some continuing support of the tree. In the original experiment, trees that had been in treeshelters for only 3 years were able to stand without support 2 years after the shelter was removed.

Response to treeshelters by other species

8. Nearly all broadleaved and most coniferous species show improved height growth when inside treeshelters. The appendix indicated that kind of response which can be expected by species.

Treeshelter materials

9. A treeshelter life of at least 5 years is desirable so that the tree can grow out of the top and produce an adequate stem. Ideally a treeshelter should provide a greenhouse effect for the first 2 or 3 years and then continue to give support and protection for another 2 or 3 years while the stem thickens.

10. Any clear or translucent plastic can be used to make a treeshelter and several commercial shelters are now on the market- see "Treeshelters-A guide to their use and information on suppliers".

Foliage damage, pests and diseases

11. Temperatures up to 48ºC have been recorded inside treeshelters but this has not caused any visible damage to the trees except for browning of some leaves pressed flat against the shelter surface. During the growing season the relative humidity inside the shelter is consistently high and at 100% for much of the time.

12. This "tropical" microclimate had not led to any increase in pest or disease problems, indeed there is for example evidence that oak mildew damage is reduced. The only possible exception has been with beech (*Fagus sylvatica*) which was defoliated on one very exposed site and suffered 10% mortality during the wet summer in 1985, but generally even this species grows well in treeshelters in later years.

13. Occasional reports have been received of birds falling into treeshelters and dying. These have been infrequent and, overall, the incidence has been no more than one death per 5000 shelters. The problem can only occur in the first one or two years before trees have grown out of the top and probably only for shelters with a thick rim.
14. Once trees have emerged above the top of the treeshelter some types of shelter may rub and fray bark, which may cause a long term weakness in the tree. The problem can be reduced by tying the tree to one corner of the shelter, stuffing straw in the top, or using the prevention devices available from suppliers. The problem is worst with large crowned trees on exposed sites with treeshelters which have an abrasive top edge. Most modern designs avoid the risk of damage to young trees.

15. Some of the older square corrugated polypropylene treeshelters have split down the corners after 3 or 4 years. This deterioration is worst on exposed sites and where trees have rapidly grown out of the shelter and begun to sway in the wind. The problem is much less likely to occur with treeshelters purchased today.

16. On the whole, vandalism to treeshelters has been slight. Breaking or pulling-up stakes have been most common; use strong stakes if vandalism is considered likely.

17. As treeshelters disintegrate there will be plastic litter which may prove unsightly in amenity plantings.

Further information

18. Information on treeshelter material and their use is available on request from the address below. More general information about treeshelters and the performance of individual tree species, the effects of other silvicultural practices such as weeding and fertilising, and experimental work, will be found in the literature. Shanks (1987) describes treeshelters currently on the market and gives details of their use.

Selected literature on Treeshelters

Evans J. (1987) . treeshelters. In *Proceedings of Advances in Practical Arboriculture.* Forestry Commission Bulletin 65.

Shanks, C.W. (1987). *Treeshelters-A guide to their use and information on Suppliers*. Arboricultural Advisory and Information Service.

Tuley, G. (1985). The growth of young oak trees in shelters. *Forestry 58* (2) 181-195.

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