



Arboriculture Research Note

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THE ESTABLISHMENT OF TREES IN EXISTING HEDGEROWS
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Summary

Planting is generally the most effective and economical means of establishing trees in hedgerows; the use of natural shoots and saplings being generally unacceptable or impracticable. Natural gaps occurring in the hedge should be utilised or notches cut to allow access for planting and weed control. Transplants should be used and protected with treeshelters. Weed control should be by a sheet mulch where possible, or by careful use of herbicides. The establishment of trees in new hedgerows is discussed in Arboriculture Research Note 90/90/ARB.

Introduction

1. Hedgerow trees are important landscape features and provide a valuable habitat for wildlife, particularly birds and insects. Additional benefits include: provision of stock, visual and noise barriers; shelter; encouraging game birds to rise to the gun and, ultimately, timer protection.
2. Trees and hedgerows have suffered badly due to factors such as entire hedgerow removal, Dutch elm disease, ash dieback and over aggressive flail cutting. Over maturity and decay, felling and lack of recruitment are reinforcing this loss.
3. This note reports on research into the establishment of trees in existing hedgerows.

Promoting existing hedge material

4. Selection of existing shoots of tree species from within a hedge appears to be a cheap and easy way of recruiting hedgerow trees. However, in many hedges there is a lack of suitable material for promotion into hedgerow trees. Hedge management by laying, coppicing or flailing creates deformity and weakness in the stems of potential hedgerow trees which, as the trees mature, could lead to windsnap. Saplings that have grown from seed in the base of the hedge are a valuable source of hedgerow trees, but the natural occurrence of saplings of a desired species in a suitable situation will generally be rare.

Establishing trees in hedgerows by planting

5. From eight experiments to investigate the establishment of trees by planting in existing hedgerows, distinct trends have emerged from first and second year results. Recommendations based on these results are summarized in figure 1 and detailed below.
6. **Notches cut in the hedge:** Cutting notches in an existing hedge into which to plant trees facilitates good planting practice and weed control. This practice will not eliminate below ground competition with the root systems of the established hedge, but will increase the light available to the newly planted trees. Survival of oak (*Quercus robur*) transplants after two years was increased from 20% to 70% when planted into notches cut in the hedge (fig.1) in combination with weed

control. Mean height increment of oak transplants, all protected with 1.2m treeshelters, was 26.7cm after two years when planted into a hedge compared with 66.6cm for those planted in 1.0m gaps.

7. Carefully cut notches in the side of a hedge should not require additional stock proofing, but in thin hedges where gaps are temporarily created, fencing of gaps may be required.
8. **Weed control:** The dense vegetation in a hedge, both woody and herbaceous, creates a strongly competitive environment into which to plant a tree. Although often not initially present, competition from herbaceous weeds can develop rapidly once a notch has been created. It is likely that the established hedge plants themselves exert a greater competitive effect than herbaceous weeds in the hedge base, but control of herbaceous weeds is the only practical way of reducing competition with the newly planted tree.
9. Although initially more expensive than chemical weed control, the use of black polythene sheet mulch is a robust, one off treatment. However, if laying mulch mats is very difficult due to the presence of woody root systems and large stones, chemical weed control is an alternative provided it is continued for several seasons and applied carefully to avoid damage to the hedge.
10. **Treeshelters:** Increased early height growth is the main benefit from the use of treeshelters in the hedgerow tree establishment. After one year the height growth of ash (*Fraxinus excelsior*) in a laid beech (*Fagus sylvatica*)/ash hedge bank was 23.3cm with the use of treeshelters compared with 10.0cm without. In a hawthorn hedge on a clay site, the height increment of ash whips protected with spiral guards was 20.2 cm over two years whilst that of ash transplants in shelters was 81.9cm.
11. The height of the tree shelter should, if possible, be to just above the height of the hedge to make a presence of such trees obvious to hedge trimmer operators, to encourage the emergence of a straight, well formed tree and to avoid the need to prevent the notch from growing over. Treeshelters should be tall enough to protect the tree from whatever browsing animals are likely to be present.
12. **Size of planting stock.** A common practice when planting in hedgerows is to plant trees that are taller than the hedge. Research has shown that this can result in unnecessary expenditure and poor stock survival (Davies 1987). In one experiment, the survival of Pedunculate oak whips (115cm mean height at planting) was only 19% compared with 87% survival of transplants (52cm mean height at planting). Transplants in tree shelters are most cost effective as they generally survive better and grow faster than larger stock sizes.
13. **Treatment combinations:** Survival and growth rates have generally been better where treatments have been combined. Chemical weeding and a 1.2m treeshelter resulted in 46% survival of beech transplants in a competitive beech hedge bank compared with 8% survival of trees receiving only chemical weeding or no treatment and 0% survival for unwedded trees in shelters. After two years growth, oak transplants planted in 1.0m gaps with shelters and a sheet mulch showed a 40cm height advantage over those in treeshelters in the hedge with neither gap nor weed control.

Figure 1. The recommended method of establishing trees in existing hedgerows.

Conclusions and Recommendations

14. In existing hedgerows, trees should be planted as transplants and protected with treeshelters. Natural gaps occurring in the hedge should be utilized or notches cut to facilitate good planting

practice and weed control. Weed control should be by sheet mulch where it can be laid and with appropriate herbicides in situations where the use of sheet mulch is impractical. The height of the treeshelter should, if possible, be just above the height of the hedge, to ensure that a straight, well formed tree emerges from the top of the hedge, and to make the presence of such trees obvious to hedge trimmer operators. If shelters and sheet mulches are used gaps can be allowed to grow over. However, gaps must be kept open for access if chemical weed control is used and to reduce above ground competition if treeshelters are not used.

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Reference

DAVIES, R.J. (1987) a comparison of the survival and growth of transplants, whips and standards, with and without chemical weed control. *Arboriculture Research Note 67/87/Arb*. Forestry Commission Edinburgh

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