



Arboriculture Research Note

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THE ESTABLISHMENT OF TREES IN NEW HEDGEROWS

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Summary

Experimental results demonstrate that the use of polythene sheet mulch is the most effective method of establishing new hedgerows. Transplants, protected with 1.2 treeshelters, should be used to establish trees within hedgerow. The cost of weed control in new hedgerows and of establishment of trees in existing hedgerows is discussed in Arboriculture Research Note 91/90/ARB

Introduction

1. Hedgerows and 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, timber production.
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. Overmaturity and decay, felling and lack of recruitment are reinforcing this loss.
3. An expansion of hedgerow and hedgerow tree planting can only slow this trend if it takes place in a continuous and sustained way using effective methods of hedgerow and tree establishment.
4. The effect of different methods of weed control on the establishment of hedging plants and hedgerow trees are under investigation in three experiments and early results are already indicating the effectiveness of various techniques.

Hedge establishment

5. In one experiment, a double row hawthorn (*Crataegus monogyna*) hedge was planted at 25cm spacing on a sandy site adjacent to an existing gappy hedgerow. Half of the transplants were weeded using 1.0m wide polythene sheet mulch (laid by hand prior to planting), whilst the remaining plants were not weeded. Both height and stem diameter growth of the hawthorn transplants were significantly improved with sheet mulch; the difference in mean height being 17.2cm after two growing seasons.
6. In a second experiment, 800m of new hawthorn hedge are planted on a free draining site with three weed control treatments; black polythene sheet mulch, herbicide and no weed control. The even nature of the land to be planted allowed a tractor mounted mulch layer to be used. The transplants were planted through small slits in the mulch. The first year height and stem diameter increments were significantly greater with sheet mulch than with either no weed control or chemical weed control.
7. The ecological effects of the use of sheet mulches in a hedgerow situation are largely unknown. Such mulches become buried in leaf litter after one or two seasons and thus cease to be visually intrusive. However, leaf litter will prevent sunlight degrading the polythene and it will remain buried at the base of the hedge for many years, influencing the recycling of nutrients in that narrow strip and possibly affecting the colonization of the hedge base by plants and animals. The high density of hedging plants makes the removal of the plastic mulch, after its useful life, difficult.
8. The application of broad spectrum herbicides around new hedgerows with knapsack sprayer or drench gum is generally impracticable due to the close spacing of the hedging plants, but such broad spectrum

herbicides can be applied using a hand-held direct applicator (Lane,1990) although hand weeding of rank weed growth is requires to improve the effectiveness of this method. Grasses can be successfully controlled using selective herbicides such as propyzamide and atrazine (Williamson and Lane,1989).

Hedgerow tree establishment

9. Treeshelters and weed control. In the experiment on a sandy site the total height increment of Field maple (*Acer campestre*) after two years was 110cm where both mulch and treeshelters were used; significantly greater than the 69cm for shelter alone and 36cm for mulch alone. The absence of mulch and shelters gave 50% survival of oak transplants compared with 100% survival with either mulch or shelter or both.
10. The first year survival of Wild cherry (*Prunus avium*) planted into another new hedgerow was significantly better with chemical weeding (96%) and sheet mulching (94%) than with no weed control (67%). The first year height growth of trees weeded sheet mulch (7cm) was significantly greater than that of trees with no weed control (-11cm) or chemical weed control (-8).
11. Size of planting stock. The survival of oak (*Quercus robur*) whips (115cm mean height at planting) planted into a new hedgerow was only 19% as opposed to 87% survival of transplants (52cm mean height at planting). This is likely to be due to the better root to shoot ratio of the transplants.
12. In the experiment involving 800m of new hedgerow on a free draining site the first year survival of the four stock sizes used was: seed 67%; transplants 89%; whips 86% and half standards 100%, the survival of seed being significantly lower than that of the other stock sizes. The fact that Wild cherry establishes easily is indicated by the good survival of the half standard stock. In another experiment (Davies, 1987) oak and hornbeam, which do not transplant easily, have established much more successfully from smaller stock than from half standards. Such differences in ease of transplanting are explained by Sturve(1990) in terms of differences in root morphology; fibrous rooted species transplanting more successfully than coarse rooted species. Work is under way to categorize species according to ease of establishment.
13. There were significant height growth differences between the Wild cherry stock size; the most notable being 22.8cm height growth for seed in contrast to the various degrees of dieback experienced by the other stock sizes . The mean height increment of mulched seed was particularly high (36.2).

The cost of hedgerow and hedgerow tree establishment

14. Costing information has been collected on the establishment of 800m of new hedge. Costings after the first growing season are summarized below (excluding any adjustments for replacement or losses) expressed in 1989 prices.

	Labour	Materials	Total
Hedging plants (cost per metre of hedge)			
Unweeded	£0.22	£1.50	£1.72
Chemically weeded	£0.49	£1.52	£2.01
Mechanically laid sheet mulch	£0.24	£1.96	£2.20
Hedgerow tree (cost per tree)			
Half standards	£0.39	£3.58	£3.97+
Whips	£0.12	£1.84	£3.97+
Transplants	£0.08	£1.14	£1.22+
Seed	£0.09	£0.99	£1.08+

(+ These figures include the cost of protection with plastic mesh guards, but do not include any weeding costs, these being incorporated into the hedging plant cost.)

Conclusions and Recommendations

15. New hedgerows should be established using polythene sheet mulch, laid mechanically, where the ground is even and a machine is available, or by hand. However, in some situations where grass is the dominant weed species a graminicide only regime of chemical weed control may be used in establishing new hedgerows. The regular chemical weeding of closely spaced hedge plants with broad spectrum herbicides is difficult and time consuming and thus there is little additional expense required for the use of polythene sheet mulch. Hedgerow trees are most cost effectively established using transplants protected with 1.2m treeshelters. Direct sowing of germinated seed in treeshelters merits further research.

16. Anon (1982) gives practical advice on the planting of hedgerows and creation of hedge-banks.

Before using a herbicide always read carefully the manufacturers instructions on the label (including any accompanying leaflet) and apply the chemical for the use, at the rate and by the method recommended paying particular attention to aspects of safety.

Acknowledgement

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References

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