



TREE SEEDING

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NOTE 10

Best Practice Guidance
for Land Regeneration

Introduction

Establishing woodland on reclaimed land is a complex process! To achieve a sustainable tree cover many activities need to be performed satisfactorily. Each successive operation depends on the quality of the previous one. This 'rule of thumb' applies strongly in the case of tree establishment. Conventionally, this has usually been achieved by tree planting, using tree stock grown from seed or cuttings in the nursery. However, alternative methods have been proposed and used in land reclamation, which involve the direct sowing of tree seed onto the site in question (Figure 1). This Guidance Note reviews the tree seeding practice for reclaimed brownfield land, taking account of modern guidance on site preparation and recent research on tree seeding technology.

Advantages and disadvantages of tree seeding

Compared to conventional tree planting, direct seeding is said to have a number of advantages. For example:

- Tree seed of many species is comparatively inexpensive, and woodland so created can be cheaper than using the equivalent nursery stock.
- Tree seeding is more ecological – it mimics nature more closely than artificial planting.
- Woodland emanating from tree seeding is more natural looking – it doesn't look artificial like lines of planted trees.
- Growth from tree seed results in rapid ground coverage and reduced herbicide use.
- Tree seeding and associated operations can be mechanised, using modified agricultural machinery.
- Woodland created by seeding may be more robust, and gives more opportunities for selection of quality timber trees.

In contrast, seeding has a tendency to produce uncertain results, even if carried out according to best practice. The technique is prone to the effects of weather extremes, and seed depredation from mice, voles, squirrels and some bird species.

Methodological considerations

Direct seeding is not suitable on all types of substrate. Heavy textured, clayey soils or spoils subject to winter waterlogging should be avoided – and these soils are often used for vegetation establishment on landfill sites. Low-lying areas in the landscape are unsuitable for similar reasons.

It is an often overlooked issue, but to achieve a sustainable woodland whether using direct seeding or conventional planting, the underlying substrate must be capable of allowing tree roots to penetrate and exploit the substrate volume. Direct seeding is no alternative to suitable soil preparation and if compact, decompaction must take place, using complete cultivation or deep ripping.



Figure 1 Example of the type of woodland that results from successful tree seeding.

Another myth that has grown up with the direct seeding technique is that it requires little or no management – it is a natural process and therefore human interference is counterproductive. Yet, there are several operations that must be undertaken if woodland, rather than scrub, is to be achieved. These include:

- **Seed pretreatment.** Seed of most species chosen for native woodland establishment requires pretreatment to break dormancy. This may take up to 48 weeks depending on species. Seed cannot simply be spread from freshly collected sources.
- **Seedbed preparation.** It is recommended that all sites should be fully cultivated and rotavated to achieve a fine firm tilth.
- **Sowing at appropriate depth(s).** Different tree species require their seeds to be placed at different depths to ensure maximum germination. Sowing must take place at the appropriate time of year, normally in the autumn.
- **Protection against mammal damage.** Woodland plots established by direct seeding will still require protection from rabbits and deer if they are present in the area.
- **Weed control.** Effective weed control is vital, especially in the first year after germination. This is usually accomplished using herbicides. However, further weed control is likely to be needed for another 1 to 3 years, depending on aggressiveness.
- **Thinning and respacing.** Trees will generally be too densely spaced after establishment, and thinning or respacing will be required to prevent the intense competition which results in thin weak stems. Herbicide may be needed to prevent resprouting.
- **Monitoring and inspection.** Woodland established using direct seeding is very dynamic in nature and frequent inspection or monitoring is needed to plan for weed control, respacing or protection from mammals.

Direct seeding therefore requires a greater silvicultural proficiency and greater supervisory responsibility than conventional planting.

Suitability for reclamation of brownfield land

Direct seeding can produce pleasing results, and may be appropriate on parts of some brownfield sites in certain circumstances. However, one of the main advantages of seeding, namely its ability to be mechanised, cannot be taken advantage of on sites where final soil or soil-forming material cover has been placed by loose tipping or complete cultivation. In addition, seeding requires the production of a fine seedbed which can be difficult to produce in materials often used as final cover on reclaimed sites. Direct seeding therefore seems most suitable on parts of a reclamation site where natural soils are present and relatively undisturbed. It is not recommended for most areas of the site where soil materials have been moved and placed in the course of mineral extraction, landfilling or reclamation operations. Limited tree seeding may be possible by hand if soil conditions are suitable, though this is unlikely to be a widespread option.

Because of the inherent risks associated with direct seeding, it is not considered suitable for sites where a 5-year aftercare period follows the restoration process, i.e. those sites reclaimed after mineral extraction or landfilling. If woodland fails to become established using this technique there will be inadequate time in which to demonstrate satisfactory woodland cover by other means. But direct seeding may, for similar reasons, be unsuitable on some sites in urban areas where public expectation of a successful reclamation is high. Direct seeding may be permissible where time constraints are less, and where risk of failure can be tolerated. However, the technique should never be used as a cynical means of avoiding proper attention to restoration and silvicultural operations.

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Further reading

- Moffat, A.J. and McNeill, J.D. (1994). *Reclaiming disturbed land for forestry*. Forestry Commission Bulletin 110. HMSO, London.
- Willoughby, I., Jinks, R., Gosling, P. and Kerr, G. (2004). *Creating new broadleaved woodlands by direct seeding*. Forestry Commission, Edinburgh.