

WEED CONTROL

Geoffrey Sellers

BPG

NOTE 11

Best Practice Guidance
for Land Regeneration

Introduction

Weed control is of fundamental importance when planting trees, particularly during the establishment phase which may last up to five years. Weeds compete for nutrients, water and light, and can severely threaten the survival and early growth of newly planted trees. Failure to control weeds represents one of the single most important factors leading to tree loss.

Weed control methods fall into two broad categories: cultural/mechanical and chemical (see, for example, Figure 1). These are often used in combination to provide effective long-term control. Whatever appropriate weed control strategy is chosen, it is likely to be intrusive and may appear expensive. However, weed control is cost-effective when considering costs which would occur if trees needed replacing because of death from weed competition.

Factors to be considered when choosing a weed control strategy

There are few circumstances where there will be no requirement for weed control, but deciding on what your strategy will be, and how intensive it should be, is based on a number of factors.

- Type of tree chosen and area into which it is planted. Trees planted into more fertile land, for example well-restored brownfield sites, are likely to need more intensive weed control measures than trees planted in infertile areas. This is because the land is likely to contain a large weed seed bank and repeated application of herbicides or a combination of several methods may be needed to gain full control of the weeds during the establishment phase.
- Environmental factors need to be evaluated as all weed control methods, whether cultural or chemical, will have both positive and negative environmental effects.
- Timing of weed control is important. It is often better to control weeds pre-emptively rather than to try to deal with a weed problem retrospectively after the situation has become severe. Avoiding a problem is better than taking remedial action.

Weed control methods

Cultural/Mechanical

Cultural weed control methods include the use of fast-growing plants to suppress weeds, and mulching. Mechanical weed control methods include hand-pulling, hoeing and mowing. With any weed control strategy, basic cultural/mechanical good practice should be followed.

- Carry out appropriate ground preparation which does not lead to over compaction. For example hoeing or ploughing, which reduces compaction, can sometimes be beneficial through cutting.



Figure 1 Spot application of herbicide around base of newly planted trees.

- Use quality tree planting stock as it will be able to resist competition better and will become established more quickly.
- Use trees appropriate to the environment and substrate that they are to be grown in. For example, on disturbed land, it is better to choose robust varieties of transplants and containerised stock rather than specimen trees. On more fertile sites, fast growing tree species that can reach canopy closure more quickly may be more appropriate.
- On brownfield sites it is advisable to plant in the late autumn allowing plants to settle in rather than risk spring planting when they will have little time to establish a foothold before being subject to competition from faster growing weeds and possible drought.
- Choice of weeding option may be dictated by ground or weather conditions. On brownfield sites where total cultivation has taken place prior to planting the ground may be too soft in the first season to allow for any form of mechanical weeding. It is also better to weed early rather than delay treatment as inclement weather may preclude chemical weeding beyond a time when plants have become severely distressed, have died or are almost impossible to locate.

Other cultural techniques that may be appropriate to a chosen site include:

- Establishing a low maintenance grass sward on areas to be planted will reduce the opportunity for broadleaved weeds to establish, minimise the risk of soil erosion and improve the appearance of the newly restored site. Spots or bands around each tree can then be kept free of vegetation by cultural or chemical means (Figures 1 and 3).
- Planting as soon as possible after primary cultivation cuts the time that land is left fallow, which reduces the amount of time for weed seed to germinate. This is often important when reclaiming brownfield sites where exposed land can quickly become colonised by pioneer weed species that may be difficult to suppress later.
- Closer spacing of trees reduces the amount of weeding that is required over the medium term because canopy closure occurs faster, thus leading to the shading out of weeds. Trees should not be planted at less than 2500 stems / ha (2 m x 2 m). It has been found that spacing at 40 000 stems / ha (0.5 m x 0.5 m) substantially reduce weed control requirements. Direct seeding of broadleaves at 10 000–50 000 stems / ha has been used on some brownfield sites. However, some extra expense may be incurred later on when very dense stands of trees need to be thinned out or remedial measures are needed because the saplings have grown too tall and thin.
- Cutting is often used to control some weeds. The method has little effect against grasses but may be effective against some annual herbaceous species. However, continuous cutting favours the development of grass weeds.
- Mulches reduce soil moisture loss and suppress weeds. There are many different types of mulches available such as wood chippings, straw and impermeable plastic sheeting (Figure 2). Mulches should create a 1.2 m diameter weed free spot to prevent root ingress from weeds at the margins. Impermeable barriers such as plastic sheeting can also warm the soil, which improves tree root growth thus aiding establishment. However, all mulches are relatively expensive compared to chemical methods.



Figure 2 Mulching using plastic sheeting.

Chemical

Herbicides are often the most cost-effective way of long-term weed control but if misused they carry a greater environmental and pollution risk which has to be taken into account. The usual method of weed control is to target a 1–1.5 m spot or band around the tree (Figure 3). Sometimes, on areas of land heavily infested with established weeds or where fast establishment of trees is required, total weed control is needed, but this is a rare occurrence. After establishment, grasses and wildflowers can recolonise the spot or band to improve the biodiversity and appearance of a site.

This BPG Note does not specifically cover herbicide groups or make any recommendation about their use as this is an extensive topic. Information on herbicide selection can be found in the Further reading section. However, there are two broad categories of herbicides available:

1. Foliar acting herbicides, which are used to control weeds that have already appeared.
2. Residual soil acting herbicides, which are applied as a layer to the soil before the weeds become established and act as a chemical weed control barrier.

Pre-emptive control is usually more successful with herbicide treatments than trying to deal with a weed problem once it has arisen. For example, it is often more effective to use a soil acting residual, which forms a chemical barrier just below the soil surface, killing germinating weed seeds before they emerge. This can give six months of good weed control between applications as long as the soil surface is not disturbed. This technique is more successful than attempting to use repeated sprays of foliar acting herbicides on large well-developed weeds at a later stage, in an effort to resolve an established weed problem.



Figure 3 Maintaining weed-free bands around trees using chemical control.

Special regard should be given to the use of chemicals in the environment especially with the use of chemicals in the vicinity of surface or ground waters. In general, this means that if you are spraying 'near' to water courses ('near' in this context means on a river bank or next to a lake), then you need to consult or reach agreement with the local water regulation authority (Environment Agency for England and Wales, Scottish Environmental Protection Agency for Scotland). For pesticides with a buffer zone requirement (refer to www.pesticides.gov.uk for further details) then a Local Environmental Risk Assessment Plan needs to be agreed with the relevant water regulation authority.

Herbicides can cause damage to the aquatic environment, in some cases at low concentrations. The water industry has a statutory duty to reduce individual pesticide concentrations to below 0.1ppb in drinking water, which necessitates expensive water treatment. Chemical spraying should always be kept to a minimum but anyone planning to spray herbicides near watercourses including structures such as drains should refer to the *Guidelines for the use of herbicides on weeds in or near water courses and lakes* (MAFF, 1995) to obtain information on approved products to be used near water courses. In general, it is good practice not to spray pesticides within 10 m of streams, 20 m of lakes and reservoirs or within 50 m of a borehole or well. Lists of approved pesticides can be obtained from the Health and Safety Executive (HSE) websites.

Even so, prior approval or advice for your spray programme needs to be obtained from the relevant water regulation authority.

Further information can also be found in: *The UK Forestry Standard* (Forestry Commission, 2011); *The use of herbicides in the forest* (Willoughby and Dewar, 1995); *Reducing pesticide use in forestry* (Willoughby et al., 2004); *Pesticides: code of practice for using plant protection products* (Defra, 2006).

References and further reading

Department for Environment, Food and Rural Affairs (Defra) (2006). *Pesticides: code of practice for using plant protection products*. Defra Publications, London.

Forestry Commission (2011). UKFS Guidelines: Water, in *The UK Forestry Standard*. Forestry Commission, Edinburgh. 78-84.

MAFF (1995). *Guidelines for the use of herbicides on weeds in or near water courses and lakes*. PB2289. DEFRA, London.

Willoughby, I., Evans, H., Gibbs, J., Pepper, H., Gregory, S., Dewar, J., Nisbet, T., Pratt, J., McKay, H., Siddons, R., Mayle, B., Heritage, S., Ferris, R. and Trout, R. (2004). *Reducing pesticide use in forestry*. Forestry Commission Practice Guide. Forestry Commission, Edinburgh.

Willoughby, I. and Dewar, J. (1995). *The use of herbicides in the forest*. Forestry Commission Field Book 8. HMSO, London.

Useful links

www.forestry.gov.uk/pesticides

www.pesticides.gov.uk