



Arboriculture Research Note

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Blight to trees caused by vegetation control machinery

By D Patch, Arboricultural Advisory and Information Officer
and A Denyer, Forestry Officer, East Sussex County Council

Summary

The damage that can be caused to trees by grass and weed cutting machinery is reviewed and alternative treatments are recommended.

Introduction

1. The penalties for not maintaining weed free conditions around the base of young trees are reduced tree survival and [or early growth (Davies, 1987a). However, on many sites trees are still being planted into grass sward. These swards and those around established trees are routinely mown to achieve a degree of tidiness and formality, but the machines used often damage the bark at the base of the stem and on surface roots. The cautious machine operator will keep away from trees but that leaves tufts of vegetation around their stems, which compete for soil water and can depress tree growth (Potter, 1988). Such tufts are also considered by some managers to be unacceptably unsightly. This Note discusses the disadvantages of mechanical weed cutting and suggests preferable alternatives.

The Dangers of mechanical vegetation control

2. The sward of many public open spaces is cut by self powered gang mowers, flails, rotary cutter or pedestrian-operated power-driven mowers. If these machines strike the base of a tree a piece of bark may be knocked off and the exposed wood may be damaged. Callus growth at the edges of the wound is frequently prevented or damaged by a later pass of a machine. Even mature trees may suffer in this way, the prominent buttresses and surface roots being particularly vulnerable.
3. Rotating filament cutter (e.g. 'strimmers') and pedestrian-controlled clearing saws can be effective tools for cutting the tufts of herbaceous vegetation around the base of trees. However, control of the tool is critical- even the slightest misjudgement of the position of the end of the rapidly rotating filament or blade can result in damage to the bark, especially on young trees. Even the thick bark of a mature tree can be damaged in this way.
4. Damage to the bark and cambium, whether bruising or laceration, will restrict or prevent movement of sugars from the leaves to the roots where they are needed for growth. Repeated injury of this kind will prevent the development of callus tissue or even enlarge the wound. If the stem is girdled, dieback down to the wound will occur. Conifers will usually be killed outright by such damage, but most deciduous trees will produce new shoots from below the wound. If the original objectives of the planting are to be fulfilled these regrowth shoots will need intensive pruning over several years. However, many landscape plantings use ornamental varieties which are grafted or budded onto a root stock and regrowth shoots from below the wound may be from the rootstock and differ markedly from that of the original 'tree'.
5. Once the bark has been broken, fungal or bacterial pathogens may enter and, by killing the cambium, enlarge the wound or delay callusing. Where the wood is fractured, wood rotting fungi can enter the stem and decay will then develop. In either case the wound will result in a physical weakness and the stem could snap at that point.

6. The use of plastic tree guards designed to protect the stems from mechanical damages goes some way to preventing these problems, but the guards themselves may constrict the stems as they increase in diameter. Timely removal of the guards must, therefore, be programmed but that could leave the trees vulnerable to future mechanical damage; alternatively the guards must be replaced with guards of larger diameters.
7. In addition to inflicting mechanical damage to the tree, cutting herbaceous vegetation can also adversely affect young trees by stimulating the weed plants into vigorous growth (Davies & Gardiner, 1989). Absorption of water from the soil by the weeds is then increased and the trees may suffer more from the weed competition than if the weeds had not been cut at all.

Alternative Weed Control Strategies

8. Applications of an appropriate herbicide (McCavish & Insley, 1992) correctly applied by certified staff is an efficient and safe method of controlling vegetation around newly planted trees (Davies 1987a). Even so, because of the often ill-informed adverse publicity given to herbicides there is continuing resistance to their use in public places.
9. Organic and plastic sheet mulches are also effective in suppressing herbaceous vegetation and conserving moisture (Davies, 1987b and 1987c). The principal disadvantages of organic mulches are that they may be blown away and that they can become colonised by seedling weeds so that routine topping-up or weeding will then be needed.

Recommendations

10. Machinery, whether gang mowers, flails or rotary cutter, pedestrian-operated power-driven mowers, clearing saws or filament cutters, should never bee used close to trees as they can injure stems and surface roots. Such damage can have long term implications for the safety, health and growth of the tree.
11. Herbaceous growth around trees is effectively controlled by a plastic sheet or organic mulch applied at planting or by periodic applications of an approved herbicide. Such methods will be more effective in reducing water absorption from the soil by grasses and weeds than mowing or cutting them with potentially damaging machines. Improved tree establishment and early growth will be the reward.

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Arboricultural Advisory and Information Officer
Forest Research Station
Alice Holt Lodge

Wrecclesham
Farnham
Surrey
GU10 4LH

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