Wider application

Newly planted trees benefit from weed control around their base. However, the choice of method of control is dependent on many factors. If mulching is the preferred weed control option then the mulch type should be based on:

Coverage	The mulched area should be at least 1m^2.
Effectiveness	Weed growth should be suppressed for the entire duration of the life of the mulch (i.e. for at least three years after planting).
Cost	Cost differences can be considerable when large numbers of trees are involved. e.g. for 1 hectare of newly planted trees (2500 number) material costs would be:
	Black polythene sheet - £450
	Coir matting - £5000
Ease of application	Distance from roadside and ease of laying must be taken into account.

The appearance, availability and other environmental factors will also influence choice.
There are significant differences in the effectiveness of the different mulches.
Woven polypropylene out-performed all other mulches in this trial.

Further information

National Urban Forestry Unit

This leaflet is one of a series produced by the National Urban Forestry Unit. NUFU provides a national focus for the exchange of information and good practice in urban forestry.

If you would like further information on other case studies or their application, or if you have examples of good practice to share with others, please contact:

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Further reading

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Urban Forestry in Practice

Mulches as a method of weed control around trees

CASE STUDY 6

Mulches as a method of weed control around trees

Introduction

One of the major causes of poor performance of newly planted trees is competition from weeds. Weeds compete with the tree for water, nutrients and sometimes light, causing a much reduced growth rate or even the death of the tree.

Weeds can be controlled by physical removal, by the application of herbicide or by laying sheet or particulate material around the base of the tree to create a mulch.

Specific example

Project name and location

MULCH TRIAL land adjacent to Fowlers Playing Fields, off Stafford Road, **WOLVERHAMPTON**, West Midlands. Grid reference: SJ 918 007

Project partners

- National Urban Forestry Unit
- Wolverhampton Metropolitan Borough Council

Project objectives

The mulch trial aimed to test the effectiveness of seven types of mulch in suppressing weed growth around newly planted trees, by monitoring their growth rates. The mulches were assessed for their performance, appearance, ease of application and price.

Site description

The experimental trial plots were located within a larger 5 hectare planting scheme on a site previously used as allotments, but subsequently used for a small amount of tipping of inert building materials and parks green waste. The site was flat, uniform and had no significant toxicity problems.

Project design

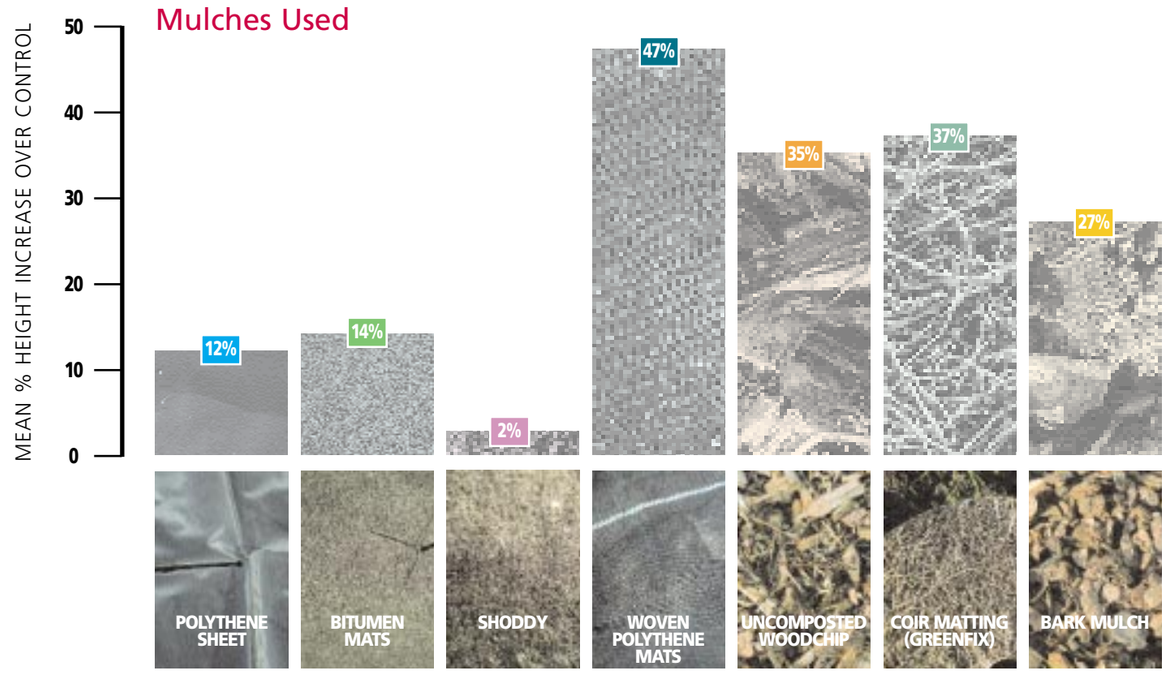
The trial was designed by the National Urban Forestry Unit. 15m x 7.5m trial plots, each containing 50 trees, were laid out in two main blocks. Each block contained all seven mulch treatments with two replicates of each treatment giving a block total of 14 plots and 700 trees.

The ground was ripped to a depth of 500mm to achieve uncompacted growing conditions.
The trees (450 –600mm, bare root transplants) were planted at 1.5m x 1.5m spacing.
Common alder *(Alnus glutinosa)* was chosen for the trials as it is a hardy, fast-growing pioneer species.

To ensure that the effects being measured were attributable solely to the use of the different mulches, each trial plot was divided in half. One half of the trees was weeded with herbicide in addition to the use of mulches to ensure complete weed control and the other half had the mulch only. Mulches were applied immediately after the trees were planted in February 1993.

Monitoring

Each tree was measured immediately after planting for overall height and for girth at 10cm above ground level. Growth of the trees was then monitored for one growing season.



POLYTHENE SHEET	BITUMEN MATS	SHODDY	WOVEN POLYTHENE MATS	UNCOMPOSTED WOODCHIP	COIR MATTING (GREENFIX)	BARK MULCH
Black 500 gauge sheet cut into 1m x 1m squares, cut to the centre point and placed around each individual tree. Edges of the sheet were dug into the ground to make them secure.	500mm square mats of bitumastic felt placed around each individual tree. Edges of the mat were weighed down, using bricks and rubble found on the site.	A non-woven wool matting cut into 1m x 1m squares. Applied as for polythene sheet.	1m x 1m squares of woven black polythene sheet placed around each individual tree and secured using metal pegs.	Derived from street tree / other woody prunings (average chip size 20 - 40mm). Applied evenly around each tree in a 0.5m radius to a depth of approximately 100mm.	A non-woven matting derived from waste coconut husk fibres. 1m x 1m squares and applied as for polythene sheet.	Coarse grade bark (20 - 40mm) composted for at least six months. Applied as for uncomposted woodchip.
Material unit cost £0.18	Material unit cost £0.30	Material unit cost £0.50	Material unit cost 0.50	Material unit cost 0.50	Material unit cost 2.00	Material unit cost 1.50
Installation cost £0.60	Installation cost £0.75	Installation cost £0.60	Installation cost 0.60	Installation cost 1.20	Installation cost 0.60	Installation cost 1.20
Total cost £0.78	**Total cost £1.05**	**Total cost £1.10**	**Total cost 1.10**	**Total cost 1.70**	**Total cost 2.60**	**Total cost 2.70**

Analysis

An analysis of the results (Analysis of variance) showed a statistically valid difference between the performance of different mulches. Where herbicide was used in conjunction with the mulch, no significant differences in tree growth were found between the different mulch treatments. This showed that the differences detected in the trial were directly attributable to the effect of the mulches on weed growth.

In promoting the initial tree growth, the two most successful mulches were woven polypropylene and coir matting. There was little discernible difference between the woodchip and the bark, despite one being a composted product (bark) and the other recently chipped, street tree prunings.

The bitumen and black polythene mats did not perform as well as the above, possibly due to their slightly smaller size (0.6m^2 as opposed to 1.0m^2 for the other sheet mulches). Although this precludes them from statistical comparison* with the mulches covering 1m^2, they were included for general comparison as they are a readily available commercial product.

Shoddy benefited tree growth very little due to its fairly rapid disintegration and the tendency of weeds to grow through the material.