Heavy Mulching

EROSION CONTROL TECHNIQUE

Revegetation		Temperate Climates	✓	Short-Term	✓
Non Vegetation	[1]	Wet Tropics	✓	Long-Term	✓
Weed Control	✓	Semi-Arid Zones	✓	Permanent	

[1] Heavy mulching can be used in association with established plants and newly established seedings.

Symbol

Photo 1 – Heavy mulching used for temporary erosion control measure instead of grassing (pre-building phase)

Photo 2 – Heavy mulching of garden bed

Key Principles

1. Heavy mulching can be used to control weed growth and soil erosion on flat to medium sloping land not intended to be grassed. Critical application measures are percentage cover (ideally 100%), and depth of cover (application rate).
2. If a final landscaping plan is available during the construction phase, then heavy mulching of future garden beds is recommended.
3. Consider *Rock Mulching* in areas subject to concentrated overland flow.
4. If water conservation is critical, then avoid fibrous mulches that may absorb excessive quantities of water.

Design Information

Minimum 100% coverage of the soil surface.

Spread evenly to a minimum thickness of 75–100mm.

On slopes of 15% or greater, a binding chemical (tackifier), or other suitable anchoring mesh, may need to be applied to the mulch (depending on expected severity of surface runoff).

The following suggested usage and application rates are a guide only.

Lucerne:

Lucerne is considered a good soil conditioner, lasting around 3 to 4 months; however it generally contains excessive weed content for use as a low-maintenance garden mulch.

Bark Chips and Shredded Bark:

Bark chips and shredded bark is a by-product of timber processing often used in landscape planting. Unlike wood chip, the use of bark does not require additional nitrogen fertiliser. Pine bark lowers the pH of the soil, so should not be used on low pH soils.

Application rate of around 165m^3/ha.

Brush Mulch:

Brush mulch normally consists of local felled native vegetation. It is often preferred on areas being regenerated with native seedlings (e.g. rural sites). It can also be used as a trap for wind-blown sand in coastal sand drift control.

Brush mulch should be applied parallel to the contours, and should be stockpiled with care since spontaneous combustion can occur. The mulch should be free of non-endemic seed.

Straw Mulches:

Commonly used as a light mulch, but can also be used as a heavy mulch. Other than in bushland areas, wheat or oat straw is suitable. Heavy straw mulch may also be applied to small areas such as earth embankments (not intended to be grassed) and soil stockpiles.

Expected reduction in erosion rates are (Fifield, 2001):

- 75% at 1.1 tonnes/ha
- 87% at 2.2 tonnes/ha
- 98% at 4.5 tonnes/ha

Application rate of around 3.5 to 4.5 tonnes/ha (heavy mulching).

Sugar cane mulch:

Typically weed free and lasting 3 to 4 months, but can form a water-resistant mat on the soil.

Tea tree mulch:

Tea tree mulch is a highly absorbent mulch that can help retain soil moisture when incorporated into the soil (soil conditioner), but can also reduce water leaching into the soil when used as a heavy, surface mulch. A 75mm layer can last approximately 1 year.

Wood Chip Mulches:

Wood chip mulches are developed from mulched tree loppings, pine flake, or processed hardwood. These mulches are useful for weed control and mulching small areas.

Woodchips and pine bark are considered a good, durable mulch. They may, however, draw nitrogen from the soil as discussed above. Application of a nitrogen rich fertiliser may be required. Woodchips and bark from pine trees are acidic when they break-down—this can be helpful on alkaline soils, but not on already acid soils.

Woodchip obtained from on-site felled trees should in general consist of native vegetation only. Exotic species of trees and shrubs are not preferred; however, seek expert advice before disposing of a potential useful source of mulch.

Woodchip mulch promotes natural regeneration of disturbed areas and is suitable on batter slopes between 1.5:1 and 3:1(H:V) depending on slope length, and expected severity of surface run-on and runoff water.

On steep slopes woodchip may be retained with the use of wire mesh. However, the use of wire mesh, particularly plastic-based mesh, may not be suitable in bushland areas containing ground dwelling fauna.

Application rate of 10 to 15 tonnes/ha.

Weed control applications:

Application of a thick layer of mulch (heavy mulching) can be used for weed control. Required applications rates are around 8 tonnes/ha (depending on type of mulch). On slopes less than 10%, a copolymer PVA binder (tackifier) can be applied at a rate of 300 to 400kg/ha.

Description

Application of a thick blanket of organic matter to the soil surface sufficient in thickness to suppress weed growth.

Purpose

Primarily used during revegetation to control weed growth, assist the growth of newly planted seedlings, and reduce soil erosion.

Heavy mulching assists seedling growth by:

- reducing moisture loss from the soil;
- reducing watering requirements;
- moderate soil temperature fluctuations;
- reducing soil erosion around the root system of juvenile plants.

Heavy mulching controls soil erosion by:

- reducing raindrop impact;
- reducing wind erosion;
- increasing the organic content of the soil (long-term), therefore increasing stormwater infiltration.

Heavy mulching can also be used to rehabilitate heavily compacted clayey soils such as urban parks damaged by excessive pedestrian traffic. Special, high organic, decomposed mulch (*Compost Blanket*) is applied in a thick layer over the soil, then a suitable groundcover (usually grass) is applied to the surface of the compost.

Brush mulch is also used to control wind-blown sand in coastal areas.

Limitations

Some mulches cannot be used in bushland areas due to possible introduction of unwanted seed (seek expert advice).

Heavy mulching is not suitable for areas of concentrated flow. Instead, consider the use of *Rock Mulching,* or *Erosion Control Mats/Blankets*.

Mulch should not be placed directly onto highly dispersive soils.

Advantages

Heavy mulching is the most effective and practical means of controlling erosion prior to the establishment of garden beds.

Particularly useful in higher rainfall areas to protect against raindrop impact, and in arid and semi arid areas to reduce plant watering requirements.

Disadvantages

Decomposition of some wood products can tie-up significant amounts of soil nitrogen, thus requiring modification to fertiliser application rates.

Can be displaced if subjected to flooding or concentrated overland flow.

Common Problems

Displaced mulch can become a stormwater pollutant. Mulch can be washed from slopes as a result of inadequate up-slope drainage controls and/or inadequate anchorage of the mulch.

Fibre-based mulches can be blown from the site as a result of inadequate anchorage or stacking (gluing).

Special Requirements

Heavy mulch should cover 100% (minimum) of the soil surface to give adequate protection against erosion.

Requires good drainage control to avoid displacement.

In windy areas, or on steep slopes, the mulch may need to be anchored by applying a tackifier, or by covering the mulch with a suitable synthetic or biodegradable mesh.

Synthetic meshes should be used with extreme caution and with due regard to possible long-term impacts on the use of the land as well as any potential impact on any local ground-dwelling animals.

Site Inspection

Check for displacement by wind or water.

Check even and continuous coverage.

Performance Indicators

Application depth measured at random test locations.

Application rate can be measured by placing collection trays at random locations across the proposed treatment area prior to application of the mulch. The trays (of known surface area) are dried and weighed pre and post application to determine actual dry application rate. The wet application rate (i.e. with water) can also be recorded.

Percentage cover can be measured using the quadrant method (a grided inspection plate which is photographed and analysed) or by visual estimation (refer to the *Revegetation* fact sheet).

Materials

- Mulch: to the maximum degree practical the mulch must be free of weed species especially prohibited noxious weed seed.
- Do not use woodchip mulch that is too fresh or contains sappy softwood.
- Do not use resinous pine materials that can transfer water repellence to the soil.

Installation

1. Refer to approved plans for location, extent, and application details. If there are questions or problems with the location, extent, or method of application contact the engineer or responsible on-site officer for assistance.
2. Ensure the surface is free of deep track marks of other features that may result in flow concentration down the slope. Where necessary, establish up-slope drainage controls to limit run-on water that may disturb the mulch.
3. Spread enough mulch to completely cover the surface of the soil at the density or thickness specified in the approved plans, or otherwise not less than 100mm.
4. Suitable anchorage of the mulch must be accomplished immediately after the mulch has been placed.
5. Ensure the mulch is restrained from excessive movement by wind or stormwater runoff by appropriately anchoring or gluing the mulch with an approved tackifier.
6. Application (spraying) of a tackifier must not be performed during periods of windy conditions that would prevent the proper placement of adhesive.
7. The Contractor must take appropriate steps to protect all traffic, signs, structures, and other objects from being marked or disfigured by the tackifier material.

Maintenance

1. Inspect all mulches fortnightly and after runoff-producing rainfall and strong winds.
2. Check for rill erosion, or dislodgment of the mulch.
3. Replace any displaced mulch to maintain the required coverage.
4. If stormwater runoff displaces more than 10% of the mulch, then investigate the need for additional drainage controls to prevent further displacement.