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Mulching Trees

The benefits

This article is in reference to organic mulches only. Organic mulches such as bark (pine nuggets), wood chip, leaf mulch and pine needles are some of the more common examples of organic mulches. Inorganic mulch is commonly seen as river stone, gravel, brick chips, and scoria. Organic mulches break down over time and become part of the soil, inorganic mulches do not.

The benefits of mulching around trees is well recognized and is a main stay for increasing the general well being and vigour of a tree. The addition of mulch around a tree mimics the natural environment where the native ground cover is typically composed of a composite of decaying tree matter (ie. branches and leaves) and this is the necessary link of the nutrient cycle, vital for maintaining soil health. The benefits of such an addition can be summarized within the following points.

- **Adds nutrition to the root zone**; the breakdown of mulch is a benefit to the root zone by preserving the soil structure and adding to the organic matter content. The organic matter increases the nutrient holding capability and slowly releases its deposit of nutrients into the root zone.
- **Increases microbial activity within the root zone**; the increase in organic matter also increases the proportion of micro organisms within the root zone. This includes beneficial predators such as spiders and centipedes, and within the soil, earth worms. Amongst these benefits are the increase of pore spaces and therefore aeration, water holding capacity and water movement through the soil.
- **Maintains an even ground temperature;** insulating the root zone from sudden temperature changes by protecting the feeder roots from excessive drying out during hot days, and maintaining root, microbe activity and nutrient uptake when the temperature drops excessively.
- **Removes or reduces the need for lawn maintenance**; other than the saving in time and energy, this removes the opportunity of wounding to roots and stems by grass cutting equipment and the compaction associated with heavy machinery.
- **Reduces evaporation, therefore reducing the need for irrigation**; by acting as a protective blanket over the ground area mulch will significantly reduce evaporation, and depending upon the type of mulch can actually hold water, where feeder roots will start to penetrate the mulch layer. Overall this saves watering time and the amount of water required.
- **Reduced soil compaction**; mulch acts as a dampening agent by spreading the load of any pedestrian traffic.
- **Reduce dust and erosion**; areas beneath trees can often form bare patches, either from lack of light or excessive traffic and these are prone to erosion,

from rain or wind. Mulch protects these areas from losing any soil by shadowing the wind and slowing the movement of surface water

- **Reduce trip hazards**; erosion around the root zone, often leads to support roots becoming exposed. These exposed roots can act as a trip hazard and the potential for wounding of these roots also exists. Mulch can cover these roots and fill in the gaps in between, removing not only the trip hazards, but acting as a natural barrier the public often avoid.
- **Retards weed growth**; by preventing light penetration to the soil area and providing that additional thick layer with good airflow, the germination of weed stock is reduced, and those weeds that do germinate are generally smothered, and have difficulty with establishing roots. Mulching reduces maintenance, that is the time required for weeding, as well as the use of herbicides.
- **Reduces the transmission of pathogens**; the opportunity for dirt splash from rain on to the foliage and stem is removed with mulching around a tree. This reduces the opportunity for infection from soil bound pathogens that can be transmitted via dirt splash.
- **Increases the aesthetics of the area**. The large array of mulch textures and colours offers the opportunity for personalizing and adding to the character of the landscape, where a uniform atmosphere can be created.

Photo 1

How to mulch

Mulching around trees is certainly a benefit, however this is limited to the way it is applied, and the incorrect application can be of detriment to a tree. The benefits associated with mulch are limited to a collection of factors including the type of mulch used, site conditions, preparation and method of application. The following guidelines provide the process for applying mulch around a tree, so as to avoid any detriment.

1. **The larger the area mulched around a tree, the greater the benefit**. The size of the area to be mulched is generally reflected by the size of the tree. By allowing for the average root system of a tree to extend up to 3-4 times the area of the dripline, suggests that the larger the area being mulched the greater the benefit. However the minimum recommended size of the area to be mulched can be summarized for small trees (up to 7m high) as 1m radius, medium sized trees (8-15m high) 2m radius and large trees (greater than 16m); 3m radius, see photo 1.

2. **Unwanted plants, and especially grass is recommended for removal**,. The removal of grass around trees is certainly beneficial because they compete for water, air, nutrients and essential nitrogen. The feeder roots of both trees and grass reside within the top 300mm of ground area however the grass roots form a dense mat and colonize faster. Grass has also an antagonistic chemical released into the soil that inhibits the growth of most tree roots (known as allelopathy). Studies support that growth is retarded when trees are grown in turfed areas compared to trees with mulched root systems. The preferable method for turf removal is by mowing the grass low followed by an application of a weak solution of herbicide. The removal of grass by hand tools where the ground area is disturbed can be detrimental to a tree due to the disturbance of the fibrous roots.

3. **Condition the root zone before laying the mulch**. Before laying the mulch the root zone may require conditioning, in particular if the area has been compacted, or the soil consists of a high proportion of clay. The application of gypsum to break up the clay, and addition of a soil conditioner such as lucerne or mushroom compost will improve the soil structure and nutrient holding capacity. The application of a seaweed based product will also aid with the promotion of new root growth.

4. **Choice of the type of mulch**. When choosing a mulch, if the trees vigour takes precedence over the aesthetics of the landscape, then choosing mulch that is of the same species as the tree is the most beneficial. That is if a *Eucalyptus* is being mulched, then try to acquire mulch that has been made from a Eucalypt.

5. **Size of the mulch.** Mulch composed of chunky nuggets (ie. >10mm thick) is more beneficial than that of finer graded mulch. The larger grade offers greater air spaces and water percolation. Thick layers of fine mulch (>7mm in diameter)

can become matted, prevent water percolation, and inhibit gas exchange, as well as forming an ideal media for weeds to germinate.

6. **Caution about the type of mulch**. Leaf chip mulch purchased from tree removalist is some of the most economical available, however this is rarely composted, and caution must be observed regarding the types of trees that have been fed through the chipper. Weed species (such as Privet, Camphor laurel, Coral tree, etc.) should be avoided due to the seed content and high proportion of oils and toxins the species can have, providing detriment as a mulch. Also infected trees hosting pathogens such as *Armillaria* can be transferred via mulch. Ask the tree contractor what the mulch is made up of first, or better still, book a load when a specific tree is being removed and mulched which is free of disease and is of the same species as the tree you wish to mulch around.

7. **Composted mulch is preferable**. Mulch should be composted before being used. Two negative attributes are associated with fresh mulch, the former is related to the alcohols and organic acids that are created with the composting process and the possible toxicities associated with these leaching into the root zone. The second is nitrogen drawdown. This is because mulch requires nitrogen within the process of breaking down and it will draw on the reserves from the ground to do this, resulting in a deficiency. Unfortunately acquiring composted mulch can be difficult, so the easiest method to sustain the essential nitrogen when using fresh mulch is to apply a nitrogenous fertilizer (eg. Ammonium nitrate) to the ground, or mixed into the mulch during the laying exercise. This should be applied at the rate of 250-500gms per $10m^2$.

8. **Some mulches can affect the soil pH**, Different mulches can have an impact upon the pH of the root zone, and this will have a direct affect upon the nutrient availability to the tree, resulting in deficiencies or toxicities. Some leaf mulches can decrease the pH, while wood chip often increases the pH value. The pH is recommended to be checked within 6-8 months of applying the much, and rectified if required to suit the specific tree species.

9. **Mulch thickness over root zone**. One of the most crucial factors when applying mulch is the correct thickness of the mulch. The mulch should be no thicker than 100mm, see Figure 1. Excessive thickness of mulch will retain too much moisture within the root zone and increase the opportunity for root rot. It can also inhibit sufficient water percolation via irrigation, leading to water stress.

10. **Keep mulch away from the stem.** The mulch should be no closer than 200mm to the trees stem, and battered back from the root flare, see Figure 1. Piling mulch up against the stem will promote insect and disease (bacterial and fungal) attack of the vascular tissue, such as collar rot. When the vascular tissue dies, this is equivalent to ring barking a tree, that is, the tree dies.

11. **Maintenance**. As organic mulches break down, they will become thin and require topping up approximately every 2 years depending upon the type of mulch used.

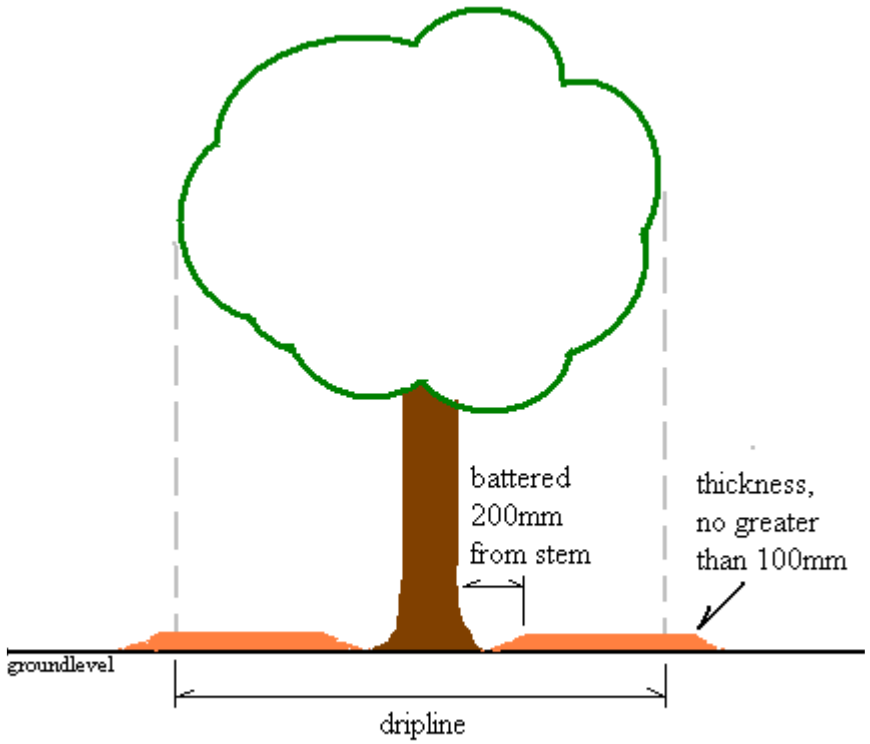

Figure 1.