



# Mulching & Staking Trees

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Web Site Guide: [\[Home\]](#)

[Purpose](#)

[Right Tree / Right Place](#)

[Selecting Trees](#)

[Transplanting Trees](#)

[Mulching & Staking](#)

[Summary Diagram](#)

[Pruning Trees](#)

[Topping Hurts!](#)

[Protecting Trees](#)

[Tree Root Myths](#)

[Pine Bark Beetles](#)

[Live Christmas Trees](#)

[Glossary](#)

[List of Figures](#)

[List of Video Vignettes](#)

[Related Links](#)

[Bibliography](#)

## Mulching Trees: Introduction

Mulch is good for trees for a variety of reasons. It *looks good* in the landscape and can help *provide unity* among different planting beds. It can *suppress weed growth* from underneath (lawn mower clippings blown onto it may have weed seeds that will germinate and grow well in it, however). It helps to *conserve soil moisture* and *keep the roots cool* in the summer. It can *prevent soil erosion* around roots on slopes. It can *modify temperature extremes* during winter freezes.

Mulch is beneficial because it:



- prevents erosion,
- conserves soil moisture and keeps tree roots cool during summer,
- buffers low temperature extremes during winter freezes,
- suppresses germination of weed seeds,
- Is aesthetically pleasing,
- helps provide unity among a group of planting beds.

Many different materials can be used as mulch (Figure 5-1). In addition, shredded pine bark and hardwood bark are commonly available and used for mulching.

(Figure 5-1) Example Mulches.

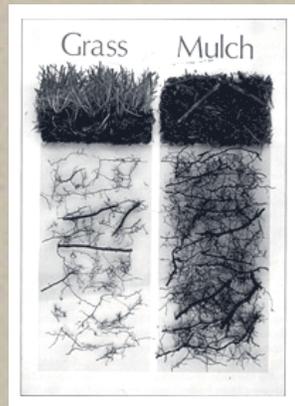
All are attractive and will allow air and water penetration into the root zone.



If you use wood chips (frequently dyed to different colors) we recommend you lightly sprinkle the ground with granular fertilizer to prevent nitrogen deficiency. The bacteria that decay the wood chips need nitrogen. If you don't apply it, the soil reserves to the tree may become low.

We suggest that you *not use sheet plastic (black or clear)* under the mulch in an attempt to control weeds. The plastic does not allow rain or irrigation water to penetrate to the root zone, and it also may slow down oxygen exchange to the roots. Figure 5-2 shows the effects of mulch on root development of trees. Any organic matter may be applied to the top of the root zone.





(Figure 5-2) Root Growth Under Mulched Surface vs. Grass.

But mulch can cause problems if it is applied improperly. It can be applied so deep that air cannot penetrate into the soil and roots will suffocate. It can also be so deep that water cannot penetrate and the roots may dry out. Either of these conditions is not healthy for the trees.

### Mulch Volcanoes

*If people like trees enough to buy them, why do they risk killing the tree by smothering the trunk with mulch?*

The biggest problem about mulch can be seen in many places: "Mulch Volcanoes". You know, those mounds or inverted cones of mulch that are two or three feet deep, and piled up onto the trunks of trees. We are not sure why this habit has developed, but these deep mulch piles can cause damage to trees.



(Figure 5-3) Mulch Volcano Excavated to Expose Buried Trunk.

Mulch should not be touching the trunk. Some trees may develop girdling roots under the mulch pile.

The trunk flare is not visible and note the discoloration on the stem just below the mulch line. This discoloration may develop into disease and decay.

Tree trunks are covered with bark that is designed to protect the trunk. It works best in the air and the light. If you pile mulch onto the bark, it will be exposed to dark and moisture. As the bark continues to be in the moisture, it will begin to rot. Rotted bark cannot protect the tree from diseases, and in fact, diseases grow better in the dark moisture of the mulch. So now the tree is more likely to get diseases.

Some trees have shallow roots, especially maples. If Mulch Volcanoes are piled around the trunk, the roots will start to grow into it. These roots tend to stay in the mulch volcano and will then grow around the trunk in the mulch. As the root grows in diameter, it pushes against the trunk, which is also trying to grow bigger. These roots will eventually strangle the trunk. This type of root is called a "girdling root". The trunk will keep growing wider above and below the girdling root, and may actually encase the root.

(Figure 5-4) Girdling Roots on Young Tree.

Trunk growth is restricted by the large root in front of the trunk. Another younger girdling root has emerged from the right side as well.



While the root is constricting the stem growth, the tree will begin to suffer. Young, outer branches will begin to die back. Leaves may appear yellow and become smaller than in previous years because water, nutrients and foods cannot flow through the tree properly. Total growth will slow down. Trees must continue to grow to remain healthy, thus the tree's health will decline further.



(Figure 5-5) Girdling Roots on Mature Tree.

The trunk flare is not visible on the left side. The root has restricted trunk growth.

Trees may survive girdling roots for a short period of time, but their health will begin to decline. And more roots may grow around and re-girdle the trunk. We have seen trunks grow four to six inches larger around the girdling root, such as in the next figure. The tree has become hazardous due to being very top heavy for the size of the trunk at the girdle.

(Figure 5-6) Severe Girdling.

Note the trunk swelling above my left hand. This tree was planted too deep, about a foot between grade (my top finger) and the top of the root ball (my bottom finger - after 25 years, wire basket still exists!). Root girdling put this maple in decline. In fact, it failed and toppled seconds after taking this photo.



Mulch Volcanoes can cause all this damage as the tree is growing larger. Remove the mulch from being on and around the tree trunk. Keep mulch over the root zone instead.

Mulching Recommendations: (After [Carlson, 2002](#))



- Identify plant and its moisture / low oxygen tolerance.
- Determine current mulch depth; tine rake to aerate / dry.
- Use composted mulches only.
- Well-drained soils: apply 2-inch (fine mulch) to 4-inch (coarse).
- Poorly drained soils: apply 2-inch maximum.
- Very poorly drained soils: use chemical weed controls.
- Keep mulch 4 (young trees) to 8 (old trees) inches from trunk.
- Soil test periodically for pH.
- Avoid "sour" (smell ammonia) mulches.
- Excavate soil to expose trunk flare; use coarse aggregate to fill.
- Irrigation should not flood trunk or trunk flare.
- Tine rake any slime mold or fungal mats to aerate.
- Mulch out to the drip line if possible.
- Share this knowledge with others. Avoid "mulch volcanoes".

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## Staking Trees: Introduction

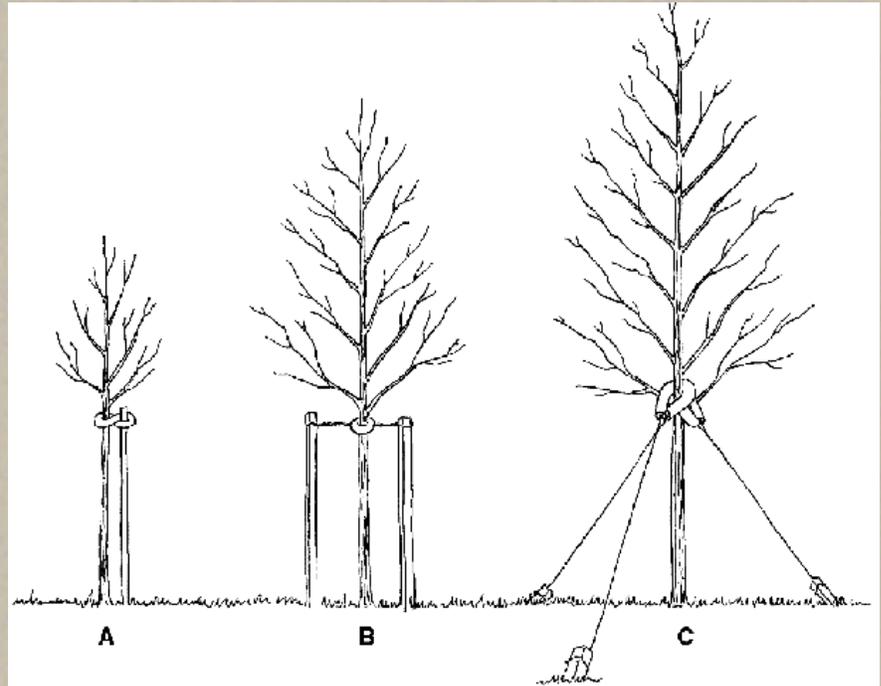
Staking young trees is NOT usually required if good quality trees were purchased. In fact, staking often **causes** many problems to occur in young trees during establishment. Good B&B and containerized trees will have an adequate root mass to support and stabilize the tree when it is transplanted properly. Bare root trees probably will need minimal staking for the first growing season.

Medium and large trees may need to be staked if they are top-heavy compared to the root mass, or if wind conditions will cause the trees to topple before roots can grow to provide balance, or if pedestrians might accidentally bump a tree and dislodge it from the planting hole. We have seen wooden cages placed around trees newly planted in some pedestrian malls, public courtyards and parking lots, but this is an extreme measure.

(Figure 5-7) Two Possible Staking Methods (A & B) and Guying (C).

All illustrated options protect the trunk from scarring and allow trunk sway for good root strength development.

**Staking (or Guying) may not be necessary at all.**



The main consideration for staking is that it is **temporary for the first growing season**, if it is needed at all. The frequent problem with staking is that homeowners and contractors do not return at the end of the first season to remove the ties and bands. Then the tree grows enough to engulf them, creating a serious flaw in the trunk and branch structure.

[Video Vignette: \(See it live!\)](#)

If tall stakes are desired, they should be driven into undisturbed soil at the edge of the planting hole. Driving them through the root mass may damage roots. Generally, they should be tall enough to reach to the lowest permanent branch, at which point the bands should be placed.

The banding material should be soft, flexible and wide enough to protect the trunk from being marred. Canvas webbing, old denim strips and old nylon hosiery may be used. The bands should be secured loosely around the trunk.

[Video Vignette: \(See it live!\)](#)

You have probably seen on large trees the use of stiff wire as a tying material, slipped through short pieces of garden hose as banding to protect the bark, and secured with short stubs in the ground. This is acceptable, as shown in Figure 5-6 above. However, the tie wires should not be stretched tightly. If the stubs are outside the mulched zone, the wire should be flagged with reflective warning tape.

A common guying error is to stretch the tying strands very tightly, holding the trunk dead still. But actually, the tree trunk should *be able to sway slightly* in the wind during establishment. This swaying movement carries down to the trunk flare and causes the roots to develop suitable strength to support the trunk and canopy when guying is removed.

[Video Vignette: \(See it live!\)](#)

Remember, remove the banding and tying strands at the end of the growing season. If staking may be required for another season, repeat the tying and banding to accommodate for trunk and branch growth.

[Purpose](#) [Right Tree / Right Place](#) [Selecting Trees](#) [Transplanting Trees](#) [Mulching & Staking](#) [Summary Diagram](#) [Pruning Trees](#)  
[Topping Hurts!](#) [Protecting Trees](#) [Tree Root Myths](#) [Pine Bark Beetles](#) [Live Christmas Trees](#) [Glossary](#) [List of Figures](#) [List of](#)  
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