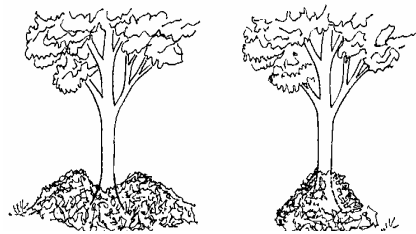
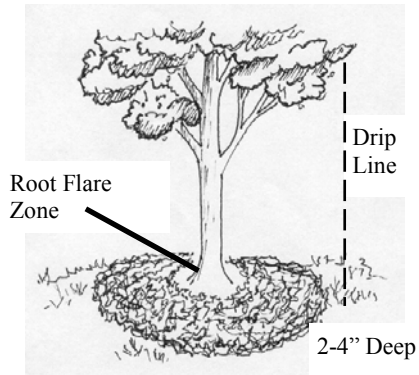


Mulch Out Not Up



Incorrect Mulching



Proper Mulching Method

What To Do?

The best way to determine if you have a mulch problem is simply to dig through the mulch layer to see how thick it really is. If it is excessive (over 4 inches), spread it out to the drip line or remove much of it. Sometimes a light raking of existing mulch is sufficient to break up any crusted or compacted layers that repel water.

A visual inspection of the root flare zone or trunk collar (where the spreading base of the tree just goes into the soil) is the best way for you or an arborist to check the condition of the trunk for possible rot, pest chewing or diseases. If detected early on, removal of mulch to allow drying out may help curb more serious problems. Complete root flare zone excavation may be necessary and is best performed by a professional arborist.

For More Information:

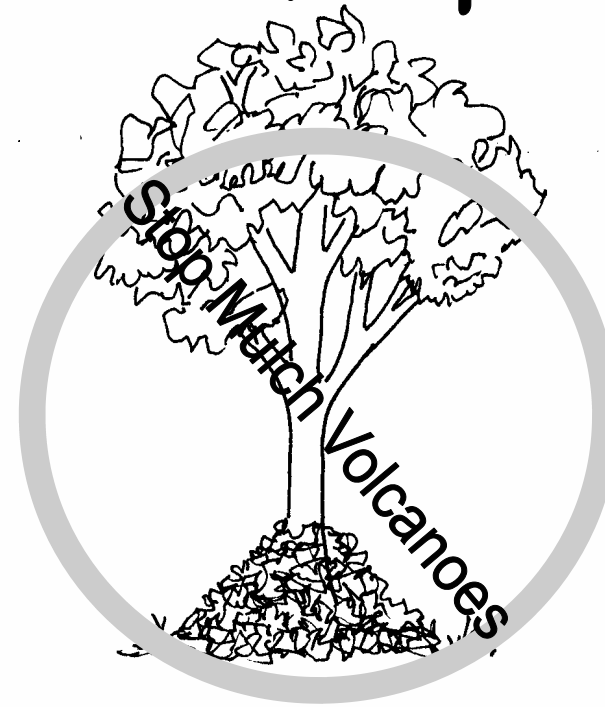
- Call or visit your County Cooperative Extension Office (Loudoun Co. 703-771-0373)
- Visit the following web sites:
www.leesburgva.org ; click on "Tree City"
<http://www.treesvirginia.org/>
<http://www2.champaign.isa-arbor.com>
<http://www.natlarb.com>

-Information in this publication was borrowed extensively from articles by Chris Carlson, Dir. Hort.Tech, Kent State Univ.; Diane Relf, Environm. Hort., VA Coop Ext, VA Tech; Dr. Robt. Nuss, Hort., Penn State Univ.; Donald Rakow, Cornell Univ.

-Drawings copied from International Society of Arboriculture Training Manual, or drawn by Barbara Lupfer, Certified Arborist

-Compiled and edited by Barbara Lupfer, Certified Arborist

-Edited and produced by Jay Banks, Certified Arborist, Town of Leesburg, Virginia. Urban Forester



Proper Mulching Techniques and
Problems Caused by Over-mulching

Why Does Wrong Mulching Look Right?

Fortunately, we have, at last, acquired an appreciation of the aesthetics of mulch in the landscape, somewhat like the leafmold on the forest floor. Unfortunately, our tastes are influenced by what we see, and we have seen so many wrong examples of mulch around trees and shrubs that some people think they are correct.

When you pile the wood chips or pyramids of mulch high around the base of a tree, you are simply following a common, but sadly mistaken model. In trying to control several problems, you create several new ones.

The heavy application of mulch probably got started with the simple directions to apply 4 inches of loose, course mulch. As the mulch began to decompose or just discolor and look less attractive, the application was repeated and repeated, until the original mulch was a foot or more deep.

The next logical step has been to start off with 12 to 18 inches of mulch and then keep it that deep. From these mistakes come the multitude of problems.

From "Over Mulching" by Diane Relf, Virginia Cooperative Extension Service, September 7, 1998

The Virginia Gardener

- **No higher** than the heel of your hand, generally 2-4 inches. If using finely textured or double shredded mulch, use 1-2 inches because these materials allow less oxygen to the root zone.
- **Not against the trunk** - keep all mulch 3-4 inches away from the trunk of the tree or shrub, allowing the root flare zone to show just above ground level.
- **To the tree's drip line** if possible. Remember that the drip line moves out as the tree grows. (see "How Roots Really Work" drawing.)
- **Other Tips:**
 - If a "fresh" look is desired each season, take some of the old mulch away before adding a new layer to reach the 2-4" depth. Just lightly raking the existing mulch can achieve a finished look. Applying new material over old in successive years is the same as applying a too deep layer all at once!

Remember: Keep the bark dry and the roots moist.

Problems Associated With Over-Mulching

Incorrect mulching is a waste of time and money and is quickly becoming the **number one cause of death** of trees and shrubs. Over-mulching, with mulch piled high, directly against the stems or trunks, smothering the root flare zone; or with very deep mulch covering part or all of the root area cause:

Root Suffocation/ Root Rot - Repeated or deep applications of mulch cause waterlogged soil by slowing water loss through evaporation. Roots must "breathe", taking in oxygen. When oxygen levels drop, root growth declines then they die, making it impossible for the plant to take up water and nutrients, leading to death.

Inner Bark Death - The living tissue (phloem) just inside the outer bark must be able to freely exchange oxygen and carbon dioxide. Mulch piled high onto the trunk decreases gas exchange, killing the inner bark and then the roots which can no longer receive food from the leaves.

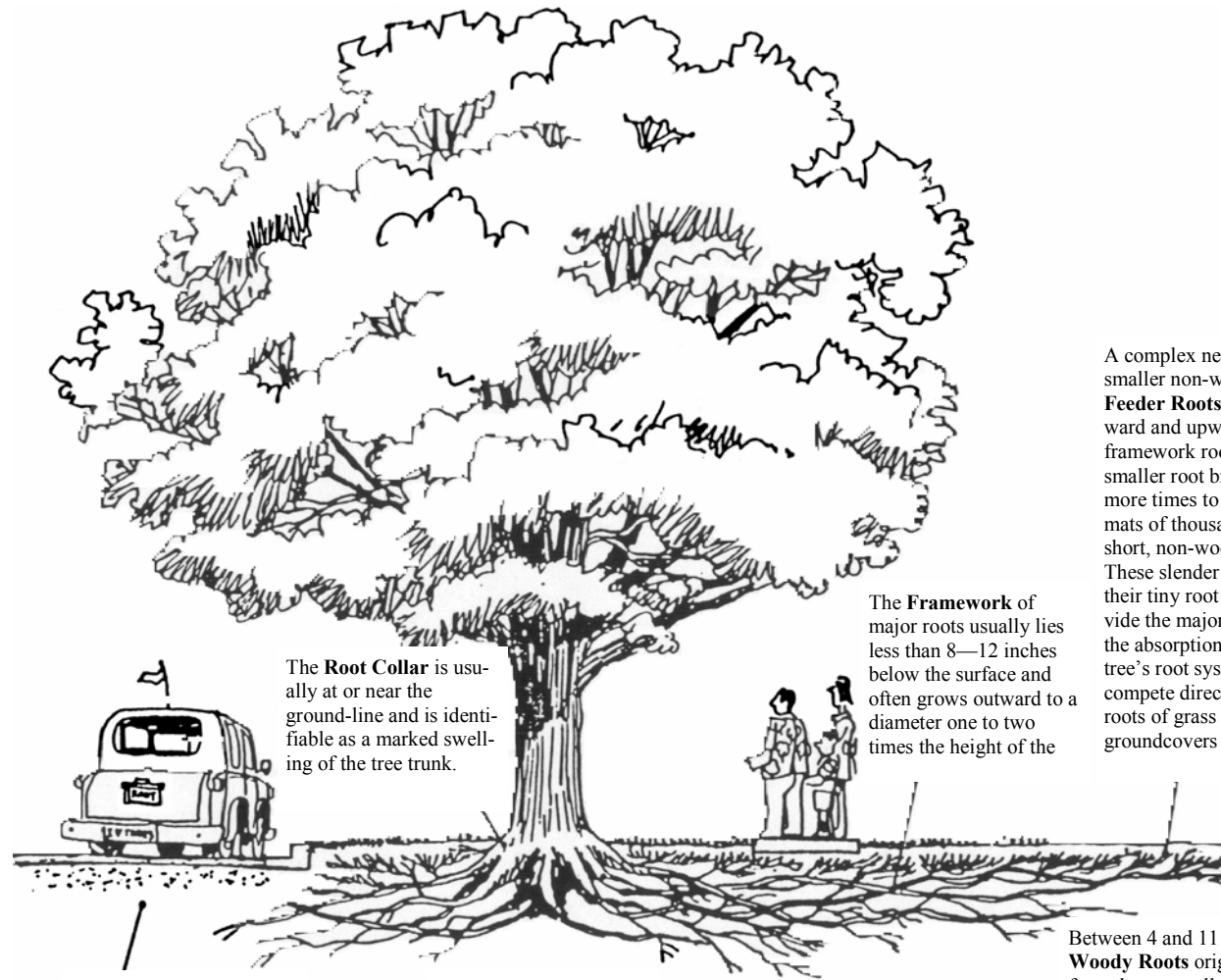
Rodent/ Insect Chewing - Deep layers of mulch against the trunk provide a perfect habitat for these pests. If chewing is extensive (more than 50% of the circumference) or "girdles" the entire tree, little can be done to save the tree.

Fungal and Bacterial Diseases - These can grow and reproduce in the thick, moist mulch next to the trunk, gaining entry into the stressed, decaying bark. Once established, cankers caused by these diseases, can encircle the tree, killing the inner bark, starving the roots and killing the plant.

Excessive Heat - Thick layers of mulch begin to decay and can produce heat (similar to composting).

Waterproof Layers - Thick layers of certain mulches can create impervious surfaces that do not allow water to reach to roots, especially during drought. Roots dehydrate and die, killing the tree.

How Roots Really Work



The **Root Collar** is usually at or near the ground-line and is identifiable as a marked swelling of the tree trunk.

Because **Roots Need Oxygen** in order to grow they don't normally grow in the compacted, oxygen poor soils under paved streets.

Note: A few species have a **Taproot** that grows straight down three to seven feet or more until they encounter impenetrable soil or rock layers, or reach layers with insufficient supplies of oxygen.

The **Framework** of major roots usually lies less than 8—12 inches below the surface and often grows outward to a diameter one to two times the height of the

A complex network of smaller non-woody **Feeder Roots** grow outward and upward from the framework roots. These smaller root branch 4 or more times to form fans or mats of thousands of fine, short, non-woody roots. These slender roots, with their tiny root hairs, provide the major portion of the absorption surface of a tree's root system. They compete directly with the roots of grass and other groundcovers

Between 4 and 11 **Major Woody Roots** originate from the root collar and grow horizontally through the soil. These major roots branch and taper over a distance of 3-15 feet from the trunk to form an extensive framework of long, rope-like roots which as 1/4 to one inch in diameter. These are important structural roots, supporting the tree against wind, etc.

Symptoms of Decline

Death from over-mulching is gradual, with symptoms sometimes taking 3-5 years to express themselves. It starts with the decline of plant vigor and rate of growth.

- Off-color leaves (pale or marbled)
- Abnormally small leaves
- Poor twig growth
- Die-back of older branches
- Rotting, peeling trunk bark under the mulch

are classic signs which get worse every year, and at which point they are recognized, it is too late to apply corrective measures.

Benefits of Proper Mulching

Good tree maintenance is common sense - it is what trees need to flourish in nature. In the wild, the forest floor is naturally covered with a layer of decomposing leaves, twigs and other plant material. In urban settings, the most common mulch is made of wood chips of varying types and sizes. Mulch:

- *Impedes growth of weeds and grass* that compete with tree roots robbing them of water and nutrients.
- *Conserves soil moisture* by slowing down the evaporation of water from the soil surface helping to retain more water for root use for longer periods of time.
- *Protects the trunk from mower/ weed whacker damage* by eliminating the need to mow or trim immediately around the trunk.
- *Reduces soil compaction* by reducing foot and vehicle traffic allowing roots to breathe.
- *Moderates soil temperature* keeping the roots cool in the summer and warm in the winter thereby reducing stress.
- *Improves soil fertility* as it decomposes.
- *Prevents erosion.*