MULCHING 101

Mulches are important components of environmentally sustainable gardens and landscapes. Unlike soil amendments, **mulches are simply materials laid on top of the soil rather than worked into it**. Select the right mulch and you reap the benefits of healthier soils and plants; choose the wrong mulch and the only plants that thrive are the weeds.

Benefits to mulching:

- improving overall tidiness,
- conservation of water by reducing evaporation,
- preventing soil erosion and compaction,
- preventing the leaching of soil nutrients,
- weed suppression,
- adding organic matter to feed your soil as it decomposes
- moderating soil temperature. Cools the soil by up to 5 C degrees in hot weather – important for young plants and those with short roots.

When is the right time of year to apply mulch? There are several things to consider:

- Your schedule and when you have time to work in your garden.
- Your climate - mulch can add protection from frost to root crops and perennials if done in the fall. In our climate, we want to 'lock in' moisture for the long dry summer months.
- If your main concern is aesthetics and weed control, it is best to wait until spring when weed seeds are starting to germinate.
- Empty vegetable beds are best mulched in the fall to protect the soil from erosion and nutrient loss from driving rains.

How to Mulch:

1. *Begin mulch application before annual weeds germinate*. Bare soil should be mulched as soon as practical, especially in the spring and fall when weed seed germination is at its peak. If this is not possible, the most effective, non-chemical way to remove weeds prior to mulching is to mow them as close to the ground as possible, followed immediately by mulching.

2. Prune or *mow perennial weeds at the root crown*. This is best done in early spring when root resources are lowest, just as leaf growth begins. Mowing undesirable plants before mulching keeps soils undisturbed and reduces regrowth.

3. Optionally, *add a thin underlayer of compost* before installing wood chips for the first time, create a thin underlying layer of a more nutrient-rich mulch like compost if there are concerns about nutrient deficiencies. Use fresh chips unless there are still concerns about disease.

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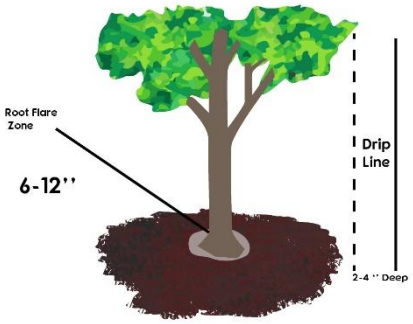
4. A successful mulch *must be deep enough* to suppress weeds and promote healthy soils and plants. Research has demonstrated that weed control is directly linked to mulch depth, as is enhanced plant performance. A review of the research on coarse organic mulches and weed control reveals that *shallow mulch layers will enhance, rather than prevent weed growth*. Wood chips maintained at a depth of 4 to 6 inches will control weeds without detracting from appearances. While 4 inches of fine mulch like coffee grounds or sawdust will inhibit water and gas movement, you can use up to 12 inches or more of a chunkier mulch like bark chips or whole leaves without having a similar effect.

5. *Keep mulch away from trunks* of trees and shrubs. Piling mulch against the trunks creates a dark, moist, low oxygen environment to which above-ground tissues are not adapted. Fungal diseases require a moist environment to grow and reproduce. Piling mulch on the trunk provides exactly the right conditions for fungi to enter the plant. Likewise, opportunistic pests are more likely to invade a plant whose bark is wet due to excessive mulching. Rather than creating mulch volcanoes instead, taper the mulch down to nearly nothing as you approach the trunk. This donut-shaped application will protect the soil environment as well as the above-ground plant tissues.

Incorrect Mulching



Proper Mulching Method

6. *In a food garden*, hay and straw are common choices for mulch. *Keep mulches away from the stems of vegetables* as this can encourage fungal growth. *Beware of overwatering* as it is easy to underestimate how much moisture a good layer of mulch can retain. Trees, shrubs and perennials tend to be more forgiving of overwatering.

7. Because vegetables appreciate a warmer soil temperature be sure to *pull back mulch about a week before seeding/transplanting*. It can then be re-applied as the plants grow and the weather warms.

8. *Reapply mulch as needed* to maintain desired depth; replacement rate will depend on decomposition rate. Once mulch is applied, little management needs to be done other than reapplication to maintain minimum depth. High traffic areas are most likely to need replacement.

9. *Keep mulch away from building foundations*. Mulches can act as a bridge allowing pest insects to enter houses and garages. Maintain a narrow strip of bare soil next to the foundation to prevent infestations.

What material should we mulch with?

There are many choices, and each has its own pros and cons. In choosing a mulch you must think of function foremost, but you also need to think of availability and cost. Ideally you want to pick a good product that matches your needs, but also one that is affordable and can be locally sourced.

Mulches can be divided into **organic** and **inorganic** products.

- Inorganic mulches include natural choices such as stone and pavers, or synthetic products such as small pieces of glass, rubber or plastic and the most infamous 'landscape fabric'.

- Organic mulches are by far the largest category of materials and include things like grass clippings, whole leaves, manure, straw, hay, bark chips, wood chips, saw dust, compost, coffee grounds and living mulches or green manures.

<u>Inorganic Mulches</u>

If you want an area of your yard to be low maintenance, inorganic mulches can be a good choice. They have the added advantage of rarely if ever needing to be replenished. Rocks, pavers or glass pieces are the best choices. If choosing rocks, **pebbles are better than crushed rock.** Crushed rock is covered in rock dust and tends to get compacted with the addition of water. It is best used in pathways.

Beware of things like plastic and rubber. While it may seem like the ultimate in recycling and a good method of keeping these products out of the landfill, each can have problems with leaching unwanted chemicals into your soil. This is particularly inadvisable in a food garden.

Another inorganic mulch to **avoid is landscape fabric**. Contrary to its advertised properties, it is not water permeable and can create a barrier to beneficial insects, nesting native bees, microbes, water and oxygen. Not only that but it does not suppress weeds, often having the opposite effect as organic material, water and weed seeds can pool on the surface creating ideal growing conditions.

Some inorganic mulches can have an important temporary role in your garden. If you are dealing with an infestation of weeds that you cannot control, often **sheet mulching** with a layer of fabric, cardboard or plastic for several months is the only way to address the problem.

Remember that long term sheet mulching with cardboard and newspaper can also create a

barrier to water and beneficial insects/microbes, and it can take longer to break down than you might think.

Organic Mulches

The benefits of organic mulches are many. There are however a few things to keep in mind when choosing which type best suits your needs.

'Greener' finer-ground mulches such as compost or coffee grounds will break down and need to be replaced much quicker than the larger pieces of mulch such as wood chips or bark. Mulches consisting of larger pieces are also much more permeable to both gases and water.

What to use for Organic Mulch?

Fallen Leaves

Leaves are free and excellent for winter and summer mulches. Do not shred them for this like you would for composting because fluffy intact leaves are better for shading or insulating the soil. Stockpile lots of leaves in the fall and keep them dry over the winter in bags, under tarps or in covered bins. This slows the rate of decay so they are as intact as possible when you want them for summer mulching.

Straw

Straw from barley, oats or wheat is very good but it is expensive. It does make a durable mulch that lasts at least a year. The light color of straw is ideal for summer mulching because it reflects the sun and does not absorb as much heat as darker mulches. Fresh straw out of the bale is so light and fluffy that it blows around, so buy it in the fall when it is cheaper and leave out in the rain over the winter. By the spring, seeds in the bale have sprouted and the partly decomposed straw is stuck together in matted sheets that do not blow around.

Lawn Clippings

Lawn clippings are best left on the lawn to nourish the grass, but you could use a few cuttings to mulch a garden. Because they are fine and soft, clippings are ideal for mulching around seedlings. They are mostly water so there is not much left when they dry out but even a light layer of mulch is better than none.

Partly Digested Compost

Compost that is still rough and fibrous can be used. Also old, ragged, lower leaves of squash, rhubarb, cabbage and other plants with big leaves can be snapped off and laid on the soil under plants.

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Arborist Wood Chips

In areas where trees are a dominant feature of the landscape, arborist wood chips are one of the best mulch choices for trees and shrubs. Studies have found wood chips to be one of the best performers in terms of **moisture retention, temperature moderation, weed control, and sustainability**. In many urban areas, arborist wood chips are available free of charge.

Unlike uniformly textured sawdust and bark mulches arborist wood chips include bark, wood, and often leaves. The diversity of these materials resists the compaction often found in sawdust and bark mulches. The materials vary in their size and decomposition rate, creating a more diverse environment that houses a diversity of microbes, insects and other organisms. A biologically diverse soil community is more resistant to environmental disturbance and will in turn support a diverse and healthy plant population.

Wood chips are considered to be slow decomposers, supplying nutrients slowly to the system; and absorbing significant amounts of water that is slowly released to the soil. Wood chips have been cited as superior mulches for enhanced plant productivity and have been especially effective in helping establish trees and native plants in urban and disturbed environments.

In a society where using locally produced materials is increasingly popular as a measure of sustainability, arborist wood chips are a natural choice.

<u>Common Questions with Answers about Arborist Wood Chips:</u>

Do woody mulches, like cedar, leach allelopathic chemicals that kill other plants?
No. Most allelopathic compounds have no effect upon established plants. Cedars (Thuja spp.) have not been found to have this ability. Even Juglans nigra (black walnut), the best
known allelopathic species, has not been shown to have negative effects when wood chips are used as a mulch.

Will mulches made from diseased trees infect healthy trees?
No. Most studies indicate that diseased mulch cannot transmit pathogens to the roots of healthy trees. **Under no circumstances should wood mulch be worked into the soil** as
an amendment: not only is this a poor planting practice but increases the likelihood of disease transfer. Fungal communities found in wood chip mulches are generally decomposers, not pathogens.

Are wood chips a fire hazard?
No. Coarse textured organic mulches, like wood chips, are the least flammable of the organic mulches. Fine textured mulches are more likely to combust and rubber mulch is the most hazardous of all tested landscape mulches. If organic mulches are kept moist, they are less likely to catch fire.

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Will wood chip mulches tie up nitrogen and cause nutrient deficiencies in plants?
No. Many studies have demonstrated that over time woody mulch materials will increase nutrient levels in soils and/or associated plant foliage. However, there is a nitrogen deficiency at the boundary between the mulch and soil which probably inhibits weed seed germination.

Will woody mulches attract termites, carpenter ants, and other pests?
No. Many wood-based mulches are not attractive to pest insects but are actually insect repellent. For instance, cedar (Thuja) species produce thujone, which repels clothes moths, cockroaches, termites, carpet beetles, Argentine ants, and odorous house ants.

Will woody mulch acidify my soils?
No. Significant changes in soil pH can only occur after decades or centuries of mulch use.

Living Mulches
Living mulches are typically low maintenance ground covers and other low-growing, ground-hugging plants that can help conserve soil moisture and control temperatures. They are a huge aesthetic benefit to your landscape, and many people prefer to use living ground covers as opposed to other mulches because they are so beautiful. Beware of invasive living mulches such as English ivy, periwinkle or gout weed to name a few. **Interplanting** some vegetable combinations, like cucumbers with taller plants like cauliflower works well to cool the soil and make use of limited growing space.

As with many gardening choices, one of the most important things to remember is that there is no one size fits all solution to most problems, and this includes mulching. Try to make smart decisions based on what goal you are trying to achieve which will include thinking about the types of plants you are mulching, the individual challenges your plants are facing, and your specific needs.

REFERENCES:

1. Compost Education Centre - Mulching Fact Sheet https://compost.bc.ca/wp-content/uploads/2015/03/7-Mulching.pdf
2. RHS - Mulches and Mulching - https://www.rhs.org.uk/advice/profile?pid=323
3. The Science of Gardening Course Guidebook - Linda Chalker Scott, Washington State University.
4. Resilient Gardens 2016 – Climate Change, Stress Disorders, Pest Update by Linda A. Gilkeson
5. Washington State University Extension – "Using Arborist Wood Chips as Landscape Mulch", 2015, Linda Chalker-Scott https://pubs.extension.wsu.edu/using-arborist-wood-chips-as-a-landscape-mulch-home-garden-series

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