



CMG GardenNotes #245

Mulching with Wood/Bark Chips, Grass Clippings, and Rock

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Terms: Mulch and Soil Amendments

The term *mulch* refers to a material placed on the soil surface. By contrast, a *soil amendment* refers to any material mixed into a soil.

Benefits of Mulching

Depending on materials used, mulches have many benefits, including the following:

- Reduces evaporation from soil surface, cutting water use by 25-50%
- Organic mulches promote soil microorganism activity, which in turn, improves soil tilth and helps lessen soil compaction. For additional details, refer the *CMG GardenNotes #211, The Living Soil*.
- Stabilizes soil moisture
- Prevents soil compaction
- Controls weeds, which rob soil moisture
- Moderates soil temperature extremes

- Controls erosion
- Gives a finished look, improving aesthetic quality

Edging and Soil Grade

It is a common practice to add mulch above grade level. Without a defined edge, the mulch can spread off the bed onto lawns or sidewalks, creating a mowing or trip hazard. [Figure 1]

Figure 1. Mulch added above grade spills out onto the lawn or sidewalk.



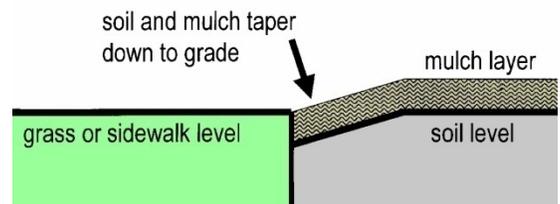
An effective alternative is to drop the soil level on the mulch bed 3 inches so the top of the mulch is at grade level. However, ensure that the mulched bed does not fill with water draining from higher areas. [Figure 2]

Figure 2. To keep mulch in place, drop the soil level in the mulch bed so the top of the mulch is at the grass or sidewalk level.



An effective alternative is to round down the soil level along the edge of the bed. This gives a nice finished edge at grade level and creates a raised bed effect for the flowerbed. [Figure 3]

Figure 3. An alternative is to taper the soil level along the edge of the bed.



Wood/Bark Chip Mulch

Benefits

Wood or bark chip mulch is great around trees, shrubs, perennials, and small fruits. [Figure 4] A wood/bark chip mulch creates a favorable environment for earthworms and soil microorganisms. Over time, this helps reduce soil compaction. For additional details, refer to the *CMG GardenNotes* #211, *The Living Soil*, and #218, *Earthworms*.

In perennial and shrub beds, wood/bark chips can reduce the need for irrigation by as much as 50%. Mulching materials that mesh together are more effective at reducing water evaporation from the soil.

When placed on the soil surface as mulch, wood/bark chips do not tie-up soil nitrogen. However, incorporating wood/bark chips into a soil can create a nitrogen

deficiency due to a carbon-to-nitrogen imbalance, and can interfere with seedbed preparation. It takes ten or more years for chips to decompose in a typical soil. The use of fine chips or sawdust as mulch can tie-up soil nitrogen and can decrease soil oxygen levels.

Wood/bark chips are not recommended in vegetable or annual flowerbeds where the soil is routinely cultivated to prepare a seedbed.

Figure 4. Wood/bark chip mulch in the perennial and shrub bed greatly enhances soil tilth over time.



Product Selection

There is a wide variety of wood and bark chip products available for mulching. Wood chips have the advantage that they decompose faster, enriching the soil. Bark chips decompose slower, requiring less frequent replenishment. **Primary selection is based on desired appearance and cost.** Some can be colored to match the paint color of the home or landscape features.

Cedar mulch

A number of references discuss the phytotoxicity of cedar when used as mulch around young plants. Most of the information, however, refers to the use of cedar sawdust (smaller particles with more exposure to the surrounding plants and their roots) rather than chips that are typically used as mulch.

The other issue, and probably the more relevant question, is what plant is actually referred to as “cedar”. In Colorado, we have very few true cedars (the genus of true cedar is *Cedrus*). What most people call “red cedar” is either a juniper (i.e., eastern red cedar, *Juniperus virginiana*) or arborvitae, (i.e., western red cedar, *Thuja* spp.). Neither of these have toxic qualities for young plants when used as a mulch.

Most “cedar” mulch in Colorado (unless they are bagged and shipped from another part of the country) will not be the true cedar. They will most likely be either the juniper or arborvitae, which are not toxic when used as mulch. If you are buying mulch in bulk from a local source it likely does not contain wood from true cedars.

General Use

Depth

The desired depth of wood/bark chips depends on chip size. Smaller size chips should not exceed a one to two inch depth. Larger chips are typically applied at three to four inches deep. Thicker layers may reduce soil oxygen. Additional mulch needs to be added every few years to bring the mulch depth back to the desired amount.

With the larger chips from the tree pruning industry, three to four inches are needed for effective weed control and to eliminate the compaction forces of foot traffic. It is common to see where the mulch is too thin and does not provide for weed control and compaction management.

On compacted and/or clayey soil, three to four inches of wood/bark chips may reduce water evaporation from the soil surface so much that susceptible plants develop root rots in wet years or under frequent irrigation.

In wet soil situations, mulching may be undesirable as it may help hold excessive water leading to root rots.

Around Trees

Wood/bark chip mulch is great for trees and shrubs, protecting trees from lawnmower damage. However, do not make “mulch volcanoes” around tree trunks by applying chips up against a tree’s trunk. Wet chips piled up against the trunk can cause bark problems and interfere with the natural trunk taper, making the tree more prone to wind throw. Keep the mulch back at least 6” from the trunk.

[Figure 5]

Figure 5. Never make a “mulch volcano”. It leads to decay of the bark and interferes with trunk taper. Keep mulch back six inches from the trunk.



Windy Areas

Wood/bark chips move in strong winds. It is reported that the shredded type chips are somewhat more wind resistant. Basically, wood chip mulch does not work in open windy area, like on the high plains. In subdivisions, the wood fence around yards may adequately block the wind. Wood/bark chips also float, and are not suited to areas with standing water or heavy surface runoff during heavy rainfall.

Chips Over Landscape Fabric or Newspapers

It is a common procedure to apply mulch over a landscape fabric to reduce weed growth. However, the chips will give a greater improvement on soil tilth where they can breakdown into the soil without the fabric layer in between.

Weed growth in a mulch bed is a problem when the mulch is not at an adequate depth. As an alternative to the weed fabric, maintain a proper mulch depth to manage weeds coming for seed. Weed seeds that germinate above the fabric layer will be difficult to pull.

Converting Lawn to a Mulch Area

In situations where a lawn is being converted to mulched beds, spray the lawn out first with glyphosate (the active ingredient in Round-up and other products). Apply the mulch after the lawn has died. Do not put mulch over a growing lawn.

Cultivating Chips into the Soil

Do not cultivate wood/bark chips into the soil. The high carbon content of the wood product ties up soil nitrogen. Chips create soil texture interfaces that interfere with air and water movement and root spread. Chips decompose only slowly, taking approximately ten years. Wood/bark chips on the surface do not tie-up soil nitrogen. However, do not use sawdust for mulch as it may tie up soil nitrogen. Wood products need to be composted before use as a soil amendment.

Grass Clipping Mulch

Grass clippings make good mulch when applied in thin layers and allowed to dry between applications. Add additional layers each week as the lawn is mowed. With a few layers, weed seed germination will be checked. Grass clippings decompose rapidly, requiring additional layers during the growing season. A grass clipping mulch recycles its nutrients into the garden bed.

Do not apply fresh grass in thick layers as it will mat, produce foul odors, reduce air and water infiltration, and even become hydrophobic. Do not use clippings from lawns that have been treated with herbicides, or other pesticides, for at least 4 weeks after application.

Grass clippings are a good choice in vegetable and annual flower beds that receive annual cultivation to prepare a seedbed. Around leafy vegetables (such as lettuce, spinach, chard) carefully place the mulch at the base of the plant, to avoid getting dry grass clippings stuck to the lettuce leaf. [Figure 6]

Figure 6. Grass clipping are great for the vegetable garden and around annual flowers. Directly from the bag, place them around the plants in thin layers, allowing each layer to dry before adding more.



Newspaper Under Mulch

Newspapers make a good *underlayment* for a wood/bark chips or grass mulch. The newspaper shuts out light, giving a quick stop to germinating weed seeds that were brought to the soil surface during cultivation for seedbed preparation. Newspaper shades out many, but not all, growing weeds.

Apply newspapers only one to two sheets thick and top with wood/bark chips or grass to hold it in place. As newspapers blow away with the slightest breeze, apply it just before covering with chips or grass. Do not use thick layers of newspaper; the high carbon content can tie-up soil nitrogen. [Figure 7]

Figure 7. Use newspaper under the grass or wood/bark chip mulch to shut out light and stop weed seed germination. Apply it only in thin layers to prevent a carbon to nitrogen imbalance.



In situations where the newspaper is wet from rains or sprinkler irrigation, it rapidly decomposes. Where it remains dry (like over a drip irrigation system) it may still be intact at the end of the growing season. Any remaining newspaper may be cultivated into the soil in the fall.

Newspapers are printed with soy-based inks and are safe for use. Do not use glossy magazines as their inks may contain heavy metals or other soil contaminants.

Rock Mulch

Rock over landscape fabric is a common mulching material often considered as low maintenance. It is the preferred material for non-plant areas. Rock mulch has the advantage over wood/bark chips that it does not blow, float, or require additional amounts every few years as it decomposes. [Figure 8]

Pea gravel over a weed mat helps reduce evaporation from the soil surface. The use of small size rock, such as pea gravel, has been reported to encourage plant growth due to warmer soil temperatures in the springtime. However, in Colorado's climate this may encourage early growth that is sensitive to late spring frosts.

Figure 8. Rock mulch is great for non-crop areas



Rock mulch may be desirable in some specialty gardens, like a cacti garden, rock garden, or alpine garden.

Rock mulch can become a heat sink, creating a significantly warmer afternoon, evening, and nighttime microclimate. Outdoor people space adjacent to rock mulch will be warmer and less comfortable for summertime afternoon and evening use. In planting beds, rock mulch increases temperatures and may increase water requirements.

Rock mulch may interfere with shrub rejuvenation. Refer to *CMG GardenNotes* #619, **Pruning Flowering Shrubs**, for details on shrub pruning. Because shrubs in rock mulch cannot be effectively renewed by rejuvenation pruning, they are replaced when the shrubs become overgrown and woody. In this situation, it would be better to consider the rock mulch as “deferred maintenance” rather than “low maintenance”. [Figure 9]

Figure 9. Rock mulch interferes with shrub rejuvenation pruning. Here a wood/bark chip mulch will help enhance soil tilth.



Avoid using rock mulch beds adjacent to lawn areas. Rocks in the lawn are a safety issue with lawn mowers and ruin mower blades. For safety, avoid using rock mulch in children's play areas.

Rock over **black plastic** is very undesirable for planting areas. The plastic will reduce air infiltration into the soil and create soil moisture problems. The soil is often very dry or very wet under plastic.

Summary: Considerations in Selecting Mulch

Gardeners often inquire about the **best** mulching material for their situation. There really is not a best. What is practical and available varies from gardener to gardener and within different communities. The following summarizes considerations in selecting mulches:

- **Site**
 - Continual plant cover: trees, shrubs, perennials, and small fruit
 - Annual soil preparation: annual flowers and vegetables
 - Non-crop areas
 - Specialty crops (rock garden, cacti garden, alpine garden)

- **Function**
 - Soil improvement potential
 - Frequency of reapplication
 - Depth needed for weed management
 - Depth needed to minimize soil compaction
 - Appearance
 - Heat sink
 - Off-site movement by wind, water and gravity
 - Safety (children, lawn mowers)

- **Cost**
 - Local availability
 - Cost of product
 - Appearance
 - Size of area to be treated (quantity needed)
 - Depth of application (quantity needed)
 - Transportation costs

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