

Make Mine Mulch

Peter Del Tredici

Using mulch in the garden not only reduces maintenance, but also contributes to the overall health of the plants.

The use of organic mulches in landscape situations mimics the natural processes that occur in deciduous forests where a "blanket" of leaves is deposited on the forest floor every fall. Leaves not only act to insulate the soil during the winter but also are the mechanism by which carbon and mineral nutrients are recycled through the ecosystem (see The Organic Matter "Recycle" flow chart). In the list below I have summarized the principal benefits of mulch from the gardening perspective, along with some cautions about its use.

Benefits of Organic Mulch

1. Conserves Water

The most immediate effect of mulch is to reduce water evaporation from the soil surface. By protecting the soil surface from the drying effects of the sun and wind, mulch promotes water conservation.

2. Inhibits Weed Growth

A one- to two-inch layer of mulch will suppress the growth of many weeds, especially annuals, thereby reducing the amount of weeding time required.

3. Improves Soil Structure

Organic mulch acts as a source of carbon for soil decomposers, which turn it into humus. Humus benefits the soil by improving its

tilth and water-holding capacity, and by increasing soil aeration. Mulch is the most cost-effective way of improving the compacted condition of many urban soils.

4. Adds Mineral Nutrients

As organic mulching material decays, mineral nutrients are absorbed by symbiotic mycorrhizal fungi, which pass them on to plants in "exchange" for carbon (see flow chart). These nutrients, including phosphorus in particular, are essential for the healthy growth of plants.

5. Moderates Soil Temperature

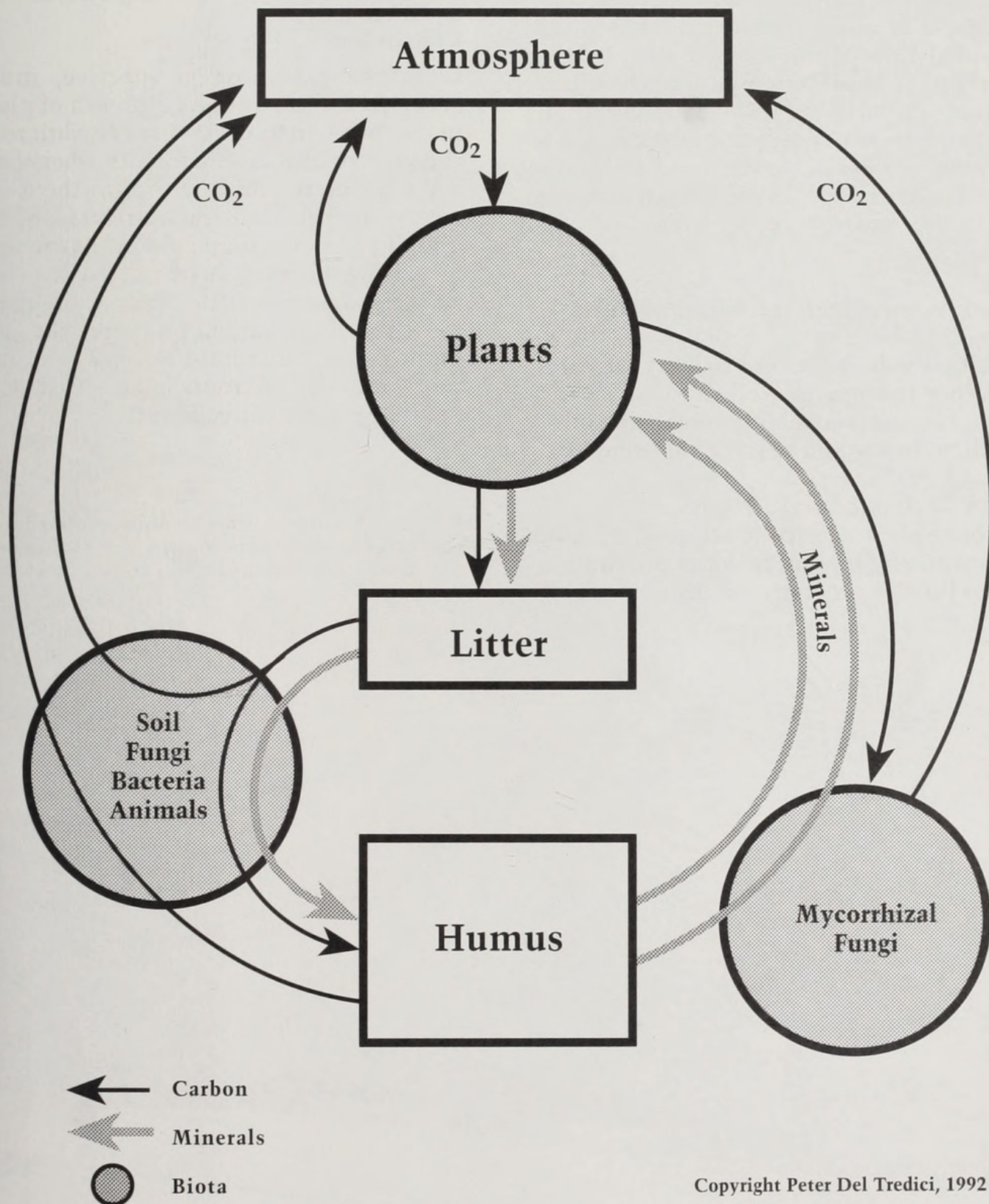
Mulch helps protect the root zone of plants from fluctuations in temperature. In summer, the soil under mulch is both cooler and more uniform in temperature than bare ground. In winter, mulch can act as an important soil insulator, particularly in years when there is no protective snow cover. By reducing soil temperature fluctuations, mulch also helps to prevent small plants from being heaved out of the ground during the winter.

6. Reduces Soil Erosion

Soil covered with mulch is better able to absorb rainfall than bare soil, thereby reducing soil erosion, particularly on steep slopes.

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The Organic Matter "Recycle"



Problems With Mulch

1. Can Cause Temporary Nitrogen Deficiency

Because of the high carbon-to-nitrogen content ratio of most organic mulches, they should always be top-dressed with a light sprinkling of an all-purpose garden fertilizer (such as 5-10-5) in the spring. Supplemental nitrogen not only speeds up the decomposition process, but also serves to minimize the temporary translocation of nitrogen from the soil to the mulch layer by fungal decomposers.

2. Can Provide Habitat for Herbivorous Animals

Mulch provides excellent habitat for voles and other rodents, as well as for slugs and snails, making control measures more difficult than they would be if the soil were bare.

3. Can Be Applied Too Thickly

On young plantings, too much mulch can be detrimental by inhibiting water penetration and air flow. In general, two inches of mulch

should be the maximum depth with woody plants. With herbaceous perennials, too much mulch can lead to rot problems, particularly during a wet growing season.

Conclusion

From the gardening perspective, mulch accounts for the improved growth of plants in two ways: first, it improves conditions for the growth and development of beneficial soil microorganisms by providing them with both carbon and mineral nutrients; and second, it promotes increased root growth by increasing the water-holding capacity of soil and improving its tilth. The use of organic mulches in the garden promotes the same harmonious interactions between plant roots and soil microorganisms that occur naturally in our native forests.

Peter Del Tredici has recently been appointed to the position of Assistant Director for Living Collections at the Arnold Arboretum. He has served as Editor of *Arnoldia* for four years.



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