Using Organic Matter in the Garden

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Health of the garden depends on organic matter. What happens below the soil line may not be as romantic as roses, but it does make the garden more healthy and those roses more beautiful. In gardening, many products are called organic matter. Animal manures, peat moss from bogs, leaves, straw, newspaper, sludge, yard and garden waste, kitchen scraps, and green manures or cover crops - all are forms of organic matter that can be incorporated directly into the soil. Often such products are composted, rather than used directly, and the compost is used in the garden. Compost can be made at home from kitchen, garden, and yard wastes, or it can be produced by an industry or local municipality.

Organic matter is used in the garden and landscape for many reasons, beginning with its effect on soil structure. Organic matter helps soil particles bind together into aggregates, or clumps, which makes it easy to dig or penetrate. We often call this quality *tilth.* In this way, adding organic matter helps all poor soils, whether they are too sandy or made of too much clay. A soil with good tilth also has good nutrient-holding and water-holding ability. In addition, organic matter improves soil by stimulating or feeding the life of the soil. It provides nutrients to bacteria, fungi, earthworms, and other organisms in the soil, which in turn recycle the nutrients into forms that are readily available for plants to absorb through their roots. Organic matter also helps to prevent soil and wind erosion by binding sandy soil particles together. Organic matter also prevents caking, cracking, and water run-off that occurs when clay soil dries out.

This publication describes some of the more familiar organic materials available to home gardeners, their effect on soil, plants, and soil life, and how they are commonly used.

When to Use Organic Matter

The short answer is "as often as you can." Amending the soil of planting areas for landscaping -- trees, shrubs, lawns and herbaceous plants -- is an important gardening practice for new homeowners or those who are revamping their property. Adding organic matter to a vegetable garden, a fruit orchard, or to an existing lawn is equally important for success. Experienced gardeners often consider soil building or soil replacement, i.e. bringing in and incorporating organic matter, nearly half the work of gardening.

Community projects often begin with substandard soil that needs amendment. In the rush to set out plants, gardeners sometimes do not add any or add insufficient amounts of organic matter. In reality, the soil preparation for planting beds is more important than the act of planting.

There is some disagreement about using any organic matter amendments in *backfilling planting holes* for trees, shrubs, or woody perennials. There is little data about long-term benefits. Some professionals have demonstrated that amending the original soil hole with a backfill mix encourages a *teacup effect*. That is, the artificial well or teacup of improved soil is so different from the surrounding soil that the roots never

leave their comfort zone, becoming entrapped in the teacup over time. Other professionals have shown that there is early root growth and possibly reduced soil-borne pathogens in soil that has been amended with organic matter. Currently, backfilling planting holes with organic matter, when planting new trees or shrubs, is not recommended for homeowners unless the soil quality is exceptionally poor. Incorporating organic matter over an entire site or planting bed, however, is recommended

In most situations, gardeners should add organic matter to "poor" soils, whether they are too clayey, too sandy, compacted or poor in nutrients.

Compost

Compost is often called *black gold* and many consider it the most important form of organic matter. It is universally recognized for improving soil structure and water-holding capacity. Compost helps the soil stay loose and easy to cultivate. Compost is, in fact, the end-product of the decomposition of organic matter. Making and using compost is also a way to *recycle* organic matter, especially materials which might otherwise have been treated as home or industrial wastes.

In addition to soil improvement and the economic and social benefits of recycling organic matter, composting can provide other benefits. Composts help fight soilborne pathogens that cause plant diseases. However, not all composts are suppressive to all diseases. Compost, along with other organic matter, improves the capacity of soil to hold nutrients through a complex process called *cation exchange capacity*. In addition, compost indirectly provides nutrients for plant use when earthworms and other organisms digest the organic matter, producing nutrient- rich castings, or excrement. These products are significantly richer in nutrients than the surrounding soil, and in a form, which is readily available to plant roots. While compost provides small amounts of nutrients and makes other nutrients more available, it is not considered fertilizer. However, in many organic gardening or farming systems, compost is the major amendment to enrich soil.

Not all composts are alike. Composts vary greatly, depending upon what goes into them and how they are processed. Quality also varies depending on maturity, pH, presence of weed seeds, concentration of toxic substances, and the population of soil-dwelling organisms, such as earthworms, insects and microorganisms. The term "compost" is not regulated, so a wide range of products can be marketed under that name. Higher quality compost is not too wet, is mature and has good water holding capacity and nutrient availability.

Maturity makes a difference. Use of immature composts can cause problems. Maturity means that the compost has decomposed extensively and has become fairly stable. Immature compost may still contain some plant inhibitors and excessive soluble salts. When immature compost is added to the garden, its bacteria compete with plants for nitrogen in the soil. The result is unhealthy plants with symptoms such as yellow leaves or stunted growth. If compost is still hot, smells like ammonia, or you can still recognize the original form of organic matter, then it is not ready to use. When in doubt, let compost mature longer.

Maturity is not the same as quality. Maturity means the energy and nutrient

containing materials have merged into a stable organic mass. Mature compost (also called "finished" compost) is dark-colored and has an earthy odor. Quality is the chemical composition of that mass. For example, a compost could be mature, but of poor quality, if nutrients had leached away or it contained contaminants.

Source materials affect quality. Soluble salts, nutrients and contaminants vary, depending on what the source material of the compost is. Soluble salts are actually chemically charged particles (ions), usually from dissolved fertilizer and irrigation water, but may come from the composted material itself. While not a human health concern, concentrated soluble salts can cause problems in plant growth. Compost made from food (fruits and vegetable scraps, fish residues, coffee grounds, brewery and bakery wastes) is typically richer in nutrients, but may have high salt content. The concentration of soluble salts, as well as the concentration of contaminants like lead and other heavy metals, in composted sewage sludge varies greatly, depending upon which industrial waste products are discharged to the sewage treatment plant. Yard waste compost is typically low in nutrients, contaminants and soluble salts. Composted manure is generally high in nutrients and soluble salts, while low in contaminants. Letting the compost cure in exposed piles for several months can reduce salts, allowing them to leach out as precipitation moves through the compost.

Hot is different from cold. Composts may or may not heat up during decomposition. Particularly in small-scale home composting systems, compost may not get hot. Some tests have shown that finished cold compost may actually have a higher nutrient content than products from a hotter compost. However, weed seeds and disease organisms are more likely to be destroyed in hot compost.

Uses of Compost. Gardeners and landscapers use compost in many ways. It is used in establishing a planting bed; improving soils; mulching gardens or landscape plantings; backfilling during the planting of trees, shrubs, or perennials; establishing or topdressing lawns; side-dressing vegetables; or controlling erosion.

The **amount** of compost to use varies, depending upon soil and site characteristics, plant selection, compost quality, and availability. Most mature composts can be used in most planting situations without serious concern for precise amounts. In estimating how much compost is needed, measure the overall planting area, and calculate how much compost you will need to cover the area with 1 inch (or your preferred amount) of compost in a season. For instance, to apply 1 inch of compost over a 10 x10-foot area, you'll need about 8 cubic feet , or about 300 pounds, of compost. For a home garden, two 4 x 4 x 4-foot piles of compost can provide enough compost to accomplish this. Experienced compost users rarely have enough compost for its many functions and are concerned with dispersing the *black gold* equitably among the garden and landscape plants.

There are easy ways **to apply compost** for different horticultural uses. Compost in **planting beds** for perennials is often applied at a rate of 1 to 2 inches. This could be about 8 to 16 cubic feet of compost per 100 square feet of the planting beds. Incorporate the compost evenly about 6 to 8 inches into the soil. The prepared bed for trees and shrubs, however, should be 30-50% compost by

volume to change structure, as well as to improve drainage, and root penetration into the site. To achieve this, add 4 inches of compost and incorporate it into the top 12 inches of the planting bed. This is about 32 cubic feet of compost per 100 square feet of planting bed. To use it as a **landscape mulch**, apply compost 1-3 inches deep over the soil surface. This could be 8-24 cubic feet of compost per hundred square feet of mulched area. A few inches of compost may also be layered under other landscape mulches, such as wood chips, to improve the soil without working the compost into the soil. In using sludge composts, apply no more than 2 inches. Limit sludge compost to one inch if you are mulching around salt sensitive plants. In **establishing a lawn,** mix compost with the planting soil, in order to improve drainage, especially in a heavy clay soil.

Compost may also suppress specific soil-borne diseases and plant pathogens in lawns. Before seeding a new lawn, evenly apply 1-2 inches of compost over the entire area. This could be 8-16 cubic feet of compost per hundred square feet of lawn. Incorporate into the top 5-7 inches of soil, resulting in a final volume of 30% compost content. **Established lawns** may be top-dressed, that is, sprinkled with compost over the top of the grass and watered into the top layer of soil. However, it is important not to apply more than a quarter of an inch at a time, as the compost could smother established lawns, if it is applied more thickly.

Any compost, except composted sewage sludge, may be added in many ways to **vegetable gardens**. Prior to planting, compost may be spread 3 inches over the surface and worked into the top 3-6 inches of soil. Other guidelines suggest 2-3 bushels of compost per hundred square feet should suffice. Side-dressing, or digging in compost next to growing plants, is often done a month or two after planting. Compost is also an excellent vegetable garden mulch, which breaks down slowly, encourages soil life and maintains an even soil temperature in the heat of summer.

For **erosion control**, compost may be added to a sloped area to increase the soil's ability to retain water and discourage run-off. To do this, spread a 3-4 inch layer of compost over the entire area and work into the top 6-8 inches of soil.

Biosolids or Sludge

What does sludge have to do with gardening? Biosolids or sewage sludges are the semi-solid residue from wastewater plants that treat residential, commercial and pre-treated industrial wastewater. Sludge is typically about half organic matter and is half inorganic. Composted sludge may be available to homeowners.

The goal of wastewater treatment is to clean up the water, and most pathogens and contaminants are deposited in the sludge. Before distribution for home use, sludges must be treated to essentially **eliminate pathogens.** Sludges are also treated to regulate the level of nine **metal contaminants** often found in municipal and industrial sludge. Standards for legally acceptable levels of these metals is regulated by NYS Department of Environmental Conservation (DEC) and by the Federal EPA. Testing for those contaminants is required with a frequency determined by the size of the treatment plant. There are no requirements for providing such quality information to users, however, the DEC does

require that all compost products, including sludges, be labeled with the source of the composted material, recommended uses, application rates and any restrictions on its use in the state.

Biosolids are fairly rich in plant nutrients (similar to manure) and the pH level is generally 6.0-7.5. Some biosolids used to produce composts have been treated with liming agents, which can affect pH, buffering capacity and soluble salts level, thus limiting their horticultural use with certain plants.

NYS regulations prohibit the use of sludge products made in NYS on crops for human consumption, such as in the home vegetable garden. There is a concern that crops can potentially be affected by pathogens in the sludge. In addition, there is concern that crops may take up heavy metals (such as cadmium, lead, zinc, mercury, etc.) from sludge. Cadmium could be taken up in all parts of the plant; it is relatively soluble at lower pH's. Keeping the pH at 6.8-7.0 or higher is useful in decreasing solubility of cadmium and other heavy metals. However, higher pH alone is not enough to reduce uptake of lead from soils contaminated with lead. Increasing the organic matter or phosphorus is also necessary to tie up lead in the soil, making it less likely to be absorbed by the crop. At the levels of lead in composts, even composted sludge, uptake of lead is low. Leaf splash and soil adhering to the plant is more of a concern. In urban or roadside sites, where lead contamination in soil is more likely, the issue of reducing lead absorption by plants becomes more acute.

Use of sludge products presents a special risk to children, who might unknowingly eat particles of soil. The exposure of children to lead, cadmium and other potential metal contaminants in soil enriched with sludge is the chief concern. When sludge is used, it should only be incorporated as an amendment to soil growing ornamental plantings. Using sludge in ornamental plantings in limited amounts where young children aren't in contact with the sludge in the soil is a relatively low risk. If sludge has already been applied, a concerned resident can dilute it with additional topsoil or cover it with mulch.

Milorganite as a Fertilizer and Deer Repellent. Milorganite is a commercially available, dried, aerobically digested sewage sludge. It has been available from Milwaukee since the 1930's as an organic-slow release fertilizer for turf, gardens and commercial agricultural use. Because brewery waste contributes to the production of Milorganite, it has a higher nitrogen content than most other sewage sludges. The processing of Milorganite kills pathogens and adds iron as a clumping agent. Its once high cadmium metal levels have been reduced through pretreatment of industrial wastes.

Milorganite has also achieved some popularity as a possible deer repellent for landscape plantings. In a demonstration project in Dutchess County, New York in the mid-nineties, Milorganite, used as a deer repellent, provided some protection for perennials and woody plants during the summer and early fall. These are times when deer have much alternative forage available. It provided almost no protection during winter and early spring, when either snow covered the ground or deer were short of food.

Sludge products like Milorganite are not legally registered as deer repellents by

federal EPA and therefore cannot be recommended.

Manures

Animal manures have long been a popular form of organic matter as well as fertilizer for farms and gardens. Farm manure is still the most readily available manure, purchased directly or sometimes free from the farm. It is sometimes bagged and sold in garden centers - with a wide range in its quality, nutritional content, age, and weed seeds present. It is not recommended that homeowners use any manure from dogs, cats, or other meat-eating animals, since there is risk of parasites or disease organisms that can be transmitted to humans.

Characteristics of animal manures: Farm animal manures provide NPK - nitrogen (N), phosphorus (P), and potassium (K). Generally, cow and horse manures are more readily available than other kinds of animal manures. For nutrient analysis of manure from eight kinds of farm animals, as well as other kinds of organic matter, refer to Cornell's Eco-Gardening Factsheet #8, "A Guide to the Nutrient Value of Organic Materials."

Using manure: Manures differ from each other because of their source, their age, how they were stored (piled, spread, turned over or not), and the animal bedding material, which may be mixed in. For that reason it is difficult to provide precise guidance about how long manure should be aged before use, or how much to use. Composting is the safest way to make the most of manure's nutritional potential - if the logistics of making and hauling compost are viable. For direct use in the garden, first aging manure for 6 months is a good rule of thumb. Many farmers and gardeners spread fresh manure in the fall or winter, and till or turn it in at spring planting time. When manure is spread in the spring, even if aged, it is safest to wait for at least one month before planting crops, since the microbial activity it stimulates may interfere with seed germination or plant growth before that time.

When composted manure is spread directly over the soil, it is helpful to add about 40 lbs. per 100 square feet, turned into the top 6 to 9 inches. Aged manure is often used in home vegetable gardens as a side-dressing, or placed directly in holes under the soil where vine crops such as pumpkins are planted.

Manure tea, made by soaking bags of manure in tubs of water, is a nutrient-rich liquid that is full of microbial life. It is another way to use manure as a fertilizer, whether it is poured on the leaves of plants (called *foliar feed)* or into the soil.

Problems with manure: While it is one of the most readily available forms of organic matter and fertilization for many gardeners, manure can present some problems.

- The relatively high nitrogen content makes manure extremely valuable in composting, where it activates soil bacteria and contributes to rapid decomposition of organic matter. But, as a direct soil amendment, that same high nitrogen content can be a deficit. Fresh, raw, or hot manure activates and builds up soil microbial activity to the extent that the nutrients *volatilize*, or burn up, before plants can use them.

- Fresh manure also can damage plant tissue and kill seedlings. An exces-

sive amount of soil nitrogen can produce plants with a high nitrate content. These high nitrate levels are not only potentially harmful to humans; they also are more attractive to pests than crops grown with less nitrogen, and do not store as well either.

- Manure also is notorious for adding undigested weed seeds to the garden, particularly from horses and other animals that eat hay. Composting in a hot system (when the pile reaches over 155 degrees F.) destroys most weed seeds, but many composting systems are inexact and seeds can come through. For that reason, those who use manure usually plan on weed-control techniques such as mulching, interplanting (growing cover crops between rows), mechanical or hand-weeding, or herbicides in some situations.
- Particularly in agriculture, manure use can pose pollution problems when rain or irrigation systems carry nitrogen from the fields before it is used by plants. Nitrogen from manure or synthetic fertilizers has been identified in New York State as a pollutant found in groundwater.

- Fresh manure must be used with caution in the garden because it may contain pathogenic bacteria such as *E. coli*, *Listeria*, and *Salmonella*. Although the chance of contamination is slim, severe sickness and even death may occur if contaminated produce is eaten. To be safe, either compost your manure or apply it in the fall after harvest. Wash your hands after handling manure and try to leave at least 120 days between application of fresh manure and harvest of a crop.

Green Manures or Cover Crops

Several grasses, grains, and legumes are used in gardening and farming and referred to as cover crops or green manures. The term *cover crops* describes an important function of these crops: to cover the soil, block weeds, prevent erosion, and maintain soil moisture, among other benefits. *Green manure* refers to the other primary function of using these crops: to add organic matter to the soil. Green manure crops are grown during fallow seasons (when a garden or field is not in use), during part of the growing season, or over winter, to add biomass to the soil. *Biomass* is the quantity of organic matter that living crops provide. Some green manure crops are also used between crop rows or plants while they are growing, called *intercropping* or *interplanting*. Cover crops are sometimes broadcast over existing crops a few weeks before harvest, so that the cover crop is already growing before the area is left bare. There are as many systems for green manuring or covercropping as there are garden layouts, and many ways to add organic matter with these plants.

Crops used for green manure: There are many choices of green manure crops, with a variety of benefits for using them. The crops are divided into legumes (beans, peas, alfalfa, clovers, hairy vetch, and soybeans) and non-legumes. The latter includes annual ryegrass, buckwheat, oats, winter rye, sudan grass, and winter wheat. The legumes provide the benefit of fixing nitrogen, actually taking nitrogen from the air and holding it as nodules on plant roots. As plants are turned under or cut off at the stem this nitrogen becomes available in the soil for future plant use. Some cover crops are biological *subsoilers*, such as alfalfa, with roots that reach down into the subsoil up to 8 feet, bringing valuable hard-

to-reach nutrients up to the soil surface as the crops are harvested.

Which green manure to choose In choosing a green manure crop, many factors have to be considered: the amount of biomass, the nitrogen-fixing factor, time required to grow, and most of all how the crop coordinates with the other plants in the particular garden's system. Even the equipment available, or your individual strength, are factors in choosing. For instance, taller crops, such as oats or winter wheat offer the most biomass, but they require serious equipment or massive effort to cut them down or turn them under.

Crops that over-winter, such as winter rye, protect the soil during the winter and provide spring growth, which is later cut down and turned under. However, to incorporate these into the soil in late spring requires powerful equipment. Tilling earlier in the spring is possible, but getting into the garden or onto the field during a wet spring can be a problem. Other crops, such as buckwheat, do an excellent job of blocking weeds and attracting beneficial insects, but offer less biomass. The governing factor in most cases is the timing. Once the summer crops are harvested there are only a few choices that can be established in September (annual ryegrass or oats) or as late as October (winter rye or winter wheat). For additional information on seeding rates and selection of cover crops, please refer to: Cornell's Eco-Gardening Fact Sheet #9, "Improve your soil with cover crops".

Peat Moss

For many years, bales of peat moss have been on our list of garden supplies and we've never given it a thought. Now, gardeners around the world wonder if peat companies are destroying these fragile and unique bog ecosystems by removing the peat. They ask whether these companies are harvesting this abundant resource in a responsible, sustainable manner. Canada, where we get most of our peat moss in the United States, has 25% of the world's peatlands and only .02% of them is being harvested. The industry is regulated and practices restoration and reclamation to attempt to keep peat a sustainable resource. Environmental assessments are conducted before opening a virgin bog to harvest. Horticulturally, peat is used in a variety of ways. It is a soil amendment, an ingredient in potting soils and planting mixes, and used as a bulking agent and carbon source in composting.

Can you use North American peat without feeling guilty Perhaps the answer to this question can be found by using peat conservatively. Use peat in your growing mixes for starting seeds and cuttings. Since peat is sterile, it minimizes disease problems. However, focus on compost and manure to supply the larger quantities of organic matter needed to improve your garden soil. By substituting compost for some of your garden needs, you can help to cut down on the rate of peat moss mining.

If you choose to use peat moss in the landscape, plan to add 33% (by volume) of peat moss before tilling it into garden beds. This could be 1-6 inches laid over the top of the planting bed before tilling. The actual amount will depend on how deeply you incorporate it into the soil. A shallow incorporation may only require a one inch layer, while deep digging will require more in order to achieve the 33% volume of peat moss to the entire soil mass.

A highly decomposed form of peat, dark brown to black in color, is peat *humus*. It has a much lower water-holding capacity and is more expensive than peat moss. It is, however, an excellent soil conditioner.

Because of its tight, fibrous structure, peat moss should not be used as a soil surface mulch. As it dries, it has the tendency to absorb water to itself, robbing the soil underneath from valuable water from rain or irrigation. Peat should only be mixed into the soil, not laid on top of it.

Since compost is often considered a substitute for peat moss, the following chart may help to delineate the **differences and similarities between peat moss and compost**.

Peat Moss	Compost
Expensive	Often free
Poor in nutrients	Relatively rich in nutrients (but not a fertilizer)
Low pH	pH usually neutral or slightly alkaline
Doesn't compact	May compact
Excellent at holding water	Good at holding water
Hard to re-wet	Re-wetting capacity varies
Uniform in composition	Variable in composition and contaminants
Contains few microorganisms	Full of microorganisms (mostly beneficial)
Contains no weed seeds	May have weed seeds if not composted properly*
No disease suppressing qualities	Capable of suppressing some plant disease-causing pathogens
Uses a natural resource, obtained by mining	Recycles organic waste matter
Not a mulch	Excellent as a mulch

* "Not composted properly" refers to situations where the compost has not gotten hot enough for a long enough period of time or where the compost goes anaerobic or where it has not been turned adequately to assure that all particles have been exposed to hot temperatures.

Other kinds of Organic Matter

In various regions of the state and across the country, plant and animal products from lakes, orchards, vineyards and fields are available. Such products as fruit pomace (seeds, pulp, skins), seaweed, brewery waste, buckwheat hulls, mushroom waste, fish industry, zoo, fair and circus waste are only a few kinds of organic matter that may only be available in specific regions.

Paper

Several paper products - especially newspaper and cardboard - are useful in the garden and landscape. While it provides no nutrients, paper is organic material, made primarily of wood fibers. It decomposes slowly but provides structure when used in a compost pile. Shredded newspaper or telephone book paper are good paper choices for composting or digging into soil directly; they decompose well when mixed with high nitrogen products such as a manure.

Shredded newspaper may also be used under other mulches in the landscape, where it is broken down by earthworms. Shredded computer or other office paper and glossy magazine-style paper decomposes slowly and may contain dioxins. There are enough concerns about the dioxin in bleached and glossy paper that it would be wise not to use them in the garden. Waxed paper almost never breaks down.

There has been concern about using colored paper or ink, which contains heavy metals. Evidence shows such low concentration of heavy metals - if any at all - that colored paper may be used without significant risk. Many inks currently used are soy-based.

Cardboard and newspaper (several sheets thick) are effective mulches around vegetables or flowers, used to block weeds and retain soil moisture. For similar reasons, in landscape plantings, cardboard or paper may be used under other mulches such as wood chips. This method has several other benefits: the paper products may block the light and prevent weeds longer than less solid mulches, and may decrease the amount of wood chips or other surface mulches needed. In addition, there is the benefit of reusing paper products, which reduces costs and the need for their disposal in overcrowded landfills.

Direct Incorporation of Organic Matter

Composting is not always a viable option for the home gardener. However, there are many other ways to add organic matter to the soil and still reap the benefits. Since the following methods do not create hot compost piles, gardeners should take care not to introduce diseased plants or weed seeds in any of them. Some of the methods of *direct incorporation* include:

- **Sheet method**: spreading organic matter such as leaves and grass clippings, straw, rotted hay or raw manure directly over the soil. Some users turn it under whenever it is applied and others let it cover the soil in winter and turn it under in spring. When opaque (black or red) plastic is used, a variation on sheet composting is to spread the organic matter under the plastic, where it decomposes more quickly using the heat created by the plastic.
- **Trench method**: one of the oldest and simplest ways to add organic matter is simply digging a trench or one hole at a time and burying organic matter as it becomes available. The trench can even be made between plants or rows during the growing season. The organic matter is typically kitchen waste, such as food scraps or coffee grounds, but any organic matter can be added this way.
- ***Hugel* method**: often called **in-place composting**, the gardener creates a mound or hill (*Hugel*, in German) of organic matter in the garden. While there are several variations, all include piling up organic materials in layers, usually with the coarsest on the bottom and letting the materials decompose in place. In most systems, crops are planted in the top layer, while the lower layers are still in the original undecomposed form. Possible materials from bottom to top are: twigs, leaves, manure, straw, grass clippings and compost or soil.

Mulch

Another way that organic matter is used in the garden is to cover the soil.

Mulches can be applied in winter or summer. Winter mulches protect young perennials, while summer mulches retain soil moisture and limit weed seed germination. Tree bark, branches and trunks can be chipped and spread as a mulch. Plant residues from locally grown crops such as buckwheat, peanut, cocoa, wheat, corn, and salt marsh grasses can serve the same purpose. Even newspaper is used. Almost any composted material can be used as a mulch, while peat moss cannot. Mounding compost mulch (or any mulch) against tree trunks poses serious dangers of disease, rodent or insect damage to the tree.

Summary

Far from being a luxury, organic matter is essential to the life of the soil and the plants growing in it. Knowing what to use, when to use it, how much to use and what effect each will have ultimately results in better success in the art and science of gardening.

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