Organic Gardening-Think Mulch

by Wesley P. Judkins

Organic gardening is the production of crops without the use of inorganic chemical fertilizers or pesticides. This means that only organic fertilizers such as manure, sewage sludge, cottonseed meal, bone meal, or dried blood are used. Also, diseases, insects, and weeds are controlled by natural resistance, birds, predator insects, or mechanical means, rather than by using pesticides or herbicides.

Organic methods may be followed with success in the home vegetable garden. This is especially true if mulches are used during the summer, and the crop refuse is returned to the soil each year to replenish and increase the organic matter content.

Regardless of the original source, fertilizer in the soil must break down into its ionic form before it can be used by plants. The ions which are then absorbed are identical, whether derived from an organic or inorganic source. Therefore, in terms of benefits to plants, when similar quantities of nutrients are available there is no advantage for either organic or inorganic fertilizer.

Organic materials are less caustic than inorganic fertilizers and, except for poultry manure, may be used with little possibility of damage to plants. The nutrients from organic fertilizers are rather slowly made available to plants. This may be an advantage where delayed release is desired to promote plant growth over an extended period.

Manure is commonly salvaged as a low cost fertilizer by farmers who produce livestock or poultry. It is usually not readily available to home gardeners. Dried manure with an analysis of about 1-1-1 may be used.

Other materials such as cottonseed meal, bone meal, and dried blood are available as organic fertilizers. These, and dried manure, are much more expensive than inorganic fertilizers. Also, from a practical conservation point of view, cottonseed meal, bone meal, and dried blood should be recycled as feed for livestock or poultry, and their manure then salvaged as fertilizer.

Most inorganic chemical fertilizers are much cheaper than organic types per pound of nutrient element. These elements become available for plants quite rapidly when applied in the inorganic form. Because of their concentration and solubility, inorganic commercial fertilizers are somewhat caustic and must be used with care to avoid damage to roots or foliage.

Sewage Sludge

Sewage sludge may serve as a desirable source of nutrients for gardens if a property processed product is used correctly.

Raw sewage sludge, which is sometimes called primary or settled sludge, is a solid, lumpy material with an offensive odor. It is not recommended for use in the production of any type of crop, because it is a potential carrier of harmful pathogenic organisms.

Digested sludge is settled sludge which has been anaerobically decomposed. During this process, much of the organic matter is converted to gases and soluble material, and most of the pathogenic organisms are destroyed. The nutrient content of digested sludge is low and variable with an average of about 2% nitrogen, 2% phosphoric acid, and .5% potash. This type of sludge may be used on the home garden if applied in fall.
before the soil is prepared for planting the next spring.

Dried activated sludge is settled sludge which has been treated with large amounts of air to cause aerobic decomposition. The resulting product is then heat dried and ground. The aeration and heat treatments inactivate any harmful pathogenic organisms. Activated sludge has a composition of about 6% nitrogen, 4% phosphoric acid, and 5% potash. This product may be used for gardens.

**Benefits of a Mulch**

One of the most important uses of organic matter by the home gardener is as a mulch. When so used it reduces the damaging impact of rain or irrigation on the soil. This is very important because it increases the infiltration of water and reduces erosion. An organic mulch conserves soil moisture by reducing evaporation, and helps to suppress weed growth.

Some of the best organic materials to use as mulch in the garden are leaves, lawn clippings, fresh sawdust, fine wood shavings, pine needles, chopped straw, ground corn cobs, shredded tobacco or cane stems, peanut hulls, or cottonseed hulls. They will not add important amounts of nutrients, or have a significant effect on the pH of the soil.

The dead vegetable and flower plants in your garden should be chopped down and left on the ground as a protective mulch during winter. This trash mulch will help reduce erosion, and improve the organic matter content of the soil when the garden is prepared for planting in spring.

Cut corn stalks, tomato vines, and other tall plants into 8-inch pieces with a sickle or pruning shears. Chop up low plants like beans and bushy flowers by running along the row with a rotary lawn mower.

**Cover Crops**

The planting of rye or wheat in fall is sometimes recommended as a means of controlling erosion during winter, and providing organic matter to improve the soil. Most home gardens are small and on relatively level land, so erosion is not a serious problem. Also, the use of mulch, leaves, lawn clippings, and plant refuse from the garden and flower bed usually will provide more organic matter than would be secured from the cover crop.

If the garden is planted in early spring, and a fall garden of hardy vegetables is maintained until late fall, there will not be enough time to plant an overwintering cover crop and secure a beneficial growth to plow into the soil the following year. Therefore, the use of overwintering cover crops is usually not recommended for the home garden.

**Checking soil moisture under organic mulch of lawn clippings.**

For gardeners who have a relatively poor soil and cannot secure adequate supplies of mulching material, the use of an overwintering cover crop may be desirable.
Sow rye or wheat broadcast at the rate of 3 to 4 pounds per 100 square feet, and scratch into the top inch of soil with a rake. This should be done several weeks before the average date of the first fall frost.

If crops are still growing in the garden, the rye or wheat may be planted between the rows.

Plow or rototill the cover crop into the soil in spring when the garden is prepared for planting, about a month before the average date of the last frost.

Mulching with fresh sawdust, lawn clippings, or other organic material is an ideal way to raise vegetables. Such mulch will conserve soil moisture, help control weeds, and improve the infiltration of rain or irrigation water into the soil.

Plant your vegetable seeds at the recommended depth and cover with soil in the usual way. Then spread a band of sawdust or vermiculite about 4 inches wide and 1/2 inch thick on top of the row. This mulch helps to conserve moisture, reduces crusting of the soil, and allows the young seedlings to emerge easily.

When the vegetable seedlings are about 6 inches tall, apply between the rows a 1-inch mulch of fine organic material such as fresh sawdust, lawn clippings, or peanut hulls, or a 2- or 3-inch layer of loose non-shredded leaves.

If weeds are present which are 2 inches tall or more, kill them by cultivating or hoeing before the mulch is applied. Mulch will smother weeds less than 1 inch tall.

Be sure the sawdust or fine shredded bark you use as mulch is fresh, or well aerated if old. Sawdust or shredded bark from the inside of a pile may go through anaerobic decomposition and become very acid, with a pH of about 3.0, and have a pungent odor. Such material is very toxic to plants.

Some weeds may continue to come up through the mulch. Pull these out by hand or carefully cut them off with a sharp hoe. Weeds are easy to pull when the ground is moist after a rain. Do not cultivate because this will mix the mulch with the soil and reduce its effectiveness.

The mulch should be worked into the soil by plowing, rototilling, or spading when the garden is prepared for planting in spring. This will add organic matter to the soil and improve soil structure and workability. It gives all the advantages of adding compost, plus the benefit of a full season with mulch.

Apply 4 pounds of 5-10-5 fertilizer per 100 square feet when the garden is plowed. This will counteract any tendency toward nitrogen deficiency, and provide adequate nutrients for the vegetable crops in the garden. Base the kind and rate of fertilizer to apply on soil tests for best results.

If plants develop light green color during the growing season, apply a side dressing of a fertilizer containing nitrogen. Use 1 pound of 10-10-10 per 100 square feet, or per 50 feet of row, or use 2 pounds of 5-10-5. Spread the fertilizer uniformly between the rows of plants, and scratch into the soil or mulch with a rake. If there is no forecast for rain it is advisable to apply water to dissolve the nitrogen and carry it down to the roots.

If you prefer an organic fertilizer as a side dressing, use 10 pounds of 1-1-1 dried manure per 50 feet of row. The nitrogen from this material is not as rapidly available as from chemical fertilizer, and therefore it is a less effective side dressing treatment.

**Compost**

Compost is a relatively fine, homogeneous organic material secured from the decomposition of various types of plant refuse such as leaves, lawn clippings, weeds, old vegetable plants, and garbage. The composting process reduces the volume of the plant material to a third or
less of its original amount, and usually destroys the viability of any weed seeds which may be present.

Composted humus material is particularly useful for making soil mixtures for the production of seedling plants for the vegetable garden. Compost is also useful as a mulch when more plant refuse is available than can be used as a mulch in its fresh or undecomposed condition.

If you make compost regularly, it will be helpful to construct 2 long bins of planks or concrete blocks. Make the bins about 4 feet wide, 4 feet high, as long as desired, and open at one end. Plant refuse may be accumulated in one, while the composting process is taking place in the other.

Composting is a disintegration process caused by bacteria and fungus organisms. This results in a considerable reduction in bulk, which may be helpful if you have large amounts of organic refuse and a relatively small garden. There is usually no objectionable odor during the process when layers of soil are added to the pile. If the compost is thoroughly decayed, there is little possibility of disease or insect problems from using it.

Start the compost pile with a 6-inch layer of plant material. Coarse plants such as corn stalks should be cut into pieces about 8 inches long. Sprinkle with 1 pint of 5-10-5 or 5-10-10 fertilizer per square yard of pile. If you prefer to use an organic fertilizer, scatter 5 pounds of 1-1-1 dried manure on each layer of organic material. If an alkaline compost is desired, add 1 pint of ground limestone per square yard of surface area. Add a layer of soil about 1 inch thick.

Repeat as many layers of plant material, fertilizer, and soil as needed to use all available plant refuse. The top should be lower in the center to cause water to move in rather than drain off.

Water the pile as often as necessary to maintain a relatively high moisture content, promoting decomposition. The pile should be forked over after about 3 months. The plant materials should decompose into good compost in about 4 to 5 months in warm weather, but may take longer under cool or dry conditions. It is not necessary to use bacteria pills or other substances to increase the rate or effectiveness of the decomposition process.
A plastic trash bag may be used to make a small quantity of compost from relatively fine material such as leaves, lawn clippings, or chopped garden refuse. Make layers of plant trash, fertilizer, and soil as in a compost pile. Add 2 quarts of water to dry material, and 1 quart if it is quite moist or succulent. Tie the bag and turn every few weeks to cause the moisture to move back and forth through the organic material.

Reducing Pesticide Needs

The homeowner who wishes to follow organic methods exclusively can have a more rewarding garden by planting only those crops which are not susceptible to damage by pests, or by selecting resistant varieties. The latter are usually described in seed catalogs, and information on them is available from your county Extension office. There is no conclusive evidence to indicate that crops grown organically are more resistant to pest damage than similar vigorously growing crops which have received commercial fertilizer.

Although some vegetables may be severely damaged by diseases or insects, many types can be grown successfully without the use of pesticides. Some of the best crops for the home garden are asparagus, heels, carrots, celery, Swiss chard, collards, cress, endive, kohlrabi, leeks, lettuce, mustard, onions, parsley, parsnips, peas, peppers, radishes, salsify, spinach, sweet potatoes, turnips and watermelon.

They may of course be damaged by diseases or insects in some seasons but, by planting only these vegetables, you can usually have a productive garden with little or no spraying. When soil insects are troublesome, and the gardener is unwilling to use synthetic pesticides, it may be wise in avoid growing certain root crops.

All home gardeners should be concerned about the use of pesticides. Some of these materials are more hazardous than others and their use should be limited to those crops which would otherwise be severely damaged by diseases or insects. A good rule to follow is to use the least toxic pesticide that will do the job.

Several non-hazardous organic or biodegradable pesticides are available for the home gardener. Our remarks here concern mechanical and biological controls.

Aphids occasionally are a serious pest on some garden plants. Lady beetles, available from many organic gardening supply houses, can be released to feed on aphids, but there is a chance of only temporary control because they may soon leave the area.

Cutworms often destroy certain vegetables in the garden. Newly set cabbages, tomatoes, and other plants may be protected with a cardboard collar which encircles the plant a half inch out from the stem, extending an inch into the ground and 2 inches above.

Slugs may cause damage, especially in a mulched garden, which provides excellent living conditions for this pest. A ring of wood ashes or sharp sand around plants helps control slugs. Also, shallow aluminum pans sunk into the ground with the rim level with the soil and filled with beer will attract and kill slugs. They drown in the liquid.
Bacillus thuringiensis is a bacterial disease effective against the larvae of a number of moths and butterflies. It is useful for controlling cabbage loopers on broccoli, brussels sprouts, cabbage, cauliflower, collards and kale.

Sweet corn may be damaged by borers fn the ears, but this is usually confined to the tip, which can be cut away when the corn is prepared for cooking. Also, there will be less trouble if you select some of the new hybrid varieties with tight husks. All damage by corn borers can be prevented by treating the silk with mineral oil before it turns brown. This is a harmless organic compound.

Beans may be severely damaged by Mexican bean beetles unless the post is controlled with insecticides.

Broccoli, brussels sprouts, cabbage, and cauliflower may become inedible because of cabbage loopers. Use of Bacillus thuringiensis is an effective, non-pesticide method of controlling this insect.

Pumpkin and squash vines may lie killed by squash bugs and vine borers. They may be controlled with a pesticide.

Cucumber varieties such as Gemini and Victory, which are resistant to several diseases, may be grown quite successfully without spraying unless cucumber beetles become a problem. A pesticide will control the beetles.

Eggplant is very difficult to raise in most gardens unless the plants are sprayed with a pesticide to control flea beetles and Colorado potato beetles.

Many potato varieties are severely damaged by mosaic and late blight.

Kennebec is resistant to these diseases, but may need a pesticide spray if potato beetles become a problem.

Tomato varieties are available which are resistant to fusarium and verticillium wilt and nematodes. Such varieties should be selected for the home garden. The plants may need to be sprayed to control blight.