

City of Clifton's Guide to **Sustainability** through Backyard Composting



Photo: EPA Website

What is Backyard Composting?

Backyard composting is the controlled biological decomposition and conversion of solid organic material through a sustainable system derived within nature which creates a nutrient rich humus like by-product referred to as compost. Compost saves energy, natural resources, landfill space, and tax dollars; in addition to reducing greenhouse gas emissions and chemical dependency on inorganic petroleum based fertilizers.

Controlled because the operation is maintained in an area or pile that has material added, turned and watered - when needed.

Biological decomposition is the aerobic breakdown of organic material through microbial activity. Bacteria starts the process, fungi, protozoan, along with centipedes, millipedes, beetles and earthworms (micro and macro organisms) all have a significant aspect in the biodegradation of materials.

Organic materials called (brown) and (green) are "**resources**" needed to create compost. Browns are dry carbon rich materials, and greens are fresh moist nitrogen rich materials.

BROWNS

Dried Leaves
Wood Chips
Hay and Straw
Newspaper/Cardboard

GREENS

Grass Clippings
Plants and Green Trimmings
Fruit and Vegetable Scraps
Egg Shells

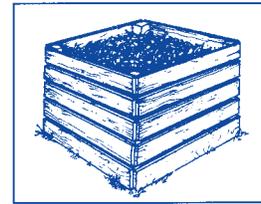
For the organic materials to work a proper mixture of water, oxygen, micro and macro organisms, heat, and particle size reduction are needed to balance a successful composting operation.

Some items to avoid in your compost are: meat and dairy products (since they may attract insects and other animals); pet waste (may contain disease); chemically treated grass, diseased or pernicious invasive plants.

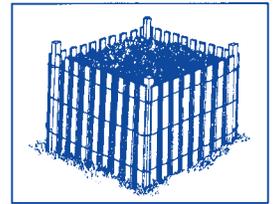


Types of Compost Bins and Structures

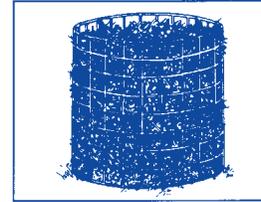
Compost bins and structures are helpful in keeping your compost pile neat and clean, however you do not need one to have a compost pile. Homemade structures can be made with wire fence, cement blocks, untreated lumber or hay bales. Commercial plastic units are available at many local garden and home improvement centers.



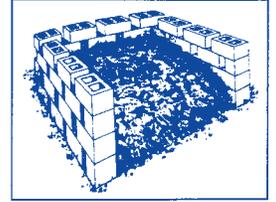
Holding bin made from pallets



Snow fence bin



Bin from woven wire



Concrete block bin

Whatever type of bin you choose make sure there is enough air circulation into the pile and that the size of the pile is sufficient to generate and hold heat. A small pile of (2x2') or (3x3') should be sufficient for residential suburban backyards.

How to Compost

- Step 1:** Choose a location. The best areas for a compost pile are away from the home and trees, good drainage and away from direct sunlight.
- Step 2:** Remove the sod and loosen the soil to a depth of about 12-15 inches. If possible make a 4-5 inch base of porous material such as brush or woodchips. Keep the soil from the base on the side of the pile.
- Step 3:** Add your greens (nitrogen rich) and browns (carbon rich-if you have it) materials to the pile. Make sure materials are chopped-up to reduce the size (this will speed up decomposition). Lightly cover this layer with the soil left over from the base this will bring the microorganisms to the pile.
- Step 4:** Add water if needed. Once the pile reaches 2-3' it will begin to heat-up and decomposition will begin.
- Step 5:** If possible turn your compost pile every few days and move the materials from the outside to the middle of the pile. Turning increases air circulation and speeds up decomposition.
- Step 6:** During the colder months as you add materials to the pile-continue to turn the pile as best you can, and try to cover your pile with some leaves or straw.

Other Methods of Composting

Other forms of backyard composting includes passive and active composting, Grasscycling, worm (vermi) composting, mulching, and the use of chippers and saws for the management of tree parts such as branches and logs.



Grasscycling (leaving cut grass on the lawn) forms the most important component of source reduction of residential or commercial generated organic materials. Grasscycling saves time and money. Citizens won't have to buy lawn bags, will spend less or nothing on fertilizer needs, and save money and resources by not having to water your lawn. Some communities throughout the country give tax breaks to property owners who compost and participate in Grasscycling programs.

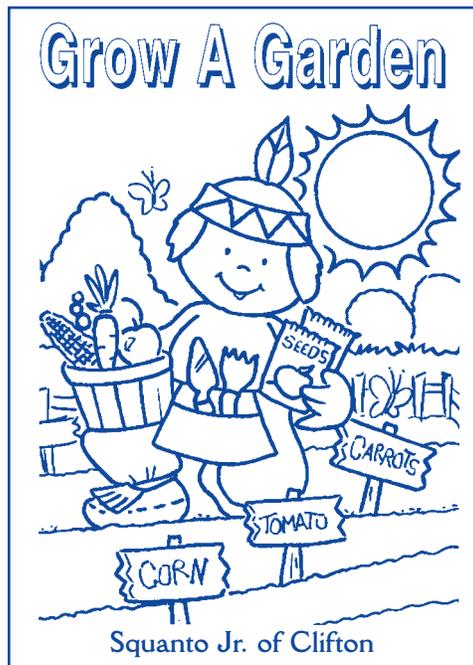
Composting and Sustainability

What is sustainability? Citizens who participate in composting projects practice environmental stewardship through sustainability: leaving the earth capable of sustaining life at the same level as when we started or doing as little damage to the ecology of nature as possible. Will our planet be in better condition after our time spent on this planet?

Composting is nature's method of recycling and is needed today more than ever to sustain life, reduce environmental degradation, and improve our soil and soil fertility. Compost as a soil amendment improves soil texture and aeration, increases the soil's ability to retain water and has the ability to improve plant growth and other beneficial uses in bioremediation, erosion control, and soil restoration.

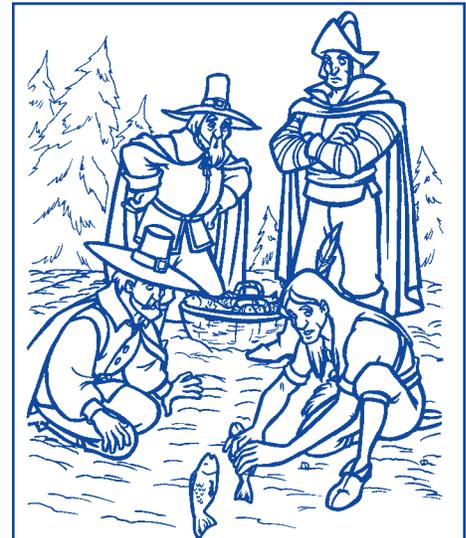
Composting and Health

Helen and Scott Nearing in their classic book Living the Good Life: How to Live Sanely and Simply in a Troubled World - were twentieth century "back to the land" homesteaders that epitomize the reality of sustainability.



In chapter four of their book (Our Good Earth) they state "Top soil is alive in several senses. It contains large quantities of organic matter, made up of plant and animal residues, leaves, twigs, grasses, manures, carcasses. Alive with microscopic organisms which convert organic matter such as dead leaves and grasses into available plant food. Alive with earthworms which work the land by passing particles through their bodies, extracting certain nutritive factors upon which they live and casting forth the remainder to greatly enrich the land."

They continue into the next chapter (Eating for Health) "food consumed by human beings comes directly or indirectly from the upper few inches of top soil... Good food should be grown on whole soil, be eaten whole, unprocessed, and garden fresh.... We might remind our readers in passing that compost – grown fruits and vegetables taste better than the same product grown with commercial fertilizers ... NOTE: Scott Nearing lived to be one hundred and Helen Nearing lived into her nineties.



Here, Squanto teaches Pilgrims how to survive and plant corn using fish as natural fertilizer. The Native Americans were a Sustainable Nation.

Composting and (Storm) Water Protection

Composting reduces the need to consume inorganic petroleum based chemical fertilizers and pesticides that are placed on lawns, vegetable and flower gardens. Healthy compost provides all the micro and macro nutrients necessary for plant health and growth. Compost mixed into the soil or applied as "compost tea" is absorbed by the plants or soil with little water runoff or erosion.

Nonpoint Source Pollution (NSP) is contamination affecting our waterways. NSP occurs when rainfall or snowmelt flows into catch basins, storm drains, lakes, rivers, streams, bays, coastal areas, and into ground water. NSP pollutants include: excess fertilizers, pesticides and herbicides; litter; dumped oil, grease and toxic materials from household hazardous waste; animal waste; sediment from construction sites; and soil erosion.

Chemical fertilizers and pesticides do not enhance the ecology of soils, soil fertility, plant life or our waterways. Most chemical fertilizers are applied improperly and in excess which is washed by rain into ground and surface water supplies. Excessive nutrients pollute water quality and marine ecology, decrease oxygen levels, while increasing algae and plant growth in lakes and ponds.

Overtime, excessive nutrients, sediments from erosion, algae, weeds and other plant life alter and increase the

aging process of the ecology of the lake. This aging process called eutrophication is a stage in a mature lakes life. Natural eutrophication occurs over hundreds or thousands of years but eutrophication caused by human activities can occur in as few as ten to fifteen years.

Composting, active or passive, protects our water quality and waterways, thereby preserving our planet and maintaining sustainable communities.

Composting and Waste Management

Composting is also a viable, cost effective and useful component of solid waste management. In-Vessel composting can compost the organic content of municipal solid waste. Another method called Co-Composting can compost the organic content along with sludge and other materials.

In-vessel composting systems can compost yard trimmings, food scraps, sewage sludge, mixed wastes, and paper products. These materials degrade in a vessel under ideal conditions. This kind of composting demands exact oxygen and temperature regulation. Carbon to nitrogen ratios and moisture content must be considered as well. Materials must be sorted to keep non-biodegradable materials from entering the compost pile. Again, like most forms of composting the compostable materials are chipped, pulverized or shredded into similar-sized pieces to promote rapid decomposition. The temperature must be elevated in order to kill pathogens and weeds, but low enough to keep the decomposition organisms alive. Air is produced by blowers, flowing up through the compost pile.

Composting/Greenhouse Gas and Climate Change

According to the Environmental Protection Agency (EPA) "understanding the greenhouse effect is critical to understanding global climate change... Since the Industrial Revolution humans have changed the composition of the earth's atmosphere by increasing the levels of GHGs, primarily carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The increased levels of these gases have the potential to cause global climate change..."

"Two potential types of GHG emissions are associated with composting... methane (CH₄) will result from anaerobic (without oxygen) decomposition." This occurs mostly when any organic biodegradable materials are buried in landfills, and if organic materials are left in large compost piles that are not properly maintained. Another greenhouse gas that is emitted is carbon dioxide (CO₂). This gas is emitted from the transportation of compostable materials and a minimal amount is emitted during the turning of the compost piles. EPA has also determined that utilizing compost as a soil conditioner may have an effect on soil carbon storage.¹

(1) Solid Waste Management And Greenhouse Gases - A Life Cycle Assessment of Emissions and Sinks; 2nd Edition, June 2002; EPA530-R-02-006

Reference Material

Living the Good Life, 1954, Helen and Scott Nearing

Worms Eat My Garbage, 1982, Mary Appelhof

Rodale Guide to Composting, 1979, Organic Gardening Staff, Rodale Press

EPA-Waste Wise Update; Recovering Organic Wastes-Giving Back To Mother Nature, 1999, EPA530-N-99-007

EPA – Website – www.epa.gov/wastewise

Backyard Composting, (Your Complete Guide to Recycling Yard Clippings), 1992, Harmonious Technologies

Let it Rot! The Gardeners Guide to Composting, 1975. Stu Campbell

Questions regarding this flier please Call: Alfred Du Bois, Municipal Recycling Coordinator at (973) 470-2239 or e-mail at adubois@cliftonnj.org

For further information on Clifton's Environmental programs please check-out the web-site at www.cliftonnj.org