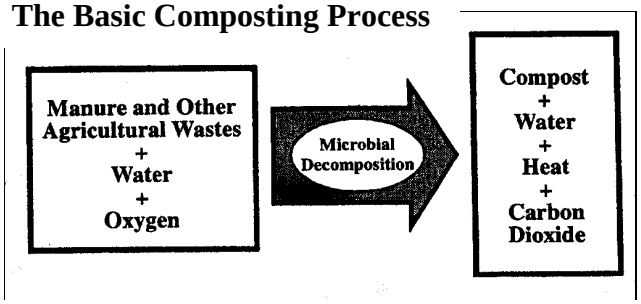
Abbotsford Soil Conservation Association Factsheet on

Compost

Using a Liability as an Asset

Composting is the biological decomposition of organic matter under controlled conditions. Decomposition occurs naturally but can be accelerated and improved by human intervention.

The Basic Composting Process



Composting stabilizes organic matter to give an end product that contains humus, and has a uniform crumbly texture. Improved physical properties also include low moisture content (usually below 35%), and reduced volume and weight. These improved physical properties lower hauling and spreading costs.

Without regular addition of organic material to soil, there is a potential for increased leaching, erosion, and gradual deterioration of soil physical properties. Moreover, as soil degrades there is an accompanying decrease in crop use efficiency of fertilizer nutrients, especially nitrogen.

Most of the plant nutrients in compost are not immediately soluble in water, but are released gradually. Composts allow for nutrients to be used more efficiently reducing the amount of fertilizer that needs to be applied and the potential loss of soluble nutrients such a nitrate to groundwater. The pH of most solid waste compost ranges from 7.0 to 8.0, and its introduction to soil will have little or no effect on soil pH.

Composts provide a more stabilized form of organic matter than raw wastes and can greatly improve the physical properties of soils.

A farmer has two options for producing the crop: bypass the soil system and feed the plant by emphasizing N-P-K fertilizer use, or build the soil and let the soil feed the plant.

Addition of compost to sandy soils will increase their ability to retain water and render them less prone to drought. In heavy-textured clay soils, the added organic matter will increase permeability to air and increase its water infiltration capabilities, thereby minimizing surface runoff and increasing water storage. It may also reduce soil compaction, lower its bulk density and increase rooting depth.

Compost attracts earthworms that aerate the soil, improve drainage and bring up minerals from the subsoil for plant use.

Factors to Use in Evaluating Compost

Here are some questions that will help you chose the compost that's right for your soil, cropping system, and budget:

What were the starting materials for the compost? Materials used for composting can include manure, sawdust, straw, mushroom waste, biosolids, yard trimmings, ground pallets, and agricultural byproducts

What was the carbon to nitrogen ratio of the compost at the beginning of the process, and at the end of the process? Optimum beginning carbon to nitrogen ratios are 25:1 or 30:1. When compost is finished, the ratio should be less than 20:1. High carbon compost competes with plants for nitrogen to continue the decomposition process

How was the compost aerated? Decomposition slows or stops if oxygen is not replenished. Turning, agitation, or blowing of forced air can provide aeration.

How often was the compost turned (windrow composting)? Growers generally prefer highly aerobic compost

What were the temperatures during composting? Temperatures of 110 – 190° F can occur during composting. Optimum temperatures are 130 – 140° F. With time, these high temperatures kill pathogens and weed seeds. If temperatures are over 150° F, beneficial organisms are killed.

What is the temperature of the finished compost? When compost is mature, the temperature in the pile should not rise more than 10 degrees above ambient air temperature. Temperature reading should be taken when compost is aerated and reasonably moist.

What is the moisture content of the finished product? Moisture content of finished compost should be over 35% to minimize dust problems during spreading. Also, some beneficial microorganisms will die of moisture content is too low. On the other hand, if compost is too moist, it is heavy to transport and may have a tendency to clump.

What is the nutrient analysis of the compost? Although large quantities of nutrients are not typically found in compost, it is applied at much greater rates than fertilizer, and can have a significant effect on crop nutrients. Nutrients in compost are mostly in complex organic form and must be mineralized in the soil before they become available to plants.

What is the particle size of the finished compost? Compost that can pass through a one-inch screen or smaller is generally preferred to minimize non-biodegradable contaminants and to limit large woody pieces in the finished product. However the preferred particle size may depend on the texture classification of the soil being amended, crop to be planted, and equipment to be used.

How many cubic yards are in each ton of compost? The answer to this question impacts the cost of the material and also the handling costs.

Additional Benefits of Compost

Professional growers are discovering that compost-enriched soil can also help suppress diseases and ward off pests. These beneficial uses of compost can help growers save money, reduce their use of pesticides, and conserve natural resources.

Disease control with compost has been attributed to four possible mechanisms: successful competition for nutrients by beneficial microorganisms, antibiotic production by beneficial microorganisms, successful predation against pathogens by beneficial microorganisms, and activation of disease-resistant genes in plants by composts.

Compost can also eradicate some types of pests, such as parasitic nematode (worm) infections, in addition to is use in controlling diseases. Most types of compost help control parasitic nematodes by providing nutrients to the soil, which encourages the growth of fungi, and other organisms which in turn compete with, or destroy, nematodes. Compost also contributes to plant's basic health, making them less susceptible to pests.

The major advantage of composting is the production of a stabilized product that can be stored or spread with little odour or insect breeding potential.

Compost can be effectively applied after harvest and incorporated before planting the cover crop. It can even be side-dressed after the crop is planted using a dry fertilizer

Compost improves the water-holding capacity, and stability of soils and allows for easier root penetration by plants. It may also reduce the need for commercial fertilizer. Application of composted manure is less likely to pollute watercourses compared to raw manure in a similar situation.

Examples of Use:
compost has many uses and provides a number of agronomic benefits.

Agricultural

advantages of field-applied compost include:

- **organic fertilizer for organic farmers**
- **increased aeration and organic matter content**
- **improved moisture and nutrient retention**
- **decreased soil erosion and soil crusting**
- **plant disease suppression, and**
- **improved tilth**

Land Development

compost in land development applications are mostly used for:

- **landscaping and golf courses maintenance,**
- **renovation and establishment of turf,**
- **land reclamation for landfills and gravel pits**

Horticulture

Horticultural enterprises making use of compost are:

- **Greenhouses and nurseries**
- **Field growers and sod producers, and**
- **Home gardeners**

References:

- *BC Agricultural Composting Handbook, 2nd Edition,* British Columbia Ministry of Agriculture and Food
- *Innovative use of Composts,* US Environmental Protection Agency
- *Yard Trimmings Products Use Guide,* Agriculture in Partnership with San Jose

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Directed by Farmers, for Farmers

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Abbotsford Soil Conservation Association

The Abbotsford Soil Conservation Association is a non-profit society registered in the Province of British Columbia. Key issues the group will be addressing are the following:

- soil conservation and soil conservation practices
- storm water management
- riparian and fisheries issues
- education

The ASCA takes a cooperative approach to solutions regarding these issues, focusing on land stewardship and keeping in mind that farming is a business. The ASCA intends to further the success of the past groups, moving soil conservation and sustainable agriculture into the new

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