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**Composting On the
Organic Vegetable Farm**



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Introduction

- Human Health
- Environmental Health
- Nutrient Retention through production, storage and handling to get the most benefit from compost.

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Principles of Organic Agriculture

- Protect the environment
- Maintain long term soil fertility
- Maintain biological diversity
- Recycle nutrients, use biological inputs
- Provide care to livestock which promotes health & meets the animals' behaviour needs
- Preserve organic integrity of products
- Feed the soil

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**Organic Standards Re:
Manures/Compost**

- Feedstocks
- Process
- Off farm sourced materials
- Liquid manure should be aerated.
- Storage & Application
- Immediate incorporation & immediate cropping or cover crop

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Definition of Composting

- Composting is defined as a managed process of biological oxidation including a thermophilic phase, of a solid heterogenous organic substrate.
(from Canadian Organic Standards)

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Another Definition of Compost

In the soft warm decaying compost heap, a transformation from life to death and back again is taking place. Life is leaving the living plants of yesterday, but in their death these leaves and stalks pass on their vitality to the coming generations of future seasons. Here in a dank and mouldy pile the wheel of life is turning.

Compost is more than a fertilizer or a healing agent for the soil's wounds. It is a symbol of continuing life. Nature herself made compost before man first walked on the earth. Leaves falling to the forest floor and slowly mouldering are composting. The dead grass of the meadow seared by winter's frost is being composted by the dampness of the earth beneath. Birds, insects and animals contribute their bodies to this vast and continuing soil rebuilding program of nature.

Sir Albert Howard, a pioneer of the organic movement who worked in Indore, India in the 1930s.

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Benefits of Composting

- Support Soil organisms
- Increase Organic matter (OM)
- Ph less acidic
- Compost provides nitrogen, phosphorus, potassium, calcium, magnesium & micro-nutrients
- Nutrients not lost through evaporation
- Nutrients released over more than 1 season.

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Benefits of Composting (continued)

- Weed seeds are killed
- Fly eggs are destroyed
- Harmful bacteria/pathogens are killed
- Plant Resistance is improved
- Less trips to the field with compost than raw manure.
- Smell is pleasant

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Benefits of Compost (continued)

- Prevent damping off disease (rhizoctonia, fusarium & pythium) in transplants
- Plant roots coated with mycorrhizal fungi are less susceptible to disease and resistant to nematodes
- Compost tea trials & late blight

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Benefits of Compost (cont'd)

- "The role of organic matter in protecting crops from disease first became apparent because of the realization that improvements in yield as a result of applying compost were greater than could be explained in terms of nutrient content alone."

(Organic Farming, Lampkin)
- The 'humus effect' is associated with increased microbial activity, reduced aggressiveness and infestations of pathogens, increased viral resistance and reduction in soil 'tiredness' or toxicity.

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Compost Supports Soil Organisms

- Soil Bacteria
- Fungi
- Mycorrhizal fungi colonize plant roots
- Nematodes
- Protozoa
- Earthworms
- Micro-arthropods (ie. 200 species of mites in 1 sq.ft. of top 2 inches of forest litter and soil)
- Insects (Macro-arthropods), Birds & Animals

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Disadvantages of Using Raw Manure

- Results in nutrient imbalances.
- Raw manure is acidic and reduces pH of soil.
- Up to 70% of the nutrients in raw manure can be lost.
- Raw manure tends to be spread on closest acres because of volume.
- Odor is unpleasant.
- Weed seeds, fly eggs & harmful bacteria spread with raw manure.
- Raw manure is a primary cause of waterway pollution

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**Building The Pile &
Maximizing Its Benefits**

Pile Types

- Windrow
- Static Pile
- Ruth Stout's No Till Method

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Undesirable Ingredients

- Pesticide residues
- Herbicide residues
- Pathogens or antibiotic residues
- Growth hormone residues
- Genetically modified organisms
- Heavy metals
- Carcasses (Prion diseases)
- Manures from intensive livestock operations

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Notes On Cross Contamination

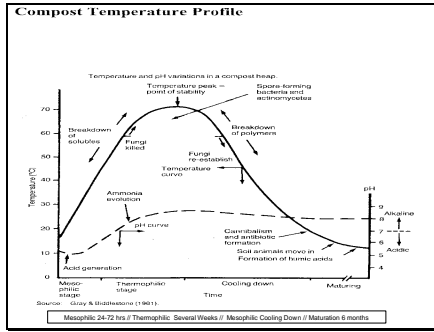
- Mature compost is susceptible to cross contamination from fresh manure on the loader if, for example, a loader is used to scrape out the fresh manure from the barn, and then immediately used to turn a mature pile of compost.
- E Coli is anaerobic and proliferates in mature compost.

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Compost Pile Additions

- Rock phosphate
- Clay minerals
- Kelp
- Rodale's Study on Compost Pile Additives

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Storage

Two principles of storage:

- conservation of nutrients during the composting process
- protection of the environment.

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Troubleshooting

- Pile doesn't heat up
- Fly or mosquito problems.
- Putrid odour
- Pile Overheats

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Land Application

- Cover crops
- Immediate incorporation
- Application to frozen soil is a waste of nutrients.
- Application followed by heavy rains result in major losses of nutrients.
- Application rates to vegetable gardens
- Compost applications in the rotation
- Side dressing
- Overuse of compost

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Compost Tea

- Definition of Compost Teas
- Definition of Compost Leachate
- Made from properly composted mature material
- Additives
- Aeration
- Application – Foliar & Soil Drench
- Prevention of E. Coli
- Disease Prevention

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Worm Composting

- 2 species of worms live in decaying environments: Eisenia Foetida (Tiger Striped) and Lumbricus Rubellus (Red Wiggler)
- Biology
- Vermicompost quality & uses
- Management issues
