Composting and Vermicomposting

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With waste, you can make MONEY!

How? Turn organics into COMPOST or VERMICOMPOST

Compost & VC Can Be Sold

• Potential buyers: home gardeners, landscapers, vegetable farmers, turf growers, golf courses, ornamental crop growers, construction industry, DOT, parks, vineyards, silvaculture industry

• A disposal problem has been converted into a revenue stream!

Composting

• Controlled, biological stabilization of organics through generation of heat

• Finished compost looks like soil--dark brown, crumbly and smells like forest floor
What Can Be Composted?

- Leaves, lawn trimmings
- Animal manure, litter
- Rice hulls, straw, hay
- Sawdust, wood shavings, bark
- Paper & paperboard
- Vegetables & fruits
- Coffee grounds, hulls, pulp
- Organic byproducts from industries
- Agricultural crop waste
- Food residuals
- Brewery residuals
- Spoiled liquids
- Fish, seafood, meat
- Nut shells
- Hair, fur, nail clippings
- Dryer lint
- Cotton, wool, silk
- Agricultural crop residues
- Sludge

Windrows

Aerated Static Piles (ASP)

Trenches or Bunkers
What Plants Benefit From Compost?

Seedlings
Potted plants
Garden crops
Field crops
Lawns
Shrubs
Trees

Compost Benefits

• **Provides nutrients & minerals**
• **Reduces compaction** (makes soil spring back)
• **Increases water retention** (like a sponge)
• **Holds onto nutrients** (so plants can use them)
• **Reduces chemicals needed** (makes healthy plants)
• **Reduces erosion** (disperses force of raindrops)

More Compost Benefits

• **Increases infiltration** (spongy nature of compost keeps small channels open for water to move into it)
• **Increases water holding capacity** (compost “sponge” swells with water and holds it)
• **Reduces some diseases** (beneficial microbes outcompete bad diseases)

Compost Suppresses Soil Borne Diseases

such as brown patch, pythium, dollar spot, red thread, etc.

*Shown: Root rot, no compost on left*

(Cornell, OSU research)
Before Compost

Moccasin Run Golf Course, PA (1987)

After Compost

Compost/Sand Construction Mix
Moccasin Run Golf Course, PA (2004)
**USCC/NCCC Compost Operator Training Course Sept. 14-18, 2015**

- NC State University, Raleigh, NC
- 40-hour, 5-day course
- Lectures, hands-on activities, field trip
- Knowledge & skills to run composting facility
- Taught by leading composting professionals and educators

**Vermicomposting**

A process that relies on **earthworms** and **microorganisms** to help stabilize active organic materials and convert them to a valuable soil amendment and source of plant nutrients

Vermicomposting should **not** heat up

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**Windrows**

- Composting
- < 3 feet high
- 10-12 feet high

**Worm Beds At a Prison**

- Vermicomposting
Beds on a Hog Farm

200 feet by 4 feet by 21 inches deep

Worm Power
Dairy Manure

Continuous-flow reactors
120 feet by 8 feet by 30 inches deep
Feed 8 million earthworms 10 tons per day

Effects of Vermicompost On Plants

- Regulates availability of essential plant nutrients and enhances fertilizers
- Improves plant health and appearance
- Promotes activity of enzymes and plant growth regulators
- Enhances germination and early growth of seedlings and cuttings
- Stimulates flowering and improves fruit set and quality

Fast release initially since nutrients are in available forms (nitrates, NH₄⁺, etc.) when applied, then slow like compost after (takes some time to mineralize these nutrients from the organic pool). — Dr. Norman Arancon

Turnips Grown With 0%, 10%, 20% Swine Manure Vermicompost
Pythium Suppression

Pythium symptom suppression in cucumber seedlings planted in a soil-less medium (MM360) substituted with vermicompost, inoculated with *Pythium* (mean ± SE). SMM is sterilized MM360, VC is vermicompost and SVC is sterilized vermicompost. Plants received all needed nutrients.

Effects of Vermicomposts on Mealy Bug Infestations on Peppers

Some producers sell vermicompost for $1,200 per cubic yard

Compost sells for ~$30 per cubic yard

NCSU’s 16th Vermiculture Conference 2015

- Benefits & uses of vermicompost
- Vermicomposting technologies
- Vermicompost research studies
- Marketing products
- Testing vermicompost, soil and feedstocks
- Brewing and using vermicompost tea

http://www.bae.ncsu.edu/workshops/worm-conference/
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