

Why Use Compost on Farms?

Many farmers are finding that composting animal and crop wastes is a useful tool for managing materials and nutrients, and reducing pollution from runoff. Using compost improves soil quality and health because it adds stable organic matter to the land which:

- * improves moisture retention
- * promotes plant establishment,
- * suppresses soil-borne diseases, reducing the need for pesticides,
- * reduces the need for fertilizers,
- * prevents erosion, and
- * safeguards water quality.

Composting manures, using the compost to reduce other inputs, and selling excess compost can be a profitable practice.

On-Farm Compost Use

This brochure contains brief descriptions of several of the valuable on-farm applications of compost.

1. **Soil Amendment for Field Crops**
2. **Container Crops & Potting Mixes**
3. **Plant disease suppression**
4. **Selling farm compost**



Compost Quality

Compost quality is defined by the ingredients and the maturity of the compost. Mature compost is dark in color and with a crumbly, humus-like texture. It has a pleasant soil smell. It doesn't reheat if watered or stirred. If its maturity is in doubt, water, stir, and cure it for a few weeks before using it. Commercially available maturity tests and seed germination test can also be used.

Compost made on the farm is ready to use on crops when the temperature of a recently turned pile is near ambient levels if the pile has at least a 50% moisture level and enough volume to self-heat. Controlling the ingredients and moisture of the compost will insure it is of good quality. Managing the pile at high temperatures is needed to kill weed seeds and pathogens.

When purchasing compost, it is best to buy from companies with known feedstocks. There are currently no requirements for labeling compost and few regulations regarding compost quality. Good compost companies will provide the buyer with a typical analysis of finished compost. Of particular importance are the pH level and the salt content. High pH and salt can stunt plant growth.

Application rates for compost containing sewage sludge or mixed solid waste should not exceed four cubic yards per 1,000 square feet, unless extensive testing is done on the compost.¹ This limit has been established to prevent environmental risks.

Low quality compost can be used in forestry, sod production, and on some hardy ornamental plants and flowers.

1. **Soil Amendment for Field Crops**

Soil testing should be routinely done before applying compost to field crops. The results of the test will help determine which type of and how much compost to use. Test soils and compost for all nutrient levels as well as pH level and soluble salts. Composts from typical sources (organic solid waste, manures, and biosolids) **commonly** have the following composition: 0.7-2%N (poultry manure 4%), 1-2% P₂O₅, 0.5-2% K₂O; 30-70% organic matter, 6-9 pH, and 700-1,500 lbs/yd³ bulk density but variations can be much higher. Lime fortified compost can be used with acidic compost or on acidic soils but is generally not recommended if the soil pH is above 6.0.



Nitrogen is bound up in the form of organic nitrogen, which must be converted by microbes into an inorganic form so it can be used by plants. In the first year only 8-12% of the nitrogen in compost is available for plant growth. Extra fertilizers may be necessary for crops that require a lot of nitrogen such as corn. If compost is applied every year, there is an accumulation of organic nitrogen, which increases the amount of available nitrogen. Soil tests should be repeated yearly to see if additional fertilizer is needed. This will depend on the soil type and the crop being grown. On organic farms, compost can be



augmented with green manures and organic fertilizers.

Apply compost over an entire field or in raised bed rows and planting rows. Except for high quality compost, fall application is preferred. To maintain the level of organic matter in the soil, use an application of two to twenty tons/acre per year. Applications of 45 tons/acre have been shown to be suitable for corn, soy beans, and grass hay. To raise the organic level by 2% for very poor clay/loam soil, apply one inch of compost (70 tons or 135 cy³). Spread the compost using rear-delivery or side-delivery manure spreaders. Add any needed fertilizers or pH balancing agents then incorporate it to a depth of 6 inches into the soil.

Compost can also be used as a mulch to help control weeds. If drip irrigation is being used, install the drip system before mulching

When applying compost as a top dressing use a broadcast cyclone-type applicator or a modified rear-delivery manure spreader with brushes. To spread the compost evenly as a top dressing the compost should contain less than 40% moisture. On level ground compost can be applied with a front-end loader, land-leveler or road grader.



If the compost feedstocks contain sewage sludge or mixed solid waste, application rates should not exceed 4 cubic yards per 1,000 square feet, unless extensive testing is done on the compost. These limits have been set to reduce environmental risks.

Container Crops & Potting Mixes

For container crops, It is important for to develop compost standards regarding allowable levels of:

- * pH
- * soluble salts
- * respiration rates
- * particle size

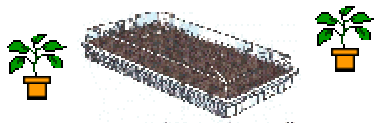
Each new batch of compost may have a different chemical composition so it is important to test the soil and compost initially. Consider the nutrient needs of the crop being grown. If a crop requires very specific soil conditions check the soil nutrient levels regularly.

In potting mixes for container crops the amount of compost should be between 20 and 33% of the total mix. Compost should



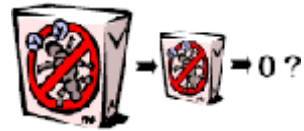
not be used alone because it is very porous and can have a high soluble salt content. For container crops it is best to do plant tests using fast-growing seeds such as barley, cress or radish to check the potting mix for possible phytotoxic contaminants.

Compost can be blended with soil, perlite, vermiculite, peat moss and coir (coconut shell mulch). If compost has high organic matter, peat moss may not be needed. Fertilizers and pH adjusters such as lime or sulfur can also be added.



2. Plant Disease Suppression

Another benefit of using compost is plant disease suppression. In order to have disease preventing properties compost must be stable and well decomposed. High temperatures during the composting process kill pathogens and weed seeds. Weed seeds are still present in raw manure. The microorganisms in compost are antagonists of plant pathogens as well. Soils lacking organic matter have low energy reserves for microorganisms and are susceptible to developing soil-borne diseases.



3. Selling Farm Compost

There is potential for farmers to create a market for quality compost made on the farm from food, plant and animal by-products. Potential buyers are homeowners, garden centers, greenhouses, other farmers and landscapers. The most likely market for the compost will be within a 50 mile radius. The compost must be of good quality taking into consideration properties such as moisture, odor, feel, particle size, stability, nutrient concentration, lack of weed seeds and other contaminants. It must also be competitively priced.



Resources:

[1On-Farm Composting Handbook](#). Northeast Regional Agricultural Engineering Service. © 1992.

[Compost: It's a Natural, A Farmer's Field Guide to Compost Production and Use](#). United States Composting Council. © 1996.

[Field Guide to Compost Use](#). United States Composting Council. © 1996.

[Compost Maturity Tests](#). Florida's On-line Composting Center. © 2001.
<http://www.compostinfo.com/tutorial/MaturityTests.htm>

[Application of Composted Organic Waste to Agricultural Soil](#). 1997
http://res2.agr.ca/london/gpres/download/rep1_6.pdf

Prepared by the:



103 South Main Street
Waterbury, VT 05671-0404
802-241-3448, compost@anr.state.vt.us

with assistance from
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For more information about compost and compost use go to the ANR web page at
www.anr.state.vt.us/compost

Clipart Courtesy of the United States Compost Council and other web and program sources.

Compost Uses For Farmers



State of Vermont
Agency of Natural Resources
Compost Center