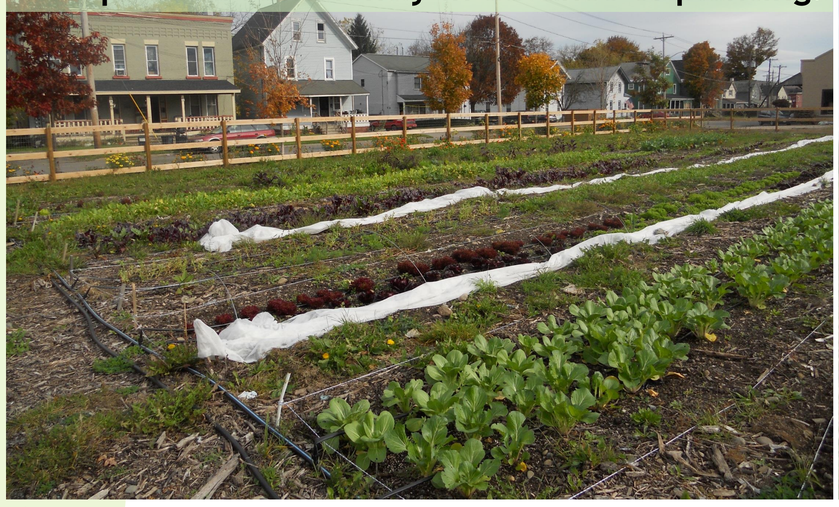
Compost Use for Improved Soil

Gardening/Vegetable Production

It is feasible to less mature compost in vegetable production, as long as it is incorporated sufficiently in advance of planting.



A rate of 1-2 tons compost per acre is common practice.

Benefits of Using Compost

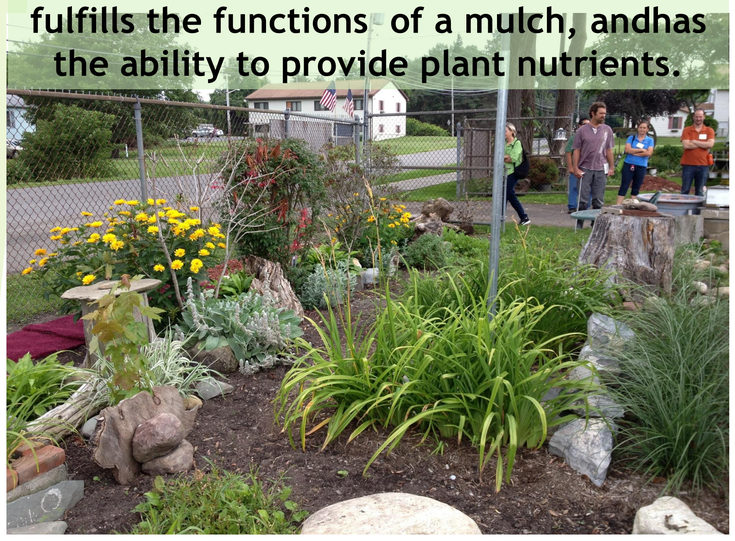
- Improves soil structure, porosity and density, creating a better plant root environment.
- Increases water infiltration and permeability in heavy soils.
- Improves water holding capacity, reducing water loss and making nutrients more plant available.
- Supplies significant quantities of organic matter and a variety of macro and micronutrients as well as beneficial microorganisms.
- Buffers soil pH and improves cation exchange capacity (CEC) of soils and growing media, improving their ability to hold nutrients for plant use.
- Binds contaminants within the organic matter and helps to suppress disease.

Find your compost here: http://compost.css.cornell.edu/maps.html

Landscaping and Tree Planting/Backfill

The addition of compost improves the physical structure of the soil, which in turn, promotes root development and heightens a plant's resistance to stress.

Use as mulch in established beds. It fulfills the functions of a mulch, andhas the ability to provide plant nutrients.



Use up to 50% compost in tree planting and most horticultural applications.

Improves Highly Compacted Soils

Compost reduces the bulk density of damaged soil.

Before compost addition

After compost addition

What is Compost?

An organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils.

Nursery/Growing Media

In determining how much compost to use, plant requirements and compost characteristics should be taken into consideration.

The use of compost as a growing media has, in general, been shown to reduce fertilizer and liming requirements, improve crop vigor, increase the number of flowers per plant, reduce the need for fungicides, and improve root growth.

Athletic Fields Parks and Lawns: Maintenance and Establishment

Athletic fields are prone to compaction due to heavy traffic, use of fields when wet, and weight of vehicles on the fields. Wet and/or hard surfaces can cause injury to the turf and the players.

Top dressing improves playability

Addition of organic matter promotes aggregation of soil particles, increasing porosity and reducing bulk density to make a less compact soil.

Compost promotes faster turf establishment, improved turf density and color, increased rooting, and less need for fertilizer and irrigation.

Funded in part by NYSDEC

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Cornell University

Compost Use for Improved Soil

Roadsides, Street Trees and Medians

What is Compost?

An organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils.

Compost reduces bulk density and improves aggregation

Before compost addition

After compost addition

Why Use Compost?

- Long-term soil conditioning benefits
- Higher rate of plant germination and establishment
- Protection from erosion
- Keep seeds in place, even on steep slopes
- New vegetation can be established directly into compost

Roadkill compost spread Nov 2006
Highland NY DOT

Roadside vegetation acts as a buffer and manages storm water to prevent flooding and erosion

Compost application on slope above waterway in Brooktondale NY

November 2016

April 2017

April 2017

June 2017

Socks reduce sediment, fertilizers, chemicals, metals and other pollutants from reaching surface water by acting as a filter.

Compost adds organic material to build healthy soils where a diverse group of beneficial organisms thrive and helps suppress disease for better growth and health of plantings.

Street Tree Planting

Use up to 50% compost in tree planting

Three years growth without compost

Three years growth with compost

Photo credit: City of Portland Bureau of Environmental Services
http://www.portlandoregon.gov/bes/article/199748

Compost, soil and plants slow, filter and cleanse storm water from streets removing up to 90% of pollutants.

Find your compost here: http://compost.css.cornell.edu/maps.html

Funded in part by New York State Department of Environmental Conservation

Cornell Waste Management Institute – cwmi.css.cornell.edu

Cornell University

Compost Use for Improved Soil
Make it and Use it: Urban Environments

Earth Matter:
Make it Turned windrow
Use it Vegetable production

Fresh Kills:
Make it Turned windrow
Use it Top dressing for landscape beds at golf course (left)
Amend on-site soils for turf establishment (below)
Photos courtesy of WeCare Compost

Earth Matter: Make it
2-yard bin; passively aerated

Use it Vegetable gardening

Red Hook Community Farm: Make it Compost windrows created and maintained entirely by solar, wind, and human power
Use it Community Farm

NYC Compost Project hosted by NY Botanical Garden:
Make it Compost curing area
Use it Street tree planting

LESEC: Make it In-vessel (hot-phase): alternating layers food waste and sawdust.

Turn out to windrows: red wiggler worms finish the job

St. John's University: Make it
In vessel composting, compost tea brewer

Use it
Apply tea to soils of tree roots and shrub planting beds in late April and September

Use it
Street tree planting
Photos courtesy of NYC Compost Project hosted by LESEC

Earth Matter: Make it
3-bin system; passively aerated

Use it
On-site beautification

Funded in part by New York State Department of Environmental Conservation

Find your compost here: http://compost.css.cornell.edu/maps.html

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Cornell University

Compost Use for Improved Soil

Agricultural Applications

The use of compost improves moisture retention, fertilizer efficiency, and suppresses soil-borne disease while improving yield.

In determining how much compost to use, plant requirements and compost characteristics should be taken into consideration. A rate of 1-2 tons compost per acre is common practice

Benefits of Using Compost

- Improves soil structure, porosity and density, creating a better plant root environment.
- Increases water infiltration and permeability in heavy soils.
- Improves water holding capacity, reducing water loss and making nutrients more plant available.
- Supplies organic matter and a variety of macro and micronutrients as well as beneficial microorganisms.
- Buffers soil pH and improves cation exchange capacity (CEC) of soils and growing media, improving their ability to hold nutrients for plant use.
- Binds contaminants within the organic matter and helps to suppress disease.

What is Compost?

An organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils.

Compost application on soybeans: Field trial

Event	Date	No Compost	Compost applied
Compost top-dressed	5/19/16	No compost	75 cubic yards
Planted soybeans	5/23/16		
Soybeans germinated		6/7/16	6/7/16
Harvest	Sept 2016	32.8 bu./acre	40.1 bu./acre

Soybean Growth

Five weeks after planting, soybeans in the test plot with compost were 34” while those in test plots with no compost were 28”

Compost as Mulch

- Reduces evaporation
- Suppresses weeds
- Moderates soil temperature
- Reduces erosion and runoff
- Amends soil (even well below the surface)

Find your compost here:
http://compost.css.cornell.edu/maps.html

Funded in part by New York State Department of Environmental Conservation

Compost Use for Improved Soil

Slope Stabilization and Erosion Control

Application to 1:1 Rock Slope
2” compost mulch with native seed mix
Austin, TX - August

8 Months Later
Irrigation install, never used

Sheet flow protection

Roadkill compost spread Nov 2006
Highland NY DOT

March 2007

Coarse **Fine**

What is Compost?

An organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils.

Find your compost here:
http://compost.css.cornell.edu/maps.html

Compost socks/Filter tubes

Compost socks reduce sediment, fertilizers, chemicals, metals and other pollutants from reaching surface water by acting as a filter.

Why Use Compost?

Compost improves soil and controls erosion by:

- Increasing water infiltration in to the soil surface.
- Increasing water holding capacity of soil which reduces runoff.
- Reducing soil particle dislodging
- Increasing plant growth and soil cover.
- Buffering soil pH which can increase vegetation establishment and growth.
- Alleviates soil compacting by increasing soil structure.
- New vegetation can be established directly into compost.

Street Tree Planting

Use up to 50% compost in tree planting and most horticultural applications

Three years growth without compost

Three years growth with compost

Improves Highly Compacted Soils

Compost reduces the bulk density of construction damaged soil.

Before compost addition

After compost addition

Turf Maintenance

Composts can be top-dressed at a rate of ¼ to ½” on turf to promote aggregation of soil particles, increase porosity and reduce bulk density to make a less compact soil. Use 1 to 2” with incorporation for turf establishment

Landscape and Nursery

Compost adds organic material to build healthy soils where a diverse group of beneficial organisms thrive and helps suppress disease for better growth and health of plantings.

Compost Use for Improved Soil

Slope Stabilization, Erosion Control and Storm Water Management

Application to 1:1 Rock Slope
2” compost mulch with native seed mix
Austin, TX - August

8 Months Later
Irrigation installed, never used

Sheet flow protection

What is Compost?

An organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils.

Compost and Wood Chip Applications:

- Preserve topsoil and prevent erosion
- Purify soil and water by managing nutrients, improving salinity, filtering storm water runoff, binding pollutants in soils and suppressing plant pathogens
- Restore soil and water quality by revitalizing wetlands and invigorating depleted lands
- Remediate soil resources by managing problem organics in contaminated soils.

Organic matter in “socks” along waterways prevents erosion of banks and keeps contaminants out of surface water.

Storm water is created when the soil’s ability to absorb and retain rainfall is exceeded.

Compost application Oct 2016
Bridge damage due to heavy rains and impermeable soil

May 2017
Sock and vegetation keep soil and sediment in place

Sock should be filled with wood chips or coarse compost for best filtration.

Find your compost here: http://compost.css.cornell.edu/maps.html

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Cornell Waste Management Institute - cwmi.css.cornell.edu

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Compost Use for Improved Soil

Reclamation and Remediation

Soil amended with compost in August

Blended soil placed and mulched with straw in September

Compost used to revitalize and reconstruct wetlands boosts the organic content of wetland soils, establishing a fertile environment for vegetation which is critical to a healthy ecosystem

Wetland Reclamation

Vegetation cleans the air and water, provides cover to soil and contributes to biological diversity.

Re-vegetation started 2 weeks later

Fully established October 2016

Remediation

Compost reduces the bulk density of construction-damaged soil.

Before compost addition

After compost addition

What makes compost so valuable?

- Its organic matter enhances the proliferation of microorganisms that promote root development and assist with extraction of nutrients from the soil.
- It can hold up to 20 times its weight in water, reducing water loss and storm water generation and inhibiting leaching in soil.
- It is a good source of N, P, K and micronutrients for plant growth and reduces nutrient loss in runoff.
- Its microorganisms can suppress specific plant diseases.
- It has the ability to bind heavy metals, pesticides, herbicides and other contaminants, reducing their leachability, transport in runoff and absorption by plants and thus can be used as a filter for storm water runoff.

Construction-damaged soil removed and blended with compost to allow for healthy plant growth

Find your compost here: http://compost.css.cornell.edu/maps.html

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