

# COMPOST



Produced through **The Northern Rhode Island Conservation District's Providence County Urban Growers Leadership Program**  
in partnership with  
**Michael Bradlee from The Compost Depot.**



[nricd.org](http://nricd.org)



[earthapplianceorganics.com](http://earthapplianceorganics.com)

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**Composting is the controlled decomposition of organic matter, such as leaves and food scraps, in the presence of oxygen and microorganisms.**

**Microbes metabolize (break down) the materials into their base components, such as minerals and nutrients.**

- Composting happens the same way at all scales, from small backyards to large facilities.
- All the tools and materials to compost can be found locally and are inexpensive.
- Compost is an odor-free material that improves soil, holds water, like a sponge and helps plants grow. Everything once living decomposes via microorganisms and can be returned to the soil.

## **Benefits of Composting**

### **1. Keeps food out of the landfill**

- **Food scraps take up about 1/3 of the space in a landfill.**
- When the food is in the landfill it decomposes anaerobically which releases methane gas, a much more potent greenhouse gas. Anaerobic means the trash is in an environment that has no oxygen which leads to bad smells and greenhouse gasses.
- **Rhode Island has one landfill. It is on track to be full by 2040 and there are no plans for after it is full.**
- The cost to manage waste after it is full will be expensive and so keeping food out of the landfill can help extend the life of the landfill.

### **2. Erosion control and flood mitigation**

- Compost can hold about 1.5 times its weight in water

### **3. Protects plants against disease**

- Healthier soil makes for more resilient plants and compost improves soil health

### **4. Benefits plant growth and productivity**

- Compost is nutrient rich and improves overall soil health

### **5. Creates community**

- It helps create healthy soil community in its microbes and macroinvertebrates
- The people managing and creating compost build community with each other

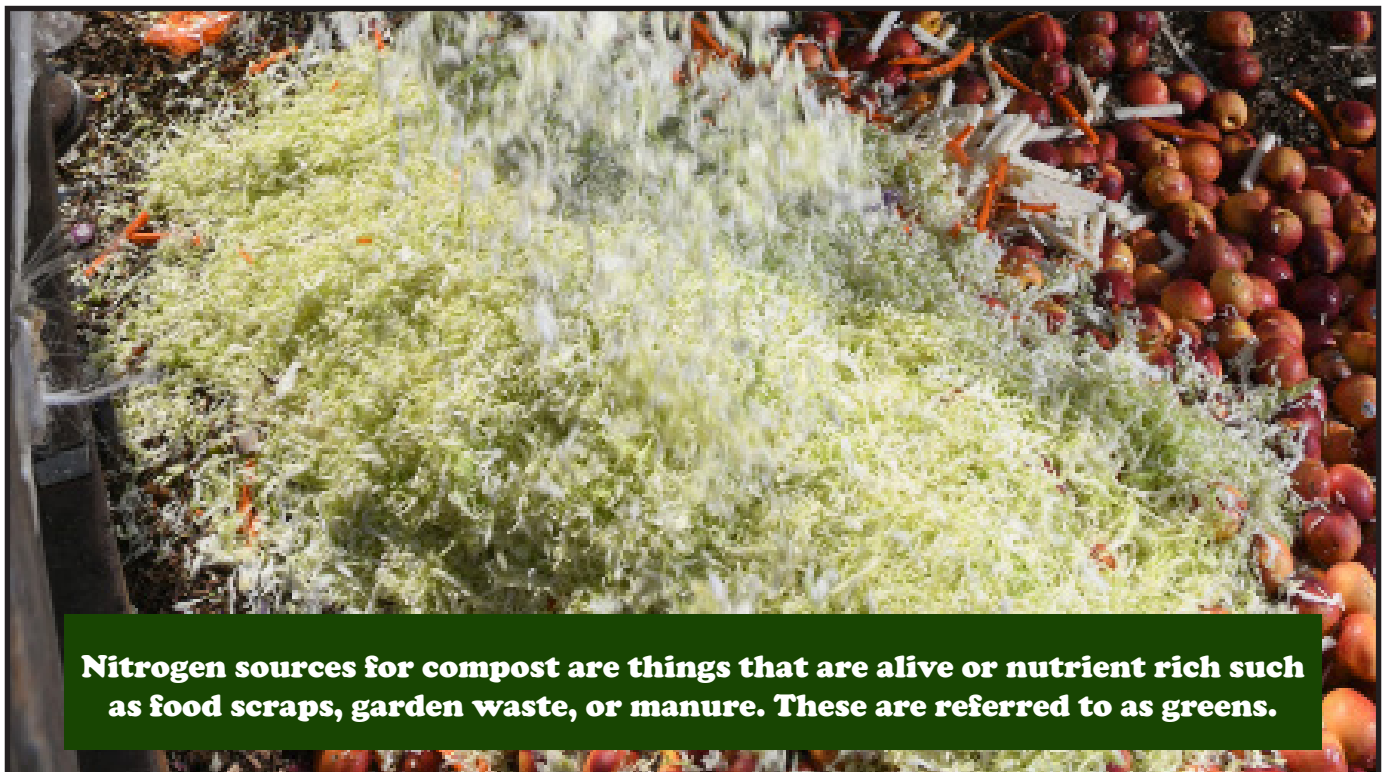
Decomposition of organic material is a natural process, but actively managing compost allows for the process to happen on a faster timeline. The actual breakdown of organic material happens due to the tiny microbes. The general equation for composting is:

**Carbon + Nitrogen + Oxygen + Water = ideal habitat for organisms to break down material and create compost**

Composting happens when carbon and nitrogen interact with tiny microbes in an oxygenated environment. It is an aerobic process, meaning the microbes in the pile breathe oxygen.



**Carbon sources for compost are dry, brown materials such as dried leaves, wood chips, or straw. Referred to as browns.**



**Nitrogen sources for compost are things that are alive or nutrient rich such as food scraps, garden waste, or manure. These are referred to as greens.**

**The microbes also need water in the environment to be able to move around and break down the organic material. To test if the compost pile has enough moisture, you can perform a squeeze test.**



## **Squeeze Test Steps**

### **Grab a handful of compost and squeeze it**

1. Too dry = it will crumble when you open your hand
2. Too wet = there will be water drops when you squeeze your hand
3. Just right = it will clump together when you open your hand but you won't see water droplets

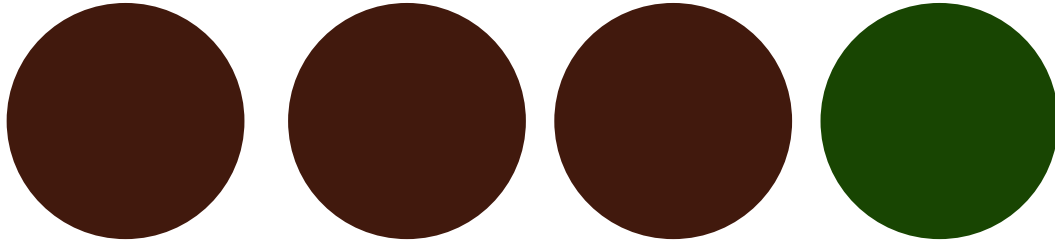
## **Porosity**

Porosity, sometimes referred to as bulk density, is also important for a compost pile. A good compost pile has porosity, meaning there is space between particles for air, water, and eventually plant roots to move.

1. Too dense = too wet, anaerobic decomposition
2. Too porous = too dry, not hot, slow and ineffective decomposition



# The basic ratio for composting:



## 3 parts browns, 1 part greens

For example, 3 buckets of leaves would be mixed with 1 bucket of food scraps to start a compost bin. People may edit this ratio to what works well for them, for example some people may add more browns to their bins.

The size of the pieces in your compost pile also impact how it breaks down.

**The smaller the particle sizes, the quicker the decomposition.**

A variety of particle sizes allows for air pockets and ideal microbe movement within the pile.



**Microbes are thermophilic, meaning they work best in hot temperatures and they produce heat as they work.**



# The Composting Timeline



## **Phase 1 and 2 Mesophilic and Thermophilic Phases 6-8 weeks**

Compost is hot.

Bacteria do most of the decomposition. They break down the more simple components of the material – starch and sugar during mesophilic and protein and fat during thermophilic



## **Phase 3 Curing Phase 2-12 months**

Compost is no longer hot.

Fungi do most of the decomposition. They break down the larger pieces and things that are harder to decompose like cellulose and lignin.

Macroorganisms like worms and bugs enter the pile and help with decomposition



**Urban composting is possible anywhere with enough space, including:  
Backyards, Community Gardens, School Grounds, Parks and Green Spaces!**

# The Compost Depot Processes

## Repurposed Trash Cans

Holes and pipes drilled into the trash cans provide airflow for compost process  
The wheels make them easy to move around  
New bins can be made when you need more capacity

## Engineered 3-Bay System

Combines leaf storage, active compost, and curing storage into one system  
Can be made with pallets as a DIY option

## Plastic Earthen Vessels

Can be purchased at Rhode Island Resource Recovery Corporation  
Simple, lightweight, no tools required to set up  
Can be insulated with leaf bags to keep the bin productive through the winter

## Other Processes: Continuous Pile

Add material as it is available  
More common for backyard composting  
Takes longer and may not get as hot





# Best Recipe for Active Composting

*Compost is like cooking and requires the right ingredients at the right proportions to succeed*

*Compost also requires the right timing, together with appropriate mixing and “cooking” steps to ensure success*

*The process does not cause odor problems or attract pests*

## Contaminants that should NOT be composted

- Plastic, glass and metal
- Bags, bottles, and containers
- Rubber bands, wire ties, and veggie stickers (please remove)
- Dog feces, and kitty litter require special treatment. These are compostable (just not in your backyard composter!)



## Fall is the Perfect Time to Start Composting!

Each Fall, stockpile leaves in yard waste bags, and store under a tarp to keep dry.

Autumn and winter are a great time to organize and build your compost system.

Apply compost to the lawn, gardens, under trees and shrubs, potted plants, or share with a neighbor!



# Sensory Checks for Your Compost Pile

|   |  |
|---|--|
| New compost that's doing well (first week)                                    | It will be smelly at first, but should not smell like sulfur or rotten eggs. Should smell slightly acidic. Visible actinomycetes. Hot.   |
| Anaerobic Composting conditions (bad)   | Smells very smelly, like rotten eggs   |
| Too much moisture   | Smells moldy. There may be liquid coming out of the bottom. Visible fungus.  |
| Too little moisture   | Dry and flaky, things aren't breaking down. Not hot.   |
| "Ready Compost" (compost that is done curing and is ready to be used as soil) | No recognizable food scraps, small particle size, smells good like soil or being in a forest. 50-50% moisture (if you grab a handful and squeeze, it sticks together but no water beads out) |

## Best Management Practices for Preventing Pests:

1. Keep open space around bins or piles
2. Compost on a hard surface
3. Line the bottom of bins with wire mesh
4. Get your recipe right
5. Don't leave feedstocks lying around uncovered



# Compost Application

|   |  |
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| If you have good soil that you've already been growing in | Add a top dressing of compost – just a thin layer or a sprinkle on top. Worms, rain, and plant roots will incorporate it into the soil |
| If you have poor quality soil                             | Add a thicker layer of compost and mix it into the first 6-9 inches of soil  |
| If you're making a soil mix                               | Add 20-30% compost to your potting soil  |



## Rules and Regulations on Composting in RI

Rules for on-farm composting are different and more lax than rules for non-farm composting facilities.

Small facilities (less than 25 cubic yards) do not need a permit, but they must meet certain standards.

Backyard piles do not need a permit or meet the same standards as small facilities.