

The Art and Science of Composting

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Plant
Natives!
We'll talk
about this
more later 😊



What is Compost?

- Definition: A mixture of decayed or decaying organic matter used to fertilize soil. **Compost** is usually made by gathering plant material, such as leaves, grass clippings, and vegetable peels, into a pile or bin and letting it decompose as a result of the action of aerobic bacteria, fungi, and other organisms.
- Compost in Latin = To bring together

What is Compost?

“A compost pile is a sensible and even necessary adjunct to a garden, for it means a conservation of waste and a reduction in the expense of the operation”

-Samuel Ogden, organic gardening guru

But compost needs us to occur, right?



Not exactly.



The creation of compost is as old as the first plant on Earth. In the forest, we just call it humus.

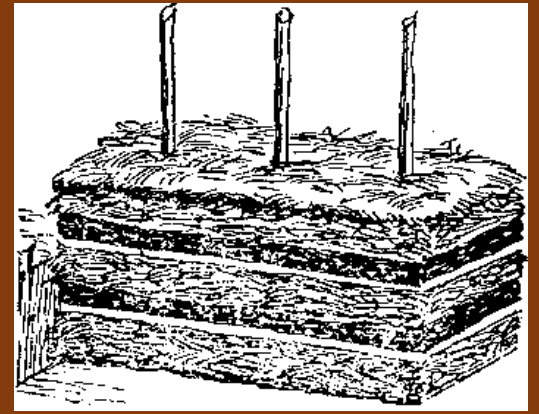
But, we can do all sorts of things to make it occur faster.



Modern composting is nothing more than the speeding up the naturally occurring process.

How is this accomplished?

- Many, many methods for generating compost
- Like a recipe, keep to basic principles, and modify to suit needs
- Select a design and capacity that are appropriate
- Keep it simple, and start small!



Composting Methods

- Practically speaking, a compost system needs to include multiple vessels, that are a size that is suitable to your needs, and provides room for “critical mass”
- No one is going to stop eating and making compostable material while we wait, right?
- Varied materials = greater variety of nutrients and a more valuable finished product
- Leave a little for the next generation, a “Compost Mother” or compost culture (11-1-1 fertilizer) for the next batch



Figure 1: Example of Education Material

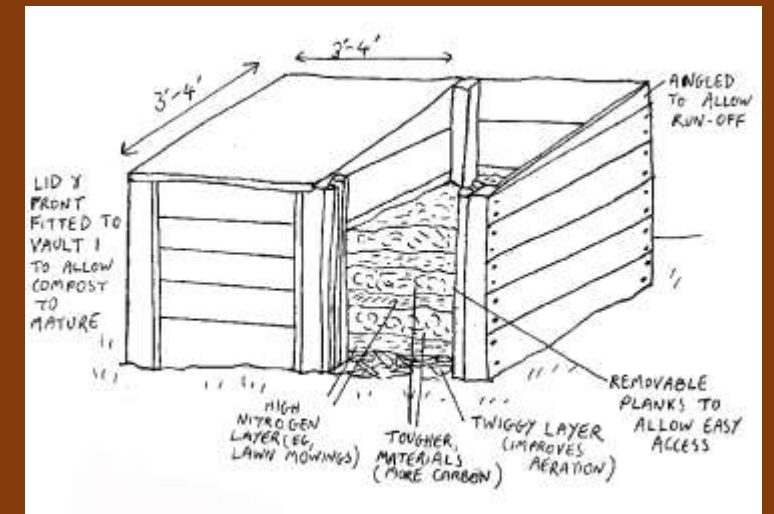
Composting Methods

- Ogden
- Least energy intensive
- Requires no shredding, mixing, turning
- Generally takes longest to finish, can be up to two years for carbon heavy matter
- Utilizes a three bin method
- 1.5m (H) x 1.5m (W) x 3m? (L)
- Ogden referred to his method as “Lazy Man” composting and used it to recycle his garden residues, but it can be modified to suit needs



Composting Methods

- **Indore**
- Created by British colonist Sir Albert Howard in Indore, India (1940s)
- Built in layers alternating green and brown materials & manure
- Requires the addition of soil, bone or blood meal
- Passive method using two bins, materials are moved once
- Takes up to three months, even in tropics
- Maybe not the best fit for Latvia



Composting Methods

- **University of California**
- More effort, as materials must be shredded, blended and watered
- Must be turned every three days at minimum
- Generally produces a finished product in ~14 days
- Great for new gardens, or in locations with long cold seasons
- C-N Ratio, diversity



Composting Methods

- Anaerobic vs. Aerobic: Which ones are we hoping for, composters?
- Why?
- Aerobic bacteria are more productive than anaerobic bacteria by an order of magnitude, and anaerobes often have a pathogenic relationship with plants
- Why are they more productive? Feedback loop created in energy catalyzed by O₂ in soil. More O₂ = More N, P & Mg + Keep your compost aerated!!

Composting Meth



- Who are our aerobic friends?
- Psychrophiles – Usually the first to show up, these are the cool temp bacterium (4-15C), they make amino acids, eat lignin and cellulose (trees), and work for us in the winter sometimes (at least in Memphis!)
- Mesophiles – Second wave moderate temperature bacterium (18-30C), and generally the most abundant. Among these is **Actinomycetes** (hybrid fungi + bacterium) which are the true decompositional closers, create those neat grey cobwebs
- Theromophiles – The showoffs, they are the high temp metabolizers that make your compost smoke like Lonely Mountain

Composting Methods

- Sheet Composting
- Great lower energy alternative
- Cuts out the “middle man” of building a compost pile
- Excellent way to prepare large spaces (even commercial scale), or to rehabilitate depleted or compacted soils
- Traditionally materials were tilled into existing soils
- A better practice is to allow materials to degrade slowly on the surface
- Place materials in fall, plant in the spring



Remember that the science of composting is a forgiving discipline.

No matter what, you
will likely
have a useable finished
product



But why should we compost?



- Why should you have to buy something that nature makes for free out of stuff some people throw away?
- On average, 35% of the waste we produce at home is food waste. 75% of that is compostable
- Nature works in cycles, not conveyor belts

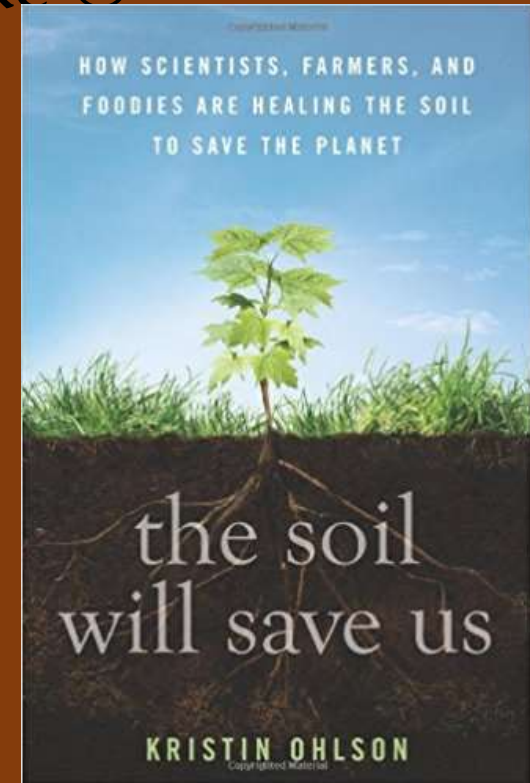


Throwing away compostable materials and burying them in landfills is not a sustainable solution



But why should we compost?

- Think of it as repaying a debt
- Due mostly to unsustainable agricultural and forestry processes, 80% or historic soil carbon is now in the atmosphere
- We can talk about Carbon Farming later if you like 😊



But why should we compost?

- Composting in all it's various forms is a simple way we as individuals can act to correct huge planetary scale issues like:
- Global warming
- Overburdened landfills
- Leachate entering groundwater/ drinking water supplies
- Over reliance on synthetic chemical inputs in agriculture

Do we feed plants, or do we feed the soil?



Not accurate. Not sustainable.

Healthy soil makes healthy plants that are more resistant to drought, disease and other stresses. Feed the soil with compost and...



Compost Tea!

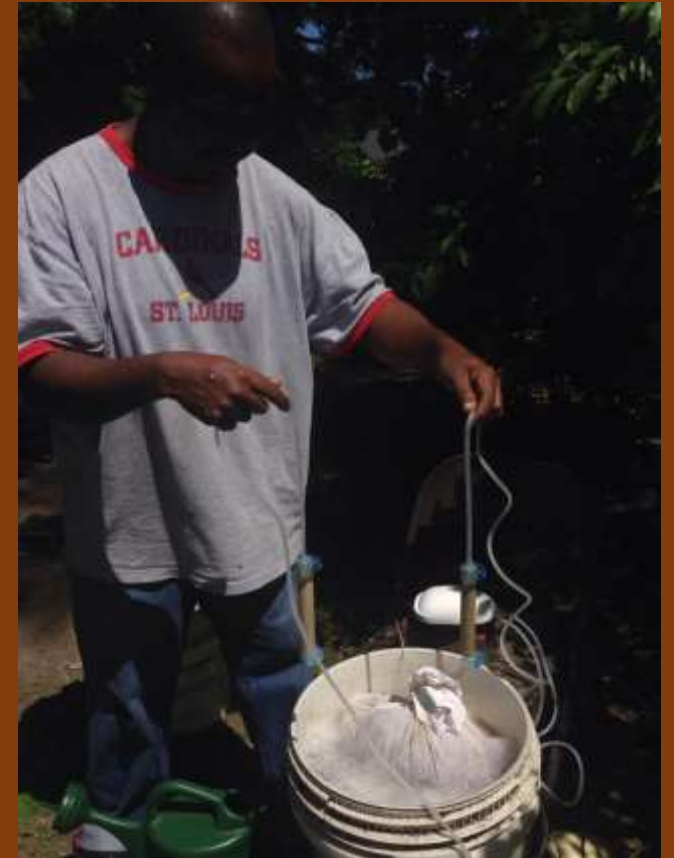
- What is it?
- A very simple way of restoring ecological function to soils and undoing an unhealthy and sometime even toxic environmental condition
- Compost tea is a concentrated organic liquid fertilizer that is made from steeping biologically active compost in aerated water



Benefits of Compost Tea

- Increase the biomass and species diversity of microbes, introduce a highly beneficial group of bacteria and fungi, protozoa and possibly nematodes
- Replace pathogenic (often anaerobic) bacterium by introducing beneficial predatory organisms
- Remember! There are more organisms in 15g of healthy soil than there are humans on planet Earth (also nearly 40km of fungi!)
- Increases the ability of soil to hold nutrients and retain water
- Reduces fertilizer use, chemical runoff into the watershed, and leaching of synthetic chemicals into ground water
- Reduces salt accumulation in soils
- Improves the soils pH buffering ability through microbe diversity

I'll show you how to make it later on...



This is my friend and colleague Nathaniel "Bug" Davis, leader of the North Memphis Farmers Collective And the King of Compost Tea

Selected Reading

- The Soil Will Save Us, Kristin Ohlson
- The Sheer Ecstasy of Being a Lunatic Farmer, Joel Salatin
- You Can Farm, Joel Salatin
- The Hidden Life of Trees, Peter Wohlleben
- Let it Rot!, Stu Campbell
- The Grazing Revolution, Allan Savory
- Holistic Management, Allan Savory



- Thank You! Please feel free to connect with me via email:
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<https://www.facebook.com/compostfairy>