Making and Applying Compost on a Small Vegetable Farm

CT Compost Conference
03/14/2024

Farm Overview

- Putnam, CT - Nipmuc land
- Organic vegetables with emphasis on Japanese varieties and vegetables/herbs
- Entering 7th season (land purchased in 2016)
- 10,000 outdoor bedft
- 1 greenhouse - part prop part growing space
- 1 high tunnel in construction
- 3 seasonal full-time employees
- Thur market and Sat farmstand May-Nov
- No winter growing
- No-till from the start

Our Practice

- Hand powered, no tillage
- 8-12 species cover crop between cash crops
- Growing plants (=photosynthesis) as much as possible
- All beds are mulched unless direct sown or in early Spring
- Homemade compost and compost teas
- Perennial hedgerow for species diversity, pollinator habitat

Our Practice

Before - "Deep compost" method

Starting in 2021 - Homemade compost as inoculant

- Ensure diversity
- Knowing all inputs
  - avoid contaminants including persistent herbicide
- High quality
  - do not need large amounts of compost
  - can be turned into tea/extract
- Purpose is to inoculate soil with beneficial microbes
- Adjust fungal:bacterial ratio

Our goals

- Making our own fertility (minimize organic fertilizer)
- Avoiding large outside inputs
- Recycling materials on-farm

Composting on our farm

Intensive composting based on Elaine Ingham's Soil Food Web course

- Thermophilic piles on pallets
- Quick turnaround (~1 month)
- Weekly, 30-40 buckets per pile

Less intensive composting

- Vermicomposting indoors
- Bulk pile
  - Veggie scraps that we have in excess mixed with enough carbon sources to keep from rotting
  - Eventually used as "browns" ingredient for intensive composting

This season we will be building a static aerated system which will replace our intensive composting system.

Materials

- Pallets
- Wire netting - stapled into pallet
- Fencing - (cut into 4' height and wide enough to make a cylinder on top of pallet)
- Bungee cords (2 per pallet to hold fencing together) and more to hold tarp on top
- Minimum 6' x 6' tarps (three to turn pile and then one to place above the pile)
- 2+ manure forks
- Watering can or other water source
- Thermometer (at least 2' long)
- 5 gallon buckets
- Landscape fabric for underneath pallet (optional)

Compost ingredients

HIGH NITROGEN SOURCES

- Manure
- Grass clippings
- Bloodmeal*

GREENS (use immediately, keep in walk-in, or store dried)

- Veggie scraps
- Foraged greens from surrounding area

BROWNS

- Leaves
- Woodchips
- Chipped branches
- Woody plant scraps
- Bulk compost pile from previous season

Ratio

Depends on the season (less N needed in warmer weather) but our basic recipe is~

- HIGH NITROGEN (10%)
  - Chicken manure
  - Grass clippings
- GREENS (30%)
  - Veggie scraps
- BROWNS (60%)
  - New wood chips (no more than around 40% of browns)
 - Aged wood chips
  - Leaves
  - Hay

Process- Initial Pile Building

- Gather ingredients, soak overnight
- Group into 10-12 bucket piles (with correct ratio)
- Drain out water from bucket then shake ingredients onto the tarp, one at a time
- Mix well and throw then throw into cage
- Make sure to remove any clumps
- Check moisture - a couple of drips from squeezing = perfect. Add more water if necessary.
- Cover with tarp and insert a stick in the center to create a pitch at the top so water can drain down the side

Process- First Turn
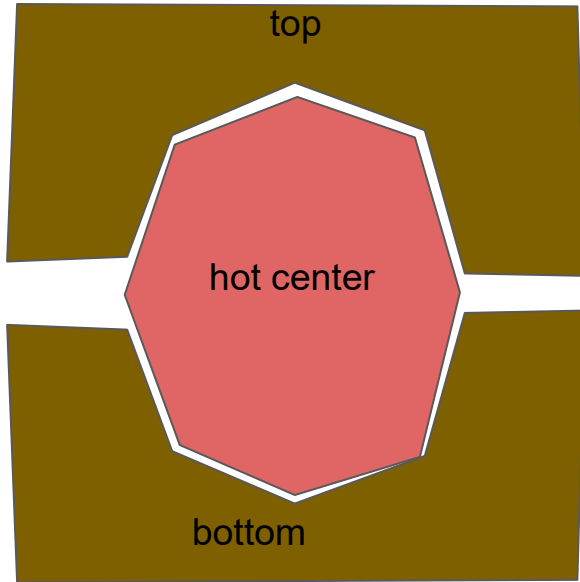
- Check core temperature frequently and record
- Record when core hits 131F
- First turn depends on temperature -
  - 131F-150F - 3 days
  - 150F-160F - 2 days
  - 160F-170F - 1 day
  - Above 175F - Caution! Poke holes to release heat
- Prepare 3 tarps around the pile
  - Remove top and shake onto a tarp
  - Remove hot center and shake onto another tarp
  - Remove bottom and shake onto last tarp
- Place back into cage in following order - center, top, bottom
- Add more water if necessary

Process- Second Turn and Final compost

- Second turn follows the same procedure as first turn
- After the second turn, the final third in the center should come up to temp (at least 131F) for the required time
- After all 3 parts are heat treated, allow temp to come down
- Compost is ready to use in the garden/farm once the pile is at ambient temperature

Check -

- Smell
- Color
- Under microscope
  - Bacteria, fungi, protozoa, nematodes, microarthropods
  - Aerobic vs anaerobic organisms

Compost Application - Direct

- Two 5-gal buckets of compost per 100' bed
- Broadforking prior to and raking after application
- The bed is normally mulched with hay afterwards
- Applied before every cash crop and fall cover crops
- For sidedressing large summer plants, apply at the base of plants and cover with mulch
- Teas and extracts will go much further (next page)

Compost Application - Tea

- 75% compost/25% vermicompost (compost does not contain manure)
- 5-gallon bucket brewer
  - ~1lb of compost per 5-gal batch
  - 1 tbsp each of kelp meal, molasses, fish hydrolysate (humates optional)
- Scaled up for 35-gallon brewer
- Brewed for minimum 24 hours
- Checked under microscope
- About once a week
- Sold at our weekly farmstand

Compost Application - Tea

4 Gallon Backpack Sprayer

- 1 gallon compost tea + 1-3 gallons of water depending on situation
- Cucumbers and tomatoes usually
- Covers about 4-6 beds per backpack depending on leaf surface area
- Cover both top and underside of leaves

2 Gallon Watering Can Drench

- 1 gallon compost tea + 1 gallon water
- All other crops
- This season we will try running it through our sprinklers

This 100' bed of outdoor cucumbers produced 600 pounds last year!

Compost Application - Extract

- ~1lb of compost per batch - covers one bed
- Massage mesh bag with compost in 2 gallons of water, about 3 minutes
- Apply with watering can
- Adding fish hydrolysate optional
- Mixture of vermicompost and finished compost is best. Each has different set of microbes.
- Remaining compost can be spread on bed, go back into another compost pile, or mixed into potting mix