

COMPOSTING FOR YOUR GARDEN IN THE AGE OF COVID-19

29 JULY 2020

BY

RACHEL DAVIS & NATHANIEL SMITH



THANK YOU!

We appreciate the opportunity to speak with you tonight and grow together
community learning



& special thanks to Christi Marshall
for leading the development & completion of this seminar

Additionally, we hope each of you listening are safe and well. We welcome all questions and comments.

FYI

This seminar is the 3rd in an ongoing series sponsored by the East Goshen Sustainability Advisory Committee. Upcoming zoom seminars will be announced shortly.

Sustainability Advisory Committee
Zoom Seminar, Part 3
July 29, 2020
7 pm - 8 pm

questions/comments go to
SAC@eastgoshen.org



TONIGHT'S AGENDA

- Introductions
- Local Affiliate Groups
- WHAT
 - What is Compost?
 - History
 - Acceptable vs. Avoid
 - Addressing Compostable Dishware
 - Chemistry & Final Balance
 - Rachel and Nathaniel's experience
- HOW
 - Composting Inside your Home or Office and Outside in your Yard
 - All types of containers
 - Cost
 - Common Problems & Resources

WHY

Community and Planet Benefits
Alternate Options

LOCAL PROGRESS

Covid Considerations
Bryan Hutchinson Example
Philly Suburbs Examples

RESOURCES & STATS

Chester County & PA

QUESTIONS



INTRODUCTIONS & LOCAL AFFILIATE GROUPS



INTRODUCTION

Ms. Rachel Joy Davis

Resident of Chester County 2015-2020

Environmental Resources Management, Inc.

- Geologist and Environmental Consulting Project Manager
- Sustainability Advisor North Atlantic Business Unit
- Founder of Terracycle at ERM, Inc. – Free \$ for non-traditional waste
- Illustrator & Painter

Current Community Work (March 2020 – Present)

- Sierra Club Member & Volunteer
- Environmental Education Volunteer in K-12 Schools & Colleges
- Avid environmentalist, recycling/upcycling/composting/ waste reducing advocate
- Ethical vegan and “low impact” waste producer

Previous Community Work (Early 2018 - March 2020)

- West Chester Sustainability Advisory Committee Member
- Don't Spray Me! Board Member
- West Chester Green Team Co-Lead for Plastic Free Please! Action Group
- Member of Chester County Environmental Alliance



Soil sampling, VA



The Land Conservancy For Southern Chester County



Downingtown Earth Day, 2019

INTRODUCTION

Mr. Nathaniel Smith

Resident of Chester County (1986 – Present)

Undergrad Major History and Literature, PhD Medieval Studies

Taught French and other Romance languages and Literary History at Smith College, University of Georgia, and Boston University

Administrator at Franklin & Marshall College - Also taught freshman seminar in poetry writing.

Retired 2006 and has increasingly developed his lifelong interest in nature and gardening.

Co-Founder of the Chester County Environmental Alliance

Co-Founder of Don't Spray Me!

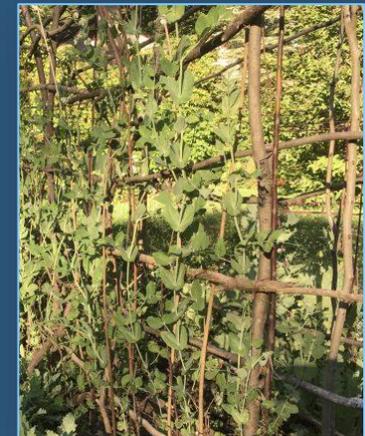
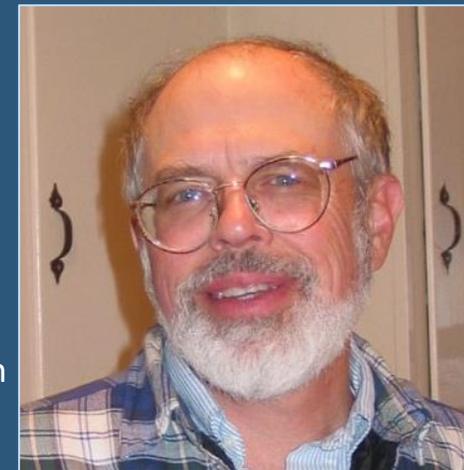
- Green Team Garden Projects – Inspirational tours, videos, advice & projects
- Avid blog writer for Don't Spray Me! – Mosquito biology and spraying, gardening, food co-ops, air quality, chemicals, climate change, energy, herbicides, non-toxic methods, pesticides, sustainability, water, weeds, trees, plastic, activism, foraging
- Into foraging and eating edible plants in his garden and town including shepherd's purse, common orange day lilies, dandelion, broadleaf plantain, and ostrich ferns
- Enriched by a civic duty lifetime of volunteer environmental experience, reading, meetings, reflection, rallies, fundraisers, speeches, & other opportunities to better his community



With Downingtown Mayor Josh Maxwell et al



With Co-Founder Margaret Hudgings, Don't Spray Me!



Homemade trellis of sticks for peas

DON'T SPRAY ME!

"Let's prevent unnecessary mosquito spraying in Chester County."



- Civic citizens' organization in West Chester PA and surrounding communities that came into existence in 2015 to raise awareness about the dangers of and oppose the unnecessary use of anti-mosquito spraying, pesticides, herbicides and the use of other chemicals.
- Don't Spray Me! is also a founding member of the Chester County Environment Alliance, which since 2018, with almost 30 member groups, aims to enhance the environment and environmental consciousness in Chester County.
- DSM is a founding member of the West Chester Green Team, whose mission since 2018 is to promote green living in the West Chester area. See <https://wcgreenteam.com/>.
- Worked with Sierra Club's Southeastern PA Group for help with planning and financing in 2015-19, and notably for a Grassroots Network grant that paid for the first summer intern in 2018.
- DSM also works closely with Sierra Club's Ready for 100% Renewable Energy campaign.
- Helps community members apply for Pesticide Hypersensitivity Registry.



<https://dontsprayme.com/>

WEST CHESTER GREEN TEAM

- Started in 2019
- Part of Chester County Environmental Alliance
- Helping people in the West Chester area to lead more sustainable daily lives
- Alliance of four other environment-related interest groups in West Chester: Don't Spray Me!, Chester County Citizens for Climate Protection (4CP), Ready for 100 (i.e., 100% renewable energy), and Plastic-Free Please Action Group (PFP).
- The Green Team calls you to action, whether you want to start planting trees, or raise awareness about the harmful effects of toxic chemicals, or help people commit to solar energy, or stop the many balloons that are going up in the air every year and land somewhere unknown.
- Team features inspirational tours, videos, advice & easy environmental projects including Kid's Organic Veggie Gardening Program called Roots n Shoots

SATURDAY, DECEMBER 7TH, 5-8PM

WEST CHESTER GREEN TEAM AUCTION

Benefit organic gardening, community building, and children's programming and education about the natural environment

Bid on sushi lessons, vacation houses, museum tours, and many more unique prizes

Enjoy live entertainment, drinks, and dinner including organic vegetable soup, bread from La Baguette Magique, and desserts by pastry chef Kim Stack, former owner of the 3 Little Pigs



Unitarian Congregation, 501 S High St,
West Chester

GET YOUR TICKETS AT [HTTPS://WCREEN.BPT.ME](https://wcreen.bpt.me)



<https://wcreenteam.com/>

Ready to get outside and garden? The West Chester Green Team offers you:

1) The Lawn to Garden Movement: saving the planet, one yard at a time

This could be your yard, before and after:



2) Be inspired by our virtual veggie garden tour videos



See our video interviews with local gardeners. You can do it too!

3) Roots 'N' Shoots veggie garden program for kids

Twice a week in summer we teach kids to plant, grow, compost, and harvest in a local back yard. The program still has some room in 2020!



Get involved, join us, find out more!

See the menu at wgreenteam.com for these programs and also what the Green Team is doing in renewable energy, avoiding chemical exposure, and more.



May 18, 2020



July 25, 2020



CHESTER COUNTY ENVIRONMENTAL ALLIANCE

- Founded in 2018 by Nathaniel Smith
- CCEA is non-partisan and does not post partisan political content.
- 25+ member groups aims to enhance the environment and environmental consciousness in Chester County. Groups concentrate on pipelines, clean water & air, land preservation, climate protection, pesticides, plastic-free living and WCU's environmental topics
- A common calendar on the homepage links all groups' events for easy access.
- Supporting the PA Common Conservation Agenda (<https://www.pennfuture.org/Files/Admin/Updated-Final-Version-of-the-PA-Common-Conservation-Agenda-5.1.18.pdf>)



<https://chescoenvt.org/>



GENTLE REMINDER WE ARE NOT COMPOSTING EXPERTS BUT HERE TO HELP EDUCATE AND FIND FUTURE ANSWERS!

About 42,600,000 results

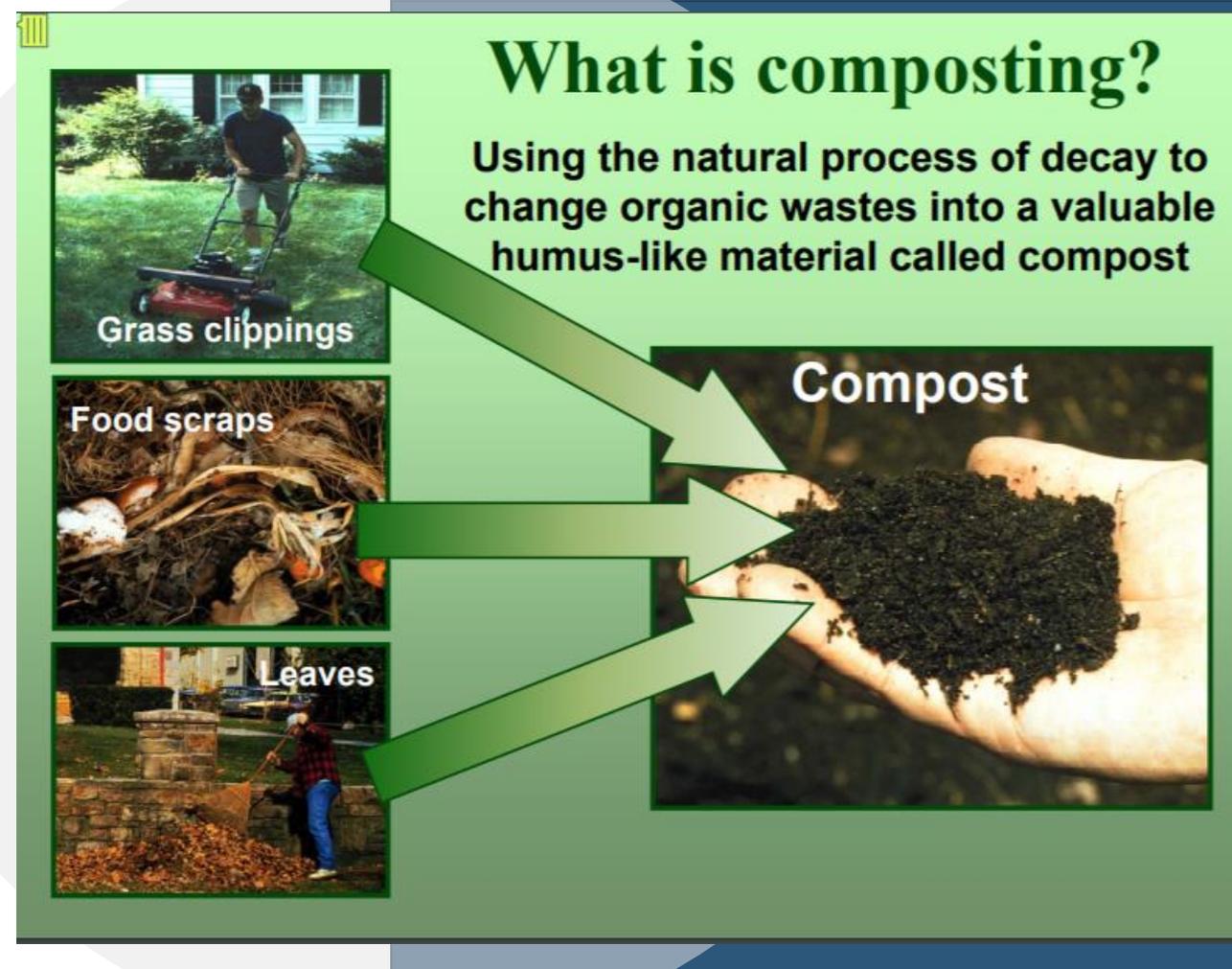
For “compost expert” on google...so continue to do your own research to supplement this presentation!

WHAT IS COMPOST?



COMPOSTING ORGANIC MATERIAL

- Composting is the ***aerobic method**** of using the natural process of decay to change organic wastes into a valuable humus-like material called compost
 - *Requires air!
- You can control the decay in a contained area to speed up the process of breakdown by using oxygen, water, food and temperature to your benefit
- Fungi, earthworms and other detritivores further break up the material
- The process recycles material that would end up in landfill



HISTORY OF COMPOST



- Present in many cultures around the world for thousands of years
- First Nation used fish skins and guts as fertilizer. Narragansetts called the fish "munnowhatteaûgs," which means "fertilizer" or "that which enriches the land," a word the English corrupted into "menhaden." The Abenakis of Maine called them "pauhagens," which also means "fertilizer," a name the English shortened to "pogies."
- **Indore Method** – 1905-1934, Sir Albert Howard, materials are layered sandwich fashion, then are turned (or mixed by earthworms) during decomposition.
- **Biodynamic agriculture** – 1924, philosopher Rudolph Steiner, Austria. Emphasized composting as a central practice. Steiner promoted the idea of gardening in harmony with nature including the phases of the moon.
- **Organic Method** – 1942, J. I. Rodale, America. Assimilated the ideas of Howard and adding knowledge gained by further experimentation.
- **University of California Method** - 1950s, Dr. Golueke. Materials are being layered, the pile is built all at one time with a minimum volume of 1 cubic yard and turned often for hot fast decomposition.
- *Many other methods! The City People's Method, Compost Tumblers, Compost in a Bag, Raised-Bin Method, Ogden's Step-by-Step Method, Pit Composting, Mulch and Sheet Compost, Trench and Posthole Composting, Anaerobic Composting

WHAT CAN I ADD?

- Animal manure from herbivores (not meat-eaters like dogs or cats)
- Biochar
- Cardboard rolls, cereal boxes, brown paper bags
- Clean paper
- Paper towels
- Coffee grounds and filters
- Cotton and wool rags
- Crushed eggshells (but not eggs)
- Fireplace ashes
- Fruits and vegetables



- Grass clippings, yard trimmings
- Hair and fur
- Hay and straw
- Houseplants
- Leaves
- Nut shells
- Rock dust
- Seaweed (rinse off saltwater)
- Shredded newspaper
- Tea and tea bags
- Wood chips, sawdust, toothpicks, burnt matches



WHAT SHOULD I NOT ADD?

- Meat, fish, egg or poultry scraps (odor problems and pests)
- Dairy products (odor problems and pests)
- Fats, grease, lard or oils (odor problems and pests)
- Coal or charcoal ash (contains substances harmful to plants)
- Diseased or insect-ridden plants (diseases or insects might spread)
- Pet wastes (dog or cat feces, cat litter) (might contain parasites or germs)
- Yard trimmings treated with pesticides (might kill composting organisms)
- Black walnut tree leaves or twigs (substances harmful to plants)



CAN I ADD “COMPOSTABLE” MATERIALS?

- Products certified by the Biodegradable Products Institute (BPI) break down in under 12 weeks, or 84 days
- Plastic-like compostable material PLA (polylactic acid), which is made from corn, one study found that in landfills PLA breaks down anaerobically to release methane. But another study found that PLA doesn't break down at all in a landfill and therefore does not produce significant greenhouse gas emissions.
- Breaks down much faster with hotter compost
- Better for environment? Probably not. Most compostable plastic food-service items are bio-based, which means they are displacing fossil-based ingredients with renewable sources but 93% end up in landfill and produce methane.
- *Better not to buy them at all – Just bring your own if applicable

WHAT DOES IT REQUIRE?

- Possible through human management, aerobic conditions, and development of internal biological heat
- Require four equally important ingredients to work effectively:
 - **Carbon** — for energy; the microbial oxidation of carbon produces the heat, if included at suggested levels. High carbon materials tend to be brown and dry.
 - **Nitrogen** — to grow and reproduce more organisms to oxidize the carbon. High nitrogen materials tend to be green (or colorful, such as fruits and vegetables) and wet
 - **Oxygen** — for oxidizing the carbon, the decomposition process
 - **Water** — in the right amounts to maintain activity without causing anaerobic conditions

WHAT SHOULD THE FINAL BALANCE LOOK LIKE?

- Best compost is a ratio of approximately 2:1 to 10:1 of brown: green (C:N)
- “Brown” material (shredded dried leaves, fur, cloth, cardboard, and paper)
- “Green” material (fruits and vegetables, grass clippings and weeds, etc.)
- “Perfect” compost has a fine, crumbly texture and pleasant earthy smell
- Original ingredients used to make the compost will no longer be visible
 - Cut up banana peels and big watermelon rinds to increase surface area to make these big pieces break down faster

HOW DOES IT WORK?

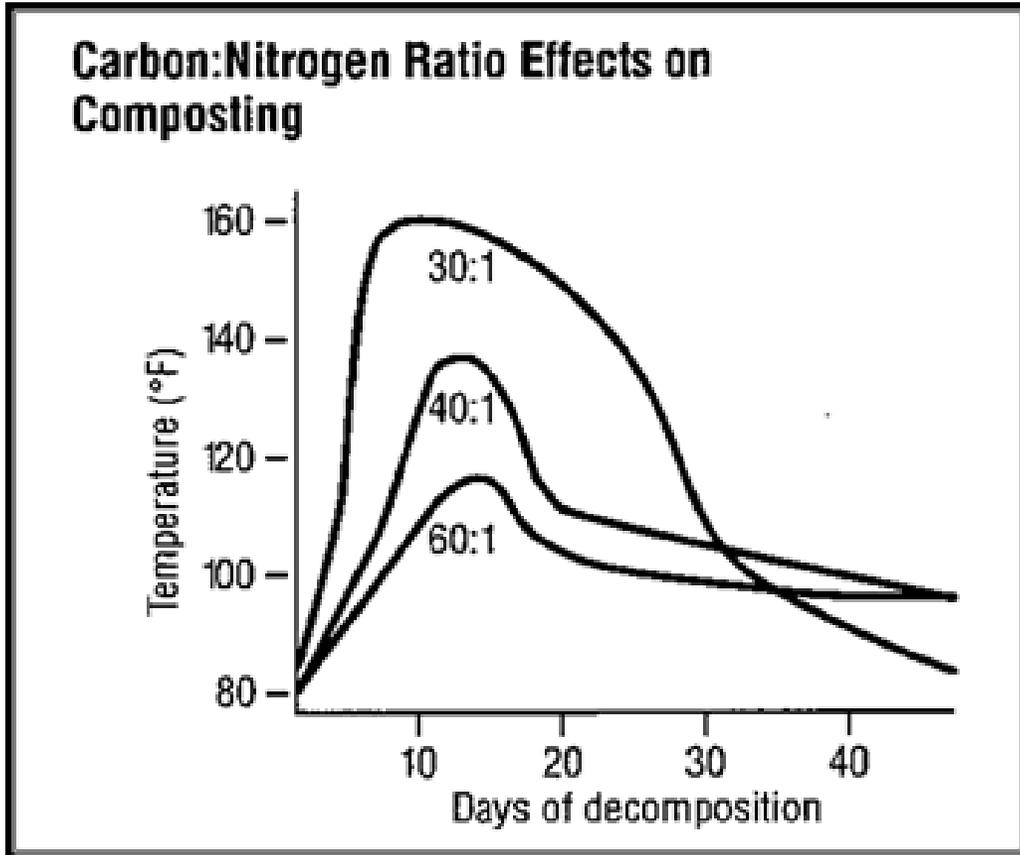
Aerobic Condition

- Decomposers (bacteria and fungi), worms and insects consume **oxygen** while feeding on organic matter
- **Food scraps + clippings** add nitrogen which is used for formation of proteins, nucleic acids, amino acids, and other enzymes for organisms
- **Dry, brown materials** add carbon which provides the energy source and building material for 50% of composting organisms' cell growth
- Add **water** if not enough moisture
- Creates heat + CO₂ + water vapor
- Composting is most efficient when the major parameters, oxygen, nitrogen, carbon, moisture and temperature, which affect the composting process, are properly managed
- The carbon dioxide and **water** losses can amount to half the weight of the initial organic materials, so composting reduces both the volume and mass of the raw materials while transforming them into a beneficial humus-like material.

Anaerobic Condition

- **Food scraps + clippings** and **dry, brown materials** does not have oxygen, methane is produced, no need to turn it, does not create “compost”

CHEMISTRY



- Highest ratio of C:N in general compost that does not rob soil of Nitrogen is 20:1 but opportune ratio is 10:1
- *Researchers at Washington State University report optimum values from 20 to 31

Sandy loam (fine)	7:1
Humus	10:1
Food scraps	15:1
Alfalfa hay	18:1
Grass clippings	19:1
Rotted manure	20:1
Sandy loam (coarse)	25:1
Vegetable trimmings	25:1
Oak leaves	26:1
Leaves, varies from	35:1 to 85:1
Peat moss	58:1
Corn stalks	60:1
Straw	80:1
Pine needles	60:1 to 110:1
Farm manure	90:1
Alder sawdust	134:1
Sawdust weathered 3 years	142:1
Newspaper	170:1
Douglas fir bark	491:1
Sawdust weathered 2 months	625:1

NATHANIEL'S EXPERIENCE

“Mother Nature doesn’t negotiate – she’s in charge. Humans used to work in harmony with nature, but now we need to get back to seeing the big picture that we are part of.”

- Patience is key! Unpredictability is the fun part!
- I just make a big pile and turn it over every couple of months (more often is better, of course!). If it’s not turned over, pockets of wet leaves or dry branch parts can form and sit for years.
- You can add in compostable packaging materials too!
- My experience with the patient compost method was that the pile only really decomposed into usable product in the lowest 6 to 12 inches.
- Finding right compost layer in pile is like doing archeology!
- Can use “gum ball” sweet gum tree seeds as natural slug detractor
- Can discuss his rats/voles experience if you have these!
- Does NOT use any chemicals on his garden & compost



RACHEL'S EXPERIENCE

- Grew up in Media PA area on less than one acre, contributed to two big compost piles throughout life
- Inspired by mom to compost – practical, great product, easy enough, less trash
- Prefers low maintenance options! Stores compost temporarily in old bread bags or used ziplocks (photo) in lower fridge drawer or at sink edge until I can move them outside into the pile
- Family successfully grew several trees, flowering plants and fruit/vegetable-producing plants from pile accidentally including peach tree from peach pit that produced 1000s of peaches
- Always chemical-free growing
- Have experienced ants & fruit flies inside and squirrels & birds in outside barrel
- Smashing materials into smaller pieces is good exercise
- Now growing tomatoes & zucchini in 5-gallon buckets



HOW TO COMPOST?



COMPOSTING INSIDE YOUR HOME OR OFFICE

- No yard? No worries!
- Start collection area in your kitchen in any container
- Get self-sufficient compost system – will need to add “browns”
- Before adding scraps, add a light sprinkling of garden soil or recently finished compost between layers of our green and brown materials
- 5-gallon bucket – Put 6” of browns in bucket first + 12” kitchen waste
- - Get screw top lid! Not prying kind (hard to open)



<https://www.glad.com/teachable-trash/how-to-make-a-compost-bin/>



VERMI-COMPOST



*Try not to have more than 3" of uneaten food at top



Add food into the top. Worms come up to the top to eat (they like food about 3 days old) where it's less compacted (top 6")



Blue Indian worms are tropical and good for use outside vs. red wigglers don't need it as warm

TUMBLER

Tiny ones for your counter top or kitchen floor

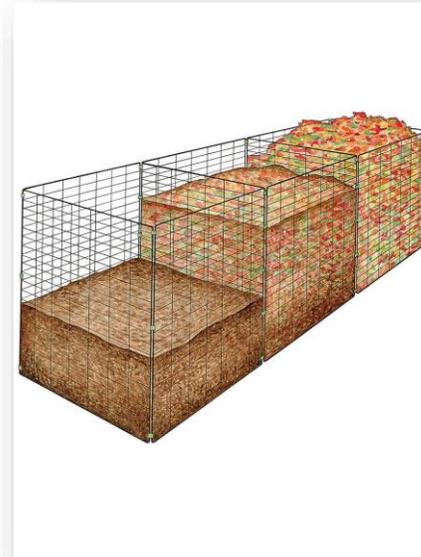


- Growing your Greens Youtube Channel
 - https://www.youtube.com/watch?v=PWrXkE_s3M
 - Lifetime 80 Gallon 60058 Composter
 - Joraform 270L Metal Compost Tumbler
 - Joraform 400 - Metal Compost Tumbler
- Add one shovel of soil from your yard into the tumbler to add local microbes



PILE (WITH OR WITHOUT WIRE)

- Build pile directly onto the soil so natural microbes can come up from ground into pile
- Add a layer of green materials such as vegetable scraps, plant trimmings, or grass clippings over each 6- to 8-inch layer of leaves.
- Materials that tend to mat, such as grass clippings, should be either mixed in or placed in 2- to 3-inch layers within this 6-8-inch layer.
- A great mix of materials for the pile is one part grass, vegetable scraps, or plant clippings to two to three parts autumn leaves, depending on leaf moisture,
- Educate your household on what to add to bin
- Collect compost from base of pen in spring for garden usage



PALLET

- Should be at least 4' on each side for generating heat
- Requires a bit more physical movement for rotating pile



WHERE TO PUT IN YOUR YARD

- Tuck open compost pallet areas into corner of yard that is reasonably sunny
- Want it to be easily accessible
- Level, well-drained ground
- Somewhere where smells or leaching liquids won't cause a nuisance
- Tumblers can go anywhere in yard

WHAT DOES IT COST?

- Store inside
 - \$8 - 30 - Compost pail with carbon filter for your counter top – Do not line with plastic bag!
 - \$0 - Any lidded container
 - \$3 – 5-gallon bucket
- Build outside
 - \$7 – Shovel
 - \$5 - Gloves (try to avoid using plastic lined! Tiny bits break off and end up in garden soil as microplastic)
 - Free to \$200 - Wood pallets
 - \$50 – 600+ Tumbler
 - \$20 - Compost thermometer
- \$0 - Waste

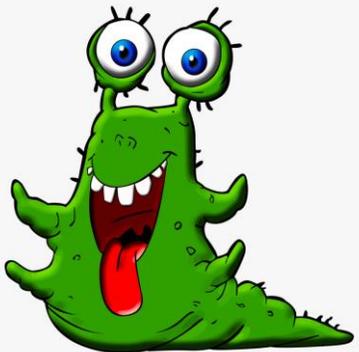


NEED BROWN MATERIAL?

- Schedule @ <https://getchipdrop.com/>
 - Free wood chips! Delivered to your yard in big pile
- Coconut coir
- Ask neighbors for leaves and brown material



PROBLEMS?!



COMMON PROBLEMS & SOLUTIONS THAT MAY WORK FOR YOU

- **My compost smells like poo!** You may have too much “green” material (raw kitchen material) – Add more “brown”! Might need to be turned for air to reach through it.
- **My kitchen bin / pile is getting slimy!** Excess acidity could be a problem! Add sprinkle of wood ash or lime to the mix
- **My compost pile is too dry!** Bacteria and fungi responsible for the composting process won't be able to work unless the pile is wet so add collected rainwater or tap water evenly at the top of the pile and then mix materials at same time if you can
- ***Google is your friend – someone's likely to have had your problem already!**

ONLINE RESOURCES

- Few gardeners get compost right the first time so reach out to other friends and family who may have tried it already!
- Lee Reich @ leereich.com – works on his “farmden”
- Chris Mattingly @ backyard-eats.com – started raised-bed gardening starting and tending company in Philadelphia area
- Uncle Jims Worm Farm @ unclejimswormfarm.com
- Amy Landers @ amy@gardensthatmatter.com
- Courtney Bodle @Courtney_bodle and @wcu_sustainability
- West Chester Green Team @wc_green_team (Instagram) & westchestergreenteam.com
- Bennett Compost @bennettcompost (Instagram) & bennettcompost.com
- Local universities (Rodale Institute, PSU)

WHY COMPOST??



BENEFITS FOR YOU AND YOUR COMMUNITY

- Will significantly benefit community garden health and give depleted nutrients back to the soil. Also loosens clay soils and helps sandy soils retain water.
- Reduce smell and bioattraction of animals/bugs in trash cans in your home
- Decrease weight of waste removed from homes – less weight you have to drag to trash can
- Contribute to lessening impact of useful organic matter in landfills
- Decrease cost to communities - Garbage handling is the 4th largest expense for many cities. Composting can reduce those costs
- Not only does compost contain no petroleum-based compounds, like most commercial fertilizers do, but it can also suppress plant diseases and pests.
- Gardens that are composted produce higher yields of healthier fruits, yields of healthier fruits, vegetables, and flowers.
- Connects generations together in nature, reducing stress and anxiety



BENEFITS FOR THE PLANET

- Contribute to lessening impact of useful organic matter in landfills
- Landfills across the planet are running out of room
- EPA estimates roughly 25% of the garbage in the US is made of yard trimmings and food scraps – 60 million tons each year!
- Prevents and controls foliar and root diseases
- Increases nutrient availability to plants which we then can eat
- Increased crop yields with less chemicals
- Increased drought tolerance & less water usage
- Keeps water ways and soil horizons cleaner and smelling better



STILL DON'T WANT TO DO IT?

- Some cities have compost programs that will remove your material for free
- Still don't want to do it yourself?
 - Bennett Compost will pick up weekly at your house
 - <https://www.bennettcompost.com/>
 - Back to Earth Compost will pick up weekly to monthly at your house
 - <https://backtoearthcompost.com/learn-more>



LOCAL PROGRESS



COVID CONSIDERATIONS

- “There are certain very stabilizing forces in gardening that can ground us when we are feeling shaky”
- Stronger demand for gardening items and fertilizers – good thing you’re making your own!
- Victory Gardens can bring families & friends together – be sure to keep wearing your mask & distancing from each other
- New interest in backyard activities – Remember to continue to find alternate methods for unwanted pests or crops – Do not use pesticides or herbicides
- Gardening and composting can reduce anxiety and help establish control to calm the mind
- Composting grounds us and brings us back to natural roots – Good for mental & physical health
- Remember to avoid putting any medical waste in or around compost & wash hand tools when you can and leave in sun to dry

BRYAN HUTCHINSON



- West Chester, PA
- Uses Berkley Method to break down wood chips
- Started in May 2020
- Won't break down fully until after autumn 2020

PHILLY SUBURBS



Growing vegetables east of leaf mold pile



Leaf mold, in anaerobic stage (needs mixing!)



Bennett Compost process

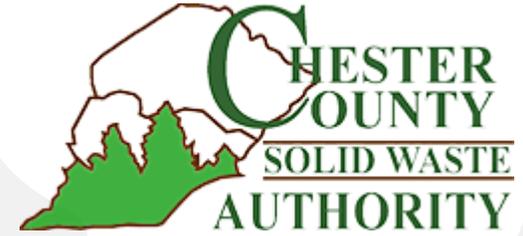


Growing celery from scrap



Compost 'pile' without wire mesh, leaf mold + scraps

CHESTER COUNTY & PA

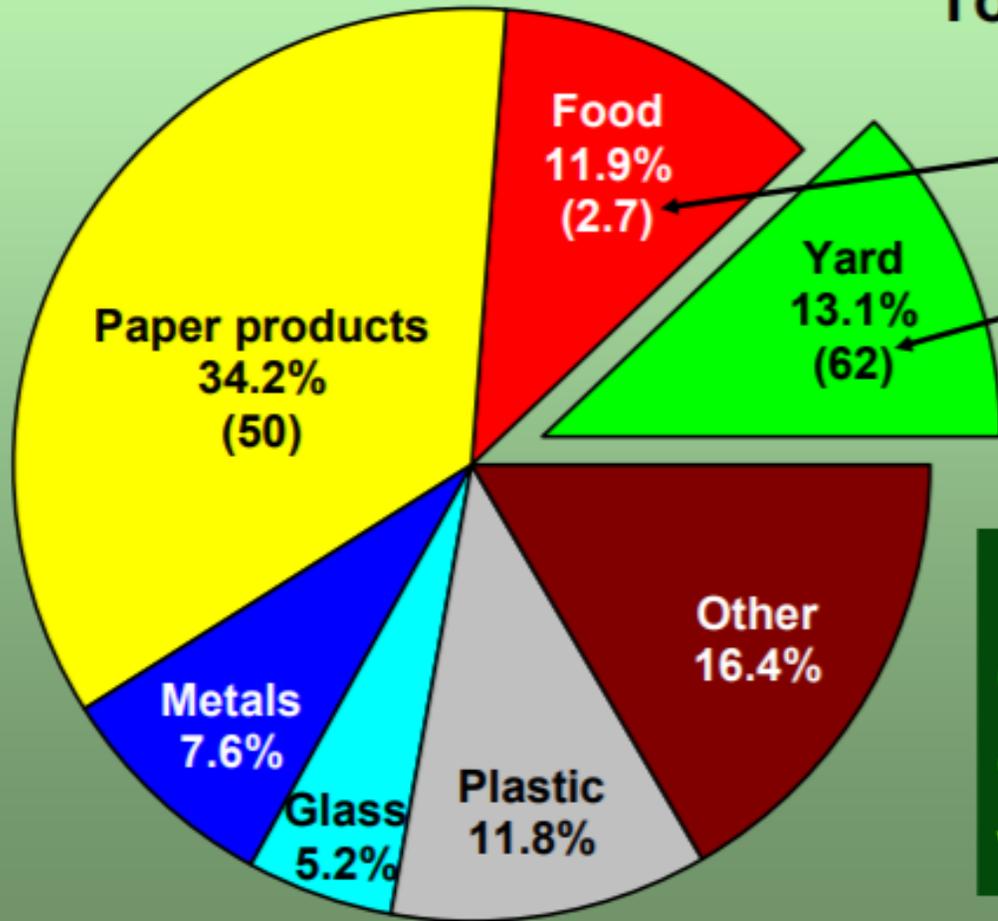


- Chester County Solid Waste authority sells “leaf mold” (leaf compost)
 - Page devoted to compost tips, uses, design, locating, waste reduction, benefits, etc.
- National Composting Council estimates average US household generates 650 lb. of compostables / year
- 34% of landfill waste in PA is food and 30% is paper
- PA’s goal is to recycle 35% of municipal waste – composting helps!



2005 Municipal Solid Waste Production in the U.S.

Total = 245 million tons/yr
(4.6 lb/person/day)



Percent of category
that was recycled

The overall recycling
rate was 32% in 2005

**Backyard composting
can increase recycling
of yard and food
wastes.**

CONNECTION TO SUSTAINABILITY

- Thermophilic (high temperature) composting acts as natural pesticide for soil by destroying unwanted seeds and pathogens
- Compost is useful for erosion control, land and stream reclamation, wetland construction, and as landfill cover.
- Advanced waste processing systems like industrial composting can create massive amounts of compost and reduce millions of pounds of waste.
- Mechanical sorting of mixed waste streams combined with anaerobic digestion or in-vessel composting is called mechanical biological treatment. It is increasingly being used in developed countries due to regulations controlling the amount of organic matter allowed in landfills.
- Treating biodegradable waste before it enters a landfill reduces global warming from fugitive methane
- Untreated waste breaks down anaerobically in a landfill, producing landfill gas that contains methane, a potent greenhouse gas.



LOCAL PROGRESS AND INITIATIVES ON SUSTAINABILITY

- WC SAC worked with Borough Council and Solicitor to craft first ever PA Single Use Plastic Bag and Straw Ban despite Fiscal Year Budget containing “ban on bans” – Voluntary portions of the ban went into effect 2 July 2020
- As of early 2020, Tredyffrin Township EAC was looking to implement their own bag ban
- Downingtown Borough voted in Bag Bag in November 2019
- West Chester Green Team moving forward with environmental education movement on pesticides, plastics, climate change and energy
- WC, Downingtown, Phoenixville and Kennett Square are signed Ready for 100 pledge for 100% renewable energy by 2050
- WC Green Team started 20 person “Tree Team” & continues to educate children and provide hands-on learning opportunities despite Covid-19 H&S limitations
- Pottstown has been chosen as the first municipality in all of North America to pilot an innovative recycling program that could drastically reduce waste heading to landfills.
 - The new program will allow residents to recycle flexible plastic packaging — things like plastic bags, wraps, pouches, product packaging, potato chip bags, and more.

RESOURCES

- <https://www.chestercountyswa.org/DocumentCenter/View/154/Composting-Naturally?bidId=>
- <https://patch.com/pennsylvania/pottstown/pottstown-usas-1st-city-have-flexible-plastic-recycling>
- <https://www.chestercountyswa.org/114/Composting---Its-RecyclingNaturally>
- http://whatcom.wsu.edu/ag/compost/fundamentals/needs_carbon_nitrogen.htm
- <https://modernfarmer.com/2018/05/how-to-build-a-three-bin-compost-plan/>
- <https://www.illinoistimes.com/springfield/confessions-of-a-reformed-composter/Content?oid=11442472>
- <https://www.livescience.com/63597-compost-trash-in-landfills.html>
- <https://historynewsnetwork.org/blog/153202>

**Never doubt that a small group of thoughtful,
committed citizens can change the world. Indeed, it
is the only thing that ever has.**

Margaret Meade





THANK YOU!



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