



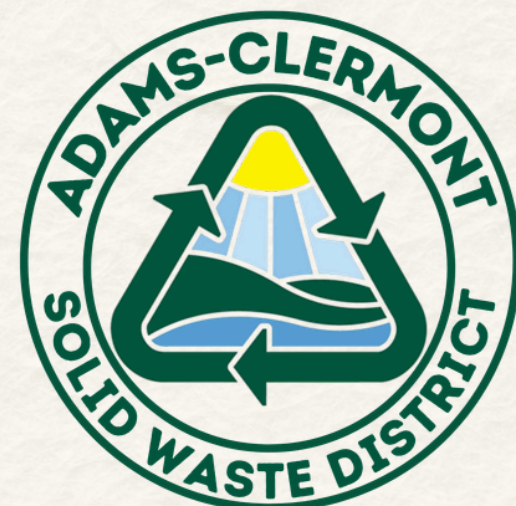
# VERMICOMPOSTING

**ELEA COOPER, EDUCATION & COMM. COORDINATOR,  
CLERMONT SOIL & WATER**

**HANNAH LUBBERS, DIRECTOR,  
ADAMS CLERMONT SOLID WASTE DISTRICT**



**CLERMONT** EST 1943  
**SOIL & WATER**  
Conservation from the Ground Up



# WHAT IS VERMICOMPOSTING?

Vermi = worms! Vermicomposting = Composting + worms!



The process of using worms to recycle food scraps and other organic materials to produce worm “castings”

# TYPES OF COMPOSTING

## Hot compost

- Produces compost
- Fast

## Cold Compost “Set and forget”

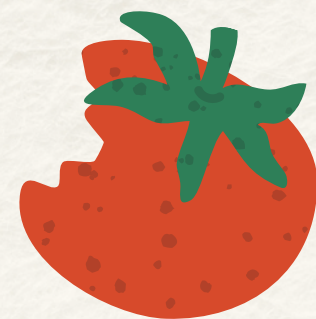
- Produces compost
- Slow

## Anaerobic

- Fermentation - acidic product
- Rapid

## Vermicomposting

- Produces castings
- Fast



# CASTINGS VS COMPOST

Don't use castings the same way you use compost!

## Compost

- Adds nutrients
- Improves structure
- Use in bulk

## Castings

- Adds microbes
- Improves biological activity
- Use in concentrated amounts



# VERMICOMPOSTING MICROBIOLOGY

A healthy worm bin contains:

- bacteria
- fungi
- protozoa
- mites
- springtails
- and many other tiny organisms

Worm gut cultivates castings full of:

- plant-available nutrients,
- beneficial microorganisms
- and compounds that can stimulate root development.





# WHICH WORM?



**NO**

## Common Nightcrawler - Anecic

- Burrow 6-10 feet
- Picky about habitat
- Reproduce slowly

**YES!!**

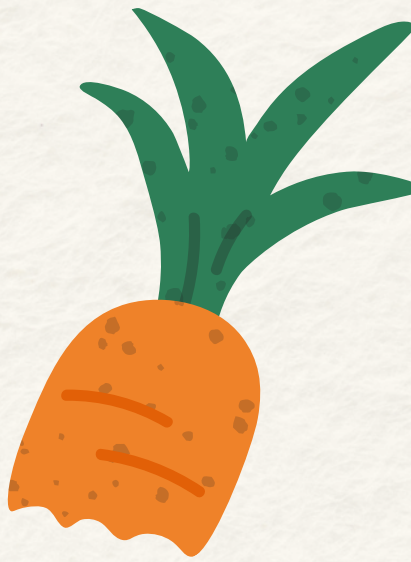
## Red Wigglers (*Eisenia fetida*) - Epigeic

- Surface dwellers
- Reproduce quickly
- Very adaptable
- Can eat ~50% of body weight daily



# SETTING UP YOUR WORM BIN

## AIR, SHELTER, WATER, FOOD



1

### Pick a Bin

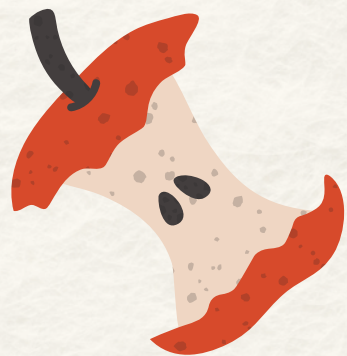
- Buy a worm bin or build one from a box or bucket
- Dark in color
- Second layer ideal to catch excess liquid

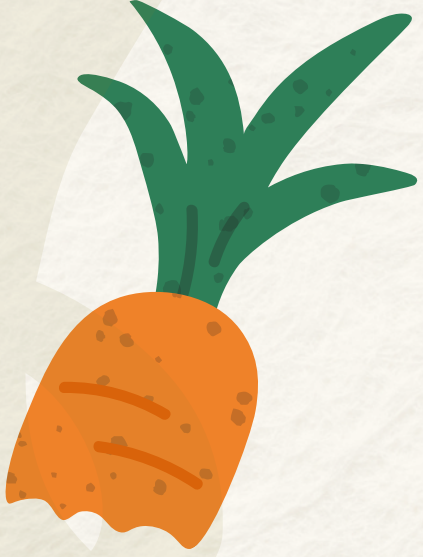
2

### Add Bedding Material

- provide shelter
- hold moisture
- provide carbon
- create air spaces

Gravel (grit, drainage),  
coco coir, soil, compost,  
leaves, paper/card





# SETTING UP YOUR WORM BIN

3

## Choose the Right Spot

Needs to remain between 55-77°

Inside

- Convenience - under counter
- Possible pests/smell

Outside

- More temperature variation
- Less convenient
- Larger bin potential



# SETTING UP YOUR WORM BIN



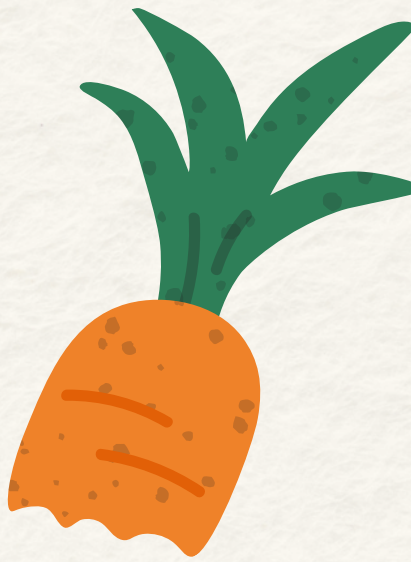
4

## ADD WORMS!

- 1 lb worms/ sq.ft. of surface area (500-1000 worms)
- Wait a few days before adding food scraps
- Some climbing is normal early on
- No need to add more! Population doubles within 60-90 days until carrying capacity is reached
  - Start a second bin, share with friends
  - Don't release into regular soil/garden beds



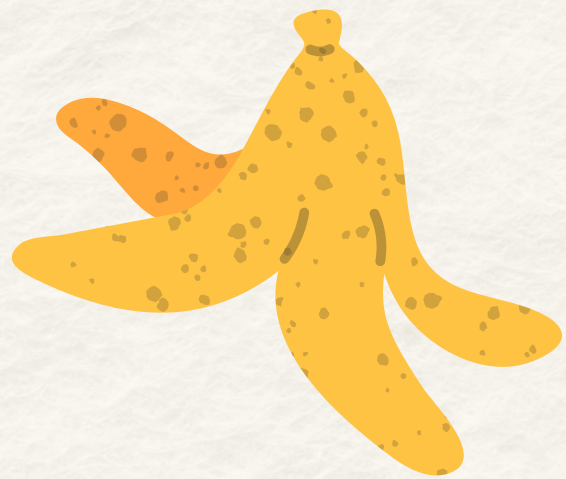
# SETTING UP YOUR WORM BIN



5

## Add Greens and Browns

- Bury small food scraps (greens) with dry leaves or paper (browns) on top.
- Tip: freeze food first to kill pests
- Add food only when most of the previous feeding is gone
  - Approx. every 2 weeks
- Overfeeding = mold, pests, odors
- Rotate feeding locations around the bin.



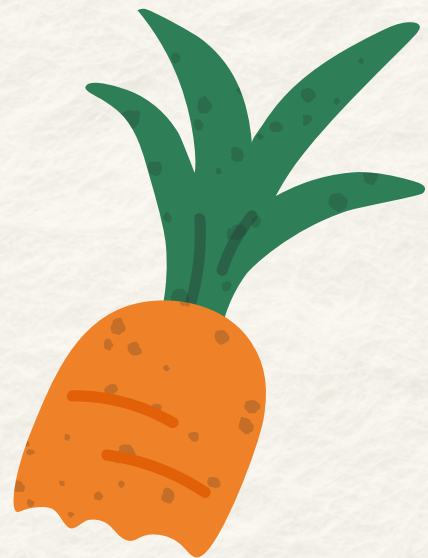
# SETTING UP YOUR WORM BIN



## Keep It Balanced

6

- Layer wet and dry waste to help materials break down efficiently and aerate the bin.
- Check moisture levels often at first
  - Wrung out sponge
  - Approx 1 cup every 1-2 weeks
- 24 hrs. to dechlorinate tap water
- LOTS of bedding



# THE GREENS (N)



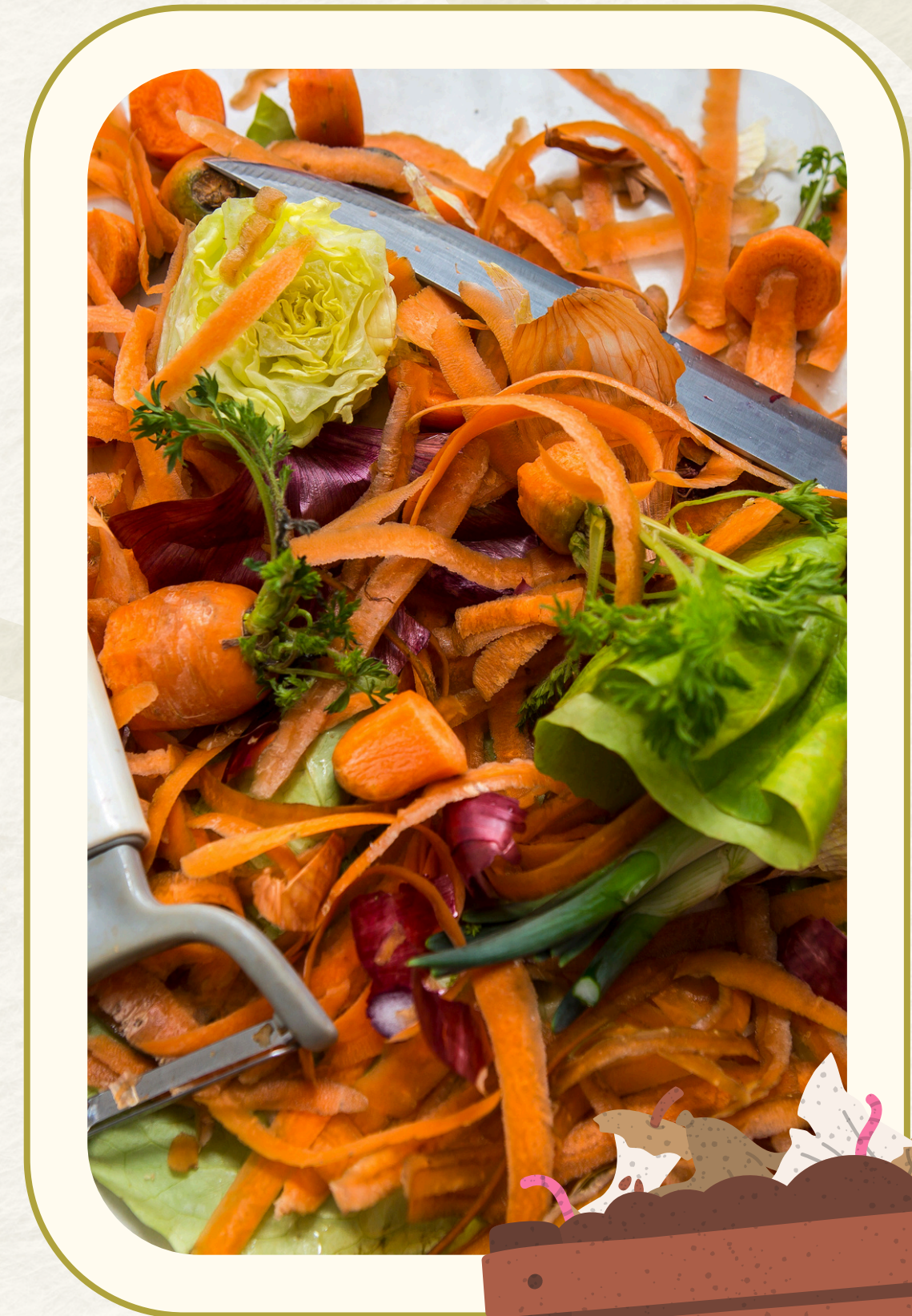
Aim for about 3 browns to 1 green ratio

## Greens:

- Vegetable scraps
- Fruit scraps (NO CITRUS)
- Tea bags (no staples/plastic)
- Crushed, rinsed eggshells
- Fresh garden waste

## SOMETIMES

- Plain bread/pasta/rice
- Coffee grounds & filters



# THE BROWNS (C)



Aim for about 3 browns to 1 green ratio

## Browns:

- Shredded newspaper
- Corrugated cardboard
- Dry leaves
- Coconut coir
- Plain paper



# THE NOs

- Meat & bones
- Dairy
- Oils, greasy foods, and sauces
- Cooked foods
- Citrus, pineapple, and peppers
- Large amounts of garlic or raw onion
- Pet waste
- Diseased plants or weeds
- Glossy or waxy paper
- Plastic-lined materials





## MAINTENANCE TIPS

### Turn it often

Worms need air! Mix the bedding every 2 weeks for better airflow.

### Keep it moist

Make sure it stays moist like a wrung-out sponge.

### Add some grit

Periodically throw in some sand or ground eggshells for the worms gizzard

# TROUBLESHOOTING



What You Notice	Possible Cause	What's Happening	How to Fix It
<b>Bad smell / rotten odor</b>	Too much food, not enough bedding, poor airflow	Food is decomposing without enough oxygen	Add shredded cardboard or newspaper, mix bedding, pause feeding for a few days, improve ventilation
<b>Bin is too wet / soggy</b>	Too much water or juicy foods, poor drainage	Worms can't breathe well because water is prevent oxygen from entering their habitat	Add dry bedding (cardboard, paper, leaves), fluff materials, drain excess liquid
<b>Bin is too dry</b>	Not enough moisture added, dry bedding	Worms need moisture to breathe through their skin	Mist with water, add moist bedding, mix in damp cardboard
<b>Pests</b>	Food scraps exposed, too much fruit, inappropriate materials	Fruit flies are attracted to exposed decomposing foods	Bury food under bedding, freeze scraps before adding, add a layer of dry bedding on top, feed less
<b>Worms are escaping/dying</b>	Environment is stressful	Conditions may be too wet, too dry, too acidic, too hot, or lacking oxygen	Check moisture, temperature, food levels, and airflow; keep lid on for a few days while they adjust





# HARVESTING

There are multiple ways to harvest your castings!



1

## Sifting For Worms

This will be more labor intensive than the others. You will manually section out your compost and pick out worms individually.

2

## Using Light

By shining a bright light on the top of your worm bin, the worms will dig deep down and hide from the light, leaving worm free castings up at the top! It might take a bit for the worms to migrate, however.

# HARVESTING

There are multiple ways to harvest your castings!

**3**

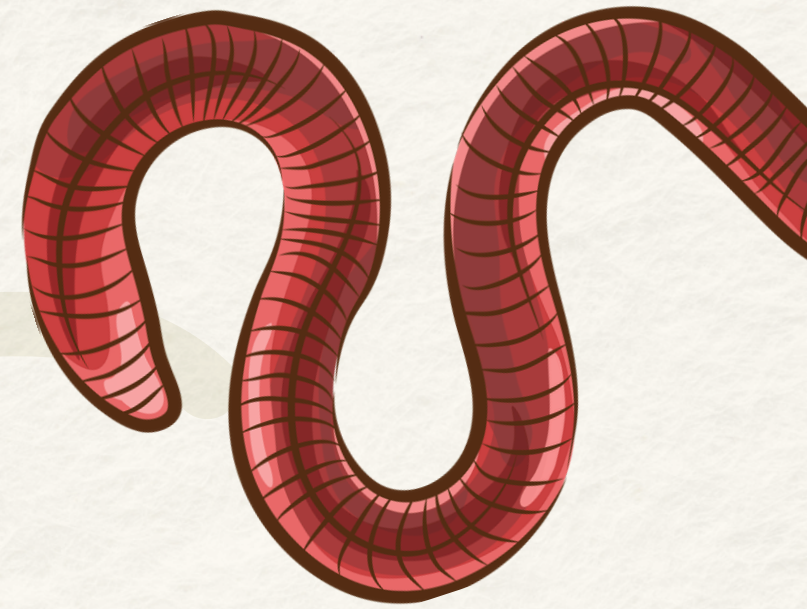
## Keeping Food and Substrate Apart

When setting up the bin, some people prefer to have one half of the bin be all food, and the other half be the substrate and worm castings. This makes it easy to harvest, but is a bit more effort to maintain.



# LEACHATE

- Leachate is the excess water that drains from your bin. It is a nutrient rich byproduct of vermicomposting
- If your bin is too wet, it can lead to bad bacteria. If the leachate smells bad, the liquid ,may not benefit your plants.
- If it does not smell, you can dilute with non-chlorinated water and even aerate it to add to plants. But there is a better liquid fertilizer made from worm castings...



# WORM TEA!

Worm Tea is cultured or brewed to increase the number of good bacteria.

## Ingredients/Supplies:

- a handful of worm castings, about a pound;
- 10 gallons of water (if your water is chlorinated, let it sit for 24 hours before using);
- a fine mesh bag or nylon stockings or large sock with no holes and string to hold it closed;
- 1 tbsp organic molasses (or other simple sugar, to feed the microbes)
- a bubbler (the kind used in an aquarium);
- a 5-gallon bucket.



# WORM TEA!

- Fill the mesh bag (or stocking/sock substitute) with worm castings and close it up securely. This is the tea bag that you submerge in the 5-gallon bucket of water. Add the molasses and submerge the bubbler.
- Let it bubble away for 24 hours, to make sure everything stays aerobic. After 24 hours have passed, remove the bubbler and mesh bag. Dilute the compost tea concentrate with another 5 gallons of water. Use immediately.
- You can use the liquid to water special plants or spray it over your entire lawn and garden. (If you use a sprayer, be sure to strain the liquid well so no particles clog the nozzle.) The best time to spray is mid to late afternoon, after the heat of the day has passed.



# BLACK SOLDIER FLY LARVAE

**Black Soldierfly Larvae/Maggots can be used for organics reduction, similar to worms!**

- BSFL are able to eat meat and dairy products, unlike red wigglers
- BSFL can consume up to twice their weight in one day
- When matured, BSFL can be frozen and stored for chicken/reptile food.



**THANK  
YOU**

