UCCE
El Dorado County County Master Gardeners Present
Making Worms Work for You

Overview
Worms
Habitat
Food
Critters in the bin
Vermicompost
Troubleshooting
Wrap Up and Questions
From Garbage to Soil Amendment!
Why Worms?

- Recycle kitchen scraps
- Castings
- Small spaces
- Easy
- Fun and great science
## Three categories

<table>
<thead>
<tr>
<th>Nightcrawlers</th>
<th>Deep and vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthworkers</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Composters</td>
<td>Top layer</td>
</tr>
</tbody>
</table>
Nightcrawlers (Anecic)

Vertical burrows, 4’ – 6’ deep
Earthworkers (Endogeic)

- Horizontal burrows
- Top 12 inches
Composters (Eisenia fetida and others)

- No burrows
- Forest litter, manure
- Reproduce rapidly
Anatomy

- One big intestine
- No eyes, ears, bones or teeth
The clitellum

My clitellum forms on my head end.
Reproduction

- Hermaphroditic
  - Need two to reproduce
- Cocoon forms on the clitellum of each
- Cocoon contains the eggs
- 30 days 1-5 babies will hatch
- Mature in about 3 months
Habitat
A Comfortable Worm Bin Has

- Moisture
- Air
- Decaying organic matter
- Darkness, quiet
- Optimal temperature
Moisture and Air

I breathe through my skin as long as it stays wet . . .

air
Leachate
Other Liquids

• Compost Extract – quick soak
• Manure Tea – soluble nutrients but food safety issues
• Vermicompost Tea – oxygenate, add microbe food
• Herbal Tea – mint, chamomile, etc...
Worms and Light
Temperature

- Same temperatures we like
- Optimal 55° to 77°
- Don’t freeze or overheat
Bin Choices

- Build or buy
  - Wood
  - Plastic
  - Concrete block
  - Earth
Bedding, Bedding, Bedding
More Bedding
Maintain Proper Moisture
Food
• Decomposing organic matter
• Worms eat microbes (not food)
Microbe Deli

Allow

• Fruit and vegetable peeling
• Egg shells
• Coffee grounds and filters
• Tea bags
• Bread
• Lettuce
• Watermelon rinds
• Banana peels
Avoid

• Bones
• Mayonnaise
• Salad Dressing
• Meat
• Cheese
• Butter
• Oil
• Excess # of citrus peels
Test!
Optimize

• Increase surface area
  o Chop
  o Shred
• Freeze
• Microwave
• Pre-compost
Pocket Feeding

Feed a different corner each time...
Row Feeding
Re-Cover
Critters in the Bin

Fruit flies
More Critters in the Bin

Mites

Soldier fly larvae
More Critters in the Bin

Pot Worms

Mold and Fungi
More Critters in the Bin

Springtails

Pillbug/Sowbug
Vermicompost
Harvesting Methods

• Dumping & sorting
• Migration
  – Vertical
  – Horizontal
• Sifting
Dumping and Sorting
If Too Wet

- Dump onto newspaper
- Gently aerate
  - Gloved hands
  - Hand fork
Migration Method

• Prepare new bin
• Place “harvesting” bin on top
Sifting
Voila! Vermicompost
The Finished Product

- **RICH STUFF!**
- Humus content
- Stimulates plant growth
- Helps control harmful pathogens
Using the Vermicompost

- Concentrated soil amendment
- Seed starting
- Transplanting
- Potted plants

Don’t let it dry out!
Troubleshooting
Most common problem

• Insufficient bedding
  - Causing excess moisture
  - Anaerobic conditions in the bin
## Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bin smells bad</td>
<td>• Poor air circulation</td>
<td>• Add fresh bedding</td>
</tr>
<tr>
<td></td>
<td>• Improper food scraps added</td>
<td>• Remove meat, bones or other animal products</td>
</tr>
<tr>
<td></td>
<td>• Too much food</td>
<td>• Feed less</td>
</tr>
</tbody>
</table>
# Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worms are dying</td>
<td>• Not enough food</td>
<td>• Add food into bedding</td>
</tr>
<tr>
<td></td>
<td>• Bin too dry</td>
<td>• Moisten until slightly damp</td>
</tr>
<tr>
<td></td>
<td>• Bin too wet</td>
<td>• Add bedding</td>
</tr>
<tr>
<td></td>
<td>• Too many castings</td>
<td>• Harvest</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fly infestation</td>
<td>• Food exposed</td>
<td>• Cover bedding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cover worms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Secure lid</td>
</tr>
</tbody>
</table>
Wrap up and Questions

Worm compost trivia

Who is considered the father of worm composting?

Charles Darwin
UCCE
El Dorado Master Gardeners

Contact us:
530-621-5512 (Tues-Fri 9:00AM-Noon
mgeldorado@ucdavis.edu
Visit us at 311 Fairlane, Placerville