UCCE
El Dorado 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

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

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!

• Increase surface area
  • Chop
  • 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
Soldier fly larvae
Mold and Fungi
Pot Worms
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

Voila! Vermicompost

Sifting

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>

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<tbody>
<tr>
<td></td>
<td>• Not enough food</td>
<td>• Add food into bedding</td>
</tr>
<tr>
<td>Worms are dying</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

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<tr>
<th>Symptom</th>
<th>Problem</th>
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</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