UCCE El Dorado County
Master Gardeners Present

Making Worms Work For You
Thank you to....

Today’s Hosts!

- Elissa
- Gloria
- Janet
- Pat
- Ruth
Welcome!

- We are the UCCE MGs of EDC
- Volunteers, trained by the U of C
- Goal of providing research-based information to our community’s home gardeners
- Sign in & evaluation form
- Statewide survey
- Publications
- Timetable/snacks/restrooms
- Contributions
UC ANR
University of California Agriculture & Natural Resources
Strategic Initiatives Survey

• Endemic and invasive pests and diseases
• Healthy families and communities
• Sustainable food systems
• Sustainable natural ecosystems
• Water quality, quantity and security
What brought you here today?

Where?

How?

When?
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 . . .
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
Greens

Browns
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!
Test!
Optimize

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

Feed a different corner each time...
Row Feeding
Make Art!

Jan 14, 2015 - lid off.
Carrot pulp, asparagus, paper
Make Art!

Make Art!

Jan 27, 2015 - end
Transformed into fertilized dirt
Make Art!

Jan. 27, 2015 - Coffee, cardboard, eggshells
Make Art!

Mar 24, 2015 - Apple, teabags, cantaloupe and shredded paper.
Make Art!

Feb 12, 2015 - Tea, cucumber peels, radishes, toiletpaper rolls
Make Art!

Feb 25, 2015 - end
Worms at Work
20 days in the bin
https://youtu.be/n9Mnf9ysNSs
Re-Cover
Critters in the Bin
MicroOrganisms

BACTERIA
Critters in the Bin

Fruit flies

Mold and Fungi
More Critters in the Bin

Mites

Soldier fly larvae
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!**

• Stimulates plant growth

• Aids in suppression of diseases

• Increases microbial activity in the soil
Using the Vermicompost

- Concentrated soil amendment
- 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

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<tr>
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</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>
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## Troubleshooting

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</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>
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</table>
Wrap up and Questions

Worm compost trivia

Who is considered the father of worm composting?

Charles Darwin
Don’t be Prickly ... Take Our Survey.

Our follow-up survey provides us the tools we need to grow and improve the quality of our program.
UCCE
El Dorado Master Gardeners

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