To:  WormEzine list
Subject: WormEzine Vol. I, No. 6. November 2002

**WormEzine Vol. 6**
News and information from Mary Appelhof
… about vermicomposting, worms, and other critters that live in the soil.
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For the Small Print, scroll to end.

They laughed when I said worms eat my garbage, but I showed them how, and now thousands say the same thing …

A WORD FROM WORM WOMAN a.k.a. MARY APPELHOF
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Dear Worm Workers,

It's hard to believe I've been here in Kalamazoo the entire month of November!  I head back out to New Mexico next week for the final ZERI Training session, but before then I'll enjoy Thanksgiving day with friends.

We had a sunny Sunday a couple of weeks ago, so I made hay while the sun shone, so to speak, and winterized my Patio Bench Worm Bin, photographing the process as I went along. As with last time, this issue of the WormEzine will have the text-only version which everyone should be able to read regardless of technology, and the photo-story which we will post on my website. I have received several comments from people who are reading the WormEzine and viewing the photos, so this seems to be an effective way to communicate.

Thanks for staying tuned. As always, I welcome your email and letters.

Sincerely,

Mary

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1==========FEATURE==========

PREPARING MY PATIO BENCH WORM BIN FOR MICHIGAN WINTERS
Mary Appelhof

Michigan winters can get pretty cold. Temperatures are often in the 20's Fahrenheit (-6 to 1 degrees Celsius) and they can easily go below zero F (-18 degrees Celsius). It's not unusual for us to have blizzards bringing a foot or more of snow. I've found that I can keep the worms alive in my outdoor Patio Bench Worm Bin by preparing it ahead of time with insulation and a supplemental heating source. The redworms work all winter, albeit slowly, under a blanket of several inches of snow, just as their relatives, the nightcrawlers do under snowcover. You can create your own variations, but here's how I did mine this year. {You can see color photographs of harvesting my bin on my website at http://www.wormwoman.com/acatalog/worm_bins_world.html. I've kept this WormEzine version as a user- and space-friendly verbal description of the process so as not to clog up your email with unwanted bytes.}

TOOLS and MATERIALS NEEDED

Insulation such as rigid foam board or bales of straw
Utility knife to cut foam board
Tape measure
Straight edge
Scale drawing for how to cut board
Writing utensil of choice
Strap or rope to hold insulation in place
Immersion water heater
Jug of water with lid (minimum two gallons)
Shredded paper
Outdoor-grounded extension cord
Plastic baggie and water proof tape (Disclaimer: this has been an effective process for me, however it is not an endorsed electrical solution by any electricians' union, nor do I claim to have any expertise in this area. So, to ensure the safety of your outdoor connection, consult the experts in electricity, to ensure the success of your vermicomposting experience, consult me, the expert in worm composting;-)

## INSULATING THE BIN

I've found that insulation alone does not provide adequate protection to keep worms from freezing here in Michigan. Although some heat would be generated in the six cubic feet (0.2 cubic meter) volume of decomposing material in the Patio Bench Worm Bin (4' x 2' x 1', or 120cm x 60cm x 30cm), the surface is a foot or less (1' or 30cm) from the interior. Interior heat quickly dissipates to the atmosphere when the outside temperature is cold. So I immerse a thermostatically controlled water heater in a lidded container filled with water. When the temperature gets down to 40 degrees F (4 degrees C), the element heats up, the water doesn't freeze, and the worms sit around and warm their setae by the fire.

I have used bales of straw snuggled around my worm bin for insulation, but they are so thick I found it awkward to lean over the bale to open the lid and bury garbage. And my knees got wet if I leaned on the snow-covered bale for easier access. When spring came, I could, however spread the straw on the flowerbeds for much, and throw the rest of it in the worm bin for bedding.

I now use rigid foam board. I was delighted to find this year that I could get it 2 inches (5cm) thick. A 4' x 8' (120 240 cm) sheet cost me about $22, and it should last me 3 years--so it costs about the same as I would pay for three years' worth of straw. A disadvantage of the foam board is that it eventually breaks apart, becomes unusable, and must be landfilled. Foam board doesn't decompose and return to the earth the way straw does.

Prepare a plan for cutting the foam board so that you make best use of the foam. Remember to allow for the 2' (5cm) thickness of the foam in planning the size of the side panels. For example, the sides of my bin measured 49" and 24" (125 x 61 cm), so I cut the foam 51" (130 cm) and 26" (66 cm)" to allow the sides to overlap on the corners. I find that snuggling a piece of strapping tape and holding it together with a small clip keeps the foam in place without having to nail, screw, or glue the board together.

I use the "floating lid" principle for insulating the top of the worm bin. By cutting the lid to fit inside the bin and rest on the surface of the bedding, it retains some of the heat that may be generated, rather than letting the heat dissipate to the space between the top of the bedding and the bottom of the closed lid. Space around the edges lets air in so the worms don't suffocate and the bacteria, fungi, protozoa, nematodes, springtails, enchytraeids and sow bugs can get their required oxygen

## SETTING UP THE HEAT SOURCE

The bird bath water heater that I use is the immersion type with a thermostat and safety controls. The thermostat turns the heating element on when the temperature drops to between 40-45 F (4-7 C), and shuts off when it's out of water. I place this heater in a lidded container with from 2-4 gal. (7.5-15 l) water and screw on the lid, which I've notched to accommodate the heater. I dig a hole in the bedding and set the container in it. When the edges of the bedding begin to freeze, the worms find their way to the center of

the bin near the jug where they continue to work. They would work faster if the temperature were warmer, but at least they don't freeze.

My biggest safety concern about this setup is the connection between the extension cord and the heater. To keep moisture out, I placed a zip loc bag around the connection and closed it as much as I could. Being careful to seal all edges, I then wrapped waterproof tape around the bag several times. The sealed connection may rest on top of snow, but it never sits in water, and I haven't had any problems in the 8 or 10 years I have used this technique. I dig out three bricks from the sidewalk and run the cord under them to prevent people from tripping over the cord that I plug into a garage outlet.

USING THE BIN

I put garbage in the bin two or three times a week, raising both the lid and floating lid. I can usually see live worms, especially if I poke around a bit near the jug. Some of the garbage freezes and doesn't thaw out until spring. When spring comes and temperatures warm up, cocoons hatch, hungry juvenile worms chow down, and eventually everything gets processed. It never ceases to amaze me how well the system works with so little effort put in.

That is all there is to it, before you know it you will be spreading your glorious castings in the spring. Don’t forget to check out the pictures at: http://www.wormwoman.com/acatalog/worm_bins_world.html.

2==========NOTABLE BITS==========

A. CORRECTION! In WormEzine No. 5, I made the statement, "After all, when I taught high school biology we only had nine kingdoms to deal with. Under Lynn's current scheme there are 96! Bottom line, I've got a lot more to learn!"

Nine kingdoms? No, nine PHYLA. And Lynn Margulis' current scheme is 96 phyla in 5 kingdoms. Other people are saying it really ought to be 8 kingdoms. Well, I guess we can find out when we went to school by how many kingdoms and phyla we think there are! Boy, I sure goofed there!

B. PHOBIA TRIVIA. Did you ever think about what phobia you would have if you were afraid of worms? According to the list of phobias at http://www.phobialist.com, it would be: Scoleciphobia -fear of worms. The closest reference I can find that would make that term make sense is scolex, which to us is a segment of a tapeworm. I guess we should fear having a tapeworm in our gut, so it would be reasonable to have a fear about the possibility. But then, if it's reasonable, is it a phobia? Even though to the Greeks, scolex was worm, I don't think scoleciphobia will be of much use to us worm workers.

There are rules for creating terms for phobias. Phobia is based on the Greek phobos, meaning fearing, so a word joined to it should also be Greek. Not everyone obeys those rules, especially those in medicine who find more Latin terms in their vocabulary.

You and I are probably more used to using the Latin vermi- as a root for things having to do with worms. If we try to find a phobia using Vermi as a root, we come up with: Verminophobia- Fear of germs. You can see that violates the Greek/Greek convention for naming phobias, but it was probably the doctors that did it . . . after all, they're the ones all concerned about germs.

Here's one we might use. Do you know what Scatophobia is? Fear of fecal matter. Send me some sentences using worm-related phobias and I'll print the non-X-rated ones in this WormEzine.

3==========RESOURCES==========

A. VICTOR POTYLKIN of Belarus found the EARTHWORMS AND SOIL'S FERTILITY conference in Vladimir, Russia, an excellent opportunity to learn about what's going on in the scientific and practical aspects of vermicomposting and vermiculture. He also commented on the benefits of the connections he made. For information on how to obtain any conference documents, contact Igor Titov email: ic_pic@port33.ru Tel: (0922) 32 10 42 FAX: (0922) 32 79 60

B. "COMPOST, BY GOSH!" by Michelle Portman will be available by the time you receive this WormEzine! This is Flower Press's first book printed in full color, our first book printed as a hardback, and our first book written specifically for children. I am so pleased to be able to make this delightful, beautifully illustrated book available to everyone. It teaches about vermicomposting, about worm bins, about the kinds of food waste that goes into a worm bin. It takes the process further by adding the humus produced to plants and making them grow bigger. And it says it all in very readable rhyme. Congratulations to Michelle Portman for writing and illustrating this children's book. We're gathering readers' comments, so we'd love to have you send them in once you've read your book! Send comments to ranee@wormwoman.com to order visit http://www.wormwoman.com/acatalog/Compost_By_Gosh_.html or call the worm team at 269.327.0108.

C. BIOCYCLE ARTICLE FEATURES SCOTT SUBLER. Rhonda Sherman gives a lot of detail in her article about Dr. Scott Subler who left his academic position at Ohio State University to make a difference in the vermiculture industry producing and marketing worm castings. Marketed as Dr. Subler's Living Soil, Scott's castings are produced by Eisenia fetida processing dairy solids in a continuous flow system operated by farm manager Curt Hawley in Bellingham, WA. I visited the operation in October, along with a visit to Cascade Vocational Services where I met the developmentally disabled, but very enthusiastic workers who package the castings. In next month's feature I will cover both the flow-through system and my visit with Frances, Naomi, and Paul at Cascade Vocational Services.

D. ICE WORMS FEATURED IN SCIENCE TEACHER. When I was in Alaska in 1999 I heard about ice worms that live on the glaciers. Curious, my host Cheryl Paige and I went in search of information. We finally found a park ranger who found a skimpy

pamphlet in a file and he copied it for us. We learned that they are tiny enchytraeids that live in the snowmelt. They appear on the glacier when the sun's angle is low. Best time to see them is in evenings and early morning, but it's tricky because you have to go out on the glacier and it's not always safe.

Junior high students had a chance to learn a lot more about ice worms by participating as Argonauts in the JASON project. Several went to Alaska to work side by side with leading research experts, studying iceworms from the glaciers and in their labs. They developed three simple experiments to compare ice worms (Mesenchytraeus soilfugus) with their segmented, soil-dwelling relatives, the white worm (Enchytraeus albidus), and common earthworm (Lumbricus terrestris.) They developed experiments to get answers to the following questions: 1) Are annelids sensitive to light? 2) Are annelids attracted to heat? and 3) What substrate do annelids prefer?

Many more questions were raised through their experiments than were answered ... such is the result of scientific experimentation. Students are encouraged to do more of these experiments and report their findings. Anyone with a worm bin should be able to find two species of annelids, Eisenia fetida and white worms. For more information, see Duchovnay, Bram and Daniel H. Shain. "Worms on Ice." Science Teacher Dec. 2002, 20-25. Email addresses: bram@jason.org, and dshain@camden.rutgers.edu. To learn more about The JASON Project: http://www.jasonproject.org

4==========COMING EVENTS==========
A. Dec. 5-9. ZERI Training in Santa Fe. This is the final session of the first USA ZERI Training with Gunter Pauli.

B. Dec. 11-14, 2002. A second, three-module USA ZERI Training is scheduled immediately following the first. Sessions will be in Santa Fe, New Mexico in Dec., Mar., and June. Contact Lynda Taylor for more info: lyndataylor@cybermesa.com

5==========PRODUCT HIGHLIGHTS==========
==========Holiday gift guide==========
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**COMPOST, BY GOSH!**
A wonderful adventure where a young girl and her Mom convert a storage box to house their new pets, pets with a purpose. The box becomes a vermicomposting bin and the pets are redworms. Poetic, rhyming couplets provide a grand explanation of the process of vermicomposting in a manner that the youngest reader/listener will enjoy, which is supported by adorable illustrations. The book ends with How To and Resources sections to encourage further exploration of vermicomposting. Written and Illustrated by Michelle Eva Portman and shipping NOW!!!!
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6==========ABOUT THE AUTHOR==========
Mary Appelhof is founder and president of Flowerfield Enterprises, which develops and markets educational materials on vermicomposting. Its publishing imprint is Flower Press, publisher of the how-to book *Worms Eat My Garbage*, the classroom activity book and curriculum guide, *Worms Eat Our Garbage*: Classroom Activities for a Better Environment, *The Worm Cafe*: Mid-scale vermicomposting of lunchroom wastes, *Compost, By Gosh!* An Adventure in Vermicomposting, and *Diabetes at 14*: Choosing tighter control for an active life, which is not about vermicomposting but is a valuable asset for anyone affected by diabetes.

7========== THE SMall PRINT==========

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