

## Equipment List

Materials you may need to conduct earthworm surveys and hints on getting them

### **Earthworm Sampling Supplies**

- *Ground Mustard Powder (non-organic)*

### **Preservation Supplies**

- *Isopropyl Alcohol*
- *Formalin*
- *Vials*

### **Field Supplies**

- *Forceps*
- *Trays*
- *Gallon Jugs*
- *Sample Frames*

### **Don't Forget!**

- *Data Sheets*
- *Extras*

### **Earthworm Sampling Supplies**

#### Mustard

Ground yellow mustard powder (not the liquid condiment) used in the liquid extraction method of earthworm sampling can be ordered by bulk from a local food coop. [Frontier herbs](#) is a good supplier you can buy direct from them. Be sure to choose the **non-organic** mustard powder, I found the organic mustard powder doesn't seem to pack the same wallop because they use a different plant species.

1-lb of yellow mustard powdered does about 11 samples

#### Vials

After trying many different preservation jars and vials, I prefer to use polypropylene centrifuge tubes for preservation of earthworm samples. They are mostly unbreakable (unless you drive your car over them) and have good fume and leak proof lids.

You can order larger quantities (minimum order 320 vials) through [Midwest Scientific](#) and though there are several different types, we prefer like the "TPP Centrifuge Tubes" with yellow tops in both 15ml and 50ml sizes. The 50ml size is nice for sample plots with a lot of worms and the 15ml size is nice for sample plots with fewer worms. I typically put all the worms from one sample plot in one vial (sometimes you need 2 if there are LOTS of large earthworms).

**BE SURE TO LABEL YOUR VIALS FULLY AND COMPLETELY WITH PERMANENT MARKER AS YOU COLLECT THEM!** There is nothing more frustrating than trying to figure out which vials go with which samples hours, days, months or years after you collected them.

If you are unable to procure vials contact: [greatlakeswormwatch@gmail.com](mailto:greatlakeswormwatch@gmail.com)

### Alcohol (Isopropyl)

To anesthetize your earthworms before final preservation you will need to **use Isopropyl alcohol**. Do not use Ethyl-alcohol because it bleaches the earthworm samples which prevent species identification. Rubbing alcohol (70% isopropyl) is the cheapest and can be obtained from your local grocery store or pharmacist. It is usually cheaper to buy it at your local drug store than to order it through a lab supply house.

### Formalin

10% Formalin is used in the final preservation step of your earthworm specimens. It is a biological fixative, which prevents decay and keeps the specimen relatively firm and in good condition for years to come. “10% formalin” is in fact, 3.7% or 4.0% formaldehyde and may be purchased in small quantities from your local pharmacy.

After the earthworms have been stored in formalin for at least 48 hours, you can transfer the earthworms back into Isopropyl alcohol, and re-use the formalin that is left.

BE AWARE – formalin is a known carcinogen and needs to be handled and stored using appropriate safety equipment (latex gloves, apron, eye protection) in a well-ventilated area.

If you are unable to procure formalin contact: [greatlakeswormwatch@gmail.com](mailto:greatlakeswormwatch@gmail.com)

### Field Supplies

#### Forceps

Forceps (4-5 inch) with blunt tips are handy to have when collecting earthworms using the liquid extraction method.

#### Plastic or aluminum collection trays

Used to collect your earthworms and anesthetize them in the alcohol as they come up. Once collection is completed, you can transfer them to the vial. They can stay in alcohol for the day, but get them in formalin within 24 hours or they get mushy.

#### Gallon Jugs

Sturdy gallon jugs with a nice screw cap are great for mixing and carrying your mustard juice for the liquid extraction method (old windshield wiper fluid jugs, large fruit juice jugs with handles, etc.). Standard plastic milk jugs work fine too, but don't last as long. HINT – wash them out after you use them, after few days they can really stink up the place if they haven't been cleaned out.

#### Sample Frames

If you are using a sample plot to sample earthworms it is handy to have a frame made of wood or aluminum that you can lay down to define your sample plot. I don't count on it to hold in the liquid when using the mustard extraction method, but more to define the sample area. I recommend the frame be 33cm x 33cm for consistency and easy in data calculations (see **Conducting Your Own Studies**) and about 2-3 inches high.

#### **Don't forget**

#### Data Sheets

Print data sheets off our website or create your own. Depending on the conditions, you may want to use “write in the rain” paper. HINT – write with pencil on data sheets, it doesn't run (like pen does) when the data sheet gets wet. You don't want to lose all that data you collected when you get caught in the rain at the end of a long day!

#### Extras

Other handy items include a clipboard, gallon sized ziplocks to collect your sample vials in, extra pencils and markers, and maybe rain gear. Also remember yourself! Bring water to keep yourself well hydrated while working and a treat to reward yourself for a job well done at the end.