The mathematics of Nematodes

Heterorhabditis bacteriophora magnified about 50 times

Maybe I was ripped off.

I have grubs in my yard that eat the roots of both my lawn and my vegetable plants and kill them. I get grossed out when I dig in my garden and find them. They are icky looking … they have a high *gross-out factor*. (This is an internationally recognized mathematical rating scale for disgusting things.) [1]

Here's an ordinary Japanese beetle grub. They are pretty large.

Since I try not to add poisons to the earth, I ordered beneficial nematodes from a natural gardening store online. Nematodes are supposed to enter the grubs through their orifices and kill them by poisoning their blood. The garden company will send 10,000,000 nematodes. I wondered how big a box that was going to come in. Sounds pretty big.

Well they are microscopic … 0.6 mm or 0.02 inches in length each.

Do you know the expression, "How many angels could dance on the head of a pin"? Well, I found the measurement of the head of a pin = 1.5 mm in diameter.

1. How many nematodes might you be able to get on the head of a pin?

So, I bought ten million beneficial nematodes for $29.99. That's a lot of nematodes.

2. How many nematodes could I get for a penny?

3. What if I just wanted 300 nematodes? How much should I have to pay?

This all sounds like a pretty good deal. But wait … since they are microscopic when you receive your shipment it is very small and seems to be made up of sawdust and dirt. The package was marked "PERISHABLE" and here's a picture of the contents.

This picture was taken on my porch floor that it is made up of 1 foot x 1 foot tiles.

4. About how big is this package of nematodes?

It weighed practically nothing.

I was instructed to add the contents of this package to 2 quarts of water. I had an old plastic pitcher that held 2 quarts so I added the nematode contents to my water-filled pitcher. A quart contains 32 ounces.

5. How many nematodes were now swimming in each ounce of my water?

Then I was supposed to dilute my nematodes even further. I was instructed to take ½ cup (4 oz.) of the nematode solution and add it to my 2-gallon watering can (1 gallon = 128 ounces) in order to spread the worms.

It is important for me to say here that I cannot yet see any nematodes. I saw no nematodes in the sawdust dirt mixture. I see nothing happening in my 2-quart pitcher and I am not able to see nematodes in my watering can.

6. After I diluted them this second time, how many nematodes are in each ounce of liquid in my watering can?

I very carefully sprinkled nematodes in my vegetable garden and throughout my lawn area.

7. How many watering cans of nematodes did I prepare to use all of my purchase?

I then had to keep my garden moist so that the worms could feel comfortable in my dirt and search out some great grub food. Now I hope they are eating grubs … but I have never seen anything and I have my doubts.

8. Do you think that I have been ripped off?

Addendum: On July 6, 4 days after I sprinkled the nematodes over my yard and kept the yard watered, I weeded and planted some more in my garden. As I dug small holes for my new plants I would have ordinarily discovered many, many grubs. Today I only found one. There is hope.

[1] I made this rating scale up.
Source: http://ento.psu.edu/extension/factsheets/white-grubs-lawns
http://www.ianrpubs.unl.edu/epublic/live/g1899/build/