



Snake Worm Invasions

What are Snake Worms?

Snake worms are earthworms in a group called pheretimoids. The three species currently of concern in the northeastern US are *Amyntas agrestis*, *Amyntas tokioensis*, and *Metaphire hilgendorfi*. Snake Worms were introduced with plant material from Japan and Korea. They are regarded as forest pests and are regulated in at least three states: Wisconsin, New York and California. Minnesota is currently working towards regulation.

How can you tell if you have them?

The best way to know if you have them is to see them. When you find an earthworm, look for the “ring around the collar”, scientifically known as a clitellum. The clitellum in pheretimoids



is clearly set off from the rest of the body by color and it goes all the way around the body. The European earthworms have a clitellum that is more like a saddle and only wraps part way around the body. Another tell-tale characteristic is the thrashing

movement they make when you put them on your hand or disturb them. The three species look very similar but differ in size. The longest is *M. hilgendorfi* (up to 8 inches), the smallest is *A. tokioensis* whose (adult) length varies between 1-3 inches.

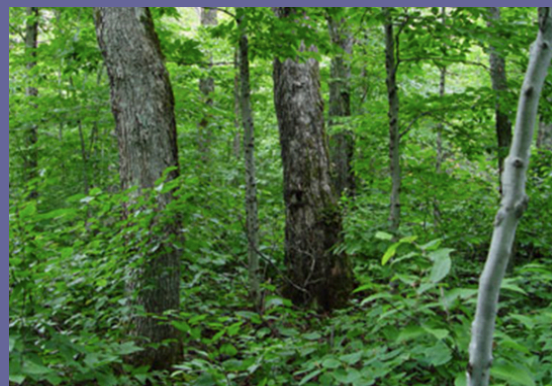
These worms have an annual life cycle. They begin hatching in April and die in early to late frosts between October-December. You won't notice an infestation until early June when there are juveniles of reasonable size. Juveniles and even early hatchlings already exhibit the thrashing behavior. You can also look for their castings which looks like a layer of coarse coffee grounds. The best time to confirm that you have pheretimoids is when they are adults and you can see the clitellum.

How wide-spread are they?

They are in all states throughout the North East. Although they have only been recorded by scientists for a few sites, gardeners and landscapers are becoming more aware and frequently find them in gardens and parks. They love any kind of organic matter and spread through horticultural materials (plants, mulches and composts).

What makes them pests?

When these worms invade forests they modify the forest floor by consuming the organic material. Their castings are very loose and form a thick layer at the soil surface. Their activity suppresses the understory, including saplings. The images below show earthworm-invaded and earthworm-free forests. They reduce plant biodiversity and also have negative effects on salamanders and ground nesting birds such as the Oven Bird and Wood Thrush. The effects on the sustainability of forest stands are currently difficult to assess because the regeneration in invaded forests will take several decades to play out.



Top: uninvaded forest near Camels Hump; Bottom: earthworm invaded forest in South Burlington.

Do they cause damage in gardens?

There is no scientific evidence of damage being done in gardens, as little data has been collected to date on the effect of these earthworms on garden or agricultural crop plants. However, there are anecdotes:

- The New York Times reported that a Hosta Farm was invaded and that 1/3 of the plants were wiped out (<https://www.nytimes.com/2007/03/15/garden/15nature.html>).
- Lady Slippers also seem to be susceptible, and there have been some reports of lawn damage.
- Exposed roots in horticultural crops and less rooting of some vegetable plants has also been observed.

Some talk about a “culturally invisible invasion” because earthworms are considered beneficial creatures. So seeing a snake worm doesn’t conjure up images of doom and gloom in the way that seeing a tomato horn worm does.

How can you help reduce the risk of invasions?

First, report them with the address of where you saw them or coordinates (cell phones can give you GPS coordinates) to Professor Josef Görres at jgorres@uvm.edu.

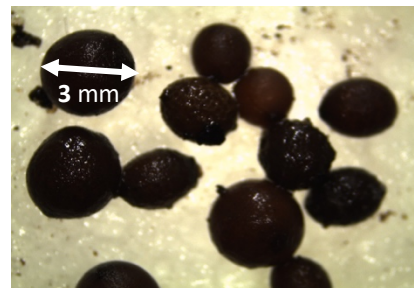
There are no tried and true methods to control them in your garden. But you can try applying earthworm specific irritants to the soil, such as a mustard solution (1 oz of dried, ground mustard to 1 gallon of water). Sprinkle freely on the infested soil and wait for the worms to come to the surface. Collect and put into a bucket of water (with detergent). Put a tight fitting lid on the bucket as these worms are escape artists. This will reduce numbers but won’t rid your garden of them. There is also a fertilizer that has a molluscicide in it that seems to be effective as a vermicide as well (Early Bird, the liquid formulation). Again wait for the worms to come to the surface, collect them, and put them in pail of water.

Meanwhile, UVM researchers are working on potential biocontrols and mechanical ways of controlling them.

Prevention is best

The best way to avoid the problem is to prevent the worms from getting to your garden.

- ✓ Wash the roots of plants you buy or receive in a plant exchange. Bare root exchanges are best.
- ✓ Grow plants from seed, if you have the time and patience.
- ✓ Buy compost from reputable sources. Recently there have been some reports of snake worms in bags of commercial compost. Even though you may not see any worms in the compost, their egg casings may be present. Also avoid uncomposted leaf mulch sourced from offsite.
- ✓ Make your own compost. Make sure that your carbon source is clean, which likely means using material from your own site or acquiring wood chips or shavings from clean sources.



Egg casings of A. agrestis and A. tokioensis.

If you already have them, do what you can to prevent them from spreading

- ✓ If you are providing plants, make sure to wash the roots before sending them offsite. Bare root exchanges are best.
- ✓ If you make your own compost, snake worms and egg casings die during the process of hot composting (meeting PFRP temperatures of 131° F). Be sure to turn your pile so that all the material reaches these temperatures.
 - Site your compost curing pile uphill from the active compost pile to reduce opportunity for re-infecting the finished compost, as evidence suggests that snake worms are less likely to move upslope.
 - Unless you can be sure that your finished compost is not infected, do not sell or share it with others in uninfected areas.
- ✓ If you don’t make your own compost, compost your yard waste on your own property if at all possible.