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Jumping worms (Megascolecidae) in Connecticut

What are jumping worms?



Introduction

There are three species of concern *Amyntas agrestis*, *Amyntas tokioensis*, and *Metaphire hilgendorfi* in the family Megascolecidae. They were introduced from Asia, principally from Japan. They are also called crazy worms, crazy snake worms, Georgia or Alabama jumpers, or Jersey wigglers. These are noticeably fast moving,

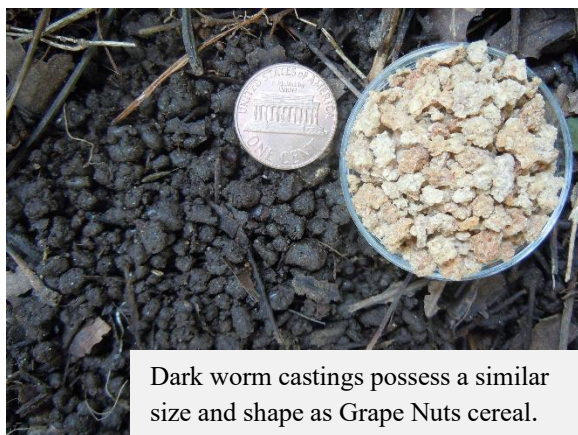
highly active worms with a strong rigid muscular body that can whip violently when disturbed. These are earthworms on steroids! They can displace and outcompete other earthworm species. In their native range they are naturally controlled through predation. It is important to be educated about jumping worms and to educate and warn others.

Description

The clitellum or collar behind the head in mature adults is not raised, it is smooth, flat, and milky-white (cream colored) while juveniles lack this distinctive collar. In night-crawlers (*Lumbricus* spp.) and other earthworm species it is raised and pink.

Body color is gray/brown/purple with a metallic sheen. They are darker on the top side and lighter underneath. Their cocoons are 0.04” to 0.19” (1 -3 mm) in diameter and look like soil particles.

These worms alter top soil composition by homogenizing the natural organic layers that include the leaf litter (the epi-endogeic region). These worms do not dig down deep into the soil, but favor leaf mulch not grass or conifer settings. Their castings (feces) are coarse dark and granular. They look similar in size and shape to Grape Nuts cereal. Their feces have also been described as looking like taco ground meat but blacker. They over aerate the soil and cause nutrient leaching and erosion. Native trees and plants (including garden plants) cannot germinate or develop in this worm feces altered soil while invasive species often thrive in this diminished, nutrient poor soil.



Life Cycle

Jumping worms live for one year. They range from 1.5” to 8” (3.8 – 20.3 cm) in length.

In spring young worms hatch from poppy-seed-sized cocoons that had survived the winter. Between 60 to 90 days they mature into adults. There is concern that climate change may promote two generations per year.

- **Adults** are active from July to October.
- **Overwintering Cocoons** are present from November to April.
- **Juvenile worms** are active during May and June.

Adults are killed by the first hard frosts. Their cocoons overwinter and hatch when the soil temperature reaches a constant 50°F (10°C). Reproduction can be without mating (parthenogenesis) or through mating.

Distribution

Jumping worms are established in the Midwestern states and are spreading throughout New England. At the time of this writing, jumping worms have been reported from 27 towns in Fairfield, New Haven, Hartford, New London, and Litchfield Counties.

Indicators of Jumping worms

The worms themselves will be highly active and whip, jump, and thrash in snake-like movements when disturbed. They favor leaf litter and/or mulch.

Distinctive large globular dark castings (feces) uniformly covering the ground.

Unexplained loss of understory plants and young trees in forests and/or failing garden plantings etc.

Prevention

- Buy plants with only roots, not in pots. Jumping worms are being distributed in potted plants. Check everything very carefully.

- Do not share potted plants unless you are certain there are no jumping worms.
- Avoid plant exchanges or sales.
- Make your own compost.
- Avoid purchasing compost unless the seller can prove that the compost has been heat-treated between 104°F and 131°F (40-55°C) for at least three days and there was no opportunity for trapped worms to flee to cooler areas of a compost pile during treatment. This applies to mulch as well.
- Pay attention when bringing soil onto property. Worms particularly juveniles and/or cocoons can be carried on shoes, plants, tools, or building/landscape equipment.
- Do not buy worms as fish bait or vermicomposting unless you are certain they are not jumping worms.
- Do not discard unused bait-worms on the ground or in water following fishing.

Control

Currently, there are no well-established proven methods for control or registered chemicals for use against jumping worms once present or established. Control of jumping worms is a relatively new area of research. Diligence is your best control method. Nevertheless, some suggested management techniques are provided below.

Mustard

Testing for and partial control can be achieved using mustard.

Mix 1/3 cup of ground yellow mustard seed into 1 gallon of water and pour half of the liquid slowly over a 1 square foot of soil you want to test. It irritates the worms and they will surface. Hand pick the worms and drown in a bucket of soapy water or bag,

place in the hot sun for 10 minutes, and discard in the trash. Do not throw what you think of as dead worms back onto the property. Some may be stunned, recover, and continue to reproduce. The mustard will not harm plants.

Natural predators and biocontrol's

There are some known predators of earthworms in general. These are some species of native salamanders and a particular species of hammerhead worm, *Bipalium adventitium*. This is an exotic land planarian accidentally introduced during the last century from Southeast Asia which is present in Connecticut. It is an active worm hunter. It is yellow/tan colored with a medial dark dorsal stripe. The head is fan-shaped. It tracks the mucus and other secretions of a



worm, then wraps itself around the prey while piercing the worm with its everted pharynx. There is evidence these planarian uses Tetrodotoxin to subdue their prey that can be up to 55 times larger than themselves (Stokes 2014; Zaborski 2002). Anecdotal conversations with other researchers in New England and public submissions of this particular planarian to the Insect Information Office reveals a noticeable increase in their populations during the past year. This may reflect the prey/predator dynamic where higher numbers of prey promote an increase in predator activity.

Additionally, toads, snakes, weasels, rats, moles, pigs, raccoons, American robins, woodcocks, ants, cluster flies, centipedes, ground beetles, mites, and a recently discovered nematode in the genus *Phasmarhabditis* attack earthworms as well. Organisms that are known to infect earthworms include bacteria, protozoa, rotifers, platyhelminths, and fungi. Since the jumping worm is a relatively recent introduction to the United States, it is not yet known what predators or pathogens may be effective in controlling populations.

Hand-picking

Rake or hoe soil surface, then hand-pick disturbed worms. They are always close to the soil surface. They also seem to aggregate around partly buried stones that are close to the soil surface. Either bag, leave out in sun for 10 minutes, or drown in a bucket of soapy water and discard in the trash. If you do not have a container or bag at hand, throw the worms into the center of a hot sunny driveway to kill them.

Worm grunting

Worm grunting is a technique using vibration to promote worm emergence. A 2"-wide stick called a "stop" is hammered into the ground and then a flat iron is rubbed rhythmically back and forth over the top of the "stop." The technique makes the ground vibrate and worms emerge within the range of the vibrations. It is thought that the vibrations mimic the activity of a digging mole causing the worms to flee. They then can be handpicked and destroyed.

Killing cocoons using solarization

In late spring or summer cover moistened soil or mulch with a sheet of clear plastic for 2-3 weeks or when soil temperatures exceed 104°F for 3 days.

Abrasive materials

Biochar or diatomaceous earth incorporated into infested soil has been shown to harm and kill the worms.

Organic fertilizer

Organic fertilizer made from the non-toxic tea seed meal irritates and slowly kills the worms. Treatment times are late April to early May and during the summer. Researchers are also exploring the efficacy of Saponin against the worms.

Vinegar or rubbing alcohol

Worms can also be killed in vinegar or rubbing alcohol

Buying mulch or compost

If concerned about jumping worms in your purchased mulch or compost, spread on to a driveway preferably on a hot day and hand pick. Heat stress will also harm the worms.

Soil organic content

Reduce organic soil content in your soils when possible to create a harsher environment for the worms.

References

- Stokes, A. N. et al. 2014. Confirmation and distribution of Tetrodotoxin for the first time in terrestrial invertebrates: two terrestrial flatworm species (*Bipalium adventitium* and *Bipalium kewense*). 9(6) e100718. PLOS/one.
- Zaborski, E. 2002. Observations on feeding behavior by the terrestrial flatworm *Bipalium adventitium* (Platyhelminthes: Tricladida: Terricola) from Illinois. The Amer. Mid. Nat. 148(2): 401-408.

This is a developing scenario and information is subject to change.

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