Jumping Worms—A Peril to Our Northern Forest

By Dale Odorizzi, Lanark County Master Gardeners

For most of my gardening life, I believed that lots of earthworms in my garden meant my garden soil was healthy. A few years ago, I was surprised to learn that all earthworms in Ontario are, in fact, invasive species. Native earthworm species were wiped out in Ontario by the glacial ice sheets that covered the landscape. When the glaciers retreated, they left behind earthworm-free ecosystems. For thousands of years since, our ecosystems have evolved to recycle nutrients and decaying organic matter through a multitude of fungi, invertebrates, and bacteria.

And then, the earthworms arrived.

Earthworms devour leaf litter that most of our native plants and insects rely on, much more rapidly than our native decomposers. They burrow into the soil to feed on the leaf litter and severely impact existing soil structure and nutrient availability. Most earthworms move slowly on their own and are mainly transported through human activities.

Sadly, in the summer of 2021, invasive (pheretimoid) jumping worms were confirmed in gardens and ravines in Ontario. The term "jumping worms" refers to several species of invasive earthworms that damage gardens and forests. At least two of the species identified, Metaphire hilgendorfi and Amynthas agrestis are known to be particularly harmful to our northern forests.

A healthy forest develops a thick blanket of duff (leaf litter) that slowly decomposes over time. This layer creates a home for insects, amphibians, birds, and native flowers. When worms devour the litter, the stored nutrients are released too quickly for the plants to capture.

How did Jumping worms get here?

Like many invasive species, jumping worms were brought to North America from Europe and Asia by the horticultural industry. Their eggs in little cocoons were likely in the soil and roots of imported plants. Once they arrived, they spread further in potted plants, compost, and mulch.

Jumping worms have become a leading ecological concern in hardwood forests, agriculture, nursery production and home gardens. They:

- Have a smooth white clitellum (ring) in contrast to the raised pink one in other earthworms. (figure 1)
- Writhe like snakes and can jump when startled.
- Live one year.
- Mature in August or September leaving behind tiny egg-encased cocoons that overwinter to become next year's worms.
- Can reproduce without fertilization. One worm can launch an invasion.
- Grow to about 20 cm long.
- Occupy the top 5 cm of soil, unlike earthworms which burrow deeply.
- Turn all fallen organic matter, including seeds, into material that resembles coffee grounds.



Figure 1

They can halt the regeneration of trees by eating their seeds and have the potential to dramatically change soil structure, impact forest ecology and reduce biodiversity (see figure 2)

There is hope and it is up to us, the home gardeners, to help stop the spread.

- Certain fungi kill them. (Entomopathogenic fungus, Beauveria bassiana, shows some promise).
- Some soaps kill them.
- Solarization of compost and mulch may help, but it must get it hot enough.

- Sharp angular particles like biochar, sand and diatomaceous earth may deter and kill worms when ingested.

Please be on the look out for Jumping Worms.

What can we do to prevent the spread?

- Inspect all plants and soil for these worms, eggs or cocoons and remove any you find.
- Do not move plant material to cottages or other properties that contain any worms.
- If you find jumping worms, contact your local Canadian Food Inspection Agency office (CFIA) Tel: 647-790-1100.

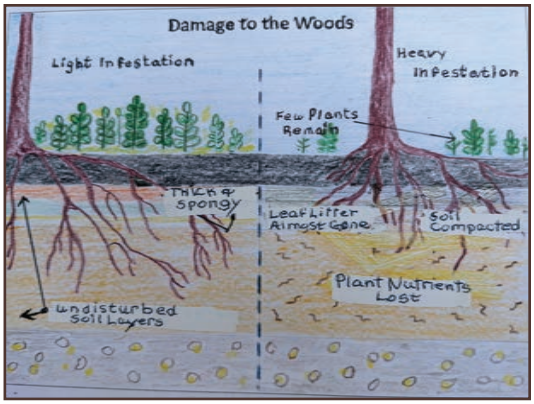


Figure 2 - Drawing by Gail Labrose

To test for jumping worms, use a dilute mustard solution. Mix 4 L of water with 40 grams of ground yellow mustard. Pour slowly into the soil. This drives any worms to the surface. Put the worms in a sealed plastic bag and leave in the sun for at least 10 minutes before discarding in the garbage. Do not compost as any eggs in them may still be viable.

Controlling the spread is crucial

Avoid buying mulch, compost, nursery stocks, or potting mixes from areas with established infestations, as these may contain egg-filled cocoons which are difficult to distinguish from the surrounding soil or debris.

Check with your provider to determine if compost or mulch has been heat treated to at least 400C for at least three days. Become familiar with the look and castings of jumping worms. Soil with jumping worms looks like coffee grounds and is very loose. If you think you have jumping worms, do not donate plants and materials to a plant sale or to a neighbour.

They may also be introduced as bait worms. If bait worms are used, it is vital to follow all proper procedures, euthanize worms before disposal, and never dispose of unused dead or live worms into the environment.

- Thoroughly clean tools, shoes, and vehicles when moving from one site to another.
- Only purchase compost, mulch, or other organic matter that has been heated high enough and long enough.
- Remove adult jumping worms. Place in a plastic bag and leave in the sun at least 10 minutes. Dispose of the bag in the trash.
- Remove soil from all plants before transporting them.
- Wash roots by completely submerging plant roots in water and washing away remaining soil. Water is enough to remove soil and other materials from the roots.
- Buy bare-root plants when possible.
- Do not buy jumping worms for bait, vermicomposting, or gardens.

Plant sales are used by many horticultural groups as a source of income. If jumping worms are known to be in your area, sell only bare-root plants. Remove all soil from the plants and submerge the roots in water. This process also reduces the risk of transferring weeds and invasive insects and plants to someone's garden.

Most of our garden helpers—birds, snakes, frogs, and salamanders—enjoy snacking on insects, caterpillars and earth worms but will not eat jumping worms. They try them and spit them out. Moles, it appears will eat them.

Jumping worms have been spotted in Western Ontario, Toronto, and Hamilton. It may not be long until they reach Eastern Ontario. Please watch out for these pests that are so dangerous to our forests and help control the spread.