

## **Invasive Worms in Connecticut**

**By William Flahive**

### **Summary**

Worms are generally considered an overall benefit to the soil but they can be destructive. The US National Park Service and others, who are concerned about the health of our forests and woodlands, report that some species of worms, more particularly the recently introduced earthworm from Asia, the *Amyntas agrestis*, commonly called the Crazy Snakeworm or Jumperworm, are destroying the forest understory. This, in turn, can lead to the introduction of invasive plants and the slowing or failure of forest regeneration. While looking like common night crawlers, the Crazy Snakeworms are distinguished by their startling, rapid movement when disturbed. Recently, in Connecticut, these worms have moved into gardens consuming the top organic layer of the soil and mulch. They deplete the nutrients that beneficial organisms and worms, such as night crawlers, need to survive and keep the soil healthy. In one case, having apparently run out of suitable organic material in the garden, they moved into and destroyed a residual lawn. Research, including the use of a natural predator, has failed to find an organic control mechanism. A non-organic chemical, Sevin, apparently works but unfortunately it also kills beneficial non-target organisms in the soil, as well as the Crazy Snakeworms. Research focus and money are needed to find a solution to this serious problem.

In the interim, home gardeners might try to stop the Crazy Snakeworms from doing more damage to the garden by digging up the worm's casting piles and an additional inch or so of

soil. It is in these casting piles that the worms leave the capsules that contain its eggs. The castings and any worms that are caught could be put in a black plastic bag and placed in a sunny place to be killed by the sun's heat and then into the trash. Worms that are caught could be put in a pail of 20% vinegar and water to die.

### Details

There are no indigenous earthworms in Connecticut. They all became extinct during the last ice age. The worms that we see in yards and gardens such as the common night crawlers, *Lumbricus terrestris*; redworm, *Lumbricus rubellus*; red wiggler, *Eisenia foetida*; and the pink nose worms, *Apporectodea spp.*, were all imported from Europe and, as a rule, are regarded as positive indicators that the yard or garden is healthy. They generally contribute to an overall benefit to the lawn and garden.

However, these European worm species and the recently introduced earthworm from Asia, the *Amyntas agrestis*, aka the Crazy Snakeworm, are problematic for Eastern deciduous forests where they devour the top, organic soil layer and destroy the seed bank and germination medium for many understory plants. The *Amyntas* species lay down a thick layer of castings on top of soils. The full extent of the consequences of their activity is still unknown but what is known is that they do displace other soil dwelling organisms such as other worms, beetles, millipedes and other organisms. Additionally, they affect the presence of ground-nesting birds. Wisconsin has banned the introduction of *Amyntas* species which is sold in other states as fish bait and for use in composting.

Forest ecologists are concerned, but why should Connecticut home owners worry about the Crazy Snakeworm? The reason is that the worm was accidentally introduced to gardens by horticultural materials, such as compost, where they thrive, and then they get established causing harm to the environment. Property owners often dismissed these worms as beneficial, but they are not. Excessive worm activity can cause more rapid decline of mulch, as well as countering the effects of fertilization. Researchers at the University of Vermont found that the Crazy Snakeworm can increase the enzymes that break down the usually very resilient lignin in mulch, probably increasing the rate of decomposition of this important soil amendment. Most gardeners and horticulturists may not notice the change in the speed of depletion but in some extreme circumstances there has been considerable damage to a garden. A 2007 New York Times article, "The Dark Side of a Good Friend to the Soil", reported that Crazy Snakeworms and night crawlers had damaged a couple's prized Hostas. In one case, a four foot wide Hosta had been reduced in size to two feet and, when pulled out of the ground, nineteen worms fell out from the root system. The owners realized that "they had been helping the worms proliferate by carting in mulch for paths and top-dressing their plants with compost".

While the night crawler usually burrows deep in the soil taking leaf litter with them, the Asian Crazy Snakeworm prefers soil surface and duff layer *e.g.*, the mulch and compost layers. Night crawlers usually make large excavation mounds with plant debris pulled into their middens, where as Crazy Snakeworms make a layer of castings on the surface of the mulch. A night crawler it is thick-skinned and when it stretches becomes long. If you touch its nose, the tails

flattens out. Crazy Snakeworms are also long, but tend to be more slender. The Crazy Snakeworm will squirm violently when handled, sometimes actually leaping from one's hand. It has the ability to shed its tail, which continues to squirm, while the rest of the earthworm will try to escape. Crazy Snakeworms are also called "Jumperworms" because they reportedly can jump out of a fisherman's bait box and move quickly along the ground in a snake-like movement, making them difficult to catch. It is this startling fast movement that distinguishes the Crazy Snakeworm from other worms in the garden. The winter snows and cold of Connecticut usually kill adult Crazy Snakeworms, but the capsules that contain the worm eggs can survive and healthy populations can start up during the following spring.

### **The lawn is a different problem.**

On Friday, August 16, a couple came into the Master Gardener office in Bethel, Connecticut, a service of the University of Connecticut Extension Service, with a container of worms, some associated castings and what appeared to be ¼ inch diameter clumps of loose soil found in a mound with the worms. A Master Gardener on duty was able to tentatively identify the worms as *Amyntas* species thanks to the internet article, [Invasive Earthworms in Vermont](#) written by Dr. Josef Görres.

The Vermont article, US National Park Service studies, and other states' reports focused on the damage to the forest understories by the Crazy Snakeworms and the effort to find a solution to the problem. They did not report anything about these worms in gardens and lawns. The

worm specimens that the couple brought into the Master Gardener office, however, were not found in forest understory but, in their garden, -- and more importantly, in their lawn. The couple reported that their lawn had been virtually destroyed by these worms. It was covered with worm casting piles and the worms had taken all of the nutrition from the soil to the detriment of their lawn.

The couple reported having noted lots of worms in their garden in the past few years which seemed to be changing the structure of the soil, but they believed that worms were good for the soil and didn't think much more about it until this spring when their lawn was badly damaged by the worms.

The couple said that they had noticed some worm casting piles in their lawn last year but assumed that they were benign. There were a few more piles this last spring, but after the period of high humidity and rain which Connecticut experienced in June, the lawn became covered with the casting piles. Additionally, the author discovered these worms in mulch in his yard, in friends' yards and, in one case; they had destroyed the understory of a wooded area between two homes, indicating that the problem was more widespread. Of particular interest was that the worms found in the author's yard were on top of garden cloth in the overlying playground mulch which is chipped wood rather than the usual bark mulch. More recently, the worms were discovered in the author's front yard approximately 100 feet from the initially found worm pile.

How can *Amyntas* be managed? There is no industry standard called “worm-free”. Checking mulch for worms is one proactive integrated pest management approach. The earthworms are usually found at the interface between the mulch and the soil. Use a trowel to explore the edge of a mulch pile for worms. To try and save their lawn, the couple spread granular Sevin according to the manufacturer’s instructions. Within days, most of the worms were dead or dying. They gathered up the remaining worms, put them in a barrel, and covered them with Sevin to make sure none survived. There were still some cast piles that remained and they also treated those using Sevin. The couple is probably fighting a losing battle because behind their property is a town-owned hill that is covered with worm casting piles. Unfortunately, the non-organic Sevin also kills non-targeted organisms in the soil as well.

The author has been looking in the literature for a solution to this worm problem, preferably organic, but to no avail. Dr. Josef Görres, a professor of Soil Science at the University of Vermont, said that he had tried Neem and *Bacillus thuringiensis* (BT) but they did not work against this worm species.

The use of salamanders, a natural predator of earthworms, was examined by some studies. Adult salamanders that consume these Crazy Snakeworms were reportedly more successful at reproduction. But the juvenile salamanders faced two obstacles. The Crazy Snakeworm was too big for juvenile salamanders to eat and the juveniles were faced with the decline of the small arthropods that are a staple resource for salamanders. One study found that the salamanders faced a more general problem. The Asian earthworm invasions caused a

reduction in leaf litter on the forest floor and that the loss of forest leaf litter is commonly associated with declines in forest fauna, including amphibians. In the study, salamander abundance declined exponentially with decreasing leaf litter volume. The salamanders themselves are also an important prey species for snakes, small mammals, turkeys and a host of forest creatures. Another study observed that the worms had the ability to flip and secrete a distasteful substance in the face of danger, perhaps successfully defending against predators such as salamanders. The result of all

Researchers agree that the best hope is to contain the worms, which spread only five to 10 meters a year on their own. In the forests, that may mean new regulations governing off-road vehicles, bait disposal by anglers, or equipment hygiene and use in the logging industry. For the home owner, five to 10 meters may be most of their yard.

Discussions with professionals indicate that until it becomes an economic problem, that is, reducing the regeneration of trees in infested forests or affecting food or grain production, research dollars may not be made available to search for a solution.

### Go on the offensive!

This paper has been depressing. The victory of the Snakeworm at the expense of our gardens and lawns seems inevitable. There is no identified organic solution, even the natural predator of worms, the salamander, does not win in the end. The non-organic solution, Sevin, would be even worse for the garden.

It has been said that the best defense is a good offense. The Snakeworms might be discouraged from the garden and thus from moving to the lawn by looking for their casting layers and disturbing them. If disturbed worms just squirm away, then the layer is made by a nightcrawler or another beneficial worm. If they are the Crazy Snakeworm's, they will move away quickly with startling speed. The solution would then seem to be to clean up identified Snakeworm layers by shoveling up the castings and an inch or so below the surface where the cocoons that contain the snake's eggs may be located. The Snakeworms that try and escape seem to use a lot of energy in their first move and should be catchable. . It is in these casting piles that the worms leave the capsules that contain its eggs. The castings could be put in a black plastic bag and placed in a sunny place to be killed by the sun's heat and then into the trash. Worms that are caught could be put in a pail of 20% vinegar and water to die.

This is not the end of the war. It is just a first battle that requires continuous vigilance but it is a battle that should be fought.

### **The Author**

The author, William Flahive, resides in Prospect, Connecticut, and is an Intern in the Connecticut Master Gardener program.

## **Acknowledgements**

Special thanks must go out to Dr. Josef Görres, a professor at the University of Vermont, for his review and editing. Thanks are also extended to Jackie Algon, the Master Gardener coordinator in Bethel, CT, to Henry Bissonnette, a CT Master Gardener, and to Gale Ridge, Assistant Scientist at the Connecticut Agricultural Experiment Station, for their careful review and helpful suggestions.

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For more information on this worm problem see the following:

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