

Bloat Nematode on Garlic



Cornell University
College of Agriculture and Life Sciences
New York State Agricultural Experiment Station

Nematodes are microscopic, nonsegmented roundworms that cause disease in many plants. Bloat nematode (*Ditylenchus dipsaci*) was first reported in the United States in 1935 and affects many crops, including **garlic**. The first report of bloat nematode in NY was in 1929/30 on onion in Madison Co. An outbreak of this nematode on garlic in NY was discovered in 2010. Crop loss from the bloat nematode in NY was as high as 90% in areas of affected fields. A follow-up survey analyzing several hundred samples documented the high prevalence of bloat nematode on garlic with 28% of samples testing positive.

Symptoms

Foliar symptoms on severely infected garlic include:

- Stunting;
- Yellowing and collapse of leaves; and
- Premature defoliation (Fig. A);

Symptoms on the bulb begin as light discoloration and later become shrunken, soft, light, and their cloves are dark brown in color (Fig. B). Cracking is often visible around the basal plate at later stages of development (Fig. C).



Where does bloat nematode come from?

The primary source is *infested seed*. The nematode is able to survive and reproduce in seed during the season and in storage.

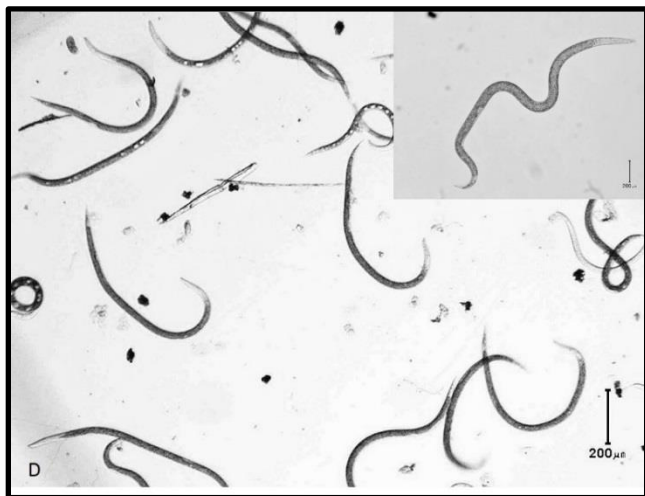
Other plants: Bloat nematode (Fig. D) occurs as many races. The race affecting garlic and onion also causes disease on leeks, chives, celery, lettuce, and flower bulbs. This race is also able to survive on hairy nightshade and Canadian thistle.

Soil: Bloat nematodes move from diseased plant tissue into the soil at later stages of bulb decay. Movement of infested soil on equipment or in conjunction with surface water can contribute to their distribution.

Prevention is better than cure!

Use **ONLY clean garlic seed**. Although hot water treatment of infested garlic seed either alone or in combination with various chemicals is available, this is often impractical and only provides incomplete control. **No treatment** should be considered as a substitute for the use of clean seed.

Select fields for planting that have been tested several times to be free of bloat nematode. Low populations of bloat nematode ($\leq 10/500$ cc soil) have been reported to later cause significant damage and crop loss.



**CLEAN SEED + CLEAN SOIL
= NEMATODE FREE AND
HIGH QUALITY GARLIC**

Management

Prior to planting, bloat nematode populations may be reduced by:

- *Fumigation* of sites with registered nematicides in conventional garlic production. No non-fumigant nematicides are currently registered in NY for use on garlic.
- Consider the planting of biofumigant cover crops (e.g. mustard or sorghum-sudangrass) and incorporation prior to planting.
- **Rotation** with non-host plant species (e.g. carrots, potatoes, corn, grain, etc). **Four years** between *Allium* species is recommended.
- Monitor plants regularly and remove any unthrifty plants to ensure diseased bulbs and crop debris are removed. Do not discard in an area that may distribute the nematode across your farm from surface water run-off.



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Or your local Cornell Cooperative Extension Agent
Photos courtesy of Professor George Abawi
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Testing for Bloat Nematode

Testing of garlic and soil samples for bloat nematode can be conducted at The New York State Agricultural Experiment Station, Geneva, NY. **Only samples from within NY State are accepted.** Keep samples at room temperature and send as soon as possible after collection.

Garlic: Select up to 10 bulbs (per sample) with potential damage caused by bloat nematode. Place in moist paper towel within a sealed, plastic bag.

Soil: Collect 15-20 sub-samples from the top 6 to 8" of the soil in an X or V pattern across the field or area to be planted with garlic. Mix the sub-samples and send ~ 1 quart of soil for testing.

Cost: \$40/sample (bulbs or soil).

Results: E-mailed or posted within 10 days.

Submission Form:

Collection Date: _____

Business Name: _____

Contact Person: _____

Address: _____

Phone: _____ Email: _____

Has bloat nematode been detected on the farm previously (yes/no)? _____

Description/Notes: _____

Note seed for sale (off farm): should be sent to the Plant Disease Diagnostic Clinic, Cornell University, Ithaca, NY. Details at: <http://plantclinic.cornell.edu/>



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