Stem & Bulb Nematode Confirmed in Garlic in NY

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In early June 2010 Cornell Vegetable Program Specialist Christy Hoepting discovered stem and bulb (bloat) nematode in two commercial garlic fields in Western NY. The nematode caused high levels of damage in one of the fields. The discovery of this disease in NY, the first since the 1930’s, when it came in on onion sets, has led to a statewide response by Cornell Cooperative Extension staff and the Garlic Seed Foundation. The first goal is to determine which areas of the state contain infected garlic. Symptoms of stem and bulb nematode include twisting, looping or swelling of leaves (leaves are infected), stunting, and yellowing. If you have seen unusually high levels of damage from Fusarium or other fungi, bacteria or insects, this may be a sign of nematode infection. Any NY grower that suspects problems should contact their local Extension support person, who can submit a sample for verification. As of late 2011 the garlic bloat nematode had been found on many farms across the state.

Symptoms of *Ditylenchus dipsaci*, a plant-parasitic nematode: According to Dr. Abawi, “Symptoms on cloves of infected plants initially appear as light brown discoloration but later the cloves becomes soft, mealy or spongy in texture and deformed. At later stages of infection, the cloves break away from the basal plate leaving cracks of various sizes and usually soft rots follow due to invasion by various secondary soil organisms. However, documenting the presence of the bloat nematode in infected plants/tissues is critical in confirming the disease diagnosis and recommending the proper management.” Additional symptoms noted by the Ontario Ministry of Agriculture, Food and Rural Affairs include underdevelopment of the bulb and the absence of roots on one side of the basal plate (Image 1) as well as soft rot (Image 2).

Symptoms of Fusarium Basal Rot (*Fusarium oxysporum* f. sp. *cepae*: It is possible to confuse Fusarium with nematode infection. Dr. Abawi notes of *Fusarium*: “At early stages of disease development, infected and healthy heads or cloves can not be distinguished from each other by external symptoms. However, cutting open an infected clove vertically will clearly show a brownish discoloration of the stem plate from the outermost layer and extending upward. At later stages of infection, the stem plate tissues become pithy in texture, but the cloves will only show a dry rot. A wet bulb/clove rot will develop starting with the basal plate tissues only when secondary organisms become involved. Under moist and favorable temperature, abundant growth of the pathogen covering the basal plate tissues become evident. Roots of infected plants are dark brown and at various stages of decay. Most severe and diagnostic symptoms are generally found on stored heads, but field symptoms are also detectable and especially in heavily infested fields. Above-ground symptoms on severely infected plants appear as stunting and yellowing of the leaf blades starting at the leaf tip and progressing downwards involving the entire blade. Later, such leaves may shrivel and decay.”

If you are unsure if you have Fusarium or nematodes, contact your local vegetable Extension specialist.

Image 1: Stunting and root loss on one side of the basal plate caused by stem and bulb nematode.
Source: www.omafra.gov.on.ca

Image 2: Basal plate soft rot due to nematode infection. Other fungi, bacteria, maggots, thrips larvae may also invade the bulb.
Source: www.omafra.gov.on.ca
Bloat Nematode Diagnostics Lab
SAMPLE SUBMISSION FORM

Location where the sample was taken
☐ Home Owner ☐ Commercial Growers ☐ Others
Collection Date ____________________________
Business Name ______________________________
Contact Person ______________________________
Address ____________________________________
County ________________________________
Phone ________________________________
Email ____________________________________

Referring Agent (i.e. CCE Educator)
Name ____________________________________
Email ____________________________________

Sampling Instructions
Samples can be collected anytime, but best close to harvest and before planting. Send 10 representative bulbs/variety/garlic sample, or one pint or more of a composite soil sample (> 10 subsamples)/field or bed. Pack garlic and soil sample separately and avoid exposure to sun and high temperature. Send early in the week by overnight delivery, if possible.

Describe the nature and extent of the problem

Production History
☐ Organic ☐ Conventional
Previous Crops 2011 ___________ 2010 ___________ 2009 ___________ 2008 ___________

Objective of Testing
☐ Sale for Seed ☐ Sale for Food ☐ Sale for Seed and Food
☐ Seed for Replanting ☐ Poor Growth/Quality ☐ Soil Infestation

Size of Planting
☐ < 1/4 Acre ☐ 1/4 – 1/2 Acre ☐ 1/2 – 1 Acre
☐ 1-2 Acres ☐ > 2 Acres ☐ Area Affected ____________________________

Fee: $20/sample (garlic or soil) for NY growers and industry reps; $40 for all others.
Make check payable to Cornell University. Write Garlic Project on the check’s memo line.

Mail sample and payment to: Cornell - NYSAES, Barton Lab, Room 11, 630 West North St, Geneva, NY 14456