Garlic Problems.....Again

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Last year at about this same time there were calls from growers about their garlic plantings turning yellow and wilting (fig. 1). When dug up the bulbs were often times blackened and rotting with some or much of the basal plate or roots missing (fig. 2). The calls are coming in again this year with the same complaint and unfortunately, the same problems—bulb mites and garlic bloat nematode.

Bulb mites are a problem of garlic and sometimes of onion that usually go unrecognized. These pests can reduce stands, decrease plant vigor, and increase post-harvest diseases by their feeding on the roots and the stem plate. Bulb mites have a very wide host range, but cause most of their damage to onions and garlic. These mite pests are usually not seen on the bulb and prefer crawling into crevices between the roots and stem plate. Early in the growing season, bulb mites can cause poor plant stands and stunted growth as they feed on roots. Infested plants easily can be pulled out of the soil because of the poor root growth (fig. 2).

The mite is bulb shaped with its legs moved forward and a bulbous rear end and many long fine hairs (fig. 3). The mouthparts and legs are purplish-brown while the main body is creamy white. These mites have been described as looking like tiny pearls with legs. The mites are extremely small (from 0.02 to 0.04 inches) and are very slow moving. They are usually found in clusters underneath scales and at the base of the roots.

The garlic bloat nematode *Ditylenchus dipsaci* can destroy a crop of garlic in one season. Symptoms of bloat nematode in garlic plants include: bloated, twisted, swollen leaves, distorted and cracked bulbs with dark rings (fig. 4). These nematodes also can move to the inflorescence and remain in seeds for long periods of time in some plant species, i.e., beans, clover, and alfalfa where they are major sources of nematode dispersal. The nematodes can be spread around fields by equipment or on clothing and shoes. Garlic bloat nematodes can overwinter in soil or crop debris.

It is not just the direct feeding of the nematodes and mites on garlic and onions that causes problems, their feeding also allows pathogens to enter through the wounds they create. These wounds are very good entry points for pathogens like *Fusarium* spp., *Sclerotium cepivorum* (causes the disease white rot), and various soft-rotting bacteria. The white rot fungus does best in cool temperatures, and symptoms include white fungal growth on the stem or bulb with small, dark structures called sclerotia in the decayed tissue. Later in the season, higher than normal amounts of soft rot and *Fusarium* dry rot may be seen because of the wounds caused by these mites (as we saw in a couple of the garlic fields).

There is no program that certifies garlic as nematode-free. Commercial suppliers of garlic bulbs are aware of this important problem, and may send a portion of their crop to a laboratory for nematode testing, but this does not certify a crop as nematode-free. Because the nematode and mite can survive for long periods on infected plant material, to prevent build-up of the nematode
or mite populations in a field, you MUST rotate away from any *Allium* crops (garlic, onions, and leeks) and control nightshades for at least 4 years. DO NOT keep any bulbs or seed from an affected field no matter how clean it looks. You should start from fresh seed or bulbs. Rotation to areas of the farm that have not had garlic or onion plantings for many years with new garlic or onion seed is the best method of control, however, growers can use soil fumigants to reduce or eliminate the nematodes from infested areas of the field. Growers also can use bio-fumigant cover crops that can be planted after harvesting garlic. Mustard, sorghum-sudangrass have been shown to reduce nematode populations due to the bio-fumigant constituents they produce. Be sure to clean equipment and storage areas with meticulous sanitation techniques.

Fig. 1 Bulb mite/bloat nematode infested garlic field
Fig. 2 & 3. Infested garlic bulbs, misshapen or rotting bulbs, sometimes roots are intact other times there are no roots

Fig. 3 Bulb mite
Fig. 4 Severe garlic bloat nematode damage to the two bulbs on the right vs. non-infested bulbs on the left