Preliminary results from garlic eriophyid mite control study show promise

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During the last 5 years we have seen increasing incidence of eriophyid mites in garlic. These microscopic mites can cause stunted, twisted growth early in the season and may contribute to garlic rotting in the field over winter. However, the numbers on garlic that grows well tend to be low, and growth outpaces the damage for most of the season. The low numbers that persist on garlic until harvest may explode during storage, leading to significant losses of bulbs which may shrivel and turn yellowish (Image 1). Upon closer inspection of the wrapper leaves and clove surface, one can sometimes see hundreds of mites feeding on the garlic (Image 2).

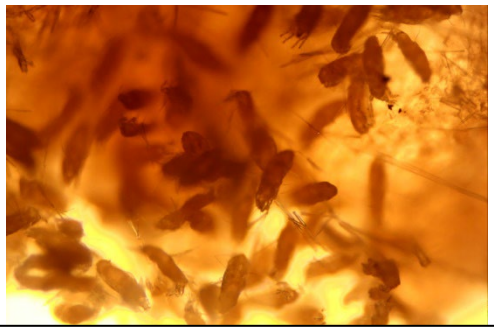

Image 1 (left, by Frank Hay): garlic is yellowish, shrunken, and has a powdery or sparkly surface. Image 2 (right, by Crystal Stewart Courtens): Eriophyid mites on garlic skin at 40x

Two primary research-based strategies have emerged to combat mites in storage: high heat drying and deployment of predatory mites in storage. Heating garlic to between 113° and 119° F briefly during the drying process kills mite eggs within an hour (Courtin et al, 2000). This process should be done with great attention to prevent bulbs reaching an internal temperature of 120°, at which point waxy breakdown occurs. In preliminary work with Chris Callahan from UVM, we realized that the surface or garlic bulbs remains cooler than the air temperature until the garlic is nearly dry due to evaporative cooling. Because of this factor, bringing garlic to a high temperature as it completes drying is the best option to actually reach the correct temperature.

Mites are able to move into the space between cloves in addition to being on the outer-facing surface, which makes the heat exposure method useful but not foolproof. In order to control mites that survive in these protected spaces and emerge during storage, we added the extra control measure of *Stratiolaelaps scimitus* predatory mites during storage based on work completed in Holland using the same protocol on tulip bulbs. Our initial results vary from farm to farm, with incomplete control in some applications, but on average applications reduce eriophyid mite severity. After this initial work we are recommending *S. scimitus* applications as one tool in the toolbox, with the understanding that biocontrols can be positively and negatively

affected by a variety of factors and that control may be variable because of this. If you are interested in trying this approach, *S. scimitus* mites can be purchased from Applied Bio-nomics through these distributors: https://www.appliedbio-nomics.com/distributors/

There is still work to be done before we really have Eriophyid mites under control in garlic, but careful monitoring and a multi-pronged control approach is our best recommendation at this point. Make sure you examine garlic regularly in storage, and check varieties with looser (easier to peel) wrapper leaves first, as they are preferred hosts.

Sources:

Courtin, 0., Fauvel, G. and Leclant, F. Temperature and relative humidity effects on egg and nymphal development of *Aceria tulipae* on garlic leaves. Ann. Of Appl. Biology, 137: 207-211. 2000