Pest Control of Winter High Tunnel Greens
Judson Reid and Kathryn Klotzbach
<jer11@cornell.edu>
Cornell Vegetable Program

The Cornell Vegetable Program recently completed its first full year of a project looking at the unique winter pest infestations of high tunnel winter crops. These include aphids, cabbage worms, whiteflies, thips and slugs. Many of these pests persist inside the tunnels despite sub-freezing air temperatures, making greens crop unmarketable at a time of year when supply is scarce.

An integrated pest management system for organic growers is being developed by the project team, including collaborating farmers. The steps in this system include examining the contribution of different summer crops to winter pest loads; the potential for introduced biological controls; and applications biorational pesticides.

As most high tunnel growers use their winter growing facilities also in the warm season, it is prior to the winter crop that organic pest control begins, as warm season crops can increase winter pest loads. In the project team's experience cucumbers can lead to high populations of Thrips (Thrips spp.) and Two Spotted Spider Mites (*Tetranychus urticae*). At one cooperating farm Whiteflies (*Bemisia and* Trialeurodes spp**.**) thrived on summer tomatoes and later contaminated a winter lettuce crop.

The reason scouting the summer crop is so important for organic pest control in winter is that we can still employ biological controls such as beneficial predators and parasitoids during the warm season. As temperatures and day-length decrease in the fall, beneficials are no longer a viable option as they cannot survive winter high tunnel climatic conditions.

Thus the next step in pest management of winter greens is selection of resistant or less attractive varieties. Farmer input is being gathered on which greens varieties are most attractive to pests. One participating farmer reports decreasing the percentage of Asian greens and Brassicas lowered aphid infestations.

If after these steps we still have pests contaminating our greens, we may consider appropriate sprays. In our work we have documented success with winter time applications of Mycotrol and Molt-X (see chart 1); however growers are cautioned that many pesticides may not be as efficacious in the winter as they would be in the summer. It is also advised to wait until tunnel temperatures are above freezing when applying liquid to foliage.

In this the first full year of our research and education project, 5 farms cooperated with trials and were monitored bi-weekly. These farmers also provided percent marketable (clean) crop, and yield in pounds for 2009/10 and 2010/11 growing seasons.

They reported an average financial increase of $573.69 from previous year's gross after program exposure. These farmers implemented natural pest management techniques promoted by the project including:

- Scouting
- Crop rotation
- Variety selection
- Organic pesticides:
    - Mycotrol (*Beauveria bassiana*)-to control Aphids
    - Molt-X (azadiractin)-to control Aphids (Myzus and Macrosiphum spp.), Thrips and Whiteflties
    - Dipel (Bt)-to control Imported Cabbage Worms (*Plutella xylostella)*
    - Sluggo (Iron Phosphate)-to control Slugs (*Arion spp.)*

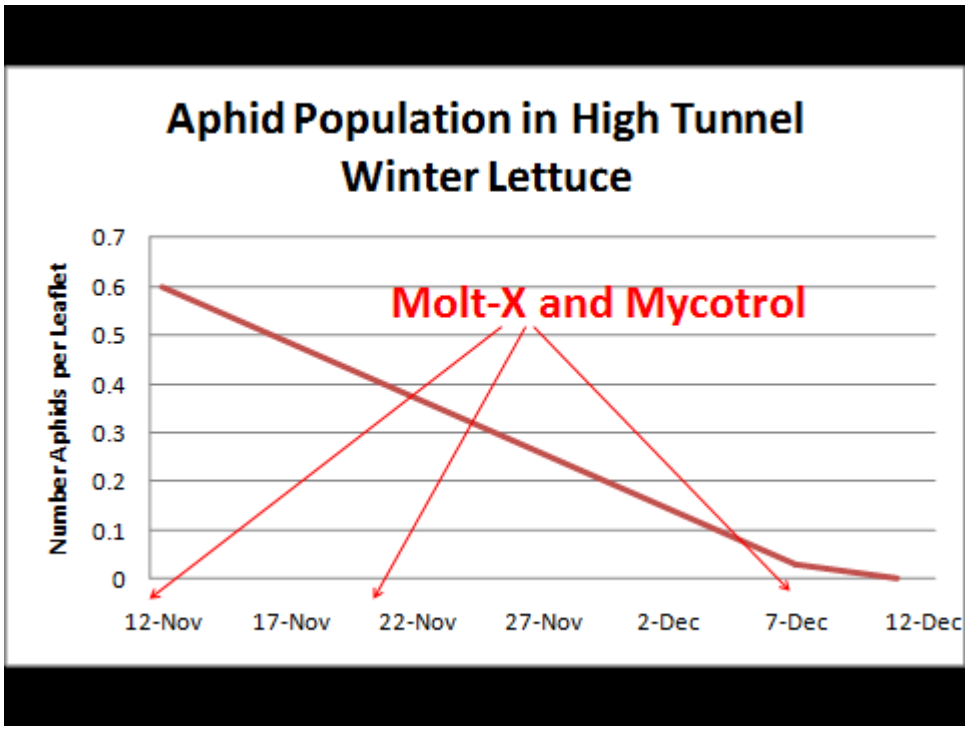

Chart 1. Aphid populations were controlled with late Fall sprays.

The Cornell Vegetable Program received funding from Northeast Sustainable Agriculture Research and Education (NESARE) to conduct this work.