**Aphid Control in Greenhouses, Micro Greens and High Tunnels**

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Aphid populations can virtually explode in greenhouses , in micro greens, hydroponic leafy lettuce and high tunnel production systems. Biological control is the best long term control methods but often a grower finds that the aphid populations has exploded and they must bring it under immediate control. You will want to select materials that have minimal impact of biological releases you may wish to emply after using as bio-pesticide.

The following are some suggestions.

Azadirachtin would be a good option as a preventative to supplement other tactics as long as you understand the mode of action.  It acts primarily as an insect growth regulator, killing immature insects when they molt to the next developmental stage. That means it is slower to kill than some other insecticides, which can be a challenge with a rapidly reproducing insect such as aphids.

Growers may have to mix with another insecticide like Entrust (organic spinosad) to kill the adults if there is already an established infestation, then go on a preventative program with azadirachtin.

Since azadirachtin is taken up systemically in the plant through translaminar translocation, after 2 or 3 weekly applications it becomes difficult for the nymphs to build back up.  Azadirachtin is relatively soft on beneficials, with a low hazard rating on both the BioBest and Koppert side effects lists.  BioWorks sells a 3% a.i. formulation as Molt-X.  Certis Company of Columbia, Maryland make a more concentrated formulation (4.5% a.i.) that is sold as Azatin by OHP and as Neemix by ag retailers (Nutrien, Helena, etc.) or online sources such as 7 Springs Farms.  A premix of azadirachtin and natural pyrethrins is also available (as Azera from MGK) that provides both knockdown and IGR effects.  All of these azadirachtin products are approved by OMRI for use in organic production,  but the pyrethrins in Azera may have a detrimental impact on the beneficials.

Another bio-pesticide that can be use on aphids is *Beauveria bassiana,* which is sold under several brand names. Which one you choose depends if you are an organic grower or not.

BotaniGard is an entomopathgenic fungus (insect killing fungus) that can be used on aphid in non-organic operations. BotaniGard is not approved for use on organic crops.  Mycotrol WPO (wettable powder) and Mycotrol ESO (emulsifiable suspension) are approved by the WA State Dept. of Ag for organic use, although OMRI has not listed them.  Both products are available from BioWorks.

All of these products contain the same active ingredient (viable spores of the entomopathgenic fungus *Beauveria bassiana*GHA strain).  In terms of spore count, Mycotrol WPO is the same as BotaniGard 22WP and Mycotrol ESO is the same as BotaniGard ES.  However, the co-formulants in the Mycotrol formulations are organically acceptable.