

Pest Management of Hemp in Enclosed Production

Rice Root Aphid

(*Rhopalosiphum abdominalis*)

Damage and Diagnosis. Rice root aphids are dark olive-green insects with a generally round body form. Wingless stages would be observed belowground, feeding on roots. Winged stages are also produced which emerge from soil to fly to new plants; these are most often observed when they have been trapped and killed by the hairs on the upper surfaces of leaves.

Rice root aphids feed by sucking fluids from the phloem of the plant. This normally will produce little injury and rice root aphid is considered a minor pest on other crops with which it is associated. If they occur in very high populations there is potential to reduce growth due to their removal of plant nutrients. It is possible that they may indirectly contribute to development of root rotting pathogens by stressing the plant and producing small wounds.

Biology Notes. Rice root aphid has a wide host range, but is most often associated with the roots of various grasses, including wheat and barley. Infestation of *Cannabis* plants can occur if plants are taken outdoors and exposed to colonizing by winged forms of the aphid. Aphids may also enter vents. Once established in a growing area rice root aphid can continue to reproduce and spread as long as live host plants are present. As with other pests of the crop, infestations can also originate from introduction of infested plants and this is the likely route through which most indoor facilities become infested with this insect.

Reproduction by rice root aphids is entirely asexual; no males are produced and females give live birth to genetically identical daughter aphids. They develop rapidly and will mature in about 9-10 days. The adults can live for about a month during which time they can produce several new daughters each day. At 73⁰F, an optimal temperature, rice root aphid populations can double every 1.6 days. Under warm indoor conditions, rice root aphid will reproduce year-round as long as host plants are available.

Adults can develop into either winged or wingless forms. Wingless forms will predominate and these are associated with the plant roots. The periodic production of winged forms, which emerge to the surface through soil cracks, allow the aphids to spread to new plants.

Management of Rice Root Aphid

Biological Controls. Although there are a great many natural enemies of aphids, most are adapted to feed on aphids colonizing above-ground parts of the plant (e.g., green lacewings, lady beetles, most parasitic wasps, aphid predator midge). Since rice root aphid develops on roots, soil dwelling generalist predators, such as *Stratiolaelaps scimitus* (formerly *Hypoaspis miles*) are likely to be most effective for suppressing this insect in soil. However, no commercially available predators are likely to be adapted to the root conditions associated with hydroponic production.

The insect parasitic fungus *Isaria fumosorosea* (Preferal, PFR-97) may have ability to control soil dwelling aphids. Optimal conditions for infection of the host insects is 80% relative humidity or higher for 8-10 hours, which can be achieved in soil applications. Label directions allow use as a drench, surface spray followed by irrigation, as a soil injection, or in chemigation. **Important note:** The March 30, 2016 regulations of the Colorado Department of Agriculture deleted this product for use in Colorado since it lacks registration in tobacco. It is still allowable in some other states, but presently *formulations of Isaria fumosorosea are not allowed to be used in Cannabis production in the state of Colorado.*

Insecticides. Azadirachtin soil drenches, as applied for control of fungus gnat larvae (following) may help suppress aphids.

Contact foliar sprays (e.g., pyrethrins, soaps) are unlikely to have any effect except against exposed aboveground stages, such as the winged forms. Since these products have very short persistence their application can be expected to provide very minimal control, at best.

Eradication of Rice Root Aphid. Rice root aphid can be eradicated by establishing a brief host-free period in the planting area. The aphids can live only a few days in the absence of living host plants and indoors they do not produce a persistent egg stage. A one week period should be sufficient to allow all the aphids to die out after plants are removed.