Biological Control

Field Evaluation of Commercial Formulations of the Codling Moth Granulovirus

L.A. Lacey¹, S.P. Arthurs¹, H. Headrick¹, R. Fritts, Jr.² and D. Thomson³

¹USDA-ARS, Yakima Agricultural Research Laboratory, Wapato, WA
²Certis USA, Clovis, CA
³Sumitomo USA, Seattle, WA

Keywords: Cydia pomonella, codling moth, granulovirus

Abstract: Among the biological control options available for codling moth, the granulovirus of C. pomonella (CpGV) offers potential for effective and selective control. In 2003 we assessed the persistence and efficacy of three CpGV products—Cyd-X (Certis), Virosoft (Biotopp), Carpovirusine (Sumitomo)—and monitored the season-long performance of Cyd-X used by several commercial organic growers. For the persistence study the products were applied according to label rates (3 oz/acre for Cyd-X and Virosoft and 13.7 oz/acre for Carpovirusine). All three products were also compared at 6 oz/acre. Fruits were exposed to neonate larvae using a standardized laboratory bioassay immediately after spraying and at 1-, 3-, 7-, 10- and 14-day intervals. Ten days after exposure, apples were destructively sampled to quantify fruit damage and larval mortality. Residual activity of all products remained highly effective (>80% larval mortality relative to controls) for 24 hours following application and moderately effective (>70%) after 72 hours. Significant activity in all treatments remained after 14 days, suggesting prolonged survival of the virus in UV-protected locations, such as the calyx of fruit. Fruit damage was also reduced; while overall >97% control larvae formed deep entries, <35% of CpGV-killed larvae stings were >3mm. The results of grower applications of virus provide strong evidence for the effectiveness of well-timed CpGV applications against codling moth outbreaks. In all cases where 1st generation larvae were targeted, fruit damage was reduced or eliminated in the 2nd generation.