Efficacy of Phosphine at Low Temperature for Insects of Quarantine Significance

Scott Myers and Jami Nydam
USDA, APHIS, PPQ, CPHST
1398 West Truck Rd
Buzzards Bay, MA 02543

Recent advances in the technology to safely dispense pure cylinderized phosphine without the phytotoxic impurities associated with metallic phosphine pellets has facilitated a new interest in its use for quarantine treatments for fresh produce. We conducted several experiments to evaluate the efficacy of phosphine fumigation at low temperature to control eggs of *Copitarsia decolora* and gypsy moth, *Copitarsia decolora*. Fumigations were conducted in under refrigeration at 6 ºC in 10 L glass jars using a phosphine and air mixture. Treatments ranged from 1500-3000 ppm, for durations from 24 to 120 hours. Phosphine levels were monitored during fumigations using gas chromatography. Insect eggs were held at 23 ºC for 7-10 d following fumigation and mortality data was collected by evaluating eggs for hatch. Complete control of *C. decolora* was achieved in fumigation treatments of 120 hours with 2500 ppm phosphine. Our results suggest that lengthy fumigation schedules are required to achieve quarantine level control for difficult to kill insect stages at low temperatures.