

Pome Fruits—Biology

Effects of Temperature Extremes on Codling Moth Mortality: Potential Alternatives for Quarantine Treatment

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Codling moth larvae were subjected to initial heat shock treatments followed by long-term cold storage and scored for adult emergence. Fifth instar codling moth larvae were heat shocked for 30 minutes at either 43, 44, or 45°C. Control larvae were not subjected to a heat shock. Following the heat shock treatment, individual larvae were placed in cups containing artificial diet with a cardboard flute and stored at +5°C for up to 28 days. Internal control groups (AMB) were not subjected to cold storage and were placed directly into the rearing room. Following cold storage, treatment groups were placed into rearing rooms which were held at 23°C, 18:6 (L:D), 60% RH. Treatment groups were scored weekly for mortality and adult emergence. The graph shows the mortality of codling moth larvae from heat shock alone (indicated by AMB) and the mortality from heat shock combined with varying durations of cold storage. The legend denotes the heat shock temperature and control groups. Mortality was higher with increasing duration of cold storage and increasing temperature of heat shock. One break in the trend was the high mortality in the 44°C heat shock/7 day cold store group. It is not known why this result was achieved in two out of the three replications of this experimental procedure. However, it is important to note that the level of mortality was significantly higher in the combined treatment groups than in either the heat shock or cold storage treatments alone.

