

**PROJECT NO:** ARS

**TITLE:** Assessing Codling Moth Overwintering Mortality

**YEAR INITIATED:** 1999-2000

**PERSONNEL:** Tom Unruh, Research Entomologist, USDA-ARS Yakima  
John Dunley, Entomologist, WSU-TFREC, Wenatchee

**Objectives:**

1. Describe the distribution of cocooning sites of codling moth through a series of trapping and banding experiments in orchards differing in tree architecture.
2. Measure the proportion of larvae entering diapause through summer beginning with first generation and describe the distribution of subadult stages through spring.
3. Develop mark recapture methods to provide whole-orchard assessments of population size and test it as a means to measure the impact of passive or active control practices against the cocoon stage.
4. Characterize effect of refugia on predation and parasitism using cocooning substrates that vary in the protection they offer and where they occur in the tree or ground cover.

**Significant Findings**

**(An expanded report will be provided at the end of November)**

- 1) Codling moth move long distances to secure cocooning sites and significant number pupate on habitats in the canopy and the ground when they are available.
- 2) Mark recapture experiments to estimate overwintering population size failed in both 1999 and 2000 and this study is abandoned
- 3) Two cool springs have prevented studies of spring diapause and this objective is abandoned
- 4) Mortality in the cocoon stage is significant and the following patterns were observed
  - a. Predation and parasitism are greater on natural versus cardboard or pine substrates
  - b. Predation is greater on the ground than in the canopy which is greater than on the trunk
  - c. Parasitism is greater on the trunk than in the canopy than on the ground
  - d. Parasitism and predation are greater at insecticide-free or organic sites