

Pome Fruits—Biology

Codling Moth on Pear

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The induction of diapause in CM was studied in Courtland, CA. Fifty Bartlett pears were infested weekly from June 30 through August 25, 1992, and from June 2 through August 11, 1993, by placing 2 recently hatched CM larvae on each fruit. A small plastic cup was placed over the larvae and sealed to the fruit to prevent predation or loss of the young larvae. The fruit was removed from the trees 2 weeks after infestation and placed individually in a large plastic container. The plastic container had a layer of corrugated cardboard above and below the infested fruit to serve as a site for pupation or diapause. The containers were inspected weekly for 6 weeks to determine if a larva was present. If a larva pupated during the 6-week period, then the larva was considered to be non-diapausing. If the larva did not pupate during the 6-week period, then the larva was considered to be diapausing.

In 1992, approximately 30% of the larvae from fruit infested on June 30 entered diapause. By July 21, 100% of the larvae entered diapause (Fig. 1). In 1993, between 12.5% to 16.7% of the CM larvae from fruit infested on June 2 through June 16 entered diapause. On June 23, the percent larvae entering diapause increased to 20%. By July 21, 100% of the larvae entered diapause. These data would indicate that a low percent (ca. 1.5%) of larvae that infest fruit in early June will enter diapause and all larvae will enter diapause from fruit infested after July 21. Diapause induction has often been based on the date of larval emergence from the fruit instead of date of larval infestation of the fruit. We then reanalyzed our data based on the date when the larvae emerged from the fruit. In 1992, 28% of the CM larvae that emerged from fruit on July 28 entered diapause. By August 18, 100% of the larvae entered diapause. In 1993, between 0% to 14.3% of the CM larvae that emerged from June 30 through July 21 entered diapause (Fig. 2). The percent larvae entering diapause increased to 30% on July 28. By August 18, 96.3% of the larvae entered diapause. These results indicate that some CM larvae that completed their development in early July will enter diapause and that all larvae that complete their development by mid-August or after will enter diapause.

In 1992, a total of 41 larvae (diapausing and non-diapausing combined) completed their development per 50 fruit when infested on June 30 (Fig. 3). The number of larvae gradually declined to 7 larvae for fruit infested on August 25. In 1993, the total number of larvae completing their development increased from 6 larvae from fruit infested on June 2 to 40 larvae from fruit infested on July 7. The number of larvae then gradually declined to 7 larvae for fruit infested on August 11. These results indicate that CM larvae have a difficult time infesting immature pears in early June. As the pears mature through June and early July, CM larvae increase their ability to successfully infest and complete development. After mid-July, which is about the time of first harvest, the CM larvae can infest the fruit but the fruit is rotting faster than CM larvae can complete their development. If the maturity of pears remaining on the tree after

harvest can be increased by the use of a plant growth regulator such as ethephon, then the number of diapausing CM could be reduced without manual fruit stripping.

Fig. 1 Codling Moth Diapause Induction at Date of Larval Infestation in Courtland, CA

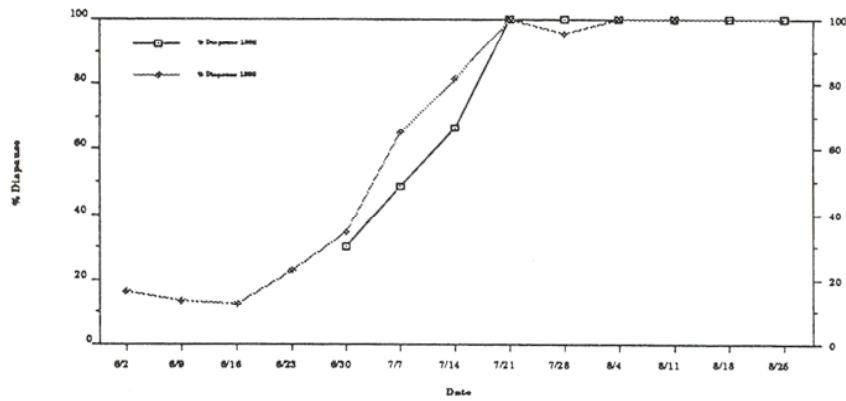


Fig. 2 Codling Moth Diapause Induction at Date of Larval Emergence in Courtland, CA

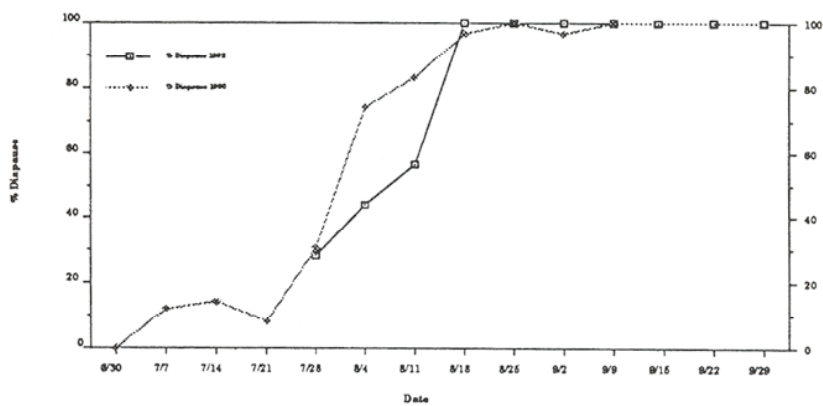


Fig. 3 Total Number of Diapausing and Non-diapausing Larvae per 50 Infested Fruit in Courtland, CA

