

Walnut Growers Have Sprayed Insecticides for 80 Years to Prevent Major Losses

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The codling moth has been known to attack walnuts in California since 1909 [1]. At that time, less than 1% of the crop was affected. An increase followed, with yearly fluctuations, and by 1918 the infestation had become serious – as high as 50% in some orchards [1]. At the insistence of the California Walnut Growers Association, a special appropriation was made by the legislature. The Citrus Experiment Station undertook studies aiming for control of the pest [1].

Each overwintered female deposits about 30 eggs singly on leaves near nuts. Later generations of females lay an average of 60 eggs on leaves or nuts. Young larvae penetrate directly through the husk and shell into the nutlets. The larvae remain in the nuts about 35 days, on average [1]. The larvae leave the nut after completing their development. The damage caused by the codling moth is different with each generation [2]. First generation larvae reduce yield directly by causing nutlets to drop from the tree. Nuts attacked by later first generation, second, and third generation larvae remain on the tree but are unmarketable due to the feeding damage present in the kernel [2]. Even though only a portion of the kernel may be consumed, the remainder is practically worthless.

Early research determined that there was only one thoroughly satisfactory method for controlling the codling moth: to coat the nuts with an insecticide to destroy larvae before they enter the husks [1]. By 1926, spraying was the commercial practice employed in all of the codling moth infested groves [1]. Insecticide tests have shown that untreated walnuts incur about 15-18% codling moth damage at harvest while insecticide-treated walnuts incur less than 1% damage [3],[4].

Although over 250 biological control organisms have been shown to attack codling moth, none are capable of keeping populations below that which causes economic damage [5]. A classical biological control program for codling moth was initiated in California walnut orchards in 1992 [6]. Following an initial survey for parasitoids of codling moth in Central Asia, three species were selected for importation and release in California. The introduced parasitoids were released in 72 walnut orchards. The most successful parasitoid was *M. ridibundus*, a cocoon parasitoid, which parasitized only 9% of the cocoons in walnut orchards [6].

References

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Codling moth



Codling moth damage



Spraying walnut trees