Monitoring navel orangeworm (*Amyelois transitella*) in California almond, pistachio, and walnut orchards

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INTRODUCTION

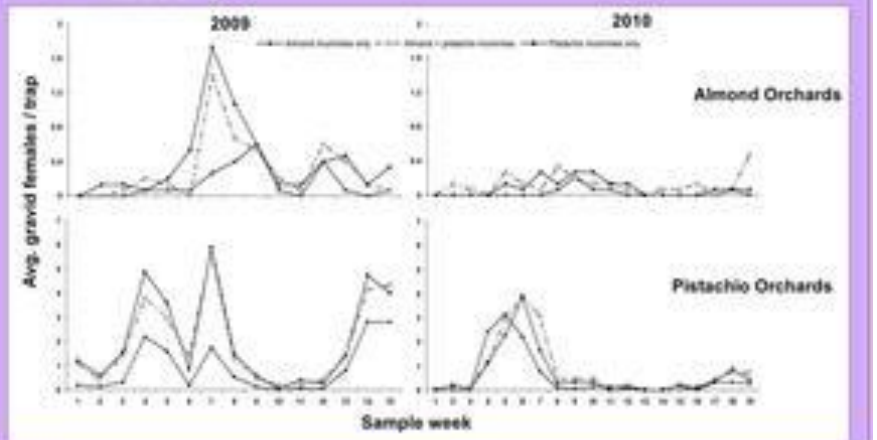
Almond, pistachio, and walnut production in California was valued at approximately $3.6 billion USD on over a million combined acres in 2009. Direct and indirect costs associated with NOW and its management are likely to exceed 2% annually and in severe years may be as high as 5%. Seasonal NOW activity normally is monitored by the use of ovipositional egg taps, but this trapping system has severe limitations from competition and the amount and type of information it provides. Recent studies suggest that NOW has a preference for pistachio as compared to almonds. This study determines if traps baited with almonds caught more adult moths than traps baited with pistachios in almond versus pistachio orchards.

METHODS

6 Field Sites – 3 pistachio ranches and 3 almond ranches
3 Treatments – traps baited with equal volumes of ground pistachio mummies only, ground almond mummies only, or half pistachio plus half almond (by volume).
Replication – 5 sites at each ranch for a total of 90 traps for two years.
Implementation – Deployed on last week of March and removed 16 and 20 weeks later in 2009 and 2010 respectively.
Sampling – Weekly for 15 and 19 observations per trap in 2009 and 2010 respectively, noting total number of female moths caught each week.
Statistical analyses – SAS GLM with Tukeys test for multiple comparisons when null rejected

RESULTS

Pistachio Orchards	2009	2010	Row Total
Almond mummies only	294	146	330
Almond + Pistachio mummies	418	224	642
Pistachio mummies only	472	179	651
Total	1114	549	1663
Almond Orchards			
Almond mummies only	31	8	39
Almond + Pistachio mummies	67	35	102
Pistachio mummies only	91	23	114
Total	189	66	255
Combined			
Almond mummies only	235	154	389
Almond + Pistachio mummies	565	259	744
Pistachio mummies only	563	202	765
Grand Total	1365	615	1898



CONCLUSIONS

Results from this study indicate that standard sticky bottom wing traps baited with either ground almond mummies or pistachio mummies can be used to monitor gravid NOW females in both California almond and pistachio orchards; traps also were used to monitor flight activity in walnut orchards in 2010, data not shown. Traps baited with pistachios caught 2.9 times the number of gravid females than traps baited with almond mummies in almond orchards and 1.9 more gravid moths in pistachio orchards. This indicates that there may not be a preference for host material from which they were reared as larvae, but this was not directly measured in this study. Since the number of moths caught in the combined bait trap was not of the linear addition fashion (i.e. half the number caught from pistachio + half the amount caught in the almond), but rather more similarly reflected the numbers caught in the traps baited with pistachio mummies only indicates that pistachio may produce a greater odor plume, which may be responsible for the greater trap captures in traps that included pistachio mummies. Of the 1918 total gravid moths caught, 87% were caught in pistachio orchards which is a result of farmer sanitation and the inherent difference in NOW carrying capacity between pistachio orchard and almond orchards. Another benefit of this new trap system is the time it takes to scrape a few gravid females vs. hundreds of eggs from the industry standard egg trap monitoring system.

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