



SURVEY OF NAVEL ORANGEWORM STRATEGIES

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Objectives

- 1** Determine the adoption rate of NOW monitoring and management tools across the three nut crop industries.
- 2** Determine barriers to implementing the four NOW control methods: sanitation, pesticide sprays, timely harvests, and mating disruption.

Background

Navel orangeworm (NOW) (*Amyelois transitella*) is the most significant insect pest of almonds and pistachios and can be a pest of walnuts. There are multiple research-validated tools for managing NOW; however, anecdotal reports and observations suggest that adoption of these practices has been unequal. In this project we sought to verify this evidence through a grower survey that was administered at seven UC Cooperative Extension (UCCE) meetings for almond, pistachio, and walnut industry professionals.

Results

PCAs (Pest Control Advisers) were more likely to report using monitoring and some control methods than owners or ranch managers. Those who manage fewer acres were less likely to utilize monitoring and control methods. Orchard access was the most cited barrier to sanitation, followed by cost and equipment/labor access. Equipment/labor availability and late-maturing varieties were the most commonly cited barriers to timely harvests. High costs, low cost effectiveness, unclear efficacy, and small acreage were all barriers to adopting mating disruption. Fewer respondents selected barriers to using pesticides, but of the barriers we asked about, costs and regulatory restrictions were the most selected barriers to using pesticides.

In general, as consistent with their role as hired pest management experts, a higher proportion of PCAs reported using monitoring and management tools than owners and managers. PCAs also tended to select the same barriers to adopting sanitation, mating disruption, timely harvests, and pesticide use as owners and managers, demonstrating that they have a keen understanding of the struggles their clients face. We also found that adoption of monitoring and management tools generally decreased as the number of managed orchards decreased from 2000+ to <50. This could be due to a PCA skew (a large proportion of PCAs also managed more than 2000 acres). Unfortunately, due to the small survey response, we could not examine demographic groups as interactions; thus some effects like PCAs tending to manage large acreages could not be separated.

Discussion

It is unsurprising that PCAs are more likely to use monitoring tools at higher rates than owners and ranch managers. Many owners and managers outsource pest management monitoring to PCAs. The lower adoption of monitoring and management practices among those with smaller acreages is an important finding. There could be several reasons for this: those managing fewer acres could have less available capital, which requires them to cut costs in areas they deem acceptable. Alternatively, it could be that those who manage smaller acreages are in the industry part-time and do not rely as heavily on income from farming or farm-support activities, and do not have the time or see the importance of intensive NOW management. It could also be that they are not as knowledgeable about NOW management as those with larger acreages, due to farming being a second occupation. Regardless, small farmers (those who farm 49 or fewer acres) are a significant proportion of California farms; 64% of farmers manage fewer than 49 acres, farming 44% of arable land in the state (2017 Agricultural Census for California). If these proportions are similar in the nut crop industry, this is a significantly large group of people, and more time needs to be spent determining their specific barriers, whether it is lack of NOW management education, insufficient incentive to control NOW, or inability to access effective control measures.

Industry Role?	# Acres Managed	Time Spent Managing NOW?	Crops Managed*
Orchard Owner (50%)	< 50 (20%)	1 to 5 years (28%)	Almonds (75%)
Ranch Manager (20%)	51 – 500 (33%)	6 to 15 years (32%)	Pistachios (27%)
PCA (30%)	501 – 2000 (18%)	16+ (40%)	Walnuts (61%)
	2000+ (29%)		

TABLE 1. Asterisks denote “select all that apply” questions. Numbers in parentheses indicate the percent of respondents who selected a response.

Response Options	Do You Evaluate Mummy Nuts?	Do You Use Egg Traps?	Do You Use Pheromone Traps?	Do You Use Peterson Traps?
Yes, multiple/yr	47%	N/A	N/A	N/A
Yes, once/year	27%	57%	64%	35%
Yes, some years	6%	6%	5%	7%
No	20%	37%	31%	58%
Response Options	Do You Use Biofix and Degree Days?	Do You Use Mating Disruption?	Do You Sanitize?	Do You Use Pesticides?
Yes, once/year	68%	27%	78%	79%
Yes, some years	5%	11%	13%	12%
No	27%	62%	9%	9%

TABLE 2. Responses to monitoring and management questions, averaged across all included respondents.

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