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Visual ID guide from UC aids in managing new almond pest

Nut orchard hygiene is key for controlling carpophilus beetle, say UC Cooperative Extension and UC Integrated Pest Management experts.

by Michael Hsu

Since the first reports of a new almond pest — the carpophilus beetle (*Carpophilus truncatus*) — came in during fall 2023, it has become clear that the beetle is widely dispersed across the San Joaquin Valley.

“My lab has identified infestations from every county in the San Joaquin Valley; we have found infestations in both almonds and pistachios, and we will likely find infestations in walnuts this fall,” said Houston Wilson, a University of California Cooperative Extension (UCCE) entomology specialist at UC Riverside. The California Department of Food and Agriculture has confirmed the beetle’s presence in Stanislaus, Merced, Madera and Kings counties.

Historically a major threat to almond production in Australia, the beetle — as larvae and adults — feeds directly on the nut kernel. In California, some almond growers have lost 10% to 15% of their yield — a “significant economic loss,” according to Jhalendra Rijal, University of California integrated pest management (IPM) advisor for the region. Given the prominence of almonds as a commodity, even a 1% overall reduction statewide represents an approximately \$70 million loss.

“This year there have been a lot more reports from PCAs [pest control advisers]; they’re sending me the pictures of the damage and beetles,” said Rijal, noting that the increase is likely due to greater awareness of the pest.

To help almond growers identify the carpophilus beetle and develop management plans, Rijal, Wilson and their IPM colleagues have put together a [visual identification guide](#) online for the beetle and the damage it causes, as well as telltale signs of navel orangeworm (*Amyelois transitella*) and ant damage. In particular, the experts would like PCAs and growers to differentiate between the carpophilus beetle and navel orangeworm, another key pest in almonds.

“Even though their way of causing damage looks more or less similar, we’re dealing with two different types of insects,” Rijal explained. “One is a Lepidoptera moth [navel orangeworm], and the other one is a beetle — many of the management practices and biological controls would be different for these two different things.”



A hullsplit almond showing a large number of carpophilus beetles (*Carpophilus truncatus*). Photo: Jhalendra Rijal.

To control carpophilus beetle, “sanitize, sanitize, sanitize”

One crucial cultural practice for managing both pests, however, is destroying the remnant “mummy” nuts — the nuts that remain in the orchard postharvest. They serve as overwintering habitat for the carpophilus beetle, as well as its sustenance for the next generation of beetles in spring.

“The best way to manage this pest is to do the orchard hygiene — continuing the winter sanitation, destroying the nuts that are on the ground and on the tree and on the berms,” Rijal said.

Based on observations in Australia and locally, carpophilus beetles tend to rely more on mummies on the ground, whereas navel orangeworm generally favors mummies in the tree canopy. Correctly identifying the pest — with help from the new ID guide — enables growers to better target and prioritize their management efforts, Rijal said.

“What we are strongly emphasizing is that growers need to sanitize, sanitize, sanitize to control both pests,” Wilson added.



Mature larva of navel orangeworm (NOW) is three to four times larger than carpophilus beetle (CB) mature larva. *Photo:* Jhalendra Rijal.

Left, both carpophilus beetle adults and larvae feed on the kernel and cause damage characterized by fine powdery frass and nutmeat, a white-creamy color with some webbing. Often, large numbers (more than 10) of adult and larvae are found per nut. *Right*, navel orangeworm larvae cause damage characterized by thicker frass and silky webbing entangled with a darker, brownish appearance. Only larvae are present at harvest, usually one to three larvae per nut. *Photos:* UCCE Stanislaus IPM team.

Correct identification of the pest would also prevent unnecessary application of insecticides, as those used for controlling Lepidoptera such as navel orangeworm would be largely ineffective on the beetle.

Indeed, another insight shared by Australian experts is that the carpophilus beetle cannot be controlled just by insecticide.

“Insecticides are not very efficient, given the cryptic nature of these beetles; exposing these beetles to the insecticide is very hard,” said Rijal, noting that the beetle spends most of its life cycle protected inside the nut.

Reporting carpophilus beetle infestation helps researchers

This harvest season, Rijal advises almond growers to harvest as efficiently as possible, to minimize the number of mummies that need to be cleaned up. And because signs of damage (like damaged hulls and frass) are most obvious during harvest time, Rijal said growers should review the [new guide](#), using the photos and other resources to help identify potential pests.

If the grower or PCA suspects a carpophilus beetle infestation, they should contact the [UCCE farm advisor](#) in their area.

Scientists are looking to expand their knowledge about this relatively new pest to California. In the coming weeks, for example, researchers are planning to survey for the carpophilus beetle in the Sacramento Valley.

“Technically it has not been found there, but we suspect that we’ll find it this fall when we go looking for it,” Wilson said.

Researchers are also collecting samples from infested orchards to better understand the biology of the species, as well as how it progresses through and responds to seasonal and climactic changes. In addition, they are analyzing data from a trial study of an insecticide that might be used as a supplemental control measure.

“This is our first full season dealing with this insect, and there are still many things we need to understand,” Rijal said. “We are continuing our research efforts on all fronts.”

The visual guide for identifying carpophilus beetle damage in almonds is available at www.sacvalleyorchards.com/wp-content/uploads/2024/08/Carpophilus-Flyer-med.pdf. [CA](#)

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