

Questions and Answers: Light Brown Apple Moth

Q: What is the light brown apple moth?

A: The light brown apple moth (LBAM), *Epiphyas postvittana* (Tortricidae) is an insect that can severely damage plants, trees and agricultural crops. LBAM are native to Australia but are now found in New Zealand, Ireland, the United Kingdom, and in the United States. In the adult stage, the moth is tan-colored, with irregular darker markings on the wings. It is approximately ¼ inch long.

Q: When was the light brown apple moth found in the United States?

A: In 2007, USDA confirmed that LBAM had been found in Alameda County, California. Just two years earlier, a USDA pest survey found no LBAM in the state. No signs of LBAM have been found over the last ten years as a result of pest surveys conducted in 21 other states.

Q: What areas of California are currently infested with LBAM?

A: LBAM now have infested California's Bay Area and its central coast. California counties experiencing light brown apple moth infestations include: Alameda, Contra Costa, Marin, Monterey, San Francisco, San Mateo, Santa Barbara, Santa Clara, Santa Cruz and Solano.

Q: Why is this moth so harmful?

A: The LBAM has the potential to be one of the most destructive pests the United States has experienced. If left to spread unchecked, the LBAM could adversely impact more than 2,000 plants including native tree species, horticultural crops and food crops. This moth's potential for widespread destruction is staggering.

Q: What damage does the light brown apple moth inflict?

A: During the larval stage, LBAM attacks more than 250 fruit and vegetable crops, as well as 2,000 species of plants and trees. Potentially impacted crops include—but are not limited to—grapes, citrus fruits, peaches, plums, cherries and apricots. Vulnerable trees include—but are not limited to—pine, cypress

and oak. Almost every ornamental plant in the average garden or yard is in danger of being harmed by LBAM.

Q: Why should we eliminate these pests?

A: If the LBAM is not completely eradicated while the moth population in the United States is relatively small, the long term impacts to the environment and agricultural production could be significant. A 2007 economic assessment by USDA evaluated geographic areas where the moth could permanently establish itself and thrive based on moth behavior as researched in Australia. The analysis indicated that LBAM could become established throughout the majority of the United States. The west coast, southwestern, and southeastern States would be at the highest risk.

Q: Just how prolific are LBAM?

A: A mature LBAM female can deposit 300-1,500 eggs before dying. Each LBAM generation lives approximately 6-7 weeks. So, the progeny of a single female can result in at least 20 million adults in one season. Furthermore, these moths are not native to the United States and have no known predators or parasites here to reduce populations naturally.

Q: How will the LBAM impact farmers and local farm communities?

A: Based on reports from New Zealand, a 5-20% crop yield loss due to LBAM is not uncommon. Using the New Zealand crop loss results of 5% to 20%, the State of California alone could experience \$685 million to \$2.7 billion in annual crop losses if LBAM were to thrive and flourish.

Other countries want to keep the pests out. The current infestation has already caused Canada and Mexico to enact restrictions on crops and plants grown in the 11 California counties infested with LBAM. Economic impacts from LBAM will reverberate beyond the California agricultural community if the moth is not controlled.

Q: What is the best way to eliminate these invasive pests?

A: Extensive research and numerous environmental assessments have determined that the best way to eradicate the light brown apple moth is to reduce their ability to mate through use of a pheromone developed exclusively for them. This will reduce the population until they are eliminated.

Q: What are pheromones and how do they work?

A: Insect pheromones are chemical signals that some insects release to attract mating partners. When the synthetic pheromone is released as well, confused male moths cannot locate female partners. The moths simply live out their natural life cycles unable to mate. With breeding stopped, the moths will die off.

Q: Why use a pheromone to eradicate the light brown apple moth?

A: The pheromone used to treat the light brown apple moth, a Straight Chain Lepidopteran Pheromone, is the safest and most environmentally friendly way to eliminate the pest. It is not a pesticide to kill moths. This particular treatment was proposed by an independent and international panel of scientists after extensive testing. It is an effective alternative to conventional pesticides, and since this pheromone is specific only to the light brown apple moth, it affects just this one species. Also, the pheromone is not toxic, so it does not harm butterflies, endangered insects or beneficial insects such as bees and other pollinators.

Q: Are these pheromones safe?

A: Comprehensive studies show that the pheromone used for the light brown apple moth does not pose any health risks to any creature. Humans, mammals and other organisms cannot detect the insect pheromones, even though the pheromones are actually present in our environment every day.

Moth pheromones have been used for more than 10 years in Australia and New Zealand with no adverse effects reported. The U.S. Environmental Protection Agency indicates the pheromones are safe and pose no risk to humans or food. Further, all Straight Chain Lepidopteran Pheromones, the class that includes LBAM pheromone formulations, are approved for use on organic crops by USDA's National Organic Program. While newer formulations still require approval for organic use, USDA anticipates that approval will be obtained soon once new LBAM pheromone formulations are selected.

Q: How are the pheromones applied?

A: Twist ties containing the pheromone can be applied by hand when there are only a few moths in isolated areas. Small airplanes can release the pheromone to treat the heaviest infestations over a large area. In the case of aerial treatments, they are performed at night to minimize inconvenience to the community and to take advantage of reduced air traffic.

Q: Have the aerial treatments been approved by scientific experts?

A: Yes. In addition to USDA's Animal and Plant Health

Inspection Service, the following agencies and organizations consider this approach to be acceptable: U.S. Environmental Protection Agency; U.S. Fish and Wildlife Service; California Department of Public Health; California Department of Pesticide Regulation; California Office of Environmental Health Hazard Assessment; California Department of Parks and Recreation; Central Coast Regional Water Quality Control Board; Monarch Watch; and the Monterey County (Calif.) Otter Project.

Q: Is the aerial dispersal of pheromones supplemented with insecticides?

A: No. The LBAM pheromone formulation used in California in 2007, as well as the formulations being considered for use in 2008, do not include a traditional chemical insecticide.

Q: What if no aerial dispersal takes place?

A: If the LBAM infestation is not addressed with pheromone applications, farmers, along with suburban and urban gardeners and even nursery operations will most likely turn to chemical pesticides on a permanent basis. Additionally, California-grown products will be restricted from moving out of infested counties and the state. The moths could also spread out of California into other states and across the country.

Q: Why aren't European Countries working to control and eradicate LBAM by labeling it an "actionable pest" and instituting quarantines to control the movement of plants and plant products that could host the insect?

A: While LBAM is known to be present in parts of England and Ireland, it is not found in continental Europe. However, LBAM is considered established in the European Union (EU) due to the presence of LBAM in parts of England and Ireland. Therefore, LBAM is not regulated as a quarantine pest, and does not have any phytosanitary requirements to prevent the introduction or movement of LBAM-host plants or plant products into or within member States. LBAM is just one of many examples of pests that are considered actionable—or, quarantine significant—in North America but not in Europe.

Q: Is the United States the first country to regulate LBAM?

A: No, the United States was not the first country to establish import restrictions for LBAM to prevent the pest's introduction through international trade. Each of the following countries considered LBAM an actionable pest of quarantine significance long before the pest's detection in California: Canada, Chile, Mexico, Peru, South Africa, South Korea, and Thailand.

Q: What are the LBAM regulatory requirements for Canada and Mexico?

A: Canada currently requires all commodities imported from countries where LBAM is prevalent, such as Australia and New Zealand, to be fumigated with methyl bromide. When LBAM was first detected in California, Canada quarantined the entire state and Mexico refused shipments of all host crops from California.

However, the plans to eradicate LBAM and progress made towards that goal has convinced Canada and Mexico to relax their trade restrictions and accept LBAM-host crops from non-infested California counties, without any restrictions. The strategy now is to reduce the impact of both countries' phytosanitary restrictions on LBAM-host articles from California by continuing to pursue eradication. If The USDA suspends eradication efforts, Canada and Mexico are very likely to impose more stringent phytosanitary requirements.

Q: Would USDA take over the LBAM program if the California Department of Food and Agriculture (CDFA) is unable to continue?

A: CDFA and USDA are jointly committed to pursuing LBAM eradication in California given the negative impacts associated with this invasive alien species to agriculture, the natural environment and horticulture.

Q: What can I do to help?

A: Invasive species, such as LBAM, can arrive in the United States in any number of ways, but the most common method is for international travelers to bring in fruits, vegetables, plants, seeds, soil or other such items from foreign countries. Please leave these items in their native lands. If you suspect the presence of LBAM, please notify your state department of agriculture or the State Plant Health Director's Office of USDA, APHIS, PPQ.

Visit <http://www.aphis.usda.gov> for more information about invasive species and how to report an agricultural pest. Click on Light Brown Apple Moth under "Hot Issues" on the home page for more information about this particular species and to report infestations.

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