

# ECONOMIC ANALYSIS OF LIGHT BROWN APPLE MOTH USING GIS AND QUANTITATIVE MODELING

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## ABSTRACT

We conducted an economic analysis of the light brown apple moth (LBAM), (*Epiphyas postvittana* (Walker)), whose presence in California has resulted in a regulatory program. Our objective was to quantitatively characterize the economic costs to apple, grape, orange, and pear crops that would result from LBAM's introduction into the continental United States. This information can be used to inform regulatory policy and funding decisions on LBAM.

Our economic analysis had two components: (1) a geospatial analysis that identified areas at risk for LBAM establishment based on climate and hosts and (2) a quantitative analysis, using a probabilistic modeling approach, which estimated the economic losses LBAM could cause if introduced into these areas due to damage, control, quarantines, and research.

Our geospatial analysis estimated that LBAM could establish throughout most of the continental United States, including throughout most of the analyzed U.S. crop production areas. The mean total annual crop costs due to damage and control if LBAM were introduced in the at-risk areas was estimated at \$104 million. The mean total economic costs including quarantines and research was \$118 million.

Our analyses indicated that LBAM could cause substantial economic losses to U.S. apple, grape, orange, and pear crops if introduced into the continental United States. LBAM is polyphagous and would probably cause additional economic damage to other crops and sectors of the U.S. economy.