

CALIFORNIA APPLE COMMISSION
PROJECT PLAN / RESEARCH GRANT PROPOSAL

Work group / Department: USDA-ARS-SJVASC, Crop Protection and Quality Unit

Project Year: 1 (2012)

Anticipated Duration of Project: 2 year

Systems-based strategies for postharvest insect control: Mortality and removal of Light Brown Apple Moth, Coddling Moth, Brown Marmorated Stink Bug, and other insect pests in California apples during packing and export

Project Leader:

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Current Funding Request: \$7,345

BACKGROUND/JUSTIFICATION

Insect pests, such as the Light Brown Apple Moth (LBAM), coddling moth (CM), and oriental fruit moth (OFM) are an economic concern to California (CA) apple growers and shippers when found in production regions. Perhaps more important than losses caused by leaf defoliation/herbivory and superficial damage to fruit, is the economic threat insects pose as trade barriers. At any time, importing countries can confront industry with quarantine and/or treatment requirements with the potential to terminate, or at least inhibit, trade. Research on postharvest insect "control" is needed to retain the ability of CA to continue exporting apples when an importing country raises concerns regarding the potential for insects to enter, establish, and spread via CA imports.

Long-term research goal. The overarching goal of this project is to ensure pest-free apples are channeled to markets.

Short-term research goal. Reduce the need for (and efficacy requirements of) standalone fumigations by developing systems-based approaches to demonstrate the removal and/or mortality of insects as fruit is harvested, cleaned, packed, and shipped using the commercial methods employed by California industry.

2012 OBJECTIVES:

In general, research is planned in compounding phases as indicated below with corresponding objectives.

Phase I (Yr. 1, 2012).

Objective 1. A commercial-scale Berlese funnel trap will be constructed. Leaf debris will be collected from 1) the QA-QC inspection stations at the end of export packing lines, and 2) beneath grating/fall-outs as field bins are dumped. Insects that emerge from leaf debris will be identified and reported (to CAC only) relative to the mass of debris collected as related to production levels. Our findings will be compared to public records collected by academics as well as county and state inspection officers.

Timeline: Trap has been constructed; Debris will be collected throughout 2012 production season.

Objective 2. Insects will be exposed to elements of postharvest processing individually and in series; statistically robust data on removal and/or mortality will be generated. Specifically, LBAM eggs will be deposited on leaves that will then be traced through a packing operation (performed at UC Kearney). BMSB life stages will be placed on fruit and leaves and traced through a packing operation (performed in West Virginia).

Timeline: Run throughout 2012 apple production season and into winter.

2013 OBJECTIVES: Phase II (Yr. 2, 2013). Objective 1. Continue with the “systems-based” postharvest packinghouse/processing investigation and build on 2012 results. Objective 2. Integrate field trapping, IPM, and pesticide use pattern results with postharvest systems-based approach to generate statistical framework to quantify reduction in risk from an insect pest as product moves from production areas through packing operations toward export markets.

2012 BUDGET REQUEST

Expenses

GS-3 Lab Assistant (20%):	3,368
travel	250
supplies	500
rearing	500
postharvest analysis	2,000
Subtotal:	\$ 6,610
USDA-ARS overhead (11.1%)	735
Total:	<u>\$7,345</u>