

Biological, Behavioral, and Physical Control as Alternatives for Stored Product and Quarantine Pests of Fresh/Dried Fruits and Nuts

ARS LOCATION:

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PROJECT OBJECTIVES:

1. Develop a biologically-based management program using biological agents and cultural controls.
2. Develop a sex pheromone based program for use in the integrated management of navel orangeworm.
3. Develop alternative physical treatments for dried fruits, nuts, and fresh fruits

MAJOR ACCOMPLISHMENTS (2007 – 2010):

Cold Treatments for Postharvest Dried Fruit Insects:

Exposures needed to kill non-overwintering stages of the Indianmeal moth, a common storage pest of raisins, at 0, 5, and 10°C, and overwintering stages at -10, -15 and -20°C were determined. Commercial freezer temperatures (-18°C) were found to kill the most cold tolerant stage in less than 24 hours, while commercial refrigeration temperatures (0-5°C) require several week of exposure to kill less cold tolerant stages.

Cold Storage Treatments for Spotted Wing Drosophila:

A project to develop cold treatments to disinfect table grapes of spotted wing drosophila was instituted. Methods to determine the most cold-tolerant stage on both artificial media and grapes have been developed.

TECHNOLOGY TRANSFER/OUTREACH:

Presentations have been made to the International Conference on Methyl Bromide Alternatives and Emissions Reductions, the International Conference on the Future of Agriculture, and the Sixth International Walnut Symposium on the use of cold treatments for dried fruits and nuts.

EXTERNAL SUPPORT:

Cold Storage Treatment of Spotted Wing Drosophila on California Grapes. Funded by the California Table Grape Commission (\$29,923)

COLLABORATORS:

Gary Obenauf, Agricultural Research Consulting, Fresno, CA; Terry Freeto, Sun-Maid Raisins, Kingsburg, CA; and Spencer Walse, ARS Parlier, CA.

RECENT PUBLICATIONS:

- Johnson, J. A. (2007) Survival of Indianmeal moth and navel orangeworm (Lepidoptera: Pyralidae) at low temperatures. *Journal of Economic Entomology* 100: 1482-1488.
- Johnson, J. A. (2009) Use of low temperatures to control postharvest Indianmeal moth. *Australian Nutgrower*. 23: 6-8.