POSTHARVEST CHAMBER FUMIGATION WITH CYLINDERIZED PHOSPHINE TO CONTROL KEY INSECT PESTS OF FRESH CITRUS

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Abstract. Each year, the central valley of California exports fresh citrus valued at >200 million USD. The goal of this research was to provide this sector with a commercially viable postharvest methyl bromide alternative that is effective against insect pests that serve, or have a potential to serve, as trade barriers to export. We discuss the progression of this research from initial toxicological investigations, through laboratory-scale optimization, to commercial-scale confirmatory testing. We report how to modulate the fumigation parameters to ensure control of key insect pests (e.g., Fuller's rose beetle, bean thrips, California red scale, etc.) across a variety of citrus types, including: navel oranges, Valencia oranges, lemons, and mandarins. Quantifying the residues and off-gassing potential was a were critical steps in assessing commercial viability, as any proposed use must result in residues compliant with domestic (United States) food tolerances, international maximum residue level (MRL) regulations, and worker exposure regulations.