

DEPOSITION OF PYRETHRINS AND PIPERONYL BUTOXIDE FOLLOWING AERIAL ULTRA-LOW VOLUME APPLICATIONS IN THE COACHELLA VALLEY, CALIFORNIA

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ABSTRACT

Data on adulticide deposition were collected during studies optimizing aerial ultra-low volume applications and droplet size in the desert environment of the Coachella Valley, Riverside County, California. Pyrenone 25-5® and BVA Spray 13® oil were applied by a single-engine, fixed wing aircraft equipped with 2 Micronair® AU5000 atomizers. Data recorded by a portable weather station documented that weather conditions were suitable for application. Adulticide residue was collected using 24-cm-diameter filter papers positioned along 2–3 transects, with 3 positive controls held outside of the treated zone. The trace amounts of 2 major insecticidal components (pyrethrin I and II) and the synergist piperonyl butoxide (PBO) were detected from samples near the center of the spray zone by high-performance liquid chromatography (HPLC); pyrethrin deposition was highest at the center, 156 µg/m², and it was not detectable 60 m

beyond the center of the transect, whereas PBO deposition was 5,000 $\mu\text{g}/\text{m}^2$ at the center but was not detectable beyond 150 m. Droplet diameters on spinning Teflon® slides were larger than expected for the rated output of the atomizers. For these single swath trials, the lack of swath overlap due to drift resulted in low mortality in sentinel mosquitoes. Detection of residues was limited to the centroid of droplet densities on spinning glass slides and with mortality among sentinel mosquitoes, indicating HPLC may be useful in detecting postspray residues.

Keywords: Adult mosquito control, aerial ultra-low volume, pyrethrins, piperonyl butoxide, deposition

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