

Organophosphate exposure: a preliminary assessment on the use of pesticide intensity score to evaluate exposure among fruit growers

Abstract

This study examines the influence of work hours, personal protective equipment use, and pesticide ingestion on the amount of urinary metabolites among fruit growers applying organophosphate pesticide. Thirty nine urine samples were collected from seven applicators before and after organophosphate applications. All dimethyl metabolites were present in day 1 morning urine samples for all workers. The arithmetic means for day 1 ranged from 21.5-94.17 µg/L DMP, 6.25-81.25 µg/L DMTP, and <LOQ-153.17 µg/L DMDTP. Day 2 urine samples had the highest amount of metabolites. The arithmetic means ranged from 25.8-558 µg/L DMP, 15.75-398 µg/L DMTP, 21.5-568.57 µg/L DMDTP, and <LOQ-17.67 µg/L DEP. The arithmetic means for day 4 ranges from 19.2-182 µg/L DMP, 13.33-138 µg/L DMTP, 22.75-157.83 µg/L DMDTP, and <LOQ-26 µg/L DEP. From the questionnaire, the exposure algorithm based on duration of hours worked, PPE use and pesticide ingestion showed poor relationship with urine concentration ($r=0.1847$). The linear relationship is not established due to variability within and between applicators.

Keyword: Organophosphate; Pesticide intensity score; Urinary metabolites; Fruit growers