

Sampling and analysis of Chlorpyrifos airborne residue emitted under treated field conditions.

ABSTRACT

Ambient air sampling on 12-hour daytime before and immediately after chlorpyrifos application using mist-blower (Solo 412) was done by passive air sampling (cotton gauze, cellulose filter and PUF) and active sampling (PUF plug and quartz filter cartridges). During spray application, sampling was also done in the air at operator breathing zone through active samplers. Samples were analysed by gas chromatography with micro electron-capture detection (GC- μ ECD) with full method validation under laboratory conditions. In the study, pre-spray measurements showed no detection of chlorpyrifos level both in active and passive air samplings. In post-spray measurements, PUF passive samplers recorded the highest level of residue detection in both post-spray sampling events in comparison to cellulose and cotton gauze. In active sampling, chlorpyrifos was detected only on PUF plug samples revealing the fact that chlorpyrifos are partitioned in the air as vapour rather than particles. The highest measured concentrations were recorded during spraying period, and then sharply declined in the post-spray periods with the passage of time. Paired comparison of performance between passive and active sampling methods in terms of residue uptake showed that passive sampling showed better performance than active sampling in this study.

Keyword: Chlorpyrifos; Airborne residue; Passive sampling; Active sampling.