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Quantification of emissions from knapsack sprayers: "the weight method", a new screening method for developing countries

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Misuse of pesticides kill or seriously sicken thousands of people every year and poison the natural environment. Investigations of occupational and environmental risk have received considerable interest over the last decades. And yet, lack of staff and analytical equipments as well the costs of chemical analyses make difficult, if not impossible, the control of the pesticide contamination and residues in humans, air, water, and soils in developing countries. To assess emissions of pesticides (transport and deposition) during spray application and the risk for the human health and the environment, tracers can be useful tools. Uranine was used to quantify drift airborne and later deposition on the neighbouring field and clothes of the applicator after spraying with a knapsack sprayer in one of the biggest areas of potato production in Colombia. Keeping the same setup the amount of wet drift was measured by difference in the weight of high absorbent papers used to collect the tracer. Surprisingly this weight method (Weight-HAP) was able to explain 71% of the drift variance measured with the tracer. Therefore the weight method is presented as a suitable rapid low cost screening tool, complementary to toxicological tests, to assess air pollution, occupational and environmental exposure generated by the emissions from knapsack sprayers during pesticide application. This technique might be important in places were there is lack of analytical instruments.