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The weight method: a new screening method for estimating pesticide deposition from knapsack sprayers in developing countries

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Investigations of occupational and environmental risk caused by the use of agrochemicals have received considerable interest over the last decades. And yet, in developing countries, the lack of staff and analytical equipment as well the costs of chemical analyses make it difficult, if not impossible, to monitor pesticide contamination and residues in humans, air, water, and soils. A new and simple method is presented here for estimation of pesticide deposition in humans and soil after application. The estimate is derived on the basis of water mass balance measured in a given number of high absorbent papers under low evaporative conditions and unsaturated atmosphere. The method is presented as a suitable, rapid, low cost screening tool, complementary to toxicological tests, to assess occupational and environmental exposure caused by knapsack sprayers, where there is a lack of analytical instruments. This new method, called the "weight method", was tested to obtain drift deposition on the neighbouring field and the clothes of the applicator after spraying water with a knapsack sprayer in one of the largest areas of potato production in Colombia. The results were confirmed by experimental data using a tracer and the same set up used for the weight method. The weight method was able to explain 86 % of the airborne drift and deposition variance.