

Assessment of the risk of dermal exposure to pesticides during treatment with a back-pack sprayer in the presence and absence of vegetation.

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Abstract

Assessing the dermal exposure of applicators to pesticides is still an important issue, and the measurement methods used remain open to improvement. This is particularly true when it comes to characterising the exposure of applicators using back-pack sprayers. The scenarios used for the different mathematical models continue to be riddled with approximations and uncertainties. With a view to improving these scenarios, tests were performed in an open environment to measure the levels of dermal exposure on various parts of an operator's body during treatment with this type of equipment. The main parameters studied are the presence of vegetation and the height of the crop. The method uses a tracer (fluorescein salt) and collectors placed all over the body in order to determine which parts are subject to most contamination during spraying. The quantitative determinations of the tracer show that exposure, in the presence of vegetation, reaches levels of 0.02%, 0.006% and 0.04% of the total quantity applied in treatment, at heights of 0.5, 1 and 2 m respectively. In the absence of vegetation, it stands at 0.21%, 0.61% and 0.62% of the total quantity applied at heights of 0.5, 1 and 2 m. In each of these situations, the lower limbs of the body (shins and thighs) collected large proportions of fluorescein. The contamination of the upper parts of the body increases in proportion to the height of treatment. These results show that the presence of vegetation and the spraying height are important parameters to be considered and to be integrated into the models, to validly assess the exposure of operators using a backpack sprayer.