

# **THE FATE OF ENDOSULFAN IN VEGETABLE-BASED AGRO-ECOSYSTEMS IN GHANA**

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## **ABSTRACT**

Endosulfan is applied to tomato fields to protect the crops against pests and diseases in Akumadan, a vegetable producing area in Ghana. The fate and distribution of endosulfan was investigated in an on-farm researcher-managed trial in Akumadan in the Ashanti Region of Ghana.

Following rainfall, 95% of the applied endosulfan was found to remain on the fields. About 44% was sorbed to the soil while the stem contained 10%, the root 4%, leaves 31% and fruits 3%. Only 8% was lost from the fields. Of the 8% endosulfan that was lost from the fields, 3% was attributed to volatilization and degradation. The remaining 5%, that was lost from the fields, was distributed as follows: runoff 1% and soil solution (leachate) 4%. Although only about 1% endosulfan was found to leave the field in the runoff, this was sufficient to give an endosulfan concentration of  $0.011\mu\text{g/L}^{-1}$  in the water. There were no detectable residues of endosulfan in soil collected prior to the commencement of the experiment. However, soil samples collected after pesticide applications did contain detectable residues of endosulfan. This indicated that pesticide residues accumulated in the soil. About 90% of the soil-bound endosulfan was found sorbed to the surface 0-10cm of the soil profile. The concentrations declined sharply with depth and was negligible ( $<2\%$ ) beyond 30 to 40cm. There was significant difference ( $P<0.05$ ) between the endosulfan-treated and the control fields due to application of endosulfan to the treated fields. The half-life value of total Endosulfan in Akumadan soil was 1.8 days. This shows that, in general, the endosulfan used is non-persistent in the Akumadan soil used (i.e.,  $t_{\frac{1}{2}} < 30$  days).

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