



Residue inventories for alpha-, beta-Endosulfan and their metabolite endosulfan sulfate in Chinese surface soil

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Endosulfan is currently-used organochlorine pesticide in China, with annual usage of 2,300 t between 1994 and 2004. A gridded mass balance model, Gridded PTSs (persistent toxic substances) Emission and Residue Model (GPERM), has been applied to create gridded inventories of residues in soil for two endosulfan isomers, alpha- and beta-endosulfan, on a 1/4 degree longitude and 1/6 degree latitude resolution (approximate 24 km by 24 km) by using Chinese gridded annual usage inventories of endosulfan on the same resolution as input. In order to evaluate these inventories, soil samples were collected from 92 sites (70 for rural and 22 for urban) across China in 2005, and concentrations of alpha-, beta-endosulfan and their metabolite endosulfan sulfate were measured. Measured soil concentrations of both alpha- and beta-endosulfan match well with their modeled data, and the results show that, at the 0.05 level, no significant difference was found between monitored and modeled results. Significant correlations found between measured data for endosulfan sulfate and beta-endosulfan in Chinese soil and also between monitored and modeled datasets for beta-endosulfan, inventories of endosulfan sulfate in Chinese agricultural soil in 2005 with a 1/4 degree \times 1/6 degree longitude and latitude resolution have been established, which correlate significantly with their related monitoring data in the same grid cells. To our knowledge, this is the first soil concentration inventories for endosulfan sulfate, which will pave the way for further study of this chemical.