



Earthworms lost from pesticides application in potato crops

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Bioturbation from earthworm's activity contributes to soil creep and soil carbon dynamics, and provide enough aeration conditions for agricultural practices all over the world. In developing countries where there is a long term misuse of pesticides for agricultural purposes, lost of these benefits from earthworms activity might already yielded negative effects in the current crop production. Little research has been performed on earthworms avoidance to pesticides in developing countries located in the tropics. Furthermore, the complete avoidance reaction (from attraction to 100% avoidance) from earthworms to most of the pesticides used in potato cultivation in developing countries like Colombia is incomplete as yet. Hence the aim of this study is to assess the lost of earthworm on the soils caused by different concentrations of pesticides and associated agricultural impacts caused by a lost in the soil bioturbation. As a first stage, we have studied earthworm's avoidance to pesticide concentration in a potato agricultural area located in Colombia. Local cultivated *Eisenia fetida* were exposed to four of the most frequent applied active ingredients in potato crops i.e. carbofuran, mancozeb, methamidophos and chlorpyrifos. Adult earthworm toxicity experiments were carried out in two soils, untreated grasslands under standard (ISO guidelines) and undisturbed conditions, and exposed to six different concentrations of the active ingredients. The results of the avoidance reaction on the standard soils were significant for carbofuran, mancozeb and chlorpyrifos. For each of the three active ingredients, we found i) overuse of pesticide, ii) applied dose of carbofuran, mancozeb and chlorpyrifos by the farmers potentially caused 20%, 11% and 9% of earthworms avoidance on the cultivated soils, respectively.