WATER RISK CONTAMINATION TRENDS BY YELLOW-PASSION FRUIT PESTICIDES IN A SMALL CATCHMENT IN THE EASTERN AMAZON

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Abstract: The present work has as main objective to evaluate the water risk contamination trends by pesticides applied on yellow-passion fruit cropped in the Cumarú stream catchment, in Pará state, Brazilian Eastern Amazon, where the "Pós-Barreiras" Aquifer is found. It took into account mathematical-modeling simulation by CMLS-94[1] considering information available for three main soil types, e.g. loamy/clayey kaolinitic, isohyperthermic Typic Hapludult (soil 1); sandy/loamy, kaolinitic, isohyperthermic Typic Hapludult (soil 2); and loamy, oxidic, isohyperthermic Typic Kandiustox (soil 3), as well as, for five main pesticides commonly used in the area, e.g., 2-4D acid, dimethoate, prochloraz, methamidophos and carbendazim. Individual scenarios were evaluated, considering only one type of soil and pesticide together by time, which resulted in a total of 15 evaluated scenarios. The yellow-passion fruit planting date was January 1st, 2003, and there were considered Kc [2] and root depth of 0.15m. Daily climatic information of temperature, pluviosity, evapotranspiration and infiltration were also taken into account. The simulation period was from January 1st, 2003 to December 31st, 2005. The results considered the influence of the most pluvious months in the area which increases the lixiviation processes after pesticide applications, as well as, turns shallower the water table depth levels (1.24 to 3.52m). The pesticides toxicology classes and their percentage of use in the area were also considered. As for superficial water contamination trends we concluded that water and soil monitoring should be done for almost all pesticides evaluated, immediately after their applications until at least, two months later (except for dimethoate, which must be done until one month after its application). If necessary to prioritize some of them, prochloraz and carbendazim must be selected due to their persistence along two years after the application date and their maintenance at superficial depths, when comparing to the other pesticides. According to the simulations, 2,4-D acid needs to be monitored along the first two months after its application date, because it can reach 3m depth; methamidophos needs to be monitored mainly during 35 days after application, as it can reach at 2m depth. All products had the main vertical movement for soil 3, despite that along the first months after application their movements were close to those reached for the soil 2. None of the studied pesticides presented the potential to contaminate the aquifer.

References:

[1]NOFZIGER, D. L.; HORNSBY, A. G. **CMLS-94: Chemical Movement in Layered Soils**. Oklahoma: University of Florida, 76 p. (Department of Agronomy – University of Florida) 1994.

[2] CORRÊA, R.A. DE L. **Evapotranspiração e coeficiente de cultura em dois ciclos de produção do maracujazeiro amarelo**. Piracicaba: ESALQ/USP. 2004, 71p. (Dissertação mestrado).