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ABSTRACT

A sensitive gas chromatographic method using a modified QuEChERS technique is reported for simultaneous determination, dissipation and risk assessment of fipronil and its metabolites in sugarcane and soil. Recoveries were 80.7-98.5% with precision within 1.4-16.5% estimated at the limits of detection (LOD) 0.0015-0.002 µg g^{-1} and limits of quantification (LOQ) 0.005 µg g^{-1}. Fipronil dissipated with half-life ($T_{1/2}$) of 2.8-4.3 days while for total fipronil it was 3.7-6.0 days following application of fipronil (5% SC) in sugarcane fields at recommended (100 g a.i. ha^{-1}) and double the recommended (200 g a.i. ha^{-1}) doses. Estimated pre-harvest intervals (PHI) for fipronil were 20.3-27.0 days in sugarcane plants, and for total fipronil the corresponding values were 28.2-37.8 days. No dietary risk was observed due to fipronil ($RQ_d < 1$) 5 days after application. Potential risk exists towards algae and soil macro-organism (RQs > 1), but for earthworms it was safe (RQs < 1).