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毫米级根际微域磺胺嘧啶的降解动态研究

Degradation characteristics of sulfadiazine on the rhizospheric soils

关键词: [玉米](#) [根际土壤](#) [磺胺嘧啶](#) [降解](#)

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摘要: 采用特制根际箱,研究了玉米根际效应作用下磺胺嘧啶在土壤中的降解动态.在空间上将根-土界面(0~5 mm)细化到1 mm,箱内磺胺嘧啶剂量分别设为 $1 \text{ mg} \cdot \text{kg}^{-1}$ 和 $5 \text{ mg} \cdot \text{kg}^{-1}$,分别在出苗后第20、40和60 d取样,并将磺胺嘧啶降解率与根-土界面4种有机酸含量进行回归分析,从而得出影响磺胺嘧啶在根际土壤降解的关键因素.结果表明,种植作物可有效促进磺胺嘧啶的降解,且磺胺嘧啶的最大消减水平发生在距离根室3 mm的近根区,降解顺序依次为:近根区>根室>远根区.通过对不同剂量磺胺嘧啶胁迫下有机酸响应的相关分析发现,苹果酸和乙酸是影响磺胺嘧啶在根际土壤中降解的关键因素之一.

Abstract: Using a special rhizobox, degradation dynamics of sulfadiazine in soil were investigated under the effect of maize rhizosphere. We refined the interface (0~5 mm) of root-soil to 1 mm, and the concentration of sulfadiazine were set to 1 and 5 $\text{mg} \cdot \text{kg}^{-1}$, respectively. Samples were collected after 20, 40 and 60 days, respectively. Correlation analysis between the degradation rate of sulfadiazine and the content of four kinds of organic acids was carried out to obtain the key factors affecting sulfadiazine in the process of degradation of rhizosphere soil. This study showed that the degradation rate constant of sulfadiazine on planted soils was much higher than that of unplanted soils. The largest and most rapid loss of sulfadiazine in planted soils appeared at 3 mm from the root zone. The order of degradation rate was: near-rhizosphere>root compartment>far-rhizosphere. The relationship between the degradation of sulfadiazine and the concentrations of organic acids showed that acetic acid and malic acid were the key factors which affected the degradation of sulfadiazine on root-soil interface.

Key words: [corn](#) [rhizospheric soils](#) [sulfadiazine](#) [degradation](#)

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