

农药对地表水污染状况研究概述

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A Review of Studies on Pesticide Pollution in Surface Water

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摘要 重点介绍了美国地质调查局(United States Geological Survey, USGS)实施的国家水质评价计划(National Water-Quality Assessment Program, NAWQA)。该项计划中有关农药对地表水污染状况研究的主要内容包括:于1992—2001年对美国地表水(河流和湖泊)中农药的污染状况做了全面调查和研究;在研究这些调查数据的基础上,总结出地表水中检出农药的品种和浓度及其地理分布特征以及农药浓度的季节性变化规律,认为这些规律主要与农药使用强度密切相关,同时也受气候、农药本身的理化性质及当地的水文系统特征等因素的综合影响;根据美国制定的水质评价基准,NAWQA提出了地表水中农药残留的风险评估方法。简要介绍了欧洲国家地表水中检出农药的品种和浓度以及农药浓度的季节性变化规律。分析了中国水质标准体系制定中存在的不足。基于上述研究,提出应根据中国农药的主要使用品种进行选择性的监测,依据农药浓度的季节性变化规律和作物种植类型总结出中国地表水中农药的时空分布特点,并逐步推进中国的水质评价基准制订工作,建立中国地表水中农药残留的风险评估方法,以便对中国水体中农药污染进行全面管理和控制。

关键词: 美国 农药 地表水 残留 评价 概述

Abstract: The National Water-Quality Assessment Program (NAWQA) implemented by the U.S. Geological Survey (USGS) has been introduced. The program has a section dedicated to study of pesticide pollution in surface water of the country, which includes a nation-wide survey and study of pesticide pollution in surface water (rivers and lakes) of the country in 1992-2001. Based on the study of the data collected during the survey, the section summed up a list of pesticides detected in the surface waters, their concentrations and geographic distribution, and seasonal variation of the concentrations as well, which are believed to be closely related to the use of pesticides and also to a series of factors, such as climate, physico-chemical properties of the pesticides and local hydraulic systems. A screening-level perspective on potential significance of pesticides to aquatic life and fish-eating wildlife was obtained by comparing concentrations measured in streams with water-quality benchmarks in the guidelines established by USEPA. The levels of pesticides detected in surface waters and seasonal variation patterns of pesticide concentrations in European countries have also been briefed. Shortcomings in the formulation of the existent water quality standard system of China were analyzed as well. Based on the above-mentioned studies, it is recommended that China should perform selective monitoring of the pesticides commonly used in China and find out characteristics of the temporal-spatial distributions of these pesticides in surface waters, and based on the laws of seasonal variations of their concentrations, push forward the work of formulation of benchmark criteria for evaluation of surface water quality and define risk assessment methods for pesticide residues in the surface waters of the country, and hence exercise overall control and management of pesticide pollution of surface waters in the country.

Keywords: USA pesticide surface water residue assessment review

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