

The Use And Fate Of Pesticides In Vegetable Based Agro Ecosystems In Ghana

Ghana, a country known for its vast agricultural lands, is thriving in the production of vegetables. However, with the increase in vegetable cultivation, the use of pesticides has become imperative to protect crops from harmful pests and diseases. This article will delve into the use, effects, and fate of pesticides in vegetable-based agro ecosystems in Ghana, shedding light on the challenges and potential solutions.

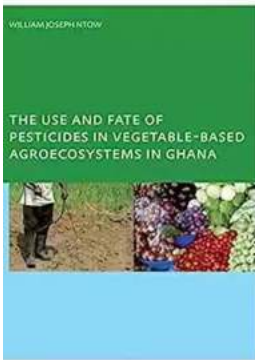
Pesticides, including herbicides, insecticides, and fungicides, are chemical substances used to prevent, destroy, or repel pests that can damage crops. In Ghana, farmers heavily rely on pesticides to combat pests such as aphids, caterpillars, mites, and fungi that can devastate their vegetable harvest. These pesticides come in various forms, including sprays, dusts, and baits, and are applied using different methods, such as aerial spraying or manual application.

While pesticides play a crucial role in protecting vegetable crops, their excessive and improper use can have detrimental effects on the environment, human health, and overall ecosystem balance. Improper handling, storage, and disposal of pesticides can lead to contamination of water bodies, soil degradation, and the loss of beneficial organisms, such as pollinators and natural predators of pests. Furthermore, pesticide residues in vegetables can pose health risks to consumers if not managed properly.

The Use and Fate of Pesticides in Vegetable-Based Agro-Ecosystems in Ghana

by William Joseph Ntow(1st Edition, Kindle Edition)

★★★★★ 5 out of 5



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The fate of pesticides in agro ecosystems is influenced by various factors, including soil characteristics, climate, application techniques, and local practices. Ghana, with its diverse agro ecosystems, experiences a wide range of pesticide fate scenarios. Pesticides can be degraded by microorganisms, volatilized into the atmosphere, leached into groundwater, or accumulated in soil and water bodies. The persistence and mobility of pesticides vary depending on their chemical composition, formulation, and half-life.

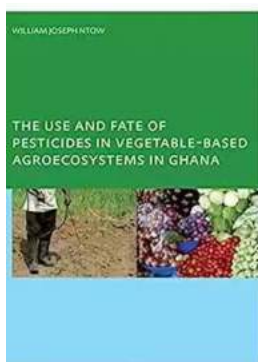
The use of organic farming practices, including integrated pest management (IPM), has gained traction in recent years as a sustainable alternative to heavy dependence on chemical pesticides. IPM focuses on combining cultural, mechanical, and biological methods to control pests while minimizing pesticide use. Adopting this approach in vegetable-based agro ecosystems can reduce the risks associated with pesticide exposure, protect the environment, and promote healthy farming practices.

Ghana's government, NGOs, and agricultural extension agencies play vital roles in promoting responsible pesticide use and educating farmers about sustainable farming practices. Training programs and workshops are conducted to increase awareness among farmers, teaching them the proper handling, storage, and

application techniques of pesticides. Additionally, research institutions are actively exploring the development of locally suitable biopesticides as a safer and more sustainable alternative.

The issue of pesticide use and its impact on vegetable-based agro ecosystems in Ghana is a complex challenge. Balancing the need to protect crops and the environment requires collaboration between farmers, policymakers, researchers, and consumers. Through continuous monitoring, evaluation, and adoption of sustainable practices, Ghana can ensure the long-term viability of its vegetable production while safeguarding human health and the environment.

, the use and fate of pesticides in vegetable-based agro ecosystems in Ghana pose both opportunities and challenges. While pesticides are essential tools for protecting crops, their misuse can lead to adverse environmental and health effects. Through the implementation of integrated pest management practices and increased awareness, Ghana can strive towards sustainable vegetable production, reducing pesticide reliance while promoting healthier farming practices.



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The Use and Fate of Pesticides in Vegetable-based Agro-ecosystems in Ghana reviews current knowledge on pesticides use in vegetable farming in Ghana and establishes the fate of pesticides in situ in tropical vegetable-based agro-ecosystems as well as their environmental and public health impacts on selected population groups. A field survey showed that vegetable farmers often spray pesticides on prophylactic basis due to lack of information. Although some farmers may be aware of pesticide hazards, adequate protection is hardly taken to minimize risks. About 70% of exposed farmers had a reduction of 30% or more in whole blood acetylcholinesterase activity. About 95% of the farmers interviewed reported symptoms attributable to pesticide exposure. Water, waterbed sediment, and vegetable crops were checked for residues of the pesticides monitored on the farmers' fields. Residues detected in water and waterbed sediment indicated that these have come from runoff from vegetable fields and that the measured levels were transient. Pesticide residue levels detected in five vegetable crop types (tomato, cabbage, pepper, onion, and eggplants) were correlated to the minimal risk levels (MRLs) set by the United States Agency for Toxic Substances and Disease Registry (ATSDR). Mean intakes of residues by 22- to 75-year old adult farmers were found to be low and did not seem to be associated with health risk. Data on persistent pesticide residues in farmers' breast milk and blood serum indicated the presence of DDTs, dieldrin, HCB, and HCHs. When daily intakes of DDTs and HCHs to infants through breastfeeding were estimated, some farmers accumulated these compounds in breast milk above the threshold for adverse effects, which raise concerns on children health. Evidence was found for persistence of isomers of endosulfan and its sulfate metabolite in tomato cropped soil and plant tissues. However, the residue concentration in tomato fruits decreased to a level below the Codex MRL given a two-week pre-harvest interval during which no application of the chemical is done. The publication concludes that successful action to

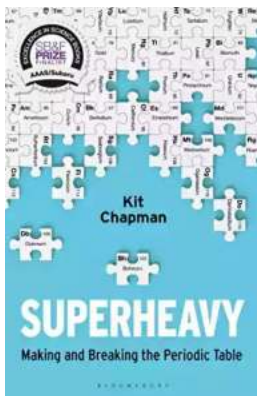
reduce the negative impact of pesticides requires sustained, low cost, and well-targeted training interventions.

Students and scientists in the fields of environmental chemistry and/or science, farmers, agricultural extension officers and environmental and health regulatory agencies will find this book very useful.



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