

Article

Biopesticides: Current status and future prospects

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Abstract

In developing countries, the agricultural sector is playing a significant role to enhance the economy. Pests cause significant damage to crop production. Globally, the human population is rapidly increasing. To fulfill the food security for the rapidly growing human population, there is a strict need for eco-friendly insect pest management in Indian agriculture to sustain the agricultural produce for future needs. The present paper highlights biopesticides' current status and importance in India's farm sector and worldwide. Chemical pesticides are commonly used to control pests, which cause harmful impacts on the environment and non-target living systems, including human beings. Biopesticides are natural and a better substitute for chemical pesticides and provide an alternative for crop protection worldwide. Exploring and building their natural biopesticide resources in crop protection can help sustain agriculture. The trend of biopesticides consumption in India has shown a drastic increase in use over time which stood at 8847 and 8645 metric tonnes in 2019-20 & 2020-2021, respectively. However, a few numbers of biopesticides are easily accessible in the market. In India, as compared to chemical pesticides, biopesticides production, utilisation, and consumption is much lower due to a lack of research advancements, innovation and policies. Thus, the present paper provides a baseline overview of biopesticides and their classifications, current status and prospects.

Keywords biopesticides; chemical pesticides; economy; eco-friendly; pest management.

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1 Introduction

Agriculture is an anthropogenic activity but adversely affected by various pests such as bacteria, fungi, insects, and weeds, leading to reduced crop yield and production quality (Kumar, 2012). Over the past 50 years, the most common method for pest control has been the extensive use of chemical pesticides (Peshin et al., 2009; Zhang et al., 2011; Peshin and Zhang, 2014; Zhang, 2018). These pesticides were adopted in the 1940s with the help of dichlorodiphenyltrichloroethane (DDT) followed by other organochlorines, organophosphate, and carbamate pesticides, respectively (Nicholson, 2007). After that, the Green Revolution technology of crop

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