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Effects of agrochemicals on the beneficial plant rhizobacteria in agricultural systems

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The implication of kernel phenology in conveying resistance to storage weevil and varietal development in sorghum

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Abstract

Conventional agriculture relies heavily on chemical pesticides and fertilizers to control plant pests and diseases and improve production. Nevertheless, the intensive and prolonged use of agrochemicals may have undesirable consequences on the structure, diversity, and activities of soil microbiomes, including the beneficial plant rhizobacteria in agricultural systems. Although literature continues to mount regarding the effects of these chemicals on the beneficial plant rhizobacteria in agricultural systems, our understanding of them is still limited, and a proper account is required. With the renewed efforts and focus on agricultural and environmental sustainability, understanding the effects of different agrochemicals on the beneficial plant rhizobacteria in agricultural systems is both urgent and important to deduce practical solutions towards agricultural sustainability. This review critically evaluates the effects of various agrochemicals on the structure, diversity, and functions of the beneficial plant rhizobacteria in agricultural systems and propounds on the prospects and general solutions that can be considered to realize sustainable agricultural systems. This can be useful in understanding the anthropogenic effects of common and constantly applied agrochemicals on symbiotic systems in agricultural soils and shed light on the need for more environmentally friendly and sustainable agricultural practices.

Keywords:

Chemical; Fertilizers; Soil microbiome; Anthropogenic effects; Sustainable agriculture