

Controlled-release fertilizers: advances and challenges

ABSTRACT

Controlled- release fertilizers (CRFs) offer an excellent option to improve nutrients uptake by plants and reduce the environmental hazards due to excess release of chemicals. Polymer-coated fertilizers, compared to the other types of CRF, are by far the most intensively researched topic because of their great characteristics. Polymer-coated fertilizers, which are less sensitive to the soil and environmental factors, offer superior control over nutrients release for plants uptake. In recent years, the art has mainly focused on the design of biodegradable polymer-based coating for fertilizers considering the effective control on nutrient release. This review covers the basic information about CRFs with an emphasis on the development of polymer-coated fertilizers. Topics that are discussed herewith include materials and methods utilized for coated fertilizer, particularly polymer-coated fertilizers, manufacturing and related issues. The large market potential for fertilizer using necessitates more studies for development and commercial production of polymer-coated fertilizers.

Keyword: Controlled-release fertilizer; Nutrient; Coating material; Polymers; Environment