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Multiwalled carbon nanotubes enhancing nitrogen uptake and use efficiency of urea fertlizer by paddy (Article)

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Abstract

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Efficient use of urea fertilizer (UF) as important nitrogen (N) source in the world's rice production has been a concern for the economic sustainability of cropping systems. The use of carbon-based materials to enhance UF efficiency still facing a great challenge. Hence, N Nano-carrier is developed based on functionalized multiwall carbon nanotubes (f-MWCNTs) grafted with UF to produce urea-multiwall carbon nanotubes (UF-MWCNTs) for enhancing the nitrogen uptake (NU) and use efficiency (NUE). The grafted N was found efficiently absorbed and utilized by rice, and overcome the N propensity for loss from soil-plant systems when UF-MWCNTs are applied. The UF-MWCNTs shown tremendous NUE up to 96% and NU at 1180mg/pot. The chemical changes were monitored by Raman spectroscopy. Hence, UF-MWCNTs provides a promising strategy in enhancing plant nutrition for rice.

Author keywords

Functionalized MWCNTs Nitrogen uptake Nitrogen use efficiency Urea

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	Universiti Teknikal Malaysia Melaka	UTeM

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