

CANOPE (Carbon Nanodots Plant Enhancer) Improving Growth Plant by Using Carbon Nanodots Synthesized from Citric Acid

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Abstract

Agriculture has been one of the vital fields in maintaining national food security for hundreds of years and requires innovation in improving the quality and quantity as well as diversification. One of the efforts to improve the quality of agriculture is to apply nanomaterials in agriculture. Carbon nanodots (C-dots) are one of the materials that have future applications in agriculture, because they are biocompatible, as well as enhance the transport of plant nutrients. In this study, C-dots were successfully synthesized using citric acid with time and temperature variations using the pyrolysis method and have been able to exhibit good performance in the application of plant growth enhancers, growth plant enhancers through hydroponic growing systems. The synthesized C-dots have absorption characteristics in the 270-300 nm region and photoluminescence at a wavelength of 495 nm where the best synthesis parameters are at a temperature of 225°C and a time of 60 minutes. Application of C-dots in a deep water culture hydroponic planting system using *Ipomoea aquatica* showed that c-dots increased plant growth by 28.5%.

Keywords : C-dots, citric acid, growth plant enhancer, hydroponics