

Effect of bat guano and rabbit urine liquid fertilizers on growth physiognomies of *Spinacia oleracea* under hydroponics

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Abstract

This pilot research study assessed the effect of bat guano and rabbit urine as organic nutrient sources for growing *Spinacia oleracea* (spinach) under a non-circulating hydroponic system. Three treatments; bat guano (5 g/L of water), rabbit urine (50 ml/L of water) and a commercial hydroponic fertilizer as the positive control were tested. Three-week-old spinach seedlings were transplanted into a small net cup fitted on a 4-litre bucket. Data collected on plant height, root length and number of leaves was analyzed using Origin Pro software. Single factor ANOVA results showed no significant difference in the height of spinach grown using bat guano, rabbit urine and commercial hydroponic fertilizer solutions ($P < 0.05$). A significant difference was observed on the length of the root and number of leaves among the three hydroponic solutions ($P < 0.05$). Results showed that both bat guano and rabbit urine have the potential to be used in hydroponic spinach production.

Keywords

Hydroponics, Kratky method, Organic farming, Soilless farming, Sustainable agriculture.