Study on soil management by using different kinds of compost combination with bio-fertilizers LDD 12 for Khao Dowk Mali 105 production in Roi-Et province

Mr. Atiwat Sittipinyapat Mrs. Oomara Chenghom

Abstract

The objectives of this study were to compare the use of bio-fertilizers LDD 12 combination with compost between LDD recommendation and farmers use, which affect on the some soil chemical properties, rice (Khao Dowk Mali 105 variety) yield and the economic internal of return. The study site was located at Ban Ku Phra-Kona, Suvarnabhumi, Roi-Et province during May 2010 - December 2011. Soil was the soil series group no.17 (Renu soil series). A randomized completely block design (RCBD) with 7 treatments and 3 replications were employed. The result of this study found that soil pH in all treatments were increased (ranged from 5.67-6.53) as compared to the control treatment. Soil organic matter was increased (ranged from 0.44-0.66%). Available phosphorus had high significantly different in all treatments as compared to the control. The use of compost produced by farmer production alone, compost produced by farmer with chemical fertilizer at the rate ½ and compost produced by farmer with chemical fertilizer at the rate ¾, led to the highest available phosphorus in both 2 years (ranged from 11-18 mg kg^{-1}) and potassium in year2 (7.7-11 mg kg^{-1}). In addition, the soil treated with compost produced by farmer alone had highest calcium in year2 (458.67 mg kg^{-1}), while the use of compost produced by farmer with chemical fertilizer at the rate ¾ had highest in magnesium contents (47.33 mg kg^{-1}).

This soil management led to increase in the rice growth and yield composition (such as stem per tiller, panicle per tiller, 100 seeds weight) in all treatments, especially in soil treated with compost and chemical fertilizer. This management led to increase in whole kernels (95%). The soil applied with compost produced by farmer with bio-fertilizers LDD 12 and chemical fertilizer at the rate ¾ (treatment no.7) showed highest average rice yield in both 2 years (626.5 kg rai^{-1}). Moreover, the average economic internal of return in both 2 years had highest (5,726.75 baht rai^{-1}) in the treated with compost produced by LDD with bio-fertilizers LDD 12 and chemical fertilizer at the rate ¾ (treatment no.6), followed by the use of compost produced by LDD with bio-fertilizers LDD 12 and chemical fertilizer at the rate ½ (treatment no.4, 5,509 baht rai^{-1}). The result of this study indicated that the use of compost produced by LDD with bio-fertilizers LDD 12 and chemical fertilizer at the rate ½ was the suitable soil management, resulting in increase in Khao Dowk Mali 105 yield and economic internal of return.

Keywords: Khao Dowk Mali 105 variety, bio-fertilizers LDD 12, rice