

Ruttanaporn Cochawong 2013: Effects of Multi-mixed Organic Fertilizers on Quality and Yield of Asparagus (*Asparagus officinalis* Linn.), and Chemical Properties of Kamphaeng Saen Soil Series. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Ms. Saengdao Khaokaew, Ph.D. 129 pages.

Improper management of fertilizers in asparagus (*Asparagus officinalis* Linn.) cropping can be costly to farmers and may result in poor yield quality. This study aims to investigate the effects of three organic fertilizers on soil chemical properties, as well as the yield and spear quality of asparagus (Brock's Improved cultivar) grown in Kamphaeng Saen Soil Series. Three of the fertilizers studied, called "W" (swine manure pellets), "SMB" and "SMC" formula, were prepared from a mixture of biogas sludge (S), cattle manure (M), and oil palm empty fruit bunch (B) or rice husk charcoal (C), respectively. Field experiments were conducted using Randomized Complete Block Design (RCBD), with three replications and eight treatments (no fertilizer, only synthetic fertilizer, SMB, SMC, or W at low and high amounts with synthetic fertilizer). The low and high amounts of each organic fertilizer were calculated based on its nitrogen content, i.e. a low amount ($56.8 \text{ kg N rai}^{-1} \text{ year}^{-1}$), and a high amount ($170.4 \text{ kg N rai}^{-1} \text{ year}^{-1}$). For every treatment that involved organic fertilizer, the synthetic fertilizer 16-16-16 formula was also applied, at the amount of $30 \text{ kg N rai}^{-1} \text{ year}^{-1}$.

Results showed that applying high amounts of SMB, together with the synthetic fertilizer, significantly enhanced the spear quality (grade ALG) and yield of the asparagus. The control treatment, where no organic and synthetic fertilizers were added, resulted in the lowest yield. The treatment that only involved the synthetic fertilizer resulted in the lowest quality of asparagus spear (grade SL). The soil organic matter content, soil cation exchange capacity, and asparagus yield increased in every treatment where organic fertilizers were added. Additionally, positive relationships between the amount of asparagus yield and nitrogen, calcium, magnesium, sulfur, iron, and zinc up-taken from soils were observed. The use of each organic fertilizer employed in this study resulted in an accumulation of nitrate in the soil. An accumulation of phosphate zinc and copper in the soil was observed when swine manure pellet was applied. This study demonstrated that the three organic fertilizers mixed with the synthetic one increased the quality and quantity of the asparagus grown in Kampaengsean Soil Series.

Student's signature

Thesis Advisor's signature