

Prattana Ploddee 2009: Chemical and Physical Properties Changes of Sugarcane Filter Cake During Decomposition and Their Effects on the Quality of Organic Fertilizer Pellets. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Thongchai Mala, Ph.D. 76 pages.

Chemical and physical properties changes of sugarcane filter cake during decomposition and their effects on the quality of organic fertilizer pellets consisted 2 experiments. Experiment 1, changes of chemical and physical properties of organic fertilizer was organized as completely randomized design with 3 replications. Six treatments of various mixtures of filter cake were 1) filter cake (FC), 2) filter cake + calcium sulfate (FC+CS), 3) filter cake + urea (FC+U), 4) filter cake + ammonium sulfate (FC+AS), 5) filter cake + urea + ammonium sulfate (FC+U+AS) and 6) filter cake + urea + ammonium sulfate + calcium sulfate (FC+U+AS+CS). The result revealed that treatments FC+U+AS+CS and FC+U+AS decomposed completely within 6 weeks and the chemical and physical properties of organic fertilizer showed had the highest quality. The temperature of the compost pile of both treatments were the same as ambient atmosphere while, the C/N ratio ($< 20:1$), the pH and electrical conductivity was in the standard range of organic fertilizer. The application of urea and ammonium sulfate enhanced the decomposition of the filter cake, but, the nitrogen loss from urea treated material was higher than that of ammonium sulfate application one. For experiment 2, the study on the quality of pellet organic fertilizer production from sugarcane filter cake with various added mixtures was arranged into 5×6 factorial in completely randomized design with 3 replications. Factor 1 was decomposition intervals times (0, 2, 4, 6 and 8 weeks). Factor 2 was various mixtures of compost previously assigned in experiment one. Every treatment, with binder, was granulated in a pan-granulator. The result revealed that application of urea and ammonium sulfate enhanced chemical properties of organic fertilizer pellets. Calcium sulfate application decreased time of granulation and increased pellets strength. Material FC+U+AS+CS showed dominant chemical properties of organic fertilizer pellets than others. The sugarcane filter cake decomposed within 6 weeks while, the granulation period, pellet dissolving, strength and bulk density acquired the highest quality. The nutrient content, the C:N ratio, pH and electrical conductivity were in the standard range of organic fertilizer.

Student's signature

Thesis Advisor's signature

____ / ____ / ____