

Pornrudee Sanguansook 2009: Development of Molded-Pulp Pot Packaging from Palm Oil Sludge and Activated Sludge Cake for Plant Seedlings. Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging Technology. Thesis Advisor: Mr.Lerpong Jarupan, Ph.D. 143 pages.

The study aims to utilize industrial wastes from an extraction operation of palm oil and pulping process for making pot packaging for plant seedlings. The experimental plan spans determining an appropriate proportion for making plant pots from palm oil sludge (POS) and activated sludge cake, improving strength by an additive, and investigating effects during the decomposition of pot package on chemical properties of soil as well as the growth of plant seedlings at the first stage. The study results showed that the appropriate proportion between POS and activated sludge cake to facilitate the fabrication of plant pots by a hydraulic compression method with cassava starch solution at concentration of 25% (w/v) were 100:0, 75:25 % (w/w). It was found that the obtained pot packaging withstood a maximum compression load at 2,544 N and drop height at 65.20 cm. After examining the decomposition of pot packaging under various soil conditions: submerged, saturated, and dry, the results showed that pot packaging under submerged soil gave the highest decomposition rate (48.05-54.05 % in submerged soil, 38.98-41.95 % in saturated soil and 7.06 -7.71% in dry soil) ($p \leq 0.01$). In addition, chemical properties of soil under the submerged condition, the decomposed pot packaging which had the fertilizer as a mixture showed the highest levels in electrical conductivity (0.365-0.482 dS/m), organic matters (1.71-1.76%), total nitrogen (0.069-0.075%) and total phosphorus (23.17-28.58 mgP/kg). Finally, the investigation upon the growth at the first stage of three plant seedlings, viz, *Peltophorum pterocarpum*, *Xylia xylocarpa*, and *Pterocarpus macrocarpus*, which grew in the pots that had mixed with the fertilizer as a mixture showed the highest higher levels in the height, trunk diameter, the amount and the SPAD reading of leaf including to dried biomass on surface of soil than the pots with no fertilizer mixture. To this end, it can concluded that pot packaging made from POS and activated sludge cake can be used with plant for cultivating seedlings and substitutes plastic bags in plantation activities in order to reduce impact toward the environment.

Student's signature

Thesis Advisor's signature