Nutta Sangnarin 2010: Phytoremediation of Lubricant Contaminated Soil
by Purple Guinea Grass. Master of Engineering (Environmental Engineering),
Major Field: Environmental Engineering, Department of Environmental Engineering.
Thesis Advisor: Associate Professor Wilai Chiemchaisri, D.Tech.Sc. 157 pages.

The objective of this study is to find the optimum conditions for obtaining highest efficiency treatment of lubricant contaminated soil by purple guinea grass (*Panicum maximum.*TD58). There were five experimental-set up via pot study of 56 days-planting period including: variation of lubricant concentrations, grasses densities, C/N ratios, soil depths and re-treatment methods. The experimental pots were examined for oil content, oil fraction, plant growth and soil activities.

The results showed that purple guinea grass could treat lubricant contaminated soil containing oil content below 30 g oil/kg soil with the optimum plant density of 3 plants/pot, C/N ratio of 49/1 and giving the highest removal efficiency at 0-20 cm. of soil depth. These conditions could enhance highest removal efficiency of total extractable matter (52%), or of oil fractions: saturate compound (52%) aromatic compound (42%) and polar compound (64%). In addition, lubricant treatment efficiency could be increased to 71% by re- treatment of treated soil through shoot cutting method in order to stimulate tillering of grasses. 42-51% removals of soil lubricant were mainly via biodegradation of soil microbes in rhizophere. Besides, it was found that contaminated lubricant could stimulate the growth of hydrocarbon utilizing bacteria (HUB); soil respiration rate and dehydrogenase activity. In contrast, it inhibited catalase activity and nitrifying bacteria activity. However amendment of appropriate urea in the lubricant contaminated soil could recover nitrifying bacteria activity as well.

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