SUMMARY

RIDHO BILHAQ. The Effect of Silicate to the Releasing Pattern of Phosphorus Andisol Lembang with Successive Resin Extraction. Supervised by ARIEF HARTONO and LILIK TRI INDRIYATI

Andisol is soil order which covers wide area in Lembang, West Java. Lembang is a horticultural crops area with intensive phosphorus (P) fertilization for years. Therefore P total in Andisol Lembang is very high. The efforts to mine in Andisol Lembang is necessary to increase the efficiency of P fertilization and decrease P enrichment in water system. The objective of this research was to evaluate the effect of silicate to the realeasing pattern of native P from Andisol Lembang.

Soil sample was collected from Indonesian Vegetables Research Institute, Lembang, West Java. Silicate in form Na$_2$SiO$_3$ (Sodium Silicate) equal 0%, 1%, 2.5% and 5% CaSiO$_3$ (Calium Silicate) that was used by Hartono (2008b) was added to the 300 g (oven-dry weight) soil and incubated for one month. A completely randomized design in three replications was set up. The number of experiment units were twelve experiment units. Water content was maintained on 80 % water field capacity. Phisicochemical properties analysis, P fractionation and P successive resin extraction were held at Chemical and Soil Fertility Laboratory, Soil Science and Land Resource Department. After one month incubation, ten successive resin extraction and P fractionation were conducted. Data of successive resin extraction were simulated with first order kinetic equation.

The results with successive resin extraction showed that application of silicate increased the maximum P release. Silicate application in form Na$_2$SiO$_3$ (Sodium Silicate) equal 5% CaSiO$_3$ (Calium Silicate) resulted in the highest maximum P released. While the application 0, 1 and 2.5 % resulted in the maximum P released 275, 479, and 744 mg P kg$^{-1}$ respectively. pH values after silicate application increased to neutral pH. Silicate application in form Na$_2$SiO$_3$ (Sodium Silicate) equal 5% CaSiO$_3$ (Calium Silicate) resulted pH increasing to the pH 7.0. While the application 0, 1 and 2.5 % resulted pH 6.5, pH 6.7 and pH 6.7 respectively. The results from P recovery showed that P inorganic Fraction (amount of cumulative resin-P$_i$, NaHCO$_3$-P$_i$, NaOH-P$_i$, and HCl-P$_i$) in initial ware not different from those silicate treatment. The changes of P fractions after successive resin extraction showed that NaOH-P$_{inorganic}$ (Al-P dan Fe-P) dan HCl-P$_{inorganic}$ (Ca-P) were P fractions contributed to P released. Each fraction contribute 42 and 40 % from total resin-P$_i$ value respectively. The results suggested that silicate can be used to mine P from Andisol Lembang.

Key words: Andisol Lembang, Phosphor release, Successive Resin Extraction