

RELATIONSHIPS BETWEEN LABILE PHOSPHORUS AND OLSEN PHOSPHORUS TEST VALUES OF ALKALINE SOILS

A. Rashid*, T. Hussain** and A. Razzaq**

ABSTRACT

For the development of soil and plant phosphate (P) model, the soil labile-P values are required in addition to fertilizer P availability indices. This study was conducted to determine the relationship of labile-P (IRA-400 anion exchange resin, NaHCO₃ form) with a routine Olsen-P (NaHCO₃ extractant) method in order to develop predictive equations for labile-P. Nineteen alkaline surface soils representing a wide range of properties with initial P treatment at the rate of 0, 30, 60, and 90 mg P kg⁻¹ soil were used in laboratory experiment for a 7-day and a 6-month incubation period. Labile-P (P_l) and Olsen-P (OP) increased with increased P rates. P_l related linearly to OP values at all P rates, showing a decreasing trend in correlation coefficient ($r = 0.877^{**} - 0.751^{**}$ with a 7-day incubation; $r = 0.856^{**} - 0.643^{**}$ with a 6-month incubation) with increased P rates. After a 7-day incubation, about 77% of variation in P_l were explained by the regression equation and it decreased to 50% at higher P rate. Both incubation periods showed similar relationships, indicating the feasibility of a 7-day incubation period for such studies. Using mean values of all P treatments of a 7-day incubation (76 soil P test values), the relationship was further improved ($r = 0.92^{**}$, $P = 0.01$) by a workable predictive equation of labile-P (P_l) from Olsen-P (OP): $P_l = 7.936 + 1.385 OP$