LONG-term Effect of Fertilizers and Organic Manures on Yield and Dynamics of Phosphorus and Potassium in Soil under Pearl Millet-wheat Cropping Sequence

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Abstract—*Long-term monitoring allows both the identification of current changes in soil and prediction of future changes. Long-term experiments are valuable tools for determining yield trend, understanding changes in yield, estimating nutrient dynamics, and assessing system sustainability. An on-going long term experiment initiated in 1995 under pearl millet-wheat cropping was selected to investigate the effect of fertilizers and organic manures (FYM, poultry manure and press mud) on yield and dynamics of phosphorus and potassium in soil under pearl millet-wheat cropping sequence. Among the inorganic P fractions, Al-P, Fe-P, Ca-P and Saloid bound-P, whereas, of inorganic K are exchangeable- K, non-exchangeable-K and water soluble-K are dominate fractions in soil. The results showed that lowest grain yield of wheat crop was recorded when either 15 t FYM or 5 t poultry manure or 7.5 t pressmud ha^{-1} was applied alone. However, a significant increase in yield was obtained when organic manures were applied in conjunction with recommended dose of NP for the crop and that was comparable with recommended dose of applied NP alone. Highest amount of P (Saloid-P Al-P, Fe-P and Ca-P) and K (Water soluble-K, Exchangeable- K and Non-exchangeable-K) fractions were recorded when organic manures were applied in conjunction with recommended dose of NP fertilizers compared to organic manures applied alone. Among the different fractions of P and K, Ca-P and Non-exchangeable K were found dominant in soils, respectively.*

Keywords*: P fraction, K fraction, yield, organic manures, fertilizers*