B-24 : EFFECT OF ACIDULATED FELDSPAR ON SOIL SOLUTION pH, K, Ca AND Mg

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The feldspar at Kaikawela comprises Sri Lanka's largest deposit of potash, ranging 10 - 16% K_2O. An attempt was made to solubilize K-feldspar by using nitric, sulphuric and phosphoric acids to obtain available K and other plant nutrients from this locally available source. The soluble K content (0.024%) in pure feldspar doubled with acidification when 5g of the 5:1 feldspar : acid (wt/vol.) mixture was extracted with 100 ml deionised water. However the recovered K content even after acidulation was less than 0.5% of total K available from feldsper.

The feldspar acidulated with sulphuric acid was applied at rates of 200 and 1000 kg/ha and compared against a control under field moisture conditions (18 - 27%) in a pot experiment, using a soil from Kalutara (active soil pH 5.36). Soil solutions were extracted by centrifuging 150g of soil and analysed for K, Ca and Mg. Active and total soil pH was measured one month after treatment.

There were no significant changes in soil pH after one month of treatment. The active soil pH in the 1000 kg/ha treatment was 5.31 (S.D. 0.05) compared to the control pH of 5.5 (S.D. 0.02). Soil solution pH after 5 weeks was 5.48 and 5.43 units respectively. Observed changes in soil solution K, Mg and Ca are discussed. Noticeable changes were only observed at the 1000 kg/ha rate of application.

Preliminary results indicate that feldspar can only be used as a soil ameliorant or very slow-release fertilizer. Acidulation appears not to be able to increase it even to a partial substitute status. This may result from the framework structure of feldspar which makes it a very resistant mineral even to acid attack compared to the sheet-layer structured mica.