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Experiment No-4: Determination of lime requirement of acid soils

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Theory

While a slightly acidic condition is often favorable for crop growth but a higher degree of soil acidity mostly exerts an adverse effect on crop growth and hence such acid soils need lime application to improve the productivity. The quantity of lime required to bring the pH to the desired level will vary according to the nature of the soil. The procedure given by Shoemaker et al. (1961) is being widely followed for determining the lime requirement of acid soils of pH less than 6.0.



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Reagent

Extractant buffer: 1.8g nitrophenol, 2.5 mL triethanolamine, 3.0 g potassium chromate, 2.0g calcium acetate and 53.1 g calcium chloride dehydrate (all chemically pure) are dissolved in a liter of water and the pH adjusted to 7.5 with dilute NaOH solution.

Instrument

A glass electrode pH meter.

Beaker, Glass rod

Procedure

To 5g of air-dry soil taken in a dry 50 mL beaker, 5 mL distilled water and 10mL of the extracting buffer are added and stirred continuously for 10 minutes or intermittently for 20 minutes. The pH of the suspension is determined on the basis of which the requirement of lime is read from the following table. The values are given in tons of pure calcium carbonate per acre required to bring the soil to the pH indicated and are to be converted to their equivalents of the form of agricultural lime to be used.



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Observation: Students must compare your results with above chart and write proper conclusion in tons per acre.

Sample No Lime requirement (t acre⁻¹)

1.

2.