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# On the Evaluation of Nutrient Pools of Forest Soils

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**Abstract:** The standard method of assessing the available portion of the nutrient reservoir of a forest soil is to use a neutral salt solution, such as  $\text{NH}_4\text{OAc}$ , to extract the exchangeable plus dissolved ions, which are analyzed and considered available. This approach, designed for evaluating nutrients available for the short growth term of agricultural crops, is inadequate for assessing the nutrient pool of forests where tree growth term may reach 100 yr or more.

Soil nutrient reservoirs were evaluated in two forest soils for K, Na, Ca, Mg and Fe, using an approach based on continuous extraction of the elements and kinetic analyses of the extraction rate curves. The analyses of the curves indicate that K, Na, Ca and Fe are each released at four separate constant rates, and Mg is released at three separate constant rates. By analogy with similar kinetic studies done on monomineralic layer silicate samples, each separate extraction rate is thought to correspond to a single type of bond site in the soil. Higher extraction rates indicate greater ease of removal and are interpreted as indicating a higher degree of availability relative to the extractant.

The available K reserves of the Everett soil evaluated by standard methods, compared with annual net K uptake rates of its forest system, indicates growth limiting K deficiency in 12– 17 yr. K availability assessed by kinetic analyses indicates about 100 yr supply of K is available.

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