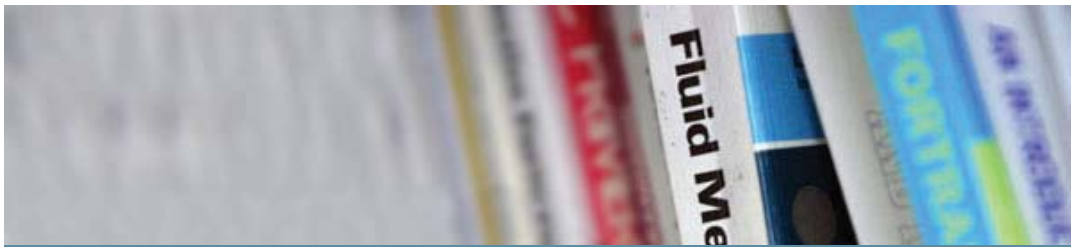

Titre du document / Document title
Changes in aluminum pools of Andisols due to soil acidification

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Résumé / Abstract
Aluminum concentrations in soil solutions are not only controlled by inorganic clay minerals but also by organically bound aluminum. The objective of this study was to determine which pools contribute to Al dissolution. Soil samples were taken at various distances from tree trunks and at various depths at the Rolling Land Laboratory (RLL), Hachioji, Tokyo. Selective dissolution techniques were used to analyze the changes in pools of solid-phase aluminum. Soil pH values around Hinoki cypresses were in the aluminum buffer range. Exchangeable aluminum contents in soils under Hinoki cypresses were 104 $mmol_c\ kg^{-1}$ on the average. This value was similar to that of the cation exchange capacity (CEC) of Andisols at RLL at a soil pH of 4. The relationship between the soil pH and exchangeable, organically bound, and amorphous aluminum pools showed that dissolved aluminum ions in the soil solution were primarily derived from the amorphous Al pool. Dissolved aluminum ions were substituted with base cations of soils, resulting in the increase of the content of exchangeable Al and/or the formation of complexes with organic matter which increased the proportion of organically bound Al pools. Increase in the proportion of organically bound Al pools indicated the importance of complexation with soil organic matter for controlling the aluminum concentration in the soil solution.

Revue / Journal Title
Soil Science and Plant Nutrition **ISSN** 0038-0768 **CODEN** SSPNAW

Source / Source
2000, vol. 46, n°4, pp. 797-805 (1 p.1/2)

Langue / Language
Anglais

Editeur / Publisher
Japanese Society of Soil Science and Plant Nutrition, Tokyo, JAPON (1961) (Revue)

Mots-clés anglais / English Keywords
Acidification ; Chemical modification ; Pool ; Cation exchange capacity ; Dissolution ; Complexation ; Chemical concentration ; Cation exchange ; Partition ; pH ; Spatial variability ; Aluminium ; Aluminium complex ; Aluminium ion ; Amorphous state ; Bound form ; Organic matter ; Solid phase ; Soil solution ; Andosol ; Experimental study ; Honshu ; Acid soil ; Forest soil ; Japan ; Asia ; Property of soil ; Chemical properties ; Physicochemical properties ; Coniferales ; Gymnospermae ; Spermatophyta ; Softwood forest tree ; Soil chemistry ;

Mots-clés français / French Keywords
Acidification ; Modification chimique ; Pool ; Capacité échange cation ; Dissolution ; Complexation ; Concentration chimique ; Echange cation ; Partition ; pH ; Variabilité spatiale ; Aluminium ; Aluminium complexe ; Aluminium ion ; Etat amorphe ; Forme liée ; Matière organique ; Phase solide ; Solution édaphique ; Andosol ; Etude expérimentale ; Honshu ; Sol acide ; Sol forestier ; CHAMAECYPARIS OBTUSA ; Japon ; Asie ; Caractéristique sol ; Propriété chimique ; Propriété physicochimique ; Coniferales ; Gymnospermae ; Spermatophyta ; Arbre forestier résineux ; Chimie du sol ;

Mots-clés espagnols / Spanish Keywords
Acidificación ; Modificación química ; Pool ; Capacidad intercambio catión ; Disolución ; Complexación ; Concentración química ; Cambio catiónico ; Partición ; pH ; Variabilidad espacial ; Aluminio ; Aluminio complejo ; Aluminio ión ; Estado amorfo ; Forma ligada ; Materia orgánica ; Fase sólida ; Solución suelo ; Andosol ; Estudio experimental ; Honshu ; Suelo ácido ; Suelo forestal ; Japón ; Asia ; Característica suelo ;

Propiedad química ; Propiedad fisicoquímica ; Coniferales ; Gymnospermae ; Spermatophyta ; Arbol forestal resinoso ; Química del suelo ;

Localisation / Location
INIST-CNRS, Cote INIST : 10004, 35400009393175.0030

Nº notice refdoc (ud4) : 858038