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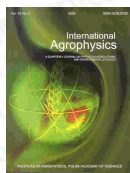
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Effect of management of a volcanic ash soil on structural properties

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abstract In Hapludand, Southern Chile with different types of land use and differentiated time periods after clear-cutting of the native forest by fire, the following parameters: pore size distribution, bearing capacity, internal cohesion, penetration resistance and spatial stress distribution due to loading were determined. The most pronounced settlement occurs immediately after forest clearing. During consecutive periods of land use, the settlement rate became smaller. Additionally, the major settlements occur on the sites with a long time of agricultural landuse while mere strong grassing had a smaller effect. As expected, changes in the pore size distribution could be detected. Coarse pores decrease and the amount of medium pores increases. These changes depended on the pedological environment and soil use. Due to the rearrangement of the parent volcanic ash material and the corresponding aggregates during soil settlement as a consequence of stress induced changes in the shape of the particles and the more spherical shape, soil penetration resistance increased with settlement as well as the amount of roots above the plow pan layer. The latter is also an index of the impermeability as a consequence of the assumed increase in the contact points due to loading and "reformation" of these particles. According to utilization-type, soil strength differs. The same soil can either react very stable or is extremely weak even if only a small stress, e.g., by an agricultural machinery, has been applied. Recently, cultivated agricultural sites have low pre-compression strength and internal cohesion values. Due to the rearrangement of particles and shape as a consequence of soil deformation during land use the strength increase even if the pore size distribution doesn't change considerably. More detailed informations are given in the text.

keywords soil management, structural properties, volcanic ash soil