

A preliminary study of chemical properties in temperate forest fire of the Chilean Andean range for planning of ecosystems restoration

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Abstract

Despite vegetation in fire-prone landscapes having different fire adaptations, a change in the worldwide fire regime could affect all ecosystem processes and systems. In this sense, soil systems play a key role in ecosystems, not only providing inorganic nutrients to plants, but also serve as filter water and carbon storage. The aim of this research was to identify the effects of wildfire on the chemical properties of young volcanic soils over the medium-term in two natural protected areas of Andean Mountain range. A comparative statistical analysis was performed to identify significant differences in different soil parameters between forty-eight unburned and burned soil samples. Therefore, significant differences were identified between evaluated samples in organic matter, macronutrients, micronutrients, and cation exchange capacity. Whilst organic soil matter and potassium content substantially increased due to incomplete vegetation combustion; the presence of calcium content and cation exchange capacity decreased with the occurrence of fire. Our findings showed that there were significant differences between unburned soils or a soil that had been burned once and soil that had been burned twice in thirteen years. These findings should support decision making, improving the selection of passive or active restoration actions and thus efficiency in forest management. © 2022 Centro di Ricerca per la Selvicoltura, Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria. All rights reserved.

Author keywords

Fire impact; forest restoration; soil properties