



Physical and hydrological properties of the soil after Pine harvesting in Maule, Chile

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The south of Chile has been under great pressure for about 150 years, with the replacement of native forests by agricultural crops and subsequently by plantations with fast-growing exotic species.

Historically, it was considered that these plantations have stopped the degradation process of the ground. However, the restoration of the soil system can be considered as very limited or even null because of three reasons: the rotations of these artificial forest systems are too short (just 25 years), the chosen areas are already degraded land, and after the harvesting it is common to get fire to clean.

The objective of this research was to evaluate current forest management practices of these forest systems to make them more sustainable, mainly studying the effect of harvesting and waste management planting some physical - hydrological properties of the soil.

This research was done in "Las Brisas", a degraded soil characterized by different planting practices of forest species, which have been harvested and, after that, burnt for taking out the residual waste. The study tried to determine the variations in the water content of the soil after fire at different depths, obtaining moisture profiles that reflect the change in soil moisture while simulating rain occurs, temperature of the fire.

Several samples were taken and divided into four different experiments of management practices: some of them were dry, others were burnt, others suffered both processes and the last no process at all. Some analysis were done to determine the behavior of the main hydrological properties (ie particle size distribution, aggregate stability, hydrophobicity, infiltration).

The information collected was analyzed by the hydrologic model Hydrus -2D, to fully assess the impact of the extraction of the forest from a highly sensitive system erosive phenomena. The information obtained will be published.