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Fire-induced risk in Andisols: An State-of-the-Art

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Wildfires are increasingly recognized as the primary natural hazard affecting forests and woodlands (Pausas, 2004), and changing the soil properties due to the heat (Aznar et al., 2013). They are also the factor that determines the increase in soil and water losses (Cerdà, 1998a; Shakesby, 2011). Fire contributes to increase the surface runoff due to the water repellency (Mataix-Solera et al., 2004; Cerdà and Doerr, 2008) although a quick recovery is found when vegetation is recovered (Cerdà, 1988b; Guénon et al., 2013). Within the recovery process ash is the key factor once the vegetation is recovered (Bodí et al., 2011; León et al., 2013; Pereira et al., 2013). To reduce the impact of forest fires some strategies were developed (Prats et al., 2013). The fire direct and indirect impacts on ecosystems and the human population, infrastructures, supplies and goods have been increasing over the last decades due to climatic and socio-economic changes and are projected to increase further in the future. In the densely populated volcanic regions that are characterized by steep and fire-prone slopes, Andisols are the main soil type. Their mineralogical properties provide them with specific chemical and physical properties which strength their fertility and resistance to erosion but also differentiate their response to environmental disturbances such as land use change (Jiménez et al., 2006; Neris et al., 2012) but also forest fires and agricultural burning (Neris et al., 2013; Poulenard et al., 2001). Despite their relevance for human development and safety, little specific knowledge exists about them and papers addressing their singularities are limited. This works seeks to compile and review existing scientific works focused on the effects of fire on this particular type of soils, evaluate their response to this disturbance and identify knowledge gaps related to the fire-induced risk in Andisols in order to develop new lines of research.

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