



Effects of shrub clearing in soil organic carbon stocks in a sub-mediterranean mountain area

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Land abandonment and secondary vegetation processes produce negative effects on the environment: increasing the risk of wild fires, reducing the availability of surface runoff and ground water, decreasing biodiversity and landscape esthetic quality, and the loss of grazing resources. With the aim of controlling these negative effects, during the last years it has been proposed to intervene in the territory using prescribed fires and/or shrub clearings (Lasanta et al., 2015).

In the Northwestern Iberian System (Spain) 25% of the total shrub areas have been cleared between 1986 and 2017. Until now, the positive effects of shrub clearings have been tested on fires control, the increment of grazing resources and the development of extensive livestock, and in the landscape structure (Lasanta et al., 2009, 2016). In this study, we present the preliminary results related to the effects of shrub clearing activities on soil organic carbon stocks.

In the Leza Valley (Iberian System, La Rioja, Spain) 72 soil samples were analyzed in 6 land uses/land covers (control meadows, rockrose, junipers, shrub clearing 5 years, shrub clearing 15 years and shrub clearing 24 years) and four depths (0-10 cm, 10-20 cm, 20-30 cm and > 30 cm). The results demonstrate that: (i) the highest soil organic carbon values are recorded in the first 10 cm and in all cases values decrease in depth; (ii) control meadows present the highest soil organic stocks in the surface and depth layers; (iii) secondary succession covers (rockrose and junipers) show lower values than control meadows and similar values to shrub clearing 15 years; and (iv) shrub clearings produce variables results: new shrub clearing (5 years) present the lowest soil organic carbon stocks, increasing these values in the shrub clearing 15 years and decreasing in the shrub clearing 24 years. Although these results could be considered preliminary and in-depth analysis should be carried out, they guide sub-mediterranean mountain management actions, that will determine local effects (fires, biodiversity, quality and meadows production...) and global effects (ecosystem services, carbon stocks...).

Acknowledgments: This research was supported by the ESPAS project (CGL2015-65569-R, funded by the MINECO-FEDER). Estela Nadal-Romero was the recipient of a “Ramón y Cajal” postdoctoral contract (Spanish Ministry of Economy and Competitiveness).

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