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I International Conference on Research for Sustainable Development in Mountain Regions

Book of Abstracts

INSTITUTO POLITÉCNICO DE BRAGANÇA

Centro de Investigação de Montanha

Embrapa

United Nations Educational, Scientific and Cultural Organization · UNESCO Chair in Sustainable Mountain Development

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Sy06O07

Assessing the soil fertility and the tree nutritional status of chestnut groves grown in the region of Bragança, Northeastern of Portugal

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In the NE of Portugal there is a growing interest in the chestnut tree crop which has led the producers to intensify the cropping system, namely by increasing the use of fertilizers. However, few studies exist on the adaptation of the chestnut trees to soil conditions as well as their response to fertilizer application. The soil testing and plant analysis laboratory of the Polytechnic Institute of Bragança initiated a project aimed to assess the soil fertility of the chestnut groves and the tree nutritional status in order to be able to better advise the producers in their annual fertilization programs. Soil (217) and leaf (84) samples were collected in three counties of NE Portugal (Bragança, Vinhais and Macedo de Cavaleiros). The results show high acidity in soils [pH<4.5 (4%), 4.51< pH<5.5 (68%), 5.51< pH< 6.5 (27%)]. The organic matter content was lower than 3% in 79% of soil samples. More than 50% of soil samples presented P contents classified as very low (25%) or low (32%). Most of the samples revealed K contents classified as high (58%) or very high (29%). Leaf nutrient concentrations varied in the ranges of 14.8-27.8 (N), 0.8-3.1 (P), 2.6-15.9 (K), 2.4-17.0 (Ca), 0.8-4.4 (Mg) g kg^{-1} and 10-215 (B) mg kg^{-1}. However, in spite of the great variability in leaf concentration of each one of the nutrients analyzed, no significant relationships were found between soil properties and the concentration of the nutrients in the leaves. The organic matter content was not correlated with leaf N concentration. The same occurred between extractable soil P and K and the concentration of these nutrients in the leaves. The best linear relationship was found between soil pH and leaf Mg concentration. The results also stressed that little information on tree nutritional status can be drawn from soil testing.