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EFFECTS OF NATURAL AFFORESTATION OF GRASSLANDS IN NORTHERN ITALY ON STOCKS AND FRACTIONS OF SOIL ORGANIC CARBON

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Land-use change is considered one of the major driving forces of global carbon fluxes; moreover it can induce significant alteration of soil carbon stocks. In the Italian pre-alps socio-economic structural changes have led in the last decades to a process of reduced management intensity/abandonment of grasslands characterized by low fertility or located in unfavorable areas. These areas are usually colonized by seedlings of the tree species growing in the surrounding areas. The net effect of grassland afforestation on soil carbon is not completely clear, due to the differences in management intensities and different turnover times of aboveground and belowground carbon stocks. The aim of the project is to study the effects of abandonment of grassland on soil carbon stocks, along a land-use management intensity gradient in Trentino region (northern Italy). Four different contrasting land uses were considered: I) managed grassland; II) abandoned grassland; III) natural afforested area abandoned after 1973; IV) reference forest (older than 1861). The study area has an elevation of about 1150 m, with south aspect and gentle slope. Both the afforested area and the reference forest are mixed forests, dominated by Norway spruce and beech. Each sampling point consisted of eight soil cores collected according to a systematic sampling scheme to a depth of 30 cm. After dividing the cores into four depth increments, carbon and nitrogen content were determined with an elemental analyzer. SOM fractionation by size and density will be performed in order to detect carbon changes in functionally homogeneous SOM fractions.