



Afforestation contribution to Carbon and Nitrogen budgets of forest in a natural park in south Spain

Beatriz Lozano-García and Luis Parras-Alcántara

University of Córdoba, Department of Agricultural Chemistry and Soil Science, Spain (a72logab@uco.es)

Forests are important ecosystems because they provide wood products to society as well as many services (recreation, habitat functions, the regulation of water, erosion, and air quality). However, the society has recently focused its attention on forests for two reasons; sequestration of carbon, on the one hand, and provision of biomass for bioenergy, on the other, also illustrates the possible trade-off even within the theme of climate change mitigation. Due to this fact, the forest surface has increased in Spain, as well in Europe in the last decades. The area covered by forest represents 34% in Europe and 35.6% in Spain compared to the total surface.

A powerful afforestation policy was carried out in Spain from the 40's decade in forward. The main objective was to increase the forest surface with trees. Two main actions were developed under these repopulations, the transformation of pasture land in forest, on the one hand, and the introduction of fast-growing tree species, on the second hand. Therefore, currently, there are a lot of forest areas in Spain in which the introduced species coexist with native.

In addition, the spatial variation of soil properties is significantly influenced by some environmental factors such as topographic aspect that induced microclimate differences, topographic (landscape) positions, parent materials, and vegetation communities. Topographic aspect induces local variation in temperature and precipitation solar radiation and relative humidity, which along with chemical and physical composition of the substrate, are the main regulators of decomposition rates of organic matter.

The aim of this study were, i) to evaluate the effect of afforestation policies on carbon and nitrogen budgets in a natural park in Spain and ii) to study the topographic aspect effect on the capacity of SOC and N storage.

Our results show how the afforested areas (in which there are simultaneously both, natural species and introduced species) had higher soil organic carbon (SOC) and nitrogen (N) concentrations and SOC and N stocks than the natural areas.