



## **The growth of pines germinated from woodchip mulch in restored soils from semiarid SE Spain quarries is enhanced by organic amendments**

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The use of pine woodchips in soil restoration in calcareous quarries is a relatively low-cost mulching technique to improve soil water conservation and decrease soil erosion, contributing to improve soil quality. Besides these two important effects, woodchip mulch is also a potential source of seeds which can germinate if environmental conditions during earlier stages are adequate. Pine germination has been observed in experimental plots treated with pine woodchips used as mulch in one of the driest regions in Europe (SE Spain). This side-effect provided an interesting opportunity to analyse the influence of topsoil and two organic wastes (compost from domestic organic waste and sewage sludge from urban water treatment plant) in mine soils on the germinated pines (*Pinus halepensis* Mill.) and the plant cover (revegetated native plants and spontaneous vegetation). Number, height and basal diameter of pines and the total plant cover were measured 6 years after the applications of topsoil and organic amendments. Results showed that organic wastes increased the pine growth and the total plant cover which could favour in turn the physico-chemical soil properties and its quality in the medium-long term. However, organic amendments negatively influencing the number of germinated pines. The likely growth of pine seedlings derived from the pine cones which come with pine woodchips used as mulch, when enhanced by organic amendments, adds a positive value in quarry restoration even under very dry climatic conditions. However, it is necessary to continue monitoring the development of vegetation to form a more precise idea about whether the development of the pines is globally beneficial, since the pines could outcompete the local native plants.