

Influence of inorganic and organic amendments in the soil properties and the growth and survival of *Olea Europaea* var. *Sylvestris* in the semiarid Mediterranean area

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Selecting the most appropriate types of plants adapted to the harsh climatic conditions of restoring drylands is essential to success in landscape restoration. Besides improving soil quality is a key factor to consider when designing the restoration procedures. The use of organic and inorganic amendments can help with this task.

On this study, we evaluated the influence of different mineral (clays) and organic (compost and poultry) amendments on the properties of a bare soil and how this influenced on the growth and survival of the *Olea europaea* var. *sylvestris*, a perennial bush plant adapted to the Mediterranean semi-arid zone.

Tests were designed and carried out in a greenhouse at the “Experimental Station of Cajamar foundation “Las Palmerillas” in El Ejido (Almería, Spain). Plants were grown in 250L pots and their substrate was bare soil and mineral and/or organic amendments. The experimental design consisted of three replicas for five treatments: 1. compost, 2. “ZeoPro”, a cliptonolite commercial clay, 3. mordenite clay from local quarries plus compost, 4. cliptonolite clay from Turkey plus compost, 5. cliptonolite from Turkey plus poultry; with four levels each one: 5%, 10%, 20%, 30% volume of amendment. Including three control samples without amendment total plants accounted for 63.

Climatic sensors inside and outside the greenhouse permitted to establish the same meteorological conditions for the plants and only emergency watering was supplied when necessary for the survival of the plants when arid conditions were extreme. The physico-chemical soil properties of each treatment and level were analyzed before planting and the biovolume and the survival rates of the plants were measured regularly along eleven months.

Statistically the best treatment for the growing of the plants was number 3 (mordenite and compost) with no deaths recorded. According to the growing rates the best level was soil with 20% of amendment. Besides we analyzed the evolution of the plants along the seasons of the year and we found this plant especially showed good growth rates during the spring.

In conclusion we found in the semi-arid Mediterranean area soils with best quality for restoration with *Olea Europaea* var. *Sylvestris* can be obtained adding combined organic (compost) and inorganic (local mordenite clay) amendments in a fifth of soil proportion.

(* Financial support by Marie Curie Intra-European Fellowship (FP7-577 PEOPLE-2013-IEF, Proposal n° 623393) and (** by the Ministerio de Economía y Competitividad (MINECO) cofinanced with FEDER funds (project CGL2015-71709-R) is acknowledged.