Restoration of soils affected by oil exploitation activities based in functional diversity studies

Jaime Villacis (1), Fernando Casanoves (), Susana Hang (), and Cristina Armas ()

(1) Universidad de las Fuerzas Armadas, Sangolquí, Ecuador (jevillacis@espe.edu.ec), (2) Tropical Agricultural Research and Higher Education Center , (3) Universidad Nacional de Córdoba, (4) Estación Experimental de Zonas Áridas

The functional characteristics of 25 forest species used in the restoration of areas affected by oil extraction activities were determined and species functional groups were constructed. Subsequently, the functional characteristics of the groups were related with performance variables of the species obtained in complementary studies, to make use recommendations. Three functional groups of species with similar responses and / or performance were characterized that showed significant differences between them for quantitative and qualitative traits. The first group formed by all shrubs and the rest of trees, most do not fix nitrogen, have single leaves and all species are evergreen and characterized by having lower values of specific foliar area, foliar nitrogen, dry matter leaf content and wood density, was denominated as intermediate acquisitions. The second group composed only for trees that do not fix nitrogen and with deciduous leaves and characterized by having the highest values of dry matter leaf content and foliar tensile force and intermediate values of specific foliar area and foliar nitrogen, was denominated as low conservative. Finally the third group formed only by trees that fix nitrogen, composed of leaves and mostly evergreen and characterized by having higher values of specific foliar area, foliar nitrogen, foliar phosphorus and lower foliar tensile force, was denominated as acquisitive. The intermediary acquisitions species Apeiba membranacea, Myrcia aff. fallax and Zygia longifolia, and the acquisitive species Cedrelinga cateniformis, Inga densiflora, Myroxylon balsamum, Piptadenia pteroclada and Platymiscium pinnatum, which showed excellent performance in nursery and / or field, represent the most suitable species to be used in reforestation programs of the sites affected by oil extraction activities in the Amazon region of Ecuador, because they have greater potential to protect soil and recycle nutrients in the initial stages of planting.