



Pasture improvement in Spanish Dehesas

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In the south-west of the Iberian Peninsula, the dehesa is a widespread agro-silvo-pastoral land use system, characterized by a grassland with a disperse cover of oak trees and shrubs, where the main production is extensive livestock combined with agriculture and forestry. Many years of inappropriate management of dehesas (deforestation, overgrazing, excessive agricultural activities, etc.) has led to the degradation of vegetation and soils in extensive areas, causing reductions in biomass and biodiversity, affecting the permanence of plants and causing important losses of palatable species. As there is growing interest in these wooded rangeland ecosystems due to their economic importance and high environmental value, the recovery of the original pasture biodiversity and the increase of productivity, together with the conservation of the environment, are the main goals in these areas of low productive potential, degraded and subject to soil erosion. Soil and climate conditions have a great influence on grassland production, with rainfall producing strong seasonal and interannual variations.

These natural pastures, mainly composed of summer withering annual species, reach maximum productions in spring and register low values in autumn, slowing down in winter. During the summer dry season, the wilting pastures can offer a good forage for animals. Autochthonous annual legumes play an important role because they are well adapted to local edaphic and climatic conditions and produce hard seeds which germinate in autumn. This helps them to survive the frequent droughts and offer a high quality forage, which is a valuable complement to other pasture plants with lower protein content. Therefore, for several decades, legume seeding combined with the application of phosphate fertilizer has been the most common strategy used to improve pastures in SW Spain, where dehesas cover an area of about four million hectares.

This paper examines the whole process of pasture improvement in these ecosystems and the possibilities for restoring degraded areas in dehesas by recovering pasture, improving its quality, assuring its persistence by means of a correct management, and reducing the risk of soil erosion. To this end, it is important to consider the whole procedure, integrating the importance of our genetic resources which include collecting expeditions, conservation, selection of adequate ecotypes and new varieties. Improvement techniques must be based on the use of these resources and the obtention of well-balanced seed mixtures, taking into account the importance of species diversity. Fertilization, the use of practices which minimize erosion risks, and giving farmers the possibility of using appropriate techniques for multiplying legume seeds must be taken into account.

The persistence of these improvement measures relies not only on the present and future correct management of pastures, but also on the adequate management of the whole ecosystem. Therefore, it is urgent to consider the problem using a multidisciplinary and integrated approach, coordinating all the implicated sectors. Research should be focussed on a multidimensional analysis of these Mediterranean ecosystems and the use of new technologies for the development of model and data-oriented systems to support future decisions.