

SOIL-PLANT-HERBIVORE RELATIONSHIPS IN MEDITERRANEAN SEMIARID
ENVIRONMENTS: EXPERIMENTAL DESIGN FOR A SUSTAINABLE
DEVELOPMENT PROJECT

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ABSTRACT

The soil degradation is a process that is not only a function of climatic factors, but also of its use and management. The abandonment of many tilled lands of the mediterranean area in our country with or without conservation tilling, being or not grazed by sheep has produced the need for a project of sustainable development in these environments. We aim to optimize factors that affect the conservation/production equilibrium of soil-plant-herbivore systems.

INTRODUCTION

One of the main aspects to consider in the development of sustainable projects is the correct management according to the environmental conditions of each region of the three natural and inter-connected resources the soil, the vegetation and the livestock. However, these resources are often considered independently over a short time, and without an integral view of them. In our country, big extensions of the mediterranean area with low rainfall and exclusive use for cereals and/or sheep (González and Hernández, 1990), are much damaged as a result of ignoring the complex system of soil-plant-herbivore. With the aim of assessing this relationship a project was prepared to try to provide the basis for the ecological development of these resources. This follows previous work by Hernández and Pastor, 1989; and Hernández et al. 1990.

MATERIALS AND METHODS

The work has been carried out in two experimental farms located in the Central area of Spain, with similar climate but with different soils, frequently used for dry farming, grazing or fallow-cereal rotations with the sheep participation (Table 1). The experimental design (Table 2) takes into consideration the different uses of these soils and their repercussions on soil structure modification, potential pioneer pasture plants and sheep stocking rate. The evaluation of the different treatments will be done by the characterization over four years of soil compactation phenomena, the productivity losses by erosion of the surface soil layer, the quantification of the nutritive elements for the plants, the action of the organic fertilizer left by the sheep, the improvement of the grazing legumes and grasses for these environments and sheep production. FAO and PNUMA methodology (1980) has been followed for soil degradation of non-tilled lands.

TABLE 1. Characteristics of experimental farms

Farm	Altitude (m)	Precipitation (mm)	Sustrate	Soil	pH
La Higuera (H)	460	450	Arkoses	Luvisol-Vertisol	6 - 7
El Encín (E)	600	470	Terraces	Alfisol	7,6 - 8,5

TABLE 2. Treatments of experimental plots.

Types	Time (years)	Plots (n°)		Sheep grazing
		H	E	
Total abandon	>10	2	1	Yes
Cereal abandoned	5			
. with stubble burning		5	-	No/Yes
. without stubble burning		5	3	No/Yes
Cereal abandoned with stubble burning	0			
. with tilled conservation		7	-	Yes/No
. without tilled conservation		4	-	Yes/No
Leguminous crop for sheep production	4	-	4	Yes

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GRASSLAND MANAGEMENT MODULE

- A PART OF THE INTEGRATED FARM MANAGEMENT SYSTEM

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ABSTRACT

A computer programme called, The Grassland Management Module has been developed by the Danish Agricultural Advisory Service to be used by farmers and advisers. This Module forms part of the INTEGRATED FARM MANAGEMENT SYSTEM. The Grassland Management Module is primarily a planning tool. The programme draws up a field plan for all grass fields. This plan contains data on field size, crop, expected yield, growth profile and number of pens. Data is recorded on the number of cows and heifers to be grazed or be fed grass in the stall. The amount of grass available to cows and heifers, respectively, is calculated. The amount of grass to be fed can then be based on the knowledge available on the feed requirements of cows and the supply of other feedstuffs. An order of priority in terms of available fields is fixed for pasture, for cutting, grazing and stall-feeding. In the planning procedure the required area for grazing is calculated. Furthermore, the number of pens required is calculated as well as the number of grazing days per pen.

INTRODUCTION

In Denmark a manual grassland calendar for pasture

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