CONVERSION OF ROCKROSE (*Cistus ladanifer* L.) SCRUBLAND INTO BIODIVERSE PASTURES

REVIT ALGARVE

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INTRODUCTION

- Pastures in the Mediterranean region are crucial for the preservation of local agriculture and biodiversity. Well-managed pastures improve soil structure and fertility, reduce erosion and improve water retention. This is especially important in a region with hot and dry summers and mild and wet winters. These agricultural systems play a crucial role in sequestering carbon, therefore contributing significantly to climate change mitigation efforts. In addition, the Mediterranean pastures are crucial for the conservation of endemic plant species and habitats for various wildlife species

In Quinta do Freixo (Algarve, Portugal) with an area of around 800 hectares, dense shrubland of rockrose (*Cistus ladanifer* L.) are converted into pastures using a holistic method that includes shrubs mechanical cutting, spreading biodiverse hay and grazing with Campaniça sheep.

MATERIALS AND METHODS

- The applied technique consists in letting the herd enter the field, with the area divided in plots with approximately 1 ha where they stay 4 to 5 days (1000 sheep/hectare). In this period the sheep will consume all the vegetation present on the land, as well some bales of hay spread throughout the area. The seeds of forage species of hay are redistributed do the soil and buried by the trampling of the animals, resulting on its germination with the first rains of autumn.

- The biomass production was estimated using a pasture plate meter. A calibration equation, the ratio between the height and the quantities of biomass (kg MS ha^{-1}), was obtain for each type of pasture. A determination of the floral cast was done in a area of 0.101 m^2. The plants were divided by botanical families and dried as 60°C until a constant weight.

- A nutricional value analysis took place by determining the contents of humidity, ash, crude protein, neutral detergent fiber (NDF), acid detergent fiber (ADF), acid detergent lignin (ADL), and *in vitro* digestibility.

Figure 1. Dense shrubland of rockrose (*Cistus ladanifer* L.) are converted into pastures. **Pasture A:** plot intervened in 2022 (3.4 hectares) and whose hay composition was based on oats and vetch. **Pasture B:** plot intervened in 2023 (2.9 hectares) and whose hay composition came from a meadow with a biodiverse mixture of legumes and grasses.

RESULTS

SPECIES-RICH PASTURES

Figure 1. Transformation of shrubs dominated by rockrose (*Cistus ladanifer* L.) into biodiverse pastures, with Campaniça sheep.

Table 1. Average nutritional value of pastures and rockrose. Values for humidity, ash, crude protein, neutral detergent fiber (NDF), acid detergent fiber (ADF), acid detergent lignin (ADL), and *in vitro* digestibility in % of dry matter ± standard error. For each parameter analyzed, different letters represent significant differences between samples (P ≤ 0.05).

Treatment	Humidity	Ash	Crude protein	NDF	ADF	ADL	Digestibility
Pasture A	5.7 ± 0.3 a	6.6 ± 0.2 a	9.8 ± 0.6 a	48.7 ± 1.3 b	32.3 ± 0.7 b	5.1 ± 0.9	57.6 ± 2.5 a
Pasture B	4.7 ± 0.4 b	5.7 ± 0.2 b	8.4 ± 0.4 b	58.8 ± 0.5 a	36.1 ± 0.5 a	6 ± 0.4	46.5 ± 1.5 b
Rockrose	3.5 ± 0.1 c	3.9 ± 0.0 c	5.9 ± 0.1 c	29.8 ± 0.3 c	20.7 ± 0.8 c	6.8 ± 0.9	42.9 ± 0.3 b

CONCLUSIONS

This approach contributed to the development of species-rich pastures, with legumes and grasses and characterized by high protein, high fiber content and excellent digestibility. In addition, the control of shrublands through this practice maintains biodiversity and reduces the risk of wildfires by effectively managing fuel loads.

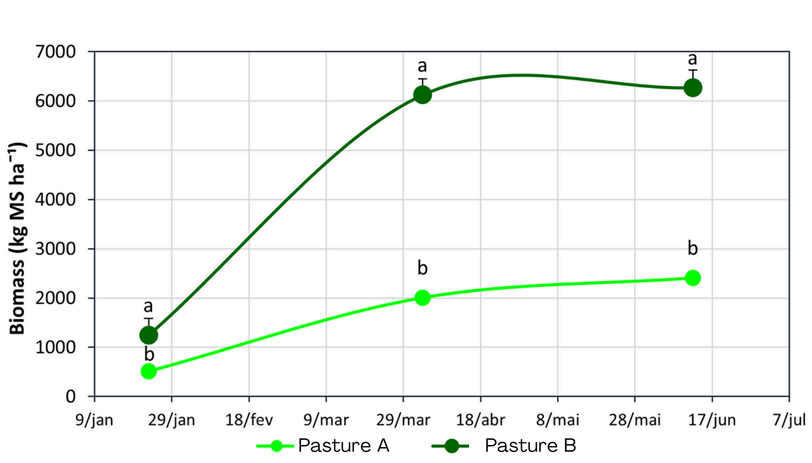

Figure 2. Evolution of average dry matter (DM) production in 2024. Different letters indicate significant differences between treatments (P≤ 0.05).

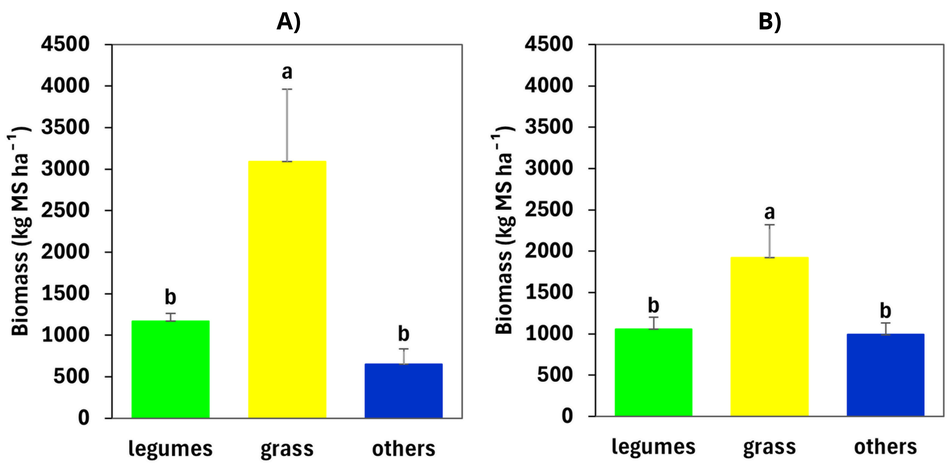

Figure 3. Average biomass production (Kg DM ha^{-1}): A) Pasture A and B) Pasture B. Different letters indicate significant differences between treatments (P≤ 0.05).

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