



ITHub 5 – Agroforestry Systems

FOREST4EU partner: USC

OG: Platform to support the management of Mediterranean pastures using nearby and remote sensors (GRASSEN)

OG's country: Spain

Type of Innovation: Technological innovation



Development of a platform through sensors for pasture management in the dehesa

Introduction

The dehesa is the most representative agroforestry system in Europe, occupying more than 940 622 ha in Andalusia (Southern Spain). In this region, livestock is the main activity of the dehesa where pasture and acorns are the basis of livestock feeding. However, it is important to be aware that in the dehesa, the management of herbaceous pastures is not a simple task mainly due to the diversity of the soils, the presence of trees, the differentiated agricultural uses and the particularities of the Mediterranean climate. For this reason, in the dehesa it is necessary to develop pasture management tools that allow land managers to know the production and quality of the pasture in order to plan grazing, the provision of complementary feed, the pasture fertilisation or the enrichment of the seed bank. In this context, currently, the diversity of existing and operational sensors mounted on nearby and/or remote platforms have the capacity to offer a high volume of data about the territory at low cost and with a spatial and temporal resolution appropriate to the needs of the dehesa.

Objective

The aim of the operational group GRASSEN is to develop a platform to support the management of pastures in the dehesa, through the integration of information from different types of nearby and remote sensors, combined with field information.

Actions

To achieve the GRASSEN objective, the following actions are being carried out: i) Analysis of experiences in the application of sensorisation and remote detection to pasture management in different biogeographic regions, ii) Compilation of geo-referenced data on production, structure and quality of Mediterranean pastures and forage crops in the dehesa, together with information from remote (Sentinel 1 and 2) and nearby spatial sensors (multispectral, hyperspectral sensors and Lidar data), iii) Development of mathematical models using different

algorithms and machine learning techniques that allow estimating pasture production, structure and quality based on information from nearby and remote sensors, iv) Validation of the developed models in a pilot farm, taking into account the barriers that limit the application of this technology in the dehesa farms, v) Development of a prototype web platform with alphanumeric and cartographic information derived from the production, structure and quality models of the pastures and their temporal evolution, vi) Development of a mobile application to consult the information included in the web platform, vii) Demonstration of how to use the information included in the web platform to make decisions in pasture management.



Figure 1: Use of platforms to support the management of pastures in the dehesa.

Lessons learnt


With the development of this operational group, a series of relevant results for the agroforestry sector have currently been obtained: i) List of most common pasture varieties in Andalusia, ii) Report on the main types of pastures cultivated in Andalusia, iii) Protocols of image analysis for pasture in vegetative growth through SENTINEL-2, iv) Protocols of image analysis for pasture in vegetative growth through unmanned flights and multispectral cameras, v) Action protocol to develop mathematical models that allow estimating pasture production, its structure and quality through information from nearby and remote sensors, vi) Development of mathematical models to estimate pasture production, structure and quality through information from nearby and remote sensors.

The information presented in this factsheet was developed by the FOREST4EU partner, drawing on the innovations and knowledge generated by the indicated operational group with their explicit authorization.

Further information

<https://cicap.es/project/go-grassen/>



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