



BOSCOLAMENTO Project: Virtual fencing for the grazing management of Maremmana cattle in an agrosilvopastoral system

Chiara Aquilani¹, Giovanni Argenti¹, Edoardo Bellini¹, Riccardo Bozzi¹, Andrea Confessore¹, Camilla Dibari¹, Marco Moriondo², Lapo Nannucci¹, Nicolina Staglianò¹, Alice Cappucci³, Elisa Gasparoni³, Marcello Mele³, Alberto Mantino⁴, Francesca Vichi⁴, Carolina Pugliese¹

¹ DAGRI, Univ. Firenze, IT: chiara.aquilani@unifi.it

² CNR-IBE, Firenze, IT

³ Centro di Ricerche Agro-ambientali "E. Avanzi", Univ. di Pisa, IT

⁴ TELLUS srl, Pisa, IT

Introduction

Agroforestry systems provide alternative highly valued feed resources for animals when grazing biomass is scarce (i.e., dry seasons or winter) and/or when fodder production is not enough to satisfy herd requirements. In this context, the use of innovative technologies, such as Virtual Fencing (VF), can greatly sustain farmers to improve the efficiency of these grazing systems. VF is a promising technology based on GPS collars able to manage animals by setting virtual boundaries on the grazing areas: when the animals approach the fences, they receive an audio cue followed by a low electrical pulse, if animals cross over the fences. BOSCOLAMENTO project aims to test VF in a silvopastoral system with Maremmana cattle. This work presents the project, which is currently ongoing.

Materials and Methods

The trial takes place in Maremma (southern Tuscany) on 30 hectares composed by pastures and forest grazing systems.



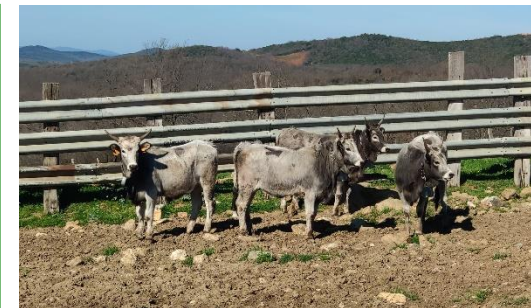
The testing activity is framed into six phases:
PHASE 1: Weighing of animals; wearing of VF collars; and collection of hair samples for cortisol analysis, to evaluate the effect of chronic stress in response to the VF.

PHASE 2: Training test in a small paddock (1.5 ha), for two weeks

PHASE 3-5: Evaluation of VF on meadow-pasture, weed after first mowing and weed after second mowing

PHASE 6: Pasture on wood.

GPS animals' positions will be remotely collected, as well as the stimuli emitted by the collars. Herbage are on-field sampled inside and outside physical exclusion zones located on the pasture and within the woodland. These data will be used to correlate them to NDVI trajectories from Sentinel2, to develop a simplified model for pasture production.



Expected Results

The introduction of VF in a Mediterranean agrosilvopastoral system will allow to test the effectiveness of innovative grazing management by optimizing the forage supply from multiple resources. Moreover, the expected outcomes will contribute to evaluate the actual impact of the application of precision livestock farming technologies in agroforestry systems on animal welfare and costs of management.

Conclusions

BOSCOLAMENTO project aims to contribute positively to the development of a sustainable precision grazing strategy with the integration of woody vegetation and crops

Acknowledgments: BOSCOLAMENTO project «Virtual fencing per la valorizzazione del BOSCO ceduo tramite la gestione sostenibile del pascolamento di bovini di razza maremmana»