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Evaluation of spatial and temporal variability of pasture based on topography and the quality of the rainy season

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Abstract Yield and botanical composition of a given dry-land pasture are heavily influenced by rainfall distribution, and vary according to topography. Through analyzing these parameters, it is possible to identify patterns of spatial distribution, related to topographic characteristics, which can be used to improve spatial management of pasture. The main objective of this project was to assess the role of rainfall, temperature and topography in the spatial and temporal variability of pasture and establish models for predicting the spatial distribution and yield of certain plant species, based on its topographic characteristics. This study was carried out over three years, 2004 to 2006, in a dry-land pasture located in Southern Portugal. The data obtained were analyzed as a function of distance to flow lines and the results demonstrate that certain topographical characteristics, associated with agronomic information, can be very useful in explaining the spatial and temporal variability of yield and the botanical composition of the pasture. The slope of the linear regression of the variables mentioned can be used to estimate the spatial variation of yield and the botanical composition as a function of distance to flow lines. The regression coefficient can be estimated from the annual rainfall, given the strong correlation between the two.

Keywords Spatial and temporal variability · Pasture · Site-specific management · Topography · Quality of the rainy season

Introduction

In precision agriculture, the main goal is to understand and manage the variability that exists within an agricultural field. A key element in this process is making maps that show

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