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ABSTRACTS

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Outline

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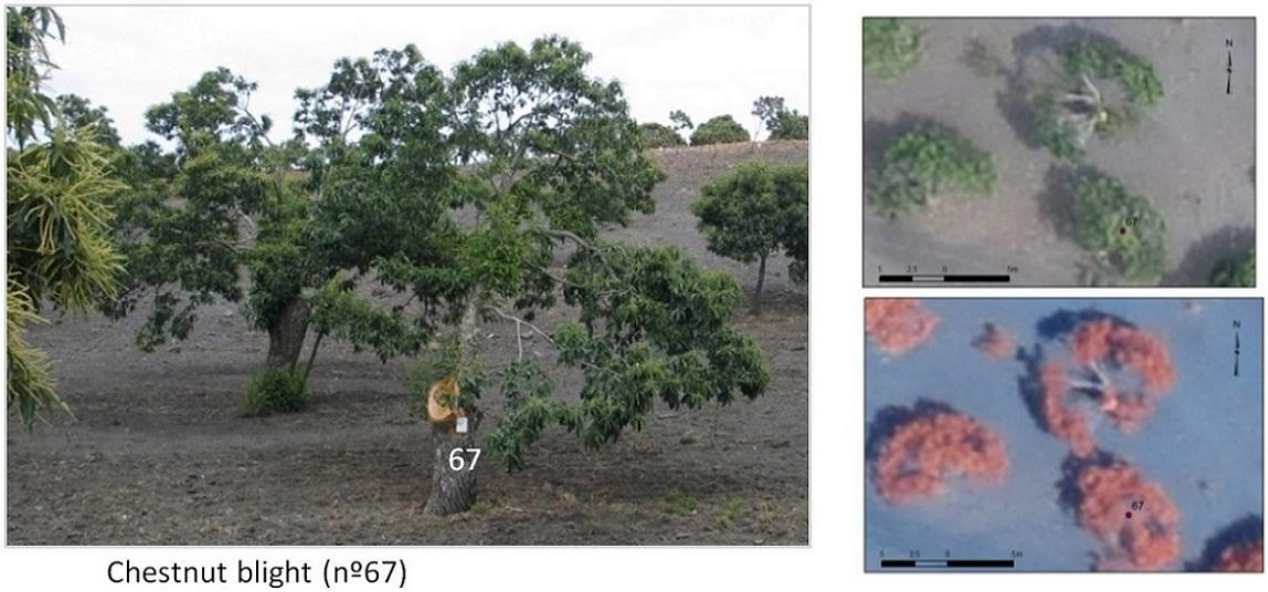
Monitoring of chestnut health condition using an Unmanned Aerial Vehicle

L. Martins[1], J. Sousa[2], J. Castro[3], R. Bento[2]
[1]*University of Tras-os-Montes and Alto Douro, Centre for the Research and Technology of Agro-Environmental and Biological Sciences, Vila Real, Portugal*
[2]*University of Tras-os-Montes and Alto Douro, INESC-TEC, UTAD, Vila Real, Portugal*
[3]*Polytechnic Institute of Bragança , CIMO-ESAB, Bragança, Portugal*
lmartins@utad.pt

Chestnut ink disease (*Phytophthora cinnamomi*) and chestnut blight (*Cryphonectria parasitica*) are diseases that cause important damages to European chestnut (*Castanea sativa*).
After two decades from the first occurrence of chestnut blight in Portugal, the hypovirulence began to be observed in some locations. The population of these strains is characterized by low diversity. Many of the sub-populations belong to the EU-11 group, which appears only in some orchards in Italy.
Successful treatment depends on the way the population of the fungus extends in the area to be treated. This study refers to the monitoring of inoculations in Padrela region (north Portugal).
The field evaluation was compared to remote sensing techniques that have the ability to collect information from various samples over a large area in a short time, especially with recent developments in sensors on spectral and spatial image resolution. The aerial images obtained by Unmanned Aerial Vehicles (UAVs) for vegetation monitoring has been motivated by the benefits as compared to full size airborne operation, namely the combination of high image quality and quick turnaround times together with lower operation costs and complexity.
For monitoring and evaluating the treated area and know the chestnut decline, were made in June 2014 aerophotogrammetric flights, covering 483 ha. It was used an UAV (*eBee*, *SenseFly*) and were obtained color and near infrared aerial photographs (Fig. 1). Those photographs were compared to aerial images obtained by piloted aircrafts in 2006.
In the period 2006-2014 occurred new chestnut plantations (67 ha), due to the eight multifunctional value of chestnut tree. However, in the study area the decline of chestnut was 56%. The biotic agents were the principal causes of the mortality and *C. sativa* decline, who was confirmed by field observations.
There are advantages on using UAV for the study purposes. Due to the low flying heights, resulting high resolution imagery, and lower image acquisition costs, compared to piloted aircraft or satellite images. UAV cover wide areas, and are virtually undetectable (flights 300 m, up ground), so animals won't be disturbed. The electric UAVs, do not have polluted emissions, resulting in benefits to the environment.

Figure 1: Chestnut tree affected by *C. parasitica* and aerial images obtained by UAV.



Chestnut blight (nº67)

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