



## **Banana Disease Detection by Close Range Hyperspectral Image**

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Bananas are one of the most appealing fruits in the world. It is reported according to the United Nations that global banana exports reached about 18 million tons in 2015. Black Sigatoka (BS) is a constant threat to banana farmers worldwide. It can cause yield losses of more than 30%, particularly in the small farms. Detection of BS is difficult, once visible symptoms appear in the leaves, the whole crop may be already compromised. Therefore, early detection of BS is very important to prevent the disease spread and reduce damage to crop production.

Hyperspectral (HS) imagery is relatively recent and has not been widely applied in plant pathology. Most work focused on measuring the crop damage using satellite images and more recently using cameras mounted on unmanned aerial vehicles (UAV). Typically, the aim of HS imaging in remote sensing is the discrimination of healthy and unhealthy plants.

In this paper, we present our current work on close range hyperspectral image (including visible and near infrared spectrum) to detect BS pre-symptomatic responses in banana leaves. We will also demonstrate that machine learning on time-series HS images analysis can benefit earlier detection of potential banana diseases. Both the method's details and the results of a comprehensive test will be presented at EGU 2018.