

EGU22-10511

<https://doi.org/10.5194/egusphere-egu22-10511>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## UAV-based precision mapping techniques for disease and pest identification

**Abraham Mejia-Aguilar**<sup>1</sup>, Dana Barthel<sup>2,1</sup>, Ekaterina Chuprikova<sup>1</sup>, Ben Alexander McLeod<sup>1</sup>, Massimiliano Trenti<sup>2</sup>, Christine Kerschbamer<sup>2</sup>, Ulrich Prechtl<sup>3</sup>, and Katrin Janik<sup>2</sup>

<sup>1</sup>Eurac Research, Center for Sensing Solutions, Bolzano, Italy (abraham.mejia@eurac.edu)

<sup>2</sup>Laimburg Research Centre, Group of Functional Genomics

<sup>3</sup>Laimburg Research Center, Plant pathology group & Coordination sustainable cropping systems

Mountain agriculture is a vital social-economic activity in Europe, including the alpine Province of South Tyrol, Italy. Here, apple orchards and vineyards are extensively cultivated. Besides the difficulty to cultivate in mountain terrain (steep slopes, difficult accessibility, extreme weather conditions), the plants are exposed to a combination of biotic and abiotic stresses that can result in diseases caused by pathogens. It results in the loss of the yield and quality of products, economic losses, reducing food security with severe ecological impacts, and affects many ecosystem services (such as agrotourism).

This work presents a proximal sensing technique based on an unmanned aerial platform with a payload consisting of multi and hyperspectral optical cameras. Such platforms are suitable to access rugged terrains in a short time to map the presence of diseases and pests, as well they provide imagery for the optimal management of farms. We study three different experiments: apple orchard, vineyard, and forestry, observing Apple proliferation, Flavescence dorée, and Pine processionary, respectively. We aim at a non-invasive and non-destructive method to monitor plant diseases in the direction of high-precision mapping agriculture applications by exploring supervised classification methods based on ground data to distinguish healthy and unhealthy trees.