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DEVELOPMENT OF A TRAINING PROGRAM FOR ENHANCING THE USE OF ICT TOOLS IN THE IMPLEMENTATION OF PRECISION AGRICULTURE

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T.P.3 Technical Visit Guide 2 - Data collection using Remote sensors in a real Production Unit

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1 Objective of the Technical Visit

The technical visit will aim to familiarize students with practical activities regarding data collection using remote sensing systems. Therefore, it is suggested that the minimum necessary activities that will take place will include the demonstration and explanation on how to create a UAV mission / flight plan for data collection on a selected parcel of interest. Ideally, a multispectral sensor and a thermal sensor should be available at the demonstration, and perform data collection with both.

Considering that, the person that will conduct this demonstration will be a licensed drone pilot, or in the case that the technical visit organizer is not one himself, he should of course be accompanied by one in order to conduct the UAV operations with safety, it is suggested that the nomothetic and legal regulations of each country / region regarding drone flights and operations are thoroughly explained. Additionally, information on how to perform flights safely, the various parameters that affect our measurements and the required maintenance on our UAVs and mounted equipment should be also mentioned.

2 Suggested schedule of the visit

- 1) The visit should be scheduled in an open field agricultural production unit that is capable of hosting all the students in each group.
- 2) The students should be introduced to the concept of optimal planning for UAV flights, including but not being limited to:
 - a. Planning of the flight, identification of a minimum number (two) of landing spots for the instance that something prevents the pilot from landing in the take-off point.
 - b. Important topological characteristics of the area that we will measure, such as potential difference in elevation that might be a potential danger for our UAV, also taking into consideration the height of obstacles (i.e. trees), and not only ground elevation. If the ground elevation increases by 10 meters, so do the obstacles' height (considering that we use relative altitude and not MSL for our flight).
 - c. Pre-flight check of all components (i.e. for a rotor UAV, rotors and propellers should be rotating normally, all components and cameras should be installed correctly etc.).
 - d. The flight capabilities of our UAV, such as available flight time **with** all components mounted, maximum windspeed limit for safe take-offs and landing.

- e. The endurance of our UAV, such as potential rainfall residence and ability to withstand gusts.
- f. Risk assessment of each operation and basic crisis management strategies.
- g. The decision on the optimal time to perform data collection, including favorable weather conditions with absence of strong winds, gusts and rain/hail, since as already explained they will expose the UAV and our sensors to danger and potential damage.
- h. The decision of the flight plan parameters. This section can examine what is the ideal flight altitude based on the characteristic / parameter that we will measure, the technical characteristics of our sensor, and the final product / dataset, based on which flight parameters such as overlap, sampling interval and cruising speed will be decided.

3 Suggested non-technical topics of discussion

Since drone operations are strongly related to the legal regulation of each country, emphasis should be given on all the requirements and safety measurements a pilot should consider, starting with the creation of a flight plan to the execution of the flight and data acquisition.

4 Outputs and data analysis

After the demonstration is finished, it is advised that the technical visit is concluded with a short session in a suitable building / hall for the analysis of the data collected from the data acquisition procedures performed during this technical visit. This will help the students gain a full understanding of all the required steps and methodology on how to use, most importantly in real conditions, the principles and skills they have learned from the theoretical and practical courses of this Training Package.