

## Getting the work field Layout

### Problem Statement

Determining the exact dimensions of the crop field is crucial for the proper navigation of agricultural robots. It is necessary to fix references so that the robotic system performs its movement accurately and repetitively. This requires measuring both the field boundaries and the position of the crop lines.

### Solution

WeLASER solves this referencing problem by first delimiting the field boundary. To do this, it uses RTK technology (Real Time Kinematic) or real-time satellite kinetic navigation, which gives centimeter-level precision in geodetic coordinates (latitude, longitude) to find out, for example, the available manoeuvring space to make turns and stay within the boundaries of the field. The coordinates of the points where the crop lines start, and end are also taken to prevent the robot from destroying the crop.



### Practical recommendations

The methodology consists of manually obtaining the latitude and longitude coordinates of the desired points in the field. To do this, a system consisting of (i) a base antenna that must be fixed and always placed at the same point, and (ii) a mobile antenna, which must be placed precisely at each point, is used. These positions are stored, and after repeating the operation at all other points, the complete measurement of the field is obtained. The layout of the work field must be done only once before the robotization of the task in that field. The coordinates of the crop lines must be taken with each crop; therefore, the automatic procedure described in PA-52 has been developed as an alternative.

**Author:** Pedro Martin-Moscardo (CSIC)

**Date:** May 2023



ALMA MATER STUDIO  
UNIVERSITÀ DI BOLOGNA

