

P09

Assessing the influence of cover crop management on the spatio-temporal dynamic of soil water content under a maize crop by electrical resistivity tomography

Chélin Marie¹, Garré Sarah¹

¹Université AgroBioTech, Liège, Belgium

Amongst other functions, cover crops are known to increase the stability of the soil structure. Commonly, their suppression is realized by using conventional tillage, but that it has been demonstrated to damage the soil structure, which directly impacts the soil water content. The proposed alternatives vary in terms of date, depth and type of tillage. As the soil water content is a major factor in agriculture, it is essential to better understand the influence of the cover crop management on its spatio-temporal distribution. Recent studies demonstrated the relevancy of the electrical resistivity tomography (ERT) to estimate the three-dimensional soil water content distribution. However, only a few of them were performed under field conditions. This study aims at (i) validating the use of the ERT method to estimate the soil water content distribution under field conditions (ii) quantifying the influence of cover crop management on the dynamic of soil water content along the growing season of a maize crop and on Belgian soil types. Three types of cover crop management content will be daily monitored: strip tillage, spring tillage and winter tillage. In order to assess the impact of plants on the soil water distribution, an additional plot will be burned after winter tillage. ERT will be used on a surface of 2 m² for each cover crop management. The validation of the average soil water content will be attended by using Time Domain Reflectrometers (TDR) and suction cups. The water stock obtained by ERT will be validated by using data from a weather station for the estimation of the evapotranspiration and rainfall and minirhizotrons for the assessment of the root water uptake.