Automated Characterization of the Mature Root System Form by a Double-Quadrangle-Shaped Polygon

HIGHLIGHTS: A covering polygon composed of two superimposed quadrangles is used to evaluate form features or to classify the growth strategy of root systems from black-and-white silhouettes. The root system density is addressed by the analysis of the hole distribution provided by the decomposition of background regions in circular elements. Global parameters of the root system form are evaluated from the geometry and density properties of the double-quadrangle-shaped polygon.

KEYWORDS: root system, root phenotyping, image processing, geometry and density characterization.

Context

The root system image processing pipeline

The double-quadrangle-shaped polygon

Global features

Some experimental results

Acknowledgement: this work is supported by Agropolis Fondation under the reference ID 1202-073 through the "Investissements d'avenir" program (Labex Agro: ANR-10-LABX-001-01).