PROJECT: PrimedRoot

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PROJECT TITLE

Impact of a defined bacterial priming scenario on root growth of barley and wheat accessions

CONSORTIUM

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SUMMARY OF THE REPORT

The activation of induced defense mechanisms by various stimuli, such as from pathogens, beneficial microbes, arthropods, as well as chemicals and abiotic cues, is generally regarded as *priming*. Upon *priming*, plants respond stronger and faster to a biotic or abiotic stress event, resulting in robust resistance and securing higher yield. Of note, microbial *priming*-induced plant responses vary between species and depend on the composition of the soil-microbiome as well as on the genotype. Apart from the genetically controlled diversity, the ability of root-associated bacteria to elicit changes in root system architecture (RSA) was shown.However, the interplay between *priming*-induced resistance/tolerance and the possibly related growth promotion, especially regarding root architecture, has not yet been deeply enough investigated. Knowledge about RSA traits could be useful to better understand possible relationships between root and microbes.Here, we propose to use a sophisticated experimental design in the rhizotron system *PKH-Rhizo* at IPK to phenotype the impact of microbial *priming* scenarios on RSA traits of wheat and barley in a genotype- and time-dependent manner. By using a bacterial seed coating prior to sowing in comparison to a control treatment with water we will study the influence of bacterial *priming* on root growth and RSA over a period of four weeks. Using existing data-processing pipelines, we expect insights in the temporal dynamics of changes of RSA induced by *priming* which may likely be species- and genotype-specific. This will finally allow us to identify accessions which positively respond to bacterial *priming*. In summary, the obtained information will help to better understand *priming* mechanisms enhancing plant resistance to biotic and abiotic stress.