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THE ROOT MICROBIOME AND PLANT IMMUNITY

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In nature, plants are attacked by a multitude of pathogens and pests that cause major crop losses in agriculture. To protect themselves, plants can activate a sophisticated immune system. Moreover, plants nurture a large community of root-associated microbiota, which provide them with essential services, such as enhanced nutrient uptake, growth promotion, and protection against pathogens. Research in the Plant-Microbe Interactions group at Utrecht University is focused on understanding plant-beneficial functions encoded by the root microbiome and the role of plant genes facilitating these functions. Recently, we demonstrated that upon foliar pathogen infection, plant roots recruit a consortium of synergistic microbes to their rhizosphere that in turn trigger an immune response in the whole plant body. We also discovered that coumarins in root exudates play an important role in the chemical communication between plant roots and the root microbiome. With our research we aim to provide a rational basis for developing sustainable microbiome-based strategies for disease resistance in next-generation crops that produce more with less input of fertilizers or pesticides.