WWTF Project MA07-008

Mathematics and Rhizotechnology. Mathematical methods for upscaling of rhizosphere control mechanisms.

Abstract

Organic farming systems are an emerging sector of agro-business. They are designed to produce high-quality food while keeping the input of resources such as fertilisers to a minimum. This is achieved through taking advantage of natural soil, microbial and plant processes that contribute towards crop stability, resource acquisition efficiency in terms of nutrients and water, and management practices. Enhancement of the production efficiency of organic farming systems requires profound insight into the complicated interactions of the rhizosphere with its environment. This is advanced by joint experimental and mathematical investigations. Aim of this project is to develop a simulation model that represents the most relevant rhizosphere control mechanisms, applying state of the art mathematical methods to link the processes on a single root scale to a whole root system.

Keywords:
mathematical model, scaling, partial differential equations, plantresource acquisition, root exudation, rooting patterns

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Status: Completed (01.03.2008 - 28.02.2011) 36 months

Funding volume: EUR 430,000

Further links about the involved persons and regarding the project you can find at
https://archiv.wwtf.at/programmes/mathematics/MA07-008