The C-Root Model.

From Mosquito Dispersal to Root Growth.

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Plant root system plays a very important role in plants life. Indeed, the main functions of a root system are anchorage and uptake of water and nutrients. Following several and numerous experiments, various models have been developed, most of them are based on the complete and explicit representation of the root system, like Architectural models or Functional and Structural Models. These models are very complex (many parameters) and are appropriate only at the plant level. At the crop level, these models are no more suitable because of computational limitations .... That is why density based models, describing the evolution of root densities in space and in time have been developed. In [2], a continuous model has been proposed, and applied to simulate the growth of a single horizontal Eucalyptus root. This model, called C-Root, is based on an Advection-Diffusion-Reaction family-like equations, like those considered to study mosquito dispersal [1]. Each operator in the model is related to a root growth process, such as primary growth, branching and mortality.

The aim of this talk is to present the C-Root model as well as new simulations on various root systems. Since root growth is not only endogeneous but may depend on abiotic interactions, we discuss further investigations to couple our model to water and soil nutrients models [3].

References

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