

# van Genuchten Awarded Wolf Prize in Agriculture

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*Martinus Th. "Rien" van Genuchten*

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SSSA and ASA Fellow Martinus Th. "Rien" van Genuchten, professor at The Federal University of Rio de Janeiro, Brazil, was awarded the prestigious Wolf Prize in Agriculture for 2023 "for his groundbreaking work in understanding water flow and predicting contaminant transport in soils." He was instrumental in establishing *Vadose*

*Zone Journal* and served as its first editor.

During his 40-year career, van Genuchten transformed the broad fields of soil physics and vadose zone hydrology, which are central to modern agricultural operations and climate science. He created a much-needed scientific basis for understanding fluid flow and contaminant transport processes in unsaturated soils, including their interactions with the atmosphere above and groundwater below. Contemporary vadose zone hydrology is unthinkable without his many contributions, which established links among agriculture, soil science, geology, environmental sciences, and civil engineering. Particularly important were his studies on the basic processes governing water and chemical transport in soil systems with his work on the nonequilibrium transport of agricultural chemicals remaining a landmark.

He pioneered the representation of dual-porosity and dual-permeability models considering mobile and immobile liquid regions in unsaturated porous media, derived novel analytical and numerical solutions, and performed some of the most definitive laboratory and field experiments to test the models. His models profoundly improved predictions of complex field phenomena and motivated an avalanche of studies along similar lines to address water and chemical transport in natural soils and rocks. Because of their attractive mathematical properties and their simplicity, the “van Genuchten equations” are now universally used in numerical simulators of subsurface flow and transport processes.

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