Obituary: Prof. Dr. Volker Römheld (1941-2013)

After a long, exhausting, but very brave fight against cancer, Volker Römheld passed away in late November 2013. With him the international plant nutrition community has lost a highly knowledgeable expert and an integrative figure. Volker Römheld earned major merits in discovering fundamental processes relating to the acquisition of micronutrients by plants and in characterizing the beneficial contributions of mycorrhizal fungi and associative rhizobacteria to the mobilization of nutrients in the rhizosphere. He further translated this knowledge into practice by developing concepts for phytoremediation or the recycling of industrial and sewage sludge as plant fertilizers. Thereby, he belonged to the group of very few agricultural plant scientists that placed a profound eco-/physiological knowledge of plant behavior into the setting of agricultural plant production. During the past decades he took a more holistic look at nutritional constraints, preferably in organic and tropical production systems, to which he proposed innovative solutions.

After his studies in chemical engineering in Nürnberg and professional experience in a pharmaceutical company, Volker Römheld first came into contact with plant nutrition when he started an apprenticeship in horticulture in 1964. Two years later this experience led him to studies in horticulture at the Technical University in Berlin, where his interest in plant nutrition was noticed by his later mentor Horst Marschner. After passing his PhD under Horst Marschner's supervision, they moved in 1979 to the University of Hohenheim, Stuttgart,

where Volker Römheld obtained his lectureship qualification (habilitation) in 1988. Four years later he became associate professor for plant nutrition with a special focus on fertilization and rhizosphere processes. He held this position until his retirement in 2008, but kept his vigorous scientific spirit until the very end.

A closer look at his work shows that his scientific curiosity led Volker Römheld through almost all areas of plant nutrition and neighboring disciplines. His earliest publications go back to his impressive Ph.D. work, which elucidated mechanisms of iron uptake in different plant species and later led to the famous classification of iron acquisition into Strategy I and II plants. A great strength of his work was to verify his initial findings with independent methodological procedures in independent experimental settings, such as in different culture systems or with different plant species and genotypes. This careful approach allowed him to obtain a more global perspective and to generalize his and others' findings in simplified schemes and models, which became a hallmark of most of his papers. With the help of his deepened chemical education and a great degree of creativity in the experimental design he, together with Horst Marschner, developed new approaches for the visualization of rhizosphere processes, such as pH changes, iron reduction or root exudation at the root-soil interface. As a skilful experimentalist he generated impressive images based on simple techniques that meanwhile have entered textbooks and have become a compulsory part of the training of students in plant nutrition all over the world. This early work has also set the stage for his life-long interest and fascination for rhizosphere biology. Consequently, he further expanded this topic by investigating the contribution of mycorrhizal fungi and associative rhizobacteria to the mobilization of micronutrients in the rhizosphere. With his employment as associate professor he took over teaching duties in tropical agriculture and combined this with a long series of journeys to explore the types and dimensions of nutritional constraints in agricultural production systems, particularly in China, Brazil, Thailand and Canada. There, he was highly

engaged in translating fundamental knowledge into practical solutions, for instance by developing inventive concepts for fertilizer or rhizosphere management.

Besides his never-saturated fascination for plant science, Volker Römheld was also a dedicated teacher. His lectures were characterized by a lively and entertaining combination of basic science with real agricultural problems. He enjoyed challenging students with provocative questions and far-reaching hypotheses, never losing focus on feasible and sustainable solutions. He loved his role as mediator of interdisciplinary approaches and cleverly bridged the borders of disciplinary thinking with original concepts. With his motivating scientific impulses he succeeded in raising the enthusiasm of many young researchers and engaging them in plant nutrition research; this is documented by more than 30 PhD theses. Volker Römheld remained, to the end, an inspiring teacher, an amiable and highly respected colleague and a constructive thinker who left a deep impact in the field of plant nutrition as highlighted by his major contribution to the textbook “Marschner’s Mineral Nutrition of Higher Plants”.

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