Prof. Dr. Klaus Raschke Obituary

On February 21, 2022 Prof. Dr. Klaus Raschke, Emeritus of the Georg-August-University of Göttingen in Göttingen passed away. The German Botanical Society remembers Klaus Raschke as a pioneering plant physiologist. His main research interest was the question of how CO_2 uptake and H_2O release through the stomata of the leaves are adapted to environmental conditions. He succeeded in identifying the biochemical-biophysical processes underlying the opening and closing of the stomata and in characterizing important regulatory parameters. The work of Klaus Raschke and his colleagues made an important contribution to the development of climate models.

Signed: His students, Profs Dr. Rainer Hedrich and Tom Sharkey, together with his successor Prof. Dr. Christiane Gatz on his life and scientific work.

Klaus Raschke was born on January 19, 1928 in Löbau in Saxony and experienced the last days of the 1944/1945 war as a marine on the Baltic Sea. After the war he taught as a teacher in his hometown before studying agricultural sciences at the Universities of Halle and Bonn from 1949 to 1951. Following a notice on the bulletin board, he went as a young researcher to Poona in India, where he worked in agricultural meteorology. He earned his PhD in 1955. His research interest was the impact of environmental change on the microclimate of crop stands. Back in Germany he was an assistant at the Technical University (TU) Berlin in 1958/1959 before leading research projects in the field of potassium fertilization in industry for five years. In 1962 he was drawn back to the academic field and in 1965 he habilitated in botany at the University of Gießen on "Experiments to analyze the guard cell reaction to light and CO_2".

In 1967 Klaus Raschke was appointed to the nascent, federally funded Plant Research Laboratory in East Lansing, Michigan, USA. As early as the early 1970s, he was a world leader in research into guard cell physiology. By developing a sophisticated system to measure gas exchange, his lab was able to non-invasively and quantitatively record guard cell movement in response to various environmental conditions. He also demonstrated in East Lansing that potassium ions move into the guard cells to open the stomata. In 1974 he received a Guggenheim Fellowship for a sabbatical at the Technical University of Munich, where, together with Heide Schnabl, he demonstrated that chloride or malate compensate for the positive charge of potassium and contribute to increasing the osmotic pressure that is important for guard cell movement. At the end of the 1970s, Klaus and his students showed that CO_2 and abscisic acid jointly regulate stomatal opening and closing.

In 1979 Klaus Raschke continued his very successful research on the physiology of stomata at the Georg August University in Göttingen. At the Albrecht von Haller Institute for Plant Sciences, he studied the carbon metabolism of guard cells when the stomata open and close. In particular, he devoted himself to the synthesis, uptake, and release of sugars, organic acids, and ions to fuel the osmotic motor of stomata movement. In order to follow the transport of ions, he established electrophysiology methods in his lab. He and his students benefited from the patch-clamp technique developed by Erwin Neher and Bert Sakmann at the Max Planck Institute for Biophysical Chemistry in Göttingen (Nobel Prize 1991). In close cooperation with Erwin Neher's laboratory, it was shown for the first time that guard cells use potassium and anion channels to regulate osmotic pressure. This refutes the then prevailing opinion that only excitable cells of nerves and muscles have ion channels.

The works of Klaus Raschke have appeared in numerous publications (for a selection see https://plantstomata.wordpress.com/tag/klaus-raschke/). Klaus Raschke was a member of the Academy of Sciences in Göttingen, the American Association for the Advancement of Science, and the American Society of Plant Physiologists.

Klaus Raschke was passionate about science. His employees and colleagues will never forget that he was ready at any time ("even coming out of deep sleep") to examine and discuss new research results. Anyone who worked with him could witness his distinctive rigorous analytical scientific approach. He always encouraged scientists in his field of research not only to describe plant reactions, but to trace them back to quantitatively measurable physical-chemical processes. This concept was formative for his students.