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Lectures	Stomatal morphology and reactions in response to changes in the environmental conditions
Key words	Water relations, stress reactions, stomatal conductance, stomatal closure, stomatal opening, climate change
Learning objectives	- Get an overview of stomatal anatomy and physiology and how it differs between plant groups. - Understand the mechanisms of stomatal opening and closing. - Learn the different ways environmental conditions affect stomatal conductance. - Develop an understanding of how stomatal conductance is related to other processes in the plant e.g., photosynthesis, WUE, hydraulic conductance. - Analyze the possible impact of climate change on stomatal reactions and therefore on the plant as whole.
Main subjects	The first aim is to introduce the variety of stomatal anatomy in different plant groups and to show how this is affecting the regulation speed of stomatal conductance. Also a short introduction about the mechanisms of stomatal opening/closing is given. Secondly the relationship of stomatal behavior and other important processes (photosynthesis, water uptake from the soil) in the plant are explained to develop a more detailed understanding how from one hand stomatal conductance affects the plant and on the other hand environmental factors control stomata. The main environmental conditions and their effect on stomatal behavior are covered separately and also in context of climate change with the emphasis on possible problems of optimal stomatal regulation in the future conditions and its implications on natural plant communities as well as agricultural species.

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Relevance to EduSaPMan	Water is a vitally important resource for plants and its movement through the plant is strongly dependent on stomatal reactions. At the same time soil (and atmosphere) water content also strongly influences stomatal conductance. Also plant communities have large impact on the water cycle due to the high rates of transpiration so stomatal behavior has an important part in the network of water movement in soil, plant and atmosphere.
Recommended literature	Passioura, John B (2010). Plant–Water Relations. In: eLS. John Wiley & Sons Ltd, Chichester. http://www.els.net [doi: 10.1002/9780470015902.a0001288.pub2] Franks PJ, Farquhar GD (2007). The mechanical diversity of stomata and its significance in gas-exchange control. Plant Physiol 143: 78–87 Merilo E, Jõesaar I, Brosché M, Kollist H (2014). To open or to close: species-specific stomatal responses to simultaneously applied opposing environmental factors. New Phytol 202: 499–508