

Project summary

Exploring Maize Genotypes for Rooting Characteristics and Water Uptake in the Swiss Variety Testing Program

Background:

Besides grassland, maize is the most important forage crop in Switzerland as nearly 12% of arable land is under silage maize cultivation. At present, limited water availability between flowering and grain filling is the main limitation for maize production (Holzkämper et al., 2015). Since rainfall during summer is projected to decrease by up to 30% (Fischer et al., 2014), we expect water shortage to become decisive for maize production in the near future.

Agroscope operates the official variety testing program of field crops in Switzerland to determine their suitability for cultivation under Swiss growth conditions. Above ground crop parameters for yield and quality as well as stress resistance of nearly 100 silage maize varieties are evaluated at multiple locations (Hiltbrunner et al., 2018). However, information about rooting depth and proliferation of the tested varieties is scarce but is likely to explain differences in crop resilience to water stress among genotypes. We therefore aim to investigate rooting characteristics of selected silage maize varieties in the Swiss variety testing program and relate those to water uptake from specific soil depths by means of isotope analysis.



Aim:

The aim of this master project is to analyse the isotopic composition (^{18}O , D) of soil and plant xylem water during the growing season and determine rooting characteristics at harvest of different maize genotypes in the field.

We are seeking a candidate with background in agronomy, ecology, or environmental sciences, who has a strong interest in field and lab work.

Beginning: 01.06.2021 or by arrangement

Duration: 6 months

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Fischer, A. M., Keller, D. E., Liniger, M. A., Rajczak, J., Schär, C., & Appenzeller, C. (2015). Projected changes in rainfall intensity and frequency in Switzerland: a multi-model perspective. *International Journal of Climatology*, 35(11), 3204-3219.

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