

Talk (15 min)

PHOTOSYNTHETIC APPARATUS RESPONSE OF THE *LOLIUM PERENNE L.* TO ENVIRONMENTAL STRESSES

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Climate change by 2100 has been announced with an increase of temperature, a new rainfall repartition and an increase of ambient greenhouse gases concentration. These environmental factors are known to have influence over the photosynthetic apparatus (PA) and a better understanding of their impact in grassland which represents about 80% of agricultural lands is crucial. The study of the chlorophyll *a* fluorescence (CAF) kinetics has been widely used to assess environmental impact over the PA. The analysis of CAF kinetic enables a phenomenological and biophysical interpretation of the PA behavior as well as a quantification of its functional activity.

In this study the PA behavior of the perennial rye-grass (*Lolium perenne*) was analyzed by performing regular CAF measurement in a grazed grassland at 4 different time of the day from May to October for 2 years. Study of CAF parameters revealed a seasonal pattern of the photosynthetic activities. A diurnal dynamic photoinhibition was also observed and indicates reversible short-term down-regulation mechanisms aimed at reducing the over-excitation drive by light in order to prevent damages to the PA. Analysis of CAF parameters and meteorological data from the site revealed that high light increased sensitivity of the PA to elevated air temperature and high vapor pressure deficit (VPD). Drought episodes alone had no impact on the PA but decreased his thermotolerance. Ozone was not identified as an important stressor in the grassland probably because ozone uptakes by the leaves were reduced during high VPD events due to decreased stomatal conductance.

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