



Plant Ecology (320b)

Light response curves of field crops to assess their potential for agrivoltaic systems

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Topic description

The use of solar panels on arable land and, hence, the simultaneous production of energy and agricultural produce is called agrivoltaics, increasing the land use efficiency many times over separated production of both.

However, solar panels are shading the crops cultivated underneath, either continuously or because of fluctuating shade. This reduction in light intensity affects the plants photosynthesis and, thus, growth and yield in the end. Light response curves are a way to describe the relationship between photosynthesis and light intensity, providing e.g. information on the maximum photosynthetic capacity and the light compensation point in response to changing environmental (light) conditions (Akhka et al. 2001; Johnson and Murchie 2011; Lobo et al. 2013). However, detailed information on light response curves of field crops and in particular information about the adjustment speed to shaded conditions are missing. This information is, though, important to estimate the potential of these crops for agrivoltaic systems, where crops need to acclimate to changing light intensity throughout the day.

The aim of this study is, therefore, to assess light response curves of several field crops (or screening several cultivars of one field crop) in general and their photosynthetic response when shaded.

Type of study: Experimental study with climate chambers

Duration of work: The experimental work depends on the choice of crops, but may take up to 4 months

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References

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