

Effects of atmospheric CO₂ enrichment on growth of spring wheat

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The ongoing increase in atmospheric CO₂ will result in climate change with respect to temperature and precipitation. These alterations are expected to modify the phenology, growth, and finally the yield and quality of crops. In order to investigate potential effects of CO₂ enrichment on crop growth and yield, two experiments were conducted on spring wheat (*Triticum aestivum* L. cv. Triso) at the University of Hohenheim (Stuttgart).

(i) Wheat was grown in a Mini-FACE (Free Air Carbon Dioxide Enrichment) system at the research station "Heidfeldhof" in 2008 under three CO₂ treatments with five replicates each: FACE (elevated CO₂ (550 ppm) with technical equipment), AMBIENT (ambient CO₂ with the same technical installation as FACE plots) and CONTROL (ambient CO₂ without technical equipment);

(ii) Plants were exposed in a Climate Chamber System at the Institute for Landscape and Plant Ecology from September 2008 to May 2009 to ambient (380 ppm) and elevated (550 ppm) CO₂ concentration in combination with current and increased temperature (+4°C).

In both experiments, phenological development, canopy height, leaf area index and chlorophyll content of wheat were examined from leaf emergence until crop maturity at weekly intervals. The growth stages were recorded using the BBCH codes. The chlorophyll content was determined by using a portable chlorophyll meter (SPAD-502). LAI was measured by using an LAI-2000 Plant Canopy Analyzer. Results from both experiments will be compared concerning future CO₂ and temperature effects on wheat growth.