

**MUTANT GENE COULD CHANGE OUR UNDERSTANDING OF CELLULOSE BIOSYNTHESIS: FUEL,
FOOD, AND FIBER- INVESTIGATING THE PHYSIOLOGICAL RESPONSES IN ARABIDOPSIS FKF1
MUTANT**

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Abstract

This presentation explores the complex phenomena of cellulose biosynthesis. A specific blue light receptor mutant (fkf1) showed enhanced cellulose and chlorophyll contents compared to wild type plants, and we hypothesize that the mutants have higher photosynthetic efficiency due to enhanced chlorophyll content. Controlled environment plant growth chambers are being used to measure CO₂ gas exchange and calculate photosynthetic and respiration rates. This research will increase the understanding of how the FKF1 protein is modulating physiological responses in order to co-ordinate development with delayed flowering time and increased cellulose content. Further research on how the mutant plant increasingly incorporates carbon throughout its life cycle may give insight on how to adapt plants to rising environmental CO₂ levels in order to optimize fiber production in cotton and similar carbon-use heavy crops. This research question is of high significance as enhanced carbon fixation will reduce the carbon from the air and fix it in the form of plant biomass. This research helps in developing "carbon hungry crops".