# Determining the Environmental Factors Controlling Respiration. (C02-frantz155055-Oral)

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## Abstract:

Light and temperature influence plant respiration. Exactly how much each influences respiration has been reported to be anywhere from no effect to quadrupling for a 10C rise in temperature. Models often assume a doubling of maintenance respiration for each 10C increase in temperature and no effect of temperature on growth respiration. Our studies over the past three years, have investigated both short term (hours) and long term (days to weeks) temperature changes on respiration. Our results indicate that the maintenance coefficient only increased by at most 50% for a 10C rise in day/night temperature during growth. There was no difference in the maintenance coefficient between two canopies grown in different constant temperatures. Surprisingly, the growth respiration coefficient was influenced by temperature. Carbon use efficiency (CUE: daily carbon gain / gross photosynthesis) did change in response to different day night temperatures during growth, but there was no difference in CUE among canopies grown in different constant temperatures. These results indicate either a rapid acclimation to temperature on a whole canopy level or a lack of whole canopy sensitivity to temperature fluctuations.

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