

Table I. Comparison of theoretical enhancements in photosynthesis in response to elevated CO₂ and experimentally observed enhancements

Observation	CO ₂ Enhancement		Source
	RuBP Regeneration	Rubisco	
	%		
Response of photosynthesis			This study ^a
5°C	+9	+25	This study
15°C	+16	+48	This study
25°C	+28	+78	This study
35°C	+50	+117	This study
Intercellular to ambient CO ₂	-1		Drake et al. (1997)
Photosynthesis (large pots) ^b	+58		Drake et al. (1997)
Photosynthesis (small pots)	+28		Drake et al. (1997)
Photosynthesis (high nitrogen)	+57		Drake et al. (1997)
Photosynthesis (low nitrogen)	+23		Drake et al. (1997)
Acclimation ^c (large pots)	-7		Drake et al. (1997)
Acclimation (small pots)	-20		Drake et al. (1997)
Acclimation (high nitrogen)	-20		Drake et al. (1997)
Acclimation (low nitrogen)	-39		Drake et al. (1997)
Starch	+162		Drake et al. (1997)
Suc	+60		Drake et al. (1997)
Photosynthesis	+40		Ellsworth et al. (2004)
Acclimation	-7.5		Ellsworth et al. (2004)
Photosynthesis	+29		Ainsworth and Long (2005)
Acclimation (V_{cmax})	-13		Ainsworth and Long (2005)
Acclimation (J_{max})	-5		Ainsworth and Long (2005)
Starch	+84		Ainsworth and Long (2005)

^aThe enhancement of rates between 700 and 350 $\mu\text{mol mol}^{-1}$, based on simulations with the Farquhar photosynthesis model as described by Medlyn et al. (2002), using RuBP regeneration-limited or Rubisco-limited responsiveness as indicated. Drake et al. (1997) summarized the results of pot experiments, and Ellsworth et al. (2004) and Ainsworth and Long (2005) summarized the results of FACE experiments. The elevated CO₂ concentration in pot experiments was usually around 700 $\mu\text{mol mol}^{-1}$, whereas in FACE experiments, increased CO₂ concentrations were usually only 500 to 600 $\mu\text{mol mol}^{-1}$. ^bLarge pots were defined as having a root volume greater than 10 L, and small pots had root volumes less than that. ^cAcclimation is defined as the rate of photosynthesis measured at a common CO₂ concentration.