Table 1. Efficiency of the transduction of intercepted solar radiation into plant carbohydrate through photosynthesis of crop leaf canopies

	% Loss at each stage (efficiency at each stage)		% Remaining	
Incident energy outside photosynthetically active wavebands	50.0 (0.5)		50.0	
Reflected and transmitted light	5.0 (0.9)		45.0	
Light absorbed by non-photosynthetic pigments	1.8 (0.96)		43.2	
Photochemical inefficiency	8.4 (0.8)		34.8	
Photosynthetic type	C_3	C_4	C_3	C_4
Carbohydrate synthesis	22.8 (0.34)	24.8 (0.29)	12.0	10.0
Photorespiration	3.5 (0.7)	0 (1.0)	8.5	10.0
Dark respiration	3.4 (0.6)	4.0 (0.6)	5.1	6.0
Resulting ε_c			0.051	0.060

'% loss' shows the proportion of energy lost at each stage from interception to carbohydrate accumulation. Efficiency at each stage is given in parenthesis. '% remaining' shows how much of the energy remains at each stage along the transduction chain. C_3 crops (e.g. rice, wheat, soybean, barley) differ from C_4 (e.g. maize, sorghum). The latter lacks photorespiration, but requires more energy for carbohydrate synthesis; hence there is a different overall ε_c. Adapted from Beadle and Long (1985) and Long *et al*. (2005b).
ε_c, radiation use efficiency.