

SHORT REPORT

LIGHT PERIOD REGULATION OF CARBOHYDRATE PARTITIONING

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We have shown that the photosynthetic period is important in regulating carbon partitioning. Even when the same amount of carbon is fixed over a 24h period considerably more is translocated out of the leaf under the longer photosynthetic period. This is extremely important when parts of the plant other than the leaves are to be sold. It is also important to notice the amount of carbon respired in the short photosynthetic period. The light period effect on carbohydrate fixation, dark respiration and translocation is shown in the following table.

Length of light period (h)	Photosyn. rate (g CH ₂ O m ⁻² h ⁻¹)	Total CH ₂ O fixed during light period (g m ⁻²)	Total CH ₂ O respired during dark period (g m ⁻²)	Total CH ₂ O translocated during light period (g m ⁻²)	Total CH ₂ O translocated over 25 h (g m ⁻²)
8	0.74b	5.95a	1.56b	1.29b	3.46a
16	0.37a	5.87a	0.55a	3.32a	4.88b

Values in column followed by the same letter are not significantly different at P_≤0.05 using F-test.

Experimental Conditions:

Incandescent and cool white fluorescent lamps (plants were grown for 38 days under 12 hr photoperiod at 150 μmol m⁻²s⁻¹. At 38 days the plants were separated into 2 groups. One group received an 8 hr photoperiod at 300 μmol m⁻²s⁻¹ and a second group received a 16 hr photoperiod at 150 μmol m⁻²s⁻¹)

Temperature: Day = 26° C
Night = 23° C

Humidity: 70-80%

CO₂: 350-400 ppm

Plants were grown in 10 cm pots in a peat: vermiculite: perlite mix (40:40:20 by volume)
Plants were irrigated twice weekly with half-strength Hoagland solution

Reference:

Lobendra, S. & H.W. Janes, 1992. Light Duration Effects on Carbon Partitioning and Translocation in Tomato. *Scientia Horticultura* 52: 19-25.

