

In open-field systems, however, medium intervals can be appropriate when water amount is sufficient and soil water storage is greater. Sensoy's field study showed that 6-day irrigation outperformed a 12-day interval, but that does not mean "daily" irrigation is always needed outside a greenhouse. The broader point is that irrigation frequency must be interpreted relative to rooting depth, evaporative demand, substrate volume, and water quality. Reviews and greenhouse-irrigation syntheses increasingly argue that the real goal is not a fixed interval but a frequency that keeps plants away from both acute stress and prolonged oversupply (Figure 2) (Sensoy et al., 2007; Nikolaou et al., 2019; Fang et al., 2026).

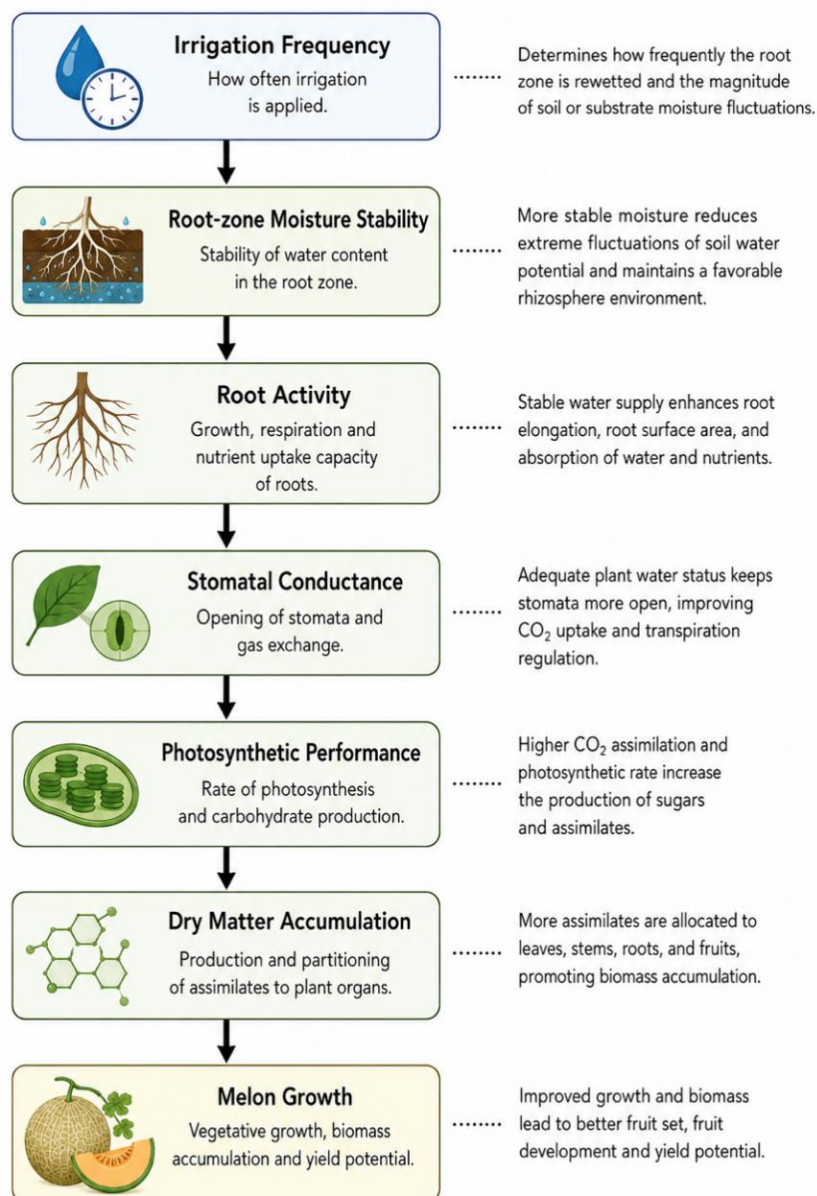


Figure 2 Physiological pathway through which irrigation frequency regulates melon growth

4 Effects of Irrigation Frequency on Fruit Development

4.1 Fruit set and early fruit growth

Fruit development begins with a fragile transition. At flowering and immediately after fruit set, the plant is deciding how many fruits it can support, and the developing fruit is establishing its sink strength through active cell division and early expansion. Water deficits at this stage can therefore reduce more than final fruit size; they can reduce the basic developmental capacity of the crop to produce marketable fruit. This principle has been clear since early controlled-deficit work, and it remains visible in current studies. Fabeiro and colleagues showed that