

# Rapid Protocol for Growing Lettuces with Artificial Light

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In hydroponic and greenhouse lettuce cultivation, seedlings typically require 8-10 weeks to reach maturity. This study aimed to expedite the growth cycle of two lettuce varieties (Red and Crispy) to just four weeks using different photoperiods (24, 18, and 12 hours of light) at reduced light intensities (100  $\mu\text{mol}\cdot\text{m}^2\cdot\text{s}$ ) with artificial light. The investigation covered the entire growth process, analyzing pigment composition, leaf area, fresh biomass, and mineral content. Results showed that 24-hour and 18-hour photoperiods reduced the growth cycle to 30 days, while the 12-hour photoperiod needed a longer duration and higher nutrient concentrations for full maturity. Despite the shortened growth period, the phytochemical levels were similar to those reported in existing literature, demonstrating the protocol's effectiveness. This advancement in lettuce cultivation offers the potential for more rapid and efficient production strategies.