

EFFECT OF LIGHT INTENSITY ON GROWTH, DEVELOPMENT, AND  
PIGMENTATION OF RED-LEAF AND RED ROMAINE LETTUCE

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Near-term space missions, such as the International Space Station (ISS) and early space exploration missions will be constrained in terms of available volume, mass, and power and the use of higher plants for bioregenerative life support functions may be limited. However the psychosocial aspects of including plants on these missions to provide a variety of fresh, nutritious, and colorful dietary supplements could be profound. A series of experiments were conducted to determine effects of light intensity on color development and productivity of red-leaf (cv. Red Sails) and Romaine (cv. Eruption and Outredgeous) lettuce cultivars. Experiments were performed in a controlled environment chamber (Model M-48, EGC) maintained at 25°C, 50% RH, 1,200  $\mu\text{mol mol}^{-1} \text{CO}_2$ , and 16-h light/ 8-h dark diurnal cycle. Light levels were maintained at 150, 300 or 450  $\mu\text{mol m}^{-2} \text{s}^{-1}$  with VHO cool white fluorescent lamps. At 300  $\mu\text{mol m}^{-2} \text{s}^{-1}$  there were significant differences in cultivar yield with Red Sails >Outredgiuous> Eruption. The results show a strong response of incident light on edible yield of all three cultivars. There was also a strong correlation increasing light intensity and red leaf coloration in all cultivars.