

1125-92-440

Payson Merrit Lippert*, lippertpayson@rocketmail.com, and **Laurie Battle**. *Impact of Light and Temperature on the Transpiration Ratio of Plants*.

A plant's efficiency is affected by different factors including light, temperature, water, and carbon dioxide uptake. When the stomata open to allow uptake of carbon dioxide for photosynthesis, water is lost through transpiration, and plants control this balance by opening and closing the stomata based on environmental conditions. While there are many factors that contribute to the loss of water and carbon dioxide uptake, the only factors used here are light and temperature. All other environmental factors were constant for this study, including soil moisture and relative humidity. One measure of efficiency is the transpiration ratio, defined as the rate of water loss through transpiration divided by the rate of carbon dioxide uptake. This balance is most efficient when the transpiration ratio is at its lowest. Three models were produced for the transpiration ratio as a function of light, temperature, and both light and temperature. Applying these models to potatoes, for instance, yielded a method to estimate the transpiration ratio according to the temperature of the leaf and the amount of radiance. Using these models, one can discover the ideal light and temperature conditions for a plant to be most efficient. (Received September 01, 2016)