

# Phenotyping of plants for drought and salt tolerance using infra-red thermography INFRA-RED THERMOGRAPHY INFORMS PLANT'S TOLERANCE AGAINST DROUGHT AND SALT STRESSES

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## ABSTRACT

Drought or salt stress induces several common physiological responses in plants such as water relation and photosynthetic capacity. It is because both stresses lead cellular dehydration in the plants, particularly, during the early phase of stress imposition. Drought and salinity decrease CO<sub>2</sub> availability for photosynthesis via stomatal limitation as well as elevate leaf temperature due to partially closed stomata. In this scenario, stomatal regulation and plant water status are important aspects in abiotic stress environment. These physiological responses have a function to stabilize the temperature inside plant / leaf. Therefore phenotyping through an infra-red thermography (heat sensitive sensor), could be a useful tool in the selection of a tolerant genotypes. Infra-red thermography is a part of the electromagnetic spectrum which emits a certain amount of radiation as a function of their temperatures. In general, the plants which have less water, would have higher temperature and display more infra-red radiations. In abiotic stresses such as drought and salinity, plant water status is affected and varied from the sensitive to tolerant level. Infra-red images of plants are often linked with some of the physiological attributes to the tolerance. This paper covers the limits, advantages, linkages, comparison and other prospectives of using thermal imagaes in modern phenotyping techniques.

**KEYWORDS:** Abiotic stress, Drought tolerance, Infra-red Thermography, Salt tolerance

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