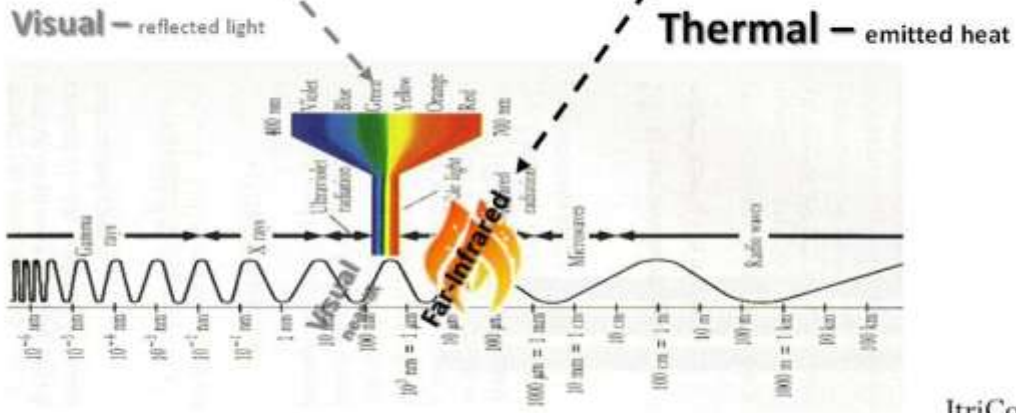
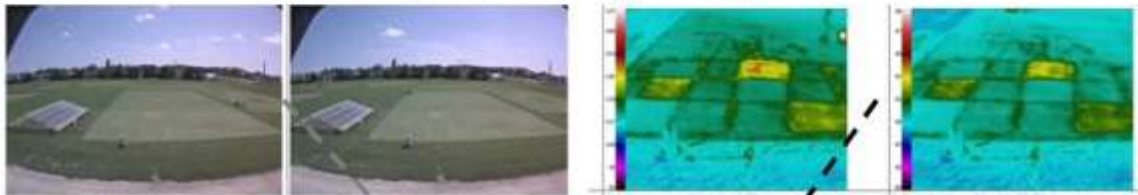


The Agricultural Imaging Spectrum Used by Hawk-Eye™ Systems



ItriCorp
The Innovators

There are no boundaries when enthusiasm and excitement are applied to the task at hand.

Thermal image data considerations are described in a compendium of resources found at [Thermography to explore plant–environment interactions](#), Miguel Costa et al. (2013).

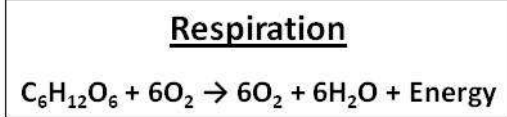
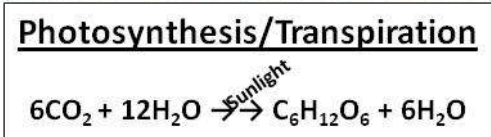
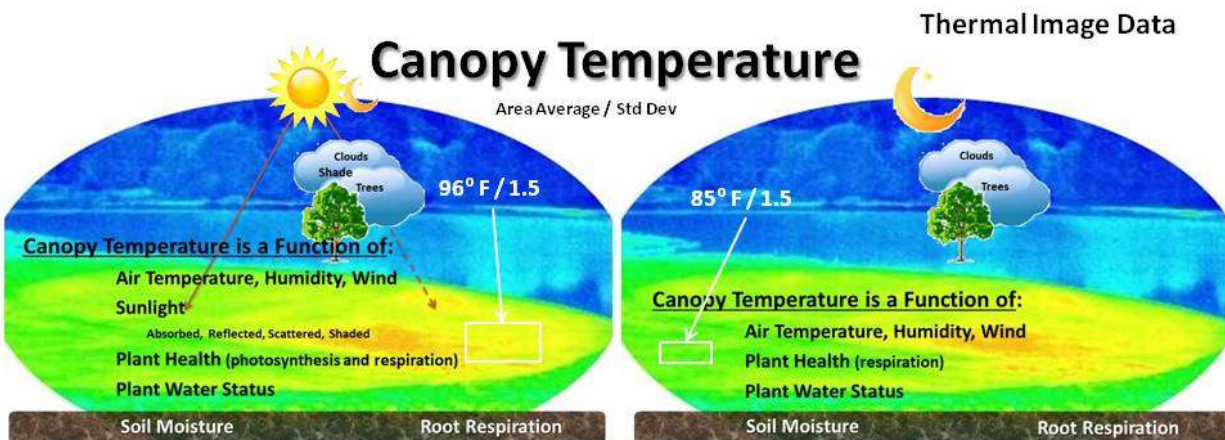
By observing the canopy temperature it is possible to make the canopy temperature an indicator of transpiration and respiration. During the day evaporation of the transpired water vapor cools the leaf/canopy. At night one can see the heat from respiration, transpiration, and evaporation of the near surface moisture. Thus, the turf's canopy temperature is the biotic integrator of the air temperature, humidity, wind, solar radiance, and the turf's health and water status.

More than seven years of ItriCorp observation and study has demonstrated that an equation of the form like one outlined by J. Miguel Costa et al. (2013), addressing plant–environment interactions is a superb indicator of the stress experienced by turf. By using a Hawk-Eye™ collocated with a weather station to persistently measure canopy temperature and air

temperature it is possible to observe/measure an upper limit and lower limit of water vapor released during transpiration. The Hawk-Eye™ System measures day and night and uses this form of an equation to determine stress; $(SI) = (T_m - T_{LL}) / (T_{UL} - T_{LL})$.

T_m = canopy temperature minus air temperature measured at image data capture time
 T_{LL} {non-stressed condition} = early daylight canopy temperature minus air temperature
 T_{UL} {stressed condition} = most stressed part of the day canopy temperature minus air temperature

The Hawk-Eye™ System measures canopy temperature day and night to establish the Hawk-Eye™ System's Stress Index.



Canopy Temperature is an objective measure of Health & Stress & Water Status

- Latent Heat of Vaporization
- Cooling during Transpiration
- Water Vapor & Heat Released during Respiration