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COMPUTER ANALYSIS OF REMOTELY SENSED WHEAT CANOPY DATA

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ABSTRACT

The existing mathematical models of wheat growth or yield are based on air temperatures two meters above the ground from standard nationwide or worldwide meteorological networks, whereas temperatures obtained by thermal infrared scanners on satellites, such as the current NOAA series are surface radiative temperatures. These temperatures are correlated, but are not necessarily the same. In order to use satellite-derived surface radiative temperatures in wheat growth or yield models developed using standard air temperatures, the empirical relationship between these two temperatures needs to be established for the range of anticipated conditions.

Experiments were performed for bare soil and wheat canopies under irrigated and non-irrigated conditions. Measurements were made between 0900 and 1500 hours of radiative temperatures, air and soil temperatures. Precipitation, soil moisture, relative humidity, sunlight and windspeed were also recorded.

Analysis of the data shows that a relationship of the form $Y = AX + B$ exists between radiative temperature and air temperature of wheat canopies. Additional effects of diurnal and seasonal variations have been found.