THE temperature of the air is one of the climatic factors frequently considered in studies of agricultural problems. With few exceptions, temperature data available for such purposes are those compiled at the nearest U. S. Weather Bureau station. When the nearest official station is considered too far away to be representative of the climate, a standard thermometer shelter often is set up at the experimental site. The fact is often overlooked, however, that the temperatures measured at or above the standard shelter height of 4.5 feet (4) may be identical over horizontal distances of several miles, while they may be materially different over a vertical distance of only a few inches at the same location below the standard height. Indeed, the standardization of thermometer exposure at 4.5 feet above the ground has the purpose of making temperature readings representative of a general area, and thus representative of the macroclimate. For appraisal of the climatic environment of forage plants, that generally grow only from a few inches to two feet tall, it is the microclimate in the air layer below the standard shelter height that is applicable (1, 3, 7).

Pronounced differences occur between the properties of the macroclimate and those of the microclimate; for example, wind speed is usually much less in the microclimatic layer, due to friction with the ground (6); vertical temperature and moisture gradients are greater (2, 3, 5, 6); and changes of these quantities are more rapid and cover a wider range of values, i. e., extremes are most pronounced in the layer immediately adjacent to the ground. In general, the space and time variations in the microclimatic layer below 4.5 feet are much greater than in the macroclimatic layer (above 4.5 feet).

The present study had two objectives: (1) the measurement of the diurnal and seasonal variations of air temperature at various heights in the microclimatic layer above a grass sod, and (2) the determination of the individual and average relationships between air temperatures at the standard height and those below it.

RESULTS AND DISCUSSION

Three general types of vertical temperature distributions occur with increasing height: (a) the temperature decreases, called lapses, (b) the temperature increases, called inversions, and (c) the temperature remains constant, called isothermal stratifications. Within the microclimatic layer a temperature decrease with increase in height occurs in both stable and unstable conditions, an inversion representing an unstable condition, an inversion representing a stable condition, and the isothermal case representing a neutral condition.

a small plateau about 200 miles inland. The climate of the area is characterized by comparatively low temperatures, high relative humidity, and alternating onshore and offshore winds. The climate is influenced by a large inland lake surrounded by land with an almost complete vegetative cover (10). The temperatures measured at or above the standard shelter height of 4.5 feet (4) may be identical over horizontal distances of several miles, while they may be materially different over a vertical distance of only a few inches at the same location below the standard height. Indeed, the standardization of thermometer exposure at 4.5 feet above the ground has the purpose of making temperature readings representative of a general area, and thus representative of the macroclimate. For appraisal of the climatic environment of forage plants, that generally grow only from a few inches to two feet tall, it is the microclimate in the air layer below the standard shelter height that is applicable (1, 3, 7).

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