Air Temperatures in the Microclimate at Four Latitudes in the Northeastern United States

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IT IS recognized that atmospheric conditions close to a surface (bare ground or a vegetative cover) differ markedly from those recorded by sheltered instruments usually placed at a height of 5 feet or more above the ground level. Where data are collected for weather forecasting, the instruments are purposely placed to avoid the microclimate. The weather forecaster must have a representative large scale picture of the atmosphere on a continental (or even hemispherical) basis. Strictly localized weather conditions must be excluded.

In recent years, the importance of microclimate in agriculture has become increasingly evident. Measurements of the components of the microclimate have been made at several widely separated locations. The usefulness of such investigations could be substantially extended by organizing a network of microclimate stations. These could provide information indicating the regional variation of the vertical gradient of climate between the microlayer (lowest few inches of the atmosphere), and the macro or standard layer (about 5 feet above ground).

Such a network was established on a limited scale in connection with a cooperative 3-year strain test of forage varieties conducted cooperatively by seven state Experiment Stations and the U. S. Pasture Laboratory. At four locations, Maryland, New Jersey, Pennsylvania, and Vermont, air temperatures were measured at two specified heights above a uniform ground cover for 3 successive years, 1951–1953.

OBSERVATIONS AND METHODS

The air temperatures reported were measured on 3 inches and 5 feet above a well fertilized Kentucky bluegrass sod that was clipped to maintain the grass at a height of 1½ to 2½ inches. At each location, (see table 1), the sensing elements were located on relatively level land free from the influence of cold air drainage.

Temperature recording potentiometers were connected to No. 30 B&S gage copper-constantan thermocouples that were shielded from solar and sky radiation. In Maryland, Pennsylvania, and Vermont, air temperatures were measured at


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3 Limited data reported by New York and West Virginia indicate similar general relationships of temperature in the microclimate.