Soil Conductivity Tests

C. W. Fischer Department of Floriculture and Ornamental Horticulture Cornell University, Ithaca, N. Y.

What do they mean ?

A soil conductivity reading is an indication of the quantity of soluble salts that is present in that soil. The higher the amount of readily soluble material, such as nitrate, ammonium, sulfate, potash, lime, etc., the higher will be the conductivity reading for that soil.

How are the readings determined ?

Conductivity readings are made using socalled "conductance bridges." "Bridges" made by the Industrial Instruments Co., Jersey City, New Jersey are satisfactory. In the test, a given weight of soil is shaken with distilled water and allowed to stand for 20 minutes. The water is then poured off into a separate flask and the conductivity is determined on this solution with the "bridge."

How do I interpret conductivity readings ?

A ratio of 1 part of soil to two parts of water by weight (1:2) is used at Cornell. Davidson at Rutgers recommends 1 part of soil to 5 parts of water (1:5). Satisfactory results may be obtained by both methods, but one must be careful in analyzing the figures.

With 1:2 ratio - readings of 200 or greater are considered excessive and dangerous.

With 1:5 ratic - readings of <u>50</u> or greater are in the danger zone.

Reasons for high conductivity tests.

Soil sterilization greatly increases conductivity because it causes the release of salts in the soil. Poor drainage with heavy fertilizer applications will give the same effect. Insufficient water coupled with heavy fertilization will also cause an increase in soluble salts. With the use of constant water level, it has been found that the soluble salts content of the upper half of the bed often exceeds that of the lower. This is due to upward movement of water and salts from the bottom of the bench by capillarity.

The most applicable remedy for lowering of salt concentration is a heavy leaching of the soil.