THE problem of reduced germination of corn in cold, wet soil has received attention in numerous investigations in recent years. Much of the work has involved a testing procedure in which seed samples are exposed in wet soil to temperatures just low enough to prevent germination or to permit it at a very slow rate. After exposure for a period of two weeks the germination test is completed at optimum germinating temperature. Various soil organisms, of which *Pythium* sp. seem to be most important, have been shown to be responsible for reduced germination under conditions similar to those of the tests (2, 4).

Various factors related to seed condition have been shown to influence germination in the tests. In well-matured seed of good quality, breaks in the pericarp have been shown to be of major importance (11, 13). Rush and Neal (9) showed that immaturity at the time of harvest and preharvest exposure to frost were associated with lowered germination under "cold test" conditions although germination percentages were high in standard laboratory tests. They indicated also that age of seed is a factor in such tests. Livingston (6) showed that artificial drying and immersion increased susceptibility. Tatum (10) and Pinnell (7) demonstrated that maternal influences are important and that ear to ear variation within the same genotype is often great. Pinnell (7) emphasized the importance of unknown environmental factors as the probable explanation of the variation within lines. Hooker and Dickson (3) and Wernham (12) suggest that residual heterozygosity in the inbreds is the explanation of this type of variation. Pinnell (7) and Tatum (10) demonstrated that genotype, particularly of the seed parent, was a factor in cold test reaction. Hooker and Dickson (3) using excised embryos showed that, with the effects of pericarp and other maternal influences minimized, the genotype of the embryo was more clearly related to resistance during germination.

Factors shown to be important might be summarized as follows: (1) pericarp damage, (2) maturity of seed, (3) exposure to frost, (4) artificial drying, (5) age of seed, (6) inherited influences associated with maternal characteristics such as pericarp and endosperm qualities, (7) genotype of the embryo, and (8) variations not easily explained on the basis of any of these factors.

There seems to have been a tendency for each investigator to attribute major importance to the particular factor or factors he happened to be investigating. A reasonable conclusion would seem to be that any of the factors can be of major importance at times and that often they may interact in various ways so that interpretations are at times difficult. The work of Hooker and Dickson (3) illustrates the possibilities of studying one factor with influences of other factors largely eliminated.

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The experiment herein reported was an attempt to determine whether seed permeability as measured by concentration of materials out of the seed is associated with cold test reaction.

**MATERIALS AND METHODS**

The method adopted for measuring permeability was the procedure suggested by Hottes and Huelsen (5) for quality in sweet corn seed. Preliminary tests of this method were made by Curme (1). The modification used consisted of steeping 10 grams of seed in 50 cc of distilled water at 25°C for 48 hours. The liquid then was decanted and coarse filter paper. The relative amounts of dispersed material in the filtered samples were determined with a Coleman Universal Spectrophotometer at a wavelength setting of 460 nm. The reported are the percentages of light transmitted by the filtrates. They vary inversely with the turbidity of the filtrate.

To permit an evaluation of the relation between turbidity readings and reductions in germination due to cold-test conditions, the germinating power of each lot of seed was determined in a normal test and in a cold-test. The cold-test was conducted by planting duplicate samples of 50 seeds in flats taken from a field that was planted to corn the previous year. The flats were watered then to approximately field capacity. The flats were transferred to the greenhouse. The experiment was completed.

The 98 lots of seed in Group I consisted of pollinated ears from single and double-cross hybrids. Fifty seeds in flats were shelled by hand to avoid mechanical injury to the pericarp. The normal test was conducted by planting duplicate samples of 50 seeds in flats taken from a field that was planted to corn the previous year. The flattened seeds were watered then to approximately field capacity. The flats were transferred to the greenhouse. The experiment was completed.

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**EXPERIMENTAL RESULTS**

The 54 lots of seed in Group II consisted of commercial samples that had been submitted to the laboratory for germination tests. The normal test was conducted by planting duplicate samples of 50 seeds in flats taken from a field that was planted to corn the previous year. The flattened seeds were watered then to approximately field capacity. The flats were transferred to the greenhouse. The experiment was completed.

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