demonstrated with cardiolipin antigen (*10, 11*), since sufficiently accurate replicate dilutions could not be prepared from the concentrated antigen, and it is known that adding saline to a dilution already made up will alter the properties of a lipid antigen. It seems reasonable, however, to expect that it can be detected in complement-fixation tests with a wide variety of antigens. Studies of the further characteristics of the reaction and its application to the standardization of antigens will be presented in greater detail elsewhere.

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Effect of Low Temperatures on the Germination of Inbred Lines of Sweet Corn

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Commercial seed corn producers have for some time been using cold-room tests as indicators of the cold hardiness of their inbred lines of seed corn and to see how well they can withstand the attacks of soil pathogens under poor conditions for germination. Usually the seeds are sown in soil taken from a near-by cornfield known to contain plenty of detrimental soil organisms. They are then placed in a 50° F room for a given length of time (usually 8 days), after which they are removed to a warm room so that the uninjured seeds may germinate. The percentage germination, measured by plumule appearance above soil level, gives an estimate of the hardiness of the lines.

In order to test whether such conditions could be applied to inbred sweet corn, 5 Connecticut lines of inbred sweet corn, viz., C4, C40, P51, T51, and C95, were obtained from W. R. Singleton and sown in flats containing soil from a field recently under corn. Each flat contained 50 seeds of each inbred for each test. One series of flats was placed in a 40° F cold room and the other in a 50° F room, the soil being kept moist by watering when necessary. After definite intervals in the cold, a flat from each room was removed to a warm greenhouse and the resulting germination of each inbred line determined.

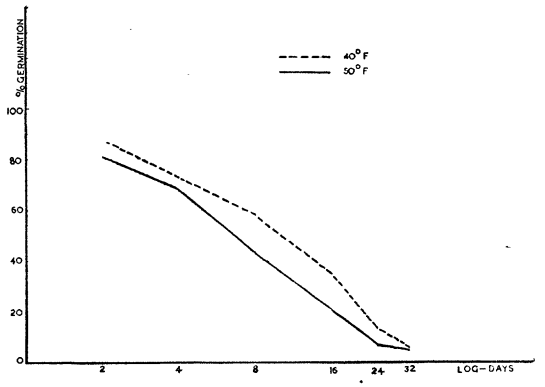

FIG. 1. The effect of cold room treatments on the subsequent mean percentage germination of 5 inbred lines of sweet corn.

The mean percentage germination of all the inbreds for each treatment was calculated and plotted against the logarithm of time of treatment. It is seen from Fig. 1 that germination drops off with increase of duration in the cold prior to plumule emergence, and that the 40° F treatment does not reduce germination as much as does 50° F. As the mean percentage germination of inbred lines in the control flat placed directly after sowing in the warm greenhouse was 84.8%, it appears from the graph that 8 days at 50° F are necessary to obtain a diminution of 50% in germination. Although this is the set of conditions commonly used by the corn companies for their estimates, it would seem that, for a more critical evaluation, a mean percentage germination of 35% is indicated. This would require 10 days in the cold room. In general, then, the empirical tests of the corn companies fit in well with the laboratory tests for the sweet corn inbred lines.

The difference between the effects of the 40° and 50° temperatures for equivalent lengths of treatment suggests that the causes of loss of germination are in part due to damage of the seed from cold during germination and in part to damage by the penetrating soil pathogens acting on the weakened seedling; these organisms are themselves partially inhibited at the lower temperature. The 40° room thus gives a truer picture of resistance of the inbreds to direct damage by cold. When using the above experimental conditions as a laboratory method for selecting cold hardy corn lines, the 50° room is preferable, for not only is it more critical, but there is selection of lines resistant to several different types of detrimental influences.

Further investigations on this aspect of cold treatment of sweet corn are now being made with funds provided by the Agricultural Research Council of Great Britain.