Both sorghum and soybeans are relatively new to most Iowa farmers. These crops have usually been late summer or supplementary crops. They may, in normal seasons, be planted from May to August; and since early-, medium-, and late-maturing varieties have been available, considerable variation in maturity has occurred at the time of the first killing frost. The result of the indiscriminate planting of varieties at different periods of the summer and attempts to save seed irrespective of its condition in the fall has been low viability in many seed lots. Because of this condition a study was made of the effect of freezing temperatures on the subsequent viability of sorghum and soybean seed differing in stage of maturity and moisture content. The germinability of soybean and sorghum seed collected at different times from field plots was determined under controlled conditions after exposure to different temperatures. It is the purpose of this paper to report the results obtained in 1939 and 1940.

**REVIEW OF LITERATURE**

The injurious effects of freezing temperatures on vegetative plant tissues are well known. Investigations pertaining to the effect of freezing temperature on the viability of seeds, however, are limited.

Thiselton-Dyer (7) reported that exposure to the temperature of liquid hydrogen for 6 hours caused no reduction in the viability of mature seed of wheat and barley. Brown and Escombe (3) found that mature seeds of oats and two-rowed barley were not injured as to germination and subsequent development of the plants when exposed to the temperature of liquid air for 110 consecutive hours. Adams (1) also found that air-dry barley seeds were not injured when exposed for 24 hours to the temperature of liquid air.

Fryer (4) observed that Banner oats collected in the field before and after frosts reacted as follows: 2 ° to 3 ° of frost did not reduce the vitality of samples ranging from water to dough stages; 4 ° to 6 ° of frost did not reduce the vitality of samples ranging from milk to dough stages; 5 ° and 8 ° of frost on consecutive nights did not reduce the vitality of samples ranging from dough to dry mealy stages. Samples ranging from milk to dough stages, however, were considerably reduced in percentage germination as a result of these frosts.

Kiesselbach and Ratcliff (5), in a very detailed investigation, found that severe freezing of immature corn caused the embryo to change from a normally light or creamy color to a dark or yellowish brown color. This change in color was usually accompanied by a loss in vitality. Seed corn samples (Hogue's Yellow Dent) containing different amounts of moisture were subjected artificially for 24 hours to various freezing temperature ranges. Parts of each frozen sample, together with corresponding unfrozen samples, were allowed to cure, after which germination tests were made. The writers concluded that seed corn maturing in the field became increasingly cold resistant as its moisture content diminished, and that the vitality of corn having as high as 15 to 20 % of moisture will not be injured by ordinary autumn freezing.