INFLUENCE OF FERTILIZER, FERTILIZER PLACEMENT, 
SOIL MOISTURE CONTENT, AND SOIL TYPE
ON THE EMERGENCE OF SOYBEANS

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A FACTOR of great importance in the continued economical production of soybeans in view of the vast expansion in soybean acreage and the constant decrease in fertility of the soil, is the application of mineral fertilizers to soybeans under those conditions that warrant their use.

Since soybeans are frequently impeded in germination and emergence by mineral fertilizers, it is of importance to know what kind and amount of fertilizer may be applied and under what conditions, without injurious effects to the germinating seed and the young seedlings.

Studies were conducted at Lafayette, Ind., by the U. S. Regional Soybean Industrial Products Laboratory and Purdue University Agricultural Experiment Station cooperating, from 1939 to 1941, inclusive, to determine (a) the influence of kind and rate of application of fertilizers, (b) fertilizer placement, (c) soil moisture content, and (d) soil type on the emergence of soybeans.

Considerable decreases in stands were obtained by Barnes (1) when mineral fertilizers were drilled in contact with soybean seed, but when applied separately from the seed stands were only slightly reduced.

The effect of Ammo-Phos (13–48–0) upon germination and plant growth of a number of crops was studied by Coe (2). He obtained very pronounced fertilizer injury to germination and some retardation in emergence when Ammo-Phos was applied in contact with soybean seed, even in small quantities, but little or no injury or retardation when applied ½ inch or 1 inch away from and on the same level as the seed. Various fertilizer mixtures applied in direct contact with soybean seed in field studies were quite injurious to germination even in relatively small quantities. Some fertilizer mixtures were more injurious than others. From studies with the several crops worked with he found moisture content a more important factor affecting germination than soil type, and the greater the moisture content in a given soil, the larger the amount of fertilizer required to injure germination. Horizontal diffusion of fertilizers was found to be very slow.

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1Contribution from the Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, and Bureau of Agricultural and Industrial Chemistry, U. S. Regional Soybean Industrial Products Laboratory, U. S. Dept. of Agriculture, and Purdue University Agricultural Experiment Station, Lafayette, Indiana, cooperating. Journal Paper No. 48, Purdue University Agricultural Experiment Station. Received for publication March 26, 1943.

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3A cooperative organization participated in by the Bureaus of Agricultural and Industrial Chemistry, and Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, of the U. S. Dept. of Agriculture, and the agricultural experiment stations of the north central states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

4Figures in parenthesis refer to "Literature Cited", p. 119.