

EVALUATION OF SOYBEAN GERMPLOSM FOR GERMINATION AND STORAGE  
UNDER CONDITIONS SIMULATING TROPICAL ENVIRONMENT



A Thesis

by

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## ABSTRACT

Evaluation of Soybean Germplasm for Germination and Storage under Conditions Simulating Tropical Environment. (December 1982)

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Great potential exists for increased soybean (Glycine max (L.) Merrill) cultivation in the tropics. Constraints among the tropical ecological regions differ, but stand establishment at high soil temperatures and seed viability during storage are common, critical problems for most regions.

A total of 2278 genotypes were evaluated for germination ability at 38 C. Genotypic variability for germination at this temperature was apparent and 318 genotypes were identified which germinated equally well at 38 and 30 C.

Phomopsis spp were the predominant pathogens associated with non-germinated seeds of 46 soybean genotypes plated on potato-dextrose agar at room temperature. Inverse relationships between fungi, including Phomopsis, and germination at room and higher temperatures were evident. The occurrence of fungi was more frequent in early maturing genotypes.

The effect of controlling seedborne pathogens on germination of seed incubated at 30 and 38 C was investigated. Significant reduction

of Bacillus subtilis (Ehrenberg) Cohn. and fungi in several cultivars was observed at both temperatures but all cultivars did not show significant improvement in germination. Equally good germination at both temperatures was observed in two genotypes (Centennial, D77-6166), despite differing incidences of pathogens.

One-year-old seeds of 38 genotypes and freshly harvested seeds of 46 genotypes were assessed for storability. Generally, germination of one-year-old seeds dropped drastically within three months at ambient conditions whereas fresh seeds stored equally well at ambient and cold storage conditions for three months. However, one-year-old seeds of two genotypes and fresh seeds of 14 genotypes maintained above 80% germination for three and six months, respectively, at both conditions of storage. Seed at low moisture levels maintained viability during storage. The rate of loss in viability was remarkably slower under cold storage than ambient conditions.

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