INTSOY Soybean Breeding in Puerto Rico in 1980

Luis H. Camacho

ISR-80-21

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International Soybean Program, INTSOY

College of Agriculture
University of Illinois at Urbana-Champaign
113 Mumford Hall, Urbana, Illinois 61801 U.S.A.

College of Agricultural Sciences
University of Puerto Rico, Mayaguez Campus
Mayaguez, Puerto Rico 00708

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University of Illinois at Urbana-Champaign
University of Puerto Rico, Mayaguez Campus

Trip Report - Puerto Rico

1. NAME: Luis H. Camacho
INTSOY Plant Breeder

2. PERIOD OF TRAVEL: April 26 - May 3, 1980

3. ITINERARY: April 26 - Travel to San Juan, Puerto Rico, from Lima, Peru
April 27 - Arrive in Aquadilla
May 2 - Depart from Aquadilla for San Juan
May 3 - Depart from San Juan for Lima

4. PURPOSES: To assist in planning the research work for the summer 1980.
To review the present status and the projections of the INTSOY breeding work at Isabela.

5. PERSONS CONTACTED:

Mr. José Bravo, Assistant Agronomist, INTSOY
Dr. Abad Morales, Director, Isabela Experiment Substation
Dr. William H. Judy, INTSOY Agronomist/Urbana
Dr. Alejandro Ayala, Dean, College of Agricultural Sciences; Director, Agricultural Experiment Station, UPR/Mayaguez
Dr. Luis Cruz Peréz, Director, Agronomy Department, UPR/Mayaguez
Dr. Sylvia Asencio, Soybean Breeder, Iowa State University/UPR,MC
Mr. Wilfredo Cruz, Field Assistant, Isabela Substation
Dr. Guillermo Riveros, Weed Scientist, UPR/Mayaguez
Dr. Julia S. Mignucci, Plant Pathologist, UPR/Mayaguez
Dr. Paul R. Hepperly, Plant Pathologist, UPR/Mayaguez
Dr. C. Stearn, Soil Microbiologist, INTSOY
Dr. Eduardo Schroder, Soil Microbiologist, UPR/Mayaguez
Mr. O. Mendoza, Graduate Student from Peru, UPR/Mayaguez
Mr. A. Celada, Graduate Student from Peru, UPR/Mayaguez

6. FINDINGS/ACCOMPLISHMENTS:

a) General

Facilities and environmental conditions in the Isabela Substation are optimal to carry out continuous breeding activities throughout the year. This will facilitate the advancing of generations of hybrid populations and the selection work required in certain breeding projects such as seed quality which should be done during the rainy period.

The working germplasm of the INTSOY breeding project at Isabela includes: (1) F_1's and segregating populations; (2) nearly homozygous lines being advanced or tested in yield trials; and (3) cultivars and strains from tropical and subtropical origin.

b) Research plans for 1980

It was agreed with Dr. Judy and José Bravo to plant the following experiments in 1980.

F_1 crosses. About 60 F_1 crosses are to be planted together with parental strains to identify hybrids, discard self-pollinations and produce F_2 seeds.

Early-generation segregates. These come from selections made by Glenn Bowers on SMV resistance, and by Peerasak Srinives on hard seed coat. Agronomic performance of these selections to be visually estimated and best types to be kept for further testing.

Advanced-generation lines. These come from individual plant selections or bulks in a previous growing season. They are to be agronomically evaluated in single-row plots. Best performers to be tested in BLT's.

Breeding line tests (BLT's). There will be two tests. BLT-IV has 16 breeding lines and six check cultivars; BLT-V has 18 breeding lines and three checks. Yield and other traits to be recorded and statistically analyzed. Promising lines to go to SIEVE in 1981.

Cultivars/line trials. Include SIEVE, SPOT, ISVEX-A and ISVEX-B of 1980 series. Seeds will be sent from Illinois. All data to be recorded and returned to Illinois.

Seed increase plots. Cultivars of ISVEX and SPOT will be increased and shipped to Illinois for preparation of the 1981 trials. Planting date to be chosen so the harvest period occurs in dry weather.

7. RECOMMENDATIONS:

a) Current breeding work. The breeding work should concentrate its effort on the development or identification of germplasm having: (1) good quality of planting seed; (2) disease (SMV) and insect resistance; (3) high yield and yield stability in tropical and subtropical environments. All these factors are priority problems in soybean growing areas of developing countries.

The first objective includes seed deterioration by pathogens and seed deterioration by weather; special breeding methodologies would be required and the assistance of a plant pathologist (Dr. Hepperly, Dr. Mignucci, UPR) would be essential for the achievement of this objective; plant maturity of the breeding populations should coincide with rainy weather.

Objective 2 requires the assistance of a plant virologist to test for SMV resistance. I have been informed that the progenies to be grown this summer are homozygous resistant for SMV; therefore, only selection for agronomic performance should be made at this stage, but new tests for SMV presence should be made in selected lines of advanced generations. For the insect resistance work, the assistance of an entomologist is also required. It may be necessary to rear insects and cage plants in order to provide a proper environment for the selection work.

Objective 3 involves breeding for a complex trait highly influenced by environmental factors. The feedback provided by ISVEX, SPOT and SIEVE trials will be of great value for the achievement of this objective. Therefore, information from combined analysis of data of these trials should be used for planning variety crosses leading toward this objective.

b) Future breeding work. It would be desirable to develop breeding work on the following problems which are relevant to soybean production in tropical and subtropical regions: (1) breeding for increased symbiotic performance; (2) breeding for day-length insensitivity; (3) breeding for adaptability to mixed cropping systems.

c) Assistance from the soybean breeder of INTSOY/Peru project. The breeder of the INTSOY/Peru project could assist the breeding work at Puerto Rico if he could travel for periods of one week, five or six times during the next 12 months - A tentative schedule of travel would be: early June, late August, late October, January (1981), March (1981), May (1981).

d) Cooperation with the College of Agriculture - UPR. Advising of graduate students and presentation of seminars by the soybean breeder would help strengthen the relations between INTSOY and the College of Agriculture at Mayaguez.

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Camacho, L. H.

5. CORPORATE AUTHORS (101)

Ill. Univ. College of Agr.

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