

PN ABD 572
63710

June 30, 1989

PROGRESS REPORT

7.112

Grant No. DPF-10688G-SS-8003

"Isozyme markers for measuring genetic erosion in potatoes in Andean farms"

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Training:

Research Assistants: Mr. Pedro Cisneros, a student from the Agrarian University, La Molina and the International Potato Center, Lima, Peru initiated his Ph.D. studies in genetics at UCD in January of 1989. As a thesis project, under the supervision of Carlos Quiros, Mr. Cisneros is working on the development of markers and genetic maps in potatoes. He has acquired extensive research experience in potato research in Peru. As a research assistant at Davis, he is fully dedicated to the AID project. In our laboratory, he has been trained on isozyme electrophoresis, which he utilizes routinely for potato genetic analysis.

Ms. Ella Schmidt is also a research assistant from Peru doing his Ph.D. studies in anthropology under the supervision of Steve Brush. During the months of June, July and August, 1989, Ella Schmidt worked in the Cuzco area of southern Peru. Her work focused on determining the structure of the regional potato market in Cuzco and its influence on the cultivation of native potatoes. She is making systematic collections of native potatoes in the marketing system of the Cuzco region to determine the amount of potato diversity entering the market. Mr. Ramiro Ortega, a professor at the National University San Antonio Abad of Cuzco has collaborated closely in this part of the study. He will come to Davis early next year and will analyze the market collections with isozyme screening techniques.

The other two research assistants, Heather Jersild and Ann Marie Flynn, have worked on statistical analysis of farm level data in relation to the maintenance of diverse native potatoes. A multiple regression model to explain the variance in diversity maintained by different households in the Cuzco area has been developed, and this model is able to explain 70% of the variance. Stephen Brush also has supervised the gathering and analysis of published data on Peru's potato commodity system so that a national context can be established for the regional study on Cuzco.

Short term trainee: Arrangements have been made to host a trainee from the International Potato Center. Ms. Maria del Rosario Herrera, a technician from the genetic resources laboratory, headed by Dr. Zosimo Huaman, will join our laboratory by the end of July of 1989. She will be trained on isozyme techniques and genetic analysis, working closely with Mr. Cisneros. At Davis, Ms. Herrera will analyze parental stocks of segregating progenies developed at CIP and Cornell University (see below). She will also analyze tubers collected in Andean farms for the genetic erosion study.

Plant Material:

Segregating progenies: During the past six months, Dr. Zosimo Huaman at CIP has created approximately 50 progenies of diploid potatoes segregating for a large array of morphological and disease resistant traits. These include tuber characteristics, bacterial and virus resistance. Ms. Herrera will bring the tubers of the parents used in the development of these progenies to determine their genotypes for the isozyme markers. Progenies from parents which show differences for isozyme genotypes will be grown at CIP and evaluated for disease resistance and tuber characteristics. Tubers from these progenies will be analyzed at Davis and CIP for isozymes.

Dr. Robert Plaisted from Cornell University has provided four progenies of tetraploid potatoes segregating for nematode and virus resistance. These are being grown at Davis for isozyme genotyping. They will be analyzed by Ms. Herrera in August as part of her training.

Introgression Study:

Mr. Ramiro Ortega in Cuzco and Paucartambo identified several mixed ploidy fields surrounded by *Solanum* wild species. Unfortunately, unusual cold weather and a snow storm at the time of berry collection killed the plants in the selected fields. We will attempt to do it again early next year.

In summary, the first six months for the granting period served us to identify and hire personnel involved in the project. Also, we developed most of the plant material necessary for the genetic analysis and initiated the collection of tubers from the Andes. Training of the key personnel was initiated and now everything is in place to prepare the short term trainees from CIP and Cuzco.