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Computer Simulation Models: A Tool for Transferring IPM Technologies from Developed to Developing Countries

By

D. Shtienberg,

Department of plant Pathology, ARO, the Volcani Center, Bet Dagan, Israel

G.A. Forbes

International Potato Center, Lima, Peru

W.E. Fry

Department of plant Pathology, Cornell University, Ithaca, NY 14853, USA

J. Revelo

Instituto nacional de Invesigacion Agropecuaria, AA 128, quito, Ecuador

1. Scientific Summary

The overall aim of this project is to examine the possibility of using computer simulation models as a tool for transferring IPM technologies from developed to developing countries. The feasibility of this approach is examined by using the potato late blight simulator as a case study. The specific objectives are: i) Simultaneously validate the late blight disease simulator in two temperate sites (Israel and NY State) and one tropical site (Quito, Ecuador); ii) Apply the simulator to several outstanding research and management problems currently facing the Ecuadorian potato program; and iii) Document the experience such that the simulators can be useful for disease control and research in other developing countries sharing the same or similar agroecosystem.

In line with the research plan, work in the first half of 2003 was focused to some extent on all three objectives. Basic experiments were done at Cornell University to verify some aspects

of the simulation model. These experiments produced new data that will be used to re-evaluate the way both sporangial survival and infection efficiency are handled in the simulation model. The first part of 2003 saw significant strides toward objective iii) at Cornell, in that software for simulations was made much more flexible. A new “shell” was developed that enables users to simultaneously simulate disease development in a number of locations and automatically compare results. This will facilitate use of the tool for testing the wide applicability of particular disease management tactics.

Work in Ecuador during this period focused on further evaluation of simple decision support systems based on accumulated rainfall (objective II). Two years of trials have now demonstrated that this approach works well at the experimental level. The Ecuadorian national program is now using this to manage their seed multiplication plots. Data from these trials are now being evaluated with the simulator and will soon be published.

Progress was made toward the third objective of the study in a meeting held in Lima, Peru (see below). In that meeting, project participants planned publications that will be used to verify results in peer reviewed journals and diffuse project outputs to the scientific community. Further progress was made toward diffusion of project outputs through an agreement with the Global Initiative on Late Blight (GILB). GILB will publish project results and tools on their web page and will also produce a summary of the project that will be published in the GILB newsletter. Finally, plans with CIP and GILB were made to develop researcher training materials which utilize the disease simulator. Additional data were acquired for simulation purposes from Peru and Ecuador.

2. Scientific Issues

No new scientific issues in this period.

3. Managerial Issues

No significant managerial issues.

4. Special Concerns

No special concerns at this time.

5. Collaboration, Travel, Training

D. Shtienberg, R. Fry, J. Andrade, M. Taibe and G. Forbes met in Lima, Peru in June, 2003 to discuss progress on the project and to make plans for project finalization.

6. Request for Action

No action is required at this time.