Horticulture CRSP Project Report

Sustainable Production and Marketing of Vegetables in Central America

Evaluating locally appropriate disease resistant tomato and chili varieties in El Salvador, Honduras, and Nicaragua and sharing marketing techniques.

Lead Project Investigators:

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- Peter Hanson and Paul Gniffke, AVRDC - The World Vegetable Center, Taiwan
- Dora Elizabeth Hernandez Centeno, CARE, El Salvador
- Don Breazeale, Fundacion Hundurena de Investigacion Agricola (FHIA), Honduras
- Martha Elizabeth Moraga Quezada, Universidad Nacounal Agraria, Nicaragua

Project Summary

This project combined the technology and biological capital of the University of Wisconsin-Madison and the Asian Vegetable Research and Development Center (AVRDC), Taiwan, ROC with the managerial and technical skills of three Central American institutions: CARE, El Salvador; Fundación Hondureña de Investigación Agrícola (FHIA) in collaboration with Fintrac, Honduras; and Universidad Nacional Agraria (UNA), Nicaragua. All institutions have hands-on, field-based experience in research, extension, marketing, and the organization of growers and small cooperatives run and owned by local women. Advanced breeding lines provided by AVRDC were evaluated in on-farm field trials in collaboration with local community leaders for resistance to two of the most important production constraints in Central America, whitefly-transmitted begomoviruses (tomato) and anthracnose (pepper). Field days were organized at each location with local growers, women's groups, and community leaders. A regional science-based workshop was organized at the University of Zamorano in Honduras with participation of cooperators from each country. To enhance the worldview of regional leaders and to gain hand-on experience in vegetable production and innovative marketing strategies, a workshop was held in Spanish at University of Wisconsin-Madison.

Some families in El Salvador were able to grow tomatoes for the first time after identifying virus resistant cultivars.

Project Objectives

1. Development of new technology to identify disease and virus resistant germplasm resources in tomato (begomoviruses) and chili peppers (anthracnose) that can be utilized directly as cultivars in more sustainable smallscale vegetable production enterprises or, alternatively, serve as parents in short-term plant breeding projects.
2. Development of human and institutional capability, focusing on women's cooperatives in the region.
3. Increase regional knowledge of best management strategies for sustainable vegetable production.
4. Increase regional knowledge of different market strategies.

Project Report Narrative

--Submitted by James Nienhuis

Viral diseases are the principal limitation to sustainable and profitable production of tomatoes and peppers for most small farmers in Central America. We identified tomato lines that are not only virus resistant, and thus higher yielding, more profitable and more sustainable but also have quality characteristics that are desirable for marketing. These cultivars lower risk for smallscale farmers in Central America. In addition, we organized community field days with women's groups and communities to discuss the vegetable evaluation trials and enable them to choose the cultivar they wanted. We also organized regional participatory workshops in the target countries and international workshops in Wisconsin to discuss the results and plan, as a group, how best to proceed. Thus, we achieved our goals. That is the good news.

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Now the bad news. Much to our dismay, after indentifying high-yielding germplasm with virus resistance, we quickly learned that we would have no impact to sustainable production by small farmers and women's groups because no seed was available of the superior cultivars. Moreover, we also quickly learned that importing seed into Central American countries was a very expensive and bureaucratic process – almost impossible. Thus, the logical extension of this Immediate Impact Project was our phase two project – "*Semillas de Esperanza*" in which we propose to produce seed in each target country. The overall impact will be based on success of the *Semillas de Esperanza* project.

<u>Partners</u>

The quality and diversity of the partnerships with stakeholders in our target countries was an unexpected benefit to this project. The World Vegetable Center (AVRDC) was our technology platform. They were a critical partner. Not only did they have tomatoes and peppers that had been bred for virus resistance, but also the germplasm had been tested in similar tropical production environments in Asia and Africa; thus, we knew beforehand that AVRDC germplasm had a reasonably high probability of success in tropical Central America. In addition, a critical advantage of working with AVRDC was they did not impose intellectual property rights over their germplasm which directly benefited the women's groups with whom we are working.

The three in-country partners were very diverse, but each brought a unique perspective to our project.

i. CARE is very hands-on working to alleviate poverty and working with women's groups. The strength of CARE is connection to the community and community organization, especially with women's groups. Our project complimented CARE by providing the one critical aspect that they lacked – access and knowledge of technology. Evaluating germplasm is completely new to CARE; yet in both Morazán, El Salvador and Tajomulco, Guatemala, CARE is evaluating germplasm in cooperation with rural poor and women's groups. Part of the success of the germplasm evaluation with women's groups was that many of the CARE personnel were in fact agronomists, they had the skills to successfully evaluate germplasm they simply had never had access to technology.
ii. The Universidad Nacional Agraria (UNA) in Nicaragua had strong professors and students who identified women's groups in Dinamba and Tisma Nicaragua. In cooperation with women's groups they planted the germplasm evaluation trials in both locations and, it appeared to me, UNA personnel clearly enjoyed having an impact in the community. Thus, in addition to the direct

impacts of this project, perhaps, with UNA we planted the seeds of a tradition of community outreach that may extend well beyond this project.

iii. Our third partner, was la Fundacion Hondureña de Investigacion Agricola (FHIA). They are professional agricultural researchers; their outreach, is through an AID funded NGO, FINTRAC. FINTRAC has worked with commercial growers in Honduras, but now has a new project that is focusing on the rural poor, small growers and women's groups. The FHIA-based FINTRAC representative, Andrew Medicott, participated in our regional meeting in Honduras in November of 2010. FHIA did a thorough, careful and professional evaluation of the AVRDC germplasm and provided a detailed report which is available upon request from Horticulture CRSP.

Impact in Costa Rica

Costa Rica was not funded by this project but, due to interest of Professor Carlos Ramirez of the Instituto Tecnológico de Costa Rica (ITCR) in San Carlos, they did participate. The AVRDC lines are being evaluated at Nadayure and Hojancha, rural areas in which tomato production by small farmers is limited by disease. ITCR and local farmers in the region are cooperating in the evaluation of the lines at no cost to our project. In addition, ITCR sent six students and faculty to participate in our 2010 UW-based workshop on Organic and Sustainable Vegetable Production and Marketing – ITCR students and faculty paid all costs associated with their participation in the UW-based workshop. Professor Ramirez is a widely recognized regional expert on greenhouse design and protected production of tomatoes and peppers; thus, Professor Ramirez has become a critical member of the new "Semillas de Esperanza" project.

Because of ITCRs interest in our HortCRSP project, I was asked to served as major professor for Professor Carlos Ramirez for his Ph.D. Thus, at no additional cost to the HortCRSP we will participate in the formation of a new Ph.D. level regional professional in Central America. In addition, another professor from ITCR, Prof. Xiomara Mata, a plant pathologist, will be coming to the Univ. of Wisconsin as a visiting professor in the fall of 2011. The HortCRSP project is not paying any of her expenses. I point out these collaborations with Costa Rica and ITCR only to highlight how this HortCRSP project has leveraged participation and had an impact in high-level training in sister countries who are not paid by HortCRSP. This is a benefit of a regional project.

About Horticulture CRSP

Horticulture CRSP (funded by USAID under Award EPP-A-00-09-00004) provides funding to realize the opportunities of horticultural development, improve food security, improve nutrition and human health, provide opportunities for diversification of income, and advance economic and social conditions of the rural poor, particularly women. Horticulture CRSP is managed by the University of California, Davis and has nearly 30 projects in over 20 countries. For more information, visit: http://hortcrsp.ucdavis.edu/.

Project Performance Indicators

4.5.1 Agriculture Enabling Environment	Project Achievements
Number of individuals who have received USG supported short-term agricultural enabling environment training - Female	50
Number of individuals who have received USG supported short-term agricultural enabling environment training - Male	40

4.5.2 Agriculture Sector Productivity	Project Achievements
Number of new technologies or management practices under research as a result of USG assistance.	50
Number of new technologies or management practices made available for transfer as a result of USG assistance.	50
Number of new technologies or management practices being field tested as a result of USG assistance.	50
Number of producers organizations receiving USG assistance.	3
Number of community-based organizations (CBOs) receiving USG assistance.	3
Number of community-based organizations (CBO) who have adopted new technologies or management practices as a result of USG assistance.	3
Number of women's organizations/associations assisted as a result of USG interventions.	3
Number of individuals who have received USG supported short-term agricultural sector productivity or food security training - Female	60
Number of individuals who have received USG supported short-term agricultural sector productivity or food security training - Male	40
Number of research projects and/or technologies of potential benefit to U.S. horticultural industries	2

Capacity Building (Horticulture CRSP Indicators)	Project Achievements
Number of host country institutions, agencies and organizations in direct cooperation or collaboration	3
Number of workshops conducted for host country institution, agency, and organization personnel	3
Number of host country professionals attending workshops, training conferences, or similar - Female	14
Number of host country professionals attending workshops, training conferences, or similar - Male	31
Number of certificate training programs conducted	1
Number of certificates earned by host country professionals - Female	9
Number of certificates earned by host country professionals - Male	11
Number of U.S. faculty providing training or instruction in host country - Female	1
Number of U.S. faculty providing training or instruction in host country - Male	2
Number of host country extension workers, university faculty or other host country professionals involved in providing training to other host country professionals - Female	3
Number of host country extension workers, university faculty or other host country professionals involved in providing training to other host country professionals - Male	1
Number of host country professionals directly involved in conduction Hort CRSP research activities - Female	3
Number of host country professionals directly involved in conduction Hort CRSP research activities - Male	3