

HORTICULTURE CRSP



Horticulture Collaborative Research Support Program

**United States Agency for International
Development**

and

University of California, Davis

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Executive Summary

Introduction

In September 2004, USAID funded UC Davis, the AVRDC (World Vegetable Center), and a consortium of U.S. Universities (Michigan State, Purdue and University of Hawaii), to conduct an in-depth, highly collaborative analysis of the opportunities and challenges for global horticultural development. The assessment was initiated with a Synthesis Workshop held at UC Davis, followed by three regional workshops to provide local stakeholders with the opportunity to discuss and analyze the regional priorities for horticultural development and research in Africa, Latin America and the Caribbean, and the Asia/Near East region. A comprehensive survey of horticultural experts, ministries, NGOs, industry, and producers supplemented the information gathered at the workshops. The resulting Global Horticultural Assessment (GHA) document calls for action to increase horticultural research and knowledge-building aimed at addressing poverty, hunger and nutrition in developing countries, and proposes a list of priorities for building research capacity in horticulture.

The USAID proposal call for a Horticulture CRSP represents an exciting opportunity to meet the challenges and explore the opportunities delineated in the GHA. In addition, the CRSP priorities include critical needs identified by UNDP (hunger, poverty, childhood malnutrition and vulnerability to climate, water and sanitation impacts), and the priorities set by USAID's Missions, IEHA, and NEPAD/CAADP.

UC Davis Mission

Through a distinctive tradition of core-discipline excellence, interdisciplinary collaborations and productive partnerships, UC Davis teaches students to think critically, objectively and creatively and to be lifelong learners, engaged leaders and productive citizens; pursues research to advance knowledge and to address state, national and global challenges; and serves the public through the generation, broad dissemination and application of knowledge.

Partners

In applying to host the Horticulture CRSP (HORT CRSP), the University of California, Davis (UC DAVIS), is adhering to the campus mission of national and global engagement and public service. Our proposal draws on the unequalled combination of horticultural and allied expertise and international connections of the faculty in the UC DAVIS College of Agricultural and Environmental Sciences (CA&ES), with that of faculty in our Partner Title XII Universities - Cornell University, North Carolina State University, and the University of Hawaii. If funded, the HORT CRSP will reach out to all Title XII universities (1890 schools) and 1994 Native American schools, seeking to include them and harness horticultural expertise from across the Land-Grant system.

Goals

The goal of the HORT CRSP is to realize the opportunity that horticultural development offers, of meeting the food needs and improving nutrition and human health in the developing world, while providing opportunities for diversification of income and consequent economic and social advancement of the rural poor and particularly women.

The results of the proposed research and training activities envisaged for the HORT CRSP will increase food security and improve the quality of life of people in developing countries while bringing an international focus to the research, teaching, and extension efforts of U.S. institutions. Our goal will be achieved through collaborations between U.S. universities and national and regional institutions abroad that are active in horticulture research and development. Initial programs will target developing countries in sub-Saharan Africa, South Asia, and Latin America.

Themes

The HORT CRSP program addresses three major themes that have significant potential to improve the sustainability and profitability of horticulture in the developing world. In addition to gender equity, discussed below, these themes are Information Accessibility, and Innovation.

Information Accessibility

The GHA notes the desperate need in rural communities for information – on marketable crops and varieties, on production techniques, on postharvest handling, and on market requirements and access. Starting from the foundation Research and Information Centers at UC Davis and similar databases at our partner LGU's and other collaborating institutions, we propose to create a Global Horticultural Information Center (GHIC) that will serve as a readily accessible database of information on production, postharvest handling, marketing of horticultural crops, food safety and quality. Recognizing that most stakeholders in the developing world are still not connected to the world-wide-web, we also propose to provide relevant information sub-sets from the GHIC in formats suited to storage on cell-phones, or other portable digital devices. A particular effort will be to encourage the development of text-less interactive information which will overcome the literacy barrier that stands between the rural poor and the wealth of information on the web.

Innovation

The HORT CRSP will encourage Pilot Projects that explore 'disruptive' or 'leapfrog' technologies providing advanced tools, in an appropriate form, to stimulate and facilitate horticultural development in the developing world. An example of this approach is to capitalize on the rapidly decreasing cost and increasing efficiency of photovoltaic devices to power innovative technologies for horticultural applications. Electric water pumps, reverse osmosis desalinizers, and Peltier effect small-scale coolers are all examples of such strategies. The HORT CRSP will encourage Pilot Projects that harness the explosion in knowledge of the molecular and biochemical basis of plant growth and development to develop novel germplasm (through biotechnology, marker-assisted, or conventional breeding) that addresses constraints to horticultural production, particularly biotic and abiotic stresses.

Technical Approach

In addressing the priorities outlined in the RFA and the GHA, we have proposed emphasizing challenges and opportunities in key areas – gender equity, sustainable crop production, postharvest technology, food safety, market access, and financing. Constraints in each of these areas can limit the opportunity for limited resource communities to participate in the value chain, as can deficits in 'core social

considerations' (capacity building, enabling environment, gender equity and nutrition and human health). Equally, there are exciting opportunities to deploy innovative technologies, introduce new germplasm, and create innovative marketing partnerships and strategies that will facilitate their participation.

In the developing world, women provide as much as 90% of the labor for the production of horticultural crops. Although they represent a reservoir of production and marketing knowledge of what are often termed 'women's crops' they usually are compensated with lower wages and less permanent positions than those available to men. Lacking knowledge of how finance works and where to get it, as well as collateral to insure it, women have unequal access to technology and production inputs and therefore reduced opportunities for economic advancement. Project proposals addressing gender inequality will be expected to evaluate gender-based constraints, provide leadership and technical training, and provide outreach or policy assistance to develop solutions. Some training activities will target women, including training for female extension specialists

In addition to external constraints to success in high value horticulture, sustainable production of the crop itself remains a primary concern. Sustainable horticultural production requires an integrated consideration of inputs (germplasm, water, fertilizer, pesticides and growth regulators), as well as potential consequences (salinization, contamination of water supplies, loss of soil structure and fertility). Pilot Projects will be sought proposing innovative technologies for obtaining and applying water, and for remediating or avoiding salinization, that depletes arable land globally at a rate of 1.5% per year.

An important function of the proposed GHIC will be to provide a database of accessible information on identification and sustainable control of diseases, pests and weeds. This database will be accessible to rural (and frequently illiterate) stakeholders through audio, graphic and video media up-loaded to cell phones.

The future of mankind depends on preservation of the genetic diversity of the world's food crops for future generations. The HORT CRSP will be mindful of the danger of losing this valuable resource when modern low-diversity varieties are introduced into cultivation. In addition to a robust component in germplasm exploration and conservation, and in the improvement of indigenous germplasm using conventional and molecular genetics, the HORT CRSP will seek projects implementing germplasm conservation techniques that have already proved promising in the developing world. Seeds represent collection, enhancement, storage, and assessment of seed quality will be developed for existing and potential seed providers.

The value of horticultural crops is strongly seasonal, and protected horticultural cultivation can spread the season, reduce market fluctuations and increase farm incomes. The HORT CRSP will include projects developing and/or testing novel coverings for protected cultivation that are low-cost and use locally available materials.

In the developing world, more than 50% of the value of harvested horticultural crops is lost between the farm and the consumer. There is an obvious opportunity to explore and implement new postharvest technologies that are cost-effective, appropriate, scalable, innovative, and environmentally friendly. Such technologies should not only ensure good postharvest handling and improve profits for producers and marketers, but also should provide commercial opportunities for local manufacturers. To provide needed

local applied research and educational programs, the HORT CRSP will support the establishment or improvement of Postharvest Technology Centers in the target regions.

Debilitating human illnesses and even death can result from ingestion of horticultural products contaminated with biological, chemical or physical hazards. Training in appropriate GAPS (Good Agricultural Practices) and HAACP (Hazard Analysis and Critical Control Points) practices to mitigate the risk of food-borne illness, improve food quality and nutrition, can provide immediate and important impact on human health, as well as increase competitiveness of products in high value markets.

The dynamics of the marketing environment, for example changes resulting from the rapid proliferation of supermarkets in developing countries, are a challenge to the participation of small-scale farms and firms, particularly those led by women, in the horticulture value chain. Successful horticultural marketing is strongly dependent on marketing know-how, so Pilot Projects in the marketing arena will focus on increasing farmers' access to market information, and on strengthening producer and marketing organizations and linkages. Horticultural producers in the developing world, particularly women, frequently lack access to essential finance, due to inadequate credit markets. The HORT CRSP will also fund projects that identify deficiencies in credit markets, develop innovative means to provide credit to horticultural producers, and undertake outreach to microfinance institutions to reduce the pervasive perception of unacceptable risk and to quantify the substantial return on investment in horticultural crops.

Training

In keeping with the principle of Information Accessibility, training will be a primary component of the HORT CRSP at all levels. In addition to providing funds for graduate and shorter-term education and exchanges, the Pilot Projects will be expected to include outreach components, particularly focusing on entrepreneurial women.

Networking

The CRSP model for research support is rooted in an understanding of the importance of collaboration and networking, and the HORT CRSP will take full advantage of opportunities to enhance networking. In addition to traditional techniques (workshops, collaborative proposals), the HORT CRSP staff will facilitate the use of modern technologies for networking, particularly social networking software adapted to professional discussion and interaction. The three proposed Centers of Excellence, each located in a collaborating institution in one of the HORT CRSP target regions, will also serve to facilitate networking.

US benefit

US horticultural producers, most of them family farmers, deal with many of the same constraints facing farmers in the developing world. Scarcity of water, increasing ambient temperatures, salinisation, high fertilizer costs, and losses to pests, diseases, and weeds are all significant constraints to production. Labor demographics, urban drift, and the dynamics of the marketplace impact profitability. Research and training activities supported by the HORT CRSP will benefit US producers, not only by providing opportunities to develop and implement novel technologies, but also by building capacity in horticultural production at the LGUs and other institutions

Management approach

The management of the proposed HORT CRSP is structured to minimize administrative overhead, ensure flexibility and transparency, and foster collaboration between institutions in the US and the developing world in building capacity for horticultural research, outreach and implementation. Housed in the Plant Sciences Department of the College of Agricultural and Environmental Sciences (CA&ES) at UC Davis, the CRSP will be led by Emeritus Professor Ron Voss, who will be responsible for overall management of the HORT CRSP, and an Associate Director, Beth Mitcham, responsible for technical management. Other management team members include Professor Michael Reid, implementation and special projects, and International Learning Center Director, Mark Bell, training and communications. A small staff (Fiscal Analyst, Program Representative, and Administrative Assistant) will be directly hired by the HORT CRSP. Since the program will be housed in Plant Sciences in proximity with the College International Programs Office, Human Relations, IT and other support services can be contracted on an as needed basis from them.

Grant administration

The HORT CRSP proposal envisages grants of three types. As a means of jump-starting the HORT CRSP, we plan to mine the recent proposals from our partners and other LGU's to the call for proposals from the USDA for research on Specialty (i.e. horticultural) Crops. Many of these research proposals address issues that are directly related to the goals of the HORT CRSP, and represent a source of 'shovel ready' research and education proposals that can rapidly be re-purposed as **Initial Impact Proposals** (IIPs), addressing priority constraints and opportunities outlined in the Technical Approach, and including collaboration with investigators in the developing world. Other similar sources of submitted proposals that can be adapted to the Horticulture CRSP requirements will also be sought. **Exploratory Projects** will be short-term projects that will be expected to provide problem analysis and develop networks of collaborators that might participate in a subsequent Pilot Project. **Pilot Projects** will be major multi-investigator grants lasting 2 -3 years. It is anticipated that Pilot Projects (and IIPs) will often be targets for Associate Awards for research or training interventions funded by the relevant USAID missions and other granting agencies.

Timeline

Rapid start-up for the HORT CRSP is recognized as key to achieving the greatest impact where most needed, and as quickly as possible. A Program Council, including faculty from the partner LGU's, HORT CRSP management, and the USAID CTO will be formed immediately and will guide the HORT CRSP during the first critical months. The council will be responsible for surfacing IIPs, and for appointing members of the International Administrative Board (IAB), which will be the long-term governing body for the CRSP. The IAB will also serve as the HORT CRSP Technical Committee, and as the review panel for the IIPs, with a goal of having these projects funded within six months of the start of the HORT CRSP.

By mid-2010, the first call for Exploratory Project and Pilot Project grants will be published, and, an Inception Workshop, planned by the IAB and organized by the HORT CRSP staff will be held in one of the target regions. The primary goal of the workshop will be to facilitate networking between LGUs and institutions/agencies/organizations in the developing world who are potential applicants for funding from the HORT CRSP. It will also provide a forum for discussion of Pilot Project benchmarks and assessment methods. In addition, the workshop will be an opportunity for discussion of the goals and structure of the proposed GHIC (Global Horticulture Information Center). To ensure broad participation, the workshop will be available on-line as a streaming webinar for would-be participants unable to travel to the workshop location.

Transparency, monitoring and evaluation

To achieve a dynamic, effective and responsive program, the HORT CRSP plan incorporates a results-driven framework, the foundation of which is a continuous cycle of evaluation. Funding opportunities will be widely publicized, and bidding for them will be nationally competitive. Impartial peer review panels will evaluate all proposals, and their advice will be key to the funding decisions recommended by the IAB. Project progress will be monitored on an ongoing basis, and budget allocation decisions will be based on performance. An independent External Evaluation Panel will provide oversight of the HORT CRSP, and of the research and outreach projects that it supports.