THE McKNIGHT FOUNDATION

Collaborative Crop Research Program

Rebecca Nelson
Program Director
Kelly Lindsay
Program Assistant

Cornell University
321/322 Plant Science Building
Ithaca, NY 14853
http://mcknight.ccrp.cornell.edu

Tel: (607) 254-7475, 255-9693, 254-6499
Fax: (607) 255-4471
Email: rjn7@cornell.edu, kal44@cornell.edu

CCRP Quarterly Newsletter

To: The McKnight Foundation grantees
From: Office of the CCRP Program Director
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CCRP News

- Pre-proposals focusing on achieving impact in the Andes were received and a subset selected for preparation of full proposals. In response to the request for proposals, which was released in January, we received 134 pre-proposals by the April 15 deadline. The pre-proposals were translated and reviewed by the oversight committee and program director. At a meeting of the oversight committee, held in Amsterdam in early June, 23 pre-proposals were selected for the next stage of the selection process. The 23 groups were requested to prepare full proposals, which are due on Aug. 20. Guidelines for preparation of full proposals have been posted on the CCRP Web site in both English and Spanish.
- The Proceedings were compiled for the Consultation Workshop on Millet-and Sorghum-Based Systems in West Africa, which was held in Niamey in January of this year. The Proceedings consist of a booklet containing a short summary of the workshop and abstracts of the presentations made, as well as a CD with longer workshop summary, full papers submitted, presentations made during the workshop, and photographs of the event. Two hundred copies of the Proceedings were prepared for distribution.
- Plans are advancing for the Grantee Conference, which will be held in the Netherlands in November. The meeting will feature oral reports and posters from each project team, as well as workshops on the following topics: connecting research and development; monitoring and evaluation; and communities of practice. The program will honor those project teams that have been or will soon be "graduated" from the CCRP. We will also honor those members of the Oversight Committee who have recently completed their service to the program.
- Kelly Lindsay is re-engineering the CCRP Website to enhance navigability and make all pages accessible to the public. Any "classified" documents can be obtained from Kelly as appropriate. See the Web section below for more information on the new CCRP-Web.
- Annual reports and workplans were received from the chickpea and finger millet project teams.
- We are pleased to welcome Dr. Julio Kalazich to the CCRP Oversight Committee. Dr. Kalazich is a potato breeder and Director of the Remehue Regional Research Center for Chile's Region 10. He

was the leader of the recently-completed CCRP potato project "Obtaining potatoes less dependent on pesticides through broad-spectrum insect resistance."

- Oversight committee members Richard Jones and Charity Kabutha visited the Ethiopia tef project on 13-14 April.
- Charity Kabutha and Richard Jones visited the project team of Robert Mwanga in Uganda on 1 June to discuss aspects of the workplan of Dr. Mwanga's renewal project, "Development of high-yielding, multiple-resistant sweetpotato germplasm."
- Oversight committee member Daowen Wang visited the China wheat scab project (17 – 18 May) and the soybean project (19-21 May) to become familiar with the program and to interact with the project teams.
- Congratulations to oversight committee member Dr. Agnes Rola on her promotion to Director of Institute of Strategic Planning and Policy Studies. We have recently updated the governance page with this and other information and ask that OC members review their profiles and let us know of any updates.
- See the last section of this update for news from each of the CCRP projects.

Upcoming Events *[This list does not include all steps in the grant selection process]*

2004

August

20 Deadline for invited full proposals on topic of food security in the Andes
We are now in the second round of selecting proposals. Full proposals are **by invitation only.**

September

1 Planned release of West Africa request for pre-proposals (RFP)
This RFP will focus on achieving food security for resource-poor farmers in millet and sorghum-based systems in West Africa.

November

6-10 2004 Grantee conference, The Netherlands
The biennial grantee conference will be held at the Dolce Kasteel Vaalsbroek in Vaals, The Netherlands on November 6-10. This conference center is located on the borders of Germany, Brussels, and The Netherlands and has room for 130 guests. For more information, click here.

2005

March

24-27 Oversight Committee meeting, The Netherlands
The Oversight Committee will meet in Amsterdam, The Netherlands to select proposals from the West Africa RFP to be released this September.

CCRP Web

The CCRP has seen a dramatic increase in activity over the last two reporting periods. A significant increase in usage can be attributed to the announcement of the request for proposals on the subject of food security in the Andes. Site activity nearly tripled from December to January, nearly doubled from January to February, and remained high through the present reporting period. The majority of users during this time frame were traced from South American countries, the target-group of the Andes RFP.

Major changes are now underway to the look and navigation of the CCRP Web. Kelly Lindsay has been working out a new template that will include the following features:

- *An entirely public website.* The private section of the site received very little usage. Because of this and the complexity of maintaining the security system, we have decided to make all parts of the CCRP Web public.
- *Drop down menus for ease of navigation*. The goal of this design is to allow the user to access any page from any point on the website. A drop-down menu structure also facilitates widespread changes and creates a uniform look to the website.
- *Slideshow of variety of pictures.* Each page will feature rolling pictures that represent the many areas of funded research.
- *New pages, updated text.* Kelly will write a new user's guide, site map, and update all pages of timely relevance.

The template is currently being worked on and hosted at a private site. It should be ready for presentation before the 2004 Grantee Conference.

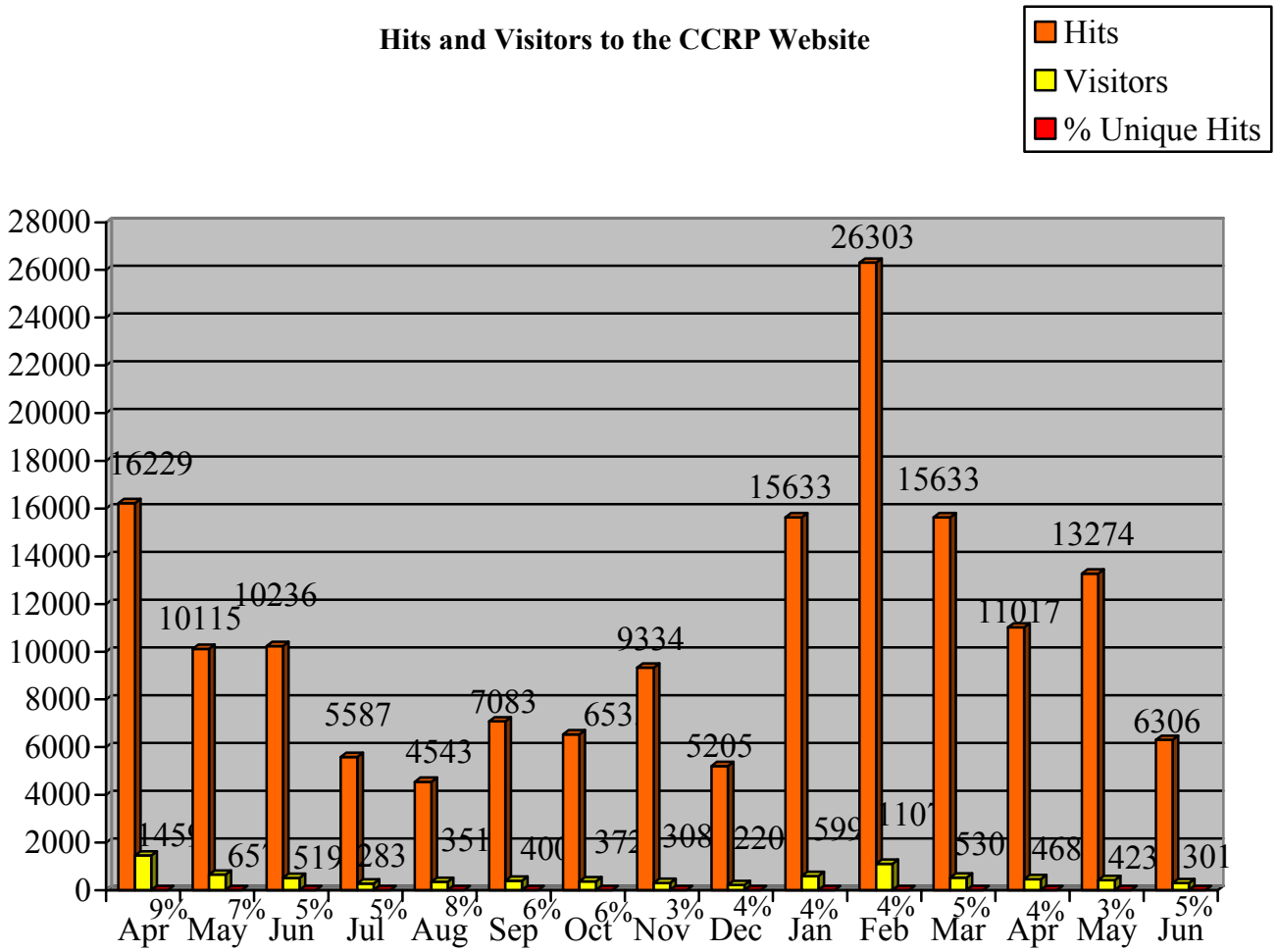
User feedback is critical to making any website truly useful. Please contact Kelly Lindsay for any questions, comments and/or concerns you may have. Your input is valuable to us!

CCRP Literature Service

The last quarter's activity picked up a little since last report. A total of 21 articles were sent to various project leaders, grantees, students and non-CCRP affiliates with similar research interests.
We encourage literature requests both within and outside of the CCRP.

CCRP Web Statistics Summary

Webalizer is a free program that generates web site usage reports. Over the past few months, we have been using Webalizer to interpret the CCRP Web's log files to determine how many hits, visitors, and countries have visited the web site.



Hits: Total number of times the site was visited. This is every single request made to the server.
Visitors: Total number of unique IP address requests made to the server.
% Unique hits: What percentage of hits were from unique users.

To view full web statistics reports by month, click here.

Updates from the CCRP Projects
The updates below are published as received. Minimal edits have been made.

Andean tubers (Peru)

1. Our preliminary results suggest that the Peruvian entomopathogenic nematode isolate, *Heterorhabditis* sp., is very lethal at low concentrations with an approximate LD_{50} between 5 and 10 nematodes per larvae. This would indicate that the isolate is very promising for future integrated management of oca weevil.

2. Molecular studies have confirmed that the villages of Matinga and Poques are important micro centers of oca diversity ("hot spots"). Additionally, the tuber seed flow between these villages is rather low. The two communities are located in two different watersheds of Southern Peru and about 30 kilometers apart.

3. Seventy two mophotypes of oca, 68 of mashua, and 29 of ulluco identified in six villages of Southern Peru were visually homologated with the material maintained *ex situ* by the International Potato Center (CIP). Our results indicate that only 2 morphotypes of oca, 1 of mashua, and 1 of ulluco are maintained by CIP. This would suggest that only particular clones are widely distributed in the country. On the other hand, most of the morphotypes are restricted to the villages. Also, either *in situ* or *ex situ* conservation should take place to prevent material of the communities from vanishing

Chickpea (India)

- Two researchers from National Chemical Laboratory, Pune, India, Dr. Ashok P. Giri, Scientist and Ms Manasi Telang, PhD scholar worked with Prof. Vincent R. Franceschi, Washington State University, Pullman, USA to carry to specific work on winged bean proteinase gene cloning and making construct for yeast and plant expression. Large-scale expression of these gene products in yeast is in progress, which will be, used to test their efficacy against chickpea pod borer, *Helicoverpa armigera* at NCL, India. Transformation events performed by Assam Agriculture University, Jorhat, India, Scientists using winged bean proteinase inhibitor gene constructs on chickpea generated several putative lines which were screened for gene insertion and few lines containing winged bean proteinase inhibitor gene were identified. Further characterization of these lines for the gene expression and copy number w! ill be attempted once these plants are well established in glass-house. Similar chickpea transformation events will be attempted at WSU for other winged bean proteinase inhibitor genes cloned under different tissue specific promoter.

- Mr. Ajay Srinivasan, PhD Scholar NCL visited Prof. John Gatehouse's laboratory at University of Durham, UK for 8 months to carry out work on a novel chickpea proteinase inhibitor protein (CaKPI) identified by NCL scientists. At present this gene product are being tested for it's in vitro and in vivo potential against *Helicoverpa armigera* and other insect pests.

- Screening of recombinant inbred lines for identification of Fusarium-wilt specific DNA markers at NCL, Pune and analysis their disease scoring data performed at Mahtma Phule Krishi Vidyapeeth (Agricultural University) during this season is in progress. In the second year farmers participatory program organized by MPKV, Rahuri and NCL, Pune was successful in several locations in different states of India. We are waiting the get feedback from the farmers. Dr. Fred Muehlbauer, WSU, Pullman, USA visited NCL and

MPKV with all the Indian collaborators, this meeting was very much useful for designing immediate plans in different areas in the project

Potato (Brazil/Chile)

- From April 12 to 17, 2004, Drs. Amauri Buso and Arione Da Silva, potato breeders from Brazil visited the Chilean Potato Breeding Program, and specifically the activities being carried out in the McKnight project in Chile. Dr. Pereira is Principal Investigator of the McKnight Project in Brazil, and is located at EMBRAPA's Research Center for Temperate Climate in Pelotas, State of Rio Grande Do Sul. Dr. Buso is also member of the Brasilian team on the McKnight Project and currently is Director of the EMBRAPA's National Vegetable Research Center located near Brasilia, Brazil's capital. EMBRAPA is the National Agricultural Research Service of Brazil. They visited three Regional Research Centers of INIA, the Chilean National Research Service, one located in Osorno, 41o S.L., where the base of the potato breeding project is located, other in La Serena, north Chile, at 30o S.L., where potato tuber moth and leaf miner, the most important potato pests abound, and where the screening for these pests is performed, and finally one research station located in Santiago, Chile's capital.

- During their visit, Brazilian scientists were received by their colleagues Drs. Kalazich, Sagredo, Rojas, Larrain and Lopez. They were able to see the advances being made in Chile on the project on the different units they visited and discussions were made on planning activities for the project which will finish in 2005. It was also discussed a project to jointly develop potato varieties for Brazilian and Chilean markets and outside countries' frontiers. This is a project dreamed by both country researchers and that hopefully will come to light during 2004.

- At the end of 2003, a new book on potatoes edited by Dr. Arione Da Silva Pereira and Julio Daniels, P.I. and researcher of the McKnight project in Brazil, respectively, was published. The book is entitled "O Cultivo da Batata na Regiao Sul do Brasil" (in Portuguese language) which translates to "Potato Crop in the Region of South Brazil". The book has 567 p. with six chapters and 33 sub-chapters plus one Anex. 34 Brazilian researchers contributed to this book, three of which are part of the Brazilian team on the McKnight project, including Drs. Pereira and Daniels and Dr. Carlos Alberto Barbosa Medeiros. The chapters and sub-chapters included in the book relates to socio economical aspects, the plant (origin and evolution, breeding, main cultivars, etc.), cultural practices, diseases (caused by fungus, viruses, bacterias and nematodes), pests (aerial part and soil), and seed potatoes. Interested people may write to Dr. Arione Da Silva Pereira (arione@cpact.embrapa.br). The book was financed in part by the McKnight Foundation.

- In April 17, 2004, at Intihuasi Regional Research Center, La Serena, Chile (30o S.L.), a seminar on potato pests control in the area was organized. It attracted farmers, extension agents, pesticides vendors, students from local universities and general public. The main objective of the Seminar was the launch of the book "Plagas de la Papa y su Manejo" (in spanish language), which translates to "Potato Pests and their Management". The book was edited by Mrs. Patricia Larrain, an entomologist and project's team member. It has 110 pages with 10 chapters and describes 24 potato pests that attack potatoes in Chile. Four Chilean authors contributed on the different chapters. Two of them are part of the McKnight project team, Mrs. Larrain and J. Kalazich, project's P.I. Mrs. Larrain contributed with the description of most of the pests included in the book, among them Potato Tuber Moth (PTM) and Leaf Miner Fly (LMF), subjects of the McKnight project and

Kalazich on the genetic resistance to insect pests. A great deal of the information given on the description of PTM, LMF and on insect resistance was obtained during the development of the McKnight Foundation project. The printing of the book was financed in part by the The McKnight Foundation.

PUBLICATIONS

- Pereira, Arione Da Silva and Julio Daniels (eds.). 2003. O cultivo da batata na regiao sul do Brazil. Embrapa Clima Temperado – Embrapa Informacao Tecnologica, Brasilia, D.F., Brasil. 567 p.
- Larrain, Patricia (Ed.). 2003. Plagas de la Papa y su Manejo. Instituto de Investigaciones Agropecuarias, Ministerio de Agricultura, Chile. Coleccion Libros INIA No9. 110 p.
- Larrain, Patricia. 2003. Lepidopteros: Polillas, Gusanos cortadores y Cuncunillas. pp. 31-55. En: Larrain, Patricia (Ed.). 2003. Plagas de la Papa y su Manejo. Instituto de Investigaciones Agropecuarias, Ministerio de Agricultura, Chile. Coleccion Libros INIA No9. 110 p.
- Larrain, Patricia. 2003. Dipteros: Moscas Minadoras. pp. 56-62. En: Larrain, Patricia (Ed.). 2003. Plagas de la Papa y su Manejo. Instituto de Investigaciones Agropecuarias, Ministerio de Agricultura, Chile. Coleccion Libros INIA No9. 110 p.
- Kalazich, Julio. 2003. Resistencia Genetica a Insectos. pp. 92-100. En: Larrain, Patricia (Ed.). 2003. Plagas de la Papa y su Manejo. Instituto de Investigaciones Agropecuarias, Ministerio de Agricultura, Chile. Coleccion Libros INIA No9. 110 p.
- Pereira, Arione Da Silva. 2003. Melhoramiento genetico. pp. 105-124. En: Pereira, Arione Da Silva and Julio Daniels (eds.). 2003. O cultivo da batata na regiao sul do Brazil. Embrapa Clima Temperado – Embrapa Informacao Tecnologica, Brasilia, D.F., Brasil. 567 p.

Quinoa (Bolivia)

- At the harvest time, farmers who planted the new variety Jach'a grano said "We like the variety because of its large seeds and early maturing". It is a good testimony of the acceptance of the new variety which was released last year.

- Representatives of quinoa processor visited us at the Letanias research station and they become interested in multiplying the seed of breeding lines to test in the processing plant.

- Our project received written notes, telephone calls and personal contacts from farmers and NGOs requesting high quality quinoa seed. It is a good opportunity for us to disseminate the outstanding varieties.

Soil (Brazil/Kenya)

- Drs. Antonio M. Coelho and Robert E. Schaffert of Embrapa Maize and Sorghum conducted a small workshop in Bamako Mali to assist INRAN (Niger) and IER (Mali) in collaboration with ICRISAT Mali to develop project preproposals for the upcoming McKnight West Africa Initiative along the lines of developing sorghum and millet genetic resources more efficient in phosphorus acquisition and developing integrated phosphorus management systems involving locally available rock

phosphates, legume species that help solubilize rock phosphate and sorghum and millet cultivars more efficient in phosphorus acquisition.

- Drs. Antonio M. Coelho (Soil fertility), Elto E.G. Gama (Maize Breeding) and Robert E. Schaffert (Project Leader and Plant Breeder) spent the first week in July visiting the Moi University component of the project in Eldoret, Kenya and the Kenya maize belt in the Western Region of the country. Dr. Sam Gudu and his colleagues programmed the visit in Kenya to the Maize breeding program at KARI – Kitale, the Kenya Seed Company in Kitale, and visits to several "on-farm" trials including selection of maize genetic resources in low pH and Al toxicity stress and in low phosphorus stress, and several fertility trials involving treatments of phosphorus fertilizer sources including regionally available rock phosphates, lime, and different phosphorus solubilizing organic sources. This visit was very informative for the Embrapa scientists and will be extremely useful in reforcing South – South Collaboration between the two institutions.

- Forty-four entries of Maize Genetic Standards for soil acidity, phosphorus, and aluminum toxicity stresses from Embrapa Maize and Sorghum were received by Dr. Sam Gudu at Moi University in Eldoret, Kenya after six months of quarantine and Brazilian and Kenyan Ministry of Agriculture bureaucracy. This material will be extremely in the Kenyan Maize improvement program.

- A Kenyan "on farm testing" collaborator, a maize farmer in Western Kenya spontaneously testified that before he began collaborating with soil fertility and maize breeding researchers in 1998, he planted about two acres of maize and harvested between a half bag (90 kg) and two bags per acre (between 110 and 445 kg/ha) now he and his family are harvesting 12 to 14 bags per acre (2.7 -3.1 t/ha). He committed that it's much better to plant less area with technology and inputs than a larger area the way they used to plant maize. He was obviously very pleased with the outcome of the Moi University "on farm" research.

- The second year Annual Progress Report and third year Workplan and accompanying documents were forwarded to project Managers at McKnight Foundation. We feel that the project is proceeding well with more results and output than originally planned. Results that can be used by our research partners as well as the farmers in Brazil and the resource poor farmers of Kenya and other countries in East Africa.

- Embrapa Maize and Sorghum and Moi University have been effective in leveraging financial support from the Rockefeller Foundation to achieve goal and objectives of this project. Scientists from Moi University and Embrapa had an exit visit with Dr. John Lynam at the Rockefeller office in Nairobi to discuss continued collaboration. Support from the Rockefeller Foundation allowed three Embrapa Scientists to Visit Kenya instead of one as proposed in the McKnight Project. We hope that continued support from both foundations will be available to meet our common objectives in the future.

<u>Soybean (China)</u>

- Dr. Daowen Wang, representing the CCRP Oversight Committee of the McKnight Foundation, visited the China-Soybean project at SCAU from May 19 to 21, during which he listened to an oral

progress report presented by the project PI, inspected the lab and field work, and interacted with both the staff and students related to the project.

- Dr. Jonathan Lynch and Dr. Hong Ma from PSU visited SCAU from May 18 to 27, during which they closely interacted with the CCRP team members at SCAU for information exchanges, experimental data analysis, and future planning. They also gave seminars on plant nutrition and molecular biology.

- Mr. Eric Nord, a Ph.D. candidate from PSU, visited SCAU from May 5 from June 15 for the purpose of collecting soybean phonological data from a field experiment at SCAU. His visit was a part of the joint-training program between Yan and Lynch's labs.

Sweetpotato (Kenya)

- **Progress on the study of beta carotene genes at the Austrian Research Centers, Seibersdorf.**

SNP discovery in the beta carotene pathway genes

In order to discover sequence differences of the beta-carotene pathway genes 29 genotypes of low and high beta carotene producing genotypes as well as the parental pair of the Beauregard x Tanzania family have been have been partially sequenced.

The following SNP sites have been detected
Farnezyl diphosphate synthase (FPP) – 4
Lycopene cyclase (LC) – 15
Geranyl-geranyl diphosphate synthase (GGPP) – No clear SNPs detected
Phytoene desaturase (PD) - SNP discovery in progress

However calculations of Gst values for the individual SNPs on the 29 clones consisting of 15 low and 14 high beta carotene producing genotypes obtained from Louisiana State University revealed that none of the SNP sites could be correlated to production of beta-carotene in the different genotypes.

Attempts to isolate the Geranyl-gerany-diphosphate synthase and the Phytoene synthase genes.

It was possible to obtain the GGPP cDNA sequence. This gene is already included in the SNP discovery. However attempts to isolate the Phytoene synthase gene sequence were still unsuccessful despite several attempts to plan redundant PCR primers based on database sequences.

- ***Summary progress report of activities of the International Potato centre***

The International Potato Center (CIP) concentrated on several breeding and technology transfer activities under the McKnight support. In addition to the identified activities, CIP backstopped the national programs to accomplish the activities. Major activities included: the introduction and dissemination of high beta-carotene content clones; cleaning and virus indexing of sweetpotato varieties; support in capacity building through degree training on the characterization of East African germplasm; ICM technology transfer techniques through Farmer Field Schools (FFS); and support to multiplication and dissemination of clean healthy planting materials. To-date ninety-three seed families and a number of clones have been distributed to ten countries in sub-Saharan. In addition to

over a half million seeds were generated. Both white fleshed and orange-fleshed sweetpotato populations have been studied at different levels of breeding. At least 12 clones/varieties have been identified for adaptability studies and 7 clones have been identified for further on farm evaluation. About 15 high dry matter, high beta carotene varieties from Lima have reached the national programs for rigorous evaluation. Farmer participatory breeding as an approach to empower farmers in making decisions when assessing varieties has been initiated in Central Uganda and North Western Tanzania. Over nineteen million vine cuttings of popular varieties were distributed to farmers during the year 2003. This is estimated to have covered about 600 hectares of farmers' fields. Orange fleshed varieties are currently estimated to occupy 1-2% in the lake zone of Tanzania, 15-20% in Central Uganda, and 10-15% in W. Kenya. Most preferred varieties have been identified in different countries. These include Zapallo, Tainung 64, W – 151, Jewel, Mafutha, Jonathan, Ejumula. . In South Africa, varieties W-19 and Excel have been selected for high dry matter, high beta-carotene content while variety 1656-97 has been selected for processing into products. Most of the varieties have high dry matter content, a characteristic that contributes to their acceptability. A total of 266 diverse germplasm from Kenya, Uganda and Tanzania have been characterized using molecular markers. Orange-fleshed clones still superior in yield performance in several agro-ecologies. SPVD-resistant sweet potato varieties desired by farmers and other stakeholders have been identified through farmer participatory research (FPR). About seven local/ improved varieties from Kenya (7) and Uganda (1) have been cleaned up at PQS –Muguga, Kenya and made available to CIP-SSA regional office for distribution to national programs. Phytosanitary methods (e.g., clean planting material, isolation, roguing) of controlling SPVD have been adapted and validated through FPR and FFS groups in Eastern Uganda, Western Kenya and North Western Tanzania. Protocols, manuals and materials for training farmers in the control of SPVD and other pests have been developed in Uganda. Cadre of trainers at national and non-government organizations level as well as farmers have been trained in the knowledge of SPVD control in Kenya, Uganda and Tanzania. Genome organization and molecular variability of sweet potato viruses and causal effects have been determined in Kenya and Uganda.

- **Progress on virus, discriminant analysis and participatory research**

Virus research. Twenty one landraces from Kenya grafted to *Ipomoea setosa* were evaluated for various viruses using Elisa and real time PCR at Louisiana State University (LSU). Viruses detected included SPFMV and SPMMV. Additional screening is planned on the same material using fresh plant DNA extracts during this summer 2004. This effort will be expanded once Douglas returns to Kenya by fall. Research related to identifying the distribution of viruses within the sweetpotato plant and identifying the response of resistant plants to infection by SPFMV and SPCSV was initiated in March 2004 at LSU.

Discriminant analysis research: Analysis of root samples from two sweetpotato populations to determine if DNA markers linked to dry matter content are similar to unrelated genotypes from the USDA repository continued at LSU. The populations were also screened for sugar, starch, and root knot nematode. Trait-linked maker association is underway and nearly complete. A draft was prepared for research comparing QTL trait-linked marker detection and discriminant analysis for resistance to Sweet Potato Feathery Mottle Virus and Sweet Potato Chlorotic Stunt Virus, i.e., the two viral components of the Sweet Potato Virus Disease. Results showed similar outcomes for the two procedures.

Participatory activities in Kenya and Tanzania

Indigenous technical knowledge and baseline information was collected in the Northern, Lake and Southern highland zones of Tanzania. In Kenya PRAs were collected in two dry areas, Ndeiya in Central Kenya and Ndhiwa in South West Kenya. After completion of training of trainers workshops, Eastern, South western and Central Kenya and the lake zone of Tanzania, several FFS have been launched (lake zone 3, Central Kenya 3, Eastern Kenya 2 and South west Kenya 2). In all these groups participatory evaluation of superior farmers' varieties and improved varieties is on-going. In Tanzania an additional 35 varieties have been collected in the western and lake zone region. Morphological characterization of the entire Kenyan germplasm collection has been completed characterization of the Tanzanian collection is in progress. Molecular characterization of a subset of the Kenyan collection using ISSRs and RAPDs is also in progress.

Sweetpotato (Uganda)

1. There has been increased concern to reduce malnutrition in the developing world. In Uganda, core funding for sweetpotato research of which one of the objectives is to reduce vitamin A deficiency, has been provided mainly by the McKnight Foundation since 1994. This sustained funding is paying dividends. On April 30, 2004, the Namulonge-based sweetpotato program of the National Agricultural Organization (NARO) officially released two orange-fleshed (OFSP) cultivars, Ejumula (landrace from Uganda) and Kakamega [(SPK004), landrace from Kenya]. Commendable collaborative research on OFSP to alleviate vitamin A deficiency (VAD) was conducted in five pilot zones in Luwero District in Central Uganda in 2001. NARO, the International Potato Center (CIP), the Child Healthy and Development Center (CHDC) of Makerere University Medical School, Volunteer Efforts for Development Concerns (VEDCO)- an NGO, the Healthy and Nutrition sector, the local administration, and the communities all joined hands to conduct OFSP research in the pilot area. The work was funded for about two years by the Thrasher Foundation (USA) through the Micronutrient Operational Strategies and Technology (MOST) of USDA. There are 55 districts in Uganda. Extensive on-station, and on-farm participatory evaluation of the OFSP cultivars in the country to provide supporting data for the official release by the Variety Release Committee was funded mainly by the McKnight Foundation. Currently, there is high demand for planting materials of the OFSP, and farmers sell both storage roots and vines, and processing of OFSP into various products for sale is picking up in a few districts.

2. The International Potato Center (CIP), the regional potato and sweetpotato network for East and Central Africa (PRAPACE), and HARVEST PLUS conducted a short training course on sweetpotato breeding methodologies with emphasis on OFSP, experimentation, and data management in Sub-Saharan Africa, 21-26 June 2004 in Kampala, Uganda. There were 35 participants from 13 African countries involved in the HARVEST PLUS, McKnight Foundation, CIP and PRAPACE sweetpotato project activities. The course was participatory and aimed at standardization of breeding and experimentation methodologies through sharing experiences. Resource persons came from CIP, Lima (1 virologist, 2 breeders), Makerere University (2 biometricians), and included nutritionists (1 from Tanzania, 1 from Makerere University, 2 from Kenya, 1 from South Africa). Seven research technicians from Ethiopia (1), Kenya (1), Tanzania (2), Burundi (1), Zanzibar (1), and Zambia (1) were trained for an extra week (June 28 –July 2) by the sweetpotato scientists and technicians of the

Namulonge Agricultural and Animal Production Institute (NAARI) near Kampala. Robert Mwanga leads OFSP breeding activities in Uganda, the PRAPACE and HARVEST PLUS countries, which complements well the McKnight Foundation sweetpotato research supported activities

3. In the Farm Africa project aimed at promoting OFSP varieties through 10 schools in urban and peri-urban communities of Kampala, school children, teachers and adults are surprised during sensitisation sessions to use OFSP to combat vitamin A deficiency by: 1) the large number of Ugandan children that die annually (10,000-65,000) due to vitamin A deficiency (VAD) (globally 3 million die), 2) failing to recognize vitamin A capsules [-common answers when asked what they are, include, simply tablets, fertilizer, and do not know] 3) the high cost of vitamin A capsule (US$ 54-108 per person/year) compared to OFSP (US$ 3-6 per person/year) 4) the simple sustainable solution of OFSP to combat VAD in their homes. The ground work of promoting sweetpotato cultivars Ejumala and Kakamega in Kampala schools and communities builds on the countrywide testing of the two cultivars supported mainly by the McKnight Foundation.

PUBLICATIONS

a. Mwanga, R.O.M., B. Odongo, G. Turyamureeba, A. Alajo, G.C. Yencho, R.W. Gibson, N.E.J.M. Smit, and E.E. Carey. 2003. Release of six sweetpotato cultivars ('NASPOT 1 to NASPOT 6') in Uganda. HortScience 38(3): 475-476.

b. Mwanga, R.O.M., and M. Cloete. 2003. The role of horticulture: issues, opportunities and constraints. Acta Horticulturae 621:45-51.

c. Odongo.B., K. Heather, P. Ewell, T. Stathers, Elske van de Fliert, J. Mudiope, V. Ogiro and E. Lugwana. 2003. Technique of re-hilling sweetpotato mounds to reduce *Cylas* spp. weevil infestation and improve sweetpotato yield in Soroti district, North Eastern Uganda. Uganda Journal of Agricultural Sciences 8(10): 117-122.

d. Opio F., A. Bua, M. Ugen, C. Ebong, G. Bigirwa, R. Mwanga, B. Odongo, S. Mubiru, and G. Semakula. 2003. Client orientation of agricultural research in Uganda: the Namulonge experience. Uganda Journal of Agricultural Sciences. 8(10):11-16.

e. Atukunda G., F. Baseke, S. David, J. Jagwe, M. Kalyebara, M. Kaweesa, R. Miiro, P. Musoke, G. Nabulo, A. Namagembe, C. Niringiye, Rnyapendi, B. Odongo, C. Owori, M. Azuba-Ssemwanga and S. Tumwegamire. 2003. Farming in the city: Participatory appraisal of urban and peri-urban agriculture in Kampala, Uganda. CIAT Africa Occasinal Publications Series, No. 42. CIAT, Kampala, Uganda.

f. Ebong, C., R. Mwanga, and W. Niringiye. 2003. Agronomic evaluation of potential of sweetpotato varieties for fodder production in sub-humid areas of Uganda. In Proceedings of the Livestock Systems Research Programme (LSRP) Annual Scientific Workshop. March 18 – 21, 2003, Kampala, Uganda. DANIDA's Agricultural Sector Research Programme (ASPS) and the National Agricultural Research Organization (NARO), Pp 202 – 205.

Tef (Ethiopia)

- Richard Jones and Charity Kabutha, members of the Oversight Committee, paid a visit to Ethiopia on 13-14 April 2004, for mid-term evaluation of the project. The visit included discussion to review the research progress from 1995 - 2004 with Hailu Tefera (PI) and Getachew Belay (Research Associate), a field-visit of the off-season breeding activities and a meeting with other researchers involved in the project, extension workers and tef farmers around Debre Zeit area. The discussion with the PI was based on a summarized progress report, "Breeding and genetic basis of tef improvement in Ethiopia", which was availed to them upon arrival. The visitors evaluated the project very positively and contributed extremely valuable suggestions for further considerations: 1) Establishing links with regional opportunities, such as with the East Africa Biosciences, has to be given due consideration for the biotechnological part of the project so that the ongoing works under the project continue beyond the project life. 2) The needs to have in-depth knowledge of the tef-market chain, and better plan of seed-supply mechanisms to the farmers after varieties in the pipeline are released. 3) The need to invest in public awareness of a much broader range of stakeholders about the significant achievements that have been made so far. 4) Documenting and sharing the knowledge and experiences of the ongoing good work of the participatory breeding approaches.

- Six researchers and technical assistants involved in tef research received training on data handling and analyses from April 26 - 30, 2004. The training also included the use of statistical software packages. The training was held at Debre Zeit Agricultural Research Center by selected resource persons from The Ethiopian Agricultural Research Organization.

Wolbachia (China)

- As the new rice season starts, another round of cage experiment to study the Wolbachia spread in planthopper population begins in Chuxiong, Yunnan.

- On May, Dr. Roger Hull, visited other partners in China and Australia to co-ordinate research works during the next and last few months of the project, and to discuss the potentials to continue the project.

- With the support from the McKnight CCRP, Mr. Jianguo Wen get his doctoral degree from Fudan University, Shanghai, China. He has been working on the interaction between rice stripe virus and its host insect, the small brown planthopper.