

fresh

News from AVRDC – The World Vegetable Center



13 January 2012

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Kaset Fair

Thailand's lively showcase of innovation in agriculture featured improved AVRDC vegetable lines

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Open Day for Agricultural Research

International institutions highlight progress, share strategies for development in West and Central Africa



Friendly faces of the AVRDC Team greet Open Day visitors in Samanko, Mali. Staff demonstrated vegetable processing methods, discussed nutrition, shared recipes, and introduced the Center's latest improved vegetable lines for the region.



AVRDC - The World Vegetable Center, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the World Agroforestry Center (ICRAF) and the International Livestock Research Institute (ILRI) invited partners to review the results of their research work during an **Open Day for Agricultural Research**, 26-27 October 2011 at Samanko, about 30 kilometers

from Bamako, Mali. The four research institutes displayed techniques to improve yield and quality of crops, market gardens, and livestock, and shared strategies for agricultural development in West and Central Africa.

International organizations, including the World Food Program (WFP) and Gesellschaft für Internationale Zusammenarbeit

(GIZ), seed companies, government institutions (Mali Ministry of Health, Department of Nutrition), farmers' and consumers' associations, international and national NGOs, donors, and vegetable processors took part in this yearly gathering. Local media covered the event, which drew more than 400 visitors from around the region.

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African eggplant (*Solanum aethiopicum* L.), roselle (*Hibiscus sabdariffa* L.), okra (*Abelmoschus esculentus*), pepper (*Capsicum annuum*) and amaranth (*Amaranthus* sp.) were among the vegetables growing in AVRDC's demonstration plots, where visitors also saw installations of net shelters to protect plants from pests and sun, and low-cost drip irrigation kits.

The AVRDC team presented the concept of the mobile garden—cultivating vegetables in buckets, bags, barrels, and other containers—as an option for urban gardening in small spaces.

Also on display at the AVRDC booth: Processed vegetables using techniques developed by AVRDC, including high beta-carotene orange tomato powder, juice, and dried tomatoes; and dried sweet and hot pepper. Visitors perused publications on vegetable processing, recipe booklets, fact sheets on nutritional values of vegetables, and Mali's official catalogue of vegetable species and varieties. Many were intrigued by the collection of *cube magnificent du Mali*—spice blends developed by the Center that incorporate dried vegetables into stock cubes for flavoring stews and soups—and

were impressed with AVRDC's efforts to improve production and processing methods to promote greater vegetable consumption.

-- Moussa Kanouté, Research Assistant

-- Cheik Amadou Marico, Irrigation Specialist

-- Theresa Endres, Community Development Specialist Nutrition

Seeing is believing



(Clockwise from top left): **Cheik Amadou Marico** shows visitors a drip irrigation installation.

Roselle thrives in the mobile garden.

Visitors view a healthy stand of amaranth in the trial plot.

At the AVRDC table, visitors got a closer look at dried spice/vegetable blends, sauces, and other ways to preserve the harvest.



South Asian Association for Regional Cooperation countries launch vegetable research network



Ram Nair (4th from right), AVRDC South Asia Legume Breeder, attended the Consultative Workshop on Regional Initiatives for Improvement of Vegetables and Adaptive Trials in SAARC Countries (SVATNet), 16-17 November 2011 in Dhaka,

Bangladesh. Representatives from Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka participated. Recommendations adopted by the delegation include the selection of five initial crops for research (brinjal, cucumber, okra, pumpkin, tomato); the use of open-pollinated varieties; the structure of

adaptability trials in each country (three locations per country and three replications per trial); reporting requirements; and an annual research forum to evaluate progress. AVRDC will provide 18 varieties in total for research trials: brinjal (2); cucumber (4); okra (5); pumpkin (5); and tomato (2).

Conference corner



VII International Postharvest Symposium
25-29 June 2012
Kuala Lumpur, Malaysia

Organizers: Horticulture Research Centre, Malaysian Agricultural Research and Development Institute (MARDI); International Society for Horticultural Science

Deadline for abstract submission: 28 February 2012
Deadline for early bird registration: 30 April 2012

Web: <http://postharvest2012.mardi.gov.my/>
E-mail: Abdullah Bin Hassan, abhassan53@gmail.com



FAO Asia and the Pacific Regional Forum



AVRDC Director General Dyno Keatinge gave the keynote presentation at the FAO Asia and Pacific Regional Forum, "Nutrition-Sensitive Food Production Systems for Sustainable Food Security" held from 7-8 December in Bangkok, Thailand. The DG's topic: *To Sustain Food and Nutritional Security in the Asia-Pacific Region: What Research on Vegetables Is Needed Today?* About 100 stakeholders from the region examined issues associated with hunger and malnutrition with an emphasis on nutrition-sensitive agricultural development and food-based nutrition approaches. Institutional and policy environments, focusing on mainstreaming of food security and nutrition issues into policies, plans and programs were discussed in roundtable sessions. AVRDC East and Southeast Asia Regional Director Robert Holmer and AVRDC Research Fellow Clemens Richert also attended the forum.

The Center in the news



The Center's effort to develop and disseminate improved vegetable varieties in Africa was mentioned in a recent editorial on the benefits of horticulture for Malawi, Mozambique, and Zambia on the *Newstime Africa* website.



Regional Director for South Asia Warwick Easdown and other partners were interviewed on Telugu TV9 in a news report about the progress of AVRDC's Bitter Gourd Project in India. A healthy bitter gourd recipe was demonstrated step-by-step for viewers.

AVRDC tomato breeder Peter Hanson provided the breeding lines used by Texas vegetable breeder Kevin Crosby to develop a processing tomato variety that can resist a group of troublesome whitefly-vectored viruses. The devastating pest had nearly destroyed the state's tomato processing industry over the past decade. Dubbed 'T-5,' the new variety is resistant to *Tomato yellow leaf curl virus* and the bipartite Mexican begomovirus complex. 'T-5' is an open-pollinated variety that carries the *TY-2* and *TY-3* resistance genes; Peter was one of the breeders who identified the genes.



For its ongoing work to ensure people in developing countries have access to nutritious food, AVRDC was mentioned along with several other organizations in a recent essay, "One Billion Holiday Wishes" by Danielle Nierenberg of the Worldwatch Institute's *Nourishing the Planet* project. Danielle noted the world's population has one billion hungry, one billion micronutrient deficient, one billion overweight, and one billion illiterate people, and wastes one billion tons of food. The essay was published by numerous media, including the *Huffington Post*, the *Daily Kos*, and the *Christian Science Monitor*.

The Center in the news

The crew of Asia Broadcasting Television Ltd., led by Werachon Naranoot, visited the Demonstration Garden at AVRDC's Regional Office for East and Southeast Asia to interview Steve Kebasen, Assistant to the Regional Director, and Somchit Pruangwitayakun, Research Assistant-Vegetable Crops. The report showcased AVRDC's mature technologies, vegetable accessions and indigenous vegetables.



(left, r to l): **Werachon Naranoot** from Asia Broadcasting Television Ltd., interviews **Somchit Pruangwitayakun** and **Steve Kebasen** in the AVRDC East and Southeast Asia Demonstration Garden, where improved chilies grow alongside indigenous vegetable species.

(right, r to l): Steve Kebasen fields a question from Werachon.

On 12 December 2011, AVRDC Cameroon staff participated in "Morning Safari," a live radio program broadcast on CRTV, Cameroon's national radio station, to discuss vegetable production and consumption in the country.

(l to r): **Ateh Francis**, CRTV Radio Presenter; **Regine Kamga**, Research Assistant, AVRDC Liaison Office Cameroon; **Roseline Nzelle Nkwelle**, CRTV Morning Safari presenter; **Takemore Chagomoka**, Liaison Officer for AVRDC Cameroon

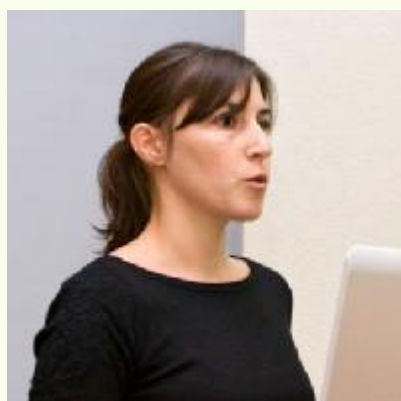


Seminars



On 8 December 2011, AVRDC tomato breeder Peter Hanson presented an historical overview of the Center's tomato breeding program from the 1970s to the present. The program began with a focus on development of a heat-tolerant, bacterial wilt-resistant lowland tropical tomato. Over time research components on new fruit market types and traits, particularly disease resistances, were added to the program. Successful varieties combine all the key traits required by farmers, markets, and consumers, Peter noted. Breeders generate many genetic recombinants by crossing, but few of these recombinants have what it takes to become excellent varieties. The challenge for the breeder is to find the outstanding recombinants; good screening methods are essential to accomplish this task. Field and greenhouse screening methods are important for breeding, and marker-assisted selection offers breeders several important advantages: the potential to select plants with desired genes in the seedling stage, allowing early discard of unwanted plants; ability to detect plants that carry targeted genes, and capacity to select plants with genes for resistance to pathogens not found where the breeding program is located. The recent adoption of markers linked to bacterial wilt resistance is an example of how markers coupled with conventional seedling screening can be applied to improve efficiency. AVRDC tomato breeding has

incorporated marker-assisted selection for the past five years, particularly for disease resistance. The Center's success in pyramiding genes to resist Tomato yellow leaf curl disease and late blight is due in large part to adoption of markers and excellent teamwork among internal and external collaborators.



Sandra Habicht, Nutritionist from Justus-Liebig University, Giessen, currently seconded at AVRDC headquarters, gave a talk on "Development of dietary strategies to treat type 2 diabetes with bitter gourd" on 15 December 2011. The prevalence of type 2 diabetes is increasing worldwide, and the disease is particularly problematic in developing countries where diabetes care is insufficient and medication and insulin are expensive for the poor. Bitter gourd is a food-based and cheap alternative for blood glucose control that shows great potential. However, there is still a long way to go from experimental science to safe, evidence-based dietary recommendations. In her presentation, Sandra explained how AVRDC and Bitter Gourd Project partners in Germany, India, and Tanzania are working toward defining the daily dosage and optimal preparation of bitter gourd to improve the quality of life for diabetics.



AVRDC Entomologist Srinivasan Ramasamy presented the Entomology Group's recent achievements in managing insect pests of vegetables to colleagues in a seminar entitled "Integrated Pest Management for Vegetables: Translating the Science into Practice" on 22 December 2011 at headquarters. Srin emphasized that the component technologies in an integrated pest management strategy need to be integrated in such a way that they act synergistically to control insect pests on vegetables. The Entomology team implemented two IPM programs—a biocontrol-based IPM strategy to manage the diamondback moth in South and Southeast Asia, and Eastern and Southern Africa, and a pheromone-based IPM strategy to manage the eggplant fruit and shoot borer in the Indo-Gangetic Plains of South Asia. He highlighted the need for active participation of the national agricultural research and extension systems to introduce and implement biocontrol-based IPM strategies. Similarly, a stronger partnership with the private sector is imperative for the sustainable adoption of biopesticide-based solutions. Following these successes, similar pathways are being adopted to develop and deploy an integrated pest management strategy against the legume pod borer (*Maruca vitrata*) in Southeast Asia and sub-Saharan Africa.

Seminars



Antonio Granell, Polytechnic University of Valencia, Spain, explained "Genomic approaches to decipher the volatile network in the tomato fruit" to AVRDC staff on 12 December 2011.

Tomato is the most widely used model species for the study of berry/fleshy fruit biology. Dr. Granell noted a combination of classic and marker-assisted genetics and molecular biology approaches contributed to the elucidation of the key signaling routes in tomato fruit ripening. The synergistic interactions of several molecules rather than just a single molecule are likely responsible for beneficial health effects of fruit consumption. Reverse genetics and metabolic engineering in berry fruits will help to unveil such interactions, their relation with the environment, and their role in human health.

Urban and peri-urban agriculture for future food security



East and Southeast Asia Regional Director **Robert Holmer** and AVRDC Research Fellow **Clemens Richert** gave the keynote presentations *Urban and Peri-urban Agriculture in Southeast Asia: Its Contribution to Food and Nutrition Security* and *Peri-urban: Place or Construct*, respectively, at a regional workshop "Roles of Urban and Peri-Urban Agriculture

for Future Food Security" held 15-16 December 2011 at Kasetsart University, Bangkok. The workshop was organized by Kasetsart University in cooperation with the Food Security Center (FSC) of the University of Hohenheim, Germany, with financial support of the German Academic Exchange Service (DAAD). More than 20 participants from Indonesia, Lao

PDR, the Philippines, Thailand, Vietnam and AVRDC attended to share experiences and practices on urban and peri-urban agriculture in Southeast Asia and discuss its potential to achieve food and nutrition security in the region.

Robert Holmer, front center, blue shirt; **Clemens Richert**, back row, second from right.

AVRDC seed on trial in Papua New Guinea



The National Agriculture Research Institute–Southern Regional Centre (NARI-SRC) Vegetable Team hosted a mini-field day, “Saving your own vegetable seeds for sustainability and improved livelihood,” on 23 November 2011 at Laloki, Papua New Guinea to promote open-pollinated vegetables such as tomato, capsicum, eggplant, yard-long bean and other beans. AVRDC – The World Vegetable Center provided seed for the trials. A crowd of more than 50 farming stakeholders from peri-urban and rural communities far and near attended, of which about 30 were vegetable farmers.

Three visiting scientists from the Tasmania Institute of Agriculture Research (TIAR) joined the event. TIAR is a partner in the Vegetable Project funded by the Australian Centre for International Agricultural Research (ACIAR), which is jointly implemented with NARI at Laloki along with other project partners Pacific Adventist University PNG, Fresh Produce Development Agency PNG, and the Central Province. Regional agricultural advisors from the five provinces of the Southern Region mingled with farmers and NARI staff to learn about vegetables and seed saving techniques. Industrial trainee students from the



(top): Farmers view the demonstration plots.

(right top): Drip irrigation in capsicum trial.

(right bottom): Philmah Seta-Waken demonstrates tomato seed extraction.

Farmers can reduce their production costs by saving seed of open-pollinated varieties for the next planting season.



University of Natural Resources and Environment PNG helped answer farmers’ queries and distributed production pamphlets and seed of eggplant and chili.

Udai Pal, the Research Program Leader of NARI Southern Regional Centre, Laloki, and coordinator of the Vegetable Project, opened the field day. Project scientist Philmah Seta-Waken guided farmers through the vegetable evaluation trial plots for eggplant (7 varieties), capsicum (6), yard-long bean (8), vegetable soybean (8), mungbean (6), French beans (5) and okra (6). The varieties were evaluated for their productivity, nutritional quality, and disease and pest resistance, with the goal of making quality vegetable seeds available to local farmers at affordable prices. The trial also compared the benefits of three different production systems: 1) low input system based on traditional

farmer’s practice and knowledge; 2) best practice system based on modified, improved technologies, and 3) high input system based on commercial practice.

Farmers appreciated having the opportunity to evaluate the varieties. They also got a closer look at the drip microirrigation system used in the test plots, and examined an affordable, modified version of the system.

Seta-Waken then demonstrated seed extraction techniques for tomato, capsicum, and eggplant. “If farmers could successfully adopt these techniques, they will not need to keep buying hybrid seeds, as they can save their own seeds for the next planting seasons,” she said. “At the same time, they can improve the family diet with nutritious vegetables, and sell the surplus for daily income.”

-- Philmah Seta-Waken

LUNA project feedback workshop



(l to r): **Sofa Stanislaus**, Mayor of Tubah; **Donfack David**, Regional Delegate of Agriculture and Rural Development for North West; **Etta Aslue**, Divisional Officer of Tubah; **Johannes Schlesinger**, LUNA PhD Student; **Takemore Chagomoka**, AVRDC Liaison Officer for Cameroon.

On 30 November 2011 AVRDC – The World Vegetable Center organized a LUNA (Livelihood, Urbanization and Natural Resources for Africa) project feedback workshop funded by the Volkswagen Foundation in Bambili, a small town 15 km from Bamenda, the capital city of the Northwest Region of Cameroon. The workshop theme was “Revolution with Greens for a Sustainable Livelihood” and the aim was to report the research findings of two LUNA students and AVRDC Cameroon interns, Aime Kamga and Geraldine Regina.

Both conducted their MSc field studies with farmers in this region in 2009. Aime studied the impact of urbanization on the vegetable production systems and Geraldine studied the impact of urbanization on livelihood and natural resources in Bamenda’s urban and rural areas. The two studies indicated that adults between 30-40 years of age are very active in vegetable production.

A total of 67 farmers from communities around Bamenda, including Bafokum, Bambui, Bambili, Bali, Bafut, Babanki, Bemensing, Santa, Njeng, Fundong

and Belo attended the workshop, along with students from Bambili Technical College, lecturers, and representatives from farmer associations and local NGOs. Etta Aslue, Divisional Officer of Tubah Subdivision, opened the workshop, followed by a welcome address from Sofa Stanislaus, Mayor of Tubah. Mr. Aslue thanked AVRDC and the Volkswagen Foundation on behalf of the Government of Cameroon for an initiative that seeks to understand the impact of urbanization on natural resources and food systems. Johannes Schlesinger represented the

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Presentations given by **Geraldine Regina** (l) and **Tchinjang** (r).



Volkswagen LUNA project and presented the overall goals and objectives of the project and its importance for the development of African towns and cities.

The Center, in collaboration with the Technical School of Agriculture, showcased improved vegetable varieties selected for traits including high yield, disease resistance, and high nutrient content. Three African eggplant (Oforiwah, DB 3, and N13), four

chili pepper (PP0337-7562, PP9852-173, and PP 97-9195-1), two jute mallow (Bafia and Aziga), two amaranth (AM-NKGN, AC-NL), and two nightshade (NW 25 and BFS-1) varieties drew a lot of attention from farmers, who received “how to grow” brochures and wanted to know where they could get seed. Seed companies GMR in Bafoussam and Semagri-Technisem are working with AVRDC to make the seeds available.

Johannes and local farmers were later interviewed on CRTV (Cameroon Radio and Television) on 5 December 2011 to discuss the LUNA project. Listen to the interview at:

<http://www.luna-project.uni-freiburg.de/index.php/news>

-- Takemore Chagomoka and
Regine Kamga



Field demonstrations

30th IVTC comes to a close

Participants wrapped up the final two weeks of *Module III: Vegetables for sustainable development* in AVRDC's 30th International Vegetable Training Course, held at AVRDC East and Southeast Asia's (ESEA) Research and Training Station on the Kamphaeng Saen Campus of Kasetsart University, Thailand.

Climate change and its impacts on food security were discussed by Ed Sarobol, Vice Dean of the Faculty of Agriculture, and Parichart Promchote, Department of Agronomy, Kasetsart University KU Bangkhen campus. Dr. Promchote gave examples on how farmers can adapt to the effects of climate change.

Ranjith Hettiarachchi, Chief Executive Officer of the Association of Asian Confederation of Credit Unions (ACCU) presented the basic concepts of credit unions and microfinance, and how these tools

can be used to help farmers in developing countries.

The final lectures of the module focused on enhancing skills in proposal writing and development communication. Annelie Oberg, Manager of AVRDC's Grants and Partnership Development, gave a presentation on the process of developing a proposal, appropriate responses to proposal calls, and essentials of a proposal, including exercises on how to prepare a logical framework. Maureen Mecozzi, Head of AVRDC's Communications and Information, discussed the importance of knowing the audience, the message that needs to be put across, and the choice of delivery in the context of development communication.

Prior to the final day of the module, the participants presented their development action plans to panelists Robert Holmer, ESEA Regional Director; Narinder

Dhillon, Cucurbit Breeder; and Steve Kebasen, Assistant to the Regional Director.

At the closing program on 2 December 2011, Sombat Chinawong, Vice President of KU Kamphaeng Saen, addressed the participants and emphasized the contribution of agriculture toward food and nutrition security, energy, and tourism. On behalf of all the participants, Mohammad Amdadul Haque, Khin Zaw Tun and I. B. G. Suryawan expressed their gratitude to AVRDC and KU for the training and the conducive learning environment.

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(Clockwise from left top): Annelie Öberg, Manager of AVRDC's Grants and Partnership Development and Maureen Mecozzi, Head of AVRDC's Communications and Information, give their presentations to the course participants; Mahamud Hossain Al-Mamun from Bangladesh presents his outputs; a lecture from Ranjith Hettiarachchi, Chief Executive Officer of the Association of Asian Confederation of Credit Unions (ACCU).

Name	Development Action Plans
Mohammad Amdadul Haque (Bangladesh)	Food and nutrition security enhancement of the poor farm family through year round production in the homestead
Mahamud Hossain Al-Mamun (Bangladesh)	Increase of tomato production through management practices in the salinity affected areas of Patuakhali district in Bangladesh
I. B. G. Suryawan (Indonesia)	Optimizing homestead space for vegetable production in Bali, Indonesia
Hari Mularsono (Indonesia)	Increasing chili productivity of farmers in north and south Blitar, East Java, Indonesia
Md. Faruk Hossain (Bangladesh)	Malnutrition and poverty reduction through homestead gardening in Bangladesh
Khin Zaw Tun (Myanmar)	Improvement of livelihood of the poorest population in Northern Shan State, Myanmar
I Made Sukadana (Indonesia)	Utilization of processed cow waste for tomato production under dry land conditions
M. Jaenun (Indonesia)	Assessment of local and hybrid chili varieties for increased productivity
Suryawan Ida Bagus (Indonesia)	Getting horticulture moving through quality based farm cooperation in Bali, Indonesia
Ni Nyoman Yuliarini (Indonesia)	Integrated pest management and seed organic treatment for vegetable production in Desa Cadikuning, Kec. Baturiti, Kab. Tabanan

#31: sign up today!

Registration is now open for the **31st International Vegetable Training Course**, "*Vegetables: From Seed to Table and Beyond.*"

Module I: From Seed to Harvest
(10 Sept. - 5 Oct. 2012)

Module II: From Harvest to Table
(8 Oct. - 2 Nov. 2012)

Module III: Vegetables for Sustainable Development
(5 Nov. - 30 Nov. 2012)

For inquiries, please contact:
info-eastasia@worldveg.org

Visitors: AVRDC East and Southeast Asia



(l): Robert Holmer (r) showing Axel Drescher (c) and Clemens Richert (l) AVRDC's advanced tomato lines.

(right, l to r): Sombat Chinawong, KU Vice President, Kamphaeng Saen Campus, Robert Holmer, AVRDC-ESEA Regional Director, Dyno Keatinge, AVRDC Director General at the Demonstration Garden.

On 6 December 2011, Axel Drescher of the Department of Physical Geography, University of Freiburg, Germany, visited AVRDC East and Southeast Asia's (ESEA) Research and Training Station on the Kamphaeng Saen Campus of Kasetsart University, Thailand, where he met with Regional Director Robert Holmer and Clemens Richert, a research fellow of the University of Freiburg based at ESEA. Axel made a courtesy call to Anamai Damnet, Assistant to the President for Education and International Affairs at KU Kamphaeng Saen and met with KU's geoinformatics experts Kumut Sanklasila and Foyfa Shutidhamrong, both from KU's Soil Science Department, to discuss possible areas for future collaboration. At ESEA's Demonstration Garden ("One of the best demonstration gardens I have seen," Axel said) he met with AVRDC Director General Dyno Keatinge. Alex joined DG

Keatinge on a tour of the 2011 Kaset Fair exhibits in the company of Sombat Chinawong, KU Vice President for the Kamphaeng Saen Campus.

In Bangkok, Axel, Robert and Clemens met with Poonpipope Kasemsap and Wiboon Chongrattanameteekul, Director and Deputy Director for Academic Affairs, respectively, of the International Studies Center of Kasetsart University to discuss details of the joint research project "*Understanding urban and peri-urban vegetable production and marketing systems through GIS-based Community Food Mapping in Greater Bangkok, Thailand.*" The project was recently approved for funding under the Small Grants Program of Germany's Gesellschaft für Internationale Zusammenarbeit (GIZ).



(top, l to r): Robert Holmer, Dyno Keatinge and Sombat Chinawong with AVRDC-ESEA staff.

(bottom, l to r): Robert Holmer, Axel Drescher, Steve Kebasen and Clemens Richert give a "V for vegetables" at the demo garden.

Kaset Fair 2011



(left): Kasetsart University's Research and Development Institute hosted a colorful exhibit.

(right): Indian Trumpet Flower and edible fern posters displayed at the annual Kaset Fair.

More than 100,000 visitors toured the annual Kaset Fair held at Kasetsart University's (KU) Kamphaeng Saen campus, Thailand in early December 2011 to learn more about the work of the university, private companies, and NGOs in agriculture and other endeavors. AVRDC Director General Dyno Keatinge joined the crowd on 6 December in the company of KU Kamphaeng Saen

Vice President and AVRDC board member Sombat Chinawong. The tour included a stop at AVRDC East and Southeast Asia's Demonstration Garden, where the Center's mature technologies such as grafting and drip irrigation and improved vegetable lines were on display. The garden featured a section on "Home Gardens of the World" to showcase the different regions where AVRDC is active.

Posters of Thailand's forest vegetables, such as the Indian Trumpet Flower (*Oroxylum indicum*) were displayed at the entrance to the ESEA office to mark the 2011 International Year of Forests with the theme: "Food from forests: Plant, manage and protect forests for food & nutrition security."



(left): Fresh kangkong catches a ride at the bicycle garden.

(bottom left): Container garden at the Kasetsart University Research and Development Institute exhibit.

(bottom right): Students enjoy the cool shade in a cucurbit tunnel constructed by Thailand's Tropical Vegetable Research Centre.

