

fresh

News from AVRDC – The World Vegetable Center



June 17, 2011

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Collaboration on project proposals in Indonesia with UN-CAPSA

Page 7



Bitter melon research begins as fruit from the first field trials is prepared for analysis

Pages 9-10



Food value chains: a new direction for research



Advancing research for food security in developing countries demands a new approach from scientists. Are they up to the task?

The first step in ensuring safe, wholesome farm products reach consumers in developing countries is to admit how little we know about complex food value chains and their effects on poverty and the environment—and then address the gap through research concepts that better integrate disciplines including agriculture, nutrition, and economics.

That was the determination of an article, “Research Principles for

Developing Country Food Value Chains” published in the June 3 2001 issue of *Science*, the journal of the American Association for the Advancement of Science (AAAS).

Dyno Keatinge, Director General, AVRDC – The World Vegetable Center and **Ray-yu Yang**, AVRDC Nutritionist, contributed to the article in the journal’s Policy Forum.

“If horticultural research is to really

help overcome malnutrition and poverty in the developing world it must span the field to the fridge to full health,” said Keatinge. “The real-world complexity of food chains—which encompass seed science, crop diversity, sustainable agronomy, employment, postharvest value maintenance and addition, storage, marketing, infrastructure, transport, supermarkets, consumer preferences, prices, home

economics, nutrition, digestion, and human health— demands broad disciplinary vision.”

The policy manifesto presents six principles to guide researchers in

the rapidly changing agricultural landscape of the developing world. By working across disciplines and integrating existing disciplinary research into more flexible models,

scientists can better elucidate and evaluate the multidimensional nature of how food moves from the farm to the table. The six principles are:

1. Focus on domestic markets.



Exports account for only about 8% of domestic production in developing countries. To improve livelihoods, research should identify public policies and innovations that can facilitate the

functioning of domestic food chains as well as export channels.

2. Pay attention to indirect effects as well as income generation.



Direct participation in food value chains as producers or traders may raise incomes for some. But addressing different aspects of the food production and distribution process, such

as providing safer working conditions for laborers in commercial agriculture and processing have indirect benefits to alleviate rural and urban poverty.

3. Enhance marketing channel efficiency.



National and regional investment in roads and market infrastructure can increase farmer earnings without driving up food prices.

4. Put postharvest issues on the agenda.



From field to fork, 15-50% of the food harvested in developing countries is lost due to poor handling. Improved food storage and energy-saving technologies can ensure more food, and safer food,

reaches consumers. Access to processing facilities allows farmers to add value to surpluses.

5. Involve farmers in natural resource conservation.



Food production will need to increase to meet growing food demand. Scaling resource-conserving, productivity-boosting innovations for small-scale farmers, such as simple drip irrigation

kits, can help producers in the developing world participate in food value chains without degrading land or scarce water resources.

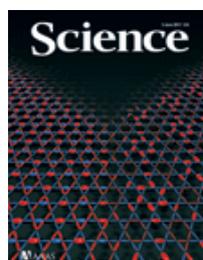
6. Certification: the means, not the end.



Compliance with various product standards assures consumers and may result in a price premium for farmers. But certification schemes are costly to implement and maintain, and may

ultimately exclude smallholders from high-value markets. It is more important to develop sustainable farming practices and enhance quality and safety through farm-level innovation.

Researchers from the following institutions contributed to the article: Cornell University, USA; International Maize and Wheat Improvement Centre, Kenya; Catholic Relief Services, USA; Bill & Melinda Gates Foundation, USA; University of New South Wales, Australia; Michigan State University, USA; Radboud University, Netherlands; Fairtrasa, Mexico; Katholieke Universiteit, Belgium; and the Centre for Alleviation of Poverty through Sustainable Agriculture, Indonesia.



Read more

<http://www.sciencemag.org/content/332/6034/1154.figures-only>

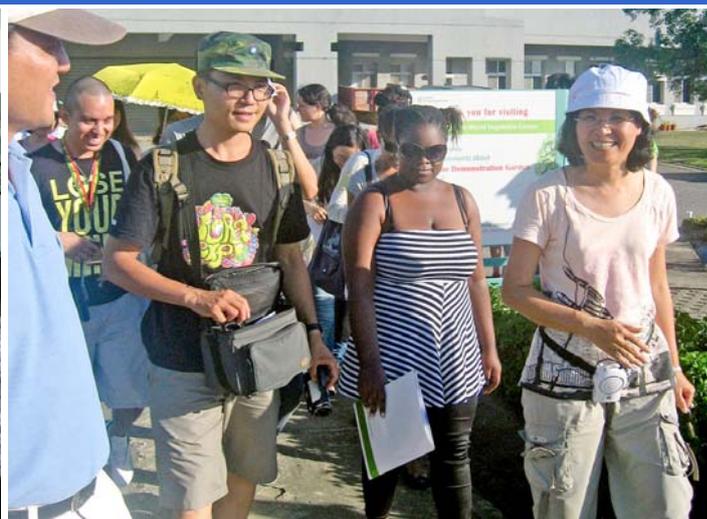
In the “Kitchen of the World”



The DG extends a wai as he accepts a gift from the congress organizers.

AVRDC Director General **Dyno Keatinge** gave a keynote address entitled “Good Health, Better Wealth, Best Taste: The Importance of Vegetables in the Kitchen of the World” to the 10th National Horticultural Congress in Bangkok, Thailand on 18-20 May 2011. Thailand has become a significant player in international agribusiness and is the only net food exporter in Asia; the country has the capacity to produce substantially more than its population consumes. However, rural poverty is still a serious problem, especially in the northeastern provinces. Vegetable production can be a means to raise incomes of small-scale farmers and improve livelihoods in the country.

Visitors



Left: (l to r) **Paul Gniffke**, AVRDC pepper breeder, **Pai-Po Lee**, Deputy Secretary General of Taiwan’s International Cooperation and Development Fund, and **Madhu Bhattarai**, AVRDC agricultural economist. Right: (r) **Jin Shieh**, AVRDC pepper researcher, leads the students through the Demonstration Garden.

Languages and faces from around the globe filled the AVRDC conference room on 11 June 2011 when a group of 35 agricultural studies students from 12 countries toured the Center. The visit was organized by National Taiwan University and National Pingtung University of Science and Technology. **Pai-Po Lee**, Deputy Secretary General of Taiwan’s International Cooperation and Development Fund, led the group. Head of Communications and Information **Maureen Mecozzi** explained the Center’s role in international agriculture, and Socioeconomist **Madhu Bhattarai** and Pepper Breeder **Paul Gniffke** outlined the specific contributions of their disciplines to benefit farmers and consumers in the developing world. **Sophie Chou**, Genetic Resources and Seed, guided the group through the genebank. **Jin Shieh**, Pepper Breeding, walked the students through the Demonstration Garden and a pepper field trial.



Paul Gniffke (r) briefs students on pepper grafting techniques in the Demo Garden.

The Center in the news

The Center signed Memoranda of Understanding (MoU) with the **Abu Dhabi Food Control Authority (ADFCA)**, Abu Dhabi, United Arab Emirates, and Oman's **Ministry of Agriculture and Fisheries** to diversify cropping systems and enhance agricultural training and postharvest processing in the region.

Low vegetable consumption is one reason why several countries in the Middle East are among the top 10 globally for diabetes prevalence.

Rashid Mohamed Al Shariqi, ADFCA Director General, said the MoU was indicative of the importance his organization places on effective strategic partnerships and exchange of expertise with international research institutes. ADFCA is especially interested in heat- and drought-tolerant vegetables for open field and greenhouse production.



Capacity building for pod borer project partners in Vietnam and Lao PDR

Training on the techniques to screen for entomopathogens against legume pod borer (*Maruca vitrata*) and to rear species-specific parasitoids were conducted in Vietnam and Lao PDR under the project “Less loss, more profit, better health: reducing the losses caused by the pod borer (*Maruca vitrata*) on vegetable legumes in Southeast Asia and sub-Saharan Africa by refining component technologies of a sustainable management strategy,” funded by GIZ (Gesellschaft für Internationale Zusammenarbeit)/BMZ (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung).

Led by AVRDC with project partners from Vietnam and Lao

PDR, the *Maruca* project will run through March 2013.

Exploration for pod borer population diversity and parasitoid samples was conducted in Southeast Asia. Although the initial screening and culturing activities were done at AVRDC’s Research and Training Station in East and Southeast Asia, the techniques must be standardized among project partners for reliable results.

Sopana Yule, AVRDC Research Assistant (Entomology), conducted the training in Vietnam on 25-26 April 2011. Staff from the Vietnam Academy of Agricultural Sciences (VAAS) under the leadership of **Vu Manh Hai**, VAAS Vice President, and the Plant Protection Research Institute, led by **Le Duc Khanh**,



Head of the Entomology Division, attended.

A similar training course was held for project partners in Lao PDR from 27-29 April 2011, attended by staff of the Clean Agriculture Development Center and the Plant Protection Center, Department of Agriculture (DOA). The partners shared project experiences and brainstormed solutions for technical problems.

Seminars

Tomas Rush, a master's candidate from Louisiana State University, USA gave a presentation on his search for an alternate host for soybean rust to AVRDC staff on 8 June 2011.

Soybean rust (*Phakopsora pachyrhizi*) was first found in Taiwan in 1903 and has since spread to Australia, India, Africa, and South and North America. The airborne fungus consumes plant nutrients, leaving less for seed development; it lowers the number of pods per plant and the number of seeds per pod, and reduces seed size, causing up to 60-70% crop yield loss. Potential alternate hosts include *Vicia* spp. *Crotalaria* spp. and *Sesbania* spp.

Searching for soybean rust hosts



Sesbania spp. (left) and *Crotalaria* spp. (right) may harbor soybean rust.

Tracking and tackling plant viruses in Australia



John Thomas, Principal Research Fellow, University of Queensland and Principal Plant Virologist/Virology Focus Team Leader, The Department of Employment, Economic Development and Innovation (DEEDI), Queensland, Australia, discussed vegetable virus research in Queensland with AVRDC staff on 17 June 2011.

Queensland is contending with several tospoviruses transmitted by thrips, and begomoviruses spread by whitefly.

Viruses can be difficult to identify as many produce similar symptoms in infected plants. Removing host plants, controlling the insect vector, and using resistant cultivars can help farmers gain a measure of control over virus outbreaks. Infected seed can also transmit viruses; the use of clean seed from reputable sources was noted as further insurance against outbreaks.

Visitors from Bangladesh Agricultural Research Council



(l to r): **Steve Kebasen**, Assistant to the Regional Director, AVRDC East and Southeast Asia, **Md. Abdur Razzaque**, and **Ranjit Kumar Ghosh** (NATP sponsored PhD. student at KU).

On 1 June 2011, **Md. Abdur Razzaque** visited AVRDC's Regional Office for East and Southeast Asia. Dr. Razzaque is the director of the National Agricultural Technology Project (NATP), under the Ministry of Agriculture, Bangladesh Agricultural Research Council. NATP aims to improve Bangladesh's agricultural productivity and farm income by revitalizing the national agricultural technology system through research, extension, development of supply chains, and project management and coordination. Dr. Razzaque's visit to Thailand included monitoring several graduate school students at

Kasetsart University (KU) and the Asian Institute of Technology (AIT). Opportunities to link NATP-sponsored graduate school students and NATP activities to AVRDC's research, training, and development initiatives in Asia and Africa were discussed.

Welcome

AVRDC's South Asia Office in Hyderabad, India welcomes two special visitors this month. **Bui Huyen**, from the Plant Resources Centre, Hanoi, Vietnam, is the recipient of the 2011 Vavilov Frankel Fellowship awarded by Bioersivity International. Huyen will carry out a study entitled "Identification of the causal agent of mungbean yellow mosaic disease in Vietnam and resistance screening of the Vietnamese mungbean germplasm collection." She will spend two months in Hyderabad and one month each at AVRDC headquarters in Taiwan and at the Department of Employment, Economic Development and Innovation, Queensland Government, Warwick, Queensland, Australia. Her fellowship is supported by the Grains Research and Development Corporation (GRDC), Australia.



(l to r): **Mary Isabella "Izzy" Esler**; **Ushakiran**, from AVRDC's legume research group; **Bui Huyen**; **Ramakrishnan Nair**.

World Food Prize intern **Mary Isabella Esler** from the USA will investigate "Prospects for vegetable soybean in India and its market acceptance" during her two-month

stay in South Asia. Both researchers will work under the supervision of **Ramakrishnan Nair**, AVRDC legume breeder.

Current and former AVRDC staff plan strategies for collaboration



Robert Holmer (l), AVRDC Regional Director East and Southeast Asia, and **Katinka Weinberger**, Director of the United Nations Centre for Alleviation of Poverty through Sustainable Agriculture (UN-CAPSA)

Robert Holmer, AVRDC Regional Director East and Southeast Asia, recently met with **Katinka Weinberger**, Director of the United Nations Centre for Alleviation of Poverty through Sustainable Agriculture (UN-CAPSA) in Bogor, Indonesia to discuss strategies for closer collaboration, particularly on a joint project proposal to EuropeAid's Technology Transfer for Food Security in Asia Program.

Katinka, a former AVRDC socioeconomist, joined UN-CAPSA

in early 2010. The institute is a subsidiary body to the Economic and Social Commission of Asia and the Pacific (ESCAP), and is tasked to serve as an effective knowledge center on sustainable agriculture and poverty reduction. CAPSA aims to foster better understanding of rural poverty and food insecurity, identify sustainable agricultural practices, and determine best market options for the poor. CAPSA's interest in underutilized crops and malnutrition complements AVRDC's work.

Robert and Katinka visited Bogor Agricultural University (*Institut Pertanian Bogor/IPB*), where they met with **Agus Purwito**, Head of the Department of Agronomy and Horticulture, **Ni Made Armini Wiendi**, Department of Agronomy and Horticulture, **Anas D. Susila**, Head of University Farms and **Ahmad Junaedi**, Secretary of Department for Academic and Facilities. IPB expressed strong interest in a closer collaboration with AVRDC, particularly in areas of plant breeding, indigenous vegetables, and strengthening Indonesia's vegetable seed sector. IPB's extension programs work closely with Taiwan's International Cooperation and Development Fund (ICDF), which maintains an office at one of IPB's research and training stations. AVRDC's tomato grafting and low-cost tropical greenhouses are among the technologies IPB is extending to farmers in West Java.

UN-CAPSA

<http://www.uncapsa.org/>

Bogor Agricultural University

<http://www.ipb.ac.id/>



Left: IPB Research Station. Right (l to r): **Robert Holmer**, **Agus Purwito**, **Anas D. Susila** at IPB research station

Conference corner

SECOND ANNOUNCEMENT

Regional Symposium

High Value Vegetables in Southeast Asia: Production, Supply and Demand

24-26 January 2012

Chiang Mai, Thailand

Hosted by AVRDC – The World Vegetable Center, Thailand Department of Agriculture (DOA), ASEAN-AVRDC Regional Network (AARNET), Vegetable Science International Network (VEGINET), and Horticultural Science Society of Thailand. Abstracts are invited on the following topics:

Session 1: From Seed to Harvest

germplasm, vegetable breeding, seed and plant health, integrated crop management with focus on Good Agricultural Practices (GAP), low-input organic vegetable production, ASEAN indigenous vegetables

Session 2: From Harvest to Table

vegetable postharvest technologies, Good Manufacturing Practices (GMP), cold chain management, vegetable economics and marketing, food safety, health and nutrition aspects of vegetables, vegetable supply chain

Session 3: Cross-cutting Issues

contributions of vegetable research and development to achieving the Millennium Development Goals (MDG), climate change, gender equity, ecological sanitation, urban and regional planning, urban and peri-urban horticulture, disaster risk management, microfinance



DEADLINE

for abstract submission:

31 August 2011

<http://www.seaveg2012.com/>

40 years of service to tropical agriculture



Four decades ago, a research and development institute dedicated to alleviating poverty and malnutrition in Asia by increasing the supply and quality of vegetables was established in Taiwan. Today, AVRDC – The World Vegetable Center operates on a global scale across Asia, Africa, and Oceania. Enjoy photos from our long and fruitful history!

In 1971, **Dr. Robert Chandler**, the founding Director General of the International Rice Research Institute, was preparing for mandatory retirement the following year, when he turned 65. AVRDC's first Board of Directors saw his upcoming retirement from IRRI as an opportunity to secure the services of an astute research administrator with a worldwide reputation for their fledgling Center. Dr. Chandler was appointed as Director of AVRDC in September 1971. He spent one week a month at AVRDC until his retirement from IRRI on June 30, 1972, when he assumed the office of AVRDC Director full-time.

*inside
insight*

'til the bitter end



The AVRDC Nutrition group is locked in a struggle with a cucurbit – and so far, warty Momordica charantia appears to be winning! As part of the project “A better bitter gourd: exploiting bitter gourd to increase incomes, manage type 2 diabetes, and promote health in developing countries,” researchers have begun preparing samples of the vegetable for later laboratory analysis.



Cucurbit researcher **Chung-cheng Lin** carefully records information about each bitter gourd accession received from the field. The analysis will cover 53 accessions from the AVRDC genebank and 23 commercial hybrids.

As crates filled with the fresh fruit of 76 *M. charantia* accessions from three field trial replications stack up at the AVRDC Nutrition lab door, the research team gets busy: Each sample is recorded and given a tracking number and labels. The fruit is sliced, the seeds scraped out, and the seeds are carefully separated from the pulp—all by hand.

Flesh, seeds, and pulp are weighed, and the samples are

bagged, freeze-dried, ground into fine powder, and stored at -70°C until analysis can begin.

The accessions represent bitter gourd's broad genetic diversity: the species displays a fascinating range of fruit shapes, colors and sizes—some as small as a walnut (prying the tiny seeds out of those requires a steady, sure hand). Seeds and flesh will be analyzed separately, to help determine the source of

inside insight

the plant's antidiabetic properties.

Three-quarters of the samples—about 400 kg—have been processed from the first field trial in Taiwan. Depending on the results, a confirmation trial with a smaller group of accessions will be conducted in 2012 or 2013 at AVRDC headquarters in Taiwan, regional offices in Arusha, Tanzania and Hyderabad, India,

and at Punjab Agricultural University.

The Bitter Gourd Project is funded by Germany's BMZ (Federal Ministry for Economic Cooperation and Development) through GIZ (Gesellschaft für Internationale Zusammenarbeit). It aims to optimize the level of antidiabetic compounds in bitter gourd through variety selection, postharvest practices and preparation methods; validate

the benefit of bitter gourd to manage type 2 diabetes; and develop evidence-based diet strategies to reduce high blood sugar in type 2 diabetics in Asia and Africa.

Bitter Gourd Project

<http://www.facebook.com/BitterGourdProject>



(left) **Jen Luoh**, assistant specialist, Nutrition, painstakingly separates bitter gourd seed from the sometimes sticky pulp.



(center) **Wan-jen Wu**, research assistant, Nutrition, takes photos of each accession. Careful documentation is needed now to ensure accurate results later in the analysis.



(right) **Sandra Habicht**, postdoctoral fellow seconded from Justus-Liebig University to AVRDC, will carry out studies on mice to help determine the effect of bitter gourd on lowering blood glucose levels.

