

# fresh

News from AVRDC – The World Vegetable Center



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Cucurbits go viral at AVRDC East and Southeast Asia! Vegetable Breeder **Narinder Dhillon** demonstrates a few of AVRDC's virus-resistant lines.

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## Q & A from A to Z

From Arusha to Zanzibar, survey participants in Africa's vegetable value chain share their opinions and discuss problems and solutions with AVRDC socioeconomists.



The conversation flows when the AVRDC Socioeconomics group is at work: As they travel to different countries in Africa, Socioeconomist **Victor Afari-Sefa**, PostDoc in Agricultural Economics **Srinivasulu Rajendran**, and

their team of research assistants—**Radegunda Francis Kessy**, **Philipo Joseph** and **Inviolata Mosha**—engage farmers, traders and consumers along the entire vegetable value chain in surveys, asking questions and listening

carefully to what people involved in various aspects of vegetable production and marketing have to say.

The team is currently in the midst of conducting two major surveys. The first involves interviewing

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farmers and traders in Tanzania, Ghana (and soon, Kenya) about production, market, quality and handling of vegetables during and after the harvest. Funded by the United States Agency for International Development, the study aims to **assess postharvest losses in the value chain for tomato and amaranth**, two highly perishable crops. Tomato is the more commercial product; Amaranth is a popular indigenous vegetable. Srinivasulu is leading the survey and data analysis, and is guiding hired enumerators in collecting data. The questionnaire was developed with the help of

AVRDC's Socioeconomics group and Postharvest Specialist **Ngoni Nenguwo**. The survey began in the first week of February 2013 with enumerator training and questionnaire pre-testing through a pilot survey, baseline survey and focus group discussion.

During the discussion, the team met with District Horticultural Officers, extension officers, village chairman, progressive farmers, village collectors, transporters, commission agents/brokers, wholesalers, traditional and modern retailers to understand the situation in the field. The main survey started on April 17 and

ended in mid-May. To date the team has surveyed 240 farmers in Arusha, Tanga and Morogoro regions of Tanzania, and 160 traders (i.e. village collectors, commission agents/brokers, wholesalers, retailers) in those regions; traders will be surveyed in Dar es Salaam and Zanzibar as well. The team also conducted a quality survey in these three regions to measure losses due to disease incidence, mechanical or physical damage, and other quality parameters within the value chain. The team has collected a total of 162 samples for two focus crops in two regions of Tanzania.



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A similar survey methodology is being followed to support the Irish Aid **Good Seed Initiative**. This second survey began evaluating grower demand for seed of African indigenous vegetables and consumer demand for indigenous vegetables in Tanzania's Arusha, Tanga, Morogoro, and Dodoma regions in early February 2013. Eighty seed growers, 150 vegetable growers, 100 traders (including village collectors, wholesale agents and retailers) and 150 consumers have been surveyed to date.

The data analysis is ongoing, but several important areas for action already have emerged from the surveys:

- **Improve roads:** Greater investment in road infrastructure is needed to link farmers with traders, as most produce losses occurred during transport from the farmgate to market.
- **Strengthen contract farming:** A governing body or confederation of farm industries backed by legal agreements could provide more coordinated oversight of contract farming to protect the interests of all parties.
- **Improve information technology:** Developing public-private partnerships to design and implement databases and mobile price tracking systems could help to link buyers and sellers, farmers' associations, trade associations, etc.
- **Establish a community radio system:** Radio remains one of the best ways to disseminate information about input usage, new crops, and markets to farmers and traders. Consumers benefit from programs on nutrition and diet.
- **Promote home gardens and indigenous vegetables:** Home gardens can provide a steady and nutritious food supply for families and communities. Growing and consuming indigenous vegetables can improve the nutritional quality of the family diet.
- **Empower women:** Self-help groups provide a supportive environment to promote the participation of women in all aspects of vegetable production.



## Science Day 2013

Members of AVRDC's Board of Directors were updated on the Center's work in 2012 during the annual **Science Day**, held on 23 April 2013 at the East and Southeast Asia Research and Training Station in Kamphaeng Saen, Thailand. In the company of AVRDC staff, the board members visited virus-resistant cucurbit trials and discussed molecular markers for cucurbits, toured the entomology lab, learned about grafting dissemination in the region, discussed postharvest and consumption issues, and more.

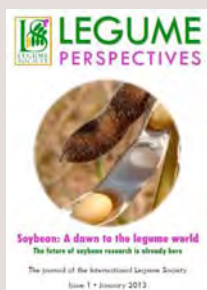




## Recent publications



Kahane R, Hodgkin T, Jaenicke H, Hoogendoorn C, Hermann M, **Keatinge JDH, Hughes J'A**, Padulosi S, Looney N. 2013. Agrobiodiversity for food security, health and income. *AGRONOMY FOR SUSTAINABLE DEVELOPMENT*. DOI 10.1007/s13593-013-0147-8.



**Nair R, Easdown W**. 2013. A perspective on soybean genetic resources in relation to vegetable soybean. *LEGUME PERSPECTIVES* 1. p. 10.



**Kamga R**, Kouamé C, Akyeampong E. 2013. Vegetable consumption patterns in Yaoundé, Cameroon. *AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT* 13(2):7399-7414. <http://www.ajfand.net/Volume13/No2/Kamga11190.pdf>

Kaur S, **Srinivasan R**. 2013. Evaluation of organic soil amendments against root-knot nematode, *Meloidogyne incognita*, in eggplant under nethouse conditions. *GREEN FARMING* 4(2):190-193.

Tamòl M, **Srinivasan R**, Dannon E, Agboton C, Datinon B, Dabiré C, Baoua I, Ba M, Haruna B, Pittendrigh B. 2012. Biological control: a major component for the long-term cowpea pest management strategy. *In: Innovative research along the cowpea value chain: Proceedings of the 2012 Conference on Improving Livelihoods in the Cowpea Value Chain through Advancement in Science*, 27 September - 1 October 2010, Saly, Senegal. IITA, Ibadan. p. 249-259.

## The Center in the news



**Farm Radio Weekly** is a news and information service for broadcasters in sub-Saharan Africa offered by Farm Radio International. In a recent broadcast, the radio report encouraged broadcasters to browse AVRDC's online publication database for future program ideas:

"The World Vegetable Center (AVRDC) has produced several online guides on methods of growing different types of vegetables ([http://avrdc.org/?page\\_id=2315](http://avrdc.org/?page_id=2315)). These guides cover field practices, the main pests and major diseases, and even the treatment of products and seeds after harvest. There is also a section on integrated pest management. Why not build a program or series of programs on the basis of one or more of these cultural guides? This will certainly attract your audience."

Farm Radio Weekly (Agro Radio Hebdo)

<http://hebdo.farmradio.org/2013/04/22/notes-aux-radiodiffuseurs-culture-de-legumes/>

## Welcome



AVRDC East and Southeast Asia welcomes **Ann-Kathrin Söllner**, a Master's student of Geography of Global Change at the Albert-Ludwigs-University Freiburg, Germany. She will stay in Bangkok for three months to collect data for her thesis on peri-urban vegetable producers and their role within the food system of

Bangkok as part of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)-funded project, "Understanding urban and periurban vegetable production and marketing systems through GIS-based Community Food Mapping in Greater Bangkok, Thailand."

Ann-Kathrin's stay is supported by a grant from GIZ's Advisory Service on Agricultural Research for Development (Beratungsgruppe Entwicklungsorientierte Agrarforschung, BEAF). Ann-Kathrin previously participated in a joint AVRDC-University of Freiburg research project in Cameroon.

## Seminars



**Chung-Cheng Lin**, Principal Research Assistant-Cucurbits, explained to his headquarters colleagues how breeders are developing multi-virus resistant pumpkin (*C. moschata* L.) on 18 April 2013. The work involves crossing inbred lines with plants that have demonstrated resistance. Chung-Cheng also introduced a study of how geminivirus resistance genes are inherited. After his talk, he invited everyone to sample the new pumpkin lines and share their opinions on the taste and texture of the flesh. For two seasons, Chung-Cheng led the bitter melon field team in growing and evaluating bitter melon varieties for germplasm trials and multilocal trials of commercial hybrids. After more than six years at AVRDC, Chung-Cheng (fondly known as Ah-Cheng) has accepted a position with Clover Seed Co. in Hong Kong. We wish him great success in his new post!



**Ismahane Elouafi**, Director General of the International Center for Biosaline Agriculture (ICBA), spoke to AVRDC staff on 30 April 2013 to share her perspective on the issue of water scarcity: how it affects agriculture now, and what it will mean for the future. ICBA seeks innovative solutions to address saline soils and production in marginal environments—for instance, by establishing remote sensing networks to collect data for the development of predictive soil moisture models and automated irrigation systems. ICBA is evaluating alternative crops that can tolerate saline soils, and researches aquaculture, hydroponics and other water-based production systems. The institution provides much-needed technical assistance to governments in the Middle East to develop water management strategies. Dr. Elouafi is interested in collaborating with AVRDC on indigenous vegetables and technology incubation. ICBA is, along with AVRDC, one of the nine founding organizations of AIRCA, the Association of International Research Centers for Agriculture. Her seminar was the seventh in a series entitled *Networking to Enhance International Cooperation in Vegetable Research and Development* sponsored at AVRDC headquarters by Taiwan's Ministry of Foreign Affairs (MOFA).



Things got hot in the AVRDC auditorium on 2 May 2013 when Pepper Breeder **Sanjeet Kumar** explained the “Evolution, domestication and versatile uses of *Capsicum* species” to colleagues. Peppers contain more than 30 carotenoids (such as zeaxanthin and beta-carotene), more than 15 capsaicinoids (including capsaicin, the component in peppers that produces the burning sensation on the tongue and skin), and high levels of ascorbic acid (vitamin C). Wild chili was harvested 8,000 years ago in what is now Mexico, and was domesticated there about 6,000 years ago (*C. annuum*). There are now five cultivated species of *Capsicum*. The plant has many uses—as a spice, a flavoring for beer, in medicinal preparations as a pain reliever and potential anti-cancer agent, and even as a weapon. The crop has great potential for income generation for farmers to supply industry as new properties and uses of carotenoids and capsaicinoids are discovered. Sanjeet noted there is an urgent need to conserve pepper germplasm from the Eastern Himalayas, which has many highly pungent landraces derived from natural inter-specific crosses.



**Kai-yi Chen**, Assistant Professor in the Department of Agronomy at National Taiwan University, gave a seminar on his work in “Mapping late blight resistance in the wild tomato accession L3708” to a group of AVRDC researchers on 7 May 2013. Dr. Chen regularly collaborates with AVRDC plant breeders and pathologists to investigate accessions that demonstrate resistance to disease.

## 40 years of service to tropical agriculture



*Over the past four decades, hundreds of people have contributed their talents and expertise to carry out AVRDC – The World Vegetable Center's mission of increasing the production and consumption of nutritious, health-promoting vegetables in developing countries. We share their reflections on working at the Center.*

### Rosario Salas

Intern

Crop and Ecosystem Management

2007-2008



I conducted my dissertation from April 2007 to July 2008 under Dr. Manny Palada. I planted different chili pepper varieties and subjected them to furrow and drip irrigation. A typhoon occurred during the early flowering stage and damaged my experimental plants, so I had to repeat the experiment. Mr. Deng-lin Wu and his team helped me replant—I will always remember the kind assistance they extended to me!

At present, I am the section head of the vegetable division in the Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Visca, Baybay City, Leyte Philippines. Aside from teaching horticulture subjects, I conduct research on vegetable legumes, hydroponics, and GRAS (Generally Regarded as Safe) coatings to enhance shelf life of harvested vegetables. I'm also interested in researching organic vegetable production and indigenous vegetables.

## Call for entries: Award for Values Education

Schools with vegetable gardening programs in Southeast Asia have an opportunity to showcase their gardens as a means to instill values about health and caring for nature among students: The Southeast Asian Ministers of Education Organization (SEAMEO) and the Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT) in cooperation with UNESCO Asia and Pacific Regional Bureau for Education and the Bank

of Tokyo-Mitsubishi UFJ, Ltd. are pleased to announce the **2013 SEAMEO-Japan Education for Sustainable Development (ESD) Award**, with the theme of "**Values Education**." All public and private schools in the 11 Southeast Asian countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam) are invited to submit information about

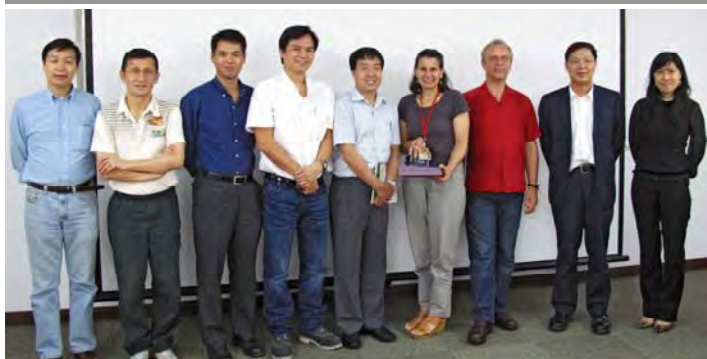
their schools' activities relating to the theme. Submission deadline is 16 September 2013.

**SEAMEO**

<http://www.seameo.org>



## Welcome



A group of professors and researchers led by **Prof. Jianhua Zhang** (*2nd from right*), Director of the State Key Laboratory of Agro-biotechnology, Chinese University, Hong Kong visited the Center on Thursday, 25 April 2013. The group met with **Maureen Mecozzi** (*4th from right*), AVRDC Head of Communications and Information and **Roland Schafleitner** (*3rd from right*), Head—Molecular Breeding.



**Shankarling Gowda IAS** (*center*), Principal Secretary - Horticulture, Government of Karnataka, India, visited the Center from 7-8 May 2013 to learn about the Center's activities, and to meet plant breeders Sanjeet Kumar (*left*), Peter Hanson (*right*), and other researchers. AVRDC will establish learning sites in Karnataka as part of the CGIAR Initiative on "Improving Rural Livelihoods through Innovative Scaling-up of Science-led Participatory Research for Development in Karnataka."



**Ismahane Elouafi** (*right*), Director General, and **Fiona Chandler**, Director for International Cooperation and Partnerships from the International Center for Biosaline Agriculture (ICBA) visited the Center from 29-30 April 2013 to meet AVRDC scientists and discuss areas for potential collaboration. ICBA and AVRDC share common interests in innovations to promote wise use of scarce water resources for agriculture.



Eight vegetable researchers from the People's Republic of China visited the Center on 2 May 2013. **Shiu-luan Lu** (*right*), AVRDC Visitors & Seminars Coordinator, briefed them about the Center's research activities and facilities.

**James Lin**, PhD Candidate, Department of History, University of California, Berkeley USA visited the Center on 10 May 2013. He is currently on a Fulbright grant in Taipei completing his dissertation research on the 20<sup>th</sup> century international agricultural development, focusing on the transnational dissemination and transformation of agricultural development discourse and practices. He met with **Yin-fu Chang**, Deputy Director General—Administration & Services, to discuss the Center's history and also visited the AVRDC Library.



## Cucurbit viruses no match for AVRDC breeders



A variety of viruses constrain tropical pumpkin production and farmers need improved varieties to stay a step ahead of these infectious agents. The fields of AVRDC East and Southeast Asia's Research and Development Station, located at Kasetsart University's Kamphaeng Saen campus in Thailand, are a hot spot for cucurbit viruses, and thus a great place to screen pumpkin for resistance in the field. March and April are ideal months to do field screening for virus resistance in this part of Thailand; a number of different potyviruses and begomoviruses appear in the pumpkin fields during this period each year. AVRDC's Cucurbit team performs routine screening of pumpkin breeding lines and accessions from the AVRDC genebank to find selections with resistance to infection from a combination of viruses. Over the years, the Cucurbit team has identified several lines possessing field resistance to mixed virus infection. Recently, breeders and pathologists from seed companies East-West Seed (4 April), Chia Tai Seeds (30 March), Clover Seed (29 March), Rasi Seeds (2 April), and Real Seeds (7 April) visited the trials. The researchers were impressed with the Center's pumpkin virus resistance work and expressed a desire to collaborate. Cucurbit Breeder **Narinder Dhillon** also explained the virus resistance potential of the lines to members of the AVRDC Board of Directors who toured the fields during Science Day (23 April).



(top): Members of AVRDC's Board of Directors tour the pumpkin virus resistance trial field located at Kasetsart University's Kamphaeng Saen campus in Thailand during Science Day, 23 April 2013.

(bottom, l to r): Narinder Dhillon, AVRDC Cucurbit Breeder, guided Prashant Kumar from Rasi Seeds to the pumpkin research field at AVRDC East and Southeast Asia's Research and Development Station on 2 April to get a closer look at resistant pumpkin lines.



## Stress: Not only a human malady



Stress isn't only a problem for humans; it takes a toll on plants, too. Legume breeder **Ram Nair** attended a national symposium on **abiotic and biotic stress management in vegetable crops** organized by the Indian Society of Vegetable Science and Indian Institute of Vegetable Research at Varanasi from 12-14 April 2013. He was among more

than 200 delegates from public research institutes, private industry, and farming enterprises of various sizes who discussed genetic resource management, breeding for stress resistance, biotechnological interventions, ecology and integrated pest management, precision farming, conservation agriculture and other topics related to managing crop stress. Participants also heard a case study on a public-private partnership to develop Bt brinjal (eggplant).

than 200 delegates from public research institutes, private industry, and farming enterprises of various sizes who discussed genetic resource management,

Ram presented a paper on "Using crop wild relatives to address biotic and abiotic stress in vegetables" co-authored with Genebank Manager Andreas Ebert. Crop plants display different mechanisms to withstand stress including shortening of life cycle, improving water uptake and reducing transpiration. Crop wild relatives are often well adapted to marginal environments, and exploiting their genetic diversity to develop stress-tolerant crops can help improve crop production in uncertain climates.

"Many delegates acknowledged AVRDC as an important source of vegetable germplasm," said Ram. AVRDC's partnership with the Asia and Pacific Seed Association also was recognized as a valuable platform for collaboration by seed industry representatives.



AVRDC Postharvest Specialist **Ngoni Nenguwo** recently attended the Crawford Fund Master Class in Communicating with Stakeholders in Addis Ababa, Ethiopia. The Australian Centre for International Agricultural Research (ACIAR) Australian International Food Security Centre (AIFSC) sponsored the training, where Ngoni developed a communication strategy for an AIFSC-AVRDC project on postharvest improvements for peri-urban vegetables. **(l to r): Dr. Eric Craswell**, Director of Training, Crawford Fund; **H E Lisa Filipetto**, Ambassador to Australia in Ethiopia; **Ngoni Nenguwo**; **Dr. Azage Tegegne**, International Livestock Research Institute representative and Ambassador for Australia Awards in Africa.



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