



The World Vegetable Center

Newsletter

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Research on disease resistant tropical tomatoes bears fruit

Top performer under pressure

The story didn't make the headlines on the nightly news, but if it had, tomato farmers in most parts of the world would have slept much easier: Scientists at the University of Amsterdam claim to have identified a key gene protecting tomatoes against the common fungus *Fusarium oxysporum*, which causes the plants to wilt. This is good news indeed to researchers and breeders.

Tomato farmers in the tropics, though, are not celebrating just yet. In the tropics, tomato yields average less than 15t/ha and are far lower than those in developed countries due to major diseases such as *Tomato yellow leaf curl virus* (TYLCV) and bacterial wilt (BW). Tomato is a high-value crop and a valuable source of vitamin A in human diets; harvests stunted by disease cause farm incomes to shrivel and prevent much-needed nutrition from reaching those who need it most.

"The most effective, cheapest and easiest way to control tomato diseases to benefit small-scale farmers would indeed be disease-resistant varieties," says Peter Hanson, AVRDC – The World



bacterial wilt, heat tolerance and good fruit quality are now under evaluation in field trials in India, Vietnam, Cambodia, Thailand, Mali and Niger. Promising results from the tests in India have raised hopes beyond the



Vegetable Center's Global Theme Leader for Breeding. However, bacterial wilt is a highly complex pathogen. Resistance is often unstable and does not work well against all pathogen strain or in all environments.

Partner institutions in India, Thailand and Germany have joined with the Center in a research program to develop tomato lines for the tropics with stable BW and TYLCV resistance. Major components of the project are the identification of resistant genes from wild and cultivated tomato species through molecular markers and a better understanding of the mechanism of BW resistance. While following a traditional breeding approach, the program's application of the latest molecular marker technology increases efficiency and saves time.

Tomato lines with multiple TYLCV resistance genes, resistance to

subcontinent. An additional motivator for the researchers: Improved varieties will increase yield by 30 percent or more and allow farmers to reduce pesticide applications, reducing production costs, improving product quality, and protecting the environment. The new lines will ultimately benefit small-scale farmers, as they are global public goods that will be disseminated by the Center through public and private sector institutions worldwide.

— Communications

The LIBRARY

New publications

...new book arrival



Zheng, J.Q. (2004). *Handbook of contemporary vegetable pests and diseases: identification and management.* (現代蔬菜病蟲鑑別與防治手冊) Beijing: China Agriculture Press. 967 pp.

...our latest brochure



We are pleased to inform you that a new library brochure is now available. This handy, compact guide provides a brief introduction to the library's services. Pick up a copy the next time you visit the library.

...from Center staff

Srinivasan, R., (2008). Susceptibility of legume pod borer (LPB), *Maruca vitrata* to δ-endotoxins of *Bacillus thuringiensis* (Bt) in Taiwan. *JOURNAL OF INVERTEBRATE PATHOLOGY.* v.97(1):79-81.

Earthquake in China

The recent earthquake in China has affected us all. The province of Sichuan, where devastation has been most severe, is the home of Yong-Hong, Peter Juroszek's wife. The Goodwill Club would like to act as a channel for any donations you would like to make to the Chinese Red Cross. A donation box will be placed in the cafeteria starting next Monday. The Goodwill Club will send a cheque for the amount collected directly to the Red Cross.

...recent articles requested by scientists

Bela-ong, D.B., Bajet, N.B. (2007). Molecular detection of whitefly-transmissible geminiviruses (Family *Geminiviridae*, Genus *Begomovirus*) in the Philippines. *PHILIPPINE JOURNAL OF CROP SCIENCE.* v.136(2):87-101.

Zhao, X., Chambers, E., Matta, Z., Loughin, T.M., Carey, E.E. (2007). Consumer sensory analysis of organically and conventionally grown vegetables. *JOURNAL OF FOOD SCIENCE.* v.72(2):S87-S91.

Takada, Y., Andreeff, M., Aggarwal, B.B. (2005). Indole-3-carbinol suppresses NF-κB and IkBalpha kinase activation, causing inhibition of expression of NF-κB-regulated antiapoptotic and metastatic gene products and enhancement of apoptosis in myeloid and leukemia cells. *BLOOD.* v.106(2):641-649.

Levin, I., Lazar, A., Bar, M., Schaffer, A.A. (2004). Non GMO fruit factories: strategies for modulating metabolic pathways in the tomato fruit. *INDUSTRIAL CROPS AND PRODUCTS.* v.20 (1):29-36.

Liu, Y.S., Roof, S., Ye, Z., Barry, C., van Tuinen, A., Vrebalov, J., Bowler, C., Giovannoni, J. (2004). Manipulation of light signal transduction as a means of modifying fruit nutritional quality in tomato. *NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, PROCEEDINGS.* v.101(26):9897-9902.

Clemens, S., Palmgren, M.G., Kramer, U. (2002). A long way ahead: understanding and engineering plant metal accumulation. *TRENDS IN PLANT SCIENCE.* v.7(7):309-315.

Miller, E.C., Hadley, C.W., Schwartz, S.J., Erdman, J.W., Boileau, T.W.M., Clinton, S.K. (2002). Lycopene, tomato products, and prostate cancer prevention. Have we established causality?. *PURE AND APPLIED CHEMISTRY.* v.74 (8):1435-1441.

— Fang-chin Chen/Communications

27th Regional Training Course on Managing Vegetable Production and Marketing

Addressing the growing needs of the South East Asian region for the efficient production and marketing of vegetables in the face of globalization and other emerging production and marketing challenges, AVRDC-The World Vegetable Center will continue with its annual 3 month modular Regional Training Course (27th). The course is designed to provide vegetable researchers and extension workers with the necessary skills and technical knowledge, emphasizing on good agricultural practice (GAP), impact assessments, indigenous vegetables, post-harvest technologies and farmer education.

— Dr. Peter Ooi/Regional Director, ARC



CORNUCOPIA

Grafting workshops conducted in India



Participants of the grafting workshop, Delhi, 1-3 May 2008
Hosted by The Energy and Resources Institute (TERI)



Participants of the grafting workshop, Coimbatore, 7-9 May 2008
Hosted by Tamil Nadu Agricultural University (TNAU)

Two training workshops on integrated vegetable grafting technology for managing soil-borne diseases and increasing tolerance to flooding in the hot-wet season were conducted by World Vegetable Center staff and collaborators recently in India. The first workshop, held near Delhi on 1-3 May 2008, was hosted by The Energy and Resources Institute (TERI). The second, held in Coimbatore on 7-9 May 2008, was hosted by Tamil Nadu Agricultural University (TNAU). Trainees built a grafting chamber and got hands-on experience grafting tomato, eggplant, pepper, pumpkin, watermelon, sponge gourd and bitter gourd. They learned about the technical requirements for successful vegetable grafting and



heard about how grafting has been applied in Taiwan, Vietnam and Bangladesh. They received an introduction to AVRDC's Production

Theme and integrated disease management of bacterial wilt.

Trainees included farmers, TERI staff, and TNAU faculty and students. Twenty-seven men and women were trained in Delhi, while the Coimbatore workshop had about 30 trainees and 25 other visitors. Most of the farmers trained in Coimbatore are Conveners of Farmer Groups for their villages. Each convener plans to train about 20 farmers now that they have completed the training. TERI staff are quite experienced in farmer facilitation and are well-equipped to carry grafting technologies forward in the field.

These workshops were part of the Integrated Pest Management Collaborative Research Support Program (IPM CRSP) funded by USAID. Trainers were Deng-Lin Wu, Greg Luther and Jaw-Fen Wang of AVRDC, and E.A. "Short"

Heinrichs, IPM CRSP Consultant and Secretary General of the International Association of Plant Protection Sciences (IAPPS).

— Dr. Greg Luther/CEM Unit

SKETCH



Name: Sanjeet Kumar

Home: Primary: Samastipur, India; Secondary: Varanasi, India

Position: Vegetable Breeder for the Sudano-Sahelian Region

Why you do what you do:

This is a question I ask myself many times. During university the subject of genetics and plant breeding attracted me, perhaps because this branch of science contributes towards prosperity in rural India. So plant breeding became my profession. I served 10 years with ICAR (Indian Council of Agricultural Research) as a plant

geneticist and worked mainly on the hot pepper genetic improvement program. Now after joining the AVRDC – The World Vegetable Center vegetable breeding project here in Niger, I've learned that the conditions in some parts of India and West Africa are very similar.

Why you do it at AVRDC:

Our hot pepper breeding program in India was initiated during 1997 and within 10 years achieved great success because our germplasm was based on AVRDC – The World Vegetable Center's elite breeding lines. I was familiar with the Center, and I when decided to move on to apply my knowledge in a new challenge, this position was offered and I accepted this opportunity.

Research and development:

After having worked on new alloplasmic lines for cms diversification and marker validation for male sterile cytoplasms as part of my hot pepper research, I currently look at other vegetables, and also investigate questions of efficient water management in vegetable crops. Other key issues are strategic

breeding of okra and the role of indigenous vegetables in the region that are important for food security, especially with the landless poor.

What's next:

I trust in the present because this is what one can have completely in one's own hand. Tomorrow will be tomorrow!! In fact there is a Hindu saying: "Today is life so talk about life, if death knocks on the door tomorrow, you will face it tomorrow so do not think more about that today." So just try to learn and contribute on a day-to-day basis.

Your favorite experiences in West Africa:

I have never seen a peaceful city like Niamey. It is just the opposite of East African cities and many other cities in the developing world (including a number of them in India). I am sure this comes from the peace-loving citizens of Niger. As one cannot find Indian food in any of the restaurants here, we enjoy cooking and eating Indian food at home. On behalf of my wife, you all are invited for Indian food when you come to Niamey!

MORE NEWS

To the highest bidder...

One lot of condemned items including sofa sets, tables, computer desks, cabinets, bookshelves, chairs, and monitors will be sold by bidding starting at 3:30 p.m. on 28 May in the parking lot of new greenhouse area. All Center staff members are welcome to bid. Please contact Mr. Ku-yu Hu, TSO Supply Unit at ext. 229 for details.

一批中心報廢物品包括沙發組、桌子、電腦桌、櫃子、書架、椅子、

電腦銀幕陳列在新溫室區停車場，將於**5月28日**下午三點半開標。有興趣同仁，請與技術服務科胡谷油先生（分機**229**）聯絡。

— Janice Chou/TSO

Bus trip to Shi-tou

Set your alarm clock: The bus to Shi-tou Forest Recreation Area will leave at 8 a.m. sharp on Saturday, 24 May. Please be sure you are at the pick-up point in front of the AVRDC cafeteria at or before 7:45 a.m. Please note only

Taiwanese nationals can be insured for the trip. For more information, contact Chee-wei Tan at ext. 374. The R&S Committee thanks everyone for the overwhelming response to this activity. More good times are in the works!

參加溪頭森林遊樂區一日遊的朋友，**5月24日**（星期六）7點**45分**請在本中心餐廳前集合，我們**8點鐘**準時出發。本國籍的人員都加保旅遊平安險。相關訊息請洽陳志威（分機**374**），祝大家旅途愉快！

— Lilia Tan-Habacon/R&S Committee