

1 August 2008

Weeds of change



Tough and resilient: Weeds thrive in a changing climate; can we breed vegetable varieties to do the same?

Vegetable breeders working to develop varieties able to withstand the elevated temperatures and increased concentrations of atmospheric carbon dioxide (CO₂) predicted by the Intergovernmental Panel on Climate Change (estimated time of arrival: 2038) should consider moving their test plots off the research farm—and establishing them instead in the center of the nearest major urban area.

Choked by vehicle exhaust and girdled by buildings and pavement that soak up solar energy, cities have higher-than-average temperatures and CO₂ concentrations in summer in temperate areas, year-round in the

tropics. In fact, today's urban gas-and-heat levels are similar to those projected in the panel's "B2 scenario" for 30 to 50 years in the future.

CO₂ is a greenhouse gas, but it is also, along with water, light, and

nutrients, one of the four essential resources for plant growth. The effect of rising CO₂ levels on plants is poorly understood.

Weed ecologist Lewis Ziska from the United States Department of Agriculture (USDA) Agriculture Research Service decided to take advantage of the city of Baltimore's futuristic atmosphere to explore how climate change might alter weed growth. Using soil from a Maryland organic farm that contained the seeds of 35 common weeds, Ziska set up uniform test beds at three sites: on the rural organic farm, in a park in a Baltimore suburb, and near the city center, where the temperature was hotter and the air had more CO₂.

Over five growing seasons, the "urban" weeds grew much larger,

matured more rapidly, produced nearly twice as much pollen, and were more resistant to herbicides. It appears crop protection, already an expensive and time-consuming activity for many farmers, is about to become even more costly and troublesome.

Weeds have developed the genetic diversity to flourish in whatever type of habitat is available. World Vegetable Center molecular breeder Dr. Robert de la Peña and his team are transferring genes for drought tolerance from two wild relatives of tomato (*Solanum chilense* and *S. pennellii*) into commercial tomato varieties. "Improved adapted vegetable germplasm is the most cost-effective option for farmers to meet the challenges of a changing climate," says de la Peña. To test crosses able to cope with rising CO₂ levels, researchers may need to look no further than downtown Taipei.

Read more:

"Can weeds help solve the climate crisis?"
International Herald Tribune, 30 June 2008

The LIBRARY

New publications

...recent articles requested by scientists

Purohit, P., Kumar, A., Kandpal, T.C. (2006). Solar drying vs. open sun drying: A framework for financial evaluation. *SOLAR ENERGY*. v.80(12):1568-1579.

Young, S.L. (2004). Natural product herbicides for control of annual vegetation along roadsides. *WEED TECHNOLOGY*. v.18 (3):580-587.

Hanafi, A., Bouharroud, R., Miftah, S., Amouat, S. (2003). Performances of two types of insect screens as a physical barrier against *Bemisia tabaci* and their impact on TYLCV incidence in greenhouse tomato in the Souss Valley of Morocco. *IOBC/WPRS BULLETIN*. v.26(10):39-42.

Bram, M.R. (2002). Effects of inbreeding in three populations of the dioecious annual *Amaranthus cannabinus* (Amaranthaceae). *JOURNAL OF THE TORREY BOTANICAL SOCIETY*. v.129 (4):298-310.

Eswaran, H., Almaraz, R., Reich, P., Zdruli, P. (1997). Soil quality and soil productivity in Africa. *JOURNAL OF SUSTAINABLE AGRICULTURE*. v.10(4):75-94.

Atiri, G.I., Fayoyin, G.A (1989). Horizontal resistance to okra leaf curl virus in okra germplasm. *ANNALS OF APPLIED BIOLOGY*. v.114(suppl.):152-153.

Reminder for staff publications

If you have publications that have not been submitted to the Library, please e-mail details to Fang-chin Chen at fcchen@worldveg.org.

Thank you for your attention and cooperation.

— Fang-chin Chen, Editorial and Library

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PEOPLE

Welcome...



Kamal G S Kumar

Dr. Kamal Gurmit Singh Kumar, Sr.
Research Engineer,
Department of Soil
& Water

Engineering; **Dr.**

Kulbir Singh

Pawar,

Olericulturist,
Department of
Vegetable Crops;

and **Dr. Abhishek Sharma,** Assistant
Virologist,



Kulbir S Pawar



Abhishek Sharma

Department of
Vegetable Crops,
from Punjab
Agricultural
University, India
arrived at our
Center on
Sunday, 27 July

2008 for three weeks of nethouse
training under the TATA–
Jharkhand/Punjab project. They will
be trained in “Sustainable vegetable
production technologies under
nethouses” in different units,
including Bacteriology, Breeding

(Cucurbit, Pepper and Tomato),
CEM, Entomology, and Mycology.
The training is coordinated by
Dr. Srinivasan Ramasamy.

Contact Kamal, Kulbir, and
Abhishek at 422 (laboratory) and
643 (dormitory); e-mail:

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— Lydia Wu, Global Technology Dissemination

Farewell to Lilia; interim Human Resources Manager designated

I regret to inform you that our
Human Resources Manager,
Ms. Lilia Tan-Habacon, has had to
resign from her position due to
personal reasons and will be
returning to the Philippines on 8
August 2008. Although the position
announcement for her replacement
has been posted on our website and

will be advertised widely, we need
to make some interim
arrangements. From 8 August 2008
until the new Human Resources
Manager is hired and at post,
Dr. Kathryn Hamilton will
handle recruitment and related
activities, and the Office of the
DDG-Administration & Services

will handle other personnel-related
matters.

I would like to wish Lilia every
happiness and success in the future.

— Jackie Hughes, DDG-Research for
Dr. Dyno Keatinge, Director General

CORNUCOPIA

Conference Calendar

**Biodiversity in Agriculture:
Harlan II Symposium**

14-18 September 2008
Davis, California USA
harlanii.ucdavis.edu/

Agricultural biodiversity plays a
crucial role in the sustainable
production of food, fiber, and feed
for humanity. An international
symposium was held in Aleppo,
Syria in May 1997, dedicated to
Jack R. Harlan, 1917–1998,
evolutionary biologist and plant
explorer. To review progress, assess

the current status of agricultural
biodiversity, and chart directions for
the future, a new symposium,
Harlan II, will be held at the
University of California, Davis.

**IV International Symposium
on Transboundary Waters
Management**

15-18 October
Thessaloniki, Greece
www.inweb.gr/twm4/

With growing water scarcity, it is
estimated that within 25 years two-
thirds of the world's inhabitants will
live in countries with serious water

problems. Growing demand,
inadequate water governance,
excessive extraction, and climate
change coupled with the
deteriorating quality of water in
many parts of the world has put
both surface and groundwater
resources under severe stress.
Scarcity leads to increasing
competition among users. This
symposium explores cooperative
arrangements based on
multidisciplinary approaches that
integrate scientific, social,
economic, and institutional
components to jointly develop,
manage and protect transboundary
waters.

SKETCH



Name: Dennis Knierim

Home: I am from northern Germany and got my PhD from the

University of Hannover.

Immediately thereafter I was invited to Taichung for one year as a postdoc in the virology department at National Chung Hsing University. I came to AVRDC in June.

Position: Postdoctoral fellow in the virology unit.

Why you do what you do: During my undergraduate studies in general horticulture I became interested in plant virology. I realized the great potential of analyzing the viruses on the genome level to better understand their biology and the factors involved in resistance. During my PhD work in the international project "Protected cultivation – an approach to sustainable vegetable production in the humid tropics" I analyzed

several tropical vegetable viruses occurring in Thailand. I studied their epidemiology and developed diagnostics. In addition I applied the recently detected mechanisms of RNA mediated virus resistance (also known as RNAi), which I was able to confirm in different resistance constructs. This novel technique interests me very much, because it opens the possibility to generate resistance against all viruses. It may solve many virus problems that are responsible for low yields of important agricultural crops and reduce incomes of farmers in the tropics.

Why you do it at AVRDC: I want to apply my experience of tropical plant viruses and in resistance mechanisms to develop virus resistant crops. I think AVRDC as a global nonprofit organization with direct links to the public and private sectors, especially in developing countries, gives me the best chance to realize my professional expectations.

Research: I currently work on

viruses infecting cucurbits. I am now surveying and characterizing the most important ones in the subtropics and tropics. Next I will develop efficient diagnostics and use them to screen for host plant resistance against these viruses. For viruses where no natural virus resistance can be found, I will explore the RNA mediated resistance strategy.

My hobbies: Numismatics, rollerblading and learning about different cultures and people, which I find very important in a globalized world.

What's next: I hope I can be a part of this international center and make some impact in further promoting and improving its virus research. I also hope to explore the area around the center on my rollerblades once the rainy season has stopped.

Favorite vegetable: Eggplant. I like it in all variations, especially Mediterranean style.

MORE TO KNOW...

New holiday calendar in AVRDC intranet

Policies & Procedures

[Newcomer's Guide](#) | [Regulation Manual](#) | [Standard Operating Procedures](#) | [Holidays](#) | [Others](#)

This calendar highlights the 2008 PUBLIC HOLIDAYS for Cambodia, Cameroon, India, Indonesia, Lao PDR, Madagascar, Mali, Niger, Solomon Islands, South Africa, Taiwan, Tanzania, Thailand, Uzbekistan, and Vietnam. Click on the holiday to find out where it is celebrated. For a list of upcoming holidays, click on "Agenda."

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30 Isra Mi'raj	31 Gudalcanal	1	2
3 Tree Celebr	4 Makira Provi	5	6	7 Peasants' D	8 Women's D	9

A new interactive comprehensive calendar highlighting the 2008 PUBLIC HOLIDAYS for Cambodia, Cameroon, India,

Indonesia, Lao PDR, Madagascar, Mali, Niger, Solomon Islands, South Africa, Taiwan, Tanzania, Thailand, Uzbekistan, and Vietnam is now available on the AVRDC intranet.

In the intranet, go to ***Policies & Procedures > Holidays***. Click on any of the color holiday bars in

the calendar to find out where the holiday is celebrated. For a list of upcoming holidays, click on "**Agenda.**"

Don't know how to access the intranet? Contact the IT team:

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