World Vegetable Center Newsletter
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Training to Grow Salad in Space

The world's most popular vegetable may soon become an interstellar traveler. A new educational outreach project known as Tomatosphere is aiming to teach children more about space travel at the same as they learn how we depend on plants for life.

About 125 million tonnes of tomatoes were produced worldwide in 2005, with China accounting for a quarter of that production. Great in sauces or salads they also provide a high value alternative for smallholder producers. But their role as an educational aid in learning about space and survival is a new twist for an old favorite.

In our quest to travel deeper into space for extended periods, we need to find ways to expand life support provisions in the limited room available in space vehicles. A plant-based life support system may provide part of the solution – and this is where the tomato comes in. Through photosynthesis, plants use light energy to consume carbon dioxide exhaled by humans and return oxygen to the air that is needed for survival. The tomato is one of the most popular plants for space applications as it provides wholesome nourishment as well as purified water through transpiration from its leaves.

The Tomatosphere project reaches over 9000 classrooms across Canada, the United States and several other nations. It is designed both to educate and inspire young students and to open the door for extended space exploration, such as to Mars. Students will study the impact of simulated spacecraft conditions on the germination and production of tomatoes to assess how to supply future space exploration missions with life support requirements.

There may even be some unexpected positive spinoffs if the students involved consume more tomatoes as a result. Perhaps the more interesting question will be whether future AVRDC lines prove to be as well adapted to space as they are to the tropics.

For more information see:
http://www.tomatosphere.org/resources.htm

- Communications

Latest Publications from the Center's Staff

Congratulations to **Drs. Jaw-Fen Wang, Paul Gniffke, Sylvia K. Green, M.L. Chadha, Mel. O. Oluoch, Liwayway M. Engle, Manuel C. Palada, Ray-yu Yang, Katinka Weinberger, Ms. Su-ling Shih, Mr. Wen-shi Tsai, Ms. Jin-the Wang, Ms. Li-mei Lee, Mr. Lien-chung Chang, Ms. Wan-jen Wu, Ms. Ying-chuang Chen, Ms. Li-ju Lin and Ms. Yun-yin Hsiao** for their latest publications, recently received by the library.

Berke, T., Black, L.L., Talekar, N.S., **Wang, J.F.**, **Gniffke, P.**, **Green, S.K.**, Wang, T.C., Morris, R. (2007). Suggested cultural practices for chili pepper. JOURNAL OF CHINA CAPSICUM. no.26:45-49.

Chadha, M.L., **Oluoch, M.** (2007). Healthy diet gardening kit-for better health and income. ACTA HORTICULTURAE. no.752:581-584.

Engle, L.M., Faustino, F.C. (2007). Conserving the indigenous vegetables germplasm of South East Asia. ACTA HORTICULTURAE. no.752:55-60.

Green, S.K., **Shih, S.L.**, **Tsai, W.S.**, **Wang, J.T.**, **Lee, L.M.** (2007). Evaluation of field management practices for the reduction of Tomato leafcurl virus (ToLCV) on tomato and Cucumber mosaic virus (CMV) of peppers. In: 2007 植物蟲煤病害與防治研討會專刊./ ed. by 詹富智; 陳慶忠; 陳煜焜; 曾國欽; Taichung: NCHU. p.101.

Oluoch, M.O., **Chadha, M.L.** (2007). Evaluation and selection of African eggplant for yield and quality characteristics. ACTA HORTICULTURAE. no.752:303-306.

Palada, M., Ali, M. (2007). Sustainable development of peri-urban agriculture in Southeast Asia: evaluation of technologies for improving year-round production of safe vegetables. In: Final summary report of SUSPER (Sustainable Development of Peri-Urban Agriculture in South-East Asia)./ ed. by Palada, M.; Moustier, P.; Hanoi: The Gioi Publishers. p.118-130.

Palada, M.C., **Chang, L.C.**, **Yang, R.Y.**, **Engle, L.M.** (2007). Introduction and varietal screening of drumstick tree (*Moringa* spp.) for horticultural traits and adaptation in Taiwan. ACTA HORTICULTURAE. no.752:249-253.

Weinberger, K. (2007). Are indigenous vegetables really underutilized crops? Some evidences from Eastern Africa and South East Asia. ACTA HORTICULTURAE. no.752:29-34.

Yang, R.Y., **Wu, J.**, **Chen, D.**, **Lin, M.**, **Shiao, R.**, Kuo, G. (2007). Distribution of edible plants for nutraceutical values. ACTA HORTICULTURAE. no.752:115-122.

New Popular Magazines Now Available in the Library

The Economist: America's Vulnerable Economy – 17th–23rd November 2007

National Geographic: Big Bad Bizarre Dinosaurs – December 2007

PC World: Secrets of the New Web (special issue) – December 2007

Time: The Best Countries For Business (special report) – 26 November 2007

- Source: Fang-chin Chen/Communications

Africa-Asia Collaboration

On 17 November 2007, a group from the Regional Center for Africa joined the Director, Asian Regional Center for a visit to the Training and Research Center based at the Kasetsart University Campus in Kamphaengsaen. The team from Arusha comprised Rémi Nono-Womdim, Mel Oluoch, Germain Pichop and Drissa Silué. They were shown around the training center as well as visiting the research fields accompanied by Ms. Somchit Preongwitayakun and Mr. Worawit Sorajjapinun. This could be the start of closer collaboration between Africa and Asia as many of the outputs of ARC research are relevant to Africa.

- Source: Dr. Peter Aun-chuan/Regional Director/AVRDC-ARC

Contact Information for Vegetable Breeding and Seed Systems Program (vBSS) in Africa

Mr. Jan Helsen, Program Manager, address: AVRDC— The World Vegetable Center, Regional Center for Africa, PO Box 10, Duluti, Arusha, Tanzania; tel.: +255-27-255-3093 / 255-3102; fax: +255-27-255-3125; e-mail: (**jan.helsen@avrdc-rca.co.tz**).

Dr. Christophe Kouame, Liaison Officer, address: AVRDC—The World Vegetable Center, Regional Center for Africa, vBSS Cameroon, c/o ICRAF, PO Box 16317, Yaounde, Cameroon; tel.: +237-22-23 75 60; fax: +237-22 21 50 89; e-mail: (**christophe.kouame@avrdc-rca.co.tz**).

Mr. Benjamin Rakotoarisoa, Liaison Officer, address: AVRDC—The World Vegetable Center, Regional Center for Africa, vBSS Madagascar, PO Box 1690, Antananarivo, Madagascar; tel.: +261-33-11-896-22; e-mail: (**rabenjamina@avrdc-rca.co.tz**).

Dr. Rémi Nono-Womdim, Liaison Officer and Program Research Manager, address: AVRDC—The World Vegetable Center, Regional Center for Africa, PO Box 10, Duluti, Arusha, Tanzania; tel.: +255-27-255-3093 / 255-3102; fax: +255 -27-255-3125; cell: +255-78-695-6345; e-mail: (**remi.nonow@avrdc-rca.co.tz**).

Dr. Albert Rouamba, Vegetable Breeder, AVRDC—The World Vegetable Center, Subregional Office for West and Central Africa, address: BP 320 Bamako, Mali; tel.: +223-222-3375; fax: +223-222-8683; cell: +223-328-7663; e-mail: (**a.rouamba@icrisatml.org**).

- Source: Communications

News from Africa

New Staff

Mr. Eliamoni Lyatuu joined RCA as a research assistant on 19 November. He is a Tanzanian citizen, but did his MSc. In Agricultural Economics in China. He will work in the socio-economic unit of RCA. His email address is: eliamoni.lyatuu@avrdc-rca.co.tz.

Visitors

Mr. Raymond Lataste, Cultural and Scientific Attaché at the French Embassy in Tanzania visited AVRDC-RCA and Global Hort on 19 November in order to gain some information about our work. A potential cooperation with the French Embassy was discussed.

Drs. Pilar Santacoloma and **Siobhan Casey** from FAO visited RCA during visit to Tanzania to promote Good Agricultural Practices and Sustainable Agriculture and Rural Development (GAP-SARD). They discussed GAP for vegetables and the supply chain with RCA on 20 November.

- Source: Dr. Shilpi Saxena/AVRDC-RCA

Travel

Drs. Gregory Luther, Manuel Palada, and **Jong-Gyu Woo** , 26 November-4 December, to Vietnam, to conduct a Participatory Rural Appraisal (PRA) survey focusing on ICM and IPM in Nghia Trung village (SANREM-CRSP); to develop a work plan for ICM and IPM activities with project collaborators; to visit an organic farm (Organik Eurepgap) in Dalat and discuss potential collaborative projects in organic vegetable production and protective cultivation; to visit the IFAD SOVP project sites in Ha Tinh and Tra Vinh Provinces and to discuss work plans and activities with the Site Coordinator.

Mr. Tsai Wen-shi, 26 November-2 December, to Honduras, to monitor the IPM CRSP trial and to meet with cooperators at Zamorano University; 3-12 December, to Guatemala, to participate in the Progress and Planning Meeting of the IPM CRSP project on "Insect transmitted viruses in Central America, the Caribbean and Sub Saharan Africa."

- Source: Yvonne Ting/ASU

Drs. Detlef Virchow, **Shilpi Saxena** and **Mr. Stefan Pletziger**, 3 December, to Dar-es-Salaam, to attend a CIM meeting for all integrated experts funded by CIM and working in Tanzania.

- Source: Dr. Shilpi Saxena/AVRDC-RCA

Field Demonstration of Organic Vegetable Soybean and Tomato Trials at Headquarters Next Week

「有機毛豆栽培技術之研究」與「有機農耕法對作物與土壤品質安全性之研究」試驗成果觀摩會

A field demonstration will be held at headquarters on Thursday, 29 November to introduce "**Integrated Production Technologies for Organic Vegetable Soybean**" and the "**Effects of Six Fertilization Strategies on Quality and Safety of Soil and Vegetables in Organic Farming Systems.**" Local experts from experiment stations, farmers' associations, and organic farmers have been invited. Interested scientists and staff members are also welcome to attend. Please contact

Maggie Shiu (ext. 403, maggie@netra.avrdc.org.tw) or **Yueh-huei Lin** (ext. 415, yhlin@netra.avrdc.org.tw) for registration before 28 November 2007.

本中心之作物與生態系統管理組訂於 11 月 29 日舉辦「有機毛豆栽培技術之研究」與「不同有機施肥策略對作物與土壤品質安全性之影響」試驗成果觀摩會，歡迎對有機毛豆栽培技術或有機蔬菜肥培技術有興趣之專家、同仁報名參加。

欲報名者，請將報名表傳至 maggie@netra.avrdc.org.tw 或 yhlin@netra.avrdc.org.tw

相關訊息請電：徐小姐（分機 403）或林小姐（分機 415）洽詢。報名截止時間為 96 年 11 月 28 日。

Time	Activity	Venue
0900-0930 h	Registration	Auditorium (3rd floor Administration Building)
0930-0940	Welcome address and Introduction	Auditorium
0940-1040	**Integrated Production Technologies for Organic Vegetable Soybean** 1. Variety Evaluation & Best Fertilization Management 2. Pest Management 3. Disease Management 4. Weed Management 5. Quality Comparison **Effects of fertilization strategies on quality and safety of soil and vegetables**	Auditorium
1040-1140	Field Observation and Demonstration	Organic Fields No. 81 & 82 Conventional field No. 95
1140-1200	Discussion and Information Exchange	Organic Fields No. 81 & 82 Conventional field No. 95
1200-1300	Lunch/Departure	Cafeteria

- Source: Dr. Manuel Palada/CEM Unit

Position Announcement

Greenhouse Aide, Crop & Ecosystem Management Unit

作物及生態管理組徵「溫室助手」乙名

Job description: (1) Performing labor intensive work in the greenhouse, net house and open field which includes sowing, transplanting, managing plants (e.g., pruning, staking, manual watering, fertilizing and spraying, as well as collecting data (e.g., plant characters, pest/disease rating, water measurement in micro-irrigation, yield sample); (2) Raising seedlings of scion and rootstock for producing grafted tomato, peppers and cucurbits for experimental use; (3) Preparing and applying nutrient and fertilizer solutions for greenhouse hydroponic and soilless experiments; (4) Maintaining the cleanliness and orderliness of the greenhouse, net house, rain shelters and other experimental facilities; (5) Preparation of plant and soil samples for nutrient analysis; (6) Performing laboratory operations for determining soil EC, soil pH and NPK quick test; (7) Assisting in data collection and management using software programs for data management; and (8) Cooperating with other units regarding interdisciplinary activities and collaborating with the Field Assistant to lay out experiments under the supervision of the Principal Research Assistant.

Qualifications: Senior high school or equivalent; physically fit to work outdoors; hardworking; ability to communicate in English is required; experience in greenhouse operations of various vegetable crops is desirable.

Application: Submit a letter of application, Curriculum Vitae, with names, and contact addresses (phone number and e-mail) of three referees. ***Send to***: Ms. Felisa Wang, Human Resources, and AVRDC— The World Vegetable Center, P.O. Box 42, Shanhua, Tainan 74199, Taiwan; e-mail: **jobapply@netra.avrdc.org.tw**

Review of Applications: The review of applications will begin 1 December 2007 and continue until the position is filled. Only shortlisted applicants will be notified.

工作內容：溫室、網室及田間勞動工作，包括播種、移植、植株管理(整枝、綁蔓、澆水、施肥及噴藥等)及協助收集試驗資料(植株性狀、病蟲害評估、滴灌系統操作以及產量試驗等調查)；培育嫁接用番茄、甜椒及瓜類幼苗；準備溫室水耕及無土栽培試驗用之肥料；維護溫室、網室、遮雨棚及其他試驗設備；準備土壤及植體營養分析的樣品；可獨立操作實驗室檢測包括土壤電導度、土壤酸鹼值及氮磷鉀快速檢定；使用資料管理軟體協助試驗資料收集、管理；與其他單位合作參與學科間之研究；協同研究助理及田間助理做試驗設計。**應徵資格：**高中畢業或同等學歷，能從事田間勞力工作，肯吃苦，會英文，具溫室蔬菜栽種經驗者。意者請請將自傳、履歷表以及三位介紹人姓名、聯絡地址 (包括電話、電子郵件信箱) 寄到：亞蔬–世界蔬菜中心，台南縣善化鎮郵政信箱 42 號，人事室或電子郵件信箱:
jobapply@netra.avrdc.org.tw

截止收件日期： 2007 年 12 月 1 日

- Source: Felisa Wang/HR

New Staff

Mr. Wang Chung-cheng 汪中正, Field Laborer, Bacteriology Unit reported for duty on 15 November 2007. He can be contacted at ext. 453.

- Source: Felisa Wang/HR

Headquarters Farewell Party for Hiroko and Ugyen

This Saturday Afternoon

Are you Busy? Tired? Stressed? Here is an opportunity to relax a little. All of us at headquarters know Hiroko our Japanese trainee and Ugyen our Bhutanese trainee. They will be leaving soon to go back to their home countries, and as a gesture of camaraderie, let's bid them farewell with a bang. We are planning to have a potluck party and get-together at the campus swimming pool on Saturday, November 24 between 1:00 pm and 5:00 pm. Please bring along juice, tea, fruits, chips, dumplings, cakes, cookies, beer, wine, etc. Anything you would like to bring will be greatly appreciated. This is non-exclusive so feel free to invite all those who have had interaction with Hiroko and Ugyen during their stay here. We hope you all can join us...The more, the merrier... See you there!

本週六（11月24日）下午1點至5點在游泳池畔，將為日本籍學員Hiroko及來自不丹的Ugyen舉辦一場歡送會，歡迎所有朋友帶著您喜愛的食物來參加，和他們話別！

- Source: Christian Genova II

2007 International Food Fair

Have you ever wondered what Nepalese or Australian food tastes like? The R&S Committee will provide you with an opportunity to sample traditional food from at least 10 different countries represented in AVRDC. Come to the 2007 International Food Fair on Wednesday, 28 November 2007!! It will be held on the soccer field behind the lab building from 1430 to 1630 hours. In an attempt to be more environmentally friendly, we encourage you to bring your own eating utensils. Also, this year ICO will prepare 6 different kinds of food using the indigenous vegetables growing in our garden. Some seedlings, cuttings and bundles of IV will be sold and all proceeds will go to the Goodwill club.

您有沒有曾經質疑過尼泊爾及澳洲菜的口味為什麼那麼類似？11月28日下午2點半至4點半康委會將在實驗室後方的足球場舉辦國際美食活動，屆時至少會有10個不同國家的傳統美食呈現。另外，國際合作室的同仁將使用原生蔬菜做為食材，準備6種風味的點心給大家品嚐，現場並義賣原生蔬菜苗以及多種原生蔬菜，誠邀大家踴躍參與並請自備餐具！

- Source: Ms. Kartini (Iin) Luther/R&S Committee

Dengue Fever Is Now Prevalent in Tainan City

Dengue fever has been prevalent in Tainan City for a couple of months now. Although there have been no cases of infection reported in the Shanhua area so far, I would like to remind all of you to be alert for this disease and to avoid being bitten by mosquitoes. If you experience a fever, please go to see a doctor and have a blood test immediately.

小心登革熱！登革熱已在台南市肆虐數月，雖然善化地區目前尚未發現病例，在此提醒所有同仁小心防範登革熱，避免被蚊子叮咬。假如有發燒症狀，應立即就醫，並作血液檢查。

- Source: Dr. Yin-Fu Chang/DDG-A&S

Understanding and Treating Dengue Fever 登革熱

What is dengue fever? Dengue fever is an acute viral disease. The incubation period is 3 to 14 days. Symptoms include high fever for three to five days, severe headache, muscle and joint pain, eye pain, nausea, vomiting and skin rash. Generally, younger children have a milder illness than older children and adults.

What is dengue hemorrhagic fever (DHF)? DHF is a more severe form of dengue. It can be fatal if unrecognized and not properly treated. DHF is caused by infection with the same viruses that cause dengue. With good medical management, mortality due to DHF can be less than 1%.

How is dengue and dengue hemorrhagic fever (DHF) transmitted? Dengue virus is transmitted to humans through mosquito bites. There is no person to person spread. The mosquito Aedes albopictus or Aedes aegypti, a vector known to transmit the disease, can be found in Taiwan. The mosquito likes to bite people during daytime, especially two hours after sunrise and a few hours before sunset.

What is the treatment for dengue? There is no specific medication for the treatment of a dengue infection. Persons who think they have dengue should use analgesics (pain relievers) with acetaminophen and avoid those containing aspirin. They should also rest, drink plenty of fluids, and consult a physician.

What can be done to reduce the risk of acquiring dengue? There is no vaccine for preventing dengue. The best preventive measure for residents living in areas infested with *Aedes albopictus* or *Aedes aegypti* is to eliminate the places where the mosquito lays her eggs, primarily artificial containers that hold water.

1. Put all used cans and bottles into dustbins with cover.
2. Change water for plants at least once a week, leaving no water in the saucers underneath flower pots.
3. Cover tightly all water containers, wells and water storage tanks.
4. Keep all drains free from being clogged.
5. Fill in ground hollows to prevent the accumulation of stagnant water.
6. Wear long-sleeved clothes and long trousers.
7. Use insect repellent over the exposed parts of the body.
8. Use mosquito screens or nets when the room is not air-conditioned.

登革熱是一種藉由病媒蚊叮咬而感染的急性傳染病，主要呈現發燒、出疹、肌肉骨骼疼痛等症狀，依抗原性可分為Ⅰ、Ⅱ、Ⅲ、Ⅳ型，一般而言，幼兒發病症狀較青少年及成人為輕。一般人感染病毒經 3-14 天的潛伏期後開始發病。

登革熱有哪些種類？症狀有何不同？登革熱依病毒侵犯後發生的症狀可區分典型登革熱及登革出血熱二種。2. 典型登革熱與登革出血熱的初期症狀很相似，兩者之最大不同點乃在於後者有血漿滲出的現象，臨床上會出現腹水和助膜腔積水，這是典型登革熱較為少見之症狀。當登革出血熱之血漿滲出量很多時，病人會呈現休克現象，即登革休克症候群。

登革熱的感染方式為何？感染方式主要是藉由病媒蚊叮咬人時將病毒傳入人體內，並不會由人直接傳染給人，也不會經由空氣或接觸傳染。台灣地區傳播登革熱的病媒蚊屬斑蚊類，特徵是身體黑色，腳上有白斑，主要是埃及斑蚊和白線斑蚊兩種。

登革熱有哪些症狀？有些人感染到登革熱病毒並不會生病，稱為不顯性或無症狀感染，有些人僅有發燒等輕微症狀，有些人則出現較嚴重的典型症狀，包括發燒、紅疹、眼窩或骨頭酸痛，甚至出血現象。由於個人感染後表現之症狀有很大的差異，必須由醫師診斷或實驗室檢驗，因此懷疑感染疾病時就必須就診。

登革熱如何治療？有無疫苗？登革熱目前沒有特效藥物可治療，一般採行支持性療法，目前尚無有效可施打的疫苗。感染後，應多休息，多喝流質的東西，並請醫師診斷。

感染登革熱以後有無免疫力？感染某一型登革病毒患者，對該型病毒具有終身免疫，而對其他型別僅具有短暫的免疫力，通常約為 2-9 個月之間，之後還有可能再感染。

如何防治登革熱？目前登革熱尚無有效的疫苗可以預防，而且又沒有特效藥，所以登革熱防治僅能控制登革熱病媒蚊密度。控制病媒蚊密度最有效的方法為清除積水容器，杜絕病媒蚊孳生。

1.把所有使用的瓶和罐放入加蓋的垃圾筒內。
2. 每周至少為植物換水一次，勿將水留在花盆下的小水碟內。
3. 蓋緊所有裝水容器、井和儲水箱。
4. 保持所有排水系統的暢通。
5. 填平地面所有的坑洞，防止污水屯積。
6. 穿長袖的衣裳和長褲。
7. 身體暴露的部位使用驅蟲劑。
8. 屋內沒有冷氣時，使用蚊帳或網。

- Source: Dr. Yin-Fu Chang/DDG-A&S