



Synthesis

R&D Digest of Universiti Putra Malaysia

ISSN. 0127 – 9394

<http://rmc.upm.edu.my/synthesis/>

• Issue 10 • 3rd Quarter • Sept. 2005

Contents

1 ▶ **BIOX™** : a New Material for Industry

2 ▶ **Editorial**

▶ **Spotlight**

3 ▶ **A Novel Method [HC MadeEZ] to Determine Hydrocarbon Pollution from Landfill Leachates**

4 ▶ **RIFEILD: River Flow Estimator for Impact of Land Development**

5 ▶ **The Super Secured Messaging System 500 (SSMS 500)**

6&7 ▶ **Research Happenings**

8 ▶ **Visual Impact of Agroforestry Management with Landscape Design Software**

9 ▶ **TrichoGreen™, the Biocontrol Agent and Growth Enhancer for the Oil Palm Industry**

10 ▶ **Reportage**

11 ▶ **A Glance at Research Inventions & Innovations at UPM**

12 ▶ **Back Issues**

What's Next

Highlights from the next issue –

- All Natural Sunscreen Agents
- Feed Additives produced by beneficial lactic acid bacteria
- Natural Food Colourant
- GMO Detection System
- UAVs in UPM!

Inspiration from a Nobel Laureate — father of the idea of optimal currency area!



Nobel Laureate Robert A. Mundell, Professor in Economic Sciences receiving a token of appreciation from the Vice-Chancellor, Professor Datu' Zohadie Baridin after his stupendous high-profile public lecture on 12th July 2005 at UPM

A high-profile public lecture entitled, "Exchange Rate Regimes and Economic Development" was hosted by Nobel Laureate Professor Robert Mundell at UPM on 12th July 2005.

Robert A. Mundell was born in Canada in 1932. After completing his undergraduate education at the University of British Columbia he began his postgraduate studies at University of Washington and continued it at M.I.T. and London School of Economics. Mundell received his Ph.D. from M.I.T. in 1956 with a thesis on international capital movements. After having held several professorships, he has been affiliated with Columbia University in New York since 1974.

Professor Mundell has established the foundation for the theory which dominates practical policy considerations of monetary and fiscal policy in open economies. His work on monetary dynamics and optimum currency areas has inspired generations of researchers. Although dating back several decades, Mundell's contributions remain outstanding and constitute the core of teaching in international macroeconomics.

Mundell's research has had such a far-reaching and lasting impact because it combines formal - but still accessible - analysis, intuitive interpretation and results with immediate policy applications. Above all, Mundell chose his problems with uncommon - almost prophetic - accuracy in terms of predicting the future development of international monetary arrangements and capital markets. Mundell's contributions serve as a superb reminder of the significance of basic research. At a given point in time academic achievements might appear rather esoteric; not long afterwards, however, they may take on great practical importance. **UMC**

BiOX™ : a New Material for Industry



Irmawati Ramli, Nor Hidayaty Kamarulzaman, Norfarizan Ngasriah Mhamat Nasudin, Taufiq-Yap Yun Hin, and Abdul Halim Abdullah

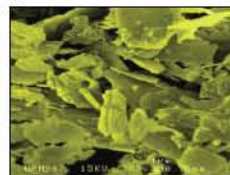


Award Winner

BiOX™ is a new type of bismuth oxide nanoparticle with distinctive bright orange colour. Its chemical symbol is Bi₂O₃ and its molecular weight is 466. The material particle size is 37nm with its corresponding specific surface area of 8.9m²g⁻¹.



Images of bismuth oxide particles – Conventional synthesis route



Images of bismuth oxide particles – BiOX™ through rational design

The oxides are of tetragonal β-Bi₂O₃ which through controlled synthesis procedure produce materials resemble into rosette morphology (see images). The preparation method opted was rather simple and distinguished by monophasic composition of the product, ecological safety and simple operation, therefore promise low operating cost.

■ Turn to Page Five



Vision of Success!

UPM pressed ahead once again tremendously with research achievements and awards this year.

Nine UPM scientists have been honoured by the Biotechnology Asia 2005 for their outstanding achievements and contributions to the field of biotechnology at an International Biotechnology Trade Exhibition and Conference held recently from 16-18 August 2005 at the Putra World Trade Centre, Kuala Lumpur.

This year, Biotechnology Asia 2005 introduced the first Innovation Awards to recognise best achievements and innovation in Biotechnology research in Malaysia to foster a greater interest in science among the younger members of the local biotechnologist community. It is hoped that, through such awards, the profile of the UPM's biotechnologist community will be raised internationally.

UPM's position as an outstanding research organisation was once again affirmed with its garnering of numerous awards in the recently held Biotechnology Asia 2005 exhibition. Out of a total of 10 contestants from UPM, 9 garnered medals each in different categories (4 Gold, 3 Silver & 2 Bronze). The 9 innovation awards, covered a broad range of research areas, enhancing the University's contribution to knowledge in science, and biotechnology.

It was a proud moment for Universiti Putra Malaysia once again when two of its scientists from the Engineering faculty won *Awards of Merit comprising Gold medals* at Invention & New Product Exposition (INPEX 2005) held at Pittsburgh, USA from 8-11 June 2005.

The 16th International Invention, Innovation, Industrial Design & Technology Invention (I-TEX 2005) added another feather on to the UPM's hat when almost all 34 of its scientists who exhibited various technology-driven products at the 3-days event held recently from 19-21 May 2005 at the Putra World Trade Centre Exhibition Hall, Kuala Lumpur were conferred 33 medals in different categories of Gold, Silver and Bronze. In addition, UPM received the "Best Booth Design" award in the open space category.

UPM continued to make great strides in the international arena as well. All of our 13 contestants who participated in the International Exhibition of Inventions New Techniques and Products in Geneva held from 6 to 10th April 2005 brought home medals each in different categories (5 Gold, 5 Silver & 3 Bronze).

A total of about 537 awards and prizes in different categories won by UPM's scientists are alimony to this success.

Congratulations to one and all, each award winner is an inspiration to us. 

Executive Editors

zulkifli@agri.upm.edu.my

raha@biotech.upm.edu.my

Editorial Board

Professor Dato' Muhamad Zohadie Bardaie

Professor Ir. Radin Umar Radin Sohadi

Professor Zulkifli Idrus

A.Prof. Raha Abd. Rahim

Nayan Deep S. Kanwal, Esq.

Professor Nor Aripin Shamaan

A.Prof. Fakhru'l-Razi Ahmadun

Jamsari Tamsir

Mustapha Kamal Tahir

Nur Nasimi Abdul Latif

Mohamad Hafiz Mohamad Zamri

Asrizam Esam

Nurhaznita Mahmood

Zaihan Yazid

Patron

Advisor

Executive Editors

Managing Editor

Reviewers

Secretary

Circulation Manager

Editorial Assistant

Online Webmaster

Administrative Assistance



Biotechnology at UPM: Current Status and Future Directions

One of UPM's goal is to use biotechnology to increase agriculture productivity and quality, and down-stream activities resulting in value-added products, so as to maintain our agriculture as well as industry lead and competitiveness.

The research in biotechnology at UPM is multidisciplinary, market-driven and top-down in key areas such as food, crops, health, aquaculture, genetic resource utilization and conservation, natural products and biopharmaceuticals which fosters partnerships and linkages with national and international research centres and industries to facilitate research and accelerate commercialisation of discoveries and inventions.


Recognising the contribution that biotechnology could make in wealth creation for the nation, UPM has a strategic framework for the systematic promotion and development of biotechnology. In 1986, UPM introduced the Bachelor of Science in Biotechnology which was followed by postgraduate studies in several areas relating to biotechnology. UPM has not only emphasised the multidisciplinary approach in biotechnology but also has forged links with the industry in downstream bioprocessing.

In 1996, UPM established the Institute of Bioscience to provide the leadership and multi-user core facilities to boost research and postgraduate training in many areas of bioscience. The Institute also serves as a platform for fundamental research that could generate useful products and processes for the industries.

Adequate investments in research and development and continuous capacity building which includes infrastructure and human resource development, coupled with research in the fundamental sciences have been the driving forces in the advancement of biotechnology at UPM. Biotechnology is not confined only to genetic engineering but encompasses any technique that uses living organisms or substances from organisms to make or modify a product, to improve plants or animals or to develop micro-organisms for specific uses. Currently, UPM's research in biotechnology has enhanced food production and crop production, increased down-stream activities in the oil palm industry and helped to solve pollution and waste management.

Biotechnology is definitely the industry of the future and can transform agricultural practices into new profitable ventures. Because of its multidisciplinary nature, Biotechnology cannot be pursued in isolation of the supporting disciplines. An in-depth understanding of many individual fields which constitute this discipline is a prerequisite since it is through the interactions of these fields that new products and processes can be developed to benefit mankind. In UPM, the university curriculum was long restructured to accommodate multidisciplinary learning. For instance, the Agriculture programme has been restructured to Bioindustry which incorporated newer disciplines such as molecular biology, genetic engineering and biotechnology.

UPM's commitment in Biotechnology is indicative by the Food Technology; Food Biotechnology; Industrial Enzyme Technology; Exotic Plants through Genetic Engineering and Mass Propagation; Natural Products; Nutraceutical Exploration/ Studies on Functional Food; and Animal Probiotic. The university will continue to promote both basic and applied research in the biological sciences of relevance to biotechnology which will not only increase productivity and quality in crops, animals and food but will also have spin-offs in value-added commercial products.

Malaysia must be able to create and generate its own scientific and technological innovations. We not only have to strengthen the national scientific and technological base, and develop the creativity of the workforce, but we have also to interconnect *science, technology and creativity* so that they operate in a more holistic manner. Making connections between the three areas will stimulate synergy and increase the yield of fresh new ideas and innovations. When this happens, the combined creative potential can become not only extremely powerful but also self-sustaining. 

Managing Editor

ndeaps@admin.upm.edu.my



A Novel Method [HC MadeEZ] to Determine Hydrocarbon Pollution from Landfill Leachates

Mohamad Pauzi Zakaria, Kho Hiaw Geik, Wong Yoon Lee, Razahidi Hayet and Chong Wei Nyen

Award Winner

Organic chemicals of environmental concern are those with known or potentially deleterious effects on natural resources, population and on human beings. These compounds are referred to micro-organic pollutants. PAHs are one of the most important classes of anthropogenic micro-organic pollutants that have long been the interest of environmental chemists. This concern arises primarily from the fact that a small fraction of the PAHs generated and released to environment has been shown to be carcinogenic and mutagenic to mammals. PAHs have also been reported to disrupt endocrine system in humans.


Landfilling and disposing of waste in open dumpsites have been and expected to remain the most common methods for the disposal of municipal solid wastes in Malaysia. In 1990, there were about 230 official municipal dumping sites in Malaysia. In 1994, the amount of waste generated and collected in Kuala Lumpur was around 3 million kg/day. In 2000, the amount of waste generated has increased to about 7.9 million kg/day and is expected to increase to 11 million kg/day by 2010.

A specific, reliable and efficient method, *HC MadeEZ* was developed for the determination of hydrocarbon pollution from landfill leachates. This study focused on landfill leachates in *Taman Beringin*, Malaysia. The landfill receives multiple sources of wastes including municipal wastes and garden wastes. Briefly, leachates samples were collected from *Taman Beringin* and *Kuala Pilah* landfills. Water samples and groundwater samples were taken from river close to landfills and boreholes in the perimeter of the landfill, respectively using pre-cleaned stainless steel buckets and placed in previously cleaned 4-L amber bottles. Leachates samples were collected in 500 mL amber bottles. All samples were transported to the laboratory in ice. Water samples were immediately filtered through pre-baked glass fiber filters (47 mm ϕ Whatman GF/F) (pore size, 0.7 μ m) within 18 hours. Glass

fiber filters containing particles and filtrates and sediment samples were stored in at -18°C until further analysis. Organic solvents were distilled in glass before use and glassware was rinsed successively with methanol, acetone and n-hexane to get rid of organic contaminants. A 60-200 mesh silica gel was baked at 380°C for 4 hours, cooled and activated at 200°C overnight, and deactivated with 5% (w/w) distilled water. The samples were purified and fractionated similar to the method described by Zakaria et al. (2002). Briefly, the filtered particulates and freeze-dried sediment samples were Soxhlet extracted overnight and the filtrate was extracted with liquid-liquid extraction. Elemental sulfur in the extract was removed with activated copper. An appropriate volume (100 mL) of PAH surrogate internal standard (1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, perylene-d₁₂) was added to the sample extracts. Each sample was roto-evaporated to near dryness (2-4 mL). The extracts were eluted with 20 mL of 3:1 hexane/DCM through a 5% H₂O-deactivated silica gel column chromatography to elute hydrocarbons fraction and to rid of polar components. The hydrocarbon fraction was further fractionated with a fully activated silica gel column chromatography. PAHs with 3-7 benzene rings were eluted with 14 mL of 3:1 hexane/DCM. PAHs fraction was evaporated to approximately 1 mL, transferred to 1.5 mL amber ampoule and evaporated to near dryness under a gentle stream of N₂ and re-dissolved into an appropriate volume (100 μ L) of iso-octane containing p-terphenyl-d₁₄ as an internal injection standard (IISTD).

PAHs were analyzed by GC-MS using a 30 m fused silica column (HP-5MS) installed in a gas chromatograph (HP6890) interfaced with



Hewlett Packard 5973A quadrupole mass selective detector (SIM mode), using helium as the carrier gas on a constant pressure at 60 kg/cm². PAHs were monitored for dibenzothiophene ($m/z = 180$), phenanthrene ($m/z = 178$), anthracene ($m/z = 178$), 2-methylanthracene ($m/z = 192$), 2-methylphenanthrene ($m/z = 192$), fluoranthene ($m/z = 202$), pyrene ($m/z = 202$), 1-methylpyrene ($m/z = 216$), benz(a)anthracene ($m/z = 278$), chrysene ($m/z = 228$), benzo(k)fluoranthene ($m/z = 252$), benzo(e)pyrene ($m/z = 252$), benzo(a)pyrene ($m/z = 252$), benzo(e)acephenanthrylene ($m/z = 252$) and dibenz(a,h)anthracene ($m/z = 278$). Individual PAHs were quantified by comparing the peak area of the selected ion with the peak area of the IISTD. 

GOLD – International Invention, Innovation, Industrial Design & Technology Invention (I-TEX 2005).

SILVER – UPM Invention & Research Exhibition Award 2005 (PRPI 2005).

Reader Enquiry

Environmental Forensic Chemistry Research Group
Faculty of Environmental Studies
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8946 6738
E-mail: mpauzi@env.upm.edu.my
drpauzi@gmail.com



RIFEILD: River Flow Estimator for Impact of Land Development

Mohd Amin Mohd Soom, Mustafa Yousif Mohamed Abdallah, Abdul Rashid Mohd Shariff and Lee Teang Shui

Award Winner

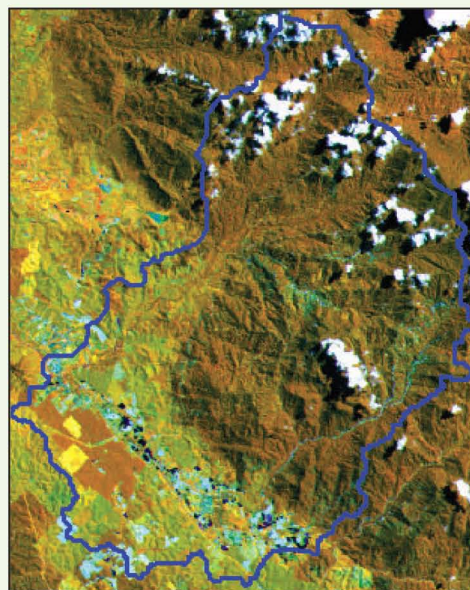
Land development for new townships, agriculture or recreational areas like golf courses is almost always accompanied by environmental problems. Some of these are soil erosion, soil fertility degradation, river sedimentation and sometimes flash floods. Exposed soil is subjected to the impact of raindrops, sealing the soil surface, reducing infiltration and causing high surface runoff. Consequently interflow and baseflow are reduced for downstream users such as irrigation water supply during the dry season. During rainy season, flash floods are common downstream of land areas that are being developed.

A question that always comes to mind is, with land development, can the river still carry the runoff rate from a certain rainfall event or is flooding imminent? There is a need then for a river flow assessment tool to evaluate the effect of land use changes on runoff volume, peak flow and lag time. RIFEILD was developed as a prototype to help planners take the necessary measures for sustainable land development.

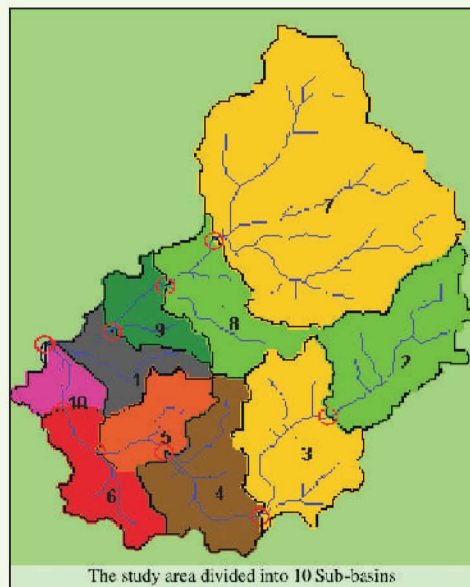
The study area selected was the Upper Bernam River Basin, where rapid land development upstream is affecting the downstream irrigation water supply for the Tanjung Karang rice granary. Data required to run RIFEILD include a digital topographic map (1:25000); Landsat images (30 m resolution) for several years; Soil map; Daily Rainfall data from surrounding rainfall stations; Daily and hourly Stream flow data from the drainage outlet.

RIFEILD involves the integration of hydrological model, satellite remote sensing data and GIS. HEC-1 hydrological model in WMS software was used to simulate the

runoff hydrographs using both lumped and distributed modeling approaches. The geometric values of the basins such as areas, slopes, and stream lengths were computed from DEM. Land use maps were derived using supervised classification of the satellite images.



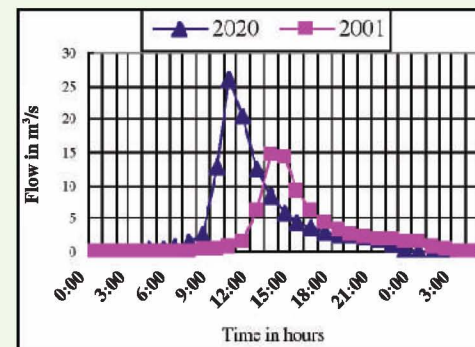
Landsat image of Upper Bernam River Basin




Distributed modeling in GIS using 10 subbasins

The model obtained values of 0.15, 0.11, 0.08, and 0.90 for RMSE, MAE, U and R2 tests,

respectively. To assess the hydrological impacts due to land development, rainfall values of year 1989, from different months, were superimposed to the years 1989, 1993, 1995, 1998 and 2001.



Simulated Hydrograph for 2020 showing doubling of runoff volume and shorter time to reach peak flow by 3 hours

Land development between years 1989 - 1998 led to 10% increase in the peak flow. The change in the peak runoff due to land use change is constant regardless of the rainfall pattern. Simulating runoff for the extreme case of a fully developed basin, the same rainfall events almost doubles the volume of peak flow and shortens the lag time by 3 hours. Local authorities and river basin authorities can run RIFEILD for any future development plans in land use to predict the hydrological impacts of land development. 

GOLD – Invention & New Product Exposition 2005, Pittsburgh, USA (INPEX 2005).

SILVER – International Invention, Innovation, Industrial Design & Technology Invention (I-TEX 2005).

SILVER – UPM Invention & Research Exhibition Awards 2005 (PRPI 2005).

Reader Enquiry

SMART Farming Program, Bio-Engineering Lab.
Institute of Advanced Technology (ITMA)
Department of Biological & Agricultural Engineering
Faculty of Engineering
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8948 6427
E-mail: amin@eng.upm.edu.my



The Super Secured Messaging System 500 (SSMS 500)

Muhammad Rezal Kamel Ariffin, Alnuddin Wahid Abdul Wahab and Mohd Abdul Halim Sulaiman

Award Winner

In today's world of communication which relies heavily on relaying messages on-line, security issues have ever more become highly important to be addressed. Organizations both governmental and non-governmental that are planning political, financial, marketing, economic manoeuvres or business takeovers etc. need to have secure means of communications when relaying messages on-line.

Institute for Mathematical Research (INSPEM), Universiti Putra Malaysia (UPM) acknowledges the presence of secured communications means for relaying messages on-line developed by companies whose products are currently found (mostly developed overseas) in the market in Malaysia. However at INSPEM, through our Laboratory of Theoretical Mathematics, we believe that our product is at par with these products and we have overcome traditional problems in their applications such as loyalty, mobility and network topology.

The SSMS 500 system is an encryption system utilizing mathematical concepts possessing an infinite number of possible forms. For example, if one is able to program a one-to-one function such that its variables do not repeat itself, then one has basically created a non-repeating cryptographic key. Together with a 256-bit private key it is difficult for anyone to identify the mathematical concepts on which this system is built on. It can withstand the worst attack – 'the known-plaintext' attack. Even with as many pairs of ciphertext-plaintext obtained, the SSMS 500 is impregnable. The SSMS 500 system allows users


to build secure messages on any personal computer (PC), provided it is connected to the internet and equipped with a USB port, and exchange messages on the internet.



The SSMS 500 satisfies all three major requirements of an encryption product. They are, namely authentication (it should be possible for the recipient of a message to ascertain its origin, an intruder would not be able to masquerade as an authorized sender or recipient), integrity (the recipient can verify the originality of the message. That is, it has not been interfered or modified while in transit and an intruder is not able to falsify or replace a message for a legitimate one) and non-repudiation (a sender is not able to deny later that he sent a message).

Embedded on a biometric device, the SSMS 500 is rendered useless if it falls into the wrong hands. Unauthorized personnel having acquired the SSMS



500 module will only be able to destroy the module, hence eliminating the possibility of unauthorized usage. Digital signatures which are available within the individually custom SSMS 500 module ensure the systems integrity. Only users with their thumbprints will be able to encrypt or decrypt a message. 

GOLD – International Invention, Innovation, Industrial Design & Technology Invention (I-TEX 2005).

Special Award – University of Creativity from National United University, Taiwan.

Reader Enquiry

Institute for Mathematical Research (INSPEM)/
Department of Mathematics
Faculty of Science
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor, Malaysia

Tel: +603 8946 6838
E-mail: rezal@fsas.upm.edu.my

BiOX™ : a New Material for Industry

From Page One

Bismuth oxide is becoming so important in everyday life for its non-toxic and non-carcinogenic status. Demand is rising to use the material as a substitute for lead particularly in copper alloys for plumbing fittings for water drinking system. Considerations have also been laid out in putting the material in tableware glazing, glasses and crystal ware. In pharmaceutical industries, the material is proven to be the most effective ingredient eradicating bacteria responsible for inflicting peptic ulcers. The material combined with chloride gives a special pearlescent, inimitable deep luster to lipstick, nail polish, eye shadows and facial powders in addition to its lubricating qualities for smoother, silkier skin comfort.

Other technological applications of bismuth oxide are in the field of advanced ceramics, rare earth chemicals, thermal spray powders, solid oxide fuel cell (SOFC) materials, catalysts, nano-magnetics, electroplating and biotechnology. 



BiOX™ – a new material for industry

SILVER – International Exhibition of Inventions, New Techniques & Products (Geneva Palexpo 2005).

SILVER – UPM Invention, Research and Innovation Exhibition Awards (PRPI 2005)

Bronze – Expo Science, Innovation & Technology (Expo S&T 2004).

Reader Enquiry

Department of Chemistry
Faculty of Science
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8946 6786
E-mail: irmawati@fsas.upm.edu.my



Research Happenings

Biotechnology Asia 2005 (16-18 August 2005)



INTELLECTUAL BUZZ: Award winning UPM's scientists with Professor Ir. Dr. Razali Umar, Deputy Vice-Chancellor (Academic & International Affairs) & Prof. Zulkifli Idrus, Director RMC after the Press Conference held at UPM on 24 August 2005



SCIENTIFIC ADVANCES: Professor Radin congratulating Prof. Khairiah and Assoc. Prof. Lai Oi Ming on their winning GOLD medals for their innovative R&D.



LOOKS GOOD: A great sense of self achievement — (from left) are Assoc. Prof. Lai Oi Ming, Assoc. Prof. Foo Hooi Ling and Prof. Khairiah with their GOLD medals.



COMMITTED TO THE CAUSE: Prof. Seriah Meon showcasing her award winning research at Biotechnology Asia 2005



TOP R&D: (right) Assoc. Prof. Abdul Rahman Omar yet another GOLD medal for his novel IBDReal Check detection kit.



BREAKING NEWS: 9 out of 10 Award winners from Biotechnology Asia 2005

Commodities Week 2005 (8-12 August 2005)



GOOD MIX: Malaysia's Prime Minister, Y.A.B. Datuk Seri Abdullah Ahmad Badawi touring the exhibits at the Commodities Week 2005 held from 8-12 August 2005.



WARM WELCOME: Assoc. Prof. Lai Oi Ming with Professor Makhdzir Mardani, Director, Institute of Plantation Studies, UPM.

MS ISO 9001: 2000 Workshop (29-30 June 2005)



KEEPING ABREAST OF CHANGES: Assoc. Prof. Fakhru'l-Razi (left) and Professor Zulkifli's aspirations are a testament to the RMC's goal of achieving an ISO 9001 status.



PROVEN EXPERIENCE: Mr. Jamsari, Deputy Registrar, RMC giving a token of appreciation to Mr. Zakaria for his informative ISO talk



BENCHMARKING: The key elements connected to quality assurance accreditation from professional bodies — Nayan (left) and Mustapha at the ISO workshop



GREATER YIELDS: Prof. Zulkifli presenting a token of appreciation to Prof. Keide, the key speaker at the ISO Workshop for his benefiting talk on ISO



TEAM WORK: RMC team at the ISO Awareness Workshop at Patronas Management Training Sch. Bhd., Bangi held from 29-30 June 2005

Down the Memory Lane (Newsmakers around the campus)



WARM WELCOME: Dato' Zohadie shaking hands with His Royal Highness Seri Paduka Baginda Yang di-Pertuan Agong XII, Tuanku Syed Saifuddin Idris Al-Marhum Tuanku Syed Putra Jamalullail on his arrival at UPM to grace the Semarak Bank 2005 program



CARING GESTURE: Malaysia's Prime Minister, Y.A.B. Datuk Seri Abdullah Ahmad Badawi being welcomed by Dato' Zohadie at PWTC, KL to officiate the ICKM 2005 held from 7-9 July 2005



PROACTIVE ROLE: Dato' Zohadie shaking hands with former Prime Minister, Y.A.B. Tun Dr. Mahathir Mohamad on his arrival at UPM for Yayasan Pak Rasehid Lecture on 5 August 2005



LOOKING FORWARD: Dato' Zohadie giving a token of appreciation to Y.B. Dato' Dr. Haji Shafie Bin Mohd. Salleh, Minister of Higher Education at the ICKM 2005 official ceremony at PWTC



READY FOR THE BIG LEAP! PM Datuk Seri Abdullah Ahmad Badawi with Y.B. Dato' Dr. Haji Shafie Bin Mohd. Salleh (left) and Dato' Zohadie (right) looking forward to realizing their goals in Knowledge Management



GRAND AGENDA: Minister at the Prime Minister's Office, Y.B. Dato' Mustapa Bin Mohamed receiving a book from Dato' Zohadie, as a token of appreciation at the 16th Asian Finance Conference held at Hotel Istana, KL from 11-13 July 2005



FOR A CAUSE: Dato' Zohadie receiving a mock cheque of RM30,000 from Mr. Robi Fiazar, Chairman Exxon Mobil Malaysian subsidiaries while Prof. Dr. Mohd. Hamimi Sahri, Dean of Forestry applauds the occasion



FORMIDABLE NAME: RM200,000 for MAKNA Fund-raising — Tun Dr. Sri Hasmah binti Mohd Ali with Datuk Mohd Farid Ariffin, President MAKNA and Datin Umi Kalsom Hussain on her left, with Mr. Anuar Hassan, CEO, and Mr. Mohd Abdullah, Chairman, Malaysian National Reinsurance Bhd.



MOTIVATION TO STRIVE HARDER: Prof. Dr. Yeakob Che Men (left), Director, of the newly established Institute for Hotel Food at the MIHAS Convention & Exhibition



EDUCATIONAL: Assoc. Prof. Sialek HJ. Abd. Aziz (4th from right) with group of developers of Project Management System (PMS), eSprint



BUZZING WITH EXCITEMENT: UPM's Vice-Chancellor with his crew in the spirit of Merdeka on the run!



PATRIOTIC SPIRIT: a symbolic dance presentation during the Game Seri Merdeka event at UPM



KEEN INTEREST: Y.B. Dato' Dr. Haji Shafie Bin Mohd. Salleh, Minister of Higher Education with Mr. Mustafa Ibrahim, Deputy Registrar, Student Affairs Division, UPM during Going Royalong Perdana



FOSTERING TIES: Deputy Prime Minister, Datuk Seri Utama Najib Tun Razak shaking hands with Dato' Zohadie at the signing of MoU between Imperial College, London and UPM



RECOGNITION OF SERVICES: Professor Zulkifli Idrus, Director RMC presenting the award of distinction to Nayan, Managing Editor, RMC



GIVING A 'LIFT': Dato' Zohadie exchanging documents with Sir Richard Sykes, Rector, Imperial College of London after the signing of a MoU on 11 July 2005



WEALTH OF EXPERIENCE: Intellectual input required for holistic learning — (from left) Dato' Zohadie, World famous Nobel Laureate Robert Mundell and Prof. Shamsher Ramdani



PROMOTING HARMONY: Culture, Art and Heritage Minister, Datuk Seri Utama Dr. Rala Yellin shaking hands with Dato' Zohadie upon his arrival at UPM at the launch of Bufo Bahasa month — instilling quality culture in university



EXULTATION: Cause for Celebration — (from left) Dr. Rosli Taib, Datuk Seri Utama Dr. Rala Yellin and Dato' Zohadie cutting the "Coke with the smiley" Insignia



POSITIVE ASPECT: Professor Nor Azipin, Deputy Director, RMC with Mohd Zuli Mohd Yusoff, IT Officer, Institute of Multimedia and Software, UPM



Visual Impact of Agroforestry Management with Landscape Design Software¹

Kanwal, N., and Auclair, D.

In a case study in the France, various agroforestry management options have been simulated with the AMAP landscape design and visualization software. The terrain was described through a digital elevation model. Information concerning the farm structure was integrated in a geographic information system. The AMAP database provides accurate 3-dimensional plant architectural models, built according to the botanical concepts developed by the Montpellier Institute of Botany. Individual tree computer mock-ups were computed for a tree species at the desired ages, in order to simulate landscape evolution with time. Images of the scene were computed and observed on the screen from several virtual viewpoints. Several management options have been tested and visualized, providing a basis for discussion between partners concerning spatial organization, such as the layout of forest and agricultural plots.

Representing a landscape has always been a difficult task. As early as the sixteenth century, 'bird's-eye' views sought to combine two-dimensional maps with a representation of perspective. Nowadays, land managers have a number of tools at their disposal. These include the following.

- ✦ Maps and plans, which have often been—and still are—used for their rigour and for their possibilities of quantification.
- ✦ Geographic Information Systems (GIS), which incorporate georeferenced data—bases as a basis for helping to produce two-dimensional maps. They contain large amounts of information, which can help to represent land use and its evolution. GIS manufacturers provide three-dimensional visualization techniques which, however, remain too restrictive to represent satisfactorily large landscapes: the terrain is generally well represented, but particular landscape features and architectural elements are often simply extruded, and do not represent real volumes.
- ✦ Photographs, which can be used directly, or may be modified with the help of computer-aided imagery. This technique has been used, for example, by Tress and Tress (2000) to discuss various scenarios with stakeholders. It is, however, very time consuming to build different scenarios of future land use.
- ✦ Schematic representations, which can be produced simply by drawing sketches or diagrams, either by hand or with the help of computer systems. Photographs and drawings are not directly linked to maps, however, and only show a limited number of viewpoints. They are purely visual techniques, which cannot easily simulate the responses of a landscape to human interventions.
- ✦ Virtual imagery—a modern tool which can help represent landscapes in three dimensions, and which can also include a dynamic element.

In order to explore further the scope for visual imagery, a landscape design software developed at the CIRAD Plant Modelling Unit (Lecoustre et al., 1997) was used to investigate various management options on an agro-forestry estate (Cessous) in the Cévennes mountains, France. The study recognizes that management options cannot fully be considered by professional foresters alone, and that the emotions and knowledge of other stakeholders must be incorporated into the decision-making process. Of particular relevance to this example is the study by Étienne and Rapey (1999) into the motivations of livestock farmers who had adopted various agroforestry techniques, which pointed to the importance of environmental concerns, especially those of landscape aesthetics. In order to study this aspect further, images based on computer-aided landscape design software were produced as a means of promoting discussion between stakeholders. The Cessous estate is dominated by a maritime pine forest (*Pinus pinaster* L.), which was almost entirely destroyed by a wildfire in 1985, and regenerated naturally. The owner of this 90-hectare estate adopted an agroforestry system to diversify production, as well as to improve the visual aspect of the landscape. Part of the farm is rented to ecotourist

holidaymakers, and the diversification of the forest was aimed at reducing fire risk as well as increasing the amenity value of the landscape. Considering the importance of the visual aspect of land management, it seemed appropriate to discuss various scenarios with the owner, who is also the farmer. Other stakeholders are the holidaymakers, as well as the state forest managers and the neighbours, who are also interested in both fire prevention and amenity aspects. Due to the importance of the area for tourism, the local government is also involved in such landscape management.

The different agroforestry scenarios studied concerned: (1) the present situation and its anticipated appearance in 30 years' time; and (2) the same scenario after a very severe thinning of every other tree. Scenarios were projected for both spring and autumn, to show seasonal variation.

In order to produce computer images of a landscape, present land-use data were collected on a GIS (MAPINFO®); 82 segments were plotted showing the main and secondary species and their proportion, age, density, planting pattern, and type of management (plastic tree-shelters, pruning). They were then transferred to the AMAP software to visualize a terrain, on which individual plots were positioned. On each plot different tree species and planting patterns were distributed either at random or according to a specific planting pattern.

The AMAP *Integral*™ software package (developed at the CIRAD Plant Modelling Unit, is divided into several 'modules', each devoted to a specific task. The final result is a representation of a landscape of up to several hundred hectares.

A digital elevation model is a list of 'control points' with their three-dimensional co-ordinates. The *Terrain* module creates a topography by triangulation. The triangulation can be based directly on the control points, or can be estimated through geostatistical interpolation, in order to avoid singular points. A texture can then be applied on the terrain, either a simple homogeneous colour as in *Figure 1*, or more complex textures based on photographs or created through computer graphics. In the study undertaken, the terrain was triangulated directly from the control points, and two different types of texture, based on photographs, were applied to simulate ground vegetation.

The *Landmaker* module provides the possibility of manually defining the contours of homogeneous plots. Another software, IMAGIS® provides a direct link between the data contained in a GIS and the *Landmaker* module (scene generator; see below). The MAPINFO® GIS was used here to transfer the data in MIF format to IMAGIS, and the map of the plots was superimposed on the previously computed terrain. This is illustrated in *Figure 2*, where the texture has been omitted from the terrain in order to verify the correct vertical positioning of two particular plots (in black on the figure).

The Genesis module is the most original aspect of the AMAP package. Three-dimensional plant mock-ups are computed, on the basis of the botanical concepts of plant architectural modeling developed by the Montpellier Institute of Botany. Halle and Oldeman (1970) were the first to suggest a classification of the entire plant world into 23 different architectural models, and their theory has subsequently undergone considerable refinement (Barthélémy et al., 1997; Jaeger & de Reffye, 1992; de Reffye et al., 1989, 1995). Each plant species can be described by a parameter file, based on qualitative and quantitative botanical observations in the field. A statistical analysis of field data provides models for the entire plant topology (branching positions) and geometry (stem and branch length and diameter growth, branching angles, etc.). The evolution of branching habit through time as the plant ages is described in the 'reference axis' (Barczy et al., 1997). The software contains a database of parameters for over 400 plant species. Under the work undertaken, computer mock-ups of the species present in the plots described in the GIS were computed for two points in time—the present and 30 years hence—with several different random seed numbers in order to simulate natural variability. The same plants were computed for spring and for autumn, in order to visualize the colour changes throughout the year. Additional species such as *Acacia mangium* were also computed.

The scene generator of the IMAGIS software automatically creates a scene corresponding to the information provided in the GIS. Three-dimensional plant mock-ups were positioned on the terrain according to the contours, species, density, planting pattern and type of management. Before computing a specific image, several camera positions and viewpoints were defined according to the most interesting positions in the field, based on the requirements. Images for the different scenarios were

¹ The writer, Nayan Kanwal graduated with Bachelor's degree in Agriculture in 1982 from the University of Papua New Guinea/ Queensland University, Australia, and Masters of Agriculture in 1985 also from the same university. He then continued to work at the university as a research associate for a year after which he left to go freelance in 1987.

In 1988, he came to Singapore to undertake studies in Information Technology (Computer Science) at the Stamford College affiliated to NCC of UK and obtained his NCC diploma in Computer studies in 1990. Whilst in Singapore, he was offered to work as an editor with a prominent publishing house for five years, where he was responsible for publication of various books, scientific journals and newsletters, etc. In 1995, he was invited to become the publishing director of a well-known British publishing house, Ashton-Brooke (Asia) Publishing (a private limited company set up with the support of Economic Development Board, Singapore) where he was in-charge of the editorial development of the company.

Nayan's push for higher education brought him to Malaysia in 1999 to pursue his second masters in Journalism. However, as destiny would have planned, he switched from Journalism to the field of Urban Landscaping at Universiti Putra Malaysia (UPM). In 2001, he was awarded a scholarship by the French government to undertake a professional scientific training in Simulation and Visualisation of Landscapes at CIRAD, Montpellier, France. Subsequently, his research proposal based on the joint scientific training and collaboration with CIRAD (Centre de Coopération Internationale en Recherche Agronomique pour le Développement, Montpellier) supported by AMAP (Botany and Plant Architecture Bioinformatics, Montpellier) to obtain his doctorate at Université Montpellier 2 was successful.

During his academic and professional career, he has published several articles in various publications and chapters in books. Although he has an Agricultural background, he has been engaged in a very wide range of subject matter from management and administration of research to information technology. He has to his advantage almost 20 years professional experience primarily in communications, media, print design with a strong publishing background, and extensive experience in R&D management and administration.

Nayan has widely travelled around and has been to more than 35 countries around the globe. He is a Fellow of the Royal Society of Arts (FRSA), United Kingdom, a Life Member of the British Institute of Management (BIM), United Kingdom, and an Associate Member of Australian Institute of Agricultural Science and Technology (AIAST).

He can be contacted at ndeeps@admin.upm.edu.my, or via tel: 603-8946 6192.

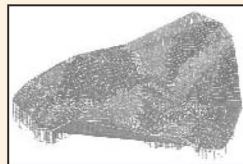


Fig. 1. Representation of the terrain based on a digital elevation model (Cessous estate, Cévennes, France)—The co-ordinates of the control points are represented by crosses, linked to their elevation by a vertical line. The terrain was triangulated, then textured. The contours figured here were calculated on the triangulated numeric model.

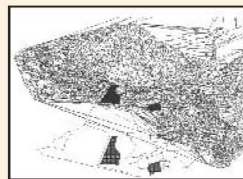


Fig. 2. Map of the Cessous estate (Cévennes, France) — with two plots placed at their normal altitude on the terrain model. The map, placed horizontally at the lowest elevation, can be seen at the bottom of the figure.



Award Winner



TrichoGreen™, the Biocontrol Agent and Growth Enhancer for the Oil Palm Industry

Faridah Abdullah

TrichoGreen™ is a *Trichoderma*-infused compost which has proven to be effective as a biological control agent against the basal stem rot disease based on repeated trials using oil palm seedlings as a disease model.



Front row: Infected, untreated oil palms showing fruiting bodies at their bases; Back: Infected oil palms treated with TrichoGreen™ showing good foliage over 24 weeks after infection.

The production of TrichoGreen™ is a recycling process, turning agricultural waste into useful products. The production process is entirely organic, eliminates the need for burning, and is an excellent form of environmentally-friendly waste management. The industry is sustainable and can generate downstream activities.

The product was later found to be a good plant growth enhancer as well. The biocontrol property of *Trichoderma* is isolate-specific and from extensive in vitro screening, isolate FA 1132 (*T. harzianum*) was selected as the best candidate for biocontrol purposes. From nursery trials, TrichoGreen™ can save as much as 95% of plants if treatment is given simultaneously to the infected seedlings; the success rate decreases with increased severity of tissue damage caused to the palm.

The product has been successfully upscaled using a bioreactor, producing $\times 10^7$ propagules/ml within 96 hours, which was then used to prepare inocula and subsequently in its mass production, using palm pressed fibres (PPF) agrowaste as the feedstock. The PPF were piled into windrows at 50 mt feedstock per row of 80m x 4m. Together with intermittent supplies of POME (palm oil mill effluents) and scheduled turnovers in a solid substrate fermentation, the final product of 22mt per windrow at $\times 10^{11}$ propagules/kg material, was achieved over 12 to 15 weeks. Field trials over 8 weeks' treatment thus far showed that it significantly enhanced growth of the oil palm, followed only by organic compost and thirdly the routinely-used



Left to right: Treatments with a) TrichoGreen™, b) compost, c) TrichoGreen™ + 50% fertilizer, d) fertilizer and e) no treatment

fertiliser application. Field applications of TrichoGreen™ on *Ganoderma*-infected fields are currently on trial and the results are estimated in 2 to 3 years. **RMC**

Bronze – International Exhibition of Inventions, New Techniques & Products (Geneva Palexpo 2005).

SILVER – Expo S&T Invention & Innovation Awards 2004 (Expo S&T 2004).

SILVER – UPM Invention & Research Exhibition Award 2003 (PRP 2003).

Reader Enquiry

Department of Biology
Faculty of Science
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor, Malaysia

Tel: +603 8946 6620
E-mail: fidah@fsas.upm.edu.my

From Page Eight

then computed through the Landmaker module of the AMAP package.

Once the different scenarios were defined within the system, virtual scenes were computed. An example is shown in Figure 3.

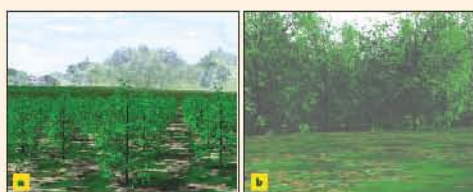


Fig. 3. Example of two virtual scenarios for the Cassoux estate (Chréennes, France), computed through the AMAP package — a) Simulation of the plant species (*Acacia mangium*) layouts at 2 years of age, (b) Simulation of the same plant species (*Acacia mangium*) at different age of 20 years.

Although the study is still underway, some preliminary results can be given. Reactions of the landowner to the virtual scenes have been investigated, and the next stage will be to interview the other stakeholders. The first images which we generated have raised a number of questions. These are as follows.

The integration of a management plan in a GIS and the ability of computer graphics systems to simulate plant mock-ups offer the possibility to predict the evolution of a landscape with time, and to project different scenarios. With the advent of computer graphics and 'virtual reality' techniques, land-use managers have become interested in such tools which help represent rural landscapes.

A large number of computer packages can now be found on the market, commercially or non-commercially, providing various degrees of simplification or of detail. For forest applications, the Stand Visualization System (SVS; McGaughey, 1997) can represent forest stands, and at a more global scale we can cite PolyTRIM (Danahy & Hoinkes, 1995), UTOOLS/UMIEW (McGaughey & Ager, 1996), SmartForest (Orland, 1997), Virtual Forest (Buckley et al., 1998) or FORSI (Tyräinen & Tahvanainen, 2000). Most of these packages can be linked more or less directly to a GIS. Nearly all of them offer the same characteristics (three-dimensional representations of the terrain, texture mapping, atmospheric effects and reflections). Some of them allow an automatic positioning of contours and of plants within the landscape. Trees are generally represented either with simple geometric forms, or with more complex tools which can simulate trees built from user-defined geometric forms (Tree Impressionist, <http://www.innovativegis.com/basis/>, or Forest Vegetation Simulator; McGaughey, 1997).

In addition to the specificity of the computer language which permits the representation of a great number of polygons with an optimization of computer space and computing time, the high rendering quality and the botanical background of three-dimensional tree mock-ups computed by the commercial AMAP package justifies its use to represent plants situated relatively close to the observer. For long distances, details which are not normally visible by eye do not require such precision, and the IMAGIS software is better adapted to larger landscapes, up to several thousand hectares (Barczl et al., 2000).

The development and the use of such computer tools show that the representation of geographic data provided by a GIS through virtual computer graphic images can provide a better

understanding of the landscape by a non-specialist public. The resulting simulations lead to realistic images, which can become efficient aids to facilitate understanding, communication and decision making by the various stakeholders in a land management project.

A number of questions can, however, be raised about how such landscape visualization might be improved. On the one hand, even the most rigorous plant architectural development models are very simplified compared to the present knowledge of tree mensurationists. A link with more conventional forest growth modeling software could be one type of improvement.

One other question concerns the amount of detail necessary for such visualizations. When elements are close to the observer, a great amount of detail can prove useful, and at further distances the automatic simplification provided by some computer packages (such as AMAP) can substantially reduce computing time. At even further distances, it may even be sufficient to visualize simple textures rather than each individual element of the landscape.

One should also question the necessity of producing images of high aesthetic quality. Urban architects request extremely high quality images, which require powerful, often time consuming and very expensive software. Such 'hyper-realistic' images may, however, not be necessary for planning purposes. They may even produce an opposite effect if the seduction they provide tends to reduce the necessary critical distance between the virtual model and the observer (Perrin, 1993). Such questions will be the object of further collaborative work with agroforesters, computer scientists, geographers and landscape ecologists. **RMC**

NewsBriefs

Biotechnology Asia 2005

The Malaysian Government has recognised the importance of Biotechnology for some time. Biotechnology will not only drive improvements in the quality of life of Malaysians; it will also propel the creation of knowledge and innovation in the country.

Biotechnology Asia 2005 presented the first innovation awards targeted at public and private research institutions of higher learning, to recognise excellence and innovation in biotechnology research. Offering four categories of awards in recognition of outstanding achievements for best products through application of Biotechnology, UPM scientists had a successful triumph when it garnered 9 Innovation Awards out of 10 entries that had showcased its exhibits at this event. A look at our winners!



Professor Dr. Khatijah Yusoff *et al.*, from the Faculty of Biotechnology and Biomolecular Sciences received a GOLD medal for her innovative research entitled, "BioCarrier™ — a universal cloning vector for your protein solutions".

Assoc. Prof. Dr. Lai Oi Ming *et al.*, and Assoc. Prof. Dr. Foo Hooi Ling *et al.*, also from the Faculty of Biotechnology and Biomolecular Sciences both received a GOLD medal each for their outstanding research entitled, "Process and Production of Novel 'All Natural' Sunscreen Agents" and "The novel feed additives produced by beneficial lactic acid bacteria, *Lactobacillus plantarum* I-UL4, isolated from fermented tapioca (*Manihot esculanta*)" respectively.

Assoc. Prof. Dr. Abdul Rahman Omar *et al.*, from the Faculty of Veterinary Medicine received another GOLD medal for his novel research, "IBDReal check — a Rapid Detection Kit for Infectious Bursal Disease".

Recipients of Silver and Bronze medals are highlighted below:

Award	Recipient
1. Silver	(Prof. Dr.) Sarah Moon <i>et al.</i> Faculty of Agriculture
2. Silver	(Assoc. Prof. Dr.) Janna Ong Abdullah <i>et al.</i> Faculty of Engineering
3. Silver	(Prof. Dr.) Mohd. Azmi Mohd. Lila <i>et al.</i> Institute of Biosciences
4. Bronze	(Prof. Dr.) Son Radu <i>et al.</i> Faculty of Food Science and Technology
5. Bronze	(Assoc. Prof. Dr.) Siti Nor Akmar Abdullah <i>et al.</i> Faculty of Agriculture

Turn to centre page for pictorial news.


Commodities Week 2005

Commodities Week 2005: *Opportunities in Commodities—Dynamic, Sustainable, and Homegrown*, this 5-day exhibition was held at The Mines International Exhibition and Convention Centre, Sri Kembangan from 8–12 August 2005, and organised by the Ministry of Plantation Industries and Commodities to raise the profile of the plantation and commodities sector and highlight its significant contribution to the national economy.

The exhibition was officiated by Y.A.B. Dato' Sri Mohd. Najib Tun Hj. Abdul Razak, Deputy Prime Minister of Malaysia on 9 August 2005. UPM showcased almost 5 of its innovative R&D exhibits from the plantation and commodities sector including biotechnology to further promote its research findings and new products with commercial potential. The sector comprised palm oil, timber, rubber, cocoa, pepper, etc.

ISO 9001:2000 Awareness Workshop

Research Management Centre (RMC), UPM organised a two day MS ISO 9001: 2000 awareness workshop from 29–30 June 2005 at the Petronas Management Training Sdn. Bhd. to create awareness amongst its staff about ISO procedures, documentation and implementation. The main objective of the workshop was to create awareness, and work towards proper documentation, planning and achieving MS ISO 9001: 2000 certification.

Professor Dr. Zulkiffi Idrus, Director, Research Management Centre officiated the workshop. Professor Dr. Nor Aripin Shamaan, Assoc. Prof. Dr. Fakhru'l-Razi Ahmadun and Assoc. Prof. Dr. Raha Abdul Rahim were also present on the occasion. Professor Dr. Kaida Khalid from the Faculty of Science and Encik Zakaria Sidek from the Corporate Planning Department, UPM were invited speakers to deliver and share their ISO experiences. The workshop was very informative and successful in causing a significant impact on the attendees. 

Turn to centre page for pictorial news.

FactFile

For the record

1 Professor Emeritus Dr. Mohd. Razeen Jainudeen has joined Research Management Centre (RMC), UPM with effect from 1 Sept. 2005 as a Consultant in Scientific Writing.



Professor Emeritus
Mohd. Razeen Jainudeen

Jainudeen graduated with a BVSc in 1956 from the University of Ceylon. He was awarded a Smith-Mundt Fulbright scholarship in 1960 for postgraduate studies at Cornell University Ithaca, USA, and obtained a MS and PhD in three years.

He joined UPM in 1974 as an Associate Professor, Veterinary Clinical Studies and became the Head of the Department of Veterinary Clinical Studies for almost 15 years. He has published over 150 papers which included 23 chapters in international text books and plenary papers in international conferences. Jainudeen's research findings published in international flagship journals attracted the attention of international organisations — FAO, IAEA, ACIAR and SIDA.

Jainudeen was conferred the JSM in 1991. He retired as Professor of Animal Reproduction at the age of 63 in 1994 after serving 37 years as a university lecturer of which 21 years were spent at UPM. He then continued to offer his services at UBC, UPM until 1999.

2 In recognition of his commitment, sheer hard work and distinctive services, Nayan Deep S. Kanwal has been honoured with an Award of Distinction for 2004 for the 2nd consecutive year, by Research Management Centre (RMC), Universiti Putra Malaysia. The award carries a certificate for Excellent Services, and a plaque with commemorative inscription.




20 years professional experience primarily in Communications, Media, Print Design with a strong Publishing background in Singapore and Malaysia paid its toll—Nayan, "Recipient, Award of Distinction"

3 Mrs. Saharia Mohd. Jami has left the Research Management Centre to join the Faculty of Computer Science and Information Technology as an Administrative Assistant (Operations) with effect from 1 September 2005.



HAPPY MOMENT: Mrs Saharia Jami receiving a token of appreciation from Prof. Zulkiffi for her services with RMC

Check it out

UPM R&D Directory, Part 2: Staff Profile—Faces of Innovation, Edition 2005, published by the Publication, Promotion and System Unit, Research Management Centre, UPM. Editors: Nayan Deep S. Kanwal, Zulkiffi Idrus and Raha Abd. Rahim. ISSN 1675-7823 is in the press and will be available for distribution from November instead of July 2005. We apologize for the error. 

Read this — a call for contributions!!

If you have any contributions comprising feature articles or research write-ups that you would like us to publish in the esteemed columns of *Synthesis*, or any suggestions that you may wish to make for the forthcoming issues, please send them to: The Managing Editor, *Synthesis*, Publication, Promotion and System Unit, Research Management Centre, 4th Floor, Administration Building, 43400 UPM, Serdang, Selangor, Malaysia or via the Internet to ndeeps@admin.upm.edu.my or rchinfo@admin.upm.edu.my

The editor reserves the right to edit articles for clarity and space before publication.

A Glance at Research Inventions & Innovations at UPM¹

Continued from Issue 9, 2nd Quarter (Jun 2005)...

No.	Faculty/ Institute	Researcher	Innovation	Research Cluster	Project Number	Allocation
238.	Institute of Community Development and Youth Studies (PEKKA)	Jamilah Othman	Conflict Resolution for Sexual Harassment in Government Agencies in Peninsular Malaysia	SSH	07-02-04-0729-EA001	RM153,000
239.	Institute of Community Development and Youth Studies (PEKKA)	Rahim Md. Sail	Inculcation of Japanese Farmers' Work Cultures among Malaysian Youth Agro-Entrepreneurs Using Transformational Learning Model	SSH	07-02-04-0232-EA001	RM155,000
240.	Institute of Community Development and Youth Studies (PEKKA)	Rahim Md. Sail	Volunteerism among retirees: A potential resource for community development	SSH	07-02-04-0540-EA001	RM171,400
241.	Institute of Community Development and Youth Studies (PEKKA)	Rumaya Juhari	Divorce Families in Malaysia: Children and Adults Wellbeing	SSH	07-02-04-0731-EA001	RM145,000
242.	Institute of Gerontology (IG)	Asnarulkhadi Abu Samah	Sokongan sosial ke atas warga tua: Satu kajian rol famili	SSH	07-02-04-0728-EA001	RM197,800
243.	Institute of Multimedia and Software (IMP)	Borhanuddin Ali	Development of a Smart Multi-tier Stack for Pervasive Computing Environment	ITM	04-02-04-0795-EA001	RM156,300
244.	Institute of Multimedia and Software (IMP)	Sidek Hj. Ab. Aziz	Design of Interactive Web-Based Instructional System	ITM	04-02-04-0791-EA001	RM169,000
245.	Institute of Multimedia and Software (IMP)	Zakaria Kasa	Effectiveness of Web cast Lectures in Higher Education	ITM	07-02-04-0744-EA001	RM186,000
246.	Malaysian Graduate School of Management	Mohd. Azhar Abd Karim	General Equilibrium Modeling of Trade Induced Adjustment	EAM	05-02-04-0690-EA001	RM170,000
247.	Medicine and Health Sciences	Ahmad Bustamam Abdul	The Anti-tumourgenic Properties of Local Plant Products Cardaminin from Alpina zerumbet and zerombine from Zinzibar zerumbet Cervical and Ovarian Candra Resectively in Cell Culture and Female Nude Mice	HAS	06-02-04-0720-EA001	RM205,000
248.	Medicine and Health Sciences	Ahmad Bustamam bin Abdul	The anti-tumourgenic effects of a local plant extract, Flavokawin B, species Alpinia zerumbet on breast cancer of female nude mice and breast cancer cell lines	HAS	06-02-04-0210-EA001	RM244,000
249.	Medicine and Health Sciences	Amin Bin Ismail	Studies on the Health Benefits of Procyanidins Extracted from Malaysian Cocoa Liquor and Cocoa Shells, and the Development of New Functional Food Products	HAS	01-02-04-0013-EA001	RM149,000
250.	Medicine and Health Sciences	Amin Bin Ismail	Functional Components from Roselle (Hibiscus Sabrifra L) Seeds	AFF	06-02-04-0804-EA001	RM129,000
251.	Medicine and Health Sciences	Asmah Rahmat	Study on the mechanism of anticancer properties of the components isolated from the local plant extracts	HAS	06-02-04-0211-EA001	RM211,000
252.	Medicine and Health Sciences	Chong Pei Pei	Development DNA based diagnostic test For detecting azole drug-resistant fungal pathogens of Candida species	HAS	06-02-04-0598-EA001	RM217,440
253.	Medicine and Health Sciences	Daud Ahmad Israf Ali	Use of proteomics in enhancing natural product drug discovery	SAE	09-02-04-0274-EA001	RM204,000
254.	Medicine and Health Sciences	Daud Ahmad Israf Ali	Induction of tumouricidal macrophage activity by natural products	AFF	01-02-04-0391-EA001	RM200,000
255.	Medicine and Health Sciences	Fauziah Othman	New castle disease virus (NDV) as anticancer agent in breast cancer cell	HAS	09-02-04-0277-EA001	RM214,000
256.	Medicine and Health Sciences	Fauziah Othman	A Study on neem leaf (Azadiracta indica) as an anti cancer agent in breast cancer	HAS	06-02-04-0597-EA001	RM155,000
257.	Medicine and Health Sciences	Mariana Nor Shamsuddin	Development of genomic probes for rapid identification of local bacterial pathogens	HAS	06-02-04-0215-EA001	RM187,500
258.	Medicine and Health Sciences	Maznah bt. Ismail	Nutraceutical products from Malaysian rice bran and their potential health benefits	HAS	06-02-04-0216-EA001	RM205,000
259.	Medicine and Health Sciences	Maznah Ismail	Development of Nutraceuticals from Strobilantens crispus Extract with Cardioprotective Properties	HAS	06-02-04-0692-EA001	RM191,500
260.	Medicine and Health Sciences	Md Zuki Bin Abu Bakar @ Zakaria	Investigation on the use of modified external skeletal fixator (ESF) on bone healing quality, the cost and management in orthopedic fracture treatment.	HAS	01-02-04-0397-EA001	RM185,080
261.	Medicine and Health Sciences	Mimalini Kandiah	Diet and exercise intervention among colorectal cancer survivors: A randomized controlled trial	HAS	06-02-04-0682-EA001	RM140,000
262.	Medicine and Health Sciences	Mohamed Zain Mohamed/ Wong Foong Yee	Creativity and Innovativeness in Malaysian Organizations	EAM	05-02-04-0203-EA001	RM153,360
263.	Medicine and Health Sciences	Mohd. Roslan Sulaiman	Mexperimental electrophysiological studies of vestibular compensation following unilateral differentiation	HAS	06-02-04-0694-EA001	RM170,500
264.	Medicine and Health Sciences	Rozita Rosli	Elucidation of the mechanisms whereby Falvokawin B inhibits the growth of human breast cancer cell lines	HAS	06-02-04-0658-EA001	RM194,000
265.	Medicine and Health Sciences	Rozita Rosli	Profiling changes in gene expression of brain cancer cells in response to tamoxifen and tamoxifen-like synthetic compounds using both cDNA micro array and proteomics	HAS	09-02-04-0339-EA001	RM156,000

to be continued...

¹ Data presented IRPA RM-8 (as at Cycle 1, 2004); Total 416 EAR Grants, sorted by PTJ & Name.

[†]The description of the some of the above Inventions and Innovative research products available for commercialisation at UPM are contained in the books—"R&D at UPM: Creating New Frontiers of Innovative Research", First Edition, and "R&D at UPM: Research Snapshots", First Edition, ISSN. 1675-1248, Editors: Nayan Deep S. Kanwal, Mohd. Shahwahid Hj. Othman and Sidek Hj. Abd. Aziz, Published by Research Management Centre (RMC), UPM, available from Publications, Promotion & System Unit, Administration Building, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor Darul Ehsan, Malaysia, Tel: +603 8946 6028 / 8946 6192, Fax: +603 8942 6539, e-mail: rschinfo@admin.upm.edu.my

Synthesis

Back Issues



DECEMBER 2003 — Issue 3, 4th Quarter

Editorial: Working together to raise standards
Spotlight: Academic Writing
Research Highlight: IPTA 2003 — Investing in Innovation
Regulars

- Production of Bacterial Inoculants as Biofertilizer and Bioenhancer
- Design and Fabrication of CVD for Nanotechnology Research
- Development of Biopesticide for Managing Cruciferous Vegetable Pest
- Genetic Engineering of Bananas for Tolerance to Fusarium Wilt Disease
- Cholera DNA Vaccine
- Detection of Iodine in Chocolate by Fourier Transform Infrared (FTIR) Spectroscopy for "I-iod" Authentication

- Low Field Magnetoresistance in Bulks and Films of Manganite Peroxides for Sensing Devices
- Environmental Friendly Synthetic Lubricant from Palm Oil
- SMS Gateway Interface

Features

- Bridging the Information and Commercial Gap Exploiting the Knowledge Factor of RPA

Research Happenings

- IPTA Research & Development Exposition 2003



MARCH 2004 — Issue 4, 1st Quarter

Editorial: Serving Community and Country
Spotlight: Funding Opportunities
Research Highlight: Great expectations— Research the key factor
Regulars

- An Integrated Management for the control of Bacterial Wilt of Tomato Caused by *Pseudomonas solanaceum*
- Genetic Variability of Four Sheep Breeds in Malaysia
- Design and Evaluation of a Comfortable Motorcycle Helmet with Bio-composite Shell for Tropical Climate
- Commercial Production of Economically Important Planting Materials Using Tissue Culture Technologies
- Development of Rice Bran Nutraceuticals with Cardioprotective Properties

- Purinet—Virtual Office

Features

- Responses of Timber Concessionaires to Selected Policy Instruments

Research Happenings

- R&D Commercialisation Luncheon
- Work Quality Enhancement Course
- MOU between UPM & MINT
- Science Motivation Dialogue with National Young Scientist Award
- Winners
- Down the Memory Lane



JUNE 2004 — Issue 5, 2nd Quarter

Editorial: Promoting Innovation: Pivotal Role in Raising Standards
Spotlight: Science and Our Future— Looking Ahead: Aspirations for a NBL from UPM
Research Highlight: UPM— Making of a Research University
Regulars

- Development of Standardised Functional Foods from *Cantabrica esculenta* (L) urban
- ZAPPA™ — The Rice Seeds Germination Enhancer and the Control of "Padi Angh" Infestation
- Palm Oil based synthetic bio Lubricant
- Optical Layer Automatic Protection Switch (APS) Module
- CRP/Nanopathy A Novel Nanocomposite-Based Controlled Release Formulation

- Recovery of Vitamin E from Palm Fatty Acid Distillate Using Neutrization-adsorption Chromatography Method
- E-ORY — Natural Anticancer Rich Nutraceutical Formulation
- Mech™ Impactor: Pendulum Impact Test Unit

Research Happenings

- Genex 2004— 32nd International Exhibition of Inventions, New Techniques & Products
- Patent Workshop
- Cluster Workshop
- National Innovation Summit 2004
- Newsletters—building report



SEPTEMBER 2004 — Issue 6, 3rd Quarter

Editorial: Re-inventing our Future
Spotlight: Science Citation Index
Research Highlight: Real Goal of University Education — formation of personalities
Regulars

- Copper-coated Urea for Rice Production
- Production of Gelatin from Red Tilapia Skins
- Palm Oil Based Fatty Acid Impregnated in Gypsum Wallboard
- Intelligent Asphalt Mix Tester (Tunamixin)
- UPM Digital Moisture Meter
- Painting Robot for House and Building

- Bacteriodes of Lactic Acid Bacteria
- Educational Software for Teaching Introductory Calculus at the University Level
- MBSoft™ — New Green Palm-Based Fine Organics for Industry
- Spodi™ for Your Feet Problem

Research Happenings

- Introductory Research Workshop for New Lecturers
- Nobel Laureate's Visit to UPM
- Nobel Laureate— Exhibition of Research Excellence at UPM
- Built: Expo Research Exhibition & Convocation Carnival
- R&D Commercialisation Luncheon
- I-TEX 2004 Exhibition
- Newsletters—building report



DECEMBER 2004 — Issue 7, 4th Quarter

Editorial: UPM's Academic Reputation
Spotlight: Innovate or be left behind— Global aspirations and pursuits
Research Highlight: In the Making: UPM showcases its vision of success
Regulars

- Development of Innovative Functional Foods and Nutraceuticals
- Chitosan base post harvest treatment for extending Storage life of Papaya and cut Chrysanthemum
- Turning Biological Diversity into Invaluable Economic Resource: Xenosensy-metal™, a heavy metal biosensy system
- Tree Crop Seeding Transplanter Ver-1
- A portable fiber optic Based Lightning Detection system

- Haruan Biomedical Products for Skin Diseases
- Fiber Optic Duplexer Module (FDM)

Research Happenings

- Vico-chenology's Fellowship Awards
- e-Spirit Training
- Excellent Scientist Award
- The British Inventions Show, U.K. and Ideas-Inventions-New Products
- International Exhibition, Germany
- R&D Commercialisation Luncheon
- Newsletters—building report



MARCH 2005 — Issue 8, 1st Quarter

Editorial: Perspectives: Research Resources— Why Scientific Writing?
Spotlight: Nanotechnology In Sharp Focus
Research Highlight: Heading Forward Towards Excellence
Regulars

- The Role of Metabolic Enzymes in the Development of Resistance In Cocoa Mirid, *Helopeltis theobroma Waterhouse*
- Natural Spray Dried Pandanus (*Pandanus amaryllifolius*) Powder: Production and Product Development
- Cost-efficient Production of the Shiitake Mushroom on Sawdust Waste
- Development of Ultrasonic and Microwave Techniques for Detection of Decay In Wooden Cross-Arms
- Fight against cancer cure— Tapioxa

- Ergonomic Design of Vehicles Using Natural Gas
- Putre Blok— Interlocking Load-bearing Hollow Block
- Microbial Bioconversion of Domestic Wastewater Treatment Plant (DWTP)
- Replication of NDV in Breast cancer cell lines

Features

- Serdang: Memories of the First Malaysian Veterinary School

Research Happenings

- Invention, Research and Innovation 2005
- National Intellectual Property Day 2005
- ISO Template Workshop & Lecturer's Month
- Malaysia Tony Science Foundation Award (MTSF)
- Vice-Chancellor's Visit to Poland
- Down the Memory Lane—Newsletters around the Campus

Letters to the Editor

If you have any comments about the content of the publication or any contributions that you may wish to make for the forthcoming issues, please send them to: The Managing Editor, *Synthesis*, Publication and Promotion Unit, Research Management Centre, 4th Floor, Administration Building, 43400 UPM, Serdang, Selangor, Malaysia or via the Internet to ndeeps@admin.upm.edu.my. The editor reserves the right to edit articles for clarity and space before publication.

The opinions and views expressed in this publication are not necessarily those of *Synthesis* or the Research Management Centre (RMC). Acceptance and publication of articles in this publication does not imply recommendations by RMC.

The publisher of *Synthesis* neither endorses nor is responsible for the accuracy or reliability of any opinion, advice or statement published in this digest. Under no circumstances will the publisher of this digest be liable for any loss or damage caused by your reliance on the advice, opinion or information obtained either explicitly or implied through the contents of this publication.

Are you reading your own copy of the UPM R&D Digest?

Synthesis is the first and only quarterly R&D digest of Universiti Putra Malaysia published in March, June, September and December with the focus on award-winning innovations. It covers research happenings emerging from the various faculties and Institutes across the university and provides a brief summary of some of the important research findings of the study conducted at UPM. It brilliantly features special topics that are of national interest in various fields and disciplines.

Scientists must be made aware of how important the impact of their work is and its possible applications on society and public opinion. It is hoped that this digest will provide the opportunity to interact particularly through feedback or direct mail to the scientist from either the private sector or by scientists from other government research institutions.

Synthesis is the official research bulletin of the University and is published by Research Management Centre. It is available free of charge to the academic community.

Readership

Researchers, academicians, postdoctoral researchers, technicians, postgraduate studentships, research institutions, techno-entrepreneurs, venture capitalists and laypeople.

If you would like to receive a copy of the *Synthesis* for research updates every 4 months, or would like further information about Research Management Centre, please contact at the address given on this page or send an e-mail message to ndeeps@admin.upm.edu.my with the only content in the body of the email message being "subscribe synthesis" to be added to the mailing list.



Research Management Centre

UNIVERSITI PUTRA MALAYSIA
 Chancellery
 Administration Building
 43400 UPM, Serdang,
 Selangor Darul Ehsan
 Malaysia

Tel
 +603 8946 6028 / 6192 / 6183
 Fax
 +603 8942 6539

E-mail
ndeeps@admin.upm.edu.my
rschinfo@admin.upm.edu.my

Website
<http://www.admin.upm.edu.my/research>
<http://www.rmc.upm.edu.my/>