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LAPORAN PUSAT KECEMERLANGAN SMART FARMING TECHNOLOGY RESEARCH CENTRE (SFTRC)

1. PENGENALAN

1.1 Sejarah

SFTRC sebelum ini dikenali dengan nama Makmal Teknologi Perladangan Pintar yang merupakan salah sebuah makmal di Institut Teknologi Maju (ITMA, UPM). Penubuhan SFTRC telah dirasmikan pada bulan Januari 2012 di bawah naungan Fakulti Kejuruteraan, UPM selepas penstrukturan semula ITMA pada tahun 2011. Pegawai penyelidik SFTRC kebanyakannya adalah terdiri daripada ahli-ahli akademik dari Jabatan Kejuruteraan Biologi dan Pertanian, Fakulti Kejuruteraan, UPM. Hasil daripada kerja-kerja penyelidikan dan pembangunan oleh staf dan pelajar siswazah SFTRC telah diterbitkan dalam bentuk makalah jurnal, buku, prosiding persidangan, paten dan hak cipta.

1.2 Visi & Misi

Visi

Untuk menghasilkan penyelidik Teknologi Perladangan Pintar yang berkualiti bagi negara membangun.

Misi

Untuk menjadi peneraju serantau yang berpandangan jauh serta menyumbang kepada perkembangan bidang Perladangan Pintar.

1.3 Senarai Staf

Staf pentadbiran terdiri daripada tiga orang Pegawai Penyelidik (RO), seorang Felo Penyelidik, , seorang juruteknik, dan sembilan orang penyelidik lain yang membantu kerja-kerja pentadbiran dan penyelidikan di SFTRC.

Bil.	Nama	Jawatan
1.	Prof Ir Dr Desa Ahmad (Machine Design)	Ketua
2.	Ezrin Mohd Husin (Soil and Water Engineering)	Pegawai Penyelidik
3.	Azhareensyah Aman (Control Engineering)	Pegawai Penyelidik
4.	Azlan Othman	Juruteknik
5.	Prof Dr Md Abul Hossain Molla	Felo Penyelidik
6.	Prof Ir Dr Wan Ishak Wan Ismail (Agricultural Automation and Robotics)	Penyelidik
7.	Prof Ir Dr Mohd Amin Mohd Soom (Soil and Water Engineering)	Penyelidik
8.	Assoc Professor Ir Dr Azmi Dato' Yahya (Machine Design)	Penyelidik
9.	Assoc Professor Dr Abdul Rashid Mohamed Shariff (GIS & Precision Farming)	Penyelidik
10.	Assoc Professor Dr Hasfalina Che Man (Environmental Eng)	Penyelidik
11.	Assoc Professor Dr Siti Khairunniza Bejo (Senior Lecturer, Image Processing)	Penyelidik
12.	Dr Samsuzana Abdul Aziz (Senior Lecturer, Electronics in Agriculture)	Penyelidik
13.	Dr Aimrun Wayayok (Senior Lecturer, Precision Farming)	Penyelidik
14.	Dr Md Rowshon Kamal (Senior Lecturer, Irrigation Engineering)	Penyelidik
15.	Dr. Muhamad Saufi Mohd Kassim (Agricultural Robotics)	Penyelidik

1. PENYELIDIKAN & PERUNDINGAN

2.1 Senarai Penyelidik

Sebagai sebuah Centre of Excellence, SFTRC diterajui oleh lima orang Penyelidik Utama (*KeyResearchers*) iaitu

- 1) Prof Ir Dr Mohd Amin Mohd Soom (Soil and Water Engineering)
- 2) Prof Ir Dr Wan Ishak Wan Ismail (Agricultural Automation and Robotics)
- 3) Prof Ir Dr Desa Ahmad (Machine Design)
- 4) Dr Aimrun Wayayok (Senior Lecturer, Precision Farming)
- 5) Dr Md Rowshon Kamal (Senior Lecturer, Irrigation Engineering)

2.2 Senarai Geran Penyelidikan

Bil.	Ketua Penyelidik	Nama Geran Penyelidikan	Tempoh	Jenis Geran	Jumlah (RM)
1.	Prof. Ir. Dr. Desa Ahmad	The Effectiveness Of Chilled Pipe As Root Zone Cooling Mechanism Fir Strawberry Cultivation In Lowland Area	2014	Geran UPM	15,000
2.	Prof. Ir. Dr. Desa Ahmad	Design and Development of an Integrated Rotary Slasher-Digger for Harvesting Sweetpotatoes	2 Disember 2013- 1 Disember 2015	Geran UPM	185,200
3.	Prof. Ir. Dr. Wan Ishak Wan Ismail	Development Of Geo-Reference Information Tools For Oil Palm Plantation: Soil Fertility Zoning	2014	Geran UPM	148,200
4.	Prof. Ir. Dr. Wan Ishak Wan Ismail	Development of Self Propel Rotary Cutter for Oil Palm Harvesting	Mac 2013- Februari 2015	United Malacca Plantation Berhad (Swasta)	190,500
5.	Prof, Madya. Ir Dr Azmi Dato' Yahya	Rice Yield Prediction Based on Soil Fertility and Crop Health	2014	FRGS	78,000
6.	Prof. Madya Dr. Siti Khairunniza Bejo	Mangrove Biomass Modeling And Mapping Using Satellite Remote Sensing And GIS.	2014	Geran UPM	15,000
7.	Prof. Madya Dr. Siti Khairunniza Bejo	Detection of The Basal Stem Rot (BSR) Using Imaging Technology and Soil Sensor.	2014	Geran UPM	165,200
8.	Prof. Madya Dr. Hasfalina Che Man	Immunosensor Development For Tungro Disease Detection In Paddy Plantation	2014	Geran UPM	167,500
9.	Dr. Samsuzana Abdul Aziz	Dielectric Spectroscopy Measurement Of Labisia Pumila (Kacip Fatimah) Water Contest And Phytochemical Content	2014	Geran UPM	15,000

10.	Dr. Samsuzana Abdul Aziz	Interdigitated Electrade (Ide) Impedance Sensing For Frying Oil Quality Assessment.	2014	Geran UPM	15,000
11.	Dr. Aimrun Wayayok	Design and Development of SRI Single Seedling Nursery Tray and Transplanter	September 2012- Ogos 2014	RUGS	87,000
12.	Dr. Aimrun Wayayok	Utilization of Optimum Potassium and Micronutrient Contents to Improve Kenaf Fiber Quality	November 2013 - Oktober 2015	GP-IPS	15,000
13.	Dr. Aimrun Wayayok	Development of a Risk Map Model for Some Selected Pests in Rice Farming using Remote Sensing	September 2012- Ogos 2014	RUGS	15,000
14.	Dr. MD Rowshon Kamal	Development and Application of Climate-Smart DSS for on-Farm Real-Time Irrigation Scheduling and Water Allocation Strategies in Paddy	November 2013 - Oktober 2015	GP-Individu Berprestasi Tinggi	98,000
15.	Dr. MD Rowshon Kamal	Modeling Optimum Fertilizer Use and Drainage Water Reuse From Two-Dimensional Water Flow and Solute Transport in Rice Production System.	2014	SCIENCEFUND	174,233
16.	Dr. MD Rowshon Kamal	Impacts Of Soil Compaction On Emitter Discharges In Sub-Surface Drip Irrigation System (SDI).	2014	Geran UPM	12,000
17.	Dr. Muhd Saufi Mohd Kassim	Vision System for Oil Palm Rows Recognition for Mobile Robot Guidance	Oktober 2012- September 2014	RUGS	28,000
18.	Ezrin Mohd Husin	Development of Rapid Fertilizer Application System for Oil Palm Plantation using Electrical Conductivity Sensor	September 2012- Ogos 2014	RUGS	58,000
19.	Ezrin Mohd Husin	Relationship of FFB Quality at the Gate against Its Soil Nutrient	Julai 2012- Jun 2017	LRGS	190,532
20.	Azhareensyah Aman	Development of a Model for Soil Organic Matter via Image Processing	April 2011- April 2014	RUGS	30,000
				Jumlah Keseluruhan (RM)	1,702,365

3. PENGLIBATAN DENGAN AGENSI LUAR

3.1 Kerjasama Dengan Sektor Awam

1. Bahagian Pengairan dan Saliran Pertanian (BPSP), Kementerian Pertanian dan Industri Asas Tani, Malaysia. Projek MOU UPM-BPSP. Projek : "Pengurusan Air Sawah Padi". (2008-sekarang).
2. Bahagian Pengurusan Tanah, Kementerian Pertanian dan Industri Asas Tani, Malaysia. Projek Pertanian Presis Padi (2008-sekarang).

3.2 Kerjasama Dengan Pihak Industri

3.3 Kerjasama Dengan Pihak Antarabangsa

4. PENERBITAN

4.1 Jurnal

1. Muhammad Hazwan Hamzah, **Hasfalina Che Man**, Zurina Zainal Abidin & Hishamuddin Jamaludin, 2014, Comparison of Citronella Oil Extraction Methods from *Cymbopogon nardus* Grass by Ohmic-heated Hydro-Distillation and Steam Distillation, *BioResources*, 9(1), pp 256-272, I.F. 1.309.
2. A. Sani, **M. Rashid**, N. Hanira, C. M. Hasfalina, 2014, The Influence of pH on the Removal of Ammonia from a Schedule Waste Landmill Leachate, *Jurnal Teknologi*, 68(5), pp 25-28
3. M.N.A. Uda, Tijjani Adam, **C.M. Hasfalina**, Faridah. S, Zamri. I, U.Hashim & Shahrul A. B Ariffin, 2014, Reviewed Immunosensor Format Using Nanomaterial for Tungro Virus Detection, *Advances Materials Research*, 832(2014), pp 410-414
4. Vudagandla Sreenivasulu, Nadavala Sivakumar, **Hasfalina Che Man** & Abburi Krishnaiah, 2014, Method Development and Validation for Quantitative Determination of 2-Acetoxy Methyl-4-Methoxy-3,5-Dimethyl Pyridine, in Esomeprazole Magnesium (API) Active Pharmaceutical Ingredient by LC-ESI-MS/MS, *Journal of Chemical and Pharmaceutical Research*, 6(5), pp 1014-1021
5. Abdul Shukor Abdul Aziz, Latifah Abdul Manaf, **Hasfalina Che Man** & Nadavala Siva Kumar, 2014, Kinetic Modeling and Isotherm Studies for Copper(II) Adsorption onto Palm Boiler Mill Fly Ash (POFA) as a Natural Low-Cost Adsorbent, *BioResources*, 9(1), pp 336-356, I.F. 1.379
6. Ramin Shamsiri & **Wan Ishak Wan Ismail**, 2014, Implementation of Galerkin's Method and Modal Analysis for Unforced Vibration Response of a Tractor Suspension Model, *Research Journal of Applied Sciences, Engineering and Technology*, 7(1), pp 49-55
7. Ramin Shamsiri & **Wan Ishak Wan Ismail**, 2014, A Comprehensive Comparison between Wave Propagation and Heat Distribution via Analytical Solutions and Computer Simulations, *Research Journal of Applied Sciences, Engineering and Technology*, 7(1), pp 111-122.
8. Muhamad Saufi Mohd Kassim, **Wan Ishak Wan Ismail** & Lim Ho Teik, 2014, Oil Palm Fruit Classifications by using Near Infrared Images, *Research Journal of Applied Sciences, Engineering and Technology*, 7(11), pp 2200-2207
9. Siti Sharifah Bibi Hanibah, **Siti Khairunniza-Bejo**, Wan Ishak Wan Ismail & Aimrun Wayayok, 2014, Determination of Physical Rice Composition using Image Processing Technique, *Journal of Food, Agriculture & Environment*, 12(1), pp 205-209, I.F. 0.517
10. Saberioon, M.M., **Amin, M.S.M**, Anuar, A.R., Gholizadeh, A. Wayayok, A. & Khairunniza-Bejo, S., 2014, Assessment of Rice Leaf Chlorophyll Content using Visible Bands at Different Growth Stages at Both the Leaf and Canopy Scale, *International Journal of Applied Earth Observation and Geoinformation*, 32(2014), pp 35-45, I.F. 2.176
11. Farid, M., **Khairunniza-Bejo, S.** & Azman, A., 2014, An Approach to Estimate Moisture Content of Paddy Rice via Thermal Imaging, *Journal of Food, Agriculture & Environment*, 12(1), pp 188-191, I.F. 0.517
12. **Khairunniza-Bejo, S.** & Kamaruddin, S., 2014, Determination of Chokanan Mango Sweetness (*Mangifera Indica*) using Non-Destructive Image Processing Technique, *Australian Journal of Crop Science*, 8(4), pp 475-480.
13. **Khairunniza-Bejo, S.** & Nor, M.S, 2014, Mature and Immature Paddy Identification using Image Processing Technique, *Journal of Engineering Science and Technology*, 9(3), pp 326-333
14. Zubairu, Usman Bashar, **Aimrun Wayayok**, & Amin Mohd Soom Mohd, 2014, Determination of some Physical Properties of Common Malaysia Rice MR219 Seeds, *Australian Journal of Crop Science*, 8(3), pp 332-337
15. Faranak Ghobadifar, **Aimrun Wayayok**, Shattri Mansor & Helmi Zulhaidi Shafri, 2014, Effects of Crop Evapotranspiration Estimation Technique and Weather Parameters on Rice Crop Water Requirement, *Australian Journal of Crop Science*, 8(4), pp 495-501

16. Zubairu Usman Bashar, Aimrun Wayayok, & Amin M. S. M. & Razif M. Mahadi, 2014, Comparison of Precision Farming and Conventional Practices for Paddy Fertilizer Management, *Bothalia Journal*, 44(4), pp 15-27, I.F. 0.846
17. R. E. Putri, **A. Yahya**, N. M. Adam, S. Abd Aziz and T. A. Ishola, 2014, Calibration and Accuracy Determination of a Microwave Type Sensor for Measuring Grain Flow, *Journal of Advanced Materials Research*, 931-932(2014), pp 1592-1596
18. P. A. Adeoye, **C. M. Hasfalina**, M. S. M. Amin, A.M. Thamer & C. O. Akinbile, 2014, Environmental Implication of Poultry Waste Generation and management Techniques in Minna, Semi-arid Region of Nigeria, *Annual Research & Review in Biology*, 4(10), pp 1669-1681
19. **Siti Khairunniza-Bejo**, Samihah Mustaffha, Wan Ishak Wan Ismail, 2014, Application of Artificial Neural Network in Predicting Crop Yield: A Review, *Journal of Food Science and Engineering*, 4(2014), pp 1-9
20. Pardis Fazli, **Hasfalina Che Man**, Mohamed Azwan, Umi Kalsom Md. Shah, Nor Aini Abdul Rahman, Azni Idris, 2014, Evaluation of Methane Oxidizer Bacteria in the Rice Soil in Malaysia, *International Journal of Enhanced Research in Science Technology & Engineering*, 3(3), pp 360-367
21. Tengku Roslina Tuan Yusof, **Hasfalina Che Man**, Nor Aini Abdul Rahman & Halimatun Saadiah Hafid, 2014, Optimization of Methane Gas Production from Co-digestion of Food Waste and Poultry Manure using Artificial Neural Network and Response Surface Methodology, *Journal of Agricultural Science*, 6(6), pp 27-37
22. Bala Ibrahim & **Wan Ishak Wan Ismail**, 2014, Development of System Rice Intensification (SRI) Paddy Transplanter, *Asian Journal of Agricultural Sciences*, 6(2), pp 48-53
23. Zubairu Usman Bashar, **Aimrun Wayayok**, & Amin M. S. M. & Razif M. Mahadi, 2014, Quality Seed: An Innovative Sorting Technique to Sustainable, Uniform and Effective Seedling Establishment in Nursery for System of Rice Intensification, *Journal of Agricultural Science*, 6(7), pp 185-193
24. P. A. Adeoye, **C. M. Hasfalina**, M. S. M. Amin, A.M. Thamer & C. O. Akinbile, 2014, Environmental Implication of Poultry Waste Generation and management Techniques in Minna, Semi-arid Region of Nigeria, *Annual Research & Review in Biology*, 4(10), pp 1669-1681
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27. Tengku Roslina Tuan Yusof, **Hasfalina Che Man**, Nor Aini Abdul Rahman & Halimatun Saadiah Hafid, 2014, Optimization of Methane Gas Production from Co-digestion of Food Waste and Poultry Manure using Artificial Neural Network and Response Surface Methodology, *Journal of Agricultural Science*, 6(6), pp 27-37
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30. Hamzah, M.H., **Che Man, H.**, Abidin, Z.Z., Jamaludin, H., 2014, Comparison of citronella oil extraction methods from *Cymbopogon nardus* grass by ohmic-heated hydro-distillation, hydro-distillation, and steam distillation, *BioResources*, 9(1), pp 256-272, I.F. 1.309
31. C. H. Fizura, **S. Abd Aziz**, S. Hafizan, 2014, Effect of Diesel Contamination on Capacitance Values of Crude Palm Oil, *Journal of Engineering Science and Technology*, 9(3), pp 286-292
32. Md. Akhira, H., **Ahmad, D.**, Rukunudin, I. H., Shamsuddin, S. & A. Yahya, 2014, Design and Development of a sweet Potato Digging Device, *Pertanika Journal of Science & Technology*, 22(1), pp 43-53
33. Diyana Jamaludin., **Ahmad, D.**, Rezuwan Kamaruddin & Hawa Z. E. Jaafar, 2014, Microclimate inside a Tropical Greenhouse Equipped with Evaporative Cooling Pads, *Pertanika Journal of Science & Technology*, 22(1), pp 243-259
34. Mohammad Reza Bakhtiari, Omid Ghahraei, **Desa Ahmad**, Ali Reza Yazdanpanah, Ali Mohammad Jafari, 2014, Selection of Fertilization Method and Fertilizer Application Rate on Corn Yield, *Agricultural Engineering International: CIGR Journal*, 16(2), pp 10-14.
35. Ishola, T. **A. Yahya**, A., Shariff, A. R. M., Aziz, S. A., 2014, A Novel Variable Rate Pneumatic Fertilizer Application, *Instrumentation Science and Technology*, 42(4), pp 369-384.
36. El Pebrian, D., **Yahya, A.**, Siang, T. C., 2014, Workers' Workload and Productivity in Oil Palm Cultivation in Malaysia, *Journal of Agricultural Safety and Health*, 20(4), pp 235-254.
37. **M. K. Rowshon**, M. S. M. Amin, M. A. Mojid, M. Yaji, 2014, Estimated Evapotranspiration of Rice Based on Pan Evaporation as a Surrogate to Lysimeter Measurement, *Paddy Water Environment*, 12(2014), pp 35-41.
38. **M. K. Rowshon**, M.M. Mbaruk, Martin J. Marriott, M. S. M. Amin, Amimul Ahsan, Eric W.K. Loh, 2014, Geospatial Water Quality Assessment System for the Sungai Buloh River Basin in Malaysia, *International Journal of Water*, 8(4), pp 401-421

39. Ahmad, H.I., **D. Ahmad**, D.D. Yusuf and M.L.Suleiman (2014). Repair and Maintenance Cost Prediction Model for Steyr Urus Tractors Used in Solid Household Waste (SHW) Collection and Disposal. *Journal of Engineering and Technology*, Volume 8, No.11, August.
40. Amer, N.N Kakahy, **D. Ahmad**, MD. Akhir, S. Sulaiman and Ishak, A (2014).Pulverization of Sweetpotato Vine Using Serrated Edge Mower Blades. *International Journal of Engineering and Innovative Technology (IJEIT)*(Accepted)
41. A. Hashemi, **D. Ahmad**, J. Othman and S.Sulaiman (2014).The effect of comboplough on some soil physical properties of Universiti Putra Malaysia Research Park. *African Journal of Agricultural Research*, Vol.9 (2), pp.216-221.
42. H.I. Ahmad, **D. Ahmad**, D.D. Yusuf and M.L. Suleiman (2014).Determination of wear elements in tropical lubricating oil: Comparison between AAS and ICP-OES Techniques. *Journal of Agricultural Engineering and Technology (JAET)*, Volume 22 (No.1) March, 2014.
43. Mohammad Reza Bakhtiari, Omid Ghahraei, **Desa Ahamd**, Ali Reza Yazdanpanah, Ali Mohammad Jafari (2014).Selection of fertilization method and fertilizer application rate on corn yield. *Agric. Eng Int>CIGR Journal* Vol.16, No.2.
44. I.Yavari, J.B.Endan, Y.A. Yusof, M.N. Ibrahim and **D. B. Ahmad** (2014).Study of the lump system analysis to finding constant coefficients C and M, of the equation $\theta(\tau)=ce-mt$ to predicting Malaysia cockle center temperature at different heating condition. *International Journal of Emerging Technology & Advanced Engineering*, Volume 4, Issue 7.
45. Diyana Jamaludin, **Desa Ahmad**, Rezuwan Kamaruddin and Hawa Z.E.Jaafar (2014). Microclimate inside a tropical greenhouse equipped with evaporative cooling pads. *Pertanika Journal of Science and Technology*, 22 (1):243-259
46. MD.Akhir, H. **Ahmad D.**,Rukunuddin, I.H. Shamsuddin, S. and A. Yahya (2014).Design and development of a sweet potato digging device. *Pertanika Journal of science and technology*, 22 (1):43-53

4.2 Prosiding

1. Maina Mamodu Mohd, Mohd Soom Mohd Amin, Md Rowshon Kamal, Aimrun Wayayok, Samsuzana Abd Aziz & Mohd Yazid, Application of Web Geospatial Decision Support System for Tanjung Karang Rice Precision Irrigation Water Management in proceedings of the International Conference on Agriculture, Food and Environmental Engineering (ICAFEE'2014), Kuala Lumpur, Malaysia.
2. Ebrahim Jahansiri & Abdul Rashid Mohd Shariff, Developing Web-Based Data Analysis Tools for Precision Farming using R and Shiny in proceedings of the 7th IGRSM International Conference and Exhibition on Remote Sensing & GIS, Kuala Lumpur, Malaysia
3. Faranak Ghobadifar, Aimrun Wayayok, Shattri Mansor & Helmi Shafri, Using Spot-5 Images in Rice Farming for Detecting BPH (Brown Plant Hopper) in proceedings of the 7th IGRSM International Conference and Exhibition on Remote Sensing & GIS, Kuala Lumpur, Malaysia.
4. Nur Aini, W. Aimrun, M.S.M Amin, M.H. Ezrin & H.Z. Shafri, Auto-Guided Oil Palm Pkaner by using Multi-GNSS in proceedings of the 7th IGRSM International Conference and Exhibition on Remote Sensing & GIS, Kuala Lumpur, Malaysia.
5. Dauda SM., Desa A., Khalina A. & Jamarei O. Physical and Mechanical Properties of Kenaf Stems at Varying Moisture Contents in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
6. A. Muazu, A. Yahya, W.I.W. Ishak, S. Khairunniza-Bejo, Machinery Utilization and Production Cost of Wetland, Direct Seeding Paddy Cultivation in Malaysia in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
7. A. Muazu, A. Yahya, W.I.W. Ishak, S. Khairunniza-Bejo, Yield Prediction Modeling using Data Envelopment Analysis Methodology for Direct Seeding, Wetland Paddy Cultivation in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
8. Rabar Fatah Salih, Khalina Abdan, Aimrun Wayayok, Anuar Abdul Rahim, Norhashila Hashim, Response of Nitrogen Content for some Varieties of Kenaf Fiber (*Hibiscus Cannabinus L.*) by aplying Different Levels of Potassium, Boron & Zinc in proceedings of the Agriculture and Agricultural Science

- Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
9. Pardis Fazli, Hasfalina Che Man, Comparison of Methane Emission from Conventional and Modified Paddy Cultivation Malaysia in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
 10. M.N.A. Uda, C.M. Hasfalina, A.A. Samsuzana, S. Faridah, I. Zamri, B. Siti Noraini, W. Nur Sabrina, U. Hashim, Comparison of Two Different Isolation & Purification Method for Rice Tungro Bacilliform Virus (RTBV) in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
 11. Siti Khairunniza-Bejo, Chin Nee Vong, Detection of Basal Stem Rot (BSR) Infected Oil Palm Tree using Laser Scanning Data in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
 12. Norazlida Jamil, Siti Khairunniza Bejo, Husk Detection using Thermal Imaging Technology in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
 13. Diyana Jamaludin, Samsuzana Abd Aziz & Desa Ahmad, Application of Impedance Spectroscopy Sensing for Leaf Water Status in proceedings of the International Conference of Agricultural Engineering (AgEng 2014), Kuala Lumpur, Malaysia.
 14. Nur Aini, M.H. Ezrin, W. Aimrun, Relationship between Soil Apparent Electrical Conductivity and pH Value of Jawa Series in Oil Palm Plantation in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
 15. E. Nurnadiah, W. Aimrun, M.S.M. Amin, A.S. Idris, Preliminary Study on Detection of Basal Stem Rot (BSR) Disease at Oil Palm Tree using Electrical Resistance in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
 16. N.S. Dlamini, M.K. Rowshon, M. Makhanya, S. Sithole, The CDAA Framework for Development of Sustainable Large-scale Smallholder Irrigation Schemes in Swaziland in proceedings of the Agriculture and Agricultural Science Procedia, 2nd International Conference on Agricultural and Food Engineering, CAFAEi2014, Kuala Lumpur, Malaysia.
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 20. M S M Alfatni, A R M Shariff, M Z Abdullah, M H Marhaban, S B Shafie, M D Bamiruddin, O M B Saaed, Oil Palm Fresh Fruit Bunch Ripeness Classification based on Rule-based Expert System of ROI Image Processing Technique Results in proceedings of the 7th IGRSM Inter. Remote Sensing & GIS Conference and Exhibition.
 21. O.M. Bensaeed, A.M. Shariff, A. B. Mahmud, H. Shafri, M. Alfatni, Oil Palm Fruit Grading using a Hyperspectral Device and Machine Learning Algorithm in proceedings of the 7th IGRSM Inter. Remote Sensing & GIS Conference and Exhibition.
 22. **M.H. Ezrin**, W. Aimrun, I. Nur Aini. and M.S.M Amin 2014. Relationship of Soil Apparent Electrical Conductivity and Total Nitrogen of Jawa Series Soil in Oil Palm Plantation in proceedings of the National Conference On Agricultural and Food Mechanization 2014 (NCAFM 2014). 20 -22 May 2014, Kota Kinabalu, Sabah.
 23. Mohd Amin Mohd Soom, Aimrun Wayayok and **Ezrin M Husin**, 2014. Adoption of Precision Farming for Higher Paddy Productivity and Profitability. International Workshop on SMART FARMING XI: Delivering Appropriate Precision Technologies & Mangement Practices in Agriculture. 11th August 2014, Universiti Putra Malaysia, Serdang, Selangor.
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 25. Aimrun W, M.S.M. Amin and **M.H.Ezrin**, 2014. Fertilizer Savings through the Application of Precision Farming Technology in Rice. International Workshop on SMART FARMING XI: Delivering Appropriate Precision Technologies & Mangement Practices in Agriculture. 11th August 2014, Universiti Putra Malaysia, Serdang, Selangor.
 26. Ramin Shamshiri, Wan Ishak Wan Ismail, Desa Ahmad (2014).Adaptive analysis framework for controlled environments plant production, case study in tropical lowland Malaysia.Proceedings of 2014 ASABE and CSBE/SCGAB Annual International Meeting, Montreal, Quebec, Canada, 13-16 July.

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28. Diyana Jamaludin, Samsuzana Abd Aziz and Desa Ahmad (2014). Application of impedance spectroscopy sensing for leaf water status. Proceedings of the International Conference of Agricultural Engineering, AgEng 2014, Zurich, 6-10 July.
29. Jamaludin D., Abd Aziz S., Ahmad D. and Jaafar H. (2014). Impedance Characteristics of *Labisia pumila* Plant Water Stress. Proceedings of the National Conference on Agricultural and Food Mechanization (NCAFM 2014), 20-22 May, 2014, Kota Kinabalu, Sabah.
30. Desa, A., Khalina A., Jamarei O. and Dauda S.M (2014). Development and Testing of a Kenaf Harvesting Machine. Proceedings of the National Conference on Agricultural and Food Mechanization (NCAFM 2014), 20-22 May, 2014, Kota Kinabalu, Sabah.

4.3 Poster

1. **M.H. Ezrin**, W. Aimrun, I. Nur Aini. and M.S.M Amin 2014. Relationship of Soil Apparent Electrical Conductivity and Total Nitrogen of Jawa Series Soil in Oil Palm Plantation in proceedings of the National Conference On Agricultural and Food Mechanization 2014 (NCAFM 2014). 20 -22 May 2014, Kota Kinabalu, Sabah.

4.4 Artikel dalam Majalah

1. Wan Ishak Wan Ismail, 2014, Guna telefon pintar periksa tahap kemasakan buah, MegaFokus, Utusan Malaysia, pp 1-4
2. Desa Ahmad, 2014, Mesin Penuai Kenaf, sains & teknologi, Utusan Malaysia.
3. Aimrun Wayayok, 2014, Anak Padi Lebih Banyak, Agro, Harian Metro.
4. Wan Ishak Wan Ismail, 2014, Teknologi pertanian tepat, agro, Utusan Malaysia, pp 6-7
5. Ezrin Mohd Husin, 2014, *SoilProp*, sistem pemetaan ciri-ciri tanah, agro, Utusan Malaysia, pp 7.
6. Mohd Amin Mohd Soom, Ezrin Mohd Husin, Aimrun Wayayok, 2014, Teknologi cerap data kesuburan tanah, Infiniti, Kosmo, pp 2.
7. Mohd Amin Mohd Soom, Ezrin Mohd Husin, Aimrun Wayayok, 2014, SoilProp lonjak industri padi, Agro, Harian Metro.
8. Mohd Amin Mohd Soom, Ezrin Mohd Husin, Aimrun Wayayok, 2014, SoilProp tingkatkan produktiviti tanaman, Utusan Malaysia.

5. AKTIVITI-AKTIVITI & PENCAPAIAN SEPANJANG TAHUN

5.1 Anugerah

1. **Silver Medal Award**: Pameran Reka Cipta Penyelidikan dan Inovasi 2014 (PRPI), Universiti Putra Malaysia on 30 September 2014 & 1 Oktober 2014. Paddy Quality Determination using Imaging Technology. Authors; Prof. Madya Dr. Siti Khairunniza Bejo
2. **Bronze Medal Award**: Malaysia Technology Expo 2014 (Invention & Innovation Awards) on 20-22 February 2014. Single Seedling Nursery Tray for SRI Planting Machine. Authors; Dr. Aimrun Wayayok.

5.2 Paten dan Hak Cipta

1. Single Seedling Nursery Tray. Aimrun Wayayok; Usman Bashar Zubairu; Mohd Amin Mohd Soom; Mohamad Razif Mahadi (PI2013700745) – Pending

5.3 Kursus, Konferens, Bengkel, Program

1. International Workshop on SMART FARMING XI: Delivering Appropriate Precision Technologies & Mangement Practices in Agriculture.
2. Bengkel Penyelidikan Jabatan, Hotel Palm Garden, IOI Resort, Putrajaya. 20 Januari 2014
3. In-house Team Building, Rumah Kayu UPM, 24 Januari 2014.
4. Soil Water Diffusivity and Sorptivity Measurements, Fakulti Kejuruteraan, UPM. 10 Februari 2014.
5. Kursus HIRARC, Fakulti Kejuruteraan UPM, 23 & 24 Oktober 2014
6. National Conference on Agricultural and Food Mechanization, Sutera Harbor Resort, Kota Kinabalu, Sabah. 20-22 Mei 2014.

5.4 Pencapaian lain

1. Aktiviti Penyelidikan bersama Japan Aerospace Exploration Agency (JAXA) di bawah Projek Kerjasama MultiGNSS

6. LAMPIRAN BERGAMBAR

6.1 Aktiviti Penyelidikan bersama JAXA di bawah Projek Kerjasama MultiGNSS

