
Curriculum Vitae of

Siva K Balasundram, PhD

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Staff ID: A02699

Curriculum Vitae



Siva K Balasundram, PhD

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DATE AND PLACE OF BIRTH

- ▶ Born on February 26, 1971 in Bukit Mertajam, Penang, MALAYSIA

ACADEMIC QUALIFICATION

(Degree | Thesis Title | Awarding Institution | Year)

- **Doctor of Philosophy** in Soil Science (Precision Agriculture) | Strategies for Precision Oil Palm Management in South Sumatera, Indonesia | University of Minnesota, USA | September, 2003
- **Master** of Agricultural Science (Soil Chemistry) | Use of Palm Oil Mill Effluent and Peat to Reduce Ammonia Volatilization from Fertilizer Urea | Universiti Putra Malaysia | May, 1997
- **Bachelor** of Agricultural Science (Agronomy) | Effect of Repeated Application of Selected Herbicides on the Growth and Physiology of Immature Oil Palm (*Elaeis guineensis*) | Universiti Putra Malaysia | July, 1994

PREVIOUS APPOINTMENT

(Designation | Institution | Year)

- Visiting Scholar | Colorado State University, USA | 2012-2013
- Senior Lecturer | Universiti Putra Malaysia | 2007-2012
- Lecturer | Universiti Putra Malaysia | 2003-2007
- Tutor | Universiti Putra Malaysia | 1997-2003

AREA OF EXPERTISE

(Field | Scope | Concentration)

- ▶ Agricultural Science | Agricultural Information System and Technology | Precision Agriculture

LANGUAGE PROFICIENCY

- Excellent command of spoken and written Bahasa Malaysia (1988 SPM Grade: A1)
- Excellent command of spoken and written English (1988 SPM Grade: A1)

RESEARCH

(Project Title | Role | Funding Agency | Amount | Year | Status)

1. Monitoring of palm oil yield and quality using a non-destructive proximal sensing approach | **Principal Investigator** | United Malacca Berhad | RM176,200 | 2013-2015 | Ongoing
2. Increasing the precision of on-farm fertilizer experiments via removal of spatial effects | **Principal Investigator** | Ministry of Higher Education (MOHE), Malaysia (Exploratory Research Grant Scheme) | RM74,400 | 2011-2013 | Completed (Final report in progress)
3. Soil carbon sequestration potential along elevational gradients of tropical forest reserves in Cameron Highlands, Pahang | **Co-Principal Investigator** | Ministry of Agriculture (MOA), Malaysia (Science Fund) | RM96,000 | 2010-2012 | Completed
4. Molecular characterization and epidemiology of a virus associated with red-tip disease in pineapple | **Co-Principal Investigator** | Universiti Putra Malaysia (Research University Grant Scheme) | RM84,000 | 2009-2011 | Completed
5. Use of remote sensing to establish oil palm productivity clusters | **Principal Investigator** | Ministry of Science, Technology and Innovation (MOSTI), Malaysia (Science Fund) | RM227,896 | 2007-2009 | Completed
6. A digital imaging technique for palm oil quality determination | **Principal Investigator** | Federal Land Development Authority (FELDA), Malaysia | RM75,000 | 2005-2007 | Completed
7. Relationship between oil palm fruit color and oil yield/quality | **Principal Investigator** | IOI Corporation and Universiti Putra Malaysia | RM16,000 | 2004-2005 | Completed

▪ **Total: RM757,296**

PUBLICATION

A. Journal

1. SALHA, M.S., **S.K. BALASUNDRAM** and J. SHAMSHUDDIN. Spatial variability of clay content and saturated hydraulic conductivity in a paddy soil. (In preparation).
2. CHONG, Y.M., **S.K. BALASUNDRAM** and M.H.A. HUSNI. Detection and monitoring plant nutrient stress using remote sensing approaches: A review. (In preparation).
3. JEYANNY, V., **S.K. BALASUNDRAM**, M.H.A. HUSNI and K. WAN RASIDAH. 2016. Spatial variability of forest floor thickness for estimation of refined carbon stocks in a tropical montane forest. *Journal of Tropical Forest Science*, 28(3):285-297.
4. NUR SHUHADA, T., M.M. HANAFI, A.B. IDRIS and **S.K. BALASUNDRAM**. 2015. Determination and mapping of Ca and Mg content using geostatistical techniques in oil palm plantation related to basal stem rot disease. *Songklanakarin Journal of Science and Technology*, 38(1): 23-30.
5. NUR SHUHADA, T., M.M. HANAFI, A.B. IDRIS and **S.K. BALASUNDRAM**. 2015. Predicting the variability of copper and zinc in leaf and soil of oil palm planted on a 12 ha land using geospatial information system technology. *Jurnal Teknologi*, 77(24): 113-118.
6. JEYANNY, V., K. WAN RASIDAH, M.H.A. HUSNI, **S.K. BALASUNDRAM**, S. MUHAMMAD FIRDAUS and A. ARIFFIN. 2015. Leaf litter decomposition and soil carbon dioxide fluxes across climatic gradient in tropical montane and lowland forests. *Journal of Tropical Forest Science*, 27(4): 472-487.
7. NORUL HUSNA, A.K., **S.K. BALASUNDRAM** and C.P. TAN. 2015. Fluorescence sensing as a tool to estimate palm oil quality and yield. *Ciência e Técnica Vitivinícola Journal*, 30(4): 58-65.
8. HUN, K.S., **S.K. BALASUNDRAM**, A.R. ANUAR, O.H. AHMED and H. AMINUDDIN. 2015. Response of irrigated direct-seeded rice yields to different nitrogen rates and precipitation patterns. *International Journal of Tropical Agriculture*, 33(2): 565-570.
9. NOURQOLIPOUR, R., A.R.B.M. SHARIFF, **S.K. BALASUNDRAM**, N.B. AHMAD, A.M. SOOD, T. BUYONG and F. AMIRI. 2015. A GIS-based model to analyze the spatial and temporal development of oil palm land use in Kuala Langat district, Malaysia. *Environmental Earth Sciences*, 73(4): 1687-1700. [# of cites: 5]

10. MEMARIAN, H., **S.K. BALASUNDRAM**, K.C. ABBASPOUR, J. TALIB, M.S. ALIAS and C.B.S. TEH. 2014. SWAT-based hydrological modeling of tropical land use scenarios. *Hydrological Sciences Journal*, 59(10): 1808-1828. [# of cites: 5]
11. MEMARIAN, H., **S.K. BALASUNDRAM**, K.C. ABBASPOUR, J. TALIB, C.B.S. TEH and M.S. ALIAS. 2014. Integration of analytic hierarchy process and weighted goal programming for land use optimization at the watershed scale. *Turkish Journal of Engineering and Environmental Sciences*, 38: 139-158.
12. SELVARAJA, S., **S.K. BALASUNDRAM**, G. VADAMALAI, M.H.A. HUSNI and R. KHOSLA. 2014. Remote sensing as a tool to assess orange spotting disease in oil palm (*Elaeis guineensis*). *Mitteilungen Klosterneuburg*, 64(4): 12-26.
13. VIJAYANATHAN, J., A. MOHD HANIF, W. KADIR, S.K. BALASUNDRAM and A. ABDU. 2014. Estimation of forest floor carbon stocks in tropical montane forest. *International Forestry Review*, 16(5): C-16.
14. JEYANNY, V., M.H.A. HUSNI, K. WAN RASIDAH, **S.K. BALASUNDRAM**, A. ARIFFIN and M. KAMARUL HISHAM. 2014. Carbon stocks in different carbon pools of a tropical lowland forest and a montane forest with a varying topography. *Journal of Tropical Forest Science*, 26(4): 560-571.
15. NOURQOLIPOUR, R., A.R.B.M. SHARIFF, **S.K. BALASUNDRAM**, N.B. AHMAD, A.M. SOOD, and T. BUYONG. 2014. Predicting the effects of urban development on land transition and spatial patterns of land use in western Peninsular Malaysia. *Applied Spatial Analysis and Policy*. DOI: 10.1007/s12061-014-9128-9. 19 p. [# of cites: 2]
16. MEMARIAN, H., **S.K. BALASUNDRAM** and M. TAJBAKSH. 2013. An expert integrative approach for sediment load simulation in a tropical watershed. *Journal of Integrative Environmental Sciences*, 10(3-4): 161-171. [# of cites: 1]
17. MEMARIAN, H., **S.K. BALASUNDRAM** and R. KHOSLA. 2013. Comparison between pixel-based and object-based image classification of a tropical landscape using SPOT-5 imagery. *Journal of Applied Remote Sensing*, 7(1): 073512. [# of cites: 2]
18. SELVARAJA, S., **S.K. BALASUNDRAM**, G. VADAMALAI and M.H.A. HUSNI. 2013. Use of spectral reflectance to discriminate between potassium deficiency and orange spotting symptoms in oil palm (*Elaeis guineensis*). *Life Science Journal*, 10(4): 947-951.
19. JEYANNY, V., **S.K. BALASUNDRAM**, M.H.A. HUSNI, K. WAN RASIDAH and A. ARIFFIN. 2013. Spatial variability of selected forest soil properties related to carbon management in a tropical lowland and montane forest. *Journal of Tropical Forest Science*, 25(4): 577-591. [# of cites: 1]
20. **BALASUNDRAM, S.K.**, H. MEMARIAN and R. KHOSLA. 2013. Estimating oil palm yields using QuickBird-derived vegetation indices. *Life Science Journal*, 10(4): 851-860. [# of cites: 1]
21. MEMARIAN, H., M. TAJBAKSH and **S.K. BALASUNDRAM**. 2013. Application of SWAT for impact assessment of land use/cover change and best management practices: A review. *International Journal of Advancement in Earth and Environmental Sciences*, 1(1): 36-40. [# of cites: 2]
22. **BALASUNDRAM, S.K.**, A.K. FAIZAH, G. VADAMALAI and M.H.A. HUSNI. 2013. Estimating red tip disease in pineapple using a non-contact sensory approach. *Agricultural Sciences*, 4(4): 206-208.
23. MEMARIAN, H., **S.K. BALASUNDRAM**, J. TALIB, C.B.S. TEH, M.S. ALIAS and K.C. ABBASPOUR. 2013. KINEROS2 application for LUCC impact analysis at the Hulu Langat basin, Malaysia. *Water and Environment Journal*, 27: 549-560. [# of cites: 4]
24. KHAYAMBASHI, B., A.R. ANUAR, A.W. SAMSURI, **S.K. BALASUNDRAM** and M. AFYUNI. 2013. Sorption and desorption of zinc by clinoptilolite and clinoptilolite-tridymite. *Malaysian Journal of Soil Science*, 17: 69-83.
25. ELSHEIKH, R.F.A., A.R.M. SHARIFF, F. AMIRI, N. AHMAD, **S.K. BALASUNDRAM** and M.S.M. AMIN. 2013. Agriculture Land Suitability Evaluator (ALSE): A decision and planning support tool for tropical and subtropical crops. *Computers and Electronics in Agriculture*, 93: 98-110. [# of cites: 7]
26. MEMARIAN, H., **S.K. BALASUNDRAM**, J. TALIB, C.B.S. TEH, M.S. ALIAS and K.C. ABBASPOUR. 2012. Validation of CA-Markov for simulation of land use and cover change in the Langat Basin, Malaysia. *Journal of Geographic Information System*, 4(6): 542-554. [# of cites: 10]

27. MEMARIAN, H and **S.K. BALASUNDRAM**. 2012. Comparison between multi-layer perceptron and radial basis function networks for sediment load estimation in a tropical watershed. *Journal of Water Resource and Protection*, 4(10): 870-876. [# of cites: 13]
28. IBRAHIM, I.F., **S.K. BALASUNDRAM**, N.A.P. ABDULLAH, M.S. ALIAS and M. MARDAN. 2012. Morphological characterization of pollen collected by *Apis dorsata* from a tropical rainforest. *International Journal of Botany*, 8(3): 96-106. [# of cites: 2]
29. IBRAHIM, I.F., **S.K. BALASUNDRAM**, N.A.P. ABDULLAH, M.S. ALIAS, M. MARDAN and M.M. SABERIOON. 2012. Mapping the spatial distribution of *Apis dorsata* host plants using an integrated geographical information system-remote sensing approach. *American Journal of Agricultural and Biological Sciences*, 7(4): 396-406. [# of cites: 2]
30. SELVARAJA, S., **S.K. BALASUNDRAM**, G. VADAMALAI and M.H.A. HUSNI. 2012. Spatial variability of orange spotting disease in oil palm. *Journal of Biological Sciences*, 12(4): 232-238. [# of cites: 6]
31. MEMARIAN, H., **S.K. BALASUNDRAM**, J. TALIB, M.S. ALIAS and K.C. ABBASPOUR. 2012. Trend analysis of water discharge and sediment load during past three decades of development at the Langat Basin, Malaysia. *Hydrological Sciences Journal*, 57(6): 1-16. [# of cites: 16]
32. MEMARIAN, H., **S.K. BALASUNDRAM**, J. TALIB, C.B.S. TEH, M.S. ALIAS, K.C. ABBASPOUR and A. HAGHIZADEH. 2012. Hydrologic analysis of a tropical watershed using KINEROS2. *EnvironmentAsia*, 5(1): 84-93. [# of cites: 17]
33. BAH, A., **S.K. BALASUNDRAM** and M.H.A. HUSNI. 2012. Sensor technologies for precision soil nutrient management and monitoring. *American Journal of Agricultural and Biological Sciences*, 7(1): 43-49. [# of cites: 9]
34. JEYANNY, V., **S.K. BALASUNDRAM** and M.H.A. HUSNI. 2011. Geo-spatial technologies for carbon sequestration monitoring and management. *American Journal of Environmental Sciences*, 7(5): 456-462.
35. EBRAHIMPOUR, M., **S.K. BALASUNDRAM**, J. TALIB, A.R. ANUAR and H. MEMARIAN. 2011. Accuracy of GeoWEPP in estimating sediment load and runoff from a tropical watershed. *Malaysian Journal of Soil Science*, 15(1): 25-33. [# of cites: 5]
36. ELSHEIKH, R.F.A., N. AHMAD, A.R.M. SHARIFF, **S.K. BALASUNDRAM** and S. YAHAYA. 2010. An agricultural investment map based on geographic information system and multi-criteria method. *Journal of Applied Sciences*, 10(15): 1596-1602. [# of cites: 2]
37. LIAGHAT, S. and **S.K. BALASUNDRAM**. 2010. A review: The role of remote sensing in precision agriculture. *American Journal of Agricultural and Biological Sciences*, 5(1): 50-55. [# of cites: 28]
38. LAW, M.C., **S.K. BALASUNDRAM**, M.H.A. HUSNI, O.H. AHMED and M.H. HARUN. 2009. Spatial variability of soil organic carbon in oil palm: A comparison between young and mature stands. *International Journal of Agricultural Research*, 4(12): 402-417. [# of cites: 4]
39. LAW, M.C., **S.K. BALASUNDRAM**, M.H.A. HUSNI, O.H. AHMED and M.H. HARUN. 2009. Spatial variability of soil organic carbon in oil palm. *International Journal of Soil Science*, 4(4): 93-103. [# of cites: 11]
40. **BALASUNDRAM, S.K.**, K.I. AHMAD FADHLIL and NINI SOPIAN. 2009. A remote sensing approach to estimate stand density in oil palm. *Journal of ISSAAS (International Society of Southeast Asian Agricultural Sciences)*, 15(1): 188.
41. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and O.H. AHMED. 2008. Spatial variability of pineapple yields on tropical peat. *Crop Management*. DOI: 10.1094/CM-2008-0418-01-RS.
42. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and O.H. AHMED. 2008. Application of geostatistical tools to quantify spatial variability of selected soil chemical properties from a cultivated tropical peat. *Journal of Agronomy*, 7(1): 82-87. [# of cites: 16]
43. **BALASUNDRAM, S.K.**, D.J. MULLA and P.C. ROBERT. 2007. Spatial data calibration for site-specific phosphorus management. *International Journal of Agricultural Research*, 2(11): 888-899. [# of cites: 6]
44. **BALASUNDRAM, S.K.**, D.J. MULLA and P.C. ROBERT. 2006. Accounting for spatial variability in a short-term fertilizer trial for oil palm. *International Journal of Soil Science*, 1(3): 184-195. [# of cites: 4]
45. **BALASUNDRAM, S.K.**, P.C. ROBERT and D.J. MULLA. 2006. Relationship between oil content and fruit surface color in oil palm (*Elaeis guineensis* Jacq.). *Journal of Plant Sciences*, 1(3): 217-227. [# of cites: 26]

46. **BALASUNDRAM, S.K.**, P.C. ROBERT, D.J. MULLA and D.L. ALLAN. 2006. Relationship between oil palm yield and soil fertility as affected by topography in an Indonesian plantation. *Communications in Soil Science and Plant Analysis*, 37(9&10): 1321-1337. [# of cites: 10]
47. **BALASUNDRAM, S.K.**, P.C. ROBERT, D.J. MULLA and D.L. ALLAN. 2006. Spatial variability of soil fertility variables influencing yield in oil palm (*Elaeis guineensis* Jacq.). *Asian Journal of Plant Sciences*, 5(2): 397-408. [# of cites: 6]
48. **SIVA, K.B.**, H. AMINUDDIN, M.H.A. HUSNI and A.R. MANAS. 2000. NH₃ volatilization from urea as affected by humic substances derived from palm oil mill effluent (POME) and tropical peat. *Tropical Agriculture (Trinidad & Tobago)*, 77(1): 13-20. [# of cites: 5]
49. **SIVA, K.B.**, H. AMINUDDIN, M.H.A. HUSNI and A.R. MANAS. 1999. Effect of palm oil mill effluent (POME) and tropical peat on NH₃ volatilization from urea. *Communications in Soil Science and Plant Analysis*, 30(5&6): 785-804. [# of cites: 34]
50. **SIVA, K.B.**, H. AMINUDDIN, M.H.A. HUSNI and A.R. MANAS. 1998. Analytical attributes of humic acids derived from tropical-based resources. *Pertanika Journal of Tropical Agricultural Science*, 21(1): 53-58. [# of cites: 2]
51. HUSNI, M.H.A., SHANTI DEVI, A.R. MANAS and **K.B. SIVA**. 1996. Physico-chemical attributes of humic acid extracted from tropical peat soils. *Pertanika Journal of Tropical Agricultural Science*, 19(2&3): 189-196. [# of cites: 3]
52. HASHIM, A.B., H. AMINUDDIN and **K.B. SIVA**. 1996. Nutrient content in rice husk ash of some Malaysian rice varieties. *Pertanika Journal of Tropical Agricultural Science*, 19(1): 77-80. [# of cites: 15]

▪ **H-index: 10**

C. Book

1. OMAR, D., T.C. LOH, **S.K. BALASUNDRAM**, H.Z.E. JAAFAR and J. TALIB. 2009. (Editors). *Tropical Agriculture in a Changing Climate and Energy Scenario (Proceedings of Agriculture Congress 2009)*. Faculty of Agriculture, Universiti Putra Malaysia. 523 p.
2. HAMDAN, J., K.J. GOH, C.I. FAUZIAH, L. MELLING, O.H. AHMED, M.B. JALLOH, A. SAYOK and **S.K. BALASUNDRAM**. 2007. (Editors). *Peat and Other Soil Factors in Crop Production (Proceedings of Soils 2007)*. Malaysian Society of Soil Science. 376 p.
3. ZIN, Z.Z., **S.K. BALASUNDRAM**, K.J. GOH, M.M. HANAFI, A. IZHAM, C.I. FAUZIAH and M.S. HALIMI. 2004. (Editors). *Innovation in Soil Science for Sustainable Agriculture (Proceedings of Soils 2004)*. Malaysian Society of Soil Science. 229 p.

D. Book Chapter

1. MEMARIAN, H. and S.K. BALASUNDRAM. 2016. Hydrological trend analysis integrated with landscape analysis at the watershed scale (Case study: Langat Basin, Malaysia). In: A. Almusaed (Editor), *Landscape Ecology - The Influences of Land Use and Anthropogenic Impacts of Landscape Creation*. InTech. Rijeka, Croatia. Chapter 4 (Open Access).
2. AHMED, O.H., M.H.A. HUSNI, **S.K. BALASUNDRAM**, A.R. ANUAR, M.M. HANAFI and H. AMINUDDIN. 2012. Towards sustainable cultivation of pineapple on tropical peat soils. In: J. Hamdan and J. Shamshuddin (Editors), *Advances in Tropical Soil Science (Vol. 1)*. Universiti Putra Malaysia Press, Serdang, Malaysia. pp. 278-300.

E. Academic/Professional Magazine

1. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and S. SUDHARSAN. 2009. Transforming towards greener agriculture: Are we there? *IMPAK*, 4: 1-3.
2. **BALASUNDRAM, S.K.**, S. LIAGHAT and S. SUDHARSAN. 2009. Is precision agriculture the solution to a degrading environment? *IMPAK*, 3: 4-5.
3. **SIVA, K.B.**, S.R. SYED OMAR and M.H.A. HUSNI. 1999. Wetlands at the crossroads. *Agro Search*, 6(1): 31-35.
4. **SIVA, K.B.** and A.R. ANUAR. 1997. Precision agriculture: A new frontier towards improving agricultural productivity. *Agro Search*, 4(2): 24-26.
5. **SIVA, K.B.**, H. AMINUDDIN and M.H.A. HUSNI. 1996. The nicest soil we ever saw. *Agro Search*, 3(2): 23-24.

F. Conference/Seminar/Workshop Proceedings

1. HUN, K.S., A.R. ANUAR, **S.K. BALASUNDRAM**, O.H. AHMED and H. AMINUDDIN. 2015. Spatial variability of rice yield components under irrigated direct-seeded cultivation. In: C.I. Fauziah et al. (Editors), Proc. Soils 2015, Putrajaya. Malaysian Society of Soil Science (MSSS). pp. 62-67.
2. SALHA, M.S., **S.K. BALASUNDRAM** and J. SHAMSHUDDIN. Spatial variability of clay content and saturated hydraulic conductivity in paddy soil. In: C.I. Fauziah et al. (Editors), Proc. Soils 2015, Putrajaya. Malaysian Society of Soil Science (MSSS). pp. 129-131.
3. JEYANNY, V., K. WAN RASIDAH, M.H.A. HUSNI and **S.K. BALASUNDRAM**. 2015. Tropical montane forest: The unusual suspect in carbon storage and its importance to soil security. In: C.I. Fauziah et al. (Editors), Proc. Soils 2015, Putrajaya. Malaysian Society of Soil Science (MSSS). pp. 46-49.
4. NORUL HUSNA, A.K. and **S.K. BALASUNDRAM**. 2014. Fluorescence sensing as a tool to estimate palm oil quality and yield. In: I. Ahmad et al. (Editors), Proc. International Agriculture Congress, Putrajaya. Universiti Putra Malaysia. pp. 802-804.
5. **BALASUNDRAM, S.K.**, S. SELVARAJA, G. VADAMALAI and M.H.A. HUSNI. 2014. Assessment of orange spotting disease in oil palm using a remote sensing approach. In: M.Y. Wong et al. (Editors), Proc. International Conference on Plant Protection in the Tropics, Kuala Lumpur. Malaysian Plant Protection Society (MAPPS). pp. 8-13.
6. JEYANNY, V., M.H.A. HUSNI, K. WAN RASIDAH, **S.K. BALASUNDRAM**, and A. ARIFIN. 2014. Contribution of duff towards C stocks in a tropical montane forest. In: A. Rosazlin et al. (Editors), Proc. Soils 2014, Kangar, Perlis. Malaysian Society of Soil Science (MSSS). pp. 281-284.
7. JEYANNY, V., M.H.A. HUSNI, K. WAN RASIDAH, **S.K. BALASUNDRAM**, and A. ARIFIN. 2013. Carbon stocks estimation in a tropical lowland and montane forest. In: K.S. Gan et al. (Editors), Proc. Agri-Dana Seminar 2013, Shah Alam, Selangor. pp. 177-179.
8. JEYANNY, V., M.H.A. HUSNI, K. WAN RASIDAH, **S.K. BALASUNDRAM**, A. ARIFFIN and M. FIRDAUS. 2013. Carbon stocks and fluxes in a tropical lowland and montane forest. In: K. Wan Rasidah et al. (Editors), Proc. Soils 2013 (Good Agriculture Practices for Soil Health Sustainability), Gambang, Pahang. Malaysian Society of Soil Science (MSSS). pp. 274-278.
9. **BALASUNDRAM, S.K.**, A.K. FAIZAH, G. VADAMALAI and M.H.A. HUSNI. 2012. A non-destructive method of estimating red tip disease in pineapple. In: R. Khosla et al. (Editors), Proc. 11th International Conference on Precision Agriculture, Indianapolis, Indiana, USA. International Society of Precision Agriculture. (Electronic copy).
10. JEYANNY, V., M.H.A. HUSNI, K. WAN RASIDAH, **S.K. BALASUNDRAM**, A. ARIFFIN and M. FIRDAUS. 2012. Comparison of selected soil chemical properties and forest floor depth in a tropical lowland and montane forest. In: Proc. International Conference on Sustainable Forest Management - The 2nd Forest Science Forum, Beijing, China.
11. MEMARIAN, H, **S.K. BALASUNDRAM**, K.C. ABBASPOUR, J. TALIB, C.B.S. TEH and M.S. ALIAS. 2012. Soil and water assessment of a tropical watershed using SWAT. In: K. Wan Rasidah et al. (Editors), Proc. Soils 2012 (Soil Quality towards Sustainable Agriculture Production), Kota Bharu, Kelantan. Malaysian Society of Soil Science (MSSS). pp. 491-502.
12. FAIZAH, A.K, W.L. LIM, W.H. LAU, J. KADIR, M.H.A. HUSNI, **S.K. BALASUNDRAM** and G. VADAMALAI. 2012. Characterization of a virus associated with red tip disease and its severity in pineapple (*Ananas comosus*). In: Book of Abstracts, International Conference on Mycology and Plant Pathology Biotechnological Approaches, Varanasi, India. Banaras Hindu University. p.156.
13. MEMARIAN, H, **S.K. BALASUNDRAM**, C.B.S. TEH, M.S. ALIAS, K.C. ABBASPOUR and J. TALIB. 2011. KINEROS2 application for soil erosion and sedimentation modeling in a watershed scale. In: M. Sudin et al. (Editors), Proc. Soils 2011 (Soil Fertility and Plantation Productivity), Kota Kinabalu, Sabah. Malaysian Society of Soil Science (MSSS). pp. 77-87.
14. VADAMALAI, G., W.L. LIM, M.H.A. HUSNI, J. KADIR, W.H. LAU and **S.K. BALASUNDRAM**. 2010. Association of a tospovirus with pineapple red-tip disease. In: Book of Abstracts, ISSAAS International Congress (Agricultural Adaptation in Response to Climate Change), Bali, Indonesia. International Society for Southeast Asian Agricultural Sciences (ISSAAS). p. 278.

15. LIAGHAT, S. and **S.K. BALASUNDRAM**. 2009. Study on biology of the tobacco beetle, *Lasioderma serricornis* F. under laboratory conditions. In: D. Omar et al. (Editors), Proc. 3rd Agriculture Congress, Seri Kembangan, Selangor. Faculty of Agriculture, Universiti Putra Malaysia. pp. 436-438.
16. ROSLINA, S., T. SATHIS SRI, J. KADIR, **S.K. BALASUNDRAM**, M.H.A. HUSNI, W.H. LAU, Y.H. TAN and G. VADAMALAI. 2009. First report of stem canker on *Jathropha curcas* in Malaysia. In: D. Omar et al. (Editors), Proc. 3rd Agriculture Congress, Seri Kembangan, Selangor. Faculty of Agriculture, Universiti Putra Malaysia. pp. 338-339.
17. **BALASUNDRAM, S.K.**, A.K. FAIZAH, G. VADAMALAI and M.H.A. HUSNI. 2009. Estimating red tip disease severity in pineapple using an optical ground sensor. In: Book of Abstracts, 3rd Regional Conference on Natural Resources in the Tropics (Harnessing Tropical Natural Resources through Innovations and Technologies), Kuching, Sarawak. Universiti Malaysia Sarawak. pp. 58-59.
18. LAW, M.C., **S.K. BALASUNDRAM**, M.H.A. HUSNI, O.H. AHMED and M.H. HARUN. 2009. Spatial variability of soil organic carbon in young and mature oil palm. In: Book of Abstracts, 3rd Regional Conference on Natural Resources in the Tropics (Harnessing Tropical Natural Resources through Innovations and Technologies), Kuching, Sarawak. Universiti Malaysia Sarawak. p. 77.
19. LAW, M.C., **S.K. BALASUNDRAM**, M.H.A. HUSNI, O.H. AHMED and M.H. HARUN. 2009. Spatial variability of soil organic carbon in oil palm. In: M. Zulkefli et al. (Editors). Proc. Soils 2009 (Soil Health: Preserving Resources for Sustainable Agriculture), Kuala Terengganu, Terengganu. Malaysian Society of Soil Science (MSSS). pp. 171-176.
20. **BALASUNDRAM, S.K.** and M.H.A. HUSNI. 2008. Application of radio frequency identification technology in agriculture: A case with dragon fruit. In: Book of Abstracts, 9th International Conference on Precision Agriculture, Denver, Colorado, USA. Precision Agriculture Center, Colorado State University.
21. **BALASUNDRAM, S.K.**, K.I. AHMAD FADHLIL and NINI SOPIAN. 2008. A remote sensing approach to estimate stand density in oil palm. In: Book of Abstracts, ISSAAS International Congress (Agriculture for the 3 Es: Economy, Environment and Energy), Bangkok, Thailand. International Society for Southeast Asian Agricultural Sciences (ISSAAS). p. 35.
22. **BALASUNDRAM, S.K.**, M.Y. HAKIMAH, M.C. SEKAR, M.H.A. HUSNI and O.H. AHMED. 2007. Is there a need for precision pineapple management? In: J. Hamdan et al. (Editors), Proc. Soils 2007 (Peat and Other Soil Factors in Crop Production), Mukah, Sarawak. Malaysian Society of Soil Science (MSSS). pp. 171-178.
20. **BALASUNDRAM, S.K.**, M.H.A. HUSNI, O.H. AHMED and M.Y. HAKIMAH. 2006. Spatial variability of nutrient uptake by pineapple. In: D. Omar et al. (Editors), Proc. 2nd Agriculture Congress, Putrajaya, Malaysia. Faculty of Agriculture, Universiti Putra Malaysia. pp. 425-428.
21. BAKAR, S.A., **S.K. BALASUNDRAM** and M.K.M. SHARIFF. 2006. Suitability analysis for urban food production in Klang Valley by using GIS and AHP. In: D. Omar et al. (Editors), Proc. 2nd Agriculture Congress, Putrajaya, Malaysia. Faculty of Agriculture, Universiti Putra Malaysia. pp. 429-431.
22. **BALASUNDRAM, S.K.**, S. TOTOK, M.H.A. HUSNI and A.R. ANUAR. 2006. A non-destructive technique for estimating crude palm oil quality. In: D.J. Mulla et al. (Editors), Proc. 8th International Conference on Precision Agriculture, Minneapolis, Minnesota, USA. Precision Agriculture Center, University of Minnesota. (Electronic copy).
23. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and O.H. AHMED. 2006. Site-specific soil management for pineapple production on a tropical peat. In: Book of Abstracts, 18th World Congress of Soil Science (Symposium: Emerging Topics in Soil Use and Management), Philadelphia, Pennsylvania, USA. International Union of Soil Sciences (IUSS). pp. 464.
24. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and O.H. AHMED. 2006. Precision pineapple management on tropical peat: II. Spatial variability of selected soil chemical properties. In: C.I. Fauziah et al. (Editors). Proc. Soils 2006 (Strategies for Enhanced Soil and Crop Quality), Kuantan, Pahang. Malaysian Society of Soil Science (MSSS). pp. 89-94.
25. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and O.H. AHMED. 2005. Precision pineapple management on tropical peat: I. Spatial variability of yield. In: C.B.S Teh et al. (Editors). Proc. Soils 2005 (Advances in Soil Science for Sustainable Food Production), Sungai Petani, Kedah. Malaysian Society of Soil Science (MSSS). pp. 90-93.

26. ANUAR, A.R., K.J. GOH, O.H. AHMED, H.H. GAN and **S.K. BALASUNDRAM**. 2005. Experimental designs, analysis and interpretations in research and development trials. In: Proc. MOSTA Series of Workshops on Best Practices in Palm Oil Industry. Malaysian Oil Scientists' and Technologists' Association (MOSTA) and Institut Kimia Malaysia (IKM).
27. **BALASUNDRAM, S.K.**, D.J. MULLA and P.C. ROBERT. 2004. Identification and removal of spatial trend in a short-term fertilizer trial for oil palm. In: Z.H. Shamsuddin et al. (Editors), Proc. 1st Agriculture Congress, Seri Kembangan, Selangor. Faculty of Agriculture, Universiti Putra Malaysia. pp. 110-116.
28. **BALASUNDRAM, S.K.**, D.J. MULLA and P.C. ROBERT. 2004. A simple data analysis protocol for site-specific phosphorus management. In: Book of Abstracts, 1st Asian Conference on Precision Agriculture, Kuala Lumpur, Malaysia. Malaysian Center of Remote Sensing (MACRES) and Universiti Putra Malaysia (UPM). pp. 37.
29. **BALASUNDRAM, S.K.** and A.R. ANUAR. 2004. Disseminating the concept of precision agriculture to plantation personnel. In: Z.Z. Zin et al. (Editors). Proc. Soils 2004 (Innovation in Soil Science for Sustainable Agriculture), Batu Ferringhi, Penang. Malaysian Society of Soil Science (MSSS). pp. 226-229.
30. **BALASUNDRAM, S.K.**, P.C. ROBERT and P.H. GOWDA. 2003. Estimating oil content based on oil palm fruit color. In: Book of Abstracts, 4th European Conference on Precision Agriculture, Berlin, Germany. ZALF, Muencheberg and ATB, Potsdam. pp. 357-358.
31. **BALASUNDRAM, S.K.** and P.C. ROBERT. 2002. Spatial variability of selected soil properties as influenced by topography in a South Sumatran oil palm plantation. In: P.C. Robert et al. (Editors), Proc. 6th International Precision Agriculture Conference, Minneapolis, Minnesota, USA. Precision Agriculture Center, University of Minnesota. pp. 596-613. (Electronic copy).
32. **SIVA, K.B.** and P.C. ROBERT. 2002. Site-specific strategies for oil palm plantation: An Indonesian perspective. In: Book of Abstracts, ASA-CSSA-SSSA Annual Conference, Indianapolis, Indiana, USA. American Society of Agronomy. pp. 253.
33. ROSMARINA, A.K., **K.B. SIVA** and H. AMINUDDIN. 1998. Improving efficiency of CIPR using CIPR-TSP mixtures. In: Proc. Soil Science Conference of Malaysia. Malaysian Society of Soil Science (MSSS). pp. 282-288.
34. **SIVA, K.B.**, H. AMINUDDIN and M.H.A. HUSNI. 1997. Humic acid as ammonia volatilization inhibitor for urea. In: Proc. Soil Science Conference of Malaysia. Malaysian Society of Soil Science (MSSS). pp. 32-41.
35. AMINUDDIN, H. and **K.B. SIVA**. 1997. Determination of field soil phosphate of flooded rice soils using the iron oxide-impregnated strip. In: Proc. Soil Science Conference of Malaysia. Malaysian Society of Soil Science (MSSS). pp. 42-46.

TECHNICAL PRESENTATION

Invited

1. **BALASUNDRAM, S.K.** 2016. Precision agriculture strategies for sustainable management of crop and soil. Paper presented at International Conference on Inventions and Innovations for Sustainable Agriculture (ICIISA). Silpakorn University-Walailak University-Chonnam National University. July 7-9, 2016. Hua Hin, Thailand.
2. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and A.S. JURAIMI. 2015. Towards a greener agriculture. Paper presented at ISSAAS Congress (Agricultural Sciences for Sustainable Development). International Society of Southeast Asian Agricultural Sciences (ISSAAS), Japanese Chapter. November 7-9, 2015. Tokyo, Japan.
3. MULLA, D.J. and **S.K. BALASUNDRAM**. 2015. Advances in hyperspectral imaging applications for sustainable oil palm productivity. Paper presented at PIPOC (Oil Palm: Powering the World, Sustaining the Future). Malaysian Palm Oil Board. October 6-8, 2015. Kuala Lumpur, Malaysia.
4. **BALASUNDRAM, S.K.** 2015. Precision nutrient management and monitoring. Paper presented at Geosmart Asia (GeoAgri Track). Geospatial Media and Communications. September 29- October 1, 2015. Kuala Lumpur, Malaysia.
5. **BALASUNDRAM, S.K.** 2015. Selected precision agriculture studies in oil palm: A 10-year summary. Paper presented at 18th International Oil Palm Conference. Fedepalma & Cenipalma. September 22-25, 2015. Cartagena de Indias, Colombia.

6. **BALASUNDRAM, S.K.** 2014. Precision soil nutrient management and monitoring. Paper presented at Workshop on Fertilizer of the Future. OCP Group. October 21, 2014; Marrakech, Morocco.
7. **BALASUNDRAM, S.K.** 2012. Precision agriculture for pineapple. Paper presented at Industry Outreach Seminar for Extension Officers. Malaysian Pineapple Industry Board and Faculty of Agriculture, Universiti Putra Malaysia. February 13-17, 2012; Klang, Selangor, Malaysia.
8. **BALASUNDRAM, S.K.** 2008. 'Disneyfication' of agriculture. Paper presented at Rotary Club International Officers' Meeting. Rotary Club of Puchong Centennial. April 3, 2008; Puchong, Selangor, Malaysia.
9. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and M. THAVALINGAM. 2007. Using precision agriculture to enhance crop production and quality. Paper presented at Advanced Global Biofuels Summit. Quality and Productivity Center (IQPC), Singapore. September 3-6, 2007; Bangkok, Thailand.
10. **BALASUNDRAM, S.K.** 2007. Precision agriculture for oil palm. Paper presented at Hands-on Course on Quantifying Soil Variation and How to Use This Information for Agricultural Management. Agriculture Crop Trust (ACT) and Malaysian Society of Soil Science (MSSS). April 23, 2007; Kuala Lumpur, Malaysia.
11. **BALASUNDRAM, S.K.** 2006. An introduction to precision agriculture. Paper presented at IAAS World Congress (Line: New Technologies in the Agricultural Sector). International Association of Students in Agriculture and Related Sciences (IAAS). August 1, 2006; Port Dickson, Negeri Sembilan, Malaysia.
12. **BALASUNDRAM, S.K.** 2006. ICT applications in Malaysian agriculture. Paper presented at Colloquium on ICT Applications in Agriculture. Indian Graduates Association of Universiti Putra Malaysia (IGAUPM). February 25, 2006; Serdang, Selangor, Malaysia.
13. **BALASUNDRAM, S.K.** and A.R. ANUAR. 2006. Harnessing the benefits of precision agriculture for plantation crops. Paper presented at National Seminar on Plantation Industry. Universiti Teknologi Mara (UiTM). January 17, 2006; Kuantan, Pahang, Malaysia.

Voluntary

1. **BALASUNDRAM, S.K.** 2006. Precision agriculture: An old concept with a new twist. Paper presented at Staff Seminar. Faculty of Agriculture, Universiti Putra Malaysia. September 13, 2006; Serdang, Selangor, Malaysia.
2. **BALASUNDRAM, S.K.**, M.H.A. HUSNI and O.H. AHMED. 2005. Geostatistical analysis of selected chemical properties in a cultivated tropical peat. Paper presented at Seminar on Advances in Soil, Plant and Fertilizer Analysis. Malaysian Society of Soil Science (MSSS). August 2-5, 2005; Miri, Sarawak, Malaysia.
3. SEE, P.T., H. AMINUDDIN and **K.B. SIVA**. 1999. Leaching of nitrogen from sandy tin tailings as affected by organic amendments and nitrogen fertilization. Paper presented at Soil Science Conference of Malaysia. Malaysian Society of Soil Science (MSSS). April 20-21, 1999; Seremban, Negeri Sembilan, Malaysia.
4. ROSMARINA, A.K., **K.B. SIVA** and H. AMINUDDIN. 1999. Effect of TSP-mixed CIPR on seedling growth of oil palm. Paper presented at Seminar on Advances in Soil, Plant and Fertilizer Analysis. Malaysian Society of Soil Science (MSSS). May 25-26, 1999; Pulau Langkawi, Kedah, Malaysia.
5. AMINUDDIN, H., **K.B. SIVA**, A.B. LATIP and T. JABI. 1999. Comparison of Bray's 2 and Pi strip methods for available P in upland and lowland soils. Paper presented at Seminar on Advances in Soil, Plant and Fertilizer Analysis. Malaysian Society of Soil Science (MSSS). May 25-26, 1999; Pulau Langkawi, Kedah, Malaysia.
6. AMINUDDIN, H., A.B. LATIP and **K.B. SIVA**. 1998. Use of Pi embedded strip in comparison with other P indices as a measure of P supply of a lowland rice soil. Paper presented at Soil Science Conference of Malaysia. Malaysian Society of Soil Science (MSSS). April 21-22, 1998; Sungai Besi, Selangor, Malaysia.
7. **SIVA, K.B.**, H. AMINUDDIN, M.H.A. HUSNI, A.R. MANAS. 1996. Characterization of POME-derived humic substances. Paper presented at Seminar on Advances in Soil, Plant and Fertilizer Analysis. Malaysian Society of Soil Science (MSSS). April 17-18, 1996; Kuching, Sarawak, Malaysia.
8. HUSNI, M.H.A., B. MASSUMI, **K.B. SIVA** and A.B. HUSIN. 1996. Adsorption of copper and zinc in tropical peat. Paper presented at Soil Science Conference of Malaysia. Malaysian Society of Soil Science (MSSS). April 14-16, 1996; Kuching, Sarawak, Malaysia.

INTELLECTUAL PROPERTY

(Type | Title | Ownership | Year)

1. Patent (pending; # PI2010700099) | A Method of Assessing Suitability of Land | Abdul Rashid Mohamed Shariff, Noordin Ahmad, **Siva K Balasundram**, Mohd Amin Mohd Soom and Ranya Fadlalla Abdalla ElSheikh | 2010
2. Copyright | Agricultural Land Suitability Evaluator (ALSE) | Abdul Rashid Mohamed Shariff, Noordin Ahmad, **Siva K Balasundram**, Mohd Amin Mohd Soom and Ranya Fadlalla Abdalla ElSheikh | 2009
3. Copyright | A Computerized Digital Imaging Technique to Estimate Crude Palm Oil Based on Fruit Surface Color | **Siva K Balasundram**, Ahmad Husni Mohd Hanif and Anuar Abdul Rahim | 2008

STUDENT SUPERVISION

Postgraduate (Completed)

(Candidate | Degree | Year of Completion | Thesis Title | Role)

1. Sudharsan Selvaraja | MS | 2014 | Quantification of Orange Spotting Disease Severity in Oil Palm using Remote Sensing Techniques | **Lead Supervisor**
2. Ananda Rao Ganesar Rao | M Plantation Mgmt | 2015 | Comparison between Laser Harvesting and Conventional Harvesting of Oil Palm Fresh Fruit Bunches | **Lead Supervisor**
3. Babak Khayyambashi | PhD | 2015 | An Investigation on Zeolite and Types of Organic Matter on Zinc and Cadmium Uptake by Sorghum in Tropical Soils | **Co-Supervisor**
4. Hinda Hassan Mohamoud | M Plantation Mgmt | 2014 | Assessment of oil palm cultivation on problem soils in Malaysia | **Lead Supervisor**
5. Hadi Memarian | PhD | 2012 | Analysis and Modelling of an Urbanising Tropical Watershed for Sustainable Land Use Planning | **Lead Supervisor**
6. Izzat Fatanah Ibrahim | MS | 2012 | Morphological Assessment of Pollen Foraged by *Apis dorsata* and Spatial Distribution of Pollen Sources in Marang, Terengganu using Remote Sensing | **Lead Supervisor**
7. Mozdeh Ebrahimpour | MS | 2012 | Use of WEPP (Water Erosion Prediction Project) Software for Prediction of Sungai Lui Watershed Sediment Yield and Runoff | **Lead Supervisor**
8. Ramin Nourqolipour | PhD | 2013 | Modeling Sustainable Land Use and Land Cover Change | **Co-Supervisor**
9. Ranya Fadlalla Abdalla Elsheikh | PhD | 2011 | Decision Support System for Agriculture Management using Geographical Information System Techniques | **Co-Supervisor**
10. Shamsul Abu Bakar | MS | 2007 | Land Suitability for Rice Growing in the Klang Valley using Geographical Information System and Analytical Hierarchy Process for Urban Food Security | **Co-Supervisor**

Postgraduate (Ongoing)

(Candidate | Degree | Expected Year of Completion | Thesis Title | Role)

1. Kamlesh Golhani | PhD | 2017 | Detection of Orange Spotting Disease in Oil Palm using a Proximal Sensing and Neural Network Approach | **Lead Supervisor**
2. Sharil Azwan Mohd Zain | PhD | 2017 | Precision Pasture Management for Improved Yield and Quality | **Lead Supervisor**
3. Kang Seong Hun | PhD | 2015 | Site-specific Management of Nitrogen for Optimized Rice Production | **Lead Supervisor**
4. Norul Husna Abu Kassim | MS | 2015 | Proximal Sensing for Oil Palm Yield and Quality | **Lead Supervisor**
5. Chong Yen Mee | MS | 2015 | A Spectral Reflectance Approach to Determine Nitrogen and Potassium Balance in Peat-Grown Pineapple | **Lead Supervisor**
6. Law Mei Ching | PhD | 2015 | Soil Carbon Sequestration Potential in Oil Palm Cultivation for Mitigation of Greenhouse Effect | **Co-Supervisor**
7. Jeyanny Vijayanathan | PhD | 2015 | Soil Carbon Sequestration Potential along Elevational Gradients of Tropical Forest Reserves in Pahang | **Co-Supervisor**

8. Faizah Abu Kassim | PhD | 2015 | Molecular Characterization of Red Tip Disease in Pineapple | **Co-Supervisor**
9. Nur Shuhada Muhamad Tajudin | PhD | 2015 | Relationship between Soil Properties and Severity of Oil Palm Infected by Ganoderma | **Co-Supervisor**
10. Maisarah Burhanuddin | MS | 2015 | Ranging Behavior of Edible Bird Nest Swiftlet | **Co-Supervisor**

Undergraduate (Completed)

(Candidate | Year of Completion | Thesis Title)

1. Sarajuz Fahmi Abdullah Pirus | 2014 | Variability of Bagworm Damage in a Mature Oil Palm Stand
2. Fakhrul Islam Sulaiman | 2014 | Nitrogen Variability in a Mature Oil Palm Stand and its Relationship with Bagworm Damage
3. Noratika Abd Rauf | 2014 | Assessment of Oil Palm Fresh Fruit Bunch Ripeness using a Fluorescence Sensor
4. Alam Syah Hanafi Witno | 2014 | Potassium Variability in a Mature Oil Palm Stand
5. Farhaneem Norazman | 2013 | Estimating Oil Palm Yield using a Proximal Sensor
6. Muhammad Farhan Abdullah | 2013 | Development of Rice Management Zones
7. Muhammad Khairul Ezad Muhammed Khalid | 2012 | Monitoring Nutrient Levels in Oil Palm Using Remote Sensing Techniques
8. Muhammad Hanif Mohd Sehat | 2012 | Relationship between Remotely-sensed Vegetation Indices and Selected Soil Properties
9. Sobihah Abdullah | 2012 | Spectral Discrimination between Orange Spotting Disease and Potassium Deficiency in Oil Palm
10. Mohd Izwan Ramlan | 2012 | Relationship between Selected Vegetation Indices and Oil Palm Yield
11. Nurul Azlin Aida Ahmad | 2012 | Spectral Reflectance of Selected Bee Plants in Marang, Terengganu
12. Siti Noraini Ahmad | 2012 | Spectral Reflectance of Selected Bee Trees in Marang, Terengganu
13. Soon Ghew Ken | 2011 | Spatial Variability Assessment of Orange Spotting in Oil Palm
14. Osmund Lainsing | 2010 | Relationship between Remotely-Sensed Vegetation Indices and Oil Palm Yield
15. Mohd Fahmi Mohd Rusli | 2010 | Relationship between Remotely-Sensed Vegetation Indices and Soil Chemical Properties
16. Sharil Azwan Mohd Zain | 2009 | Relationship between Oil Palm Yield and Normalized Difference Vegetation Index
17. Faizah Abu Kassim | 2009 | Use of Handheld Remote Sensing Technology to Detect Pineapple Stress
18. Ahmad Fadhil Khaliq Ibrahim | 2008 | Use of Remote Sensing Techniques for Oil Palm Tree Counting
19. Mohammad Firdaus Abdullah | 2008 | Development of a Soil Information Database for Radio Frequency Identification on Dragon Fruit
20. Juju Nakasha Jaafar | 2008 | Development of a Digital Agronomic Database for Pitaya using Radio Frequency Identification Technology
21. Hakimah Mohd Yunus | 2007 | Spatial Variability of Macronutrient Uptake in Pineapple
22. Merina Chris Sekar | 2007 | Spatial Variability of Micronutrient Uptake in Pineapple
23. Muhammad Shukri Mat Noor | 2006 | *Variasi Ruang pada Hasil Tanaman Nenas dan Kandungan Makronutrien dalam Tanah*
24. Aisah Abd Aziz | 2005 | *Pengukuran Hasil Minyak Berdasarkan Warna Buah pada Pokok Kelapa Sawit Muda*
25. Jenefer Berok | 2005 | Estimation of Oil Quality Based on Fruit Color in Young Oil Palm
26. Wilhelmina Sedy | 2005 | Relationship between Oil Yield and Fruit Surface Color in Mature Oil Palm
27. Kalayarasi Balakrishnamurthy | 2005 | Estimation of Oil Quality Based on Fruit Color in Mature Oil Palm

POSTGRADUATE THESIS REVIEW

(Candidate | Degree | Thesis Title | Institution | Year)

1. Palanivell Perumal | **PhD** | Increasing Rice Yield by Amending Nitrogenous, Phosphatic and Potassic Fertilizers with Organic and Inorganic Amendments | 2016
2. Nur AAINAA Hasbullah | **PhD** | Amending Phosphorus Fertilizers with Clinoptilolite Zeolite to Improve Phosphorus Use Efficiency in Acid Soils | 2016
3. Alagie Bah | **PhD** | Nutrients Runoff Losses and Growth Response of Immature Oil Palm as Impacted by Application of Controlled-Release and Conventional Mixed Fertilizers | 2014
4. Chong Siam Yee | **MS** | Net Rainfall and Micro Climate Conditions Under Various Canopies | 2012
5. Rosliza Shamsuddin | **MS** | Production of N, P and K Humates from Palm Oil Mill Effluent Sludge | Universiti Putra Malaysia | 2011
6. Lee Jia Huey | **MS** | Development of Organic-Based Nitrogen and Potassium Fertilizer from Tropical Peat and Urea | Universiti Putra Malaysia | 2011
7. Ahmad Sarwani Adni | **MS** | Determination of Oil Palm Leaf Nitrogen Concentration by Reflectance Spectroscopy | Universiti Putra Malaysia | 2009
8. Mohammadmehdi Saberioon | **MS** | *Melaleuca* Forest Flowering Inventory and Mapping Using Optical and Microwave Remote Sensing | Universiti Putra Malaysia | 2009
9. Kiran Jeet Kaur Ambra Singh | **MS** | Nitrogen Release by Controlled Release Urea and Nitrogen Uptake by Rice | Universiti Putra Malaysia | 2008
10. Jamaluddin Nasir | **MS** | Application of Soil Electrical Conductivity in Site-Specific Management of Oil Palm Plantation | Universiti Putra Malaysia | 2006
11. Soontaree Boonme | **MS** | Land Suitability Evaluation and Fertility Capability Classification in Land Reform Area within Maha Sarakham Province, Thailand | Universiti Putra Malaysia | 2005

TEACHING

Postgraduate (Currently Taught)

(Course Name | Course Code | Credit hours | Semester Offered | Role)

1. Principles and Applications of Precision Agriculture | TKP 5401 | (2+1) | 1 | **Lead Instructor/Coordinator**

Postgraduate (Previously Taught)

(Course Name | Course Code | Credit hours | Semester Offered | Role)

1. Sustainable Land Development | SST 5601 | (3+0) | 2 | **Co-Instructor**

Undergraduate

(Course Name | Course Code | Credit hours | Semester Offered | Role)

1. Modern Agricultural Technology | TKP 3001 | (2+1) | 1 & 2 | **Lead Instructor/Coordinator**
2. Precision Agriculture | PRT 4002 | (2+1) | 1 & 2 | **Lead Instructor/Coordinator**
3. Agriculture and Man | PRT 2008 | (2+0) | 1 & 2 | **Lead Instructor**

▪ **Teaching evaluation (averaged from 2010 to 2012): 4.63 (out of 5.00)**

External (Invited)

(Institution | Level | Course Name | Course Code | Credit hours | Date | Role)

1. Universiti Darul Iman | BS | Precision Farming | AMS 4123 | (2+1) | July, 2009 (one cycle) | **Lead Instructor/Coordinator**
2. Kolej Risda | Diploma | Technology in Agriculture | TKP 2000 (1+1) | December, 2007-2010 (four cycles) | **Coordinator**
3. Sime Darby Plantation Academy | Diploma | Technology in Agriculture | TKP 2000 (1+1) | July, 2005-2011 (seven cycles) | **Lead Instructor/Coordinator**

CONSULTANCY

(Work Scope | Client | Year | Man Month(s) | Role)

1. Developing precision agriculture solutions for biofuel feedstock production | Kelana Stabil Sdn Bhd | 2008 | 1.0 | **Lead Consultant**
2. Development of non-destructive assessment tools for precision oil palm management | Komconsult Sdn Bhd | 2007-2009 | 3.0 | **Lead Consultant**
3. Assessment of global market opportunities for precision agriculture | Frost and Sullivan | 2007 | 1.5 | **Lead Consultant**
4. Embedding precision agriculture components into a Plantation Management Information System (PMIS) | Rann Consulting Sdn Bhd | 2007 | 1.5 | **Lead Consultant**

INDUSTRY OUTREACH

(Engagement Scope | Collaborating Company | Role | Duration)

1. Development of information technology platforms for agricultural land use | EBSM Sdn Bhd | **Resource Person** | 2011-Present
2. Application of optical sensors for diagnosis of crop stress | Elite Scientific Instruments Sdn Bhd | **Resource Person** | 2010-Present
3. Site-specific crop and soil management for oil palm | Agrinos (M) Bhd | **Resource Person** | 2010-Present
4. Development of decision support tools for oil palm management | Rann Consulting Sdn Bhd | **Resource Person** | 2006-2007
5. Diagnosing precision agriculture needs for peat-grown pineapple | Peninsular Plantations Sdn Bhd | **Resource Person** | 2005-2007
6. Exploring the potential for a palm oil-based bio-surfactant to manage pest and disease problems at the nursery stage | Sovereign Innovations Sdn Bhd | **Resource Person** | 2005-2006
7. Digital Elevation Model (DEM) and vector map data on West Kalimantan based on satellite imagery | Asiatic Development Bhd | **Resource Person** | 2005-2006
8. Runoff losses and effect of compaction on the growth and yield of oil palm | United Plantations Bhd | **Resource Person** | 2005-2005
9. Use of spatial information tools for oil palm health monitoring | Comintel Sdn Bhd | **Resource Person** | 2004-2006

EXPERT/TECHNICAL CONTRIBUTION

(Appointment | Appointing Entity | Year)

1. **Reviewer** of manuscript entitled 'Effect of long-term fertilization on soil carbon and nitrogen in Chinese mollisols' | Agronomy Journal | 2013
2. **Reviewer** of Research Grant proposal entitled 'Sparing land for rainforest: Understanding the effect of best management practices on oil palm growth and fruit development in smallholder plots in Indonesia' | Netherlands Organization for Scientific Research (NWO), Council for Earth and Life Sciences | 2013
3. **Reviewer** of manuscript entitled 'Artificial neural network in predicting rice yield' | International Conference on Agricultural and Food Engineering for Life | 2012
4. **Reviewer** of manuscript entitled 'Feature extraction for head and broken rice detection using image processing techniques' | International Conference on Agricultural and Food Engineering for Life | 2012
5. **Reviewer** of manuscript entitled 'Spatial data infrastructure practices in agriculture information system for Malaysian agricultural agencies' | Pertanika Journal of Tropical Agricultural Science | 2012
6. **Reviewer** of manuscript entitled 'Chemical and physical properties of Andosols in Aomori prefecture described in a report on reclaimed land soil' | Journal of Agronomy | 2012
7. **Reviewer** of manuscript entitled 'Alleviation of adverse effects of seawater on growth and chemical constituents of *Chrysanthemum morifolium* by foliar Fe and Mn applications' | American Journal of Plant Nutrition and Fertilization Technology | 2012
8. **Associate Editor** | Journal of Agronomy | 2012-2015

9. **Associate Editor** | Journal of Plant Sciences | 2012-
10. **Associate Editor** | International Journal of Soil Science | 2012-
11. **Associate Editor** | International Journal of Agricultural Research | 2012-
12. **Associate Editor** | American Journal of Plant Nutrition and Fertilization Technology | 2012-
13. **Reviewer** of manuscript entitled 'Land is development: A developmental sustainability model for trade integration for Africa's advancement | USM-AUT International Conference on Sustainable Economic Development: Policies and Strategies | 2012
14. **Reviewer** of manuscript entitled 'Agriculture co-operatives society in Perak: The relationship of educational background and training attended with the competency of BODs | USM-AUT International Conference on Sustainable Economic Development: Policies and Strategies | 2012
15. **Reviewer** of manuscript entitled 'Estimating the size of human settlement of Bujang Valley, Kedah using geographic information system' | Journal of Malaysian Studies | 2012
16. **Reviewer** of manuscript entitled 'Spatial distribution of lead in calcareous soil and rice seeds of Khuzestan, Iran' | Malaysian Journal of Soil Science | 2011
17. **Invited Exhibitor** of Research Product at Research Exhibition at Langkawi International Dialogue | Research Management Center, Universiti Putra Malaysia | 2011
18. **Invited Exhibitor** of Research Product at Agricultural Scientific Information Workshop | Center for Agricultural Biosciences International and Universiti Putra Malaysia | 2011
19. **Reviewer** of manuscript entitled 'Spatial variability of selected chemical characteristics of paddy soils in Sawah Sempadan, Selangor, Malaysia | Malaysian Journal of Soil Science | 2010
20. **Subject Matter Expert** for Focus Group on Technology for Renewable Energy | Ministry of Science, Technology and Innovation | 2010
21. **Subject Matter Expert** for Agriculture Specialist Clinic during MAHA 2010 | Faculty of Agriculture, Universiti Putra Malaysia | 2010
22. **Expert Reference** on Precision Agriculture for Laboratory Support Staff Training | Faculty of Agriculture, Universiti Putra Malaysia | 2010
23. **Reviewer** of manuscript entitled 'Precision farming techniques in controlled environment greenhouse for enhancing productivity and quality of selected crop produce' | Journal of Tropical Agriculture and Food Science | 2009
24. **Reviewer** of Fundamental Research Grant Scheme (FRGS) proposal entitled 'Density and distribution of *Apis dorsata* bee trees and honey yield forecast using remote sensing in Kenyir Lake area, Terengganu' | Faculty of Agriculture, Universiti Putra Malaysia | 2009
25. **Trainer** for Course on Soil Fertility Management for Field Support Staff | Agriculture Park, Universiti Putra Malaysia | 2009
26. **Subject Matter Expert** for Application of Wireless Sensor System in Agriculture | Center of Excellence for Sensor Technology, Universiti Putra Malaysia | 2009-2010
27. **Trainer** for Preparing Tutors for Graduate Study | Center for Academic Development, Universiti Putra Malaysia | 2008-Present
28. **Editorial Board Member** | Malaysian Journal of Soil Science | 2008-Present
29. **Reviewer** of manuscript entitled 'A spatial decision support tool for oil palm plantation management' | Pertanika Journal of Tropical Agricultural Science | 2008
30. **Invited Exhibitor** of Research Product at Malaysian Agriculture, Horticulture and Agrotourism (MAHA) Show | Research Management Center, Universiti Putra Malaysia | 2008
31. **Subject Matter Expert** for *Tunas Putra* Quiz, Held in Conjunction with Invention, Research and Innovation Exhibition | Research Management Center, Universiti Putra Malaysia | 2008
32. **Subject Matter Expert** for Competency Assessment (PTK) of Support Staff | Registrar's Office, Universiti Putra Malaysia | 2008
33. **Examiner** for Tenureship of Assistant Science Officer (IT Unit) | Faculty of Agriculture, Universiti Putra Malaysia | 2008
34. **Reviewer** of Science Fund (SF) proposal entitled 'A GIS and biophysical integration modelling system for pig waste management in Malaysia' | Faculty of Agriculture, Universiti Putra Malaysia | 2007
35. **Reviewer** of manuscript entitled 'Humic acids and their chemical characteristics derived from coals and composts' | Journal of Tropical Agriculture and Food Science | 2007
36. **Reviewer** of manuscript entitled 'Leaf area index model for oil palm fresh fruit bunch yield prediction' | Pertanika Journal of Tropical Agricultural Science | 2007
37. **Reviewer** of manuscript entitled 'Nitrogen contents of rice panicle and paddy as determined by hyperspectral remote sensing' | Pakistan Journal of Biological Sciences | 2007

38. **Reviewer** of manuscript entitled 'Physical and chemical properties in relation to the management of an ultisol developed on coastal plain sands at Onne, Rivers State, Nigeria' | International Journal of Soil Science | 2007
39. **Reviewer** of manuscript entitled 'Spatial prediction of surface soil properties using terrain and remotely sensed data' | Journal of Applied Sciences | 2007
40. **Invited Exhibitor** of Research Product at Research Exhibition, Held in Conjunction with Signing of Memorandum of Understanding between Ministry of Agriculture and Agro-based Industry and Universiti Putra Malaysia | Research Management Center, Universiti Putra Malaysia | 2007
41. **Invited Exhibitor** of Research Product at Research Exhibition, Held in Conjunction with National Career Carnival | Research Management Center, Universiti Putra Malaysia | 2007
42. **Editorial Board Member** | International Journal for Agricultural Research | 2006-2008
43. **Facilitator** at Workshop on Strategic Planning | Institute of Plantation Studies, Universiti Putra Malaysia | 2005

PROFESSIONAL AFFILIATION

(Organization | Role (Tenure))

1. International Society of Precision Agriculture (ISPA) | **Country Representative** (2011-Present)
2. Agricultural Institute of Malaysia (AIM) | **Honorary Secretary** (2009-2011), **Council Member** (2007-2009)
3. International Society of Southeast Asian Agricultural Sciences (ISSAAS), Malaysian Chapter | **Committee Member** (2007-2010; 2012-2014)
4. Malaysian Society of Soil Science (MSSS) | **Assistant Secretary** (2006-2007), **Assistant Treasurer** (2005-2006), **Committee Member** (2004-2005)
5. Sarawak Development Institute (SDI) | **Invited Member** (2000-Present)
6. International Union of Soil Science (IUSS) | **Member** (1999-Present)

PROFESSIONAL ENGAGEMENT

(Event | Organizer | Date | Location | Role)

1. 1st Annual International Conference on Agriculture: Environmental Studies and Engineering (AESE) | August 5-6, 2013 | Singapore City | **Member of Program Committee**
2. 4th Agriculture Congress | Faculty of Agriculture, Universiti Putra Malaysia | September 4-6, 2012 | Putrajaya | **Member of Scientific and Technical Committee**
3. 11th International Conference on Precision Agriculture | International Society of Precision Agriculture | July 15-18, 2012 | Indianapolis, Indiana, USA | **Chairman of Session**
4. Soils 2012 | Malaysian Society of Soil Science | April 10-12, 2012 | Kota Bharu, Kelantan | **Judge for Poster Evaluation**
5. International Conference on Mycology and Plant Pathology Biotechnological Approaches | Banaras Hindu University, Varanasi, India | February 27-29, 2012 | **Co-Chairman of Session**
6. Soils 2011 | Malaysian Society of Soil Science | April 19-21, 2011 | Kota Kinabalu, Sabah | **Chief Judge for Poster Evaluation**
7. Workshop on Genomics and Bioinformatics for Agricultural Applications | Faculty of Agriculture, Universiti Putra Malaysia and Malaysian Genomics Research Center | February 28, 2011 | Serdang, Selangor | **Member of Organizing Committee**
8. 6th International Remote Sensing and GIS Conference and Exhibition | Malaysian Remote Sensing Society | April 28-29, 2010 | Kuala Lumpur | **Chairman of Session**
9. International Conference on Food Security during Challenging Times | Universiti Putra Malaysia and University of Montpellier, France | July 5-7, 2010 | Serdang, Selangor | **Member of Finance Committee**
10. 3rd Agriculture Congress | Faculty of Agriculture, Universiti Putra Malaysia | October 27-29, 2009 | Seri Kembangan, Selangor | **Organizing Secretary**
11. 3rd Regional Conference on Natural Resources in the Tropics ((Harnessing Tropical Natural Resources through Innovations and Technologies) | Universiti Malaysia Sarawak | August 3-5, 2009 | Kuching, Sarawak | **Chairman of Session**

12. 9th International Conference on Precision Agriculture | Colorado State University, International Plant Nutrition Institute and Foundation for Agronomic Research | July 20-23, 2008 | Denver, Colorado, USA | **Chairman of Session**
13. Soils 2007 | Malaysian Society of Soil Science | April 17-19, 2007 | Mukah, Sarawak | **Member of Scientific and Technical Committee**
14. 2nd Agriculture Congress | Faculty of Agriculture, Universiti Putra Malaysia | December 12-15, 2006 | Putrajaya | **Member of Venue Committee and Congress Emcee**
15. 8th International Conference on Precision Agriculture | Precision Agriculture Center, University of Minnesota | July 23-26, 2006 | Minneapolis, Minnesota, USA | **Chairman of Session**
16. Biodiesel Colloquium | Institute of Plantation Studies, Universiti Putra Malaysia | February 28, 2006 | Serdang, Selangor | **Member of Scientific and Technical Committee**
17. Soils 2006 | Malaysian Society of Soil Science | April 18-20, 2006 | Kuantan, Pahang | **Organizing Secretary**
18. Workshop on Building Smart Partnerships for Academic Collaboration | Faculty of Agriculture, Universiti Putra Malaysia | December 9, 2005 | Sepang, Selangor | **Organizing Secretary**
19. Colloquium on ICT-enabled Agriculture | Agrobio Cluster, Universiti Putra Malaysia | July 28, 2005 | Serdang, Selangor | **Organizing Secretary**
20. Workshop on Recognizing Agricultural Graduates as Professionals in Malaysia | Faculty of Agriculture, Universiti Putra Malaysia in collaboration with the Ministry of Agriculture and Agro-based Industry, and the Agricultural Institute of Malaysia (AIM) | April 22, 2005 | Serdang, Selangor | **Organizing Secretary**
21. Forum on Open Field Burning in Malaysian Rice Paddies | Malaysian Society of Soil Science | June 11, 2004 | Serdang, Selangor | **Organizing Chairman**
22. Soils 2004 | Malaysian Society of Soil Science | April 13-14, 2004 | Batu Ferringhi, Penang | **Secretary of Scientific and Technical Committee**
23. Soils 1999 | Malaysian Society of Soil Science | April 20-21, 1999 | Seremban, Negeri Sembilan | **Organizing Secretary**

STUDENT DEVELOPMENT ACTIVITY

(Appointment | Activity | Organizer | Year)

1. **Advisor** | Hindu Society of Universiti Putra Malaysia (PHUPM) | 2013-2014
2. **Scientific Advisor** | International Agriculture Students Symposium (IASS) | Agriculture Students Society, Universiti Putra Malaysia | 2012-2014
3. **Mentor** | Alumni Mentorship Program | Alumni Center, Universiti Putra Malaysia | 2010-2011
4. **Invited Speaker** | *Minggu Perkasa Putra* Program | Students' Affairs Division, Universiti Putra Malaysia | 2010
5. **Advisor** | Trust Fund | Hindu Society of Universiti Putra Malaysia (PHUPM) | 2009-2013

ADMINISTRATIVE WORK

(Appointment | Tenure)

1. **Coordinator** of Precision Agriculture Laboratory at Department of Agriculture Technology, Universiti Putra Malaysia | 2004-Present
2. **Research Associate** at Institute of Advanced Technology, Universiti Putra Malaysia | 2011-2013
3. **Coordinator** of Memorandum of Understanding between Faculty of Agriculture, Universiti Putra Malaysia and Institutions of Higher Learning Located in North America and South America | 2009-Present
4. **Internal Auditor** of Code of Practice for Program Accreditation (COPPA) at Universiti Putra Malaysia | 2011-Present
5. **Internal Auditor** of Research University (RU) Data at Universiti Putra Malaysia | 2010-2012
6. **Module Developer** of Academic Course (Modern Agriculture Technology) for Distance Learning Program | 2011-2012
7. **Member** of Industry and Community Networking Committee at Faculty of Agriculture | 2011-2013
8. **Member** of Online Teaching and Learning Working Committee at Faculty of Agriculture | 2010-2014

9. **Member** of Program [Bachelor of Agriculture (Agrotechnology)] Development Committee | 2006-Present
10. **Acting Head** of Department (Agriculture Technology) | 2016 (5 working days), 2015 (6 working days), 2014 (3 working days), 2013 (5 working days), 2012 (3 working days), 2011 (12 working days), 2009 (7 working days)
11. **Head** of Information Technology Unit at Faculty of Agriculture | 2006-2009
12. **Deputy Chairman** of Faculty of Agriculture Website Management Committee | 2007-2008
13. **Member** of Program (Bachelor of Agricultural Science) Review Committee | 2007-2008
14. **Secretary** of ICT for Agriculture User Group – Agrobio Cluster, Universiti Putra Malaysia | 2005-2006
15. **Secretary** of Steering Committee on Professionalizing Agricultural Graduates in Malaysia | 2004-2006
16. **Secretary** of International Relations Committee, Faculty of Agriculture, Universiti Putra Malaysia | 2004-2006

VOLUNTARY COMMUNITY SERVICE

(Organization | Role | Year)

1. The Malaysian Indian Educational Development Association (TheMIND) | **President** (2008-2010, 2014-2016), **Vice President** (2006-2008), **Treasurer** (2004-2006), **Committee Member** (2010-2012, 2016-2018), **Editor** of TheMIND Newsletter (2010-2012), **Chairman of Education Fund Panel** (2012-2014)
2. Indian Graduates Association of Universiti Putra Malaysia (IGAUPM) | **Vice President** (2007-2009), **Assistant Secretary** (2006-2007), **Management Committee Member** (2004-2006, 2009-2010, 2016-2017), **Editor** of IGAUPM Newsletter (2004-2009), **Chairman of Constitution Review Sub-committee** (2008-2009), **Member of Education Fund Rules Sub-committee** (2009-2010)

AWARD AND RECOGNITION

(Description | Awarding Authority | Year)

1. **Best Poster Award** for “Spatial variability of clay content and saturated hydraulic conductivity in paddy soils” (Salha, M.S., **S.K. Balasundram** and J. Shamshuddin) at Soils 2015, Putrajaya | Malaysian Society of Soil Science | 2015
2. **Publication Award** for “Carbon stocks in different carbon pools of a tropical lowland forest and a montane forest with a varying topography” (Jeyanny, V., M.H.A. Husni, K. Wan Rasidah, **S.K. Balasundram**, A. Ariffin and M. Kamarul Hisham) in Journal of Tropical Forest Science | Forest Research Institute of Malaysia | 2015
3. **Best Poster Award** for “Fluorescence sensing as a tool to estimate palm oil quality and yield” (Norul Husna, A.K. and **S.K. Balasundram**) at International Agriculture Congress, Putrajaya | Universiti Putra Malaysia | 2014
4. **Publication Award** for “Spatial variability of selected forest soil properties related to carbon management in a tropical lowland and montane forest” (Jeyanny, V., **S.K. Balasundram**, M.H.A. Husni, K. Wan Rasidah and A. Ariffin) in Journal of Tropical Forest Science | Forest Research Institute of Malaysia | 2014
5. **Excellent Service Certificate** 2012 | Universiti Putra Malaysia | 2013
6. **Excellent Service Award** 2011 | Universiti Putra Malaysia | 2012
7. **Best Poster Award** at International Conference on Mycology and Plant Pathology Biotechnological Approaches, Varanasi, India | Banaras Hindu University | 2012
8. **Excellent Teaching Award** 2009 | Faculty of Agriculture, Universiti Putra Malaysia | 2010
9. **Excellent Service Certificate** 2009 | Universiti Putra Malaysia | 2010
10. **Gold Medal** at iENA | International Trade Fair, Nuremberg, Germany | 2009
11. **Gold Medal** at Invention, Research and Innovation Exhibition (PRPI) | Universiti Putra Malaysia | 2009
12. **Bronze Medal** at Malaysia Technology Expo (MTE) | Malaysian Association of Research Scientists | 2009
13. **Excellent Service Certificate** 2008 | Universiti Putra Malaysia | 2009
14. **Excellent Service Certificate** 2007 | Universiti Putra Malaysia | 2008

15. **Gold Medal** at British Invention Show (BIS) | British Inventors Society | 2007
16. **Gold Medal** at Industrial Design and Technology Exhibition (ITEX) | Malaysian Invention and Design Society | 2007
17. **Bronze Medal** at Invention, Research and Innovation Exhibition (PRPI) | Universiti Putra Malaysia | 2007
18. **Excellent Service Award** 2006 | Universiti Putra Malaysia | 2007
19. **Silver Medal** at Invention, Research and Innovation Exhibition (PRPI) | Universiti Putra Malaysia | 2006
20. **Excellent Service Certificate** 2005 | Universiti Putra Malaysia | 2006
21. **Excellent Service Certificate** 2004 | Universiti Putra Malaysia | 2005
22. **Invited Member** of Gamma Sigma Delta, the Honor Society of Agriculture (Minnesota Chapter) | University of Minnesota, USA | 2003
23. **SWAC Block Travel Grant** to attend the 4th European Conference on Precision Agriculture (ECPA) in Berlin, Germany | Department Soil, Water and Climate, University Minnesota | 2003

ANNUAL PERFORMANCE APPRAISAL (SSM)

(Year | Score)

1. 2015 | **96.8 %**
2. 2014 | **95.7 %**
3. 2013 | **80.9 %**
4. 2012 | **97.4 %**
5. 2011 | **98.5 %**
6. 2010 | **88.0 %**
7. 2009 | **96.8 %**
8. 2008 | **91.0 %**
9. 2007 | **93.4 %**
10. 2006 | **97.7 %**
11. 2005 | **91.8 %**
12. 2004 | **91.5 %**

▪ **Recent 10-year average: 93.6 %**