

Biodata of the Scientist

Division/Section: Crop Production _____

A. Personal information

1. Name (With Title): Dr. G. BYJU

1.a. Qualification: M. Sc (Ag); Ph.D., ARS

2. Designation: PRINCIPAL SCIENTIST

3. Address (Personal): TC 6/2197(3), MUNDAKAKULANJIYIL, AITHADY ROAD, THURUVIKKAL P.O., THIRUVANANTHAPURAM 695 017, KERALA, INDIA

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(a) Residence 0471 2441067 (b) Intercom 145/331 (c) Mobile 9447740552/8547441067

5. Email: byju_g@yahoo.com

6. Countries visited: Nepal, Thailand (2), Belgium, The Netherlands, Lao PDR, Malaysia, UAE (Abu Dhabi, Dubai, Sharjah & Ajman), China, Hong Kong, Uganda

B. Professional information

1. Area of specialization: Soil Science & Agricultural Chemistry

2. Area of interest: Site specific nutrient management, Geoinformatics applications in soil resources assessment, precision farming

3. Number of institute projects completed (Add list): 9

- i) Impact of *Eucalyptus* and *Acacia* plantations on soil properties in different pedogenic environments of Kerala.
- ii) Soil resource inventory of laterite soils under tuber crops in southern Kerala.
- iii) Pedological and management aspects of hardening and softening of laterites under different land use systems.
- iv) Dynamics and transformation of potassium under sweet potato cultivation.
- v) Boron nutrition of sweet potato.
- vi) Effect of biofertilisers (*Azospirillum*) in sweet potato for increasing nitrogen use efficiency.
- vii) Management practices against tuber rot of cassava.
- viii) Soil fertility management for cassava in Tamil Nadu and Andhra Pradesh.
- ix) Development of a nutrient decision support system for precision farming of cassava.

4. Number of Institute projects being handled (Add list): 1

- i. Fertilizer best management practices by SSNM for sustainable tuber crops production and soil health.

5. Number of externally funded projects completed (Add list):2

- i. Real time nitrogen management in cassava based on leaf colour chart and chlorophyll meter (**Funded by KSCSTE, Govt. of Kerala**).
- ii. Nutrient decision support system for precision farming of cassava (**Funded by DST, Govt. of India**).

6. Number of externally funded projects being handled(Add list):0

7. Number of students guided for a) Ph.D: 3 b) M.Phil c) M.Sc: 1

8. Number of students being guided for a) Ph.D: 3 b) M.Phil c) M.Sc

8.a. Information about the students under your guidance

Name of the student	Course undergoing (Ph.D/M.Phil/M.Sc)	Title of the project/Thesis	E-mail address
Sabitha Soman	Ph.D.	GIS based nutrient decision support system for sustainable cassava production in Thiruvananthapuram district, Kerala	sabithasoman836@gmail.com
Remya Remesh	Ph. D.	Development of efficient, site specific and environment friendly fertilization programmes for yams	remyaremesh85@gmail.com

9. Information on guide ship

Guide ship for Ph.D/ M.Phil/ M.Sc	University	Subject
Ph.D.	Kerala University	Environmental Science

10. Number of Research papers (Add list): 102

3. Research Papers : 102

A. Papers in refereed journals : 45

Hridya A.C., G. Byju, and Raj Sekhar Misra. 2012. Effect of biocontrol agents and biofertilizers on root rot, yield, harvest index and nutrient uptake of cassava (*Manihot esculanta* Crantz). Archives of Agronomy and Soil Science. <http://dx.doi.org/10.1080/03650340.2012.702896>.

Byju G., M. Nedunchezhiyan, C.S. Ravindran, V.S.Santhosh Mithra, V. Ravi and S.K.Naskar. 2012. Modeling the response of cassava to fertilizers: a site specific nutrient management approach for higher tuberous root yield. Communications in Soil Science and Plant Analysis 43: 1-14.

Ravi V., A.C.Hridya, C.S.Suchithra, G. Byju, G. Suja and M. Manikantan Nair. 2011. Comparison of nitrate reductase activity in the leaves of tropical root and tuber crops. Journal of Root Crops 37 (2): 192-196.

Nedunchezhiyan M., G. Byju, and R. C. Ray. 2012. Effect of Tillage, irrigation, and nutrient levels on growth and yield of sweet potato in rice fallow. ISRN Agronomy Volume 2012, Article ID 291285, 13 pages, doi:10.5402/2012/291285.

Ravi V., A. C. Hridya, C. S. Suchitra and G. Byju. 2011. Rapid method for determining total chlorophyll, chlorophyll a and b and carotene content in leaves of elephant foot yam using SPAD meter. Journal of Root Crops, 37(1) : 29-31.

Ravi V., C.S.Ravindran, G. Suja, James George, M. Nedunchezhiyan, G. Byju and S.K. Naskar. 2011. Crop physiology of elephant foot yam [*Amorphophallus paeoniifolius* (Dennst. Nocolson)]. Advances in Horticultural Science, Italy. 25(1): 51-63.

Byju G., and C.S.Suchithra. 2011. Nutrient management strategies in tropical tuber crops. Indian Journal of Fertilizers 7(4): 98-113.

Byju G. and M. Haripriya Anand. 2011. Validation of chlorophyll meter and leaf colour chart based nitrogen management in cassava. Indian Journal of Fertilizers 2011 7(12): 94-106.

Nedunchezhiyan M., S. K. Jata, G. Byju, and S. S. Veena. 2011. Effect of tuber crop wastes/byproducts on nutritional and microbial composition of vermicomposts and duration of the vermicomposting process. Journal of Botany 2011, Article ID 801703, 6 pages, doi:10.1155/2011/801703.

- Nedunchezhiyan M., Byju G., Naskar S.K. and Mukherjee A. 2010. Effect of mulching and graded doses of fertilizer on yield and nutrient uptake of greater yam + maize intercropping system. *Indian Journal of Horticulture* 67:283-287.
- Byju G., C.S.Ravindran, R.R.Nair and V.Ravi . 2010. Tillage and planting methods on soil properties, yield, root rot and nutrient uptake in a continuously grown cassava field in a semi arid Vertisol of India. *Advances in Horticultural Science* 2010: 24(3):176-182.
- Ravi V., James George, C.S.Ravindran, G.Suja, M.Nedunchezhiyan, G.Byju and S.K.Naskar. 2010. Method for leaf area determination in elephant foot yam [*Amorphophallus paeoniifolius* (Dennst.) Nicolson]. *Journal of Root Crops*. 36 : 78-82.
- Byju G. and C.S. Ravindran. 2009. Effect of *Azospirillum* in increasing yield and nitrogen use efficiency of sweet potato cultivation in India. *Advances in Horticultural Science*. 23(4): 254-258.
- Byju, G. and Haripriya Anand M. 2009. Leaf color chart and chlorophyll meter based leaf nitrogen estimation and their critical values for real time nitrogen management in cassava. *Communications in Soil Science and Plant Analysis*. 40 :2816-2832.
- Byju, G. and Haripriya Anand M. 2009. Differential response of short- and long- duration cassava cultivars to applied mineral nitrogen. *Journal of Plant Nutrition and Soil Science*. 172(4): 572-576.
- Nedunchezhiyan M., S.K. Naskar and G. Byju. 2008. Performance of sweet potato (*Ipomoea batatas*) varieties under shaded and open field conditions. *Indian Journal of Agricultural Sciences*. 78(11): 974-977.
- Haripriya Anand M. and G. Byju. 2008. Chlorophyll meter and leaf color chart to estimate chlorophyll content, leaf color and yield of cassava. *Photosynthetica*. 46(4):511-516.
- Nedunchezhiyan, M., G. Byju and S.K. Naskar. 2008. Yield potential and economics of elephant foot yam (*Amorphophallus paeoniifolius*) + green gram (*Vigna radiata*) intercropping system as influenced by mulching and fertilizer levels. *Indian Journal of Agricultural Sciences*. 78(1): 17-20.
- Nedunchezhiyan M., G. Byju and Dinesh Kumar. 2008. Effect of sett size and spacing on growth, yield and economics of greater yam intercropped in coconut garden. *Indian Journal of Horticulture* 65(2): 248-251.

- Nedunchezhiyan, M., G. Byju and A. Mukherjee. 2008. Performance of cassava varieties intercropped in coconut plantation. *Indian Journal of Horticulture*. 65(1): 122-125.
- Nedunchezhiyan M., G. Byju and S.K. Naskar. 2007. Sweet potato (*Ipomoea batatas* L.) as an intercrop in a coconut garden: growth, yield and quality. *Journal of Root Crops*. 33(1): 26-29.
- Byju, G., M. Nedunchezhiyan and S.K. Naskar. 2007. Sweet potato response to boron application on an Alfisols under the sub humid tropical climate of India. *Communications in Soil Science and Plant Analysis*. 38 : 2347-2356.
- Nedunchezhiyan, M. and G. Byju. 2006. Influence of intercrops on growth and yield of greater yam in different planting seasons. *Journal of Root Crops*. 32(1): 41-46.
- Nedunchezhiyan, M., G. Byju and S.K. Naskar. 2006. Effect of intercrops and planting pattern on incidence of anthracnose, productivity potential and economics of greater yam (*Dioscorea alata*). *Indian Journal of Agricultural Sciences*. 76(2):132-134.
- Santhosh MithraV.S., T. Srinivas, G. Byju and S. Ramanathan. 2005. A user driven information system on agro techniques of tuber crops. *Journal of Root Crops* 31(2): 133-135.
- Nedunchezhiyan, M. and G. Byju. 2005. Productivity potential and economics of elephant foot yam based cropping system. *Journal of Root Crops*. 31(1): 34-39.
- Nedunchezhiyan, M. and G. Byju. 2005. Effect of planting season on growth and yield of sweet potato (*Ipomoea batatas* L.) varieties. *Journal of Root Crops*. 31(2): 111-114.
- Byju, G. and James George. 2005. Potassium nutrition of sweet potato. *Advances in Horticultural Science, Italy*. 19(4) : 221-239.
- Byju, G. and M. Nedunchezhiyan. 2004. Potassium: a key nutrient for higher tropical tuber crops production. *Fertiliser News*. 49(3) : 39-44.
- Ray, R.C. and G. Byju. 2003. Root surface microflora associated with post harvest spoilage of sweet potato (*Ipomoea batatas* L.). *Advances in Horticultural Science, Italy* 17(3) : 176-180.
- Shivalinga Swamy, T.M., S. Sriram, G. Byju and R.S. Misra. 2002. Tropical tuber crops production in north-eastern India: pests, diseases and soil fertility constraints. *Journal of Root Crops*. 28(2): 64-68.

- Sethi, K., A. Mohanty, S.K. Naskar, G. Byju and A. Mukherjee. 2002. Effect of sett size, spacing and NPK fertilization on yield of *Amorphophallus* in hilly areas of Orissa. The Orissa Journal of Horticulture. 30(2) : 72-75.
- Byju, G. and R.C. Ray. 2002. Effect of graded levels of potassium on yield and yield components of sweet potato. The Orissa Journal of Horticulture. 30(2) : 91-93.
- Byju, G. and R. C. Ray. 2002. Response of sweet potato (*Ipomoea batatas* (L.) Lam.) to potassium application on Typic Plinthustalfs. Journal of Potassium Research. 18: 94-98.
- Byju, G., M. Manikantan Nair and R.C. Ray. 2002. Forms and Quantity-Intensity parameters of potassium under sweet potato cultivation. Journal of the Indian Society of Soil Science. 50(3): 241-243.
- Byju, G. and T. Varghese. 2002. Impact of cassava and rubber on soil acidity parameters in a selected Ultisol from Kerala. Journal of the Indian Society of Soil Science. 50(1): 120-121.
- Nayar, T.V.R., G. Suja. and G. Byju. 2001. Effect of planting density and levels of manuring on productivity of Banana-*Dioscorea* intercropping system. Journal of Root Crops. 27(1): 176-180.
- Byju, G. and Thomas Varghese. 2001. Influence of land uses on soil acidity parameters in a typical laterite terrain from Kerala. Journal of Tropical Agriculture. 39: 124-127.
- Byju, G. and Thomas Varghese. 2001. Soil acidity parameters of laterite soils under rubber. Journal of Tropical Agriculture. 39:120-123.
- Byju, G. and T. Varghese. 2001. Impact of cassava and rubber on laterisation process in a selected laterite terrain from Kerala. Journal of the Indian Society of Soil Science. 49(3): 476-478.
- Byju, G. and Thomas Varghese. 1999. Soil acidity parameters of three selected laterite soils under cassava from Kerala. Journal of Root Crops. 25(2): 179-184.
- Byju, G. and Thomas Varghese. 1999. Free oxides of iron and aluminium in hardening and softening of three selected laterite soils under cassava from Kerala. Journal of Root Crops. 25(2): 169-174.
- Byju, G. and T. Varghese. 1998. Physico-chemical characteristics of laterites under cassava in three selected alfisols of Kerala. Journal of Root Crops. 24 (2): 127-136.

Nayar, T.V.R., V.P. Potty, G. Suja, and G. Byju. 1998. Cassava varietal response to low input management. *Journal of Root Crops*. 24 (2): 111-117.

Byju, G. 1996. Soil classification and land evaluation for agro technology transfer: a review. *Agropedology*. 6(2): 69-74.

B. Conference/Seminar/Symposia Papers : 57

Sabitha Soman and G. Byju. 2012. GIS based decision support systems for precision farming of cassava in India. Second National Symposium on 'Innovative Approaches and Modern Technologies for Crop Productivity, Food Safety and Environmental Sustainability', 19-20 November 2012, Thrissur, Kerala, Organised by Society for Applied Biotechnology.

Byju G., Hridya A.C., Suchitra C.S. and Sabitha Soman. Precision nutrient management of cassava at field scale by a modeling approach. 2012. Third National Conference on Agroinformatics and Precision Agriculture 2012, 1-3 August 2012, Hyderabad, India. Organised by Indian Society of Agricultural Information Technology and Indian Institute of information Technology, Hyderabad, India.

Byju G., Suchithra C.S., Hridya A.C., Haripriya Anand M. and Sabitha Soman. 2012. Nutrient decision support system for site specific nutrient management of cassava in India. Global Cassava Partnership, Second Scientific Conference, 'Cassava: Overcoming Challenges of Global Climatic Change, June 18-22, 2012, Kampala, Uganda.

Byju G., A.C. Hridya and R.S. Misra. 2012. Root rot of cassava: management options for higher returns. Global Cassava Partnership, Second Scientific Conference, 'Cassava: Overcoming Challenges of Global Climatic Change, June 18-22, 2012, Kampala, Uganda.

Byju G., M. Nedunchezhiyan, C.S. Ravindran and James George. 2012. Quantitative evaluation of soil nutrient supply, nutrient use efficiency and fertilizer requirements of *Amorphophallus* in India. Global conference on Aroids - opportunities and challenges, 23-25 January 2012, Bhubaneswar, Orissa. In Misra R.S. and M. Nedunchezhiyan (Eds). Book of Abstracts. pp. 50.

Ravi V., G. Byju, Saravanan Raju and A.C. Hridya. 2012. Method for predicting corm yield per plant in elephant foot yam based on leaf morphological characters. Global conference on Aroids - opportunities and challenges, 23-25 January, 2012, Regional Centre of CTCRI, Bhubaneswar, In: R.S.Misra and M.Nedunchezhiyan (Eds.), Book of Abstracts, pp. 39.

- Hridya, A.C. and G. Byju. 2011. Leaf colour chart-farmer friendly tool to predict the tuberous root yield of four contrasting cassava cultivars. Third International Conference on Climate Change, Forest Resource and Environment, 9-11 December, 2011, Organised by University of Kerala, and National Environmentalists Association, India.
- Byju G., M.Haripriya Anand, C.S.Suchitra, A.C.Hridya and Sabita Soman. 2011. Site specific nutrient management for cassava in India. Ninth Regional Cassava Workshop on 'Sustainable cassava production in Asia for multiple uses and for multiple markets', In: Lefroy et al. (Eds.). Program and abstracts, 27 November - 03 December 2011, Nanning, Guangxi, China, pp. 26.
- Hridya A.C., G. Byju and R.S. Misra. 2011. Biocontrol agents and biofertilizers on soil quality and tuberous root yield of cassava. National Seminar on Biodiversity Conservation and Management, 23-24 November 2011, VTNM NSS College, Dhanuvachapuram, Thiruvananthapuram, Kerala.
- Hridya A.C., and G. Byju. 2011. Spatial and temporal variability of soil properties at field scale in an Ultisol under cassava. Third International Geography Congress, 06-08 May 2011, CWRDM, Kozhikkode. Organised by CWRDM and National Association of Geographers India.
- Nedunchezhiyan M., G. Byju, and R.S. Misra. 2011. Effect of drip fertigation on yield and economics of elephant foot yam. Seminar on Water use in agriculture: challenges ahead, 22 March 2011, Directorate of Water Management, Bhubaneswar, Orissa, pp.20.
- Suchithra C.S. and G. Byju. 2011. Forms, amount, distribution and transformation of phosphorus in laterite soils under cassava. *In* National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 115.
- Suchithra C.S. and G. Byju. 2011. Organic and inorganic amendments and biofertilizers on microbial biomass phosphorus and phosphomonoesterase activity in a typical plinthustults under cassava. *In* National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 65.
- Hridya A.C. and G. Byju. 2011. Leaf colour chart and chlorophyll meter for prediction of tuberous root yield of four contrasting cassava cultivars. *In* National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 114.

- Hridya A.C., G. Byju and R.S. Misra. 2011. Biofertilizers and biocontrol agents for management of site specific soil related constraints to cassava production in a Vertisol. *In* National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 64.
- HariPriya Anand M. and G. Byju. 2011. Nitrogen mineralization and soil enzyme activities in a laterite soil under cassava amended with different plant and organic residues. *In* National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 113.
- HariPriya Anand M., G. Byju and S.N. Moorthy. 2011. Chemical and spectral characteristics of humic and fulvic acids from laterite soils under cassava amended with different rates of municipal solid waste compost. *In* National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 116.
- Ravi V., A.C. Hridya, C.S. Suchithra, G. Byju, G. Suja and M. Manikandan. 2011. Nitrate reductase activity in leaves of tropical tuber crops. *In* Sajeev M.S. *et al* (Eds.) National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 253-255.
- Ravi V., A.C. Hridya, C.S. Suchithra and G. Byju. 2011. Rapid method for determining total chlorophyll, chlorophyll a and b and carotene content in leaves of elephant foot yam using SPAD meter. *In* Sajeev M.S. *et al* (Eds.) National seminar on climate change and food security: challenges and opportunities for tuber crops (NSCFT 2011), 20-22 January 2011, CTCRI, Thiruvananthapuram, Kerala, India. pp. 325-327.
- Suchitra C.S., G.Byju and C.S.Ravindran. 2010. Management of soil phosphorus for sustainable cassava production in laterite soils of Kerala. First Kerala Women's Science Congress, 10-12 August 2010, Ernakulam, Kerala, Sponsored by DST, CSIR, ICMR and KSCSTE. Abstracts, Published by Shakti, Kochi, Kerala, India.

James G. and G. Byju. 2010. Sustainable cassava production for food security in the context of ensuing climate change. International Conference on food security during challenging times (ICFSDCT 2010), 5-7 July 2010, UPM, Malaysia. R.B. Mohammad et al. (eds.).

Byju G., R.S.Misra, R.R.Nair, M. Haripriya Anand, M.L.Jeeva and C.S.Ravindran. 2010. Reclamation of degraded Vertisols under cassava in arid environments of India. International Conference on soil classification and reclamation of degraded lands in arid environments, 17-19 May 2010, Abu Dhabi, UAE. Organised by International Centre for Biosaline Agriculture, UAE. Book of Abstracts, pp. 66.

Byju G., C.S.Ravindran, M. Haripriya Anand and V.S. Santhosh Mithra. 2010. Balanced fertilizer application to cassava by site specific nutrient management approach for enhanced yield, income and nutrient use efficiency. International Conference on Balanced Nutrient Management for Tropical Agriculture, April 12-16, 2010 at Swiss Garden Resort and Spa, Kuantan, Pahang. Organised by The Malaysian Society of Soil Science. Abstracts pp. 61-65.

Byju G., Hridya. A.C., and C.S.Ravindran. 2010. A modified QUEFTS model for site specific nutrient management of cassava (*Manihot esculenta* Crantz). Proceedings of 22nd Kerala Science Congress, 28-31 January 2010, KFRI, Peechi, Kerala, India, pp. 3-5.

Suchitra C.S., G.Byju and J.Sreekumar. 2010. Spatial and temporal distribution of plant available phosphorus and soil enzyme activities in an Ultisols under cassava. Proceedings of 22nd Kerala Science Congress, 28-31 January 2010, KFRI, Peechi, Kerala, India. pp. 71-72.

Suchitra C.S. and G.Byju. 2010. Spatial and temporal variability of leaf area index, plant dry matter and yield of cassava grown in an Ultisol. Proceedings of the National Seminar on Sustainable Agriculture, 15-16 January 2010, CMS College, Kottayam, Kerala, India. Sponsored by UGC and M.G. University, India. pp. 69-70.

Haripriya Anand M., G. Byju and S.N. Moorthy. 2010. Effect of municipal solid waste compost on carbon and nitrogen mineralization in laterite soils under continuous

cassava cultivation. 97th Session of Indian Science Congress, 3-7 January, 2010, Thiruvananthapuram, Kerala, India. Proceedings, Section of Agriculture and Forestry Sciences pp.164-165.

Suchitra C.S. and G.Byju. 2009. Spatial and temporal distribution of soil and canopy properties and dry matter production of cassava grown in a typic plinthustults. 19th Swadeshi Science Congress, 10-12 December 2009, Mannuthy, Kerala, India. Abstracts pp. 67-68.

HariPriya Anand M. and G. Byju. 2009. Leaf colour chart and chlorophyll meter based nitrogen management for increased yield and N use efficiency of cassava. Proceedings of the 21st Kerala Science Congress, 28-31 January 2009, Kollam, Kerala, India. pp. 5-7. Kerala State Council for Science, Technology & Environment.

HariPriya Anand M. and G. Byju. 2008. Leaf colour chart-a farmer friendly decision tool for nitrogen management for cassava in laterite soils of Kerala. 18th Swadeshi Science Congress, 5-7 November 2008, Thiruvananthapuram, Kerala, India. Abstracts pp. 69-70.

Byju, G., M. Nedunchezhiyan and G. Ramanandam. 2008. Soil fertility research for cassava in India. 8th Asian Cassava Research Workshop, 20-24 October 2008, Vientiane, Lao PDR.

Nedunchezhiyan, M., G. Byju, S.K. Naskar and S. Edison. 2008. Performance of cassava varieties under partially shaded sub humid tropics of India. Global cassava partnership: First scientific meeting GCP-1. Cassava-meeting the challenges of the new millennium, 20-25, July 2008, Ghent, Belgium.

Byju, G., R.S. Misra and R.R. Nair. 2008. Soil health, cassava yield and nutrient uptake as influenced by different biofertilizers and biocontrol agents in a Vertisol in India. Global cassava partnership: First scientific meeting GCP-1. Cassava-meeting the challenges of the new millennium, 20-25, July 2008, Ghent, Belgium.

- HariPriya Anand M. and G. Byju. 2008. Managing soil carbon in laterite soils to mitigate climate change. National Symposium on Climate Change and Low Carbon Future, 28 March 2008. College of Agriculture, Vellayani, Thiruvananthapuram, Kerala, India. Organised by British Council and Kerala Agricultural University, India.
- Byju, G. and M. HariPriya Anand. 2007. Management of laterite soils of Kerala for sustainable crop production. National Workshop on Fertility Evaluation for Soil Health Enhancement. 11-13 September, 2007, Kanakakkunnu Palace, Thiruvananthapuram, Kerala, India.
- Byju, G., C.S. Ravindran and M. Nedunchezhiyan. 2006. Site specific nutrient management as a precision farming tool for cassava cultivation in Tamil Nadu, India. Abstract of papers: 14th Triennial symposium of the International Society for Tropical Root Crops, 20-26 November 2006, Mascot Hotel, Thiruvananthapuram, Kerala, India. pp. 185-186.
- Byju, G. 2005. Management of laterite soils of Kerala. National Workshop on soil resource management, 22-24 December 2005, Thiruvananthapuram, Proceedings, Soil Survey Organisation, Dept. of Agriculture, Govt. of Kerala, India. pp. 235-245.
- Nedunchezhiyan, M. and G. Byju. 2005. Effect of spacing and sett size on biomass productivity of greater yam intercropped in newly established coconut garden. 8th National seminar on "Strategies for improved farming and ecological security of coastal region". 21-24 December 2005. Organised by Indian Society of Coastal Agricultural Research (ISCAR) at CTCRI, Thiruvananthapuram, Kerala, India.
- Byju, G., M. Nedunchezhiyan and R.C. Ray. 2004. Response of sweet potato (*Ipomoea batatas* (L.) Lam.) to boron application on typic plinthustalfs. National seminar on 'Root and tuber crops in nutrition, food security and sustainable environment'. 29-31 October 2004, Bhubaneswar, Orissa, India. Abstracts. pp. 27.
- Mukherjee, A., S.K. Naskar, G. Byju, S. Sriram and B.B. Das. 2004. *In vitro* propagation of coleus and taro. National seminar on 'Root and tuber crops in nutrition, food security and sustainable environment'. 29-31 October 2004, Bhubaneswar, Orissa, India. Abstracts. pp. 20.
- Byju, G. 2003. Setting up of a Soil and Plant Analysis Laboratory. Seminar organized by Kerala State Department of Agriculture, Soil Testing Laboratory, Thiruvananthapuram, Kerala, India.
- Byju, G. 2003. Protocols of leaf analysis for major and micronutrients in tuber crops of Kerala. Seminar organized by Kerala State Department of Agriculture, Soil Testing Laboratory, Thiruvananthapuram, Kerala, India.
- Byju, G., C.S. Ravindran, V.S.S. Mithra and J. Sreekumar. 2003. Soil fertility problems to cassava cultivation in industrial areas of India. Abstracts of Papers: Thirteenth symposium of the International Society for Tropical Root Crops (ISTRC), November 10-14, 2003, AICC Arusha, Tanzania. pp. 54.

- Byju, G. and R. C. Ray. 2002. Changes in forms and quantity – intensity parameters of potassium in soils on K fertilization. A. K. Singh et al. (Eds.) 2002. National Seminar on Developments in Soil Science: 2002. Abstracts. November 11-15, 2002, JNKVV, Jabalpur. Indian Society of Soil Science, New Delhi, India. pp. 39-40.
- Byju, G. and T. V. R. Nayar. 2002. Soil fertility constraints for cassava production in India : An overview. XII Swadeshi Science Congress, 5 – 7 November 2002, Thiruvananthapuram, Kerala, India.
- Mukherjee, A., S.K. Naskar, R. Saravanan, T.M. Swamy, G. Byju, B.S. Satapathy, and B.K. Sahoo. 2002. Performance of sweet potato in cyclone hit areas of Orissa and its impact on coastal agriculture. Manjunath, B.L. et al. (Eds.) 2002. National Conference on Coastal Agricultural Research, Extended Summaries. ICAR Research Complex for Goa, India. April 6-7, 2002. pp. 61-62.
- Byju, G. and R. C. Ray. 2002. Influence of potassium fertiliser on yield and K utilisation efficiency of sweet potato grown in an alfisols in Orissa. Manjunath, B.L. et al. (Eds.). National Conference on Coastal Agricultural Research, Extended Summaries. ICAR Research Complex for Goa, India April 6-7, 2002. pp. 62-64.
- Byju, G. and R. C. Ray. 2001. K dynamics under sweet potato cultivation. N.S. Pasricha et al. (Eds.). 2001. Proceedings of the International Symposium on 'Importance of potassium in nutrient management for sustainable crop production in India', 3-5 December 2001, New Delhi, India. PRII, New Delhi and International Potash Institute, Switzerland. pp. 187-189.
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12. Number of Technical Bulletins(Add list): 7 _____

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13. Consultancies offered(Add list and give a brief description):

1. Nutrient management of tuber crops
2. Geoinformatics applications in nutrient management
3. Site specific nutrient management of tuber crops

14. Technologies developed(Add list and give a brief description):

- Chemistry of laterite soils under rubber and cassava of Kerala with special emphasis on hardening and softening was studied in detail by physico-chemical analyses, XRD, SEM and Micromorphology. Increased rate of under rubber than under cassava. Calcium silicate, cow dung and green manuring are very effective in softening already hardened laterite.
- A fertilizer recommendation of 50:50:75 kg ha⁻¹ N, P₂O₅ and K₂O has been developed for sweet potato cultivation in Eastern India. The activity ratio of potassium (AR_e^K) showed significant positive correlation with water soluble, exchangeable and 1N HNO₃ values.
- In eastern and north-eastern India where sweet potato tuber cracking is a serious problem, a recommendation of 1.5 kg ha⁻¹ boron applied as borax at the time of planting sweet potato vines has been evolved. An amount of 66 g

of boron is taken up by sweet potato to produce 1 ton of tuber. Simple methods to calculate fertilizer boron requirement of sweet potato for a given targeted yield are developed.

- For sweet potato the recommended nitrogen dose of 50 kg ha⁻¹ can be reduced to 33 kg ha⁻¹ if we apply *Azospirillum* @ 10 kg ha⁻¹ in soil or in combination with application of *Azospirillum* as vine dipping @ 2 kg ha⁻¹. Apart from the direct role in N fixation, production of plant growth promoting substances (phytohormones) has also been found to be associated with the response of sweet potato to *Azospirillum* inoculation.
- A very successful management practice to control cassava tuber rot, a very serious problem in Salem, Tamil Nadu has been developed. i). deep ploughing to 50-65 cm depth, ii). Ridge and furrow method of planting, iii). Application of neem cake @ 250 kg ha⁻¹ at final land preparation, iv). Application of *Trichoderma viride* @ 1 kg ha⁻¹ mixed with 100 kg cow dung at the time of planting, v). removal and burning of infected tubers and, vi). Following crop rotation with millets, pulses, turmeric and sugarcane.
- Site specific nutrient management (SSNM) technology for cassava cultivation has been developed for Tamil Nadu and Andhra Pradesh. Soil fertility maps of Salem, Namakkal (T.N) and East Godavari (A.P) districts are developed to help planners and policy makers. Detailed fertilizer calculation charts are developed for SSNM of cassava in Tamil Nadu and Andhra Pradesh.
- Leaf Colour Chart (LCC) and Chlorophyll Meter (SPAD-502) have been standardized for real time nitrogen management of cassava. Critical leaf and critical values of the above two tools have been developed.
- A nutrient decision support system (NuDSS) software has been developed for site specific nutrient management of cassava, CASSNUM.
- GIS based fertilizer prescription maps were developed for site specific nutrient management (SSNM) of cassava in India.

15. Patents/Copyrights obtained (Add list and give a brief description):

Nil

16. Any other information:

Nil

