Prof. (Dr.) N.V.Radhakrishnan
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Educational qualifications : Ph.D (Agriculture); Specialization: Plant Pathology

Experience (as on 01-9-2023): 24 years in Research, Teaching and Extension in KAU

Nature of work done: Guiding PG and PhD students and being associated as Member in all advisory committee of students of Plant Pathology. Research mainly in Spices, Plantation crops, Vegetables, Fruit crops and Coconut mainly on management of crop diseases; Teaching Under graduate, Post graduate Courses and doctorate in Plant Pathology; Extension work such as training, transfer technology to farmers, Staff and Students; and administrative work in managing Office, labourers and farm work supervision. I have been involved in hybridization programme of coconut and production of value added products in coconut. I have been associating as Principal Investigator/CO-PI/Associate in many State/KAU Plan schemes and ICAR-NAHEP-CAAST-KAU Project.

RESEARCH ACHIEVEMENTS

Projects Handled & Completed

As Principal Investigator :10 (Externally aided:**2** nos.)
As Co- Principal Investigator : 8 (Externally aided: **2** nos.)

Publications

Book chapter	2
Technical Bulletin	3
Research papers (total)	31
i. International Journals	6
ii. National Journals	14
iii. International Conferences	3
iv. National/State Conferences	8
Newsletter articles	2
Popular articles	2
Multi-coloured Brochures (for farmers)	4
Post graduate programme Research Thesis	6
Doctoral Research Programme	2

Seminars/Symposia/Conferences/Workshops attended: 13

Recognitions

Member of research co-ordination groups on, "**Farming systems research & climate studies"** and "**Coconut and other palms"** in Kerala Agricultural University.

Membership in scientific organizations

Life Member of the Indian Phytopathological Society, IARI, New Delhi.

Research areas: Biological control of plant diseases, Rhizosphere studies and Integrated disease management. Nutrition on plant disease management in banana and coconut. New generation pesticides/ alternative technologies for pest and disease management in coconut. Development of microbial consortium for the management of fungal diseases of coconut with special emphasis on bud rot and leaf rot diseases.

Training Attended:
Two months training at PDBC, Bangalore and ICAR sponsored 21 days winter school & Summer School

Research Findings:
Application of *Trichoderma harzianum* @ 50 g + neem cake @ 1Kg per vine and application of Ridomil reduced the foot rot disease in black pepper gardens. Soil solarization with application of *Trichoderma harzianum* @ 1g plus AMF @ 100 cc per Kg of soil (potting mixture) in the production of Pepper rooted cuttings production in nursery increase the germination percentage of cuttings and decreased the nursery diseases in black pepper. The application of *Trichoderma harzianum, T.viride,* three PGPR isolate (P6, P7 and P8) alone and in combination had a significant reduction on the disease incidence of ginger rhizome rot. Application of 25% NPK as inorganic + 75% NPK as organic recorded the maximum nut yield in coconut on par with the application of 75% NPK as inorganic in red loam soils of southern Kerala. Medium duration scented paddy varieties such as Pusa Basmati and IET-12606 besides the traditional cultivar "Jeerakasala" hold promise for kharif cultivation in Wayanad, Kerala. Coir pith manure can be substituted for farm yard manure in black pepper, coffee and banana.

Several formulation of *Trichoderma harzianum* and *Bacillus subtilis* for seed treatment were developed and tried for control of damping off of tomato in nursery. Screening involving the host, pathogen and the antagonist performed on black pepper shoot could be used as rapid and reliable method for isolation of efficient bacterial antagonists of *Phythphthora capsici.*Seed treatment with carbendazim follows by application of carbendazim-resistant mutants of *Trichoderma harzianum* resulted in better plant stand and less damping off disease in cotton. Application of Copper hydroxide @ 0.2% at 15 days intervals reduced the Rhizoctonia leaf blight disease in amaranthus. Application of Hexaconazole + Potassium phosphonate (Samarth) @ 2ml per 300 ml of water in the crown after cleaning in coconut reduced the leaf rot disease in coconut. Application of 2% *Pseudomonas fluorescens* after crown cleaning (twice in a year) resulted in reduced disease incidence of leaf rot disease in coconut.

Developmental activities:
Associated with the revamping of Coconut Research Station, Balaramapuram. Establishing a laboratory for pollen bank for large scale production of hybrid coconut seedlings. Involved in various training programmes of plant protection aspect in coconut and other field and horticultural crops. Involved in the large scale production of coconut hybrid seedlings mainly, Kerasree, Kerasankara and Keraganga and other seeds and planting materials.Research and development of new Value added products in coconut kernel and water- Knowledge and skill development on Coconut based secondary agriculture.

RESEARCH PUBLICATIONS:

Jayaraj,J. N.V.Radhakrishnan. (2008). Enhanced activity of introduced biocontrol agents in solarized soils and its implication on the integrated control of tomato damping-off caused by *Pythium* spp. *Plant Soil*. 304;189-197.

Jayaraman Jayaraj, T.Parthasarathi and N.V.Radhakrishnan. (2007). Characterization of a *Pseudomonas fluorescens* strain from tomato rhizosphere and its use for integrated management of tomato damping-off. *Biocontrol*: 10526-006-9046-0.

Gopinath,K. N.V.Radhakrishnan and J.Jayaraj. (2006). Effect of propiconazole and difenoconazole on the control of anthracnose of chilli fruits caused by *Collectrotrichum capsici*. *Crop Protection* 25 (2006): 1024 – 1031.

Jayaraj,J.,N.V.Radhakrishnan, R.Velazhahan. (2006). Development of formulations of *Trichoderma harzianum* strain M1 for control of damping-off of tomato caused by *Pythium aphanidermatum*. *Archives of Phytopathology and Plant Protection*. Feb., 2006;39(1):1-8.

Susamma P george, Dijee Bastin, N.V.Radhakrishnan and K.C.Aipe. (2005). Evaluation of aromatic rice varieties in Wayanad, Kerala. *J.Tropical Agroculture* 43(1-2):67-69.

Jayaraj,J. N.V.Radhakrishnan, R.Kannan., K.Sakthivel., D.Suganya., S.Venkatesan and R.Velazhahan. (2005). Development of new formulation of *Bacillus subtilis* for management of tomato damping-off caused by *Pythium aphanidermatum. Biocontrol Science and Technolog*y. Month 2005;15(1): 1-11.

Jayaraj,J. and N.V.Radhakrishnan. (2003). Development of UV-induced Carbendazim-resistant mutants of *Trichoderma harzianum* for integrated control of damping off disease of cotton caused by *Rhizoctonia solani*. Journal of Plalnt Diseases and Protection. 110(5), 449-460.

Anith,K.N., Radhakrishnan,N.V. and Manomohandas,T.P. (2003). Screeening of antagonistic bacteria for biological control of nursery wilt of Blackpepper (*Piper nigrum*). *Microbiol. Res*. 158, 1-7,822.

Radhakrishnan,N.V., K.N.Anith, S.Priyanka, S.P.Suja. (2008). Studies on the effect of combined application of biocontrol agents against rhizome rot and bacterial wilt diseases of ginger. Kerala Science Congress- Extended Abstracts 20th Kerala Science Congress held at Thiruvananthapuram 28 to 31st, January, 2008

Radhakrishnan,N.V., K.N.Anith, D.Deepa and S.M.Shahul hameed. (2006). Effect of certain biocontrol agents on the growth, yield and rhizome rot disease of ginger.
National Seminar on Appropriate Technologies for sustainable Horticulture March 20 & 21,2006.

Radhakrishnan,N.V., K.N.Anith, K.C.Aipe and S.M.Shahul Hameed. (2006). Varietal reaction of ginger (*Zingiber officinale* R.) towards bacterial wilt disease caused by *Ralstonia solanacearum*. Proceeedings National Seminar on Appropriate Technologies for sustainable Horticulture March 20 & 21,2006

Shahul Hameed, S.M., N.Purushothaman Nair , N.V.Radhakrishnan, and K.Viswambharan. (2005). Long term impact of nutrient management under different plant densities on productivity of coconut in deep red loam soils. -Proceedings-International Coconut Seminar- Global Coconut Industry-Outlook for the Future during 10-11 December, 2005

K.Viswambharan, S.M. Shahul Hameed, N.V.Radhakrishnan and N.Purushothaman Nair. (2005). Effect of continuous application of nutrients as inorganic and organic forms and their combination on the yield of Coconut (*Cocos nucifera* L.) in red loam soils of Southern Kerala. Proceedings -International Coconut Seminar- Global Coconut Industry-Outlook for the Future during 10-11 December, 2005.

Jayaraj,J. and N.V.Radhakrishnan. (2004). Etiology and integrated management of a new root rot disease of mulberry. British Columbia Regional Meeting. 2004 of Canadian Phytopathological Society.

Susamma P George, Dijee Bastin, N.V.Radhakrishnan and K.C.Aipe. (2005). Evaluation of aromatic rice varieties in Wayanad, Kerala. J.Tropical Agroculture 43(1-2):67-69.

Radhakrishnan,N.V. (2006). Sustainable management of root rot disease in *Morus alba* L.- In Extended abstract, XVIII Kerala Science Congress, 29-31, January, CESS Akkulam, Thiruvananthapuram..

Viswambharan,K., S.M.Shahul Hameed and N.V.Radhakrishnan. (2006). Evaluation of chemical desorbing anions on phosphorous dynamics in the red loam soils of Southern Kerala. Paper presented as poster in the XVIII Kerala Science Congress held during 29th to 31st, January, 2006 at Centre for earth Studies, Akkualm, Trivandrum, India.

Anith,K.N., V.G.Soumya, Anjana Sreekumar, R.Arya Raj and N.V.Radhakrishnan. 2014. A Cheap and farmer friendly method for mass multiplication of *Pseudomonas fluorescens*. *J.Tropical Agriculture*. 52(2): 145-148.

Nadiya Kollakkodan, K.N.Anith and N.V.radhakrishnan. 2017. Diversity of endophytic bacteria from *Piper* spp. with antagonistic property against *Phytophthora capsici* causing foot rot disease in black pepper (*Piper nigrum* L.) J. Tropical Agriculture 55(1): 63-70.

Suman, B.M., Raj, S.K., Prathapan, K, Syriac, E.K., and Radhakrishnan, N.V. 2018. Effect of nutrient levels and nutrient schedules on physiological parameters and grain yield of upland rice intercropped in coconut garden. *J. Applied and Natural Science* 10 (3): 964-970.

Anith,K.N., S.Aswini, Shilpa Varkey, N.V.Radhakrishnan, Deepa S. Nair. 2018. Root colonization by the endophytic fungus *Piriformospora indica* improves growth, yield and piperine conent in black pepper (*Piper nigru*m L.) *Biocatalysis and Agricultural Biotechnology*. 14:215-230.

Suman, B.M., Prathapan, K., Raj, S.K., Radhakrishnan, N.V. and Syriac, E.K. 2019. Nutrient scheduling for upland rice intercropped in coconut. *J. Crop and Weed* 15 (1):17-23.

Bashma,E.K. B.Sudha, T.Sajitharani and N.V.Radhakrishnan. 2018. Growth, nutrient uptake, yield and quality parameters of Nendran banana (*Musa* sp.) as influenced by combined application of soil and foliar nutrition. *J.Tropical Agriculture* 56(2): 107-113.

Raj, B.K., Raj, S.K., Prathapan, K. and Radhakrishnan, N.V. 2019. Nutripriming with zinc sulphate and borax for early growth and seedling vigour in grain cowpea *Vigna unguiculata* (L.) Walp). *Legume Research* DOI: 10.18805/LR-4099.

Vinod Mavarkar, P.Shalini Pillai and N.V.Radhakrishnan. 2019. Nutrient scheduling for Baby corn (*Zea mays* L.) intercropped in coconut garden. *Int. J. Curr. Microbiol. App.Sci.* 8(9): 581-589.

Suman B M, Prathapan K, SK Raj, Radhakrishnan N V, Syriac EK. 2019. Nutrient scheduling for upland rice intercropped in coconut. J. Crop and weed 15(1), 17-23

Chacko SR, SK Raj, Jacob D, Pillai PS and Radhakrishnan N V. 2021, Non-chemical weed management to improve fruit yield and net income in ladies finger. Indian Society of Weed Science 53 (3) 230-237.

Raj AB, SK Raj, Prathapan K, Radhakrishnan N V, Swadija OK. 2021, Effect of seed invigouration on yield enhancement in grain cowpea (*Vigna unguiculata* L.) Legume Research-An International Journal 44(9) 1118-1123.

Raj AB, SK Raj, Prathapan K, Radhakrishnan N V 2021. Inflence of seed invigouration treatments on nutrient uptake ans soil nutrient status of grain cowpea. Indian J. Agricultural Research 1(6) 1-6.

Athira PV, Radhakrishnan N V, Anith KN. 2021. Seed biopriming and spraying at fruitset with microbial agents suppress anthracnose disease and improve growth and yield in chilli, J. Tropical Research 59(2) 273-285.

Amritha V V, Ajithkumar KG, PS Nair, Radhakrishnan N V, Prathapan, K. 2022, Relative abundance of PGRs in the liquid endosperm of young nuts of Cocons nucifera L. parental cultivars and their reciprocal hybrids. Plant Physiology Reports 27 (2) 234-241.

Chacko SR, SK Raj, Jacob D, Pillai PS and Radhakrishnan N V. 2022. Nutrient availability and nutrient uptake by crop and weed as influenced by stale seedbed, mulching and mechanical weeding in Okra. Agricultural Science Digest -A Research Jpournal 42 (5) 568-573.

(N.V.Radhakrishnan)