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## Summary

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### Summary

My research interest in weed management started with my Ph.D. program wherein I worked on a project entitled “Herbicide mixtures for weed management in direct seeded puddled rice *Oryza sativa* L” at the Department of Agronomy, College of Agriculture, Vellayani, under Kerala Agricultural University. I have been working on the broad area of “Weed management” with special emphasis on the herbicidal management of weeds and non chemical weed management in field crops. In the last 12 years, I have worked to assess the efficacy of herbicides to manage the weeds in rice, cowpea, sesame and millets. Also worked to evolve ecofriendly weed management practices for vegetables and millets. Evolved a management strategy for the management of chocolate weed in sesame. I am proud to state that “ Wheel hoe Weeder” designed and fabricated for the management of weeds in row sown crops and “Seed Cum fertilizer Drill” designed and fabricated for the row planting of crops were awarded Certificate of Registration from The Patent Office of The Government of India. “Crop Protective Herbicide Applicator” a machinery for directed application of herbicides, simultaneously minimizing herbicide spray drift and the subsequent phytotoxicity to crops was developed and filed the application for innovation patent (Patent application No. 202141013242 dt. 25.03. 2021 and was published in the Indian Patent Office Journal 39/2022 on September 30 2022). Three technologies developed during the period were included in the Package of Practice Recommendations Crops 2016 and one technology was approved in POP workshop for including in the next POP. My current research interest is to develop non chemical methods of weed control for field crops and to develop a rapid composting technology to produce enriched compost from retted coirpith.

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## Research Highlights

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- “Wheel hoe Weeder” designed and fabricated for weed management in row sown crops and “Seed Cum fertilizer Drill” designed and fabricated for the row planting of crops were awarded Certificate of Registration from The Patent Office of The Government of India.
- Three technologies viz., Pyrazosulfuron ethyl 25 g ha<sup>-1</sup> as early post emergence application for weed control in direct seeded rice, Penoxsulam 25 g ha<sup>-1</sup> as post emergence application for the broad spectrum weed control in direct seeded rice and Carfentrazone ethyl 20 g ha<sup>-1</sup> as an alternative for 2,4-D for the management of sedges and broad leaved weeds in direct seeded rice were included in the Package of Practice Recommendations Crops 2016.
- Post emergence application of penoxsulam + cyhalofop butyl @ 135 g ha<sup>-1</sup> for the broad spectrum control of weeds in direct seeded rice was approved in the POP workshop for inclusion in the next POP.
- “Crop Protective Herbicide Applicator” a machinery for directed application of herbicides, simultaneously minimizing herbicide spray drift and the subsequent phytotoxicity to crops was developed and filed the

application for innovation patent (Patent application No. 202141013242 dt. 25.03. 2021 and was published in the Indian Patent Office Journal 39/2022 on September 30 2022.

- Developed a management strategy for the control of chocolate weed in sesame.
  - Developed a rapid composting technology for the production of enriched compost from retted coir pith.
  - Identified Coconut + Nendran banana + Turmeric as the best crop combination for higher productivity under organic farming in Coconut based High Density Multi Species cropping system.
  - Morphological and Molecular characterization of Dwarf Red Banana were done and standardized the nutrient schedule for the Dwarf Red Banana
  - Identified the potential of dried banana leaves as an effective organic mulch for the management of weeds in organic farming. Application rate is 10 t ha<sup>-1</sup>
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## Experience

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- Joined as Agricultural Officer in the State Department of Agriculture on 8/7/1996 and had an extension experience of 13 years 8 months.
- Joined in Kerala Agricultural University as Assistant Professor (Agronomy) in the year 2011

## Education

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- Graduate in Agricultural Science from Kerala Agricultural University (1993)
- Post graduation in Agronomy from Tamil Nadu Agricultural University (1995)
- Ph D in Agronomy from Kerala Agricultural University (2016)

## Area of Specialization

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Nutrient Management, Weed Management, Bioutilization of Organic Wastes, Vertical farming

## Awards & Recognitions

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- Received the best poster award for the poster presentation entitled “ Nutrient availability, uptake and grain yield as influenced by integrated nutrient management practices in transplanted rice” in the National seminar on Soil Resilience-2015” during January 21- 22 at Agricultural College and Research Institute, Madurai, Tamil Nadu Agricultural University
- Received the Agronomist award instituted by Society for Educational and Scientific Research (SESR) in the International conference held at Bangalore during December 2016.
- Received the Certificate of Appreciation from Hon.Vice-Chancellor, Kerala Agricultural University for the active role played in setting up the Kerala Agricultural University Pavilion at the International Workshop and Exhibition on Agro Processing and Value Addition for Income Generating Activities (VAIGA 2016) held at Thiruvananthapuram.
- Received the Certificate of Appreciation from Hon. Vice-Chancellor, Kerala Agricultural University for the Design Patent for “ Wheel Hoe Weerder” (Patent certificate No, 10096 and design No. 346280-001 dated 11/8/202021 by the Patent office of Government of India).
- Received the Certificate of Appreciation from Hon. Vice-Chancellor, Kerala Agricultural University for the Design Patent for“ Seed Cum Fertilizer Drill ” (Patent Certificate No. 127005 and Design No. 359570-001 dated 28/02/2022 by the Patent office of Government of India).

- Received the best poster award for the poster presentation entitled “ Management of chocolate weed (*Melochia corchorifolai* L.) in sesame”. in Third International Weed Conference held at Anand Agricultural University, Anand, Gujarat, 20-23 December 2022.

## Research Projects

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### Ongoing

1. Centre of Excellence on Integrated Farming Systems and Urban Agriculture with IFSRS, Karamana as lead Centre.
2. Development of production protocol for Dwarf Red Banan a (*Musa accuminata* cv. Dwarf Red Banana)

### Completed

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1. Developing a coconut based organic farm utilizing the Integrated Farming System Model.
  2. Performance evaluation of local banana cultivars of Southern Kerala under coconut garden.
  3. Evaluation of new herbicide molecule in direct seeded rice under puddle condition
  4. Evaluate the effectiveness of herbicides for sedges and broad leaved weeds in direct seeded rice under puddle conditions
  5. Location specific best management practices for highest realizable yield in transplanted rice.
  6. Selective mechanization for enhancing productivity and profitability of rice cultivation
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## Publications

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### Journal Articles

1. Raj, S.K, Jose. N., Mathew, R., and Leno, N. 2012, Management of Nitrogen in Semi dry system of rice cultivation. *SB Academic Review* XXIII (1&2): 38-47.
2. Raj, S.K., Mathew, R., Jose, N., Leno, N. and Leenakumary, S. 2012. Enhancing the Productivity and Profitability in Rice Cultivation by Planting Methods. *Madras Agric.J.* 99 (10-12): 759-761
3. **Raj, S.K.**, Jose, N., Mathew, R. and Leenakumary, S. 2013. Influence of stand establishment techniques on yield and economics of rice cultivation in Kuttanad. *International Journal of Scientific Research Publication.*3 (4): 1-6.
4. **Raj, S.K.**, Jose, N., Mathew, R and Leenakumary, S. 2013. Chemical management of non- grassy weeds in direct- seeded rice. *Indian Journal of Weed Science*45 (3): 159-162.
5. **Raj, S.K.**, Mathew, R., Jose, N. and Leenakumary, S. 2013. Integrated nutrient management practices for enhancing the yield and profitability of rice (*Oryza sativa* L). *Madras Agricultural Journal.*100 (4-6): 460-464.
6. **Raj, S.K.**, Mathew, R., Jose, N. and Leenakumary.2013. Evaluation of early post emergence and post emergence herbicides on weed control and productivity of direct seeded puddled rice in Kuttanad. *Madras Agricultural Journal* 100 (7-9): 737-742.
7. Mathew,R., **Raj, S.K.**, Jose, N. and Leenakumary, S. 2013. Comparative efficacy of penoxulam and pyrazosulfuron ethyl for weed control in direct seeded puddled rice (*Oryza sativa* L.). *Indian Journal of Agricultural Science* 83 (12): 1420-1422.
8. **Raj, S.K.**, Bindhu, J.S. and Girijadevi, L. 2014. Nitrogen availability and uptake as influenced by time of application and N sources in semi – dry rice (*Oryza sativa*). *Journal of Crop and Weed* 10 (2): 295-302.
9. Bindhu, J.S., **Raj, S.K.** and Girijadevi, L. 2014. Sustainable system intensification of sesamum (*Sesamum indicum*) through legume intercropping in sandy loam tract of Kerala. *Journal of Crop and Weed* 10 (2): 38-42.
10. **Raj, S.K.**, Syriac, E.K., Girijadevi, L., Meenakumari, K.S., Vijayaraghavakumar and Aparna , B. 2015. Impact of new herbicide molecule bispyribac sodium + metamifop on soil health under direct seeded rice lowland condition. *Crop Research* 50 (1, 2 &3): 1-8.
11. Raj, S.K. and Syriac, E.K. 2015. Bio-efficacy of penoxsulam + cyhalofop butyl 6 % OD a new pre-mix herbicide mixture for weed control in direct seeded puddled irrigated rice (*Oryza sativa* L.). *Research on Crops*16 (3): 406-415.

12. **Raj, S.K** and Syriac, E.K. 2016. A new herbicide mixture bispyribac sodium + metamifop 14% SE for weed control in wet seeded rice. *Research on Crops* 17 (3): 421-427.
13. Sasna, S. Syriac, E.K. and **Raj, S.K** .2016. Penoxsulam as post emergence herbicide for weed control in transplanted rice. *Indian Journal of Weed Science* 48 (2): 215-216.
14. **Raj, S.K** and Syriac, E.K. 2016. Invasive alien weeds as bio-resource: A review. *Agricultural Reviews* 37 (3): 196-204.
15. Dayaram, R.N., Syriac, E.K and **Raj, S.K**. 2016 Bio-efficacy of post herbicides in transplanted rice. *Indian Journal of Weed Science* 48 (4): 446-441.
16. **Raj, S.K** and Syriac, E.K. 2017. Weed Management in Direct Seeded Rice - A review. *Agric. Rev.* 38 (1): 41-50.
17. **Raj, S.K** and Syriac, E.K. 2017. Nutrient availability and nutrient uptake as influenced by the post emergence application of herbicide mixtures. *Journal of Tropical Agriculture* 55 (2):152-160.
18. **Raj, S.K** and Syriac, E.K. 2017.Determination of bispyribac sodium + metamifop 14 SE residue in soil by bioassay method. *Indian Journal of Weed Science* 49 (1): 70-74.
19. **Raj, S.K** and Syriac, E.K. 2017. Sheeja K Raj and Elizabeth K Syriac. 2017. Impact of herbicide mixtures on earthworm population, organic carbon content and  $\beta$  glucosidase enzyme activity in soil. *Indian Journal of Weed Science* 49 (2): 159-164.
20. **Raj, S.K.**, Syriac, E.K., Anith, K.N. and Meenakumari, K.S. (2017) Compatibility of biocontrol agents and N fixing organisms with post emergence pre-mix herbicide-bispyribac sodium+ metamifop 14% SE. *Journal of Applied and Natural Science* 9: 1510-1514.
21. **Raj, S.K** and Syriac, E.K. 2017. Herbicidal effect on the bioindicator of soil health-A review. *Journal of Applied and Natural Science*. 9 (4): 2438- 2448.
22. Leno, N., **Raj, S.K** and Leenakumary S. 2017.Effect of a crop customized fertilizer mixture on yield and yield components of rice in the Kuttanad Lowlands. *Trends in Bioscience* 10 (12):2188-2192.
23. **Raj,S.K.**, Syriac, E.K and Geetha, D. 2017. Non target effect of herbicide mixtures on the mycelial growth of *Rhizoctonia solani* Kuhn. *Journal of Tropical Agriculture* 55 (2): 214-219.
24. **Raj, S.K** and Syriac. E.K. 2018. Herbicide mixtures effect on weed seed bank in direct seeded rice. *Indian Journal of Weed Science* 50 (1):64-68.
25. **Raj, S.K** and Syriac, E. K. 2018. Bioassay for the detection of penoxsulam + cyhalofop butyl residue in soil. *Journal of Crop and Weed* 14 (1): 188-194.
26. Arya, S.R., Syriac, E. K., and **Raj, S.K**. 2018. Bioassay for detecting flucetosulfuron residue in wetland rice soils. *Journal of Crop and Weed* 14 (1): 212-219.
27. George, D., Girijadevi L., and **Raj, S.K**. 2018. Magnesium sulphate fertilization for yield enhancement in direct seeded rice. *Journal of Crop and Weed* 14 (2): 195-198.
28. Suman, B.M., **Raj, S.K.**, and Prathapan, K. 2018. Effect of nutrient levels and schedule of nutrient application on the grain quality of upland rice intercropped in coconut. *Journal of Applied and Natural Science* 10 (3): 910-914.  
Suman, B.M.,**Raj, S.K.**, Prathapan K and Syriac, E.K. 2018. Effect of nutrient levels and nutrient schedules on physiological parameters and grain yield of upland rice intercropped in coconut garden. *Journal of Applied and Natural Science* 10 (3): 964-970.
29. George, D., Girijadevi L., and **Raj, S.K**. 2018: Response of direct seeded rice to magnesium in rice. *Trends in Bioscience*11(3); 3606-3611.
30. Suman B..K., and **Raj, S.K**. 2018. A review on zinc and boron nutrition in rice. *Journal of Applied and Natural Science* 10 (4): 1180-1186.
31. Suman, B.M. and **Raj, S.K**. 2019. Availability and uptake of nutrients as influenced by levels and schedule of application in upland rice. *Journal of Tropical Agriculture* 57 (2):172- 179.
32. Suman, B.M., Prathapan, K.,**Raj, S.K.**, and Radhakrishnan, N.V. 2019. Nutrient scheduling for upland rice intercropped in coconut. *Journal of Crop and Weed*. 15 (1): 17-23.
33. Raj, A.B. and **Raj, S.K**. 2019. Seed priming- An approach towards sustainability: *Journal of Applied and Natural Science* 11(1):227-234.
34. Raj, A.B and **Raj, S.K**. 2019. Zinc and boron nutrition in pulses-A review. *Journal of Applied and Natural Science* 11 (3):673-679.

35. Ravikiran, Syriac, E.K., and **Raj, S.K.** 2019. Integrated weed management in upland rice intercropped in coconut. *Journal of Tropical Agriculture* 57 (1): 71-77.
36. Raj, A.B., **Raj, S.K.**, Prathapan, K and Radhakrishnan, N.V. 2020. Nutripriming with zinc sulphate and boron for early growth and seedling vigour in grain cowpea (*Vigna unguiculata* (L.)Walp). *Legume Research* 43 (2):258-262.
37. Sinchana, J.K and **Raj, S.K.** 2020. A review on integrated approach for the management of weeds in cowpea (*Vigna unguiculata*). *Journal of Applied and Natural Science* 12 (4): 504-510.
38. Unnikrishnan, D., Girijadevi L., and **Raj, S.K** 2020. Influence of seed hydropriming on establishment of upland rice *Oryza sativa* L. in coconut garden. *Journal of crop and Weed* 16 (2):95-99.
39. Sinchana, J.K. and **Raj, S.K.** 2020. Integrated weed management impact on soil biological indicators in cowpea. *Indian Journal of Weed Science* 52 (3): 296-299.
40. Sinchana, J.K., **Raj, S.K.**, and Girijadevi L. 2020. Nutrient uptake by crop and weed as influenced by the weed management practices in bush type vegetable cowpea (*Vigna unguiculata* sub sp. *unguiculata* (L.) Verdcourt). *Journal of crop and Weed* 16 (2):210-218.
41. Sinchana, J.K and **Raj, S.K.** 2020. A review on integrated approach for the management of weeds in cowpea (*Vigna unguiculata*). *Journal of Applied and Natural Science* 12 (4): 504-510.
42. **Raj,S.K.**,Syriac, E.K., Meenakumari, K.S and Anith, K.N. 2021. Compatibility of pre.mix herbicide mixture penoxsulam 1.02% + cyhalofop butyl 5.1% OD with biofertilizer organism and bio control agents. *Journal of Pesticide Research* 33 (1):66-71.
43. Raj, A.B., **Raj, S.K.**, Prathapan, K., and Radhakrishnan, N.V. 2021. Influence of Seed Invigouration Treatments on Nutrient Uptake and Soil Nutrient Status of Grain Cowpea [*Vigna unguiculata* (L.) Walp].2021. DOI: 10.18805/IJARE.A-5659.
44. Raj, A.B. and **Raj, S.K.** 2021. Effect of Seed Invigouration Treatments on Physiological Parameters and Nodulation of Grain Cowpea [*Vigna unguiculata* (L.) Walp]. *Legume Research* 44 (8):962-966.
45. Raj, A.B., Raj, S.K., Prathapan, K, Radhakrishnan, N.V., and Swadija, O.K. 2021. Effect of Seed Invigouration on Yield Enhancement in Grain Cowpea [*Vigna unguiculata* (L.) Walp]. *Legume Research* 44 (9):1118-11123.
46. Chacko, S.R., **Raj, S.K.**, Jacob, D., Pillai, P.S., and Radhakrishnan, N.V.2021. Non chemical weed maangemnt to improve fruit yield and net income in ladys finger. *Indian Journal of Weed Science* 53 (3): 313-317.
47. Krishnasree, R.K., **Raj, S.K.**, and Chacko, S.R. 2021. Foliar nutrition in vegetables- A Review. . *Journal of Pharmacognosy and Phytochemistry* 10(2): 2393-2398.
48. Chacko, S.R., **Raj, S.K.**, and Krishnasree, R.K. 2021.Weed Management in Vegetables-A Review. *Journal of Pharmacognosy and Phytochemistry* 10(2): 2694-2700.
49. **Raj, S.K.**, Syriac, E.K., and Meenakumari K.S. 2021. Dynamics of soil microbial population as influenced by post emergence application of herbicide mixture . *Journal of Crop and Weed* 17 (1): 229-234.
50. Jayashri, S., Jayalekshmy, V.G., Beena, R., **Raj, S.K.**, and Shanas.S. 2022.Gamma Irradiation - A Tool for Enhancing Storage Life of Grain Cowpea (*Vigna unguiculata* (L.) Walp.). *International Journal of Plant and Soil Science* 34 (7):1-7.
51. Namitha, V.V., **Raj,S.K.**, Pillai, P.S., Prathapan, K., Radhakrishnan, N.V., and Jacob, D. 2022. Effect of crop combinations on nut equivalent yield and economics of coconut based cropping system. *Journal of Crop and Weed.* 18 (3): 251-255.
52. Unnikrishnan, D., **Raj, S.K.**, and Babu, A.C.S. 2022. Weed management in oilseeds- A holistic perspective: A Review. *Agricultural Reviews* DOI: 10.18805/ag.R-2417.
53. Unnikrishnan, D., **Raj, S.K.**, and Babu, A.C.S. 2022. *Melochia corchorifolia* L. (Chocolate Weed) an Underutilized Bio-resource: A Review. *Agricultural Reviews* DOI: 10.18805/ag.R-2397.

54. Namitha, V.V., **Raj, S.K.**, and Prathapan, K. 2022. Carbon Sequestration Potential in Coconut based Cropping System: A Review. *Agricultural Reviews* . DOI: 10.18805/ag.R-2553
55. Sneha, S.R. and **Raj, S.K.** Weed management in millets-A Holistic Approach. 2022. *Agricultural Reviews* . DOI: 10.18805/ag.R-2520.
56. Unnikrishnan, D., **Raj, S.K.**, Pillai, P.S., Ameena, M., Jacob, D., and Jayapal, A. 2022. Stimulatory effect of sesame on the germination and seedling growth of *Melochia corchorifolia* L. *Indian Journal of Weed Science* 54 (3): 341-344.
57. Sinchana, J.K., **Raj, S.K.**, and Prathapan, K. 2022. Weed management in bush type cowpea (*Vigna unguiculata* subsp. *unguiculata*(L.) Verdcourt). *Journal of Tropical Agriculture* 60 (1): 108-112.
58. Krishnasree, R.K., **Raj, S.K.**, Pillai, S.P., Kavitha, G.V., Jacob, D., Prathapan, K, and Chacko, S.R. 2022. Nodule Parameters, Quality and Nutrient Uptake of Vegetable Cowpea [*Vigna unguiculata* subsp. *unguiculata* (L.) Verdcourt] as Influenced by Foliar Application of Macro and Micro-nutrients. *Agriculture Science Digest* 42 (5): 604-609.
59. Chacko, S.R., **Raj, S.K.**, Pillai, P.S., Jacob, D., Lekshmi, G., Radhakrishnan, N.V., and Krishnasree, R.K. 2022. Nutrient Availability and Nutrient Uptake by Crop and Weed as Influenced by Stale Seedbed, Mulching and Mechanical Weeding in Okra. *Agriculture Science Digest* 42(5): 568-573.
60. Krishnasree, R.K., **Raj, S.K.**, Pillai, P.S., Prathapan, K., and Jacob, D. 2022. Foliar Nutrition with Water Soluble Macro and Micro Nutrient Fertilizers for Yield Maximization in Bush Vegetable Cowpea. 2022. *Legume Research* 45 (10): 1266-1272.
61. Namitha, V.V., **Raj, S.K.**, Anith, K.N., Pillai, P.S., and Jacob, D. 2022. Floor Crop Nutrition on Microbial Interactions in Coconut Based Multitier Cropping System. *Ecology Environment and Conservation*. 28:24-29.
62. Sinchana, J.K. and **Raj, S.K.** 2023. Weed management in Pulses-A Review. *Legume Research* 46 (5):533-540.
63. Unnikrishnan, D., **Raj, S.K.**, Suja, G., Paul, A., and Pillai, P.S. 2023. Effect of chocolate weed (*Melochia corchorifolia* L.) leachates on the mortality of storage pests, pulse beetle (*Callosobruchus maculatus* F.) and rice weevil (*Sitophilus oryzae* F.). *Indian Journal of Weed Science* 55 (1): 119-122.
64. Salim, S.S., Shimi, G.J., Pilla, P.S., **Raj, S.K.**, and Sruthy, O.N. 2023. Effect of foliar application of nano-N and nano-Zn on growth and yield attributes in bush type vegetable cowpea (*Vigna unguiculata* subsp. *unguiculata* (L.) Verdcourt). *The Pharma innovation Journal* 12 (5): 1073-1076.

#### **Full paper in Conferences**

65. **Raj, S.K.**, Mathew, R., Jose, N., Leno, N. and Leenakumary, S. 2012. Plant growth promoting rhizobacteria for reducing the use of chemical fertilizers in transplanted rice (*Oryza sativa* L.). In: Agriculture and Environment. Proceeding of 8<sup>th</sup> Kerala Environmental Congress, Centre for Environment and Development and Rajiv Gandhi Centre for Biotechnology, Thiruvannathapuram, Kerala (India), August 16-18, pp.288-294.
66. **Raj, S.K.**, Jose, N., Mathew, R., Sandhyadevi, C.D. and Lenakumary, S. 2013. Evaluation of broad spectrum herbicide- bispyribac sodium + metamifop on weed control and productivity of direct seeded rice in Kuttanad. In: Bakar, B.H., Kurniadie, D. and Tjitrosoedirdjo, S (eds), Proceedings of the 24th Asian- Pacific Weed Science Society Conference, October 22-25, 2013, Bandung, Indonesia, pp.447-453.

#### **Patents Granted/ Published**

1. Design Patent for “ Wheel Hoe Weerder” (Patent certificate No, 10096 and design No. 346280-001 dated 11/8/202021 by the Patent office of Government of India).
2. Design Patent for“ Seed Cum Fertilizer Drill ” (Patent Certificate No. 127005 and Design No. 359570-001 dated 28/02/2022 by the Patent office of Government of India
3. Crop Protective Herbicide Applicator” a machinery for directed application of herbicides, simultaneously minimizing herbicide spray drift and the subsequent phytotoxicity to crops was developed and filed the application for innovation patent (Patent application No. 202141013242 dt. 25.03. 2021 and was published in the Indian Patent Office Journal 39/2022 on September 30 2022).

#### **Booklets (6 No.s)**

1. Raj, S.K., Bindhu, J.S., Shar, S.R., Aparna, B., and Gladis, R. 2015. *Manu-Vila Parishodhana (Kai pusthakam)* (Malayalam). 2015. Published by Department of Agronomy. P.36.
2. Arya S.R., Anju, V.S., Renjan, B. and Raj, S.K. *Shastriya Mannu Vila Parishodhana* (Malayalam). 2017. Published by Department of Agronomy, p.39.
3. Raj, S.K. 2019. *Training notes On the Job Training Floriculturist-Open Cultivation & Gardener*, Published by Coconut Research Station Blaramaouram, p.78.
4. Raj, S.K. and Pillai, P.S. 2023. *Prospective Agronomic Interventions for Sustainability in Agriculture*, Published by Department of Agronomy, College of Agriculture, Vellyanai p.105.
5. Raj, S.K., Jacob, D., Pillai, P.S., Chacko, S.R., Sneha, S.R., Unnikrishnan, D., and Nishan, M.A. 2022. *Wheel hoe Kala Niyanthranam: Kai Kondu Kalakal Neekkam Cheyunnathinu Mikacha Badal* (Malayalam), Published by Department of Agronomy, College of Agriculture, Vellayani, p6.
6. Raj, S.K. and Pillai, P.S. Raj, S.K., Jacob, D., Pilla, P.S. and Jayapal, A. 2023. *Nutrient Rich Manures from Agricultural Wastes*, Published by Department of Agronomy, p.31.

### **Conferences/Symposium Attended and Presented the Research Paper: (17 No.s)**

**National Conferences: 7**

**International Conferences (Within the Country): 7**

**International Conferences Attended (Outside the Country): 3**

1. 24th Asian- Pacific Weed Science Society Conference, October 22-25, 2013, Bandung, Indonesia
2. 5<sup>th</sup> Organic Asia Congress, October 12-16, 2022, Goesan County, South Korea
3. 6<sup>th</sup> Organic Asia Congress, June 6-9, Kauswagan, Philippines

**Leaflets : 12 No.s**

**Popular Articles – 12 nos.**

### **Student Guidance (Major Advisor/ Advisory Committee member)**

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**M. Sc.** Completed : 6

Ongoing : 3

**Ph. D** Ongoing : 2

Completed: 1

### **Other Institutional Responsibilities**

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1. Currently acting as student Advisor to 10 Undergraduate students (2021 Admission).
2. Class teacher of 2021 Diploma in Organic Agriculture
3. Assistant Warden of PG Ladies Hostel
4. Officer in Charge of Guest House
5. Member of Project Co-ordination group “Farming System Research” of Kerala Agricultural University
6. Member of Project Co-ordination group “Coconut and Other Palms” of Kerala Agricultural University
7. Member of Parents Teacher Association of College of Agriculture, Vellayani, Thiruvananthapuram

### **Membership in Professional Associations**

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1. Life time membership in Indian Society of Agronomy
2. Life time membership in Indian Society of Weed Science
3. Life time membership in Crop and Weed Science Society
4. Life time membership in Society for Scientific and Educational Research
5. Annual membership in Indian Ecological Society