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[Nutrient Management Spear Program](#),
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EDUCATION

Ph.D. Plant and Environmental Sciences Clemson University	Jan. 2017- Dec. 2021 GPA: 4.00/4.00
M.Sc Agronomy Punjab Agricultural University (PAU), Ludhiana, India	2014- 2016 GPA: 4:00/4.00
B.Sc. in Agriculture Punjabi University (PU), Patiala, India	2009- 2013 GPA: 3.63/4.00

PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate Nov. 2021- Present
Department of Animal Science, Cornell University, Ithaca, NY, USA
Project: Building on New York Phosphorus Index (Farmer decision support system) and identifying beneficial management practices for land application of organic nutrient sources generated by agricultural production and industrial activities.

Graduate Research Assistant Jan. 2017- Nov. 2021
Department of Plant and Environmental Sciences, Clemson University, Clemson, SC, USA
Dissertation: Enhancing the nutrient use efficiency and produce quality in the crop plants by tailoring the nitrogen and phosphorous release rates from rendered animal products

Teaching Instructor Apr. 2012- Apr. 2013
Sky Wings Institute of Computer Education, Faridkot, Punjab India
Role: Handled theory and practical classes for a course titled "Basics of computer applications and computerized financial accounting" (class strength = 15).

Guest lecture-PES 4090/6090: Vegetation Classification and Plant Invasion Aug. 2018
Clemson University, SC, USA

PEER-REVIEWED PUBLICATIONS

- **Jatana, B.S.**, Kitchens, C., Ray, C., Gerard, P., Tharayil, N., (2021) Dual inoculation with arbuscular mycorrhizal fungi and phosphorus solubilizing fungi synergistically enhances the mobilization and plant uptake of phosphorus from meat and bone meal. *Frontiers in Soil Science*. <https://doi.org/10.3389/fsoil.2021.757839>
- **Jatana, B.S.**, Ram, H., Gupta, N., Kaur, H., (2021) Wheat response to foliar application of salicylic acid under different sowing environments. *Journal of Crop Improvement*. <https://doi.org/10.1080/15427528.2021.1971131>
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2020) Regulating the nutrient release rates from proteinaceous agricultural byproducts using organic amendments and its effect on soil chemical

and microbiological properties. *Biology and fertility of soils*, <https://doi.org/10.1007/s00374-020-01446-z>

- **Jatana, B.S.**, Ram, H., Gupta, N. (2020) Application of Seed and Foliar Priming strategies to Improve the Growth and Productivity of Late Sown Wheat (*Triticum aestivum* L.). *Cereal Research Communications*, <https://doi.org/10.1007/s42976-020-00036-x>

Manuscripts in review and preparation

- Zhang, Z., **Jatana, B.S.**, Gill, J., Campbell, B., Suseela, V., Tharayil, N. (20XX) Cross inoculation of rhizobiome from a congeneric ruderal plant (*Andropogon virginicus*) imparts drought tolerance in maize (*Zea mays*). *The Plant Journal* (Submitted, Under peer review)
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (20XX) Integrated use of different meat and bone meal formulations along with inorganic nitrogen fertilizer for higher nitrogen use efficiency, crop yield, and lower N leaching losses. *Nutrient Cycling in Agroecosystems* (Submitted, Under peer review)
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (20XX) Different mineral forms of nitrogen regulate the aroma and phytonutrient content of strawberry fruits. (Manuscript under internal lab revisions)
- **Jatana, B.S.**, Edayilam, N., Tharayil, N. (20XX) Arbuscular mycorrhizae fungi and phosphorus solubilizing microbes sequester the contaminants without hindering the P mobilization and plant P uptake from low grade phosphate rock. (Manuscript in preparation)
- **Jatana, B.S.**, Gami, S.K., Czymmek, K.J., Ketterings, Q.M. (20XX) Sustainable disposal of acid whey in conjunction with manure can regulate manure physiochemical properties and reduce ammonia volatilization losses. (In preparation)

Manuscripts reviewed

- **Reviewer:** *Journal of crop Improvement, International Journal of Environment and Climate Change, Plant Cell Biotechnology and Molecular Biology*

Grants Writing

- **Jatana, B.S.**, Tharayil, N. (2020) Recapture and reuse of nitrogen (N) and phosphorus (P) in rendered animal materials for integrated nutrient management in the corn-soybean cropping system. Sustainable Agriculture Research and Education Program. (Declined)
- Nishanth Tharayil (PI), Daniel B. Caplan (Co. PI) Brain A. Powell (Co-PI) (2020) Elucidating the processes that regulate the mobilization of heavy metals from soil-applied phosphate rocks and developing rhizobiome-based strategies to sequester these contaminants. (**Jatana, B.S.**: Assisted in developing the research idea, and writing the grant drafts)
- **Jatana, B.S.**, Tharayil, N. (2019) Recapture and reuse of nitrogen (N) and phosphorus (P) in rendered animal materials for integrated nutrient management in the corn-soybean cropping system. Sustainable Agriculture Research and Education Program. (Declined)

TECHNICAL SKILLS

Soil, water, and plant analysis techniques

- N¹⁵ labeled isotope studies
- Soil CO₂, NH₃ trapping and analysis (greenhouse gases)
- Soil, water, and plant tissue (N, P) nutrient and heavy metal analysis, soil enzymatic (protease, phosphomonoesterase, etc) and biochemical analysis (biomarker), soil P fractionation, soil phospholipid fatty acid analysis, microbial culturing, chloroform fumigation, Installing lysimeter

(resin and pan lysimeters), root morphological analysis, root mycorrhizal colonization, tissue chlorophyll content, chlorophyll fluorescence, photosynthesis, stomatal conductance, oxidative stress enzyme (superoxide dismutase, catalase, and peroxidase) analysis, aroma (volatile compound profiling) and phytonutrient (primary and secondary metabolites profiling) analysis of fruits

Analytical, biochemical instruments and techniques

- Time-domain reflectometry (TDR) probes, LC-MS, GC-MS, chromatography, Spectrophotometer, Fluorescence microplate reader, LICOR, chlorophyll fluorimeter, Green seeker, SPAD, Infrared Thermometer, Astoria Pacific nutrient analyzer and WinRhizo root analyzer, Infratech 1241 grain quality analyzer

Statistical data analysis

- Working knowledge of R, JMP-Pro, and SAS
- Parametric and nonparametric data analysis, multivariate data analysis

Relevant training

- Hazardous waste management training
- Laboratory safety and chemical hygiene training

SCIENTIFIC PRESENTATIONS AND EXTENSION OUTREACH

Extension and outreach

- **Jatana, B.S.** (2021) Current research about strawberries. Sustainable, Secure Food Blog: <https://sustainable-secure-food-blog.com/>
- **Jatana, B.S.** (2020). Animal materials as fertilizers. Piedmont research and education center, virtual field day, Clemson University (Audio: Visual presentation)
- **Jatana, B.S.** (2018) Rendered animal materials: available, nutrient-rich, potential N and P fertilizer materials. International Fertilizer Development Center, Muscle Shoals, Alabama
- **Jatana B.S.** (2015-2016) Application of priming strategies to improve the growth and productivity of wheat. Farmer fair's (total 4), Punjab Agricultural University, Ludhiana, Punjab, India

Oral Presentations

- **Jatana, B.S.**, Lee, J.H., Kitchens, C., Ray, C., Tharayil, N. (2021) Mineral forms of nitrogen differentially regulate the aroma and phytonutrient content of the strawberry fruits. Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting, Salt Lake City Utah, USA
- **Jatana, B.S.**, Lee, J.H., Kitchens, C., Ray, C., Tharayil, N. (2021) Global metabolomics reveal nitrogen fertilization as a robust tool to enhance phytonutrient content in strawberry fruits. Third annual Virtual Metabolomics Association of North America, Conference.
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2020). Evaluating the Produce Quality of Strawberries Grown Under Different Mineral Forms of Nitrogen (N) Fertilizers. 2020. Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting, Virtual
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2020). Can different Nitrogen forms regulate the phytonutrient content in berries? Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting, Virtual

- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2020). Integrated Use of Organic and Inorganic N Fertilizers to Improve the Crop N Use Efficiency and to Reduce the N Leaching Losses. Southern Agronomy Society of America meeting, Louisville, Kentucky
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2019). Recapture and Reuse of Phosphorus from Sparingly Available Forms in Meat and Bone Meal using P solubilizing Fungi and Mycorrhizae”, Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting, San-Antonio, Texas
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2018). Tailoring the Nitrogen and Phosphorus Release Rates from Rendered Animal Materials Using Natural Plant Amendments. Agronomy Society of America- Crop Science Society of America annual meeting, Baltimore, Maryland
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2018). Efficient, economical, and sustainable utilization of agricultural byproducts for better soil and environmental quality. Three-minute thesis preliminary and finalist (Rapid talk), Clemson University, Clemson, SC
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2017) Optimization of Nitrogen and Phosphorous Release Rates from Rendered Animal Products Using Natural Amendments. Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting, Tampa, Florida

Poster Presentations

- **Jatana, B.S.**, Lee, J.H., Kitchens, C., Ray, C., Tharayil, N. (2021) Nitrogen mineral forms as a robust tool to enhance aroma and secondary metabolites content in strawberry fruits. Third annual Virtual Metabolomics Association of North America, Conference.
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2020). Different mineral forms of nitrogen can regulate the produce quality of strawberries. Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting, Virtual
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2019). Modification of nitrogen and phosphorus mineralization from rendered animal materials for extended plant nutrient availability. Graduate student government research symposium, Clemson University, Clemson, South Carolina
- **Jatana, B.S.**, Kitchens, C., Ray, C., Tharayil, N. (2018). Enhancing the nutrient use efficiency in the crop plants by tailoring the nitrogen and phosphorous release rates from rendered animal products. PD meeting University of Delaware, Delaware

AWARDS

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| • Certificate of excellence in manuscript peer reviewing (International Journal of Environment and Climate Change) | Sept. 2021 |
| • Graduate student travel grant for attending Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting by Graduate Student Government, Clemson University | Aug. 2021 |
| • Certificate of excellence in manuscript peer reviewing (International Knowledge Press) | Nov. 2020 |
| • First position in Student rapid talk and poster competition of C2 division of Crop Science Society of America at Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting | Nov. 2020 |
| • Third position in student oral talk competition of C2 division of Crop Science Society of America at Crop Science Society of America at Agronomy Society of America- Soil Science Society of America-Crop Science Society of America meeting | Nov. 2020 |
| • Graduate student travel grant for attending Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting | Aug. 2020 |

- by Graduate Student Government, Clemson University
- Gerald O Mott award for the outstanding graduate student by Crop Science Society of America Mar. 2020
- First position in student oral talk competition of nutrient management and soil and plant analysis division of Soil Science Society of America at Agronomy Society of America- Soil Science Society of America-Crop Science Society of America annual meeting Nov. 2019
- Third position in the poster competition at Graduate Student Government Research Symposium, Clemson University Apr. 2019
- Dr. Gurbaksh Singh Gill Gold Medal for academic achievements during MSc Agronomy by Punjab Agricultural University, Ludhiana, India Sept. 2018
- Award of merit by Punjab Agricultural University, Ludhiana, India, for outstanding performance in MSc Agronomy Sept. 2018
- University merit fellowship by Punjab Agricultural University, Ludhiana, India July 2015

CONTRIBUTIONS AND SERVICE TO SOCIETIES AND UNIVERISTY

- Judge, New frontiers of nutrient management oral competition, ASA-SSSA-CSSA annual meeting Nov. 2021
- Judge, Sensor based nutrient management oral competition, ASA-SSSA-CSSA annual meeting Nov. 2021
- Judge, Nutrient management professional community oral competition, ASA-SSSA-CSSA annual meeting Nov. 2020
- Judge, Soil Health community poster competition, ASA-SSSA-CSSA annual meeting Nov. 2019
- Judge, Sessor based nutrient management oral and poster competition, ASA-CSSA annual meeting Nov. 2018

OTHER LEADERSHIP ACTIVITIES

Supervision and mentorship

- Supervised 6 undergraduate students (Christopher Williamson, Keon Singletary, Sarah Turner, Victoria Burgess, Carson Barrs, Angela Sparks) working on various research projects 2017- 2021
- Supervised the field staff in field experiments Mar. 2019-Oct. 2020
- High School student mentorship experience: Matthew Barton and Melissa Shugart May 2017-Aug. 2017
- Undergraduate student mentorship experience: Lovepreet Singh Ghuman 2014-2016

Leadership

- Representative: College of Agriculture, Forestry and Life Sciences to Graduate School, Clemson University Oct. 2020-Oct. 2021
- Graduate Student Senator, Clemson University, SC Aug. 2019-Aug. 2021
- Advisory member to health committees, GSG, Clemson University Aug. 2019-Aug. 2020
- Advisory member to Diversity and Inclusion committees, GSG, Clemson University Aug. 2020-Aug. 2021
- Chair: flower show organizing committee, Brijindra college, Faridkot, India Feb. 2012
- Volleyball team captain, Tagore public school, India 2006-2008