

CURRICULUM VITAE

PERSONAL DETAILS

Name: Dr Biswabiplab Singh

Designation: Scientist (Plant Physiology)

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LinkedIn: <https://www.linkedin.com/in/biswabiplab-singh-2677aa148/>

EDUCATION

ICAR – Indian Agricultural Research Institute, New Delhi, India

Ph.D. Plant Physiology (CGPA: 8.06)

2017-2023

NDPPC, Division of Plant Physiology, ICAR – IARI, New Delhi- 110012.

Chaudhary Charan Singh Haryana Agricultural University, Haryana, India

MSc. Plant Physiology (CGPA: 8.76)

2015-2017

Division of Plant Physiology, CCSHAU, Hisar- 125004

Orissa University of Agriculture & Technology, Odisha, India

B.Sc. (Hons.) Agriculture (CGPA: 8.3)

2011-2014

College of Agriculture, Bhawanipatna, Odisha- 766001

PROFESSIONAL HISTORY

Period	Designation	Details of Work
01/01/2024 – 31/05/2025	Research Associate	Worked under the project entitled “Computer vision for plant phenomics and smart Agriculture” at Division of Agri physics, ICAR-Indian Agricultural Research Institute. New Delhi.
07/07/2025 – 16/10/2025	Scientist	114 th FOCARS: Posting at ICAR-NAARM, Hyderabad, for Foundation Course for Agricultural Research Service (FOCARS).

17/10/2025 – 01/12/2025	Scientist	Institute Orientation Training Programme at ICAR-Central Rice Research Institute, Cuttack.
02/12/2025 – 28/02/2026	Scientist	Professional Attachment Training at IIT-Jodhpur for 3 months and worked in the area of “Application of Artificial Intelligence in Plant Phenotyping”.
01/03/2026 – Till date	Scientist	Presently working in digital sensor based plant phenotyping to characterise abiotic tolerance and resource use efficiency in plants at Crop Physiology and Biochemistry Division, ICAR-Central Rice Research Institute, Cuttack.

RESEARCH EXPERIENCE

Indian Agricultural Research Institute, New Delhi, India

2023-2025

Research Associate [PI: Dr Rabi Narayan Sahoo, Principal scientist, Division of Agri Physics, IARI, New Delhi)

Project title: Computer vision for plant phenomics and smart Agriculture.

In this project I worked on using spectral and imaging sensors to characterise plant responses to abiotic stress such as nitrogen deficiency and drought. We characterised rice and wheat crops to evaluate the abiotic stress tolerance and quantified using sensor derived parameters.

Indian Agricultural Research Institute, New Delhi, India

2017-2023

Ph.D. |Chairman: Dr Viswanathan Chinnusamy (Joint Director (Research), IARI, Principal scientist, Division of Plant Physiology, IARI, New Delhi)

Thesis title: Phenomics and genetic analysis of nitrogen use efficiency (NUE) in wheat.

I have five years of extensive research experience in high throughput phenotyping and linkage-based QTL mapping of complex traits like NUE and WUE in wheat. I have experience in high throughput DNA extraction, linkage map construction, spectrophotometric measurements, CN analysis in plant samples by CHNS analyser.

Chaudhary Charan Singh Haryana Agricultural University, Haryana, India

2015-2017

M.Sc. |Chairman: Dr. J. K. Sandooja (Head, Division of Plant Physiology, CCSHAU, Hisar)

Thesis title: Adaptive responses to water stress by nitric oxide (NO) in cotton.

Morpho-physiological and biochemical trait evaluation of cotton genotypes to identify superior genotypes and to evaluate the mitigative effect of nitric oxide over water deficit stress.

PUBLICATIONS

- Singh, B.,** Kumar, S., Elangovan, A., Vasht, D., Arya, S., Duc, N. T., Swami, P., Pawar, G. S., Raju, D., Krishna, H., Sathee, L., Dalal, M., Sahoo, R. N., Chinnusamy, V. (2023). **Phenomics based prediction of plant biomass and leaf area in wheat using machine learning approaches.** *Frontiers In Plant Science*. 14:1214801. doi.org/10.3389/fpls.2023.1214801.
- Singh, B.,** Elangovan, A., Kumar, S., Arya, S., Raju, D., Harikrishna, ... & Chinnusamy, V. (2024). **Non-destructive chlorophyll prediction by machine learning techniques using RGB-based vegetation indices in wheat.** *Plant Physiology Reports*, 1-12.

- Santhosh, S. V., Taria, S., Kumar, S., Krishna, H., Manjunath, K. K., Laxmi, S., Tamilselvan, A., Rajasekar, R., Sivapragasam, E., Elangovan, A., **Singh, B.**, Raju, D., Pandey R., Singh, P. K. & Chinnusamy, V. (2026). **QTL mapping for root traits during post-tillering stage under moisture-deficit stress in wheat.** *Plant Molecular Biology*, 116(4), 72.
- Sivapragasam, E., Taria, S., Kumar, S., Krishna, H., Devate., N. B., **Singh, B.**, Allimuthu, E., Raju, D., Kumar, R. R., Sahoo, R. N., Dalal, M., Pandey, R. and Chinnusamy V. (2026). **Genome-wide association mapping, phylogenetic study, and multivariate analysis of component traits of grain yield in wheat under heat stress conditions.** *Plant Molecular Biology*. 5;116(2):29. [https://doi: 10.1007/s11103-026-01695-w](https://doi.org/10.1007/s11103-026-01695-w). PMID: 41784646.
- Kathirvelu, D., **Singh, B.**, Ramasamy, R., Krishna, H., Vishwakarma C., Pandey, R., Sevanthi, A. M., Gaikwad, K., Chinnusamy, V. and Dalal, M, (2025). **Association of seedling root traits with field level drought tolerance in wheat (*Triticum aestivum*).** *Plant Physiology Reports*. 30, 569–581 (2025). <https://doi.org/10.1007/s40502-025-00884-x>.
- Duc, N. T., Harika, A., Raju, D., Kumar, S., Pandey, R., Sathee, L., Alimuthu, E., **Singh, B.**, Vishwakarma, C., Ellur, R. K., Iquebal, M. A., Pandey, R., Rajendran, A., Sakhare, A., Sahoo, R N., Chirravuri, N. N., Senthil, A., and Chinnusamy, V. (2025). **Identification of superior rice donors with enhanced nitrogen use efficiency using a comprehensive multivariate genotype selection strategy.** *iScience*. 7;28(9):113280. [https://doi: 10.1016/j.isci.2025.113280](https://doi.org/10.1016/j.isci.2025.113280). PMID: 40894902; PMCID: PMC12398238.
- Duc, N. T., Raju, D., Kumar, S., Pandey, R., Ellur, R. K., Vishwakarma, C., Allimuthu, E., **Singh, B.**, Rajendran, A., Sahoo, R.N. and Chinnusamy, V., (2025). **Phenomics assisted trait dissection and genotype selection for improved nitrogen use efficiency in rice.** *Plant Stress*, 17, 100909. <https://doi.org/10.1016/j.stress.2025.100909>.
- Malakondaiah, A. C., Kumar, S., Krishna, H., **Singh, B.**, Taria, S., Dalal, M., Dhandapani, R., Sathee, L., Pandey, R., Kumar, R.R. and Chinnusamy, V., (2025). **Mapping of the QTLs governing grain nutrients in wheat (*Triticum aestivum* L.) under nitrogen treatment using high-density SNP markers.** *Frontiers in Plant Science*, 16, 1553525. [https://doi: 10.3389/fpls.2025.1553525](https://doi.org/10.3389/fpls.2025.1553525). PMID: 40420860; PMCID: PMC12104049.
- Taria, S., Arora, A., Kumar, S., Krishna, H., Meena, S., **Singh, B.**, China Malakondaiah, A., S, K., Padaria, J.C., Singh, P.K. and Alam, B., Kumar, S., and Arunachalam, A. (2025). **Validation of stay-green and stem reserve mobilization QTLs: physiological and gene expression approach.** *Frontiers in Plant Science*, 16, 1541944. [https://doi: 10.3389/fpls.2025.1541944](https://doi.org/10.3389/fpls.2025.1541944). PMID: 40034149; PMCID: PMC11873102.
- Taria, S., Arora, A., Krishna, H., Manjunath, K. K., Kumar, S., **Singh, B.**, B., Meena, S., Malakondaiah, A.C., Kousalya, S., Padaria, J.C., Singh, P.K., Alam, B., Kumar, S., and Arunachalam, A. (2025). **Mapping of the QTLs governing stem-specific weight for stem reserve mobilisation in wheat (*Triticum aestivum* L.) under combined heat and drought stress.** *Plant Physiology Reports*, 30(2), 411-425. <https://doi.org/10.1007/s40502-025-00854-3>.
- Nayak, S.L., Sethi, S., Paul, V., **Singh, B.** and Dubey, A. K. (2025). **Citrus Granulation: an Unsolved Disorder with Physiological Intricacies.** *Applied Fruit Science* 67, 235. <https://doi.org/10.1007/s10341-025-01479-4>.

- Duc, N.T., Harika, A., Raju, D., Kumar, S., Pandey, R., Ellur, R.K., Allimuthu, E., **Singh, B.**, Ramlal, A., Rajendran, A. Kumar, R.R., Singh, M. P., Sahoo, R. N., and Chinnusamy, V. (2025). **Maximizing nitrogen stress tolerance through high-throughput phenotyping in rice**. *Plant Stress*, 15, 100764. <https://doi.org/10.1016/j.stress.2025.100764>.
- Deb, C.K., Das, M., Kumar, M., Kumar, S., Haque, M.A., Arora, A., Marwaha, S., **Singh, B.**, Raju, D. and Chinnusamy, V., (2025). **MuSiC V1.0: A Software Solution for Automated Mustard Silique Count Using YOLOv5**. In: Chaudhury, S., Mishra, A., Namboodiri, A.M., Jayagopi, D.B., Sinha, N., Nagar, R. (eds) *Computer Vision, Pattern Recognition, Image Processing, and Graphics*. NCVPRIPG 2023. Lecture Notes in Electrical Engineering, vol 1218. Springer, Singapore. https://doi.org/10.1007/978-981-97-5212-6_6 .
- Tamilselvan, A., Rajasekar, R., Santhosh, S. V., **Singh, B.**, Ramasamy, R., Kumar, S., ... & Chinnusamy, V. (2025). **High-Throughput Phenotyping and Phenomics for Climate-Smart Crop Breeding**. In *Plant High-Throughput Phenotyping and Functional Phenomics* (pp. 214-225). CRC Press.
- Harika, A., Ezhumalai, S., **Singh, B.**, Elangovan Allimuthu, S. T., Raju, D., Kumar, S., ... & Chinnusamy, V. (2025). 37 **Accelerate Crop Breeding Utilizing Modern Genomics and Phenomics Tools**. In *Plant Speed Breeding and High-Throughput Technologies* (pp. 37-52). CRC Press.
- Taria, S., Arora, A., Krishna, H., Manjunath, K. K., Meena, S., Kumar, S., **Singh, B.**, Krishna, P., Malakondaiah, A. C., Das, R., Alam, B., Kumar, S. and Singh, P. K. (2023). **Multivariate analysis and genetic dissection of staygreen and stem reserve mobilisation under combined drought and heat stress in wheat (Triticum aestivum L.)**. *Frontiers In Genetics*. 14:1242048. doi: 10.3389/fgene.2023.1242048
- Elangovan, A., Duc, N. T., Raju, D., Kumar, S., **Singh, B.**, Vishwakarma, C., Gopala Krishnan, S., Ellur, R. K., Dalal, M., Swain, P., Das, S. K., Singh, M. P., Sahoo, R. N., Dinesh, G. K., Gupta, P., Chinnusamy, V. (2023). **Imaging Sensor-Based High-Throughput Measurement of Biomass Using Machine Learning Models in Rice**. *Agriculture*, 13(4), 852. doi.org/10.3390/agriculture13040852
- “Indigenous Nutritional, Therapeutic, and Pest Management Practices of Tribal Communities in Mayurbhanj, Odisha” (2025). **Biswabiplab Singh**, Kapil Choudhary, Sajina K A, Rasmita Panda, Kalpana Pundalik Mugali and Ramappa S. 114th FOCARS SCIENTIST PROBATIONERS ICAR-NATIONAL ACADEMY OF AGRICULTURAL RESEARCH MANAGEMENT Rajendranagar, Hyderabad - 500 030, Telangana

PRODUCTS DEVELOPED

Wheat Stomata Phenotyper (WSP): The “Wheat Stomatal Phenotyper” App is a high-throughput phenotyping software designed to analyze stomatal traits in wheat. Developers: Elangovan Allimuthu, Viswanathan Chinnusamy, Sudhir Kumar, Biswabiplab Singh, Dhandapani Raju. Link: [Wheat Stomatal Phenotyper \(WSP\) | Zenodo](#)

Wheat nitrogen deficiency and leaf rust image dataset. Contributors: Sunny Arya, Biswabiplab Singh. Link: [Wheat nitrogen deficiency and leaf rust image dataset - Mendeley Data](#)

MEMBERSHIP

Life Member: Indian Society of Plant Physiology

International Society of Root Research

International Society of Seed Science

PRESENTATIONS

Poster presentation on “**Physiological and biochemical responses of drought stress in cotton (*Gossypium spp.*)**” in “XIV Agriculture Science Congress”- International conference on Innovation for Agricultural Transformation.

Poster presentation on “**Nitric oxide (NO) as a potential drought stress mitigating agent in cotton (*Gossypium spp.*)**” in International Congress on “Cotton and other fibre crops”.

Presented (in-person) a poster titled: “**Combining HTP and QTL Mapping to Dissect NUE Component Traits in Wheat (*Triticum aestivum*)**” during the PAG Asia India Conference, 2025, in New Delhi, at The Westin Gurgaon, New Delhi.

WORKSHOPS

Participated in World Bank – ICAR Funded National Agricultural Higher Education Project (NAHEP) Centre for Advanced Agricultural Science and Technology (CAAST) on “**Genomics-Assisted Crop Improvement and Management Present**” Sponsored training on “High Dimensional Genome Data Analysis by R and Open-Source Tools”- 10 Days workshop.

Delivered a practical session on “**Image-based characterisation of Seed morphometric traits and panicle architecture through low-cost imaging scanners and open-source software**” in the DST-SERB sponsored high-end workshop (Karyashala) 2023, on “Phenomics, the Next Generation Phenotyping (NGP), for trait dissection and crop improvement”- 10 Days workshop

Delivered Lecture on “**Non-destructive sensor-based prediction of early vigour, water use efficiency and mapping QTLs associated with drought tolerance in wheat**” in the DST-SERB sponsored high-end workshop (Karyashala) 2023, on “Phenomics, the Next Generation Phenotyping (NGP), for trait dissection and crop improvement”- 10 Days workshop

Hands on session conducted on the topic “**Hands on exposure to image-based prediction of yield traits (seed quality traits) through low-cost imaging scanners and open access software (Smart grain, grain scan, Image J, grain count mobile applications and IAP software)**” in ICAR Sponsored Short course “Non-invasive sensors based High Throughput phenotyping approaches for developing climate resilience crops”, 2025, Nanaji Deshmukh Plant Phenomics Center, Division of Plant Physiology, ICAR-IARI, New Delhi-110012.

Five days Online Training program on “**Abiotic stress management in agriculture for enhancing the farmer’s income with special reference to millets/ fodder crops cultivation in arid and semi-arid regions of India**” conducted by ICAR- IIMR and MANAGE, 2025.

Successfully completed 5-day online Faculty Development Program (FDP) on “**Artificial Intelligence and Machine Learning for Academic, Healthcare and Industrial Innovation**”, Department of Computer Science and Engineering, Amity University, Mumbai, 13-17 October 2025.

Attended Plant imaging expert group meeting, on "**Application of Infrared Spectroscopy and Image Fusion Technology in Non Destructive Quality Inspection of Individual Grains**", Wednesday 25th of March 2026.

HONORS AND AWARDS

- Qualified CSIR-UGC-JRF in the year 2017 (Fellowship worth Rupees 20 Lakh for 5 years duration)
- Qualified ASRB-NET (ICAR) in the year 2017
- NAHEP CAAST-Research Grant 2018 (Worth Rupees 6 lakh)

EXTRACURRICULAR ACTIVITIES

- 16th All India Agricultural Universities Youth Festival 2015-16: - **Bronze Medalist** – Group Song
- Winner of “**EMPHASIS PHOTO COMPETITION**” – 2020, for Plant Phenotyping (International competition organized by EMPHASIS and IPPN, Sponsored by LemnaTec and DPPN). **Here:** <https://emphasis.plant-phenotyping.eu/outreach/emphasis-photo-competition>
- Designed cover page of “**Plant Physiology Reports**” Journal (From 2023, Volume1), Published by Indian Society of Plant Physiology (ISPP). **Here:** <https://www.springer.com/journal/40502/>

RESEARCH SKILLS

- High throughput phenotyping in plants: Handling full scale phenotyping experiments, big data analysis, trait characterization
- Plant physiology instruments handling: “IRGA”, “Spectrophotometer”, “CHNS Analyser”, “Pressure plate apparatus”, “NDVI”, “CCM”, “Stomata count”, “Seed Analyser”, “Leaf area meter”, “Chlorophyll Fluorescence meter”
- Data Analysis and Visualisation in “**R**”
- **QTL mapping** and **Linkage map** construction.