

# Curriculum vitae

## Dr. AJAY KUSHWAH

Scientist-B, Central Muga Eri Research and Training Institute, Central Silk Board,  
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*Looking at new opportunities that offer key participation, team-oriented tasks, immediate challenges, and career opportunities. To participate in a dynamic work environment focused on promoting the growth of the organization, utilizing my abilities to the fullest, and exceeding expectations in all aspects of my work.*

## Academic Qualification

Examination	Year of Passing	Institute /University / Board	Result
Ph.D. (Farm Power & Equipment)	September, 2023	ICAR-IARI New Delhi	CGPA:8.19/10
M.Tech (Farm machinery & Power Engineering)	April, 2019	IIT Kharagpur, WB	CGPA:8.36/10
B. Tech (Agricultural Engineering)	June, 2017	College of Agricultural Engineering, JNKVV Jabalpur, MP	CGPA:7.91/10
Higher Secondary School	March, 2012	Sardar Vallabh Bhai H S School (MP Board of Secondary Education)	91.2%
High School	March, 2010	Shanti Niketan Vidyalaya (MP Board of Secondary Education)	84.33%

## Experience

S.N.	Name of Organization	Date of Joining	Date of Leaving	Period	Designation	Major Responsibilities
1.	Rabindra Nath Tagore Agriculture College, BAU Ranchi	24/01/2025	27/09/2025	8 months 3 days	Assistant Professor cum Junior Scientist	Teaching and Research
2.	College of Agricultural Engg., JNKVV Jabalpur	07/02/24	31/07/24	5 months 24 days (1 semester)	Guest Faculty	Teaching, Research, Extension/ Training, Academic and Examination work

## Ph.D. Project

**Title:** Design and development of precise intelligent cauliflower harvester

## Post-Graduation Project

**Title:** Determination of In-Field Tractor Performance Parameters and their Spatial Mapping

## Under-Graduation Project

**Title:** Planning and Design of Drip Irrigation System for Fruit cum Vegetable Crops

## Technical Skills

- Design Software: SolidWorks, Computer vision, Machine learning
- Programming Software: Basic Understanding of C, Python, and Embedded systems
- MS-Office
- Statically analysis software: Design Expert 8.0.6 and R Studio

## Courses Taught

1. Tractor and Automotive Engines
2. Tractor and Farm Machinery Operation and Maintenance
3. Management of Farm Power and Machinery System
4. Energy Conservation and Management in Production Agriculture

## Internship, Faculty Development Programme, and Training Experience

- Attended “AgriXplore: 21 Day’s International Winter School Training Programme” organized by UTKARSH- Agri-Business Incubation Centre, Dr. PDKV, Akola, India- 11<sup>th</sup> to 31<sup>st</sup> January 2025.
- Training on “Protected Agriculture and Natural Farming” by NAHEP-CAAST, IARI New Delhi, India- 21<sup>st</sup> to 27<sup>th</sup> March 2023.
- Training on “Advanced Entrepreneurship-cum-skill Development Programme (E-SDP)- Precision Agriculture” by CSIR- Central Mechanical Engineering Research Institute, Ludhiana, Punjab, India- 20<sup>th</sup> to 24<sup>th</sup> February 2023
- Training on “Agricultural Machinery Design, Development, and Testing” by CSIR-Central Mechanical Engineering Research Institute, Durgapur, India- 28<sup>th</sup> February to 4<sup>th</sup> March 2022.
- Complete Project/internship on “To Study the Harvel Agua’s customer and dealer Satisfaction of Drip Irrigation under the PMKSY in the state of Chhattisgarh” for Harvel Agua India Pvt. Ltd. from 1<sup>st</sup> Feb 2017 – 26<sup>th</sup> May 2017.
- Training on “Determination of Physical Properties & Dehulling of Oats at Different Moisture Content” by ICAR- Central Institute of Post-Harvest Engg. and Technology, Punjab- 01<sup>st</sup> June 2016 – 30<sup>th</sup> June 2016
- Training on “Study, selection, operation, maintenance, troubleshooting & repair of Tractor, Power tiller, and other agriculture implements” by North Eastern Region Farm Machinery Training & Testing Institute, Assam- 06<sup>th</sup> May 2015- 29<sup>th</sup> May 2015.
- Completed the **Faculty Development Programme** on Interventions in Agricultural Engineering for Sustainable Agricultural Production and Processing (IAESAAP) held at Centurion University of Technology and Management, Paralakhemundi, Odisha from 12<sup>th</sup> March 2024 to 16<sup>th</sup> March 2024.
- Attended a one-week **Faculty Development Programme (FDP)** on “Climate Change & Its Impact on Agriculture” jointly organized by the Department of Environment Sciences & Department of Agriculture Science, SRM University Delhi-NCR, Sonapat, Haryana from 5<sup>th</sup> to 11<sup>th</sup> August 2024.

## National/State level examinations

- Secured AIR-8 in the IARI Entrance exam- 2019.
- Secured AIR-56 in GATE-2017.
- Qualified ASRB NET-2023 in Farm Machinery and Power.
- Secured AIR-6 in the ICAR SRF-2024 in Farm Machinery and Power Engineering.
- Got 3<sup>rd</sup> rank in the district in the Higher Secondary Examination MPBSE-2012, and qualified MPPAT-2013.

## Conferences

- Participated in CITAAS (Current Innovations and Technological Advances in Agriculture and Allied Sciences) International Conference 2024 sponsored by ICAR held at Guru Kashi University Punjab from 29<sup>th</sup> to 31<sup>st</sup> August 2024.
- Participated (Oral Presentation) in GABELS (Global Approaches in Agricultural, Biological, Environment, and Life Sciences for Sustainable Future) Conference 2024 held at DAV College Kathmandu, Nepal from 08<sup>th</sup> to 10<sup>th</sup> June 2024.
- Participated in “35<sup>th</sup> National Convention of Agricultural Engineers & National Seminar on Emerging Technologies for Advances in Agriculture and Horticulture” jointly organized by ICAR-NAHEP-CAASTJNKVV Jabalpur and Institute of Engineers (India) held at College of Agricultural Engineering, JNKVV Jabalpur (MP) from 12<sup>th</sup> to 13<sup>th</sup> September 2023.
- Participated in iPAS (Industrial Problems Academia Solutions) Conclave 2023 held at ICAR-IARI, New Delhi from 27<sup>th</sup> to 28<sup>th</sup> July 2023.
- Participated in the annual convention of the Indian Society of Agricultural Engineers on “Agricultural engineering innovation for global food security” and the International Symposium on “India @ 2047 Agricultural Engineering Perspective” held on TNAU, India- 09<sup>th</sup> -11<sup>th</sup> Nov 2022.
- Participated in the International symposium on “Emerging Trends in Agricultural Engineering education, research, and extension” organized by ISAE India and RPCAU, Bihar, India-23<sup>rd</sup> to 25<sup>th</sup> Nov 2021.
- Participated as a Delegate in “International Model United Nations conference 112.0” from June 04<sup>th</sup> to 05<sup>th</sup>, 2022.

## Scholarships

- GATE 2017 scholarship (2017-2019) by MHRD.
- IARI Senior Fellowship 2019 (2019-2023).
- Indian Oil Educational Scholar Scheme 2013 (2013-2017).

## Publications

- **Research Papers**
  - **Kushwah, A.,** Sharma, P. K., Kushwaha, H. L., Sharma, B. B., Singh, N., Nag, R. H., Chowdhury, M., Pradhan, N. C., Carpenter, G., Mandal, S., & Salem, A. (2025). Image-based maturity detection for selective cauliflower harvesting in field condition. *Smart Agricultural Technology*, 11, 100985. <https://doi.org/10.1016/j.atech.2025.100985>

- **Kushwah, A.**, Sharma, P. K., Kushwaha, H. L., Sharma, B. B., Shrivastava, A. K., Nag, R. H., Chowdhury, M., Carpenter, G., & Yadav, R. (2024). Hybrid taguchi-grey relational analysis approach for optimizing cutter operational parameters in selective cauliflower harvesting. *Scientific Reports*, 14(1), 29709. <https://doi.org/10.1038/s41598-024-81323-z>
- **Kushwah, A.**, Chouriya, A., Tewari, V. K., Gupta, C., Chowdhury, M., Shrivastava, P., & Bhagat, P. (2024). A novel embedded system for tractor implement performance mapping. *Cogent Engineering*, 11(1), 2311093.
- **Kushwah, A.**, Sharma, P. K., Mani, I., Kushwaha, H. L., Sahoo, R. N., Sarkar, S. K., Sharma, B. B., Carpenter, G., Singh, N., Yadav, R., & Nag, R. H. (2023). Parameter optimization for selective harvesting in cauliflower (*Brassica oleracea*) using response surface methodology. *The Indian Journal of Agricultural Sciences*, 93(8), 912–918.
- **Kushwah, A.**, Sharma, P. K., Kushwaha, H. L., Nag, R. H., Carpenter, G., Choudhary, M. K., Chowdhury, M., Pandey, A., & Chaudhary, S. (2024). Economic Evaluation of Precise Intelligent Cauliflower Harvester: A Comparative Study with Manual Harvesting. *Journal of Scientific Research and Reports*, 30(1), 33–42.
- **Kushwah, A.**, Sharma, P. K., Kushwaha, H. L., Sharma, B. B., Carpenter, G., Nag, R. H., Yadav, R., & Chowdhury, M. (2023). Innovative Selective Harvesting Technology for Cauliflower: A Design Approach using Plant Characteristics. *Environment and Ecology*, 41(4B), 2595–2601.
- Chouriya, A., **Kushwah, A.**, Tewari, V. K., Gupta, C., Shrivastava, P., & Mahore, V. (2023). Development of PTO torque transducer based on an embedded digital wireless system for the 2WD tractor. *Cogent Engineering*, 10(2), 2272342.
- Bhagat, P., **Kushwah, A.\***, Yadav, R., Nag, R. H., Chowdhury, M., Carpenter, G., & Anand, R. (2023). SunSync Innovation: Empowering Traditional Solar Flat Plate Collectors with Autonomous Sun-Tracking for Tea Leaf Drying. *International Journal of Environment and Climate Change*, 13(11), 2162–2171. <https://doi.org/10.9734/ijecc/2023/v13i113378>
- Chowdhury, M., Thomas, E. V., Jha, A., **Kushwah, A.**, Kurmi, R., Khura, T. K., Sarkar, P., & Patra, K. (2023b). An automatic pressure control system for precise spray pattern analysis on spray patternator. *Computers and Electronics in Agriculture*, 214, 108287.
- Chowdhury, M., Khura, T. K., Parray, R. A., Upadhyay, P. K., Kushwaha, H. L., Lama, A., & **Kushwah, A.** (2025). Multi-vegetation indices based handheld device for precise nitrogen assessment and prescription in direct seeded rice. *Computers and Electronics in Agriculture*, 229, 109886. <https://doi.org/10.1016/j.compag.2024.109886>
- Yadav, R., Sudhishri, S., Khanna, M., Lal, K., Dass, A., Kushwaha, H. L., ... , **Kushwah, A** & Nag, R. H. (2023). Temporal Characterization of Biogas Slurry: A pre-requisite to sustainable nutrification in crop production. *Frontiers in Sustainable Food Systems*, 7, 1234472
- Chowdhury, M., Khura, T. K., Parray, R. A., Upadhyay, P. K., Kushwaha, H. L., Lama, A., **Kushwah, A.**, ... & Chaudhary, S. (2025). Development of an On-field System for Rapid Detection and Mitigation of Nitrogen Stress in Direct Seeded Rice. *Results in Engineering*, 108758.
- Madhusudan, B. S., Kushwaha, H. L., Kumar, A., Parray, R. A., Aruna, T. N., Nag, R. H., ... & Pradhan, N. C. (2026). Development and Evaluation of Retrofit Foldable Seeding Attachment for Single-Pass Harvesting cum Sowing under Conservation Tillage. *Results in Engineering*, 108980.

- Nag, R. H., Sharma, P. K., Mani, I., Kushwaha, H. L., Yadav, R. K., Chakraborty, D., ... & **Kushwah, A.** (2023). Cost-Economic Evaluation of Leafy Vegetable Harvester versus Conventional Harvesting: A Comparative Study. *International Journal of Environment and Climate Change*, 13(9), 3145-3153.
- Yadav, R., **Kushwah, A.\***, Soren, J., Ganachari, H., & Singh, I. (2024). Innovative Module Design for Advanced Automated Irrigation Systems. *Journal of Scientific Research and Reports*, 30(5), 547-555.
- Tiwari, S., **Kushwah, A.\***, Kumar, S., Singh, I., Nag, R. H., Bhagat, P., & Yadav, R. (2024). Innovation of a Low-Cost Water Quality Monitoring System in Aquaculture Ponds. *Journal of Scientific Research and Reports*, 30(9), 616–623.
- Kumar, S., Chowdhury, M., **Kushwah, A.**, Ansh, A. K., Kumar, K., Chouhan, P., Khatri, S., Kumar, M., & Yumnam, C. (2024). Development and Performance Evaluation of an Economical Solar Still for Water Purification. *Journal of Scientific Research and Reports*, 30(9), 495–506.
- Nag, R. H., Sharma, P., Kushwaha, H., B.S., M., Rathod, S. K., Kumar, A. K., & **Kushwah, A.\***. (2024). Assessing Physical Characteristics for Precision Harvester Design: A Comparative Study of Spinach, Fenugreek, and Coriander Leafy Vegetables. *Journal of Scientific Research and Reports*, 30(9), 631–639.
- Mandal, S., Sharma, P. K., Parray, R. A., Banerjee, T., Arora, A., Bhowmik, A., ... & **Kushwah, A.** Monitoring of Carbendazim residues in post-harvest treated Red Delicious apples. *Eco. Env. & Cons.* 30 (February Suppl. Issue): 2024; pp. (S220-S223).

#### ➤ Review Papers

- Chowdhury, M., Kumar Khura, T., Ahmad Parray, R., Kushwaha, H. L., Upadhyay, P. K., Jha, A., ... Kumar Prajapati, V. (2024). The use of destructive and nondestructive techniques in concrete nitrogen assessment in plants. *Journal of Plant Nutrition*, 47(14), 2271–2294.
- Chowdhury, M., **Kushwah, A.\***, Satpute, A. N., Singh, S. K., & Patil, A. K. (2023). A Comprehensive Review on Potential Application of Nanomaterials in the Field of Agricultural Engineering. *Journal of Biosystems Engineering*. Online ISSN 2234-1862.

#### ➤ Edited Books/Authoried Books

- Shrankhla Mishra, Deepak Chouhan, Rashmi Yadav, **Ajay Kushwah**, and Avinash Kumar. *Agricultural Engineering: Concept, Approaches and Applications*, ISBN: 978-93-58991-81-9, Elite Publishing House.

#### ➤ Book Chapters

- **Ajay Kushwah** and Manojit Chowdhury. Scope of Nanotechnology in Agricultural Engineering (Futuristic Trends in Agricultural Engineering & Food Sciences, ISBN: 978-93-95632-65-2, IIP Proceedings, Vol. 2, Book 9, 270-286, Chapter 20, 2022)
- Priti Tigga, Khushboo Rani, Arkaprava Roy, Rishabh Didawat, Praveen Kumar, **Ajay Kushwah**, and Koushik Bag. Potential of Soil Spectroscopy as an Alternative of Soil Testing. (Advanced Innovative Technologies in Agricultural Engineering for Sustainable Agriculture. ISBN: 978-93-5570-233-3, Akinik Publications, Vol. 4, Chapter 5, 83-104, 2022)

- Manojit Chowdhury and **Ajay Kushwah\***. Tractor wheel slip measurement and optimization (Futuristic Trends in Agricultural Engineering & Food Sciences, ISBN:978-93-95632-65-2, IIP Proceedings, Vol. 2, Book 9, 260-269, Chapter 19, 2022)
- Nrusingh Charan Pradhan, Mude Arjun Naik, Manojit Chowdhury, **Ajay Kushwah**, K. R. Asha, Tushar Dhar, Kishor P. Gavhane, Sumit B. Urhe & Ajay N. Satpute. Robotic Seeding or Sowing System in Smart Agriculture. (Artificial Intelligence and Smart Agriculture. Advances. ISBN: 978-981-97-0341-8, Springer, 495–520.
- Manojit Chowdhury, Rohit Anand, Tushar Dhar, Ramkishor Kurmi, Ramesh K. Sahni & **Ajay Kushwah**. Digital Insights into Plant Health: Exploring Vegetation Indices Through Computer Vision. (Applications of Computer Vision and Drone Technology in Agriculture 4.0. ISBN: 978-981-99-8684-2, Springer, 7-30).
- Gopal Carpenter, Gajanan S. Kothawade, **Ajay Kushwah**, & M. K. Choudhary (2025). Trends and applications in pest control technology. In K. L. Srivastava & B. T. Rangeshwaran (Eds.), Insect pathology (Current principles and methods) (Vol. 4: Patent, pest control technology, techniques, practicals, laboratory and insect pathologist in India, Chapter 54, pp. 1625-1672). Today and Tomorrow's Printers and Publishers. ISBN 9789348596147.
- Patil, A. K., Satpute, A. N., Singh, N., Satankar, M., Singha, P. S., Chaturvedi, S., **Kushwaha, A.**, Choudhary, M., Choudhary, B. B., & Barman, S. (2025). Engineering Interventions for High Biofuel Production in Forage Crops. In R. K. Singhal, Indu, A. El Sabagh, & K. K. Dwivedi (Eds.), Forage Crops in the Bioenergy Revolution (pp. 81–92). Springer Nature Singapore. [https://doi.org/10.1007/978-981-96-2536-9\\_5](https://doi.org/10.1007/978-981-96-2536-9_5)
- Yadav, R., Satpute, A. N., Kushwah, A., Kumar, J., Sudhishri, S., & Nageswar, B. (2025). Advancements in Machine Learning for Water Quality Assessment. In *Artificial Intelligence and Computer Vision for Ecological Informatics* (First, pp. 202–217). CRC Press, Taylor & Francis Group.

## ➤ Popular Articles

- Ajay Kushwah, Ramineni Harsha Nag, Priti Tigga, and Arkaprava Roy. The Prominence of Laser Technology in Orchard Spraying. Agriculture and Food: E-Newsletter, E-ISSN: 2581-8317, Article ID: 37481.
- Ajay Kushwah, Rashmi Yadav, Manojit Chowdhury, Ramineni Harsha Nag, Gopal Carpenter. Harnessing Innovation: Arduino and Raspberry Pi in Agricultural Engineering. The Science World: E-Magazine, ISSN:2583-2212, Nov, 2023 3(11). <https://doi.org/10.5281/zenodo.10141945>.
- Ajay Kushwah, Rashmi Yadav, Manojit Chowdhury. Revolutionizing Agriculture: Unleashing the Potential of 3D Printing in Agricultural Engineering. Food and Scientific Reports E-ISSN: 2582-5437, 2023 4(11): 7-11.
- Ajay Kushwah and Rashmi Yadav. Harnessing the Power of Geothermal Energy in Irrigation: A Sustainable Solution for Agriculture. Agriculture and Food: E-Newsletter, E-ISSN: 2581-8317, Article ID: 48822.
- Ramineni Harsha Nag, Ajay Kushwah, and Priti Tigga. Advances and Importance of Rollover Protective Structures (ROPS) to Provide Safety in Tractors. Agriculture and Food: E-Newsletter, E-ISSN: 2581-8317, Article ID: 37432.

- Manojit Chowdhury, Ajay Kushwah, and Pradeep Kumar. Precision Spraying: Enhancing Crop Protection and Environmental Sustainability. Agriculture and Food: E-Newsletter, E-ISSN: 2581-8317, Article ID: 43142.
- Rashmi Yadav, Ajay Kushwah, Chinmayee Parida, and Priyanka Kashyap. AI Revolutionizing Water Management: Challenges and Opportunities. Biotica Research Today 2023, 5(11):777-779. Article ID: RT1489.
- Rashmi Yadav, Ajay Kushwah, Chinmayee Parida, and Priyanka Kashyap. High-Intensity Pulsed Electric Field: A Fruitful Path to Enhanced Processing. Food and Scientific Reports E-ISSN: 2582-5437, 2023 4(11): 25-29.
- Ramineni Harsha Nag, Ajay Kushwah, Madhusudhan B. S., Sunil Kumar Rathod, Kesav Kumar, and Somnath. Advancing Transparent Photovoltaics: Efficiency, Aesthetics and Real World Feasibility of Thin Film Technology. AgriGate- An International Multidisciplinary e-Magazine. Article ID: AG-V03-I11-89.
- Rashmi Yadav, Ajay Kushwah, and Sangeeta. Navigating Wastewater Challenges: Sustainable Practices and Future Directions. Agriculture and Food: E-Newsletter, E-ISSN: 2581-8317, Article ID: 48684.
- रोहित आनंद, रमेश कुमार सहनी, मनोजित चौधुरी, अजय कुशवाह, रामकिशोर कुर्मी, मधुसुदन बी एस एवं सत्य प्रकाश कुमार. श्री अन्न फसलो का यंत्रीकरण और उसके फायदे. कृषि अभियांत्रिकी दर्पण, जनवरी एवं जुलाई २०२३, संयुक्तांक ४२-४३, प्रकाशक भा.कृ.अनु.प.- केन्द्रीय कृषि अभियांत्रिकी संस्थान, भोपाल (म.प्र.)

## Awards

- Secured 1<sup>st</sup> position in poster presentation at the Conference on 'Modernization of Instrumentation in Agriculture' during the UDAAN event in July 2016, organized by JNKVV, Jabalpur (MP).
- Secured 1<sup>st</sup> position in the poster presentation at the 'Industry Problems - Academia Solutions Conclave,' organized by ISAE and WTC at IARI, New Delhi, in July 2023
- Awarded the '**Young Scientist Award**' by the Indian Society of Agricultural Science & Technology Research (ISASTR) at the CITAAS International Conference 2024, held in Punjab from August 29<sup>th</sup> to 31<sup>st</sup>, 2024.

## Designs, Copyrights, and Patents

- Granted a Design registration (424898-001) in September 2024 for designing an "Apparatus with Adjustable Cutting Height Mechanism for Cauliflower Harvester".
- Granted a Design registration (428092-001) in December 2024 for designing an "Agriculture Sprayer".
- Granted a Design registration (424899-001) in October 2024 for designing a "Cauliflower Harvester".
- Granted a Design registration (439687-001) in February 2025 for designing a "Battery-Operated Leafy Vegetable Harvester".
- Granted a Copyright registration (SW-20231/2025) in March 2025 for "Computer Software Work Development of An Algorithm for Automatic Spray Pressure Control for Hydraulic Nozzles".

- Granted a Copyright registration (SW-20229/2025) in March 2025 for “Embedded System Algorithm for Location Tracking and Displaying Real-Time Tractor Performance Parameters”.

### **Positions of Responsibility**

- Volunteered in the Jabalpur Academia Initiative (JAI) workshop organized by IIITDM Jabalpur held at JEC Jabalpur.
- Selected as a Class Representative for one year at IIT Kharagpur.

### **Professional Membership**

- Lifetime member (LM-12126) of the Indian Society of Agricultural Engineers (ISAE).
- Lifetime member (L/4083) of the Indian Society of Agricultural Science & Technology Research (ISASTR).

### **Interpersonal Skills**

- Exceptional Listening and mediating capabilities
- Creative thinking with great diversity to adjust to any type of working environment
- Responsible attitude aimed at ensuring positive outcomes of assigned projects

### **Personal Dossier**

Date of Birth: 1<sup>st</sup> November, 1994

Permanent address: Ward no.11, Kasrawad, Distt. Khargone (451228), Madhya Pradesh

Languages Known: English, Hindi

### **Declaration**

I hereby declare that the information furnished above is true to the best of my knowledge and belief.

**Dr. AJAY KUSHWAH**