भाकृअनुपराष्ट्रीय प्राकृतिक रेशा अभियांत्रिकी एवं प्रौद्योगिकी संस्थान-
12, रीजेंट पार्क, कोलकाता –700 040, (आईएसओ 9001: 2015)
ICAR-National Institute of Natural Fibre Engineering & Technology
12, Regent Park, Kolkata - 700 040, (An ISO 9001: 2015 Certified Institute)

PROFILE

Sl. No.	Content	Data
1	Photographs	
2	Name	**Dr. Atul Singha**
3	Designation	Senior Scientist
4	Contact	9794361102
5	Email ID	singha.atul@gmail.com
6	Research Interest	Retting and extraction of Natural Fibres
7	Major Research Accomplishments	• Developed a technology of softening of root cuttings of jute by a spray formulation named as "*NINFET Jaibik*". • A jute retting accelerator named as *NINFET-SATHI* was developed as a team member for retting of jute and become popular among jute farmers.
8	R&D	-
9	Awards	-
10	Training	• 21 days winter school on Advances in product diversification and waste utilization of natural fibres organized by ICAR-NINFET at Kolkata from 3-23, December, 2019. • National level training programme on "Production and retting technology of Jute/Mesta/Ramie/Sunnhemp including other related aspects form 17th to 19th July, 2017.. • ICAR sponsored short course on "Recent advances in processing technologies for value addition of jute and allied fivers" from 11 to 20 December 2017 • Training on "Jute Grading" organized by QEI division, ICAR-NINFET, Kolkata form 02.05.18 to 05.05.2018.
11	Patents	-
12	Publications	1. R.A. Ram, A. Singha and A. Kumar. (2019). Microbial Characterization of cow pat pit and biodynamic preparations used in biodynamic agriculture. *Indian Journal of Agricultural Sciences*, 89 (2): 210-4. 2. R.A. Ram, A. Singha and V.K. Singh. (2019). Improvement in yield and fruit quality of mango (*Mangifera indica*) with organic amendments. *Indian Journal of Agricultural Sciences*, 89 (9): 1429-33. 3. Atul Singha, Avijit Das, BS Manjunatha, Manik Bhowmick, Deb Prasad Ray, AK Thakur, Biplab Saha, Ruby Das, Robin Das, Amit Das, DB Shakyawar. (2022). Softening of Barky Root Cuttings of Jute by Pectinolytic Bacterial Strains for Better Spinability and Industrial Uses, *Economic Affairs*, 67(4): 439-444.

		4. Ray, D.P., Ghosh, R.K., Saha, B., Sarkar, A., Singha, A., Mridha, N., Das, I., Sardar, G., Mondal, J., Manjunatha, B.S.,Shakyawar, D.B, 2022. Accelerated retting technology for the extraction of golden fibre from the Indian Tossa jute (*Corchorus* sp.). *Journal of Cleaner Production*. 380: 135063. 5. Kartick K Samanta, AN Roy, H Baite, S Debnath, L Ammayappan, LK Nayak, A Singha, TK Kundu (2023). Properties of Himalayan Nettle Fiber and Development of Nettle/Viscose Blended Apparel Textiles, *Journal of Natural Fibers*, 20(1), 2183924, DOI: 10.1080/15440478.2023.2183924. 6. Singha, A., Adak, T., Kailash Kumar, Shukla, S. K., and Singh, V. K. 2014. Effect of integrated nutrient management on dehydrogenase activity, soil organic carbon and soil moisture variability in a mango orchard ecosystem. *The Journal of Animal and Plant Sciences*, 24(3): 843-849. 7. Adak, T., A. Singha, K. Kumar, S. K. Shukla, Achal Singh, Vinod Kumar Singh, 2014. Soil organic carbon, dehydrogenase activity, nutrient availability and leaf nutrient content as affected by organic and inorganic source of nutrient in mango orchard soil. *Journal of Soil Science and Plant Nutrition*, 2: 394-406. 8. Adak, T., Kailash Kumar, Singha, A., Shukla, S K and Singh, V. K. 2014. Assessing soil characteristics and orchard productivity as influenced by organic and inorganic substrates. *The Journal of Animal and Plant Sciences*, 24(4): 1157-1165. 9. Ram, R. A., A. Singha, S.R. Bhriguvanshi. 2014. Response of on farm produced organic inputs on soil, plant nutrient status, yield and quality of guava (*Psidium guajava*) cv Allahabad Safeda. *Indian Journal of Agricultural Sciences*, 84 (8): 962-967. 10. Shukla, S. K., Adak, T., Singha, A., Kumar, K., Singh, V.K. and Singh, A. 2014. Response of guava trees (*Psidium guajava*) to soil applications of mineral and organic fertilisers and biofertilisers under conditions of low fertile soil. *Journal of Horticultural Research* 22(2): 105-114.
Sl. No.	Content	Data
1	Photographs	
2	Name	**Dr. Nilimesh Mridha**
3	Designation	Senior Scientist, Quality Evaluation & Improvement Division
4	Contact	8587976995
5	Email ID	nilimesh.mridha@gmail.com nilimesh.mridha@icar.gov.in
6	Research Interest	Hyperspectral and Multispectral Remote Sensing & GIS, Soil Physics, Agrotextiles, Soilless Crop Productions, Modelling

7	Major Research Accomplishments	• Developed a process technology for improving yield, water and radiation use efficiency of Chickpea (Cicer arietinum L.) under Soil Moisture Stress through Pre-Sowing Static Magnetic Field Seed Treatment. • Developed a technology of radiative transfer modelling approaches for estimation of crop biophysical parameters using hyperspectral data and different inversion approaches • Developed an innovative methodology for near real-time mapping of jute (C orchorus sp.) area using multi-temporal Sentinel-1 intensity data. • Developed a methodology for prediction of wheat yield using spectral reflectance indices under different tillage, residue and nitrogen management practices. • Developed a technology for estimating leaf area index of wheat crop canopy under moisture stress conditions using thermal imaging. • Developed an indicator based composite measure to assess livelihood sustainability of shifting cultivation dependent ethnic minorities in the disadvantageous North-eastern region of India • Developed an innovative methodology for prediction of mean weight diameter of soil using machine learning approaches • Developed an innovative composite measure of drought-prone Bundelkhand region in India for mapping rural food and nutrition security
8	R&D	**<u>Externally Funded Projects</u>** • Natural fibre waste to plant growth media development, characterization & evaluation in soilless crop production system **as PI** (NTTM funded, total cost= 49 lakhs) • Hyperspectral remote sensing for precision agriculture as Co-PI (DST funded, total cost=214.904 lakhs, Sanction No. BDID/01/23/2014-HSRS dated 18.3.2016) • Developing need-based precision technologies for Viticulture as Co-PI (Mahindra & Mahindra Ltd., total cost=14.45 lakhs) **<u>Institute Projects</u>** • MP-24: Study of soil hydrothermal environment under natural vs synthetic mulch **as PI** (April, 2020-March, 2023) • BPU/QEI/2022-06: Utilization of Natural Fibre waste as a source of crop nutrients under Natural Farming **as PI** (April, 2022 – March, 2024)
9	Awards	• Awarded NESA Young Scientist of the Year 2022 by National Environmental Science Academy, India on December 02, 2022

		• Awarded Best paper (Oral) in National Seminar on 'Water and Soil Management Approaches for Climate Smart Agriculture (WASMACS, 2018)' for research paper entitled "Assessing total soil organic carbon using airborne imaging spectroscopy (AVIRIS-NG)" at BHU, during March 23-24, 2018 • Awarded Best Paper (Oral) in Global Conference on 'Emerging Agricultural Research to Endure the Predicament of COVID-19 Pandemic (GCEAREPCP-2020)' for research paper entitled "Jute Non-woven Agrotextile: A Sustainable and Ecofriendly Technology for Improved Production of Summer Tomato" during December 12-13, 2020
10	Training	• Attended & Successfully completed 97th Foundation course for Agricultural Research Service organized at NAARM, Hyderabad during January 01-April 01, 2013 (Three months) • Attended & Successfully completed Professional Attachment Training and worked under the research topic entitled "Retrieval of crop biophysical parameters using GLUE and Genetic Algorithm (GA) with PROSAIL model" at Department of Civil Engineering, IISc, Bangalore-560012 during May 13-August 12, 2013 (Three months) under the guidance of Dr. D Nagesh Kumar • Attended & Successfully completed the winter school on "Soil-Plat-Water relations under Conservation Tillage Practices for Sustainable Agriculture" sponsored by ICAR at Division of Agricultural Physics, ICAR-IARI, New Delhi during November 05-25, 2014 (21 days) • Attended & Successfully completed the training program on "Statistical Advances for Technological Enhancement in Agricultural Research" under the aegis of CAFT at ICAR-IASRI, New Delhi during January 19-February 08, 2016 (21 days) • Attended & Successfully completed DST sponsored Training Program on "Advances in Integrated Watershed Management for Rural Livlihood" at ICAR-IISWC, RC, Udhagamandalam, Tamil Nadu during November 12-23, 2018 (12 days) • Participated & Successfully completed short course on "Digital Soil Mapping through Geostatistical Approaches using QGIS and R" sponsored by ICAR at ICAR-CAZRI, Jodhpur, Rajasthan during June 24-July 03, 2015 (10 days) •
11	Patents	• Granted copyright for the book

		Shakyawar DB, Ray DP, **Mridha N**, Basak S, Roy SB (2022) ICAR-NINFET PROFILE: A Status Report (1938-2022) p. 110 (Copyright No. L-114619/2022 dt. 23.04.2022)
12	Publications	**Research Papers** • **Mridha, N.,** Saha, B., Bera, T., Sarkar, S., & Manna, K. (2023). Near real-time mapping of jute (C orchorus sp.) area using multi-temporal Sentinel-1 intensity data over the central part of West Bengal, India. Journal of Spatial Science, 1-17 https://doi.org/10.1080/14498596.2023.2211951 • **Mridha, N.,** Chattaraj, S., Chakraborty, D., Anand, A., Aggarwal, P. and Nagarajan, S. (2016). Pre-sowing static magnetic treatment for improving water and radiation use efficiency in chickpea (Cicer arietinum L.) under soil moisture stress. Bioelectromagnetics. 37 (6): 400-408. • **Mridha, N.,** Sahoo, R.N., Sehgal, V.K., Krishna, G., Pargal, S., Pradhan, S., Gupta, V.K. and Kumar, D.N., (2015). Comparative evaluation of inversion approaches of the radiative transfer model for estimation of crop biophysical parameters. International Agrophysics. 29, 201-212. • **Mridha, N.** and Nagarajan, S. (2014). Effect of Pre-Sowing Static Magnetic Seed Treatment on Germination and Root Characters in Chickpea (*Cicer arietinum* L.). Journal of Agricultural Physics, 14(1): 22-29. • **Mridha, N.,** Sahoo, R.N., Kumar, D.N., Sehgal, V.K., Krishna, G., Pradhan, S. and Gupta, V.K. (2014). Genetic Algorithm based Inversion Modelling of PROSAIL for Retrieval of Wheat Biophysical Parameters from Bi-directional Reflectance Data. Journal of Agricultural Physics. 14(1): 87-95. • **Mridha, N.,** Ray, D. P., Singha, A., Das, A., Bhowmick, M., Ghosh, R. K., ... & Das, A. (2023). Composting of Natural Fibre Wastes for Preparation of Organic Manures and Bio-enhancers. Economic Affairs, 68(2), 1121-1128 • Ray, D. P., Ghosh, R. K., Saha, B., Sarkar, A., Singha, A., **Mridha, N**., ... & Shakyawar, D. B. (2022). Accelerated retting technology for the extraction of golden fibre from the Indian Tossa jute (Corchorus sp.). Journal of Cleaner Production, 380, 135063. • Paul S., **Mridha N.,** Vellaichamy S. & Singh P. (2021). Development of a composite measure for mapping rural food and nutrition security: application and validation in the drought-prone Bundelkhand region of India. Food Security. 13:617–635 https://doi.org/10.1007/s12571-021-01152-0 • Paul, S., Das T.K., Pharung R., Ray S., **Mridha N.,** Kalita N., Ralte V., Borthakur S., Burman R.R., Tripathi A.K., Singh A.K (2020). Development of an indicator based composite measure to assess livelihood sustainability of shifting cultivation dependent ethnic minorities in the disadvantageous

Northeastern region of India, Ecological Indicators, 110,105934.

- Banerjee, K., Krishnan, P and **Mridha, N.** (2018). Application of thermal imaging of wheat crop canopy to estimate leaf area index under different moisture stress conditions. Biosystems Engineering, 166: 13-27.
- Pramanik, P., Chakrabarti, B., Bhatia A., Singh S. D., **Mridha, N**. & Krishnan, P. (2018). Effect of elevated carbon dioxide on soil hydrothermal regimes and growth of maize crop (Zea mays L.) in semi-arid tropics of Indo-Gangetic Plains, Environ Monit Assess 190:661
- Ghosh, A. K., Hati, K. M., Sinha, N. K., **Mridha, N.,** & Sahu, B. (2022). Regional soil organic carbon prediction models based on a multivariate analysis of the Mid-infrared hyperspectral data in the middle Indo-Gangetic plains of India. Infrared Physics & Technology, 127, 104372.
- Bhattacharya P., Pramanik P., Ray M. and **Mridha N.** (2020). Prediction of mean weight diameter of soil using machine learning approaches. Agronomy Journal. 2021, 1–14.
- Adak, S., Bandyopadhyay, K.K., Sahoo, R. N., **Mridha, N.,** Shrivastava, M., and Purakayastha, T.J. 2021. Prediction of wheat yield using spectral reflectance indices under different tillage, residue and nitrogen management practices. Current Science, 121(3): 402-413.
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- Das A., Biswas D.R., Das D., Sharma V.K., Das R., Ray P., Ghosh A., **Mridha N.** and Biswas, S.S. (2019). Assessment of potassium status in soils under different land use systems of Assam. Indian Journal of Agricultural Sciences 89 (7): 1077–81.
- Varkey, L. M., Kumar, P., **Mridha, N.,** Sekhara, I. and Sahoo, R. N. (2016). Ecosystem services and fishery production dynamics of wetland ecosystem: An appraisal of Alappuzha district of Kerala, India. Fishery Technology 53: 162 – 169.
- Roy, A., Kolady, D., Paudel, B., Yumnam, A., **Mridha, N.,** Chakraborty, D. and Singh, N.U. 2021. Recent Trends and Impacts of Climate Change in North-East Region of India-A Review. Journal of Environmental Biology, 42, 1415-1424.

		• **Mridha, N.,** Ray, D. P., Singha, A., Manjunatha, B. S., Biswas, S., Saha, B., ... & Shakyawar, D. B. (2021). Prospects of Natural Fibre Crop Based Plant Growth Substrate in Soilless Crop Production System: A Review. **Book Chapters** • **Mridha, N.,** Chakraborty, D., Biswal, A., & Mitran, T. (2021). Retrieval of Crop Biophysical Parameters Using Remote Sensing. Geospatial Technologies for Crops and Soils, 113-151, Springer. • Mukherjee, J., **Mridha, N.,** Mondal, S., Chakraborty, D., & Kumar, A. (2018). Identifying suitable soil health indicators under variable climate scenarios: a ready reckoner for soil management. Advances in crop environment interaction, 205-227, Springer. • Pramanik, P., Krishnan, P., Maity, A., **Mridha, N.,** Mukherjee, A., & Rai, V. (2020). Application of nanotechnology in agriculture. Environmental Nanotechnology Volume 4, 317-348, Springer. • Kumar A., Das P.K., Mukherjee J., Das A., **Mridha N.,** Santra P., Chakraborty D. (2018). Digital Soil Mapping. In Soil resources and its mapping through geostatistics using R and QGIS, New India Publishing Agency.

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