

# Profile

**Dr. S. P. DATTA**



## **Designation: Director**

ICAR-Indian Institute of Soil Science, Bhopal

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## **Academic Qualifications:**

Completed both B.Sc. (Ag.) (72.8%) and M.Sc. (Soil Science and Agricultural Chemistry) (OCGA 4.0/4.0) from Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur in 1987 and 1990, respectively; Ph.D. from Indian Institute of Technology, Kharagpur in 1996; Post-doc from University of Nottingham, UK in 2003.

## **Experience and Field of Specialization:**

**Twenty eight** years of research experience in the area of Soil Chemistry, Fertility (micronutrients) and Pollution, and **26** years of teaching experience at IARI, New Delhi. Principal Scientist, 2009-17; Professor, Division of Soil Science and Agricultural Chemistry, ICAR-Indian Agricultural Research Institute, New Delhi, 2017 to 2023.

## **Contributions in Research and Human Resource Development:**

Dr S.P. Datta developed novel risk assessment protocols and remediation strategies to protect human health from metal and metalloid hazards. He clearly brought out the detrimental and beneficial impacts of use of sewage sludge and industrial effluents on the health and quality of soil, crops and groundwater and provided feasibility of their use in agriculture as well as remediation of metal-polluted soil. Dr. Datta has devised a programmable, portable, low-cost, digital Pusa Soil Test Fertilizer Recommendation Meter that brings soil testing services at the farmers' doorsteps. He made outstanding contributions in understanding chemistry, diagnosis and developing novel fertilizer products for alleviating micronutrient deficiency in soil-plant-human-continuum. He achieved a breakthrough in terms of enhancing the use efficiency of applied zinc (Zn) and boron (B) up to five times through developing novel micronutrient fertilizer products, viz. Zn and B-loaded nano-clay polymer composites. He developed and calibrated a simple and rapid soil test for assessing the available B. For the first time, he also developed a sequential fractionation scheme for soil B compatible with colorimetry. An enormous contribution was made towards imparting quality education and developing human resources in the area natural resource management during 1995-2023 at ICAR-Indian Agricultural Research Institute, New Delhi. Supervised 10 Ph.D. and 07 M.Sc. students as Chairman, besides guiding a large number of students as Co-chairman and advisory committee member in the area of his interest. As a Professor, he had been responsible for coordinating

overall academic activities including teaching and research of students in the Discipline of Soil Science and Agricultural Chemistry (2017-2023).

### Patents:

- Developed and commercialized the Pusa STFR Meter (Patent filed)
- Novel micronutrient products (NCPC-Zn/B): Patent filing under process

### Courses Taught/developed:

During 26 years at IARI, involved in teaching and development of various courses, like Soil Chemical Environment and Plant Growth, Nutrients in Soils and Plants, Soil Chemistry, Chemistry of Problem Soils, Analysis of Soil, Water and Plants, Fundamentals of Soil Science, Modelling Soil Plant System; developed Post Graduate Courses (Soil and Water Science) of Yezin Agricultural University, Myanmar in 2017; revised Post graduate courses of Discipline of Soil Science and Agricultural Chemistry in IARI, New Delhi.

### Awards / Recognitions:

- **Fellow**, National Academy of Agricultural Sciences, New Delhi (2018)
- **Fellow**, Indian Society of Soil Science, New Delhi (2019)
- **Fellow**, West Bengal Academy of Science and Technology (2019)
- **Commonwealth Post-doctoral Fellowship** (2003), Commonwealth Scholarship Commission, University of Nottingham, Nottingham, UK
- **Bharat Ratna Dr. C. Subramaniam Award** for Outstanding Teachers (2017), Indian Council of Agricultural Research, New Delhi
- **Jawaharlal Nehru Award** in Recognition of Outstanding Doctoral Thesis Research in the Field of Soil Science (1998), Indian Council of Agricultural Research, New Delhi
- **IARI-Best Teacher Award** (2012), Indian Agricultural Research Institute, New Delhi
- **Dr. B.C. Deb Memorial Award** in Recognition of Outstanding Contributions in Soil/ Physical Chemistry (2007-08), Indian Science Congress Association, Kolkata
- **The XII International Congress Commemoration Award** (2011), Indian Society of Soil Science, New Delhi
- **Dhiru Morarji Memorial Award** (2015-16, 2008-09, 1998-99), Fertiliser Association of India, New Delhi

### Major Externally Funded Research Projects as Principal Investigator:

- **Research Project** entitled “Risk assessment of metals and metalloids in water-soil-plant continuum under Basmati growing area of northern India” under the Niche Area of Excellence (NAE) Programme of ICAR (2019-2021); Budget **336.1** lakh
- **National Agriculture Science Fund (NASF) Project** entitled “Enhancing use efficiency of micronutrients: Novel delivery systems”, ICAR (2012-2017); Budget **210** lakh
- **All India Coordinated Research Project (AICRP)** on Micro- and Secondary Nutrients and Pollutant Elements in Soils and Plants, ICAR, Delhi Centre (2015-2023)

### Ten most important publications:

- Golui, D., **Datta, S.P.**, Dwivedi, B.S., Meena, M.C. and Trivedi, V.K. (2020) Prediction of free metal ion activity in contaminated soils using WHAM VII, Baker soil test and solubility model. *Chemosphere*, **243**, 125408.
- Das, D., Dwivedi, B.S., **Datta, S.P.**, Datta, S.C., Meena, M.C., Dwivedi, A.K., Singh, M., Chakraborty, D. and Jaggie, S. (2021) Long-term differences in nutrient management under intensive cultivation alter potassium supplying ability of soils. *Geoderma*, **393**, 114983.
- Mishra, R., **Datta, S.P.**, Annapurna, K., Meena, M.C., Dwivedi, B.S., Golui, D. and Bandyopadhyay, K.K. (2019) Enhancing the effectiveness of zinc, cadmium, and lead phytoextraction in polluted soils by using amendments and microorganisms. *Environmental Science and Pollution Research*, **26**, 17224-17235.
- Mandal, J., Golui, D. and **Datta, S.P.** (2019) Assessing equilibria of organo-arsenic complexes and predicting uptake of arsenic by wheat grain from organic matter amended soils. *Chemosphere*, **234**, 419-426.
- Das, D., Dwivedi, B.S., **Datta, S.P.**, Meena, M.C., Agarwal, B.K., Shahi, D.K., Singh, M., Chakraborty, D. and Jaggi, S. (2019) Potassium supplying capacity of a red soil from eastern India after forty-two years of continuous cropping and fertilization. *Geoderma*, **341**, 76-92.
- Golui, D., Guha Mazumder, D.N, Sanyal, S.K, **Datta, S.P.**, Ray, P., Patra, P.K., Sarkar, S. and Bhattacharya, K. (2017) Safe limit of arsenic in soil in relation to dietary exposure of arsenicosis patients from Malda district, West Bengal- a case study. *Ecotoxicology and Environmental Safety*, **144**, 227-235.
- Meena, R., **Datta, S.P.**, Golui, D., Dwivedi, B.S. and Meena, M.C. (2016) Long term impact of sewage irrigation on soil properties and assessing risk in relation to transfer of metals to human food chain. *Environmental Science and Pollution Research*, **23**, 14269-14283.
- Mandal, N., Dwivedi, B.S., Meena, M.C., Dhyani-Singh, **Datta, S.P.**, Tomar, R.K. and Sharma, B.M. (2013) Effect of induced defoliation in pigeonpea, farmyard manure and sulphitation pressmud on soil organic carbon fractions, mineral nitrogen and crop yields in a pigeonpea-wheat cropping system. *Field Crops Research*, **154**, 178-187.
- Paulose, B., **Datta, S.P.**, Rattan, R.K. and Chhonkar, P.K. (2007) Effect of amendments on the extractability, retention and plant uptake of metals on a sewage-irrigated soil. *Environmental Pollution*, **146**, 19-24.
- Rattan, R.K., **Datta, S.P.**, Chhonkar, P.K., Suribabu, K. and Singh, A.K. (2005) Long-term impact of irrigation with sewage effluents on heavy metal content in soils, crops, and groundwater- A case study. *Agriculture, Ecosystems & Environment*, **109**(3-4), 310-322.