

SCIENTIST PROFILE



1. Name & Designation : Dr. A.K. Nayak, Principal Scientist
2. Date of Birth : 18th April, 1969
3. Date of joining ICAR : 05th July, 1996
4. Date of joining the present post : 25th August, 2009
5. Qualification (highest degree) : Ph.D (Soil fertility/Chemistry/Microbiology)
6. Post Doctoral Research Experience/Training:
 - Fellow of Indo-US Norman E. Borlaug International Agricultural Science and Technology: Completed fellowship Training at Agricultural Bio system Engineering Department IOWA State University, USA on Water Management from 10 October to 22 November. 2008
 - Visiting scientist on Salinity Control to Soil Water Environment Research Institute,Cairo, Egypt from 31 August to 14 September 2008
 - Training on “Cropping system models- Application in Land Resource Management at Hyderabad organised by ICRISAT, Patancheru, Hyderabad and University of Florida
 - Computer Models in Irrigation at ANGARAU, Hyderabad organized by ILRI,The Netherlands & ANGRAU, Hyderabad
7. Area of Specialization/research interest:
 - Nutrient management, carbon sequestration, problem soil management, water quality modeling.
8. Significant Contribution including products and patents (Five bullets):
 - Nutrient management and soil quality: Developed soil quality index in a long term rice-rice system under different nutrient management options, Developed resource conservation technology (RCT) for rice wheat cropping system in partially reclaimed Indo-Gangetic sodic soils,developed iron toxicity management strategies for rice growing iron toxic acid soils, developed DRIS norms for the old and senile Anola orchards of Sultanpur district of Uttar Pradesh, developed a map based site specific N management recommendation for Ersama Block of Jagatsinghpur district, Odisha. Developed and commercialised Customized Leaf Colour Chart for Nitrogen Management in Rice for Different Ecologies. Identified best nutrient management practices having moderate GHG emissions, sustaining rice yield and maintaining soil fertility in tropical flooded soils.
 - Carbon and N dynamics under different land use and soil management systems : Estimated the C-Sequestration potential of different land use systems under sodic soil and in different INM treatments under long term rice-wheat system in IGP
 - Developed strategy for using industrial waste for crop production: Guideline for safe use of phosphogypsum as an ameliorant for sodic soil under rice-wheat system was developed in collaboration with BARC, Mumbai.
 - Management of salt affected soil: Modeling and mapping of soil salinity, sodicity and macro and micronutrient in the salt affected soil of bara tract of Gujarat, developed diagnostic criteria for sodic vertisol, developed low cost soil sodicity test kits for testing soil sodicity at farmers field , developed prognostic model using geospatial technique for predicting secondary salinisation in Sardar Sarovar canal command
 - Water quality management: Mapping and modelling of groundwater quality parameters such as salinity, SAR, Boron and Fluoride in the Baratract of Gujarat, Modeling, mapping and assessment of Fluoride toxicity in Unnao district, Uttar Pradesh, Fomulated conjunctive use strategy for use of saline water with surface

water for cultivation of wheat, safflower, mustard and dill on saline black soils with high ground water table.

9. Awards/Honours:

- Borlaug Fellow 2008 for water quality management and visited Iowa State University, USA for completion of the fellowship.
- BHU Gold Medal in M.Sc (Ag) in Soil Science and Agricultural Chemistry in 1993.

10. Publications (10 best):

- i. **Nayak A K**, Mishra VK, Sharma DK, Jha SK, Singh CS, Shahabuddin M and Mohammad Shahid (2013). Efficiency of phosphogypsum and mined gypsum in reclamation and productivity of rice-wheat cropping system in sodic soil. **Communications in Soil Science and Plant Analysis** 44: 1-13.
- ii. Mohammad Shahid, Shukla AK, **Nayak AK**, Tripathi R, Anjani Kumar, Mohanty S, Bhattacharyya P, Raja R and Panda BB (2013). Long-term effects of fertilizer and manure applications on soil quality and yields in a sub-humid tropical rice-rice system. **Soil Use and Management** (DOI: 10.1111/sum.12050).
- iii. Bhattacharyya P, **Nayak A K**, Mohanty S, Tripathi R., Mohammad Shahid, Anjani Kumar, Raja, R Panda, BB, Roy KS, Neogi S, Dash, PK, Shukla AK, Rao KS (2013). Greenhouse gas emission in relation to labile soil C, N pools and functional microbial diversity as influenced by 39 years long-term fertilizer management in tropical rice. **Soil and Tillage Research** 129: 93-105.
- iv. Bhattacharyya P, Roy KS, Neogi S, Manna MC, Adhya TK, Rao KS, **Nayak AK** (2013). Influence of elevated carbon dioxide and temperature on belowground carbon allocation and enzyme activities in tropical flooded soil planted to rice. **Environmental Monitoring and Assessment** (DOI 10.1007/s10661-013-3202-7).
- v. Jha SK, **Nayak A K**, Sharma YK (2013). Geochemical and Spatial Appraisal of Fluoride in the Soils of Indo-Gangetic Plains of India Using Multivariate Analysis. **CLEAN–Soil, Air, Water** 41(3): 313-314.
- vi. **Nayak AK**, Gangwar B, Shukla AK, Mazumdar SP, Anjani Kumar, Raja R, Anil Kumar, Vinod Kumar, Rai PK and Udit Mohan (2012). Long-term effect of different integrated nutrient management on soil organic carbon and its fractions and sustainability of rice–wheat system in Indo Gangetic Plains of India. **Field Crops Research** 127: 129–139.
- vii. Anjani Kumar, **Nayak AK** Shukla AK, Panda BB, Raja R, Mohammad Shahid, Tripathi R, Mohanty S and Rath PC (2012). Microbial biomass and carbon mineralization in agricultural soils as affected by pesticide addition. **Bulletin of Environmental Contamination and Toxicology** 88: 538–542.
- viii. **Nayak A K**, Sharma DK, Singh CS, Mishra VK, Singh G, Swarup A (2011). Diagnosis and recommendation integrated system approach for nitrogen, phosphorus, potassium, and zinc foliar diagnostic norms for aonla in central Indo-gangetic plains. **Journal of Plant Nutrition** 34: 547–556
- ix. Jha SK, **Nayak AK** and Sharma YK (2011). Site specific toxicological risk from fluoride exposure through ingestion of vegetables and cereal crops in Unnao district, Uttar Pradesh, India. **Ecotoxicology and Environmental Safety** 74(4): 940-946.
- x. Nila Rekha P, Kanwar RS, **Nayak AK**, Hoang CK and Pederson CH (2011). Nitrate leaching to shallow groundwater systems from agricultural fields with different management practices. **Journal of Environmental Monitoring** 13(9): 2550-2558.