

**Dr. D.V. K.NAGESWARA RAO**

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### **1. Personal bio-data:**

- a) Position/Designation : Principal Scientist**
- b) Joining date in ICAR : 16-07-2007, (DOB: )**
- c) Discipline and Specialization : Soil Science**

### **d) Training/advance exposure in the area of work:**

- Policy workshop on Big Data Analytics in Agriculture, ICAR - National Academy of Agricultural Research Management, Hyderabad, India, 8-9 February 2018.
- Big data Analytics in Agriculture, ICAR - National Academy of Agricultural Research Management, Hyderabad, India, 13-22 June 2016.
- Training Workshop on Geospatial Analysis in Agriculture and data requirement for ICAR-Geo-portal, ICAR - National Academy of Agricultural Research Management, Hyderabad, India, 29-30 March, 2016.
- Multiple Crop Modelling to improve Resource Use Efficiency in Agriculture under changing Climatic Conditions, Professor Jayashankar Telangana State Agricultural University, Hyderabad, India, 3-23 December 2015.
- International Workshop on Time series Satellite Data Processing for understanding Space-Time Dynamics, Birla Institute of Technology, Ranchi, India, 26-27, November, 2015.
- Short Course on Remote Sensing: An Overview for Decision Makers, Indian Institute of Remote Sensing, Dehradun, India, 17-20 June 2014.
- Training course on Space Technology for Management of Flood and Drought Disasters under Indo-Russia-China Collaboration Programme, NRSC, Hyderabad, India, 17-22 December 2012.
- National Level Training Programme on Climate Change and Geospatial Technology, CSIR National Institute of Science Communication and Information Resources, New Delhi, India, 12-18 March 2012.
- Decision Support System for Agrotechnology Transfer (DSSAT), AICRP-NICRA, Central Research Institute for Dryland Agriculture, Hyderabad, India 13-17 Feb 2012.

- Quantitative Decision Making Techniques for Grassland and Fodder Research, Indian Institute of Forest Management, Bhopal, India, 22-26 Jun 2009.
- GIS based Decision Support Systems for Sustainable Agriculture, National Academy of Agricultural Research Management, Hyderabad, India, 1 - 21 Feb 2008.
- Good Agricultural Practices for Safe, Secured and Sustainable Crop Production, G.B. Pant University of Agriculture and Technology Pantnagar, India, 28 Mar - 17 Apr 2006 11.
- Agricultural Applications of Remote Sensing and GIS techniques, National Laboratory for Agriculture and the Environment (formerly National Soil Tilth Laboratory) and Hydrology and Remote Sensing Laboratory, United States Department of Agriculture, USA, 6 Sept – 5 Nov 2004.
- Geomatica - Fundamentals, CDAC (Centre for Development of Advanced Computing), Pune, India, 21 – 25 Oct 2002.
- Winter School on GIS for Land Resource Data Management, National Bureau of Soil Survey and Land Use Planning, Bangalore, India, 3 - 23 Oct 2001.
- Spatial Information Technology: Few Issues, Jawaharlal Nehru technological University, Hyderabad, India, 28 Jan – 1 Feb 2001.
- Applications of Remote Sensing through Visual and Digital Image Processing, National Remote Sensing Agency, Hyderabad, India, Nov 1992 –Jan 1993.
- Soil Survey and Land Evaluation, National Bureau of Soil Survey and Land Use Planning, ICAR, Nagpur, India, Aug- Nov 1991

#### e) Contribution to the scientific advancement:

- In a probe to find reasons for no response to applied fertilizers, analysis of data on soils in one million hectares revealed the importance of Effective Soil Volume (ESV). The results of field experimentation adjusted to the ESV described excellently the yield of a test crop, Hevea. This highlighted the necessity to consider ESV in fertilizer application for precision nutrient management in that test crop. Suggested a simple water displacement method to measure ESV that can be adopted at farmer's level while using a specially fabricated auger for gravelly soils
- Showed the significance of volume-based expression of soil nutrients in describing the yield better than gravimetric expression. Plantation Crops Symposium XVII, 5-8 2 December, 2006, Kochi, India unanimously recommended testing this concept in all soils and for all crops.
- Identified the demerit of using neutral normal ammonium acetate in acid soils as it leads to erroneous conclusions because of extraction of elements at neutral pH. Based on a comparative study, suggested the use of 0.1 M barium chloride that described plant growth better than ammonium acetate.
- Conducted studies on soil solution, the circulatory fluid of soil body. A stainless steel centrifugal filter was devised for soil solution extraction at a lesser cost.

- Developed and tested a cheap method of rapid tissue analysis which is total, comparable with conventional leaf analysis and adoptable in mobile laboratories also.
- An Information System was developed covering the aspects of rubber cultivation including a theme on soil resources in one million hectares area
- Experience in relating landscape attributes derived from the digital elevation models with the resultant soil characteristics while visualizing the terrain in three dimensions.
- Finalized the scheme to rearrange the soil maps generated at a cost of 0.5 million USD after statistical analysis and use of GIS tools. These maps are being used in at Field Office level for advisory purposes serving 1.1 million small farmers in rubber growing areas in Kerala and Tamil Nadu of India.
- Extensively used Principal Component Analysis, Factor Analysis, Discriminant Function Analysis, Path Analysis and Multiple Regression to reveal the latent structure of data on soils and to understand soil-plant interrelationships effectively

## **2. Future Planning of research:**

- Understanding the “E” in G x E interactions, which is highly complex and variable, to realize the uniform best from the varieties
- Application of remotely sensed data coupled with GIS analysis to understand the spatiotemporal variations in plant behavior which is consequent to combinations and permutations of biotic and abiotic stressors besides plant factors
- Studying soil solid and solution phases to ascertain the role of soil solution in plant nutrition as it is the circulatory fluid of soil systems

## **3. Publications (best five):**

- Rao DVKN. 2018. Distribution maps of edaphic factors derived by geostatistical analysis of data from soil health cards. *The Andhra Agricultural Journal*, 65: 286-292.
- Rao DVKN and Jessy MD. 2007. Impact of effective soil volume on growth and yield of rubber (*Hevea brasiliensis*). *Geoderma*, 141: 332-340.
- Rao DVKN, Thomas J and Punnoose KI. 2006. A rapid method of determination of total N, P and K in a single digest of fresh leaf material of *Hevea*. *Journal of Indian Society of Soil Science*, 54(3): 277-282.
- Rao DVKN. 2005. Evaluation of soil extractants in terms of growth. *Communications in Soil Science and Plant Analysis*, 36 (11&12): 1513-1523.
- Rao DVKN and Jose AI. 2003. Cationic composition of soil solution of some rubber growing soils in Kerala, India. *Journal of Indian Society of Soil Science*, 51: 239-246.

#### **4. Other relevant activities of Scientist:**

##### **a. Life member of**

1. Indian Society of Soil Science, New Delhi
2. Indian Society of Remote Sensing, Dehra Dun.
3. Indian Society of Agricultural Information Technology, Dharwad.
4. The Society of Agricultural Professionals, Kanpur.
5. Indian Society of Soil Survey and Land Use Planning, Nagpur b.

##### **b. Received training also in**

- Twelve days Management Development Programme for Leadership development, ICAR-National Academy of Agricultural Research Management, Hyderabad, 12-23 December 2017.
- DST sponsored – Science Administration and Research Management, Administrative Staff College of India, Hyderabad, India, 17-28 August 2015.
- Indo-US sponsored International Congress cum Workshop on IPR, Amity University, NOIDA, UP, 5-7 Oct 2009.
- Open Access in Indian Agriculture: Prospects, opportunities, advantages and challenges, brainstorming workshop, International Crop Research Institute for the Semi-Arid Tropics, Hyderabad, 6-7 Sep 2009.
- Alternate Land Use Options for Resource Conservation, Emerging Market Needs and Mitigation of Climate Change in Rainfed Regions, Central Research Institute for Dryland Agriculture, Hyderabad, 16 Jan - 5 Feb 2009.
- ICAR Training-cum-Workshop on IP and Technology Management, National Bureau of Fish Genetic Resources, Lucknow, 18-20 Dec 2008.
- Training Programme on Participatory Technology Development, IGFRI, Jhansi, organised by MANAGE (National Institute of Agricultural Extension Management), Hyderabad, 3-7 Nov 2008.
- Training Programme on Local Institutional Building for Community Land Management, IGFRI, Jhansi organised by MANAGE (National Institute of Agricultural Extension Management), Hyderabad, 26-30 May 2008