

- Winter School on "Farmers' resource based site specific integrated nutrient management and online fertilizer recommendation using GIS and GPS tools" during Jan 3 - 23, 2009.

Short Courses / Short Training

- Short Course on "Carbon stabilization, saturation and sequestration: Evolving Concepts, Mechanisms and Approaches" during 23rd Nov 2010 to 2nd December, 2010.
- A short-term Training on "Soil health and fertility management" during Feb. 12-15, 2010.
- A short-term Training Programme on "Integrated plant nutrient management" was organized for the district level agriculture officers of Department of Agriculture, Govt. of Nagaland at IETC, Medziphema, Dimapur and Nagaland during Nov. 25-27, 2009.

Model Training Courses

- MTC on "Soil Organic Carbon Management for Climatic Resilient Agriculture" during 14-21st Feb, 2012.
- MTC on "Best soil and water management practices for resource use efficiency" during Oct. 17-24, 2011.
- MTC on "Efficient recycling of mineral and byproduct nutrient sources for sustainable crop production" during Nov. 2-9, 2009.
- Soil testing techniques for students, field officers and field workers at different periods during 2007-11.

Future Thrust Area

The Division is poised to play a key role in meeting out the challenges enumerated in the vision 2050 of the institute, especially, the challenges for ensuring food and nutritional security from shrinking land resources and achieving self reliance in crop fertilization through indigenous mineral and by-product sources. The Division will also be playing a key role in generating wisdom, and techniques for sustaining soil health and improving nutrient use efficiency through precision agriculture, nanotechnology and biotechnology. Besides, the Division will continue to collaborate with scientists from other divisions in meeting out the challenges of characterizing and conserving large soil-biodiversity for appropriate deployment in agriculture; developing efficient technologies of waste recycling; maintaining soil quality and ecological balance, and developing energy efficient agriculture, carbon sequestration etc.

Some Recent Publications

- Jha, P., Nikita Garg, Brij Lal Lakaria, A.K. Biswas, and A. Subba Rao (2012). Soil and residue carbon mineralization as affected by soil aggregate size. *Soil and Tillage Research*, 121:57-62.
- Jha, P., Rashmi, I., Patel, N.S., Lakaria, B.L., Biswas, A.K., Singh, M. and Rao, A.S. 2012. Effect of Ca salts on residue C mineralization. *Agrochimica*, Pp.129-139.
- Jha, P., Biswas, A.K., Lakaria, B.L. and Subba Rao A. (2010). Biochar in agriculture -prospects and related implications. *Current Science*, 99(9), 1218-1225.
- Lakaria, Brij Lal, Singh, M., Reddy, K.S., Biswas, A. K., Choudhary, R.S., Singh, A.B., Jha, P. and Rao, A.S. 2012. Soil carbon accumulation under integrated nutrient management in soybean-wheat cropping sequence in a vertisol of central India. *Natl.Acad. Sci. Letter*. 35(3): 131-137.
- Lakaria, Brij Lal, Jha, P., Mukherjee, A. and Biswas, A. K. 2012. Soil carbon mineralization as affected by land use systems and water regimes. *J. Indian Soc. Soil Sci.*, 60 (1): 71-73.
- Lakaria, Brij Lal, Manish Patne, Pramod Jha and A. K. Biswas (2012). Soil organic carbon pools and indices under different land use systems in vertisols of central India. *J. Indian Soc. Soil Sci.*, 60:125-131.
- Ramesh, K., Reddy, D.D., Biswas, A.K. and Subba Rao, A. (2011). Zeolites and their potential Uses in Agriculture. *Advances in Agronomy*, 11:215-230.
- Ramesh K., A.K. Biswas, J. Somasundaram and A. Subba Rao (2010). Nanoporous zeolites in farming: current status and issues ahead, *Current Science*, 99(6): 760-765

Sammi Reddy, K., Mohanty, M., Rao D.L.N., Singh, M., Dalal, R.C., Subba Rao, A., Pandey, M and Menzies, N (2008). Nitrogen mineralization in a Vertisol from organic manures, green manures and crop residues in relation to their quality. *Agrochimica (Italy)*, 6: 377-388.

Singh, M., Reddy, K.S. and Rupa, T.R. (2007). Phosphorus availability to rice (*Oryza sativa* L.) and wheat (*Triticum aestivum* L.) in Vertisols after 8 years of inorganic and organic fertilizer addition. *Bio-resource Technology*, 98:1474-1481.

Awards and Honours

Sl.	Name	Award	Year
1	Dr. A. Subba Rao & team	FAI-Silver Jubilee Award	1989
2	Dr. A. N. Ganeshamurthy	Golden Jubilee Commemoration Young Scientist Award (ISSS)	1990
3	Dr. A. Subba Rao	Potash Research Institute of India Award	1991
4	Dr. A. K. Biswas	Jawahar Lal Nehru Award for P.G. Research (ICAR)	1995
5	Dr. A. N. Ganeshamurthy & team	PPIC-FAI Award	1997
6	Dr. Ch. Srinivasa Rao	Golden Jubilee Commemoration Young Scientist Award (ISSS)	1997
7	Dr. Ch. Srinivasa Rao	Young Scientist Award (NAAS)	1997
8	Dr. Ch. Srinivasa Rao & Dr. A. Subba Rao	IPI-FAI Award	1998
9	Dr. Ch. Srinivasa Rao	Young Scientist Award (ICAR)	1998
10	Dr. Ch. Srinivasa Rao	Pran Vohra Award (ISCA)	2000
11	Dr. D. Damodar Reddy	Lal Bahadur Shastri Young Scientist Award (ICAR)	2001
12	Dr. D. Damodar Reddy	Golden Jubilee Commemoration Young Scientist Award (ISSS)	2001
13	Dr. A. Subba Rao	Fellow National Academy of Agricultural Sciences	2001
14	Dr. K. Sammi Reddy	Golden Jubilee Commemoration Young Scientist Award (ISSS)	2002
15	Dr. T. R. Rupa	Pran Vohra Award (ISCA)	2003
16	Dr. T. R. Rupa	Young Scientist Award (NAAS)	2003
17	Dr. A. Subba Rao & team	IMPHOS-FAI Award	2003
18	Dr. T. R. Rupa	Lal Bahadur Shastri Young Scientist Award (ICAR)	2003
19	Dr. T. R. Rupa	Golden Jubilee Commemoration Young Scientist Award (ISSS)	2003
20	Dr. T. R. Rupa	S.N. Ranade Memorial Junior Scientist Award	2003
21	Dr. A. Subba Rao	Fellow Indian Society of Soil Science	2004
22	Dr. D. Damodar Reddy	Shri B. Laxminarayana Memorial Award, New Delhi	2005
23	Dr. K. Sammi Reddy & team	TSI-FAI Award	2006
24	Dr. D. Damodar Reddy	Associate Fellowship of NAAS, New Delhi	2006
25	Dr. K. Sammi Reddy	Associate Fellowship of NAAS, New Delhi	2006
26	Dr. K. Sammi Reddy & team	FAI Golden Jubilee Award for Excellence	2008
27	Dr. K. Ramesh	Young Scientist Award (NAAS)	2008
28	Dr. A. Subba Rao, Dr. K. Sammi Reddy	Hari Om Ashram Trust Award	2009
29	Dr. Muneshwar Singh	Fellow Indian Society of Soil Science	2010
30	Dr. Neenu. S	IPNI Scholar Award	2010
31	Dr. Pramod Jha	ISSS Young Scientist Award	2011
32	Dr. Pramod Jha	IASWC Young Scientist Award	2011
33	Drs. K. Ramesh & N. K. Lenka	Borlaug Fellowship	2011
34	Dr. A. K. Biswas and team	Dr.J.S.P. Yadav Memorial Award	2012

For more Details Contact

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Division of Soil Chemistry and Fertility At a Glance



Genesis: The Division of Soil Chemistry and Fertility came into existence in the year 1996 by combining the sections on Chemistry, Nitrogen, Phosphorus, Potassium, Micro and Secondary nutrients, and tracer laboratory. The manpower and infrastructure including lab equipments were transferred from these sections into this Division. Dr. K. P. Tomar was the first Head of the Division. Since inception this division has acted as the Flagship Division of the institute and has taken a leading role in the development of Integrated Plant Nutrient Supply System (IPNS) for various crops and cropping systems, conducted significant basic research on the long-term dynamics in soil of essential plant nutrients like N, P, K, Zn and Organic C., and developed improved package of practices for cereals, pulses, oilseed and cotton crops.

Mission of the Institute: To provide scientific basis for enhancing and sustaining productivity of soil resources with a view to improve soil quality and health.

Thrust Area: To fulfill the mission of the institute the division has been entrusted with the responsibility to conduct the basic and strategic research related to nutrient management and fertility improvement of soils of India, to study the nutrient dynamics to enhance the efficiency of applied nutrient inputs, improve and maintain carbon stocks in soils, develop nutrient models to aid nutrient management decisions for important agro ecosystems to assess soil quality to monitor long term changes under different agro-ecological systems, build up models for predication of changes in soil health, and to develop new fertilizer products using locally available low cost indigenous minerals and industrial byproducts.

Present Staff Strength (As on 16 April, 2013)

Scientific	Designation	Discipline
Dr. A. K. Biswas	Pr. Scientist and Head	Soil Science
Dr. Sanjay Srivastava	Pr. Scientist	Soil Science
Dr. B. L. Lakaria	Pr. Scientist	Soil Science
Dr. R. Elanchezian	Pr. Scientist	Plant Physiology
Dr. N. K. Lenka	Sr. Scientist	Soil Science
Dr. K. Ramesh	Sr. Scientist	Agronomy
Dr. P. Jha	Sr. Scientist	Soil Science
Dr. Neenu, S.	Scientist	Soil Science
Dr. (Mrs.) I. Rashmi	Scientist	Soil Science
Dr. (Mrs.) Virgine Tenshia	Scientist	Soil Science
Dr. B. P. Meena	Scientist	Agronomy
Technical		
Mr. Deepak Kaul	Technical Officer (T7)	
Mr. Khilan Singh	Technical Assistant (T4)	
Mr. Hukum Singh	Technical Assistant (T3)	
Mr. Bhawar Singh Yadav	Skilled Supporting Staff	

On Going Research Projects

Sl. No	Title of Project	Duration	P. I.
1.	Study on nanoporous zeolites for soil and crop management	2010-2014	K. Ramesh
2.	Efficacy of soil sampling strategies for describing spatial variability of soil attributes	2010-2013	Neenu, S.
3.	Changing climatic factors influence on the nutrient acquisition, utilization and recovery of soybean and wheat germplasm lines/genotypes on black soils of central India	2010-2013	Neenu, S.
4.	Soil carbon saturation and stabilization in some soils in India	2010-2014	Pramod Jha
5.	Participatory Integrated Nutrient Management for improving the productivity and quality of soils of Nagaland	2010-2013	B. L. Lakaria
6.	Studies on soil resilience in relation to soil organic matter in selected soils	2010-2015	N. K. Lenka
7.	Development of phosphorus saturation indices for selected Indian soils	2011-2014	I. Rashmi
8.	Biochar on soil properties and crop performance	2012-2017	B. L. Lakaria
9.	Nano particle delivery and internalization in Plant systems for improving nutrient use efficiency	2013-2016	R. Elanchezian

Scientists Transferred / Promoted in the Last 25 Years

Name	Period	Present Designation
Dr. A. Subba Rao	1989 -	Director, IISS, Bhopal
Dr. K. P. Tomar	1989-1998	Retired
Dr. Muneswar Singh	1989-	PC, AICRP on LTFE, IISS, Bhopal
Dr. A. N. Ganeshamurthy	1988-1998	HOD, Soil Science, IIHR, Bangalore
Dr. S. Kundu	1992	HOD, Environmental Soil Science, IISS, Bhopal
Dr. A. K. Tripathi	1993-	Principal Scientist, Div. of Soil Biology, IISS, Bhopal
Dr. K. Sammi Reddy	1992-2012	Principal Scientist, CRIDA, Hyderabad
Dr. Ch. Srinivasa Rao	1993-1998	Principal Scientist, CRIDA, Hyderabad
Dr. K. K. Burman		Principal Scientist, PDWR, Jabalpur
Dr. D. Damodar Reddy	1995-2009	HOD, SSAC, CTRI, Rajamundri
Dr. T. R. Rupa	1996-2005	Principal Scientist, NRCC, Puttur
Mrs. Vidya Shree Bharti	2005-2007	Scientist (SS), CIFE, Mumbai

Laboratory Facilities Available in the Division

The Division has following instruments/equipments.

Total Organic Carbon Analyzer; UV-Visible Spectrophotometer; Flow Injection Analyzer; Flame Photometer; Kjelpplus Total Nitrogen Analyzer; Low Temperature Centrifuge; Elga Water purification system; Orbital Shaking Incubator; Glass Distillation Unit for Available Nitrogen Estimation; pH meter; EC meter; Sonicator; Magnetic Stirrer; Fume hood Chamber for total elemental Analysis.

Salient Achievements in the Last 25 Years

- IPNS package for soybean-wheat system on vertisols.
- Integrated N management in rice- wheat system on vertisols.
- Residual P management in vertisols for soybean-wheat system.
- Soil P maintenance fertilization technology for soybean-wheat system on medium P testing vertisols.
- Developed malachite green method for the estimation of minute quantities of P in various soil extracts.
- Mineralization kinetics and transformations of S under long term use of fertilizers and manures.
- Soil test based IPNS as per farmer's resource capacity.
- Optimizing P supply in relation to soil moisture regimes.
- Characterizing soil potassium stocks in terms of Biotite in Indian soils.
- Assessment of long term impact of cropping and fertilizer use on soil health.
- Phosphorus solubilisation from rock phosphates using soybean leaf litter.
- Balanced and Integrated Nutrient Management for rainfed cotton.
- Preparation of soil fertility maps of 11 states using GIS and GPS tools.
- Management of mechanical harvest borne wheat residue in soybean-wheat systems
- Zinc dynamics in major benchmark soils of India.
- Evaluation of new fertilizer material such as bentonite sulphur pastiles as source of sulphur.
- Developed region-specific databases on nutrient resources in agriculture and user friendly intelligent data retrieving system for rational and efficient nutrient management
- Carbon Pools Dynamics in Different IPNS Modules
- Modified Urea Fertilizer for Higher N Use Efficiency

Technologies Developed

- Integrated and balanced nutrient management technologies for soybean – wheat system, cotton, pulses, oilseed crops and soybean/maize- wheat cropping systems.
- Residual P management in soybean-wheat system.
- On-line fertilizer recommendation systems for different cropping systems.
- GIS based soil fertility maps of major states.
- Mechanical harvest-borne wheat residue management under soybean-wheat system.
- Farmers' resource based integrated plant nutrient supply system for soybean-wheat on Vertisols.
- Nutrient input output and balance of farmyard manure production by farmers through conventional method.
- Integration of broad bed furrow (BBF) and balanced fertilization: An efficient management practice for successful cultivation of soybean on waterlogged fields.

Training Organized by the Division

The Division has been imparting training in the areas of Soil fertility assessment and fertilizer recommendation; Soil testing for macro and micronutrients; Advanced instrumentation techniques for soil and plant analysis; Integrated and balanced nutrient management for crops and cropping systems to the personnel from State Dept. of Agriculture, Scientists/Professors from National Agricultural Research system (NARS). Besides, the Divisional Scientists have been guiding post graduate students for their dissertation work. Some specific training programmes organized by the Division are given below:

Winter / Summer Schools

- Summer School on "Advances in Frontier Approaches to increase Nutrient Use Efficiency in Crop Production" during July 22 to August 11, 2005
- Winter School on "Organic carbon stocks and soil organic matter management in relation to soil quality and climate change" during January 23 to February 12, 2007.