

**EVALUATIVE REPORT OF THE DEPARTMENT OF SOIL SCIENCE &
AGRICULTURAL CHEMISTRY**

1. Name of the Department : **Soil Science & Agricultural Chemistry**
2. Year of establishment: **1968**
3. Is the Department part of a School/Faculty of the university?
4. Names of Programmes / Courses offered (UG, PG, M.Phil., Ph.D., Integrated Masters: Integrated Ph.D., etc.)

M.Sc.(Ag.) Soil Science & Agricultural Chemistry

CODE	COURSE	CREDITS
SSC 501*	SOIL PHYSICS	2+1
SSC 502*	SOIL FERTILITY AND FERTILIZER USE	3+1
SSC 503*	SOIL CHEMISTRY	2+1
SSC 504*	SOIL MINERALOGY, GENESIS, CLASSIFICATION AND SURVEY	2+1
SSC 505	SOIL EROSION AND CONSERVATION	2+1
SSC 506*	SOIL BIOLOGY AND BIOCHEMISTRY	2+1
SSC 507	GEOMORPHOLOGY AND GEOCHEMISTRY	2+0
SSC 508	RADIOISOTOPES IN SOIL AND PLANT STUDIES	2+0
SSC 509	SOIL WATER AND AIR POLLUTION	2+1
SSC 510	REMOTE SENSING AND GIS TECHNIQUES FOR SOIL AND CROP STUDIES	2+1
SSC 511	ANALYTICAL TECHNIQUES AND INSTRUMENTAL METHODS IN SOIL AND	0+2
SSC 512	SYSTEM APPROACHES IN SOIL AND CROP STUDIES	2+1
SSC 513	MANAGEMENT OF PROBLEMATIC SOILS AND WATERS	2+1
SSC 514	FERTILIZER TECHNOLOGY	1+0
SSC 515	LAND DEGRADATION AND RESTORATION	1+0
SSC 591	MASTER'S SEMINAR	1+0
SSC 599	MASTER'S RESEARCH	20
SSC 601	ADVANCES IN SOIL PHYSICS	2+1
SSC 602	ADVANCES IN SOIL FERTILITY	2+1
SSC 603	PHYSICAL CHEMISTRY OF SOILS	2+0
SSC 604	SOIL GENESIS AND MICROPEDOLOGY	2+0
SSC 605	BIOCHEMISTRY OF SOIL ORGANIC MATTER	2+1
SSC 606	LAND USE PLANNING AND WATERSHED MANAGEMENT	2+0

SSC 607	ADVANCES IN SOIL MICROBIOLOGY	2+1
SSC 608	ADVANCED INSTRUMENTAL TECHNIQUES	2+1
SSC 691	DOCTORAL SEMINAR I	1+0
SSC 692	DOCTORAL SEMINAR II	1+0
SSC	SYNOPSIS SEMINAR	
SSC	PRE-SUBMISSION SEMINAR	
SSC 699	DOCTORAL RESEARCH	45

*Compulsory for Master's programme

M.Sc.(Ag.) Soil & Water Conservation (Under Special Courses of Studies)

A. Major

A.1. Compulsory Course

16 Credits

SWC 501	Physical Nature of Soil	3 Crs. (2+1)
SWC 502	Land degradation and its management	2 Crs. (2+0)
SWC 503	Soil physical environment and plant growth	3 Crs. (2+1)
SWC 504	Principle and practices of water management	2 Crs. (2+0)
SWC 505	Soil erosion and conservation	3 Crs. (2+1)
SWC 506	Irrigation and Drainage	3 Crs. (2+1)
SWC 591	Seminar	1Crs (0+1)

A.2. Optional Courses

4 Credits

SWC 507	Soil conservation and watershed management	3 Crs. (2+1)
SWC 508	Soil and Water Conservation Engineering	3 Crs. (2+1)
SWC 509	Command Area Development	3 Crs. (2+1)
SWC 510	Ground Water Hydrology	3 Crs. (2+1)
SWC 511	Soil Fertility & Fertilizer use	4 Crs. (3+1)
SWC 512	Hydrology of Small Watershed	3 Crs. (2+1)
SWC 513	Soil, water and air pollution	3 Crs. (2+1)
SWC 514	Remote Sensing and GIS techniques for soil water and crop studies	3 Crs. (2+1)
SWC 515	Weather and Climate	2 Crs. (2+0)

B. Minor courses (To be decided by the student advisory committee)

09 Credits

C. Supporting Courses (To be decided by the Student Advisory committee)

05 Credits

D. Research

20 Credits

Total credits

55 Credits

5. Interdisciplinary courses and departments involved

Non- credit compulsory courses (offered by identified departments)

Code	Course title	Credits
PGS 501	Life and information services	0+1
PGS 502	Technical writing and communication skills	0+1
PGS 503 (e-course)	Intellectual property and its management in agriculture	1+0
PGS 504	Basic concepts in laboratory techniques	0+1
PGS 505 (e-course)	Agricultural research, research ethics and rural development programmes	1+0
PGS 506 (e-course)	Disaster management	1+0

6. Courses in collaboration with other universities, industries, foreign institutions, etc. :- **Nil**

7. Details of programmes / courses discontinued, if any, with reasons : **No**

8. Annual/ Semester/Choice Based Credit System : **Choice Based Credit in Semester System**

9. Participation of the department in the courses offered by other departments: **Yes**

10. Number of teaching posts sanctioned and filled (Professors/Associate Professors/Asst. Professors)

	Sanctioned	Filled
Professor	03	02
Associate Professors	04	03
Asst. Professors	08	08

11. Faculty profile with name, qualification, designation and specialisation (D.Sc./D.Litt./Ph.D./M.Phil., etc.)

Name	Qualification	Designation	Specialization	No. of Years of Experience (Round)	No. of Ph.D. students guided for the last 4 years

Dr. Anand Prakash Singh	M.Sc. (Ag) Ph.D.	Professor	Soil Chemistry /Soil Fertility	32 years	Completed -1 Currently working - 3
Dr. Dr Satish Kumar Singh	Ph.D. in Soil Science & Agricultural Chemistry	Professor	Micronutrients Nutrition & Heavy Metals Pollution	22 Years	Completed -1 Currently working - 3
Dr.Surendra Singh	M.Sc.(Ag) Ph.D	Prof.& Head	Soil fertility / Soil chemistry and plant nutrition	23 years	Currently working - 3
Dr. Priyanka Raha	Ph.D.	Professor	Pesticide chemistry	22 years in teaching 26 years in research	Completed -4 Currently working - 1
Dr B. R. Maurya	M. Sc. (Ag) & Ph.D. Soil Science and Agril. Chemistry	Professor	Soil Microbiology (Bio fertilizers)	27 years	Currently working - 3
Dr. Janardan Yadav	M.Sc. (Ag). Ph.D.	Professor	Soil Microbiology / Soil Fertility / Organic Farming	20 years	Completed -1 Currently working - 3
Dr. A K Ghosh	Ph D	Associate Professor	Soil fertility and environmental pollution	14 years	1 completed 2 under supervision
Dr Nirmal De	Ph D	Associate Professor	Physical chemistry of soil / Soil physics	16	Currently working - 2

Dr P K Sharma	M. Sc. (Ag.) Ph.D. Soil Science	Assistant Professor (S-3)	Soil Fertility and plant nutrition. Pedology Phytoremediation .	12	Currently working - 2
Dr.Y.V. Singh	Ph. D	Assistant Professor	Soil fertility and Fertilizer and Carbon sequestration	6 Years	Currently working - 2
Dr. A. Rakshit	Ph.D.	Assistant Professor	Rhizosphere Chemistry	10 years	Currently working - 1
Sri R Meena	M.Sc. (Ag.), NET	Assistant Professor	Soil Fertility	2 years	Nil

12. List of senior Visiting Fellows, faculty, adjunct faculty, emeritus professors

13. Percentage of classes taken by temporary faculty – programme-wise information : **33% (Soil & Water Conservation); Nil (Soil Science & Agril. Chemistry)**

14. Programme-wise Student Teacher Ratio

15. Number of academic support staff (technical) and administrative staff: sanctioned and filled

	Sanctioned	Filled
Technical Staff		
Technical Assistant	02	02
Senior Lab Assistant	01	Nil
Junior Lab Assistant	01	01
Lab Attendant	02	02
Administrative Sector		
Senior Assistant	01	01

16. Research thrust areas recognized by funding agencies

- Soil chemistry - Quantification of N₂O emission from agricultural fields
- Soil Microbiology / Microbial Biotechnology / Organic Farming.
- Biostimulant application in crops
- Geomedicine: GIS mapping of iodine in soils and waters.
- Heavy metals pollution & remediation
- Soil fertility mapping
- Nutrients management
- Use of organo-mineral fertilizers in soil and crop of Varanasi region

- Fertigation in tomato crop for higher yield and quality
- Low cost techniques of heavy metal remediation
- Rainfed Agriculture, Climate resilient agriculture, Nano technology in agriculture, Organic farming
- Soil Contamination, Phytoremediation
- Bioremediation, Decision Support System

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies and grants received project-wise.

S.No.	Title	Agency	Period	Amount of Grant (In Lakhs)
1	Determination of nitrous oxide emission and crop yield through use of neem coated urea in different crops under varying soil conditions vs normal urea.	Indo Gulf – Fertilizers	2006-2011	23.56
2	Evaluation of extractants, Critical Toxic concentration of heavy metals and phytoremediation ability of Marigold (<i>Tagetes erecta</i> L) grown on metals enriched and sludge treated soils. -	CST, UP	2009-2011	3.76
3	Preparation of GIS and GPS based Soil Fertility Map for Selected Districts of the Country	MOA, HISS (ICAR) Bhopal	2011-contd...	16.17
4	Nutrient Management for Improving Soil Quality and sustaining Crop Productivity of Rice – Wheat System	USAID- AIP (Exp. Learning)	2012-15.	19.04
5	Evaluation of new fertigation grade on growth and yield of tomato” commence from	Zuari Rotem Speciality Fertilizers Ltd. Entitled	2012-13...	2.00
6	Development of enriched organo-mineral fertilizers and their utilization in soils and crops of Varanasi region”	University Grant Commission, New Delhi	2012-15	10.72
7	Evaluation of the efficiency of Siapton 10L on yield and quality of potato	Isagro (Asia) Agrochemicals Pvt. Ltd	2008-2010	1.0

8	Status of iodine in cultivated soil and drinking water of iodine deficiency disorders prevalent tarai region of Uttar Pradesh.	University Grants Commission, New Delhi	2012-2015	10.87
9	Assessment of soil health using bioindicator in central Himalaya	Institute of Himalayan Environment and Development, Almora, Uttarakhand	2009-2011	8.42
10	Isolation, characterization and screening for development of asymbiotic diazotrophic and phosphatic bio-fertilizers in eastern Uttar Pradesh	UPCAR, Lucknow	2009-2012	12.8
11	“Studies on the new bio-formulations of the PGPR’s to develop new bio-fertilizers of multiple use in crop production” (Code P-34/05)	Funded by National Centre of Organic Farming, Ministry of Agriculture, Govt. of India	(April 2006 to June 2009).	32.44
12	Development of genetically modified psychrophilic phosphate solubilizer as PGPR to nourish vegetable crops in cold regions of Himalayas. (Code P31/35)	DRDO, Min. of Defence, Govt. of India	Nov. 2007 to continued	29.85
13	A Low Cost Approach to Remediation of Cadmium Contaminated Soils Using Organic and Inorganic Amendments	University Grant Commission, New Delhi	3 years (2012-2015)	9.45
14	Use of TK (Indigenous Technical Knowledge) and experiences in crop production in Vindyan region of Eastern Uttar Pradesh	Uttar Pradesh State Biodiversity Board	2011-2013	14.8
15	Demonstration & dissemination of organic farming protocols for vegetable based cropping system under PRA technique	National Horticultural Mission	(2010-11)	8.96
16	“Conservation and development of natural resource base through plantation at RGSC, Mirzapur district”	MNREGA, Commissioner Rural Dev., U.P.	(2009-12)	187
17	National Initiative on Climate Resilient Agriculture	ICAR	(2010-2012)	35.50

18	AICRP, DLA	ICAR	(Long term, 1985-contd.)	265.00
19	Development & testing of nano clay composite superabsorbent for promotion of rainfed rabi cropping	University Grant Commission, New Delhi		6.80
20	Impact assessment of sewage sludge and effluents on soil and water quality around sewage treatment plant (STP), Bhagwanpur	CST, LUCKNOW	4.48 (october2011-october 2013)	4.48
21	Effect of chelating and non chelating compounds with VAM for phytoremediation of heavy metal contaminated soils.”	UGC New DELHI	2012-2014	2.00
22	Soil test based fertilizers recommendation for targeted yield of Wheat, Rice and Maize in Eastern Plain Zone of Uttar Pradesh”.	STCR (AICRP), I.I.S.S., ICAR, Bhopal- (M.P.)	from 01.04.2010 to till date	0.88/year.
23	Long term effects of integrated nutrient management on sustainability of rice- wheat cropping system and soil fertility in Eastern Uttar Pradesh”.	CST, Lucknow U.P.	22.03. 2010 to 21.03.2012	4.48
24	Bioremediation of soil and ground water polluted by industries in adjoining areas of Varanasi	Council of Science and Technology, UP	2008-2011	6.12
25	Empowering agrarian community through development of a DSS package	Mahindra & Mahindra, Mumbai	2010-2011	1.16

18. Inter-institutional collaborative projects and grants received

f) All India collaboration

- National Initiative on Climate Resilient Agriculture (2010-2012), ICAR (35.5 lakhs)
- AICRP, DLA (Long term, 1985-contd.), ICAR (265 lakhs)

g) International

Interdisciplinary Project –Collaboration of Soil Science & Agricultural Chemistry, Agronomy, Plant Physiology & Genetics & Plant Breeding and Tata Chemicals (under

USAID-AIP- S.K.Singh)

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, etc.:
total grants received :- **Nil**

20. Research facility / centre with :- **To be complied at Institute level**

- state recognition
- national recognition
- international recognition

21. Special research laboratories sponsored by / created by industry or corporate bodies : **Nil**

22. Publications:

- * Number of papers published in peer reviewed journals (national / international)

International Journals

Mohammad Shahid, D. K. Bhandari, Intjar Ahmad, A. P. Singh and P. Raha (2008) 'Study on fluoride content of groundwater in Jind District, Haryana, India.' *American-Eurasian J. of Agric. & Environ. Sci.* 4(6): 670-676

Mohammad Shahid, D. K. Bhandari, A.P. Singh and Intjar Ahmad (2009) 'Groundwater Quality CT Appraisal and Categorization in Pillu Khera Block of Jind District, Haryana.' *Asian J. Water Environment and Pollution.* 6(4): 67-71

C. M. Singh, P. K. Sharma, Prem Kishor, P. K. Mishra, A. P. Singh, R. Verma and P. Raha (2011) 'Impact of integrated nutrient management on growth, yield and nutrient uptake by wheat (*Triticum aestivum* L.). *Asian J. Agric. Res.*, 1-7.

Jyoti Pande, Srivastava, P.C. and Singh, S.K. (2012) Plant availability of nickel as influenced by farm yard manure And its critical toxic concentration in French bean. *Journal of Plant Nutrition.* 35: 384-395. (NAAS-7.2)

Singh, S.K., Raha, P. and Banerjee, H. Endosulfan adsorption on soils of Uttar Pradesh and Uttaranchal. *J. Soils and Crops.* 2012,22(1),34-43.

Kishor, P., Maurya B.R. and Ghosh A.K. (2010). Use of uprooted Parthenium before flowering as compost: A way to reduce its hazards world wide. *Int. J. Soil Sci.* .5(2):73-81.

Kishor, P., Ghosh A.K.; Surendra Singh and Maurya B.R. (2010). Potential use of Parthenium (*Parthenium hysterophorus* L.) in agriculture. *Asian journal of Agricultural Research.*4 (4): 220-225.

Yadav, Janardan, Verma, J.P. and Tiwari, K.N. (2011) Plant growth promoting activities of fungi and their effect on chickpea plant growth. *Asian J. of Biological sciences* 4(3). 291-299. ISBN/ISSN 1996-3351

- Yadav, Janardan, Verma, J.P. and Tiwari, K.N. (2011) Solubilization of tricalcium phosphate by fungus *Aspergillus niger* at different carbon source and salinity. *Trend in Applied Science Research*. 6(6), 606-613. ISBN/ISSN 1819-3576
- Verma, J.P., Yadav, Janardan, Tiwari, K.N., Lavakush and Singh, V. (2010) Impact of plant growth promoting rhizobacteria on crop production. *International J. Agricultural research*. 5(11):954-983. ISBN/ISSN 1816-4897
- Yadav, Janardan, Verma, J.P. and Tiwari, K.N. (2010) Effect of plant growth promoting rhizobacteria on seed germination and plant growth of chickpea (*Cicer arietinum* L.) under In-vitro conditions. Accepted for pub. in *J Biological Forum-an International Journal* in the issue of 2(20) Jul.- Dec.2010. (ISSN: 0975-1130) Accepted
- Yadav, Janardan, Verma, J.P., Yadav, S.K. and Tiwari, K.N. (2010) Effect of salt concentration and pH on soil inhabiting *Penicillium citrinum* Thom. For solubilization of insoluble phosphorus to soluble phosphorus. *Microbiology Journal*.pp.1-8. ISBN/ISSN 2153-0696
- Verma, J.P., Yadav, Janardan and Tiwari, K.N. (2010) Application of *Rhizobium* sp. BIIURC-01 and n. bioplant growth promoting rhizobacteria on nodulation and yield of chickpea (*Cicer arietinum* L.). *International J. Agricultural research*. 5(3): 148-156. ISBN/ISSN 1816-4897.
- Yadav Janardan, Verma, J.P., Rajak, V.K. and Tiwari, K.N. (2010) Selection of effective indigenous *Rhizobium* strain for seed inoculation of chickpea (*Cicer aritenium* L.) production. *Bacteriology Journal*.pp.1-7. ISSN 2153-0211.
- Verma, J.P., Yadav, Janardan and Tiwari, K.N. (2009) Effect of Mesorhizobium and plant growth promoting rhizobacteria on nodulation and yields of chickpea. *Biological Forum – An International journal*. 1(2):11-14.
- Abdala, D. B., Ghosh, A. K.*, Silva, I. R., Novais, R.F. and Alvarez, V. H. (2012). Phosphorus saturation of a tropical soil and related P leaching caused by poultry litter addition. *Agriculture, Ecosystem and Environment*. 162:15-23 (Impact factor: 3.969)
- de Souza, C. R., Ghosh, A. K., Silva, I. R., Novais, R. F. and Jesis, G. L. (2012). Transformation of phosphorus in poultry litters and litter treated oxisols of Brazil as assessed by ³¹P NMR and wet chemical fractionation. *Revista Brasileira de Ciência do Solo*. 36:1083-1091. (Impact factor: 0.8)
- Ghosh, A. K.*, Bhatt, M. A. and Agrawal, H. P. (2012). Effect of long-term application of treated sewage water on heavy metal accumulation in vegetables grown in Northern India. *Environmental Monitoring and Assessment*. 184:1025–1036. DOI: 10.1007/s10661-011-2018-6. (Impact factor: 1.4)
- Ghosh, A. K.*, Joyace Barbosa, Ivo Ribeiro da Silva (2011). An Environmental Threshold of Soil Test P and Degree of P Saturation of Brazilian Oxisols. *CLEAN – Soil, Air, Water*. 39(5): 421-427. (Impact factor: 2.17)

- Dey B. Singh MK, De C. Singh, VK and De Nirmal. 2012. Energy Utilization in Pea cultivation: an economic analysis for IGP regions. *International Journal of Bio-resource and Stress Management* 3 (2): 152-157
- Dey B. Singh VK, Dey B. Singh MK and De Nirmal. (2012). Economic analysis on chilli production in the Gangetic alluvial soil. *Inter. J. Agril. Env. Biotech.* 5 (1): 31-34
- De Chhabi, Singh VK, Dey B. Singh MK and De Nirmal. (2011). Factor productivity of agro-techniques in tomato cultivation: An economic analysis. *Asian J. Soil Sci.*, 6 (2): 221-226.
- De Nirmal and Datta S.C. (2008). Modeling time-dependent phosphate buffering capacity in different soils as affected by bicarbonate and silicate ions. *Australian J. Soil Res.* 46 : 315-322
- Kasturikasen Beura and Amitava Rakshit (2011). Effect of Bt cotton on nutrient dynamics under varied soil type. *Italian J. Agron.* 6(4)25-28.(NAAS:4)
- Rakshit, A and P.B.S.Bhadoria (2010) Role of VAM on growth and phosphorus nutrition of maize with low soluble phosphate fertilization. *ACTA AGRONOMICA* (ISSN: 0120-2812), 59 (1) 2010, p 119-123
- Sen, D., Amitava Rakshit, N C Sarkar, D. C. Ghosh and S.K. Bardhan Roy (2010). Effect of transplanting dates and spacing on yield attributing character, productivity and economics of potato cultivation through true potato seed (TPS) technology. *Italian J. Agron.* 5(1)35-42.(NAAS:4)
- Triyugi Nath, Priyanka Raha and Amitava Rakshit (2010) Sorption and Desorption Behaviour of Iodine in Alluvial Soils of Varanasi, India *AGRICULTURA(A)*, 8,9-14 (ISSN 1581-5439)
- Rakshit A., Kuldeep Singh, Dileep Kumar and Prabhat Kumar (2009) Bioremediation of peri urban areas of Varanasi irrigated with treated sewage water. *New Biotechnology Supplement 1- pp. S1-S378.* 5.0.24(NAAS 7.6)
- Rakshit, A (2009) Performance of *Abelmoschus esculentus* L. cv Arka Anamika (IHR Sel 10) grown in New Alluvial Region of West Bengal, India with different locally available Organic Manures. *e-Journal of Science & Technology*(ISSN 17905613) 4(1):17-28
- Rakshit, A and P.B.S.Bhadoria (2009) Influence of arbuscular mycorrhizal hyphal length on simulation of P influx with the mechanistic model. *African Journal of Microbiology Research* (ISSN: 1996-0808) Vol. 3 (1), pp. 001-004.(NAAS:7
- Rakshit, A and Debashish Sen(2008) Potential of different locally available Organic Manures on the performance of *Abelmoschus esculentus* L. cv Arka Anamika (IHR Sel 10) grown in New Alluvial Region of West Bengal, India *American-Eureian J.Agric& Environ Science* (ISSN 1818-6769) 4(5):603-610

- Rakshit, A. N C Sarkar and Debashish Sen(2008) Influence of organic manures on productivity of two varieties of rice. *Journal of Central European Agriculture* (ISSN 1332-9049) 9(4):629-634.
- Rakshit, A and P.B.S.Bhadoria (2008) Measurement of Arbuscular Mycorrhizal Hyphal Length and prediction of P influx by a mechanistic model *World Journal of Agricultural Sciences* (ISSN: 1817-3047 EISSN : 1817-5082) 4(1):23-27.
- Rakshit, A and P.B.S.Bhadoria (2008) Indigenous arbuscular mycorrhiza is more important for early growth period of groundnut (*Arachis hypogea*) *Acta agriculturae Slovenica*, 91(2) str. 5 - 14.(DOI: 10.2478/v10014-008-0020-7)

National Journals

- Anand Prakash Singh (2011) "Use of ameliorants in metal contaminated soils" *J. Indian Soc. Soil Sci.* 59: 574-580.
- Mohammad Shahid, A.P. Singh, D.K. Bhandari and Intjar Ahmad (2008) "Assessment of Underground Water Quality in Julana Block of Jind District, Haryana." *J. Ind. Soc. Soil Sci.* 56(1): 123-125
- C. M. Singh, A.P. Singh, P.Raha and Dileep Kumar (2010) Arsenic contamination and its management. *Intern. J. Agric. Env.& Biotch.* 3 (2):175-177
- Patel,C.B.,Singh,R.S.,Yadav,M.K.,Singh,S.K.,Singh,M.K.,Singh,K.K.andMall,R.K.(2012) Response of different wheat(*Triticum aestivum* L. emend Fiori & Paol.) Genotypes to various nitrogen levels under late sown conditions of Eastern Uttar P radish *.Environment & Ecology* 30(3C):1192-1196.(NAAS-2.1)
- Ganga Joshi, Srivastava,P.C. Singh,P.K., Singh,S.K. and Singh,J.P.(2012)Influence of Integrated Use of Mulch and drip irrigation on soil microbial biomass carbon of a young litchi orchard. *Pantnagar Journal of Research* 10(1),96-98. (NAAS-3.0)
- Ganga Joshi,Singh,P.K., Srivastava,P.C. and Singh,S.K.(2012) Effect of mulching,drip irrigation scheduling and fertilizers levels on plant growth,fruit yield and quality of litchi(*Litchi chinensis* Sonn.).*Indian Journal of Soil Conservation*.40(1):46-51(NAAS-4.6)
- Singh,P.K. and Singh,S.K.(2011) Sustainable Soil management through fertigation for achieving high yield and quality produce.*Indian J.agric..chem* Vol.XXXXIV(2&3),193-208. (NAAS-2.0)
- Ganga Joshi, Singh, P.K. and Singh, S.K. and , Srivastava, P.C.(2011)Effect of drip fertigation and mulching on water requirement,yield and economics of high density -litchi. *Progressive Horticulture*, 43(2): 237-242. (NAAS-3.6)

- Ganga Joshi, Srivastava, P.C., Singh, P.K. and Singh, S.K. (2011) Influence of drip fertigation and plastic mulching in litchi orchards. *Journal of Soil and Water Conservation*.10 (2) 142-149. (NAAS-4.0)
- Singh,P.K.,Singh,S.K., Narendra Singh and R.L.Lal (2010) Plant tissue testing as a guide for diagnosing nutrients disorders in the Litchi Growing orchards of Uttarakhand. *Pantnagar Journal of Research* 8(2),222-225. (NAAS-3.0)
- Singh,A.K. and Singh,S.K.(2010)Response of Organic and inorganic sources of nutrients in rose. *Progressive Horticulture*.42(2):205-207. (NAAS-2.1) (NAAS-3.6)
- Ganga Joshi, Srivastava,P.C., Singh,P.K., Singh,S.K. and Lal, R.L. (2010) Effect of leaf age on nutrients composition of litchi(*Litchi chinensis* sonn.) foliage. *Progressive Horticulture*.42(1):119-120. (NAAS-3.6)
- Singh,S.K.(2009) Management of micronutrients for increasing crop productivity. *Indian Journal of Agricultural Chemistry*.Vol.XXXXII(1&2),17-41. (NAAS-2.0)
- Poonam Varshney,Singh,S.K. and Srivastava, P.C. (2008)Frequency and rates of Zn application under hybrid rice – wheat sequence in a Mollisol of Uttarakhand. *Journal of Indian Society of Soil Science*:56(1):92-98. (NAAS-4.7)
- Singh, Surendra, Singh, R. N. ;Singh, B. P. and Kushwaha, Azit Kumar (2008). Integrated nutrient management practices for sustainable productivity of rainfed rice *Indian Journal of fertilizers* 4 (3) pp. 25-28&31-32.
- Singh, Surendra (2008). Effect of sulphur on yields and S uptake by onion and garlic grown in acid Alfisol of Ranchi. *Agric. Sci. Digest* 28 (3) 181-191.
- Prasad Sant, Singh, S.P., Diwedi, N. N. Singh h, S.R.,Singh, V.K.,Singh, S. and Chandola, V.K. (2008) Response of VAM, Rhizobium culture and phosphorus levels on yields and its contributing characters of Cowpea. *Veg. Sci.* 35(2) 210-211.
- Kushwaha, Ajit Kumar; Singh, Surendra and Singh, R.N.(2009) Available nutrients and response of lentil to boron application in rainfed uplands soils of Ranchi. *Journal of Indian Society of Soil Science*.57: (2) 219-222.
- Kumar Dileep, Singh Surendra and Kumar Pramod (2009) Forms of sulphur in some soils of Mirzapur district of Uttar Pradesh. *Jornal of Research (BAU)*, 21 (2) 115-121.
- Gosh, A.K Mandal, A.K. Ray, S. and Singh ,Surendra (2009) Distribution of boron in relation to soil acidity in Terai region of West Bengal. *Jornal of Research (BAU)*, 21 (1) 7-14.
- Singh, Surendra; Singh, R.N., Sarkar, A.K. and Shiv Shankar Prasad (2010) INM for higher productivity of Rice-Pea cropping system-An experience from copper mines area. *Indian Journal of fertilizers*, 6 (2), pp 43-46 & 58.

- Singh, Surendra (2010) Management of secondary nutrients for higher crop productivity. Indian Journal of Agricultural Chemistry, Vol XXXXIII (1,2), 9-16.
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Year:2009::Publisher:Westville Publishing House,New Delhi

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A Practical Manual on Conservation and Management of Soil and Water Resources(2010) Sobaran Singh, S.K.Singh and H.N Singh College of Agriculture, GBPUA&T, Pantnagar

Technical Bulletin

Mishra, V.K., Ramesh, Chand, Saket Kushwaha, Singh, S.K., Srivastava C.P., Mishra, G.C. and Kamalvansi V. (2012) Ravi Ke Pramukh Fasalon Ka Beej Utpadan (ISSN 0976-4931) Technical Bulletin sponsored by MOA, GOI, New Delhi under Seed Village Project Published by Progressive Science Society, Varanasi.

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- * SNIP
- * SJR
- * Impact Factor Range / average (0.029-2.89)/1.02 (Dr N De)
- * Citation Index - range / average (3-11)/6 (Dr N De)
- * Impact Factor - h-index = 2 (Dr N De)
- * **h-index** 2.0 (Dr A Rakshit)

23. Details of patents and income generated :- **Nil**

24. Areas of consultancy and income generated :- **Nil**

25. Faculty selected nationally/ internationally to visit other laboratories in India and abroad

- USAID – AIP sponsored visit to Cornell University and University of Illinois, U.S.A. And CIMMITY, Mexico (A.P.Singh)
- Asian Productivity Organization, Tokyo, Japan-Taiwan Agricultural Chemicals and Toxic substances Research Institute, Taichung, Taiwan (P.Raha)
- Training on 'Molecular biological techniques', IIBT, Palampur, 8 weeks, May - June 2008 (N. De)
- A.K. Ghosh, TWAS-CNPq sponsored PDI

26. Faculty serving in

a) National committees b) International committees c) Editorial Boards d) any other

(please specify)

- Member, Editorial Board – Journal of Progressive Science (A.P.Singh)
- Dr N De: Editorial Board of Economic Affair, Asian J. of Soil Sci.
- Dr A Rakshit: Member of Young Innovators' Awards Program, Cairo, Egypt (www.nahdetmasr.org)
- Chief Editor, International Journal of Agriculture Environment & Biotechnology; Reviewer of *Asian Journal of Agricultural Sciences*
- **Member of the BOS / RDC** of U.P. College, Varanasi and CCS University, Meerut-2011-12 (S.K. Singh)

- National committees - Banaras Hindu University, Varanasi and Udai Pratap Autonomous College, Varanasi (S. Singh)
- Editorial board- Journal of the Indian Society of Soil Science (S. Singh)
- Life member of journals: Journal of Indian Society of Soil Science • Life member: Journal of Research (BAU) • Ordinary member: Indian Journal of Agronomy • Life member: Indian Journal of Soil conservation (S. Singh)

27. Faculty recharging strategies

Organised

1. Course Director of ICAR sponsored Winter School (21days) on " Water and Nutrients management for Crops Under Rainfed Ecosystem of Eastern Part of Uttar Pradesh during Jan 10-30,2010,at Department of Soil Science & Agricultural Chemistry, Institute of Agricultural Sciences , Banaras Hindu University,Varanasi-221005. (S.K.Singh)

2. Organising Secretary XXXXIII Annual Convention of Indian Society of Agricultural Chemists (S.K.Singh)

National Conference on "Soil Management for Achieving Food Security and Nutritional Safety under Normal and Intensified Agroecosystem" Nov.1-2,2010 Department of Soil Science & Agricultural Chemistry, Institute of Agricultural Sciences , Banaras Hindu University,Varanasi-221005. (S.K.Singh)

Attended

Attended UGC sponsored short term training course for Academic Administrators w .e.f. 11.01.2010 to 19.01.2010 at ASC,BHU(S.K.Singh)

Attended one day workshop on " Choice based credit system" organized by Quality assurance cell, BHU dt.23.01.2010. (S.K.Singh)

Attended Brain storming workshop on 14-17 Feb.2010 at BCKV, Kalyani, Invited by NTSTC, DST,GOI as resource person to prepare activity guide for National Children Science Congress 2010-11. (S.K.Singh)

Attended Platinum Jubilee alumini meet and national seminar of AABHA held during January 5-6,2008 at B.H.U., Varanasi. (S.K.Singh)

Participated in FAI Annual seminar on Fertilizer security – A prerequisite for food security, held during 4-6 December,2008 at New Delhi. (S.K.Singh)

Participated and delivered Sushila Bala De Memorial lecture in Symposium on "Water and fertilizer Management: Present day Chemical agriculture in India" held during 40 & 41st joint annual convention of ISAC,at BAU,Ranchi during December 12-13, 2008. (S.K.Singh)

Attended 42 Annual convention of Indian society of Agricultural Chemists and National symposium on "Maintenance of soil health and food security" Nov.27-28,2009 at Bidhan

Chandra Krishi Viswavidyalaya, Mohanpur. And presented invited lecture on " Impact of sewage sludge application on crop production and soil health". (S.K.Singh)

Attended platinum jubilee annual convention of Indian society of Soil Science, New Delhi, Dec 22-25, 2009 and presented paper. (S.K.Singh)

Attended Workshop for Academic Administrators organized by ASC, BHU wef 11.01.2010-12.01.2010. (S.K.Singh)

Attended 43rd ACISAC and national Conference on " Soil management for achieving food security and nutritional safety under normal and intensified agroecosystem" held during Nov.01-02, 2010 at BHU, Varanasi(S.K.Singh)

Attended Alumni meet and National Conference held at BHU Dec, 2010. (S.K.Singh)

Attended National Workshop of GPS and GIS Project organized by IISS, Bhopal during July 30-31st, 2011(S.K.Singh)

Attended 44th Annual Convention of ISAC & National Symposium on "Balanced Fertilizer to Sustainable Soil Health : Crop Production and Food Security" Organised by Dept. Soil Science, GBPUA&T, Pantnagar during Nov 25-26, 2011. (S.K.Singh)

Training – cum – Workshop on ***E-Learning*** in Agriculture held on Sept. 4 to 11, 2012 at Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. (A K Ghosh)

Attended Refresher Course at ASC, BHU, Varanasi during February, 2011 (A K Ghosh)

Training on "Molecular biological techniques" IIBT, Palampur May –June 2008 (Dr N De)

Training on "Strengthening statistical computing for NARS" IASRI, New Delhi (ICAR) Oct 25-30, 2010 (Dr N De)

Training on "Database Analysis and Management in climate Variability in Rainfed Agriculture" CRIDA, Oct 25-30, 2010Hyderabad Feb 21-25, 2012 (Dr N De)

Refresher course in Agricultural Sciences U G C Academic Staff College, BHU, Varanasi November 11-30, 2007 (P K Sharma)

E-Resource Awareness Programme Central Library, BHU, Varanasi August 19, 2008 (P K Sharma)

Market-Led Extension IAS, BHU, Varanasi August 25-29, 2008 (P K Sharma)

Training on social harmony and human rights Literacy house, Lucknow 1-3 august, 2010 (P K Sharma)

Attended training on Market-Led Extension(MANAGE, Hyderabad -BHU) at IAS, BHU during Varanasi during August, 2008 (A Raksht)

Attended Refresher Course at ASC, BHU, Varanasi during February, 2010(A Raksht)

ICT Mediated Knowledge Management at IAS, BHU, Varanasi August, 2009(A Raksht)

Attended E learning Workshop at IAS, BHU, Varanasi during September, 2012 (A Raksht)

58th Orientation Course from Academic Staff College, BHU, Varanasi, from September 1 to 28, 2011 (R Meena)

Training – cum – Workshop on *E-Learning* in Agriculture held on Sept. 4 to 11, 2012 at Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. (R Meena)

28. Student projects

- percentage of students who have done in-house projects including inter-departmental projects: - **100%**
- percentage of students doing projects in collaboration with other universities / industry / institute: – **15%**

29. Awards / recognitions received at the national and international level by

- Faculty

Visiting professor, Cornell University, U.S.A. sponsored by USAID-AIP in 2012(A.P.Singh)

Fellow, Indian Society of Agricultural Chemists (A.P.Singh)

Fellow, Indian Society of Agricultural Chemists (S.K.Singh)

Vice President (East Zone) for three years (2012-15) : Indian Ecological Society, Punjab Agricultural University ,Ludhiana(S.K.Singh)

Fellow of Indian Society of Soil Science (S.Singh)

Fellow of Indian Society of Agricultural Biochemists, Kanpur, UP, 2007(P.Raha)

Fellow of Crop and Weed Science Society, Kalyani, WB, 2010(P.Raha)

Shiksha Rattan Puraskar by India International Friendship Society,2010(P.Raha).

Councilor of ISSS, New Delhi(B.R.Maurya)

Councilor of Indian Society of Soil Science for the period of 2009and 2010(J.Yadav)

TWAS-CNPq post doctoral research award 2010 (A K Ghosh)

Awarded ' Rashtriya Gaurav Award' from IFS, New Delhi, 2012 (Dr N De)

Awarded 'Fellow of Hind Agri-Horticultural Society, 2012' (Dr N De)

Best Teacher Award, Institute of Agricultural Sciences, BHU, Varanasi (A Rakshit)

Achievers Award by Society for the Advancement of Human and Nature (SADHNA), Himachal Pradesh (A Rakshit)

Darwin Now Bursary Award by British Council, UK (A Rakshit)

Selected Member of Young Innovators' Awards Program, Cairo, Egypt(A Rakshit)

Biovision Next Fellow BY FONDATION SCIENTIFIQUE DE LYON, France (A Rakshit)

TWAS NXT AWARD BY THE ACADEMY OF SCIENCES FOR THE DEVELOPING WORLD (TWAS), ITALY (A Rakshit)

CIMOUSEF 2009 BURSARY BY MOROCCAN ASSOCIATION FOR THE IMPROVEMENT OF THE QUALITY OF EDUCATION (AMAQUEN) AND UNESCO (A Rakshit)

- Doctoral / post doctoral fellows

UGC- Dr. D.S. Kothari Post Doctoral Fellow: Dr D.L. Devi (P.Raha).

- Students

30. Seminars/ Conferences/Workshops organized and the source of funding (national / international) with details of outstanding participants, if any.

- ICAR sponsored Winter School (21days) on " Water and Nutrients management for Crops Under Rainfed Ecosystem of Eastern Part of Uttar Pradesh during Jan 10-30,2010 at Department of Soil Science & Agricultural Chemistry, Institute of Agricultural Sciences , Banaras Hindu University

List of participants

Dr. Chandra Shekhar Singh Technical Officer (T-6) Central Soil Salinity Research Institute Regional Station, Jail Road, P.O. Alamagh Lucknow – 226005 (U.P.)	Mr. Bibhuti Bhusan Behera Jr. Scientist (Soil Science) AICRP on Agroforest, Dept. of Agroforestry Orissa Univ. of Agriculture & Technology Bhubaneswar, Orissa
Mr. Ravi Prakash Singh Asstt. Professor Agriculture Research Station Kalai Aligarh, U.P. – 202125	Mr. Raj Kumar Sachan Asstt. Professor NARP, Hazratpur Ferozabad U.P.
Dr. Siya Ram SMS (Agronomy) KVK Tisuihi Post- Marihan, Mirzapur – 231310 (U.P.)	Dr. Krishan Kumar Chandra SMS, Krishi Vigyan Kendra P.O. Jagdis Sarai Chandauli – 232104
Dr. Mahesh Chandra Dwivedi Asstt. Prof. (Agronomy)/ Farm Manager SKUAST-Jammu 81/3, Sanjay nagar, Jammu	Mr. Permendra Singh Jr. Scientist (Agronomy) D.L.R.S.S., Dhiansar SKUAST- Jammu – 181133
Dr. Vinod Kumar Tiwari Scientific Officer (Soil Science & Water Management) UPCAR, 8 th Floor, Kisan Mandi Bhawan Vibhuti Khand Gombi Nagar Lucknow – 226 010 (U.P.)	Dr. Arvind Kumar Tyagi SMS (Soil Science) P.O.- Jeolikote (Nainital) Uttarakhand - 263127
Dr. Sanjay Sachan SMS/Asst. Professor College of Forestry & Hill Ag. Hill Campus (GBPUA&T) Ranichauri, Tehri Garhwal Uttarakhand - 249199	Dr. Sushil Dimree Assistant Professor Soil Science & Agril Chemistry CSAUA&T Kanpur – 208002
Dr. Vipin Kumar	Dr. Awadhesh Kumar Singh

Asstt. Professor/ SMS (Agronomy) A-47, Pallavpuram, Phase I Modipuram, Merrut (U.P.)	Asst. Professor Deptt. of Agril. Chemistry P.G. College, Ghazipur, U.P.
Dr. Rajesh Kumar Singh SMS (Horticulture) KVK, CVSc & AH, CAU Selesih – 796 014 Aizawl, Mizoram	Dr. Raghavendra Singh Asst. Professor Department of Agronomy Udai Pratap Autonomous College Varanasi – 221002
Dr. Anand Prasad Rakesh SMS (Soil Science) K.V.K. Manjhi (Krishi Farm) Saran - 841313	Dr. Sanjay Kumar Lecturer Baba Raghav Das P.G. College Deoria - 274001, U.P.
Mr. Neeraj Kumar Vaishya SMS (Soil Science) KVK, Gumla, Vikas Bharti Bishunpur, Jharkhand – 835331	Dr. Muzaffar Ahmad Malik Asst. Professor Division of Soil Science SKUAST of Kashmir Shalimar, Srinagar – 191121
Mr. Narendra Singh SMS/ Asst. Professor (Agronomy) KVK Nagina (Bijnor) – 246762, U.P.	Mr. Raj Pal Singh SMS (Agronomy) GVT-KVK, Chakeshwari Farm Godda, Jharkhand – 814133

31. Code of ethics for research followed by the departments:- **to be complied at Institute level**

32. Student profile course-wise:

Name of the Course (refer to question no. 4)	Applications received	Selected		Pass percentage	
		Male	Female	Male	Female
M.Sc.(Ag.)	N.A.	37	14	97.29	100
Ph.D.	N.A.	25	03	100	100

33. Diversity of students

Name of the Course (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
M.Sc.(Ag.)	9.8	27.45	62.74	Nil
Ph.D.	42.86	21.43	3.56	Nil

34. How many students have cleared Civil Services and Defence Services examinations, NET.

SET, GATE and other competitive examinations? Give details category-wise.

ICAR-NET :- 35

35. Student progression

Student progression	Percentage against enrolled
UG to PG	9.8
PG to M.Phil.	
PG to Ph.D.	42.86
Ph.D. to Post-Doctoral	Nil
Employed	
• Campus selection	
• Other than campus recruitment	
Entrepreneurs	

36. Diversity of staff

Percentage of faculty who are graduates	
of the same university	46.15
from other universities within the State	30.77
from universities from other States	23.08
from universities outside the country	Nil

37. Number of faculty who were awarded Ph.D., D.Sc. and D.Litt. during the assessment period :- **NIL**

38. Present details of infrastructural facilities with regard to

a) Library :- **at Institute level**

b) Internet facilities for staff and students :- **available to all staff; and central facility of students**

c) Total number of class rooms :- **Two**

d) Class rooms with ICT facility :- **50%**

e) Students' laboratories:- **Two**

f) Research laboratories :- **Five**

39. List of doctoral, post-doctoral students and Research Associates

a) from the host university

b) from other universities

40. Number of post graduate students getting financial assistance from the university:- **All Ph.D. students**

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.

:- A Vision 2020 document was prepared on the long term basis requirement was generated

42. Does the department obtain feedback from

p. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

:- feedback is taken and complied on Institute basis and communicated to ICAR. ICAR takes into consideration these feedbacks while restructuring course

q. students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

:- feedback is taken and complied on Institute basis and communicated to ICAR. ICAR takes into consideration these feedbacks while restructuring course

r. alumni and employers on the programmes offered and how does the department utilize the feedback?

:- feedback is taken and complied on Institute basis and communicated to ICAR. ICAR takes into consideration these feedbacks while restructuring course

43. List the distinguished alumni of the department (maximum 10)

S.No.	First Name	Address
1.	Dr. Ram Sakal Singh	Regional Centre, NBSS & LUP, Rajasthan, College of Agric. Campus, Udaipur – 313001 (Rajasthan)
2.	Dr. A.K. Srivastava	National Research Centre for Citrus, Amravati Road, Nagpur – 440010
3.	Prof. A.K. Rawat	Deptt. of Soil Science & Agril. Chemistry, Jawahar Lal Nehru Krishi Vishwa Vidyalaya, Jabalpur, M.P. – 482004
4.	Prof. M.K. Mallik	Department of Soil Science, Rajendra Agril. University, Pusa, Samastipur, Bihar – 848125
5.	Dr. Jagdish Prasad	National Bureau of Soil Survey and Land Use Planning, Amravati Road, Nagpur – 440010 (Maharashtra)
6.	Dr. M.C. Manna	Sr. Scientist, Indian Institute of Soil Science, Nabi bagh, Berasia Road, Bhopal – 462038
7.	Mr. C.P. Yadav	Secretary to Chief Minister, Office of the Chief Minister, Govt. of Uttar Pradesh, Lucknow
8.	Dr. J. Adinarayana	Indian Institute of Technology, Powai, Mumbai
9.	Dr. Himansu Pathak	IRRI India Office, NASC Complex, Pusa, New Delhi - 12
10.	Dr. D. K. Shahi	Prof. & Head, Birsu Agric University, Kanke, Ranchi –

44. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.

- Guest lecture by Prof. V.S. Tomar, Vice-Chancellor, R.V.S.K.V.V., Gwalior, M.P. on the topic, "Ravine Management"
- Guest lecture by Dr. R.K. Rattan, Professor, Division of Soil Science and Agril. Chemistry, IARI, New Delhi on 25.03.2010 on the topic, "Micronutrients management: A macro issue"
- Guest lecture by Dr. Muneshwar Singh, Project Coordinator, AICRP-ITFE, IISS, Bhopal on 09.03.2011 on the topic "Quantification of atmospheric N fixation by soybean and its contribution to soil in vertisol"
- Guest lecture by Dr. Himansu Pathak, FNAAS, AVH Fellow, IARI, New Delhi on the topic, "Role of Nitrogen in Global Climate Change and Strategies for Irrigation".

45. List the teaching methods adopted by the faculty for different programmes.

- ❖ POWER PRESENTATION
- ❖ Field demonstration
- ❖ **Chalk and board method and lecture.**
- ❖ Enthusing **active learning** in class
- ❖ Experiential Learning
- ❖ RAWE

46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored? :- **to be complied at Institute level**

47. Highlight the participation of students and faculty in extension activities.

i) Extension Folder (S.K.Singh)

1.Ravi Ke Pramukh Fasal Sarson Ka Beej Utpadan(ISSN0976-4931) sponsored by MOA,GOI,NewDelhi under Seed Village Project Published by Progressive Science Society , Varanasi-2012

2.Ravi Ke Pramukh Fasal Masur Ka Beej Utpadan(ISSN0976-4931) sponsored by MOA,GOI,NewDelhi under Seed Village Project Published by Progressive Science Society , Varanasi-2012

3.Ravi Ke Pramukh Fasal Matar Ka Beej Utpadan(ISSN0976-4931) sponsored by MOA,GOI,NewDelhi under Seed Village Project Published by Progressive Science Society , Varanasi-2012

4.Ravi Ke Pramukh Fasal Chana Ka Beej Utpadan(ISSN0976-4931) sponsored by MOA,GOI,NewDelhi under Seed Village Project Published by Progressive Science Society , Varanasi-2012

(i) Research initiative in RGSC

An appraisal of soil available nutrient status of Rajiv Gandhi south campus, Barkachha, Mirzapur, was made. The soils were found to be acidic (pH 5.0 - 6.1), coarse textured with poor organic carbon content (2.8-6.0 g kg⁻¹) and low in fertility status. Field experiments to reap profitable response of rainfed oilseeds and pulses have been initiated with the addition of deficient nutrients (N, P, Ca, Mg, S and Zn) in these soils. Work on nature of soil acidity and liming for amelioration of these acid soils is in progress. The micronutrient and heavy metal status of these soils are being assessed. This research is aimed at increasing productivity of rainfed crops grown extensively in the Vindhyan region.

(ii) N₂O emission

In a study to quantify the emission of N₂O from kharif and rabi crops, it has been established that application of neem coated urea reduces on an average about 30 % of the N₂O emission from the field. It also resulted in a yield advantage of about 7.5 to 24 % over application of plain urea in wheat and mustard crops, respectively.

(iii) *Pseudomonas fluorescens*

In a field experiment to evaluate the efficacy of various tillage practices and microbial cultures with a view to manage the left over rice residue in the subsequent wheat crop, it has been established that minimum tillage using rotavator along with *Pseudomonas fluorescens* gives highest crop yield and facilitates maximum nutrient release from rice residue.

(iv) Germplasm selection for nutrient efficiency

A study was initiated to assess the variation of root morphological / physiological traits and nutrient uptake of maize hybrids for screening nutrient use efficient cultivars.

(v) Nodule signaling compound

Nodule signaling compound (Naringenin) was isolated from mung bean (*Vigna radiata* L.). This study will help in early nodulation of mung bean grown in adverse conditions. Technique for iodine fortification (application of 2.5 mg kg⁻¹ iodine through KI / KIO₃) in

spinach and carrot was developed. Status of human essential elements (I, Se and F) were estimated in soil and water in Varanasi district for geo-medicinal purpose.

(vi) PGPR

Effective bioformulations of PGPR/ PGPF for green gram, chickpea and pea were developed.

Effective isolates of PGPR / PGPF has been identified for *Azotobacter* (HUAZ-1, HUAZ-2, HUAZ-3, HUAZ-4, HUAZ-5), *Pseudomonas* (HUPSB-1, HUPSB-2, HUPSB-3, HUPSB-4, HUPSB-5, HUPSB-6, HUPSB-7), *Aspergillus* (Code Nos. HUAN-1, HUAN-2), *Trichoderma* (Code Nos. HUTH-1). Most effective *Rhizobium* isolates for different pulses are i.e., green gram (HURM-3, HURM-7, HURM-8), Chickpea (HURC-50, USDA 3378 and HURC-7) and pea (HURP-1, HURP-42, HURP-46).

51. Future plans of the department.

(a) Human Resource Development

- Training students in advanced instrumental techniques
- Summer training to students in some of the specialized areas
- Special classes to the students for JRF / ARS
- Summer / winter school / seminar / symposia

b) Productivity Enhancement

- Soil Resource Inventory
- INM for sustaining soil health and improving crop productivity
- Soil test based site specific fertilizers recommendation
- Genetic transformation
 - To develop psychrophilic P solubilizing microbes for cold desert regions
- Use of ICT in agriculture
 - Simulation and validation of different mechanistic models for NUE and environmental impact assessment
- Carbon sequestration

(c) Environmental issues

- Global Warming
 - N₂O, CH₄ and CO₂ emission
- Anthropogenic contamination and remediation
 - Heavy metals
 - Pesticide
- Geogenic contaminations
 - Fluoride
 - Arsenic

- Human health concern
 - Iodine fortification
 - Enrichment of Zn and Fe in food grain

(d) Proposed Outreach Activities

- Establishment of full fledged soil testing laboratory for farmer's
- Farmers' friendly interactive website showing fertility status and fertilizers recommendation for crops in Varanasi region.
- Development of artificial intelligence / user friendly software w.r.t GAP (good agricultural practices)
- Farmers' awareness campaign (radio/ TV talk, *kisan gosthi*, field day etc.)

52. Detail any five Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.

Strength

1. Highly educated/ qualified and trained faculty
2. Important instruments for student training (AAS, GLC, HPLC)
3. Diversity of faculty and students
4. Every faculty has a research project
5. Common facilities for filed experimentation / net house etc.

Weakness

1. Lack of technical staff to operate instruments
2. Lack of contingent grant / recurring grant in view of increase cost of consumables
3. Lack of sophisticated instruments (XRD, ICP, TOC)
4. State of the art classroom /facilities not available

Opportunities

1. Experts in different fields work together in comprehensive manner
2. Earn while you learn can generate resources
3. Utilization of industrial by-products.
4. Supplement inorganic nutrients
5. Metagenomics of plant microbiology
6. Application of nanotechnology for fertilizer use efficiency
7. Application of microbial biotechnology for increase use efficiency
8. Application in geomedicine

Challenges

1. Soil fertility related problem solving
2. Soil pollution remediation
3. Problem soil reclamation
4. Increase input use efficiency
5. Livelihood security
6. Attracting good students for Ph.D./ PG

Post-accreditation Initiatives

If the university has already undergone the accreditation process by NAAC, please highlight the significant quality sustenance and enhancement measures undertaken during the last four years. The narrative may not exceed ten pages.