SOIL SCIENCE & AGRICULTURAL Chemistry

At a Glance

2022
Faculty of Agriculture
BIRSA AGRICULTURAL UNIVERSITY
Ranchi - 834 006, Jharkhand (India)
PROFILE

The Department of Soil Science and Agricultural Chemistry came into existence in 1955 as an integral part of Ranchi Agriculture College, under Ranchi University. Since 3rd December 1970, College came under the administrative control of Rajendra Agricultural University, Pusa, Bihar. Birsa Agricultural University came into existence in June, 1981. Since inception under the guidance of Professor S. C. Mandal, Under Graduate and Post Graduate teaching contributed key role in agricultural education and research in the country. Emergence of Jharkhand as a new state after bifurcation of Bihar in November 2000, has thrown up new challenges for this department.

Since inception, a glory of renowned Soil Scientists of National and International repute having their visionary idea, keen interest, depth of knowledge and stewardship has raised the department to this stage as is visible today.

CHAIRMEN / HODs

<table>
<thead>
<tr>
<th>CHAIRMAN / HOD</th>
<th>PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. S. C. Mandal</td>
<td>1955 to 1959</td>
</tr>
<tr>
<td>Dr. H. Sinha</td>
<td>1959 to 1971</td>
</tr>
<tr>
<td>Dr. K. K. Jha</td>
<td>1972 to 1973</td>
</tr>
<tr>
<td>Dr. H. Sinha</td>
<td>1973 to 1979</td>
</tr>
<tr>
<td>Dr. N. P. Sinha</td>
<td>1981 to 1982</td>
</tr>
<tr>
<td>Dr. L. L. Srivastava</td>
<td>1982 to 1986</td>
</tr>
<tr>
<td>Dr. B. S. Mathur</td>
<td>1986 to 1987</td>
</tr>
<tr>
<td>Dr. A. K. Sarkar</td>
<td>1987 to 2005</td>
</tr>
<tr>
<td>Dr. B. Mishra</td>
<td>Nov., 2005 to Oct., 2010</td>
</tr>
<tr>
<td>Dr. B. P. Singh</td>
<td>Nov., 2010 to Jan., 2011</td>
</tr>
<tr>
<td>Dr. R. P. Singh</td>
<td>Feb., 2011 to Oct., 2012</td>
</tr>
<tr>
<td>Dr. D. K. Shahi</td>
<td>Nov., 2012 to continuing</td>
</tr>
</tbody>
</table>

MANDATE

• Under Graduate and Post Graduate Teaching
• Post Graduate research programme leading to M.Sc. (Ag) and Ph.D. degree
• State and Centrally sponsored research projects
• Long Term Fertilizer Experiment
• Micro and Secondary nutrients & polluted element experiment
• Soil Test Crop Response (STCR) experiment
• Management of Acid Soils
• Permanent Manurial Trial
• Providing Soil and Water Testing Services
• Research on Biological Nitrogen Fixation
• Production and Research on Bio- fertilizers
• Production of Enriched compost
• Farmer participatory research on soil related production constraints
• Technical advice to State Govt., Farmers, Extension functionaries on specific soil problems
• Production of value added organic manure.

TEACHING

The course curricula at Undergraduate and Post graduate in the following major areas:

- Soil fertility and plant nutrition
- Soil chemistry
- Soil physics
- Pedology
- Soil microbiology
- Soil and water pollution
- Integrated nutrient management
- Organic farming
- Bio-fertilizers
- Use of remote sensing and GIS
- Acid soil management
- Natural resource management
- Entrepreneurship development
- Experiential learning programme

THREAT AREA

- Environmental Impact Assessment in soils around industries.
- Fertigation through drip and sprinkler irrigation.
- SOM management through crop residue.
- Microbial inoculants for different crop & soil situations.
- Plant nutrient balance in soil under different nutrient and cropping systems.
- Site-Specific Nutrient Management in different cropping system.
- Scientific land use planning.
- Arsenic and Fluoride problem in the state.
- Bio-fortification of grains with zinc through agronomic measures.
- Use of Biochar on soil properties and crop performance.
- Impact of long term use of Sewage water on soil and vegetables quality in and around Ranchi city.
- Characterizing root behaviours & nutrient uptake of soybean-wheat system.
- Nutrient loss by surface runoff in Acid soil.
RESEARCH ACTIVITY

- Soil quality parameters under major cropping systems
- Environmental impact assessment in soil around industries
- Water quality issues especially in intensively cultivated areas
- Soil organic matter maintenance
- Use of biochar in agriculture
- Suitability of salvinia for soil health and crop productivity
- Microbial inoculants for different soil-crop situations
- Studies on plant nutrient balance in soil under different cropping systems
- Site-specific nutrient managements in agriculture, horticulture and agro forestry
- Management of secondary, micronutrients and pollutant elements in soil-plant system
- Sustainable soil fertility management for crops and cropping systems
- Chemistry and management of acid soils
- Crop residue management
- Possible use of industrial wastes in agriculture
- Delineation of secondary & micro nutrient and soil pollutant in different agroclimatic zones of the state.
- Preparation of soil resource inventory
- Monitoring the effect of heavy metals in soil-plant-human continuum
- Agronomic biofortification of Zn in cereals
- Scientific land use planning
- Assessment of nutrient loss by surface runoff
- Soil test crop response studies for refining fertilizer recommendation in different soil types of the state
- Assessment of Arsenic and Fluoride in soil and plant.
- Nano fertilizer (Urea and DAP) application in acid soil.

EXTENSION ACTIVITY

- Promotion of judicious use of natural resources especially soil and water
- Promote adoption of INM for crops and cropping systems
- Promotion of organic cultivation in high value crop such as scented Rice, Medicinal & Aromatic plants and vegetable crops
- Dissemination of improved technologies to masses
- Improvement in the technical skills through Summer & Winter School/ Refreshers course / Trainings / Workshop/ Seminar/Memorial lecture/ Orientation programmes etc.

FACULTY MEMBERS

**University Professor-cum-Chief Scientist**
1. Dr. D. K. Shahi
2. Dr. B. K. Agarwal
3. Dr. Rakesh Kumar

**Senior Scientist-cum-Assoc. Professor**
4. Dr. P. B. Saha

**Assistant Professor-cum-Jr. Scientist**
5. Dr. Arvind Kumar

6. Dr. S. B. Kumar
7. Dr. N. C. Gupta
8. Dr. P. Mahapatra
9. Dr. (Mrs) A. K. Sinha
10. Shri Bhupendra Kumar

**Soil Scientist at Zonal Research Stations**
11. Dr. K. S. Mohan, Jr. Scientist-cum-Asst. Professor, ZRS, Chianki, Palamau

**Soil Scientist at KVKs**
12. Dr. Sudhir Kumar Jha, KVK, Garhwa
13. Dr. Jayant Kumar Lal, KVK, Dumka
14. Dr. Binod Kumar, KVK, Pakur
15. Dr. A.K. Jha, KVK, Sahibganj
16. Dr. S.K. Singh, KVK, Simdega

FACILITIES AVAILABLE

- Under Graduate and Post Graduate lecture halls
- Under Graduate and Post Graduate laboratories
- Protected Field experimental area
- Generator/online UPS facilities (10 KVA) for all laboratories
- Glass house facilities
- Plant Clinic and Leaf tissue Analysis
- Central Instrumentation facility
- Microbiological laboratory
- Biofertilizer production unit
- Organic manure production unit
- Soil and Irrigation water testing unit
- ICP and AAS laboratory

SOPHISTICATED ANALYTICAL EQUIPMENTS

- ICP Spectrophotometer
- Gas Chromatograph
- UV-VIS Spectrophotometer
- Atomic Absorption Spectrophotometer (AAS)
- Phase contrast Research Microscope
- Ion analyser with Ion selective electrodes
- Automatic scanning visible spectrophotometer
- Microprocessor based Flame Photometer
- Microprocessor based Water Quality Analyzer
- ELISA Reader
- CO₂ Incubator
- Laminar flow
- Analytical Balance
- Pressure plate apparatus
- Fully Automatic Nitrogen analyser
- Semi Automatic N₂ analyser
- Grain Analyser
- B. O. D Incubator
- Auto digester
- Millipore water purifier
- Quality distilled water preparation plant for all labs
- Deep Fridge (-20°C)
### ACADEMIC PROGRAMME AND COURSES OFFERED

#### UNDER GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSAC 111</td>
<td>Fundamentals of Soil Science</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 121</td>
<td>Agricultural Microbiology</td>
<td>2 (1+1)</td>
</tr>
<tr>
<td>SSAC 221</td>
<td>Problematic Soils and their Management</td>
<td>2 (2+0)</td>
</tr>
<tr>
<td>SSAC 311</td>
<td>Manures, Fertilizers and Soil Fertility Management</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 312*</td>
<td>Soil, Plant, Water and Seed Testing</td>
<td>3 (1+2)</td>
</tr>
<tr>
<td>SSAC 321**</td>
<td>Biostatistics &amp; Biofertilizers</td>
<td>3 (2+1)</td>
</tr>
</tbody>
</table>

*In collaboration with department of GPB
**In collaboration with department of Entomology

#### POST GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hours</th>
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<tbody>
<tr>
<td>SSAC 501</td>
<td>Soil Physics</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 502</td>
<td>Soil Fertility and Fertilizer use</td>
<td>4 (3+1)</td>
</tr>
<tr>
<td>SSAC 503</td>
<td>Soil Chemistry</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 504</td>
<td>Soil Mineralogy, Genesis, Classification and Survey</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 505</td>
<td>Soil Erosion and Conservation</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 506</td>
<td>Soil Biology and Biochemistry</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 508</td>
<td>Radioisotopes in soil and Plant studies</td>
<td>2 (1+1)</td>
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<tr>
<td>SSAC 509</td>
<td>Soil, Water and Air Pollution</td>
<td>3 (2+1)</td>
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<tr>
<td>SSAC 510</td>
<td>Remote Sensing and GIS Techniques for Soil and Crop</td>
<td>3 (2+1)</td>
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#### Ph.D. COURSES

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hours</th>
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</thead>
<tbody>
<tr>
<td>SSAC 601</td>
<td>Advances in Soil Physics</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 602</td>
<td>Advances in Soil Fertility</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 603</td>
<td>Physical Chemistry of Soils</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 604</td>
<td>Soil Genesis and Micropedology</td>
<td>3 (2+1)</td>
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<tr>
<td>SSAC 605</td>
<td>Biochemistry of Soil Organic Matter</td>
<td>2 (2+0)</td>
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<tr>
<td>SSAC 606</td>
<td>Land Use Planning and Watershed Management</td>
<td>2 (2+0)</td>
</tr>
<tr>
<td>SSAC 607</td>
<td>Advances in Soil Microbiology</td>
<td>3 (2+1)</td>
</tr>
<tr>
<td>SSAC 608</td>
<td>Research Technique in Soil Science</td>
<td>2 (1+1)</td>
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<tr>
<td>SSAC 691</td>
<td>Doctoral Seminar I</td>
<td>1 (1+0)</td>
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<tr>
<td>SSAC 692</td>
<td>Doctoral Seminar II</td>
<td>1 (1+0)</td>
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<tr>
<td>SSAC 699</td>
<td>Doctoral Research</td>
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</table>

Exposure visit of students at Soil Survey Institute  
World Soil Day celebration at Nagri village
STUDENTS’ RESEARCH ACTIVITIES

The research work conducted by Post Graduate students as an integral part of their course curriculum leading to partial fulfilment of M.Sc. (Ag) and Ph.D. degrees in Soil Science and Agricultural Chemistry. Till date 130 M.Sc. (Ag) and 22 Ph.D. thesis have been submitted.

Degree awarded during 2016-2021

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Name of Student</th>
<th>Thesis Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. Sc. (Ag)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Jai Prakash Kumar</td>
<td>GPS enabled study on micro &amp; secondary nutrient status in intensive cropped areas of Dumka district</td>
<td>2016</td>
</tr>
<tr>
<td>2</td>
<td>Neha Kumari</td>
<td>An assessment of different rate and time of nitrogen application on maize-wheat cropping system in relation to greenhouse gas emission</td>
<td>2016</td>
</tr>
<tr>
<td>3</td>
<td>Varun Kumar</td>
<td>Effect of AM and Azotobacter on changes in microbial community and nutrient availability in maize Rhizosphere</td>
<td>2017</td>
</tr>
<tr>
<td>4</td>
<td>Shikha Verma</td>
<td>Long term effect of nutrient management practices on soil quality parameters under maize-wheat cropping system</td>
<td>2017</td>
</tr>
<tr>
<td>5</td>
<td>Prem Ranjan Kumar</td>
<td>GPS enabled study on micro and secondary nutrient status in intensively vegetables growing areas of Ranchi district</td>
<td>2018</td>
</tr>
<tr>
<td>6</td>
<td>Shubham Priya Tiu</td>
<td>Assessment of trace elements in soil and plant samples &amp; under intensive cropped area of Sahibganj block</td>
<td>2018</td>
</tr>
<tr>
<td>7</td>
<td>Sonal Kumari</td>
<td>Effect of Phosphorus, Sulphur and Bradyrhizobium on yield and quality of soyabeans</td>
<td>2018</td>
</tr>
<tr>
<td>8</td>
<td>Neha Toppo</td>
<td>Effect of liming materials on wheat productivity and soil fertility status in acid soil of Ranchi</td>
<td>2018</td>
</tr>
<tr>
<td>9</td>
<td>Kumari Prerna Deep</td>
<td>Effect of crop residue incorporation in hybrid maize on K fractions in acid soil of Ranchi</td>
<td>2018</td>
</tr>
<tr>
<td>10</td>
<td>Ritika Narayan</td>
<td>Isolation, screening and characterization of Azospirillum from acidic soils of Ranchi</td>
<td>2018</td>
</tr>
<tr>
<td>11</td>
<td>Pranshu Arunima</td>
<td>Trace metal accumulation in wheat as affected under long term fertilizer experiment in red and lateritic soil of Jharkhand</td>
<td>2019</td>
</tr>
<tr>
<td>12</td>
<td>Suryanshu Yadav</td>
<td>Effect of Calciprill and Magprill as a liming material on maize crop in red and lateritic soils of Ranchi</td>
<td>2019</td>
</tr>
<tr>
<td>13</td>
<td>Madhuri Toppo</td>
<td>Long term effect of nutrient management practices on different forms of Potassium in soil under maize-wheat cropping system</td>
<td>2019</td>
</tr>
<tr>
<td>14</td>
<td>Swati Kumari</td>
<td>Characterization of vermi-compost prepared from different raw materials</td>
<td>2019</td>
</tr>
<tr>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Saiyyeda Firdous</td>
<td>Studies on Boron and Zinc availability under rice-wheat cropping system in Alfisol</td>
<td>2016</td>
</tr>
<tr>
<td>2</td>
<td>Asisan Minz</td>
<td>Impact of crop residue and nutrient combinations on soil health and fertility under maize-wheat cropping system</td>
<td>2021</td>
</tr>
</tbody>
</table>


STUDENTS’ PLACEMENT

- 100% students are placed in State Govt., Agriculture Universities, Bank services, Private companies and NGOs.

ICAR NET (Soil Science) cleared by PG students

1. Shikha Verma 2017
2. Asisan Minz 2017
3. Saiyeyda Firdous 2017
4. Swati Singh 2017
5. Sonal Kumari 2019
6. Ritika Narayan 2019

Research Projects in operation

State Plan

| Biofertilizer Production and Research | Dr. D. K. Shahi & Sri B. Kumar |
| Soil Testing | Dr. B. K. Agarwal |
| Soil Chemistry (Permanent Manurial Trial) | Dr. P. Mahapatra |
| Soil Microbiology | Dr. N. C. Gupta |

ICAR (Co-ordinated/Network) Projects

| AICRP on Long Term Fertilizer Experiment (LTFE) | Dr. P. Mahapatra & Dr. P. B. Saha |
| AICRP on Micro, Secondary nutrients and Pollutant Elements in Soil and Plant (MSPE) | Dr. Arvind Kumar & Dr. P. B. Saha |
| AICRP on Soil Test Crop Response (STCR) | Dr. S. B. Kumar & Sri Bhupendra Kumar |

Other Research Projects in Operation

| IPNI-CIMMYT on Nutrient Expert (Concluded) | Dr. Rakesh Kumar |
| OMYA Calciprill and Magprill use in Acid Soil (Concluded) | Dr. D. K. Shahi |
| Use of Nano Fertilizer (N, Cu & Zn) in Agriculture (IFFCO) | Dr. D. K. Shahi |
| Recycling of Crop Waste in situ | Dr. N. C. Gupta & Dr. S. B. Kumar |
| Use of Biochar in Agriculture | Dr. (Mrs.) A. K. Sinha |
| Use of Salvinia in crop production | Shri Bhupendra Kumar |
| Crop Residue Management | Dr. B. K. Agarwal |
| Value added organic manure production and Research | Dr. N. C. Gupta & Dr. D. K. Shahi |
| Use of Nano-DAP in Agriculture | Dr. D. K. Shahi & Dr. P. B. Saha |
| Application and response of techno-Z in acid soil | Dr. B. K. Agarwal & Dr. D. K. Shahi |

TECHNOLOGIES GENERATED

- **Furrow method of lime application**
Liming to neutralize soil acidity is recommended for higher yield of crops.

**Recommendation:** Application of powdered lime/dolomite (80-100 mesh sieve) @ 3-4 Q/ha. When the land is ready for sowing, furrows are opened at the recommended distance from row to row suitable for the crop. Lime is applied in the opened furrow, followed by chemical fertilizers, treated seed and mixed with soil and furrow is closed.

- **Rock Phosphate as source of phosphorus for acid soils**
Use of Rock Phosphates in acid soils is recommended. Acid soils increase the solubility of rock phosphate and slowly makes available to the plant as well as reduces fixation.

**Recommendation:** Apply Rock Phosphate @ 2-3 q/ha by broadcast method at the time of final preparation of land for sowing in strongly acidic soils \((pH<5.5)\). Apply mixture of Rock Phosphate and Single Super Phosphate in furrows at the time of sowing for moderately acidic soils \((pH \text{ 5.5 to 6.0})\).

- **Integrated nutrient management in crops/cropping system**
**Recommendation:** Integrated use of 50%NPK+ FYM@10t/ha is a sustainable INM practice under maize-wheat cropping system in acid soil.

- **Acid tolerant *Rhizobium* culture for Legumes & Oilseeds**
**Recommendation:** Application of *Rhizobium* culture along with seed as seed treatment @ 500 gram culture/ha, seedling dipping, lime pelleting @ 2.0 kg culture/ha etc, are different techniques for use of *Rhizobium* culture in legumes and oilseeds (Groundnut & Soyabean).

- **Mode of micronutrient and secondary nutrient application in crops**
soil Science and Agricultural Chemistry: At a glance

Recommendation: In Sulphur deficient soils, application of 24-60 kg S ha⁻¹ increased crop yield appreciably. In B deficient soils, application of 1.0-1.5 kg B ha⁻¹ increased crop yield appreciably. Foliar spray of 0.5% borax+0.2% urea is also effective in increasing yield of crops. In Cauliflower, foliar application of 0.1 per cent solution of Ammonium molybdate is effective.

Techniques for preparation of Enriched compost

Recommendation: Preparation of enriched compost from locally available wastes for balanced nutrition of crops. Compost with higher nutrient content can be prepared by use of some microbial inoculants such as PSB, Azotobacter chroococum and Cellulose decomposer (Trichurus spiralis, Paecliomycys fusisporis, Aspergillus awamori etc.).

Possible Utilization of Fly ash in Agriculture

Recommendation: Based on extensive field and laboratory studies it is recommended for use in flower cultivation, growing non-edible tree species and afforestation. Dose of fly ash for horticultural crop: 4-8% w/w and forestry 50:50 (fly ash and soil ratio).

PUBLICATIONS


60. Asisan Minz, Asha Kumari Sinha, Shashi Bhushan Kumar, Kumari Prerna Deep, Shikha Verma and


during their visit to different units of the department, scientists along with the Vice Chancellor of BAU visited the soil testing unit. Japanese team visited different units of the department.
RESEARCH PAPER PRESENTED IN SEMINAR / SYMPOSIUM


EXTENSION PUBLICATIONS

1. बी.के. आगवाल, अरविंद कुमार, मानस घनेरे (2017). 5. ज्वारकृषि की सींडो में चूने का प्रयोग कब, कहाँ और कैसे, पाठ्यक्रिया, 18 (1-2): 16

2. आरा कुमारी सिंह, भुपेंद्र कुमार, आशीष मिश्र एवं शाही मुण्यन कुमार (2017), तेलहरी फसलों में गंध (स्पेक्ट्र) की उपायगतता, पाठ्यक्रिया, 18 (3-4): 23.

3. ब.के. आगवाल, अरविंद कुमार, मानस घनेरे, रुपलाल प्रसाद, डी.के. शाही एवं डी.एच. शिंग. (2018) फसलोपादन में तिक की भूमिका, टी.एच.पी. (भारतीय कृषि अनुसंधान परिषद, शिक्षा) प्रसार पुस्तिका सं.-1/2018

4. अरविंद कुमार, बी.के. आगवाल, मानस घनेरे, रुपलाल प्रसाद एवं डी.के. शाही, (2018) फसलोपादन में बोरों की भूमिका, टी.एच.पी. (भारतीय कृषि अनुसंधान परिषद, शिक्षा) प्रसार पुस्तिका सं.-3/2018

5. अरविंद कुमार, बी.के. आगवाल, मानस घनेरे, रुपलाल प्रसाद, डी.के. शाही एवं डी.एच. शिंग. (2018) गंधक: मृदा में कमी, प्रभाव प्रभाव प्रभाव पर अनुसंधान, टी.एच.पी. (भारतीय कृषि अनुसंधान परिषद, शिक्षा) प्रसार पुस्तिका सं.-2/2018
LIST OF VISITORS

- Dr. Muneshwar Singh, Project Coordinator, AICRP
- Dr. K. P. Tripathi, Principal Scientist, Education Division
- Dr. S. N. Sharma, Retd. Dean, Accreditation Team
- Dr. H. N. Gour, Retd. Prof., Central Agricultural University, Imphal, Accreditation Team Member of BAU, Ranchi.
- Dr. Karan, Narendra Agriculture University, Jobner, Rajasthan, Accreditation Team Member of BAU, Ranchi.
- Dr. P. Eshwara Prasad, Associate Dean, Sri Venkateswara Veterinary University, Tirupati, Accreditation Team Member of BAU, Ranchi.
- Dr. K. P. Tripathi, Principal Scientist, Education Division, ICAR, New Delhi, Accreditation Team Member of BAU, Ranchi.
- Dr. Muneshwar Singh, Project Coordinator, AICRP on LTFE Projects, Indian Institute of Soil Science, Nabibagh, Bhopal.
- Dr. Trilochan Mahapatra, Honorable Director General, ICAR (DARE), New Delhi.
- Hon'ble Justice Sri Rajesh Kumar, Jharkhand High Court, Ranchi visited Department of Soil Science and Agricultural Chemistry, BAU, Ranchi on 31st December, 2018.
- Dr. D. C. Ghosh, Professor, department of Agronomy, Vishwa Bharti, Sriniketan, West Bengal visited Department of Soil Science & Agril Chemistry on 25th February, 2020 and delivered a lecture in Dr. R. B. Prasad memorial hall, GPB, BAU Ranchi.

SEMINAR SYMPOSIUM ORGANIZED

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Name &amp; Title of Programme</th>
<th>Date</th>
<th>Organizers</th>
<th>No. of Participants</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>International Workshop on Soil Health</td>
<td>12-13th Jan., 2016</td>
<td>SSAC, BAU, Ranchi &amp; TCI, Mumbai &amp; Cornell Univ., Ithaca, USA</td>
<td>115</td>
</tr>
<tr>
<td>3.</td>
<td>UGC Scheme for providing Skill Based Education under National Skill Qualification Framework</td>
<td>18th July, 2018</td>
<td>SSAC, Birsa Agricultural University, Ranchi, Jharkhand</td>
<td>23</td>
</tr>
</tbody>
</table>

Seminar/Symposium attended

- Dr. B. K. Agarwal act as a member of Technical group of Jharkhand Biodiversity Board, Ranchi vide latter no JBB/42/2017/233, attended State Level Technical Support Group meeting scheduled on 22nd June, 2017 at Palash Meeting Hall, Near Swami Vivekanad Chowk (Opp. Macon Office), Doranda, Ranchi.
- Dr. B. K. Agarwal participate in “Policy workshop on Digital Learning in Agriculture with reference to Social Media” at NAARM, Hyderabad from 5-7th July, 2017.
- Dr. B. K. Agarwal attended the meeting of National Agriculture Higher Education Project called by DDG Education at NAAS complex ICAR, New Delhi on 23rd Aug, 2017.
- Dr. B. K. Agarwal attended 2nd Interactive meet of comptrollers of SAUs/DUs/CUs/CAUs 17-18th August, 2017 at CSK HPKV, Palampur, HP one day on line.
- Dr B K Agarwal participated in Regional Stakeholders’ Workshop on “Alternate Agricultural Production Pathways in Changing Climates” on 24.07.2018 (Tuesday), organized at RAC Auditorium, BAU, Ranchi.
- Dr. D K Shahi, Dr. B K Agarwal and Dr. Arvind Kumar attended 83rd Annual Convention and National Seminar of ISSS at Anand Agriculture University, Gujrat from 27th -30th Nov, 2018. Dr. Kumar presented paper on “Assessment of trace metals content in edible part of plant and potential health risk for Human nutrition” in oral session dated 27th Nov, 2018.
- Dr. P. Mahapatra attended and presented a poster on “Efficacy of ameliorants for increasing crop productivity, profitability and soil quality in acid soils of Jharkhand” authored by P. Mahapatra and D. K. Shahi during XIV Agricultural Science Congress 2019 held at NASC Complex, New Delhi from 20 to 23rd February, 2019.
- Dr Shashi Bhushan Kumar attended a national workshop on "Current strategies and emerging issues of soil- water-environmental management in agricultural system" at BCKVV Kalyani from 7-8th March, 2019.
- Dr. Shashi Bhushan Kumar attended and presented 3 years report of STCR in National Workshop of STCR
held at BCKVV Kalyani dated 8-9 March, 2019.

- Dr. Shashi Bhushan Kumar attended a National Conference on Doubling Farmers Income for Sustainable & Harmonious Agriculture DISHA-2019, 10-11th August, 2019 held at Birsa Agricultural University, Ranchi.
- Dr. D. K. Shahi, Dr. B. K. Agarwal and Dr. S. B. Kumar attended 84th Annual Convention and National Seminar of ISSS on “Development in Soil Science-2019” held at Banaras Hindu University, Varanasi (15-18th Nov) 2019 and presented research papers.
- Dr. B. K. Agarwal attended the 3rd Regional workshop of Eastern Zone on Procurement plan under NAHEP on 5-6th December, 2019 at Assam Agril University, Khanpara, Guwahati.
- Dr. B.K. Agarwal attended the workshop on Procurement plan under NAHEP-CAAST at Kab II, ICAR building, New Delhi.

MEMORIAL/SPECIAL LECTURES ORGANIZED

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Topic</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. R.C. Yadav, Professor and Chairman, Department of Soil Science &amp; Agricultural Chemistry, RAU, Pusa</td>
<td>Current trend of Integrated Nutrient Management and its impact on soil health in Eastern India</td>
<td>8th April, 2017</td>
</tr>
<tr>
<td>Dr. S. B. Pandey, Former Professor and Chairman, Department of Soil Science &amp; Agricultural Chemistry, DRPCAU, Pusa, Bihar</td>
<td>Caring for the planet start from the earth.</td>
<td>4th December 2017</td>
</tr>
<tr>
<td>Dr. A. P. Singh, Professor, Soil Science &amp; Agricultural Chemistry, BHU, Varanasi, Uttar Pradesh</td>
<td>New Frontiers in Soil Science Research to meet the challenge of 21st Century</td>
<td>4th December 2018</td>
</tr>
<tr>
<td>Prof. Biswapati Mandal, Professor (Soil Science), BCKVV, Mohanpur, West Bengal</td>
<td>Governance of Soil Health - some random thoughts</td>
<td>16th January 2020</td>
</tr>
<tr>
<td>Dr. B.P. Bhatt, Director, ICAR Research Complex for Eastern Region, Patna, Bihar</td>
<td>10th Prof. S. K. Mukherjee memorial lecture : Sustainable Management of Degraded and Westlands of Eastern India.</td>
<td>18th August 2018</td>
</tr>
</tbody>
</table>

TRAINING UNDER TSP

<table>
<thead>
<tr>
<th>Name of Project</th>
<th>No. Of one day training-cum-Interaction with farmers</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTFE</td>
<td>9</td>
<td>452</td>
</tr>
<tr>
<td>STCR</td>
<td>7</td>
<td>280</td>
</tr>
</tbody>
</table>

BIOFERTILIZER/ORGANIC MANURE/FIELD GRAIN PRODUCTION AND REVENUE GENERATED

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Biofertilizer Production</th>
<th>Organic Manure Production</th>
<th>Revenue Generated from experimental field (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rhizobium culture (100gm)</td>
<td>Azotobacter culture (100 gm)</td>
<td>B.G.A. culture (Kg)</td>
</tr>
<tr>
<td>1.</td>
<td>2016-17</td>
<td>17336</td>
<td>21827</td>
<td>14724</td>
</tr>
<tr>
<td>2.</td>
<td>2017-18</td>
<td>48358</td>
<td>42336</td>
<td>1281</td>
</tr>
<tr>
<td>3.</td>
<td>2018-19</td>
<td>36493</td>
<td>35918</td>
<td>9151</td>
</tr>
<tr>
<td>4.</td>
<td>2019-20</td>
<td>28256</td>
<td>28630</td>
<td>13508</td>
</tr>
<tr>
<td>5.</td>
<td>2020-21</td>
<td>1120</td>
<td>763</td>
<td>223</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>131563</td>
<td>129474</td>
<td>38887</td>
</tr>
</tbody>
</table>

Total Revenue Generated : Rs. 54,49,837.00

(Rupees fifty four lakh forty nine thousand eight hundred thirty seven only.)
# Linkages with Other Institute/Organization

## International and National
- International Plant Nutrition Institute, Canada-India Programme
- International Potash Institute, Switzerland
- Cornell University, Ithaca, USA
- International Zinc Initiatives-India Programme, New Delhi
- Indian Council of Agricultural Research (ICAR), New Delhi
- Indian Agricultural Research Institute (IARI), Hazaribagh
- Indian Institute of Soil Science (IISS-ICAR), Bhopal (M.P.)
- Fertilizer Association of India (FAI)
- Indian Farmer’s Fertilizers Corporation (IFFCO)
- National Bureau of Soil Survey & Land Use Planning, Nagpur (Maharashtra)
- Indian Institute of Horticultural Research (IIHR-ICAR), Bengalore (Karnataka)
- Central Research Institute for Dryland Agriculture (CRIDA-ICAR), Hyderabad (Telangana)
- OMYA Switzerland-India Programme, Switzerland

## State Level
- Department of Agriculture, Animal Husbandry & Cooperation, Govt. of Jharkhand
- Directorate of Horticulture, Govt. of Jharkhand
- ICAR-RCER Regional Centre, Palandu, Namkom, Ranchi, Jharkhand
- Indian Institute of Natural Resins & Gum (IINRG), Namkom, Ranchi, Jharkhand
- State Agricultural Management & Extension Training Institute (SAMETI), Ranchi, Jharkhand
- State Horticultural Mission (SHM), Ranchi, Jharkhand
- Ram Krishna Mission (Divyayan), Ranchi, Jharkhand
- SRI (NGO), Bariatu, Ranchi, Jharkhand
- Central Upland Rice Research Institute (CURRS-ICAR), Hazaribag, Jharkhand
- Demodar Valley Corporation (DVC), Hazaribag, Jharkhand
- Gramin Vikash Trust (GVT), Ranchi, Jharkhand
- PRADAN, Hazaribag, Jharkhand
- Department of Environmental Science, Central University of Jharkhand, Ranchi
- Ranchi University, Ranchi, Department of Chemistry, Jharkhand
- Forest Research Institute, Lalgunwala, Ranchi, Jharkhand
- Vikas Bharti (NGO), Ranchi, Jharkhand
- Faculty of Veterinary Science, BAU, Ranchi, Jharkhand
- Faculty of Forestry, BAU, Ranchi, Jharkhand
- College of Agricultural Engineering, BAU, Ranchi, Jharkhand
- College of Bio-Technology, BAU, Ranchi, Jharkhand
- Agronomy
- Agrometeorology & Environmental Science
- Horticulture
- All zonal research station as: Chianki (Palamu) Darisai (E. Singhbhum) Dumka
- All KVKs

ICAR nominees visited biofertilizer production unit

Laboratory workers of Soil Science Department
Summer Internship Programme on Soil Plant Analysis and Organic Manure Production for Managing Soil Health for PG students of different universities from 15-29 June, 2019

Summer Internship Programme on Soil Testing & Its Importance in Managing Soil Health for Post Graduate students of different universities from 18 June -17 July, 2018

Officers of Jharkhand Government visited Biofertilizer Production Unit

Dr. Trilochan Mahapatra, Director General-ICAR & Secretary DARE visited different units

Chairman Prof. Yoshihisa Baba and Working Dy. Chairman Prof. Rauhei Tanaka of Soka University, Tokyo, Japan visited Soil Testing Unit

ICAR members visited BGA Production Unit