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From Director's Desk . . .

This newsletter highlights some of the salient research and training achievements made and other significant activities performed during the period under report.

For providing service oriented computing to Indian NARS users through IP authentication, Indian NARS Statistical Computing Portal (<http://stat.iasri.res.in/sscnarsportal>) has been strengthened by adding the modules of Descriptive Statistics; Split Factorial (main AxB, sub CxD); Principal Component Analysis and Estimation of Heritability from half sib data.

Weather-based crop yield forecasting models using GARCH and wavelet techniques at five important stages of wheat growth have been developed. The weekly maximum temperature at Crown Root Initiation (CRI) stage, tillering stage, anthesis stage, milk stage and dough stage and evapotranspiration at CRI stage are used for model development.

Efficient Mating-Environmental Row-Column (MERC) designs have been obtained that are variance balanced for estimating the contrasts pertaining to the general combining ability (gca) effects free from specific combining ability (sca) effects when two cross classified sources of variations are present in the experimental material.

Methodology has been developed for generating cloud free images by removing clouds and their shadows using geospatial techniques and spatial imputation techniques to extract information from remotely sensed data that is pure and free from any redundancy.

The whole genome based microsatellite DNA marker database of tomato (*TomSatDB*) for mapping and variety identification has been developed.

Two training programmes sponsored by Education Division of ICAR were conducted one on Advances in Statistical Genetics under CAFT and one Summer School on Forecast Modeling in Crops. Two User Training Workshops and one Sensitization Training/Workshop under the Project MIS/FMS of ICAR; one Interactive Workshop on Experimental Designs; one Capacity Building Workshop in collaboration with ICRISAT under Agropedia 2.0; one workshop on ICT for Capacity Building in Agricultural Education in India under CAFT and two Installation Training-cum-Nodal Officers Workshops under SSCNARS were also organized.

Scientists of the institute received various awards and recognitions. Dr. Hukum Chandra received ICAR's Lal Bahadur Shastri Young Scientist Award 2012. Dr. Dinesh Kumar received Fellow Award 2012 by Society of Applied Biotechnology. Scientists have also received Research Paper Poster Awards in Hindi. Scientist of the Institute visited various countries on different assignments.

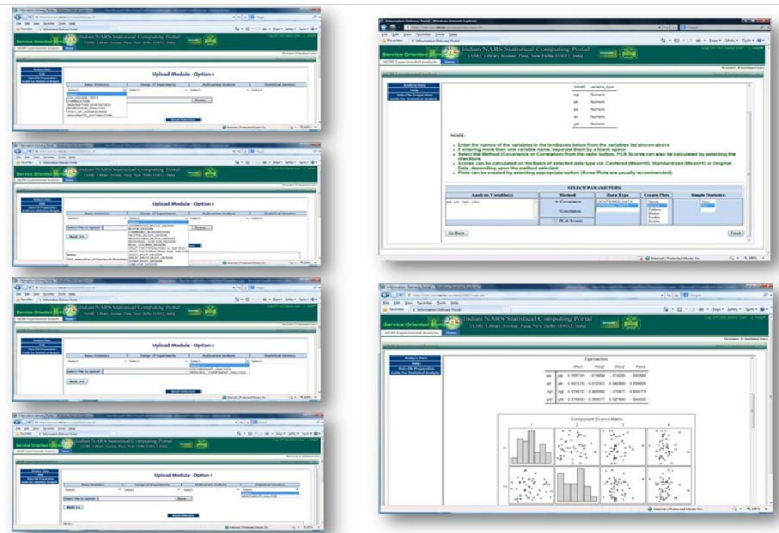
During this period, 8 new projects were initiated. Scientists of the Institute published 25 research papers, 2 project reports, 2 popular articles, 2 book chapters and 1 reference manual. Besides, 9 research papers were presented in different conferences/ symposia/ workshops, etc.

It is hoped that the contents of this document would be informative and useful to scientists in NARS. Any suggestions for improving the contents of the newsletter further would be highly appreciated.


 (UC Sud)

RESEARCH ACHIEVEMENTS

Indian NARS Statistical Computing Portal: For providing service oriented computing to Indian NARS users, Indian NARS Statistical Computing Portal (<http://stat.iasri.res.in/sscnarsportal>) has been strengthened by adding the modules of Descriptive Statistics; Split Factorial (main AxB, sub CxD); Principal Component Analysis and Estimation of Heritability from half sib data. The Portal has been submitted for Copyrights to Registrar Copyrights on September 13, 2013.



To discuss the progress made, lessons learnt and future course of action for Strengthening Statistical Computing for NARS, 4th Partner's Meet was organized on September 17, 2013 at IASRI, New Delhi. Following publications were released by the dignitaries during the Partner's Meet (i) Quick Reference Guide: Installation, Maintenance and Trouble Shooting; (ii) Poster on Indian NARS Statistical Computing Portal and (iii) Installation Manual for SAS 9.3.



Weather-Based Crop Yield Forecasting Models using GARCH and Wavelet Techniques. Autoregressive Integrated Moving Average with Exogenous variables (ARIMAX) time-series model along with its estimation procedure is studied. Five models at five important stages of wheat growth have been developed by including the most important weather variables. The weekly maximum temperature at Crown Root Initiation (CRI) stage, tillering stage, anthesis stage, milk stage and dough stage and evapotranspiration at CRI stage are used for model development. As an illustration, ARIMAX models are employed for forecasting of wheat yield in Kanpur district of Uttar Pradesh. It is demonstrated that the ARIMAX methodology is able to provide pre-harvest forecasts based on weather variables at various stages of wheat crop growth, starting from CRI stage (21 days after sowing) to dough stage (126 days after sowing). It is observed that, as wheat crop grows towards maturity; pre-harvest forecasts get closer to actual values. Autoregressive Integrated Moving Average with Exogenous variable-Generalized Autoregressive Conditional Heteroscedastic (ARIMAX-GARCH) methodology has been employed for describing volatile data by incorporating the exogenous variables in the mean-model. As an illustration, ARIMAX and ARIMAX-GARCH models are employed for modelling and forecasting of wheat yield in Kanpur district. The formulae for more than one-step ahead out-of-sample forecasts along with forecast error variances for the fitted ARIMAX-GARCH model were derived analytically by recursive use of conditional expectation. Superiority of ARIMAX-GARCH model over ARIMAX approach was demonstrated for the data under consideration.

Wavelet analysis in time-domain and frequency domain was applied for forecasting of maximum temperature at CRI stage of wheat for the Kanpur district. After obtaining the forecast, it was substituted in the ARIMAX-GARCH model developed to get forecast of wheat yield. For the selected ARIMAX-GARCH model, Maximum Overlap Discrete Wavelet Transform (MODWT) coefficients were computed for the weekly maximum temperature series at CRI stage for wheat yield time-series data of Kanpur for forecasting of maximum temperature at CRI stage. After obtaining the forecast of maximum temperature by wavelet methodology, these forecasts were used for forecasting wheat yield by the above developed model.

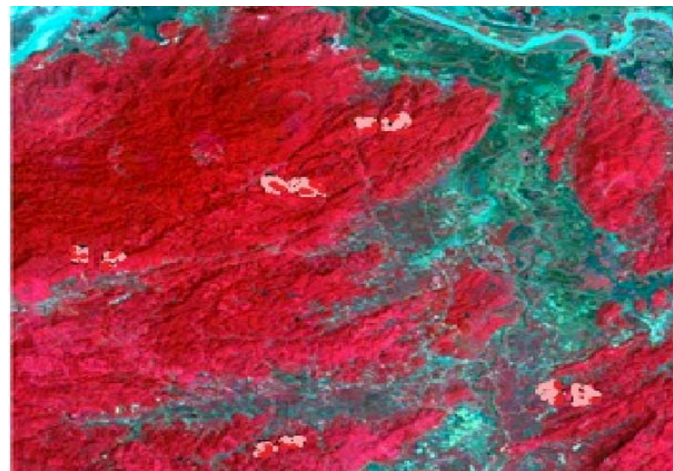
Mating-Environmental Row-Column (MERC) Designs: Mating-Environmental Row-Column (MERC) designs are suitable for breeding programmes compared to traditional mating designs as it provides designs which serve both the purpose, i.e. mating designs laid out using a row-column design. MERC designs yield more precise comparison among general combining ability (gca) effects as they eliminate two perpendicular sources of variation in the field. They facilitate comparison among gca effects free from specific combining ability (sca) effects. Following efficient MERC designs have been obtained, which are variance balanced for estimating the contrasts pertaining to the gca effects free from sca effects when two cross classified sources of variations are present in the experimental material:

1. Three series of designs for making all pair-wise comparison among gca effects.
2. Designs for Type III complete diallel mating designs (i.e. F_1 's along with parents).
3. Three series of designs for comparing t test lines with a control line.

A catalogue of the MERC designs along with parameters has been prepared for number of lines < 20. SAS Macros have been developed for the generation, randomization and analysis of MERC designs which will be of immense use to researchers for constructing MERC designs as these provide ready-made layout plans.

Methodology for Generation of Cloud Free Images by Removing Clouds and their Shadows. For using remotely sensed satellite data efficiently, the information extracted should be pure and free from any redundancy. A significant obstacle in extracting information from remote sensing imagery is the missing information due to clouds and their shadows in the satellite images. Therefore, it has been a challenge for researchers for assessing and estimating crop acreage in *khariif* period and thus an attempt has been

made to develop methodology for generation of cloud free images by removing clouds and their shadows. For removal of clouds and their shadows geostatistical techniques namely Kriging, Stratified Kriging, Co-Kriging and Stratified Co-Kriging have been applied. Spatial imputation techniques viz. Spatial Imputation based on row-wise pixels, Spatial Imputation based on column-wise pixels, Spatial Imputation based on both row-wise and column-wise pixels, Spatial Imputation based on neighbouring pixels, Spatial imputation based on ratio approach and Spatial imputation based on regression approach have also been evolved for generation of cloud free images. In addition to this, an alternative methodology based on stratification on the basis of percentage of cloud coverage using grid overlay technique for estimating the area under crop directly from the image having clouds and shadows has been suggested.



First whole genome based microsatellite DNA marker database of tomato for mapping and variety identification: TomSatDb. Traditionally, characterization of varieties is based on phenotypic observation but it is very difficult to distinguish varieties with very similar morphological characteristics and identification of the cultivars accurately is essential for maintaining cultivar integrity and Plant Breeders' Rights. In era of IPR the new variety can be identified based on allelic variation among varieties supplementing DUS test and product traceability. *TomSatDb* (Tomato MicroSatellite Database), the first whole genome based microsatellite DNA marker database of tomato, houses a total of 146602 STR markers, mined *in-silico*, using MicroSatellite (MISA) tool. To cater to the customized needs of wet lab, automated primer designing tool is added. *TomSatDB* (<http://cabindb.iasri.res.in/tomsatdb>), a user-friendly and freely accessible tool offers chromosome wise as well as location wise search of primers. It is an online relational database based on "three-tier architecture" that catalogues information of microsatellites in MySQL and user-friendly interface developed using PHP. A total of 146602 STR markers are reported using whole genome in the database.

These markers are also expected to pave the way for germplasm management over abiotic and biotic stress as well as improvement through molecular breeding, leading to increased tomato productivity in various parts of the world. Apart from abiotic stress there are more than 200 tomato diseases caused by pathogenic fungi, bacteria, viruses and nematodes affecting tomato productivity as biotic stress. In order to manage the germplasm in abiotic and biotic stress with desired productivity such closely linked DNA markers are



imperatively needed. Further economically and commercially important genes can be used for markers assisted introgression especially in new variety development programme. These findings can be of immense use in tomato genomics research in endeavor of tomato improvement and variety management at global level.

HUMAN RESOURCE DEVELOPMENT

Training Programmes/ Workshop Organized

| S.No. | Title | Venue | Date | Sponsored by | No. of Participants |
|------------------|---|------------------|---|--------------------------|---------------------------|
| Trainings | | | | | |
| 1. | Advances in Statistical Genetics under CAFT. Course Director: Dr. Wasi Alam Course Co-Director: Dr. Ranjit Kumar Paul Dr. AK Paul | IASRI, New Delhi | 02-22 July 2013 | Education Division, ICAR | 25 |
| 2. | Summer School on Forecast Modeling in Crops Course Director: Dr. KN Singh Course Co-Director: Dr. Wasi Alam Dr. Praveen Arya Dr. Sanjeev Panwar | IASRI, New Delhi | 03-23 September 2013 | Education Division, ICAR | 19 |
| 3. | User Training Workshop of MIS/FMS Project MIS (6 Batches) Finance HRMS & Self Service HR(2 Batches) Payroll & Pension | IARI, New Delhi | 02-09 September & 23-28 September 2013 09-12 September 2013 16-19 September 2013 20-21 September 2013 | NAIP | 168 33 47 23 |
| 4. | User Training Workshop of MIS/FMS Payroll & Pension Finance Purchase & Store Project MIS (4 Batches) | NDRI, Karnal | 02-03 September 2013 04-05 September 2013 06-07 September 2013 09-19 September 2013 | NAIP | 44 43 47 148 |
| 5. | Sensitization Training/Workshop on MIS/FMS solution | IASRI, New Delhi | 25 September 2013 | NAIP | 31 |
| Workshops | | | | | |
| 6. | An Interactive Workshop on Experimental Designs. | DWR, Karnal | 15 July 2013 | | |
| 7. | Agropedia 2.0: Capacity Building Workshop for New Partners in collaboration with ICRISAT | IASRI, New Delhi | 15 July 2013 | NAIP | |
| 8. | ICT for Capacity Building in Agricultural Education in India under CAFT | IASRI, New Delhi | 26-27 July 2013 | Education Division, ICAR | |
| 9. | 4 th Installation Training-cum-Nodal Officers Workshop | CIFE, Mumbai | 29-30 August 2013 | NAIP | |
| 10. | 4 th Partner's Meet and Installation Training-Cum-Workshop of Nodal Officers Under SSCNARS | IASRI, New Delhi | 17-18 September 2013 | NAIP | |

AWARDS AND RECOGNITIONS

- Dr. Hukum Chandra received Lal Bahadur Shastri Outstanding Young Scientist Award- 2012 of ICAR on 16 July 2013.
- Dr. Dinesh Kumar received Fellow Award 2012 by Society of Applied Biotechnology in recognition of outstanding achievements and contributions to the field of bioinformatics.



Awards During Hindi Pakhwara

- Following papers were awarded in the **Hindi Research Paper Poster Presentation** organized at IASRI on September 10, 2013 during Hindi Pakhwada celebration from 01-16, September 2013:
 - अर्पण भौमिक, एल्दो वर्गीस, सीमा जग्गी, सिनी वर्गीस एवं बी. जे. गहलौत । निकटवर्ती इकाइयों के प्रभावों को सम्मिलित करते हुए कृषि परीक्षणों के लिए सन्तुलित अभिकल्पनाओं का निर्माण । (प्रथम)
 - सारिका, इकबाल, मौ. ऑसिफ, राय अनिल एवं कुमार, दिनेश । कृत्रिम न्यूरल नेटवर्क कार्यप्रणाली आधारित डी.एन.ए. माइक्रोसैटेलाइट मार्कर द्वारा नस्ल पहचान विधि। (द्वितीय)
 - सुदीप, सिंह, पाल, गौतम, योगेश, यादव, वी.के. एवं मौर्या, एम.एम.। मक्का फसल के लिए दक्ष तंत्र । (तृतीय)
- Division of Design of Experiments was awarded the Shield for maximum scientific work done in Hindi in the year 2012-13 during the Hindi Pakhwara.

Recognitions

- Dr. Ranjit Kumar Paul Worked as Rapporteur in the technical session on “Agricultural Growth and Natural Resource” in the 21st Annual Conference of Agricultural Economics Research Association held in SKUAST-Kashmir, Srinagar during September 10-12, 2013.
- Dr. Hukum Chandra convened an invited plenary session on “Small Area Inference from Agricultural Survey Data” in the First Asian International Statistical Institute Satellite Conference on Small Area Estimation, during 01-04 September 2013 at Bangkok, Thailand. He also chaired a session on “Empirical Best Prediction Methods in Small Area Estimation”

VISIT ABROAD

Dr UC Sud

- Visited Bangladesh in connection with the project “Harmonization and dissemination of unified agricultural production statistics in Bangladesh” during 17-26 September 2013.

Dr. Hukum Chandra

- Visited Bangkok, Thailand as Member, Scientific Committee, during 01-04 September 2013 for attending the First Asian International Statistical Institute Satellite Conference on Small Area Estimation, 2013.
- Visited Ethiopia as FAO Consultant during 27 July - 17 August 2013.

Dr. Susheel Kumar Sarkar

- Visited Spain to attend training on Integrated Breeding Multi-Year Course (IB-MYC) Year 2 under Generation Challenge Programme-Integrated Breeding Platform (GCP-IBP) during 01-12 July 2013 at Mediterranean Agronomic Institute of Zaragoza (IAMZ) in Zaragoza, Spain.

NEW PROJECTS INITIATED

- Pilot study for estimation of seed, feed and wastage ratios for major food grains funded by MOS&PI. (w.e.f. 01.07.2013)
- Whole genome sequencing and development of allied genomic research in two commercially important fish-Labeo rohita and Clarias batrachus funded by DBT. (w.e.f. 10.09.2013)
- NAIP project Engaging farmers, enriching knowledge; Agropedia phase-II. (w.e.f. 01.04.2009, IASRI collaboration from 01 from 2013)
- NAIP project Strengthening of digital library and information management under NARS (e-GRANTH). (w.e.f. 09.05.2013)
- National information system for pest management (Bt Cotton) (NISPM for Bt Cotton) in collaboration with NCIPM, New Delhi. (w.e.f. 08.07.2013)
- Mapping and cultural authority of science across Europe and India (MACAS-EU & India). (w.e.f. 01.04.2012, IASRI collaboration from 18 July 2013)
- Factorial experiments with minimum level changes in run sequences. (w.e.f. 16.08.2013)
- Development of statistical approach for prediction of eukaryotic splice sites. (w.e.f. 03.09.2013)

PANORAMA OF ACTIVITIES

• Annual Day Celebrations

The Institute celebrated its 54th Annual Day on 02 July 2013.

- Dr. D Rama Rao, National Director, NAIP, ICAR presided over the function and Dr. B Meenakumari, DDG Fisheries, ICAR, New Delhi delivered the Nehru Memorial Lecture on “Fisheries in India: a way forward”.
- Nehru Memorial Gold Medal for the year 2010-12 was awarded to Sh. Pratyush Dasgupta & Ms. Anindita Datta M.Sc. (Agricultural Statistics) students and Sh Chandan Kumar Deb, M.Sc. (Computer Application) student.
- The Annual Report of the Institute for the year 2012-13 was also released on this occasion.



• हिन्दी पखवाड़े का आयोजन

संस्थान में 02 से 16 सितम्बर 2013 के दौरान हिन्दी पखवाड़े का आयोजन किया गया। दिनांक 02 सितम्बर 2013 को हिन्दी पखवाड़े का उद्घाटन संस्थान के निदेशक, डॉ. उमेश चन्दर सूद जी द्वारा किया गया। हिन्दी पखवाड़े के उद्घाटन के अवसर पर काव्य पाठ का आयोजन किया गया। हिन्दी पखवाड़े के दौरान शिक्षक दिवस, डॉ. दरोगा सिंह स्मृति व्याख्यान के साथ-साथ वैज्ञानिक प्रभागों में सर्वाधिक वैज्ञानिक कार्य हिन्दी में करने के लिए प्रभागीय चल-शील्ड, हिन्दी में शोध-पत्र-पोस्टर-प्रदर्शन-प्रतियोगिता, प्रश्न-मंच,



अन्ताक्षरी, हिन्दी वर्तनी प्रतियोगिता, हिन्दीतर कर्मियों के लिए हिन्दी श्रुतलेख एवं शब्दार्थ लेखन प्रतियोगिता आयोजित की गयी। सभी प्रतियोगिताओं में छात्रों सहित संस्थान के विभिन्न वर्गों के कर्मियों ने बढ़-चढ़कर सहभागिता की। संस्थान में प्रत्येक वर्ष हिन्दी दिवस के अवसर पर डॉ. दरोगा सिंह स्मृति व्याख्यान का आयोजन किया जाता है जिसमें किसी सुप्रसिद्ध वैज्ञानिक द्वारा हिन्दी में व्याख्यान दिया जाता है। इस वर्ष यह व्याख्यान भारतीय कृषि सांख्यिकी अनुसंधान संस्थान के पूर्व संयुक्त निदेशक, डॉ. अरुण कुमार श्रीवास्तव जी द्वारा “कृषि सांख्यिकी में प्रतिचयन पद्धति का विकास एवं क्रियान्वयन - एक परिदृश्य” विषय पर दिया गया। इस कार्यक्रम की अध्यक्षता राष्ट्रीय कृषि विज्ञान अकादमी के अध्यक्ष, प्रोफेसर राम बदन सिंह जी द्वारा की गयी। दिनांक 16 सितम्बर 2013 को हिन्दी पखवाड़े का समापन समारोह हुआ। इस अवसर पर हिन्दी पखवाड़े के दौरान आयोजित विभिन्न प्रतियोगिताओं के सफल प्रतियोगियों को पुरस्कृत करने के साथ-साथ अक्टूबर 2012 से जून 2013 तक की अवधि के दौरान संस्थान में आयोजित कार्यशालाओं के वक्ताओं/प्रशिक्षकों को भी सम्मानित किया गया।

• Teacher's Day Celebrations

The Institute celebrated Teacher's Day on 05 September 2013. On this occasion, Dr. VK Bhatia, Former Director IASRI was honoured. Dr. Bal BPS Goel, Former Director IASRI presided over the function.



• **Institute Research Committee (IRC)**

The 79th meetings of the Institute Research Committee (IRC) was held during 30 September- 01 October 2013. 11 new research projects (5 Institute funded and 6 outside funded) were approved, progress of 56 on-going research projects (31 Institute funded, 12 in collaboration with other Institutes and 13 outside funded) were discussed and 16 research projects were declared as complete.

Seminars Delivered

Seminars on different areas of Agricultural Statistics, Computer Applications and Bioinformatics were delivered. These seminars included presentation of salient findings of the completed research projects by the scientists, Thesis/ORW/Course seminars of students of M.Sc. and Ph.D. (Agricultural Statistics), M.Sc. (Computer Application) and M.Sc. (Bioinformatics) and Guest seminars.

| Category | Type of seminar | Number |
|--------------|----------------------|-----------|
| Scientist | Project Completion | 10 |
| | New Project Proposal | 01 |
| Student | Course | 19 |
| | Outline of Research | |
| | Work (ORW) | 01 |
| Total | | 31 |

PUBLICATIONS

Research Papers

- Aditya, K, Sud, UC and Chandra, H (2012). Estimation of domain total for unknown domain size in the presence of nonresponse. *Statist. Appln.*, **10 (1-2)**, New Series, 13-25.
- Bhar, Lalmohan. (2013). A diagnostic tool for detecting outliers in experimental data. *Mod. Assisted Statist. Appln.*, **8(1)**, 61-68.
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- Chaturvedi, KK and Singh, VB (2012). An empirical comparison of machine learning techniques in predicting the bug severity of open and closed source projects. *Int. J. Open Source Software and Processes.* **4(2)**, 32-59.
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- Iquebal, MA and Sarika (2013). Nonlinear growth models for describing country's Lentil (*Lens culinaris* M.) production. *J. Food Legumes*, **26 (1&2)**, 79-82.
- Kumar, Anil, Kumar, Pramod, Panwar, Sanjeev and Choudhary, Vipin Kumar (2013). Economic evaluation and multivariate analysis of cycles of different crop rotations. *Int. J. Agril. Statist. Sci.*, **9(1)**, 323-330.
- Kumar, Shiv, Kanika, Singh, Dharam Raj, Kumar, Anil and Kumar, Suresh (2013). Shushk shetron me kargar hain fabbara sichai. *Haryana Krishi Sanbaad*. September 2013, 18-21
- Kumar, Shiv, Kumar, Rakesh, Singh, Dharam Raj, Kumar, Anil, Kumararya, Prawin and Chaudhary, Khyali Ram (2013). Equity, efficiency and profitability of migratory sheep production system in Rajasthan. *Ind. J. Anim. Sci.*, **83 (9)**, 976–982.
- Lal, SB, Pandey, Pankaj K, Rai, Punit K, Rai, Anil, Sharma, Anu and Chaturvedi, KK (2013). Design and development of portal for biological database in agriculture. *Bioinformation*. **9 (11)**, 588-598. ISSN 0973-2063 (online) 0973-8894 (print)
- Mahajan, GR, Pandey, RN, Datta, SC, Kumar, Dinesh, Sahoo, RN and Parsad, Rajender (2013). Soil test based fertilizer recommendation of nitrogen, phosphorus and sulphur in wheat (*Triticum aestivum* L.) in an alluvial soil. *Int. J. Agric., Env. Biotec.*, **6(2)**, 271-281.
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- Sharma, Anu, Rai, Anil and Lal, SB (2013). Workflow management systems for gene sequence analysis and evolutionary studies – A review. *Bioinformation*. **9(13)**, 303-310. ISSN 0973-2063 (online) 0973-8894 (print).
- Varghese, Cini, Varghese, Eldho and Kumar, Arvind (2013). Row-column designs for investigational products vs. control comparisons in veterinary trials. *Ind. J. Anim. Sci.*, **83(8)**, 834-837.
- Yadav, SP, Sikka, P, Kumar, D, Sarkar, Susheel Kumar, Pandey, AK, Yadav, PS and Sethi, RK (2013). Variation in milk constituents during different parity and seasons in Murrah buffaloes. *Ind. J. Anim. Sci.*, **83(7)**, 747-751.

Project Reports

- Chandra, H, Gharde, Y and Jain, VK (2013). On small area inference using survey weights. (*IASRI/ PR - 14/2013*)
- Chandra, H, Sud, UC and Gharde, Y (2013). Spatial nonstationarity in small area estimation under area level model. (*IASRI/ PR - 15 /2013*)

Popular Articles

- शर्मा, नवीन, फारुकी, मो. समीर, मिश्र, द्विजेश चन्द्र, राय, अनिल, चतुर्वेदी, के.के. और लाल, एस.बी. (2013). सूक्ष्म जीवों में जीनो की अभिव्यक्ति की भूमिका, *नई उम्मीद*, अगस्त, 2013, 22.
- चतुर्वेदी, कृष्ण कुमार, राय, अनिल, लाल, शशि भूषण, फारुकी, मौ. समीर, शर्मा, अनु, कुमार संजीव (2013). ओपन सोर्स सॉफ्टवेयर का भविष्य. *नई उम्मीद*, सितंबर, 2013, 28.

Book Chapter

- Dubey, PP and Kumar, Dinesh. Microarray technology: Basic concept, protocols and applications, . *Analysing Microbes- Manual of Molecular Biology Techniques*. (2013, Eds. Dilip Kumar Arora, Surjit Das and Mesapogu Sukumar), 261-280. ISBN 978-3-642-34409-1, DOI 10.10007/978-3-642-34410-7, 352, Springer

Reference Manual

- Advances in Statistical Genetics (2013, Eds. Wasi Alam, RK Paul and AK Paul).
- Forecast Modeling in Crops (2013, Eds. KN Singh, Praveen Arya and Sanjeev Panwar).

INVITED LECTURES DELIVERED

- On the eve of Statistics Day celebrated at Department of Agricultural Statistics and Social Sciences, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur on 29 June 2013.
 - Rao, AR. Statistics for Agricultural Development.
- Management Development Programme (MDP) on “Biotechnology & Intellectual Property Right “ during July 08-12, 2013 sponsored by NAIP held at National Academy of Agricultural Research Management (NAARM), Hyderabad.
 - Kumar, Dinesh. IP Strategy in Bioinformatics.
- Brain Storming Session on Bioinformatics in Agriculture: Way Forward organized on 12 July 2013 at National Academy of Agricultural Sciences (NAAS), NASC Complex, New Delhi.
 - Kumar, Dinesh. Challenges in animal bioinformatics/ genomics approach to enhance domestic animal productivity in India.
- DBT-supported brainstorming session on “Prioritizing research areas on Nano-Bio-Information Technology for development of North-Western Himalayan States” organized during 12-13 July 2013 by Department of Molecular Biology & Genetic Engineering, College of Basic Sciences & Humanities, GB Pant University of Agriculture & Technology, Pantnagar, Uttarakhand.
 - Rao, AR. Centre for Agricultural Bioinformatics (CABin) and its role in Agricultural Bioinformatics Research in India.
- Summer School on Decision Support System in Agriculture using Quantitative Techniques organized at NCAP, New Delhi during 02-22 August 2013.
 - Rajender Parsad. SAS: An Overview. (Two lectures)
 - Seema Jaggi. SPSS: An Overview. (Two lectures)
 - Hukum Chandra. Overview of R Software.

- 4th Installation training-cum-Nodal Officers workshop organized at CIFE, Mumbai during 29-30 August 2013 under the aegis of NAIP Consortium on Strengthening Statistical Computing for NARS.
 - Rajender Parsad. Design Resources Server, Consortium Website, Indian NARS Statistical Computing Portal and Sample Survey Resources Server. (Three lectures)
- Training Programme on Advances in Methodologies Paradigm and Tools in Extension Research organized at Division of Agricultural Extension, IARI, New Delhi under the aegis of CAFT scheme during 17 September - 07 October 2013.
 - Rajender Parsad. SAS: An Overview & Fundamentals of Design of Experiments. (Three lectures)
 - Seema Jaggi. SPSS: An Overview & Tests of Significance. (Three lectures)
 - Cini Varghese. Data analysis with EXCEL. (Two lectures)
- Training programme on Research Methodology at Council for Social Development from September 18-28, 2013.
 - Seema Jaggi. Statistical Tools and SPSS along with hands on session. (Four lectures)
- Workshop on "Statistical Computing using R", at the Department of Statistics, University of Delhi, Delhi, during 14-15 September 2013.
 - Dr. Hukum Chandra. Statistical Computing using R. (Eight lectures)

PAPERS PRESENTED

- International Conference on Microfinance and Microentrepreneurship: Issues and Challenges organized by Department of Economics, Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur Kalan, Sonapat, Haryana, India during 08-09 August 2013.
 - K, Vijith Krishnan, Kumar, Shiv, Singh DR, Aarthi, LR, Kumar, Anil*, Arya, Prawin, Lohcab, Shaloo, Chaudhary, KR. Prevailing practices of paddy collective farming under kudumbashree mission in Kerala: An Economic Investigation.
- 1st National Seminar on Revitalizing Indian Agriculture "Innovations in Agro Processing and Value Chain" organized by Department of Agriculture and Environmental Sciences, NIFTEM during 12-13 August 2013.
 - Madhav, JV, Sethi, S, Kaur, C and Krishan Lal*. Modified atmosphere packed minimally processed garlic cloves – A convenience product.
- The First Asian International Statistical Institute Satellite Conference on Small Area Estimation, 2013 held at Bangkok, Thailand during 01-04 September 2013. (Plenary Session)
 - Chandra, H*, Salvati, N and Chambers, R. Nonstationary Fay-Herriot models for small area estimation. (Invited Paper).
- 21st Annual Conference of Agricultural Economics Research Association held in SKUAST-Kashmir, Srinagar during 10-12 September 2013.
 - Gurung, Bishal. Volatility and co-integration in livestock and marine export data.
 - Paul, RK. Forecasting of long memory time series.
- 3rd IFIP International Conference on Bioinformatics at Bhopal (MANIT, Bhopal) during 23-26 September 2013
 - Meher, Prabina Kumar*, Rao, AR and Sahu, Kumar Tanmaya. A di-nucleotide association based approach for donor splice site prediction.
 - Rani, N*, Gupta, S, and Rao, AR (2013). Buffalo Genome Information Resource.
 - Rani, N, Jain, S, Sahu, TK and Rao, AR* (2013). LEGMDB-HST: A legume microsatellite database for heat stress tolerance.

- Conference on “Computational Intelligence: Modeling, Techniques and Applications” (CIMTA 2013) during 27-28 September 2013.
 - Sudeep. Building and Querying Microbial Ontology.

PARTICIPATION

Conferences / Workshops / Seminars / Symposia etc.

- Technical Committee of Direction (TCD) organized by Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Govt of India during July 05-06, 2013 at Guru Nanak Dev University, Amritsar. On 05 July 2013, a presentation on Methodological aspects related to estimation of area and production of fodder crops, highlighting the related projects undertaken in the past by the Institute was also made. (Dr UC Sud and Dr KK Tyagi)
- Brainstorming session on Bioinformatics In Agriculture: Way Forward on 12 July 2013 at NASC Complex, New Delhi. (All scientists of the division of Computer Application)
- Workshop on “Agropedia 2.0: Capacity Building Workshop for New Partners” organized by IASRI and ICRISAT at IASRI, New Delhi on 15 July 2013. (Dr. AK Choubey, Ms. Shashi Dahiya, Dr. Yogesh Gautam, Mr. Pratap Singh and Mr. Subhash Chand)
- Workshop on Developing Performance Indicators for ICAR institutes at NCAP, New Delhi on 15 July 2013. (Dr. UC Sud and Dr. Seema Jaggi)
- Third Annual Review Workshop of the NFBSFARA during 22-23 July 2013 at NASC Complex, New Delhi (Dr. Sanjeev Kumar)
- CAFT Workshop on “ICT for Capacity Building in Agricultural Education in India” organized by CAFT in Agricultural Statistics and Computer Application at IASRI New during 26-27 July 2013. (Dr UC Sud, Dr PK Malhotra, Dr. Anil Rai, Dr. Sudeep and Dr. Alka Arora)
- International Expert Consultation Meet Organized by National Bureau of Fish-Genetic Resources (NBFG), Lucknow in collaboration with Asian Fisheries Society, Indian Branch (AFSIB), Mangalore and Aquatic Biodiversity Conservation Society (ABCS), Lucknow, on ‘Fish Genomics Research in India: A WayForward’ on 02 August 2013 at NBFG, Lucknow. (Dr. Dinesh Kumar)
- One day workshop on “#OpenDataApps Challenge for Innovation in Governance” held at India Habitat Centre, New Delhi organized by NIC, Department of Electronics & IT on 08 August 2013. (Dr. Anshu Bharadwaj)
- “The 50 Pact” organized by CIMMYT, BISA and ICAR during 16-17 August 2013 at NASC Complex, New Delhi. (Dr. Sushila Kaul)
- BGRI technical workshop 2013 on 19 August 2013 at Vigyan Bhawan, Maulana Azad Road, New Delhi. (Dr UC Sud)
- One day National Workshop on Repeat Study on Assessment of Post Harvest Losses of Major Horticultural Crops, Animal and Fishery Products in India held on 29 August 2013 at NASC complex, New Delhi organized jointly by Horticulture SMD of ICAR and Ministry of Food Processing Industries, Govt. of India. (Dr, UC Dud, Dr. Anil Rai, Dr KK Tyagi, Dr Tauqueer Ahmad, Dr. Prachi Misra Sahoo and Dr. Man Singh)
- Workshop on Animal Bioinformatics and Genomics Research Programs under National Agricultural Bioinformatics Grid (NABG) organized under NAIP Subproject ‘Establishment of National Agricultural Bioinformatics Grid’ on 02 September 2013 at NBAGR. (Dr.Dinesh Kumar)
- Two days workshop on Statistical Computing using R at The Department of Statistics, University of Delhi, Delhi during 14-15 September 2013. (Dr Hukum Chandra)

- Global Economic Cooperation : Views from G20 countries organized by ICRIER at Indian Habitat Centre, New Delhi on 17 September 2013. (Dr. Susheela Kaul)
- 6th Agriculture Leadership Summit 2013 organized by Agriculture Today concurrently with the Leadership Awards and the release of 6th Agriculture Year Book during 19-20 September 2013 at hotel Taj Palace, New Delhi. (Dr KK Tyagi and Dr. Susheela Kaul)
- 4th Installation training-cum-Nodal Officers workshop organized under the project Strengthening Statistical Computing for NARS at IVRI, Izatnagar during 20-21 September 2013 and at NDRI Karnal on 30 September 2013. (Dr. Rajender Parsad)
- 29th workshop of AICRP on PHT held during 23-26 September 2013 at Maharana Pratap University of Agriculture and Technology (MPUAT), Udaipur, Rajasthan. (Dr. Anil Rai and Dr Tauqueer Ahmad)

Training

- 21 days Summer School “Decision Support Systems in Agriculture using Quantitative Techniques” at NCAP, New Delhi from 02-22 August 2013. (Dr. Yogesh Gautam)
- Training on Whole genome sequence, transcriptome, metagenomic data analysis during 19-24 August 2013, at Ome Research Centre, Department of Biotechnology, Anand Agriculture University, Anand, Gujarat. (Dr. Dinesh Kumar, Dr. MA Iquebal and Dr. Sarika)
- Professional Attachment Training at Central Marine Fisheries Research Institute, Kochi, Kerala from 19 June-20 September 2013. (Sh.Upendra Kumar Pradhan)

Meetings

- High Level Coordination Committee related to the Agricultural Statistics at Dehradun on 03 July 2013. (Dr UC Sud)
- Committee on ARS under the Chairmanship of Director General, ICAR on 10 July 2013 at Krishi Bhawan, New Delhi. (Dr UC Sud)
- Meeting on On-Farm experiments for finalizing the table for data analysis and preparation of document regarding discrepancies on data sheet of OFR centers on 12 July 2013. (Dr. Sukanta Dash)
- Directors of ICAR Institutes for Introduction of Framework for Performance Indicators on 15 July 2013 at NASC Complex, New Delhi. (Dr UC Sud)
- PI of the projects funded by NFBSFARA (4th call) at Division of Plant Physiology, IARI, New Delhi on 24 July 2013. (Sri Sanjeev Kumar)
- Quinquennial Livestock Census Integrated Sample Survey Scheme on 02 August 2013 at Krishi Bhawan, New Delhi. (Dr UC Sud)
- Assessment of Post Harvest Losses of Major Horticultural Crops, Animal and Fishery Products in India under the Chairmanship of DDG Horticulture on 05 August 2013 at New Delhi. (Dr UC Sud)
- Second meeting of the Committee to examine methodology issues in fixing minimum support prices on August 07, 2013 at Krishi Bhawan, New Delhi. (Dr UC Sud)
- Project team of the DIT funded project A New Distributed Computing Framework for Data Mining at BITS, Pilani during 12-13 August 2013. (Mr Sanjeev Kumar and Mr Sudhir Srivastava)
- First meeting of the Standing Committee for the 21st Conference of Central and State Statistical Organizations (COCSSO) on 13 August 2013 at Sardar Patel Bhawan, New Delhi. (Dr UC Sud)
- Karnataka State High Level Coordination Committee Meeting (HLCC), organized by State DES at Bangalore on 22 August 2013. (Dr. KK Tyagi)

- Selection Committee, Maharana Pratap Agricultural and Technology University on 23 August 2013 at Udaipur. (Dr UC Sud)
- Review meetings chaired by the DG ICAR at Krishi Bhawan on 23 August 2013 and presented the progress of MIS/FMS Project. (Dr. A.K.Choubey, Dr. Sudeep and Dr. Alka Arora)
- Research Advisory Committee (RAC) of IARI during 26-27 August 2013 at IARI, New Delhi. (Dr UC Sud)
- Meeting on Assessment of Post Harvest Losses of Major Horticultural Crops, Animal and Fishery Products in India on 29 August 2013 at NASC Complex, New Delhi. (Dr UC Sud)
- Meeting with all project coordinators of AICRPs / AINPs and Leaders of Central Research Platforms (CRPs) on 29 August 2013 at NASC Complex, New Delhi. (Dr.AR Rao)
- 11th meeting of the Technical Monitoring Committee for Central Sector Scheme on Strengthening of Database and Geographical Information System for the Fisheries Sector on 30 August 2013 at Goa. (Dr UC Sud)
- Management Committee of National Agricultural Science Museum (NASM) on 11 September 2013 at NASC, Complex New Delhi. (Dr UC Sud)
- Departmental Promotion Committee meeting held at NBAII Bangalore on 03 September 2013. (Dr. Anil Rai)

CONSULTANCY /ADVISORY SERVICES PROVIDED

- Dr. BN Mandal provided Advisory services to Dr M Meena, Scientist, Sugarcane Breeding Institute on Stability analysis using Eberhart and Russell, Perkins and Jinks model, Freeman and Shukla model, Additive Main Effects and Multiplicative Interaction (AMMI) analysis and Biplot analysis.

PERSONNEL

Congratulations on your Appointment

| Name | Designation of Joining IASRI | Effective Date |
|---------------------|------------------------------|----------------|
| Dr. N Srinivas Rao | Senior Scientist | 29.07.2013 |
| Dr. Mukesh Kumar | Senior Scientist | 16.08.2013 |
| Dr. Monender Grover | Senior Scientist | 17.08.2013 |
| Dr. UB Angadi | Senior Scientist | 22.08.2013 |
| Smt. Poonam Singh | Administrative Officer | 16.08.2013 |

Congratulations on your Promotion

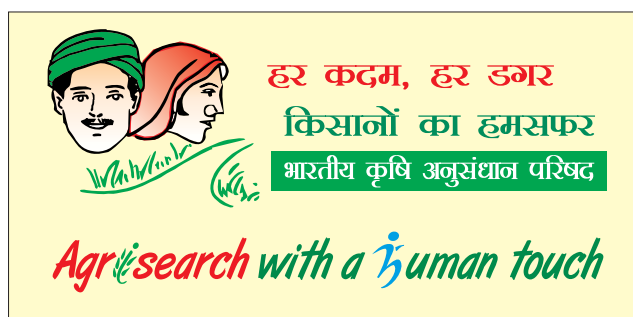
| Name | Designation | Effective Date |
|-----------------------|-------------|----------------|
| Smt. Sushma Nigam | PA | 04.06.2013 |
| Sh. Satya Vir Singh-I | LDC | 13.06.2013 |
| Sh. Raj Karan | SSS | 13.06.2013 |
| Smt. Jaswanti | SSS | 13.06.2013 |
| Sh. Trilok Singh | SSS | 13.06.2013 |
| Sh. Mohan Singh | SSS | 13.06.2013 |
| Sh. Bhaskar Datt | SSS | 24.06.2013 |
| Sh. Dev Murti Prasad | LDC | 06.07.2013 |
| Smt. Sudesh Arora | PA | 14.07.2013 |
| Sh. Ram Awadh Pal | SSS | 05.09.2013 |

Wish you a Happy Retired Life

| Name | Designation | Effective Date |
|----------------------------|----------------------------|----------------|
| Dr. Prajneshu | Principal Scientist & Head | 31.07.2013 |
| Dr. (Smt.) Ranjana Agrawal | Principal Scientist | 31.07.2013 |
| Sh. Pramod Kumar | Sr. Technical Officer | 31.07.2013 |
| Sh. Yogesh Choudhary | Assistant | 31.07.2013 |
| Ms. Doly Dass | PA | 31.07.2013 |
| Sh. Jagat Pal | SSS | 31.07.2013 |
| Sh. Mewa Ram | SSS | 31.08.2013 |

Transfer

| Name | Designation | Effective Date |
|-----------------------|---------------------|-------------------------------|
| Dr. Ramasubramanian V | Principal Scientist | 18.07.2013 to CIFE, Mumbai |
| Dr. Dharam Raj Singh | Senior Scientist | 29.07.2013 to IARI, New Delhi |
| Dr. Amrender Kumar | Senior Scientist | 01.08.2013 to IARI, New Delhi |



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