- Research Achievements
- Human Resource Development
- Awards and Recognitions
- Panorama of Activities
- Publications
- Lectures Delivered
- Participation
- Consultancy/Advisory Services
- Personnel

From Director's Desk . . .

This newsletter highlights salient research achievements, training programs conducted, workshops organized and other significant activities performed at the Institute during the period under report.

A netting factor of 12.5 per cent is being used to account for seed, feed, and wastages ratios to the food grains production in the country since 1960's. These old norms require re-examination of the basis for this conventional figure. These estimates of wastage ratios for seed, feed and total production in respect of major food grains viz. paddy, wheat, maize, bajra, jowar, ragi and barley has been relooked and recomputed. It indicates that over-all ratios have gone down by 4.5% approximately as compared to the ratios (12.5%) used since long for estimating the total availability of food grains for human consumption in the country. These developed ratios are of immense use for planning and formulation of future policies by the Government and policy makers for the economic development of the country.

An open access web solution named webFMC (http://webfmc.iasri.res.in.) has been developed to generate any combination of symmetric and asymmetric factorial design with minimally changed run sequences. An online catalogue of such run sequences has also been developed and integrated with webFMC.

First whole genome putative microsatellite DNA marker database http://webapp.cabgrid.res.in/sbmdb/) of sugarbeet for bioenergy and industrial applications has been developed and was listed as one of the Salient Achievement for the year 2015 of Indian Council of Agricultural Research (Department of Agricultural Research and Education) by Secretary, DARE & DG, ICAR. (http://www.icar.org.in/files/salient-achievements-2015-DG.pdf)

Five training programmes, three national and two under Centre of Advanced Faculty Training (CAFT) were organized. Besides, two national workshops and one Hindi workshop have also been organized.

Scientists of the Institute have received various awards & recognitions. During the period, four new projects were initiated. Scientists of the Institute have published 29 research papers, 4 book chapters, 25 popular article, 2 training manuals, 6 technical reports, 2 papers in Conference proceedings. Besides, 29 invited lectures were delivered by the scientists. Further, scientists have participated in different conferences/symposia/ workshops, etc.
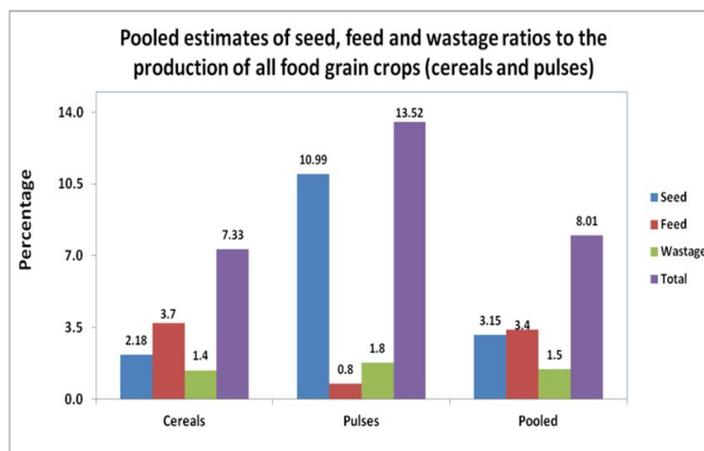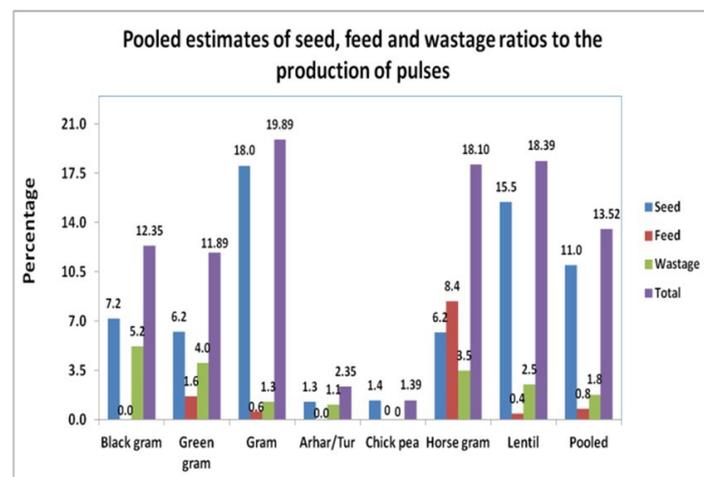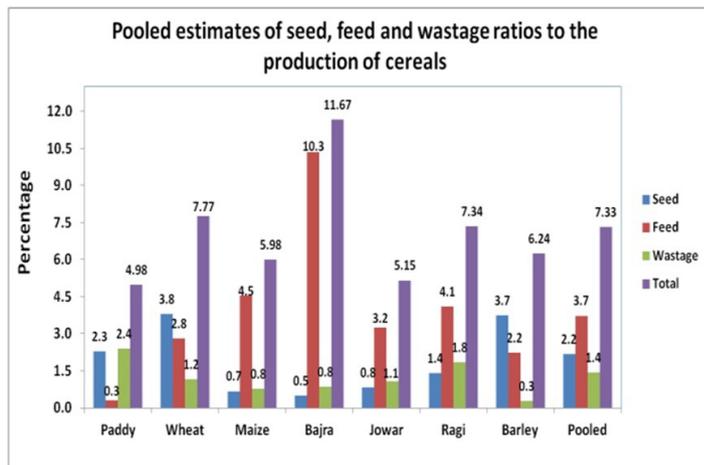
It is hoped that the contents of this document would be informative and useful to scientists in NARES. Any suggestions for improving the contents of the newsletter further would be highly appreciated.

(UC Sud)

RESEARCH ACHIEVEMENTS

- **Pilot Study for estimation of seed, feed and wastage ratios of major food grains.** A netting factor of 12.5 per cent is being used to account for seed, feed, and wastages ratios to the food grains production in the country since 1960's. Since this factor of 12.5 per cent is much old, doubts have been raised from time to time necessitating re-examination of the basis for this conventional figure. The estimates of seed, feed and wastage ratios of major food grains viz. paddy, wheat, maize, bajra, jowar, ragi and barley has been relooked and recomputed through a survey organized in selected districts of five states namely Uttar Pradesh, Karnataka, Madhya Pradesh, Rajasthan and Odisha. Pooled estimates of seed, feed and wastage ratios to the production of all cereals were to the tune of 2.182% with 1.22% SE, 3.724% with 5.71% SE and 1.419% with 5.45% SE respectively the combined estimated value being 7.325%. Black gram, green gram, gram, arhar/tur, chick pea, horse gram and lentil are the major pulses grown in the selected districts of five states under study. Pooled estimates of seed, feed and wastage ratios to the production of all pulses were to the tune of 10.985% with 5.72% SE, 0.758% with 6.33% SE and 1.781% with 6.56% SE respectively the total value being 13.524%. Pooled estimates of seed, feed and wastage ratios to the production of all food grain crops grown in the selected states were to the tune of 3.148% with 2.34% SE for seed, 3.399% with 5.57 % SE for feed and 1.459% with 4.81% SE for wastage with a total of 8.005%.

It indicates that over-all ratios have gone down by 4.5% approximately as compared to the factor ratios (12.5%) used since long for estimating the total availability of food grains for human consumption in the country. The results indicate that these estimates are within a reasonable degree of precision. These

Pooled estimates of seed, feed and wastage ratios to the production of cereals

Pooled estimates of seed, feed and wastage ratios to the production of pulses

Pooled estimates of seed, feed and wastage ratios to the production of all food grain crops (cereals and pulses)
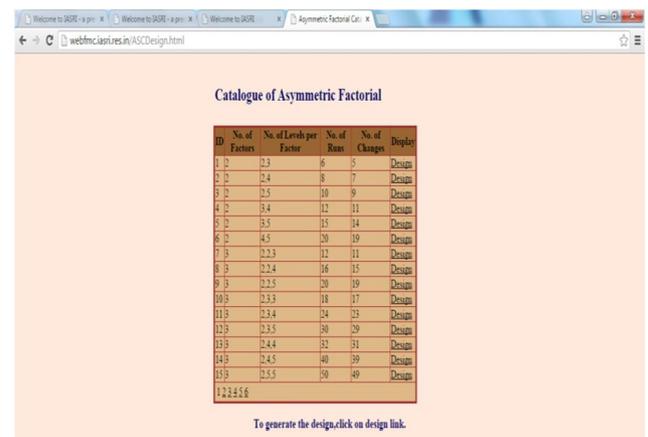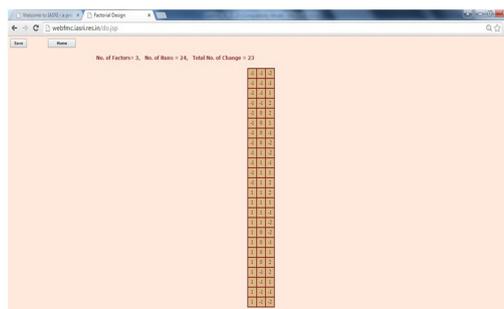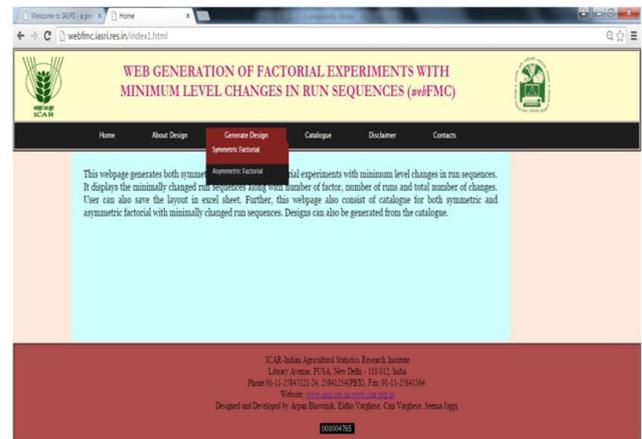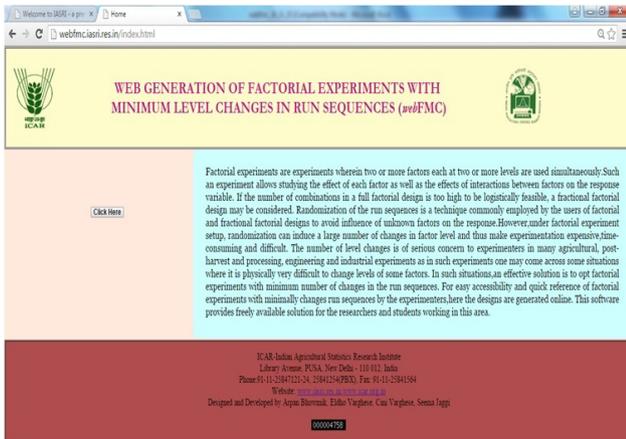
developed seed, feed and wastage ratios to the production of major food grain crops are of immense use for planning and formulation of future policies by the Government and policy makers for the economic development of the country.

It may be noted that pooled estimates of seed, feed and wastage ratios to the production of all the major food grain crops are based on pilot study conducted in five States under study by taking four districts from each State. In view of the importance of the study there is a need to organize a regional level survey for working out estimates of seed, feed to the production of major food grain crops.

- **Factorial Experiments with Minimum Level Changes in Run Sequences.**

  Randomization of run sequences is a technique commonly employed by the users of factorial designs in order to avoid bias in the estimates of the effects of interest which might result from a time trend.

However, randomization of run sequences in factorial experiment can induce a large number of changes in factor level and thus make experimentation expensive, time-consuming and difficult. The criterion of number of level changes is one of the most important criteria particularly for experiments which involve hard-to-change factors i.e. factors for which it is difficult to change the levels both in terms of cost and time. Considering this, a general methodology has been developed to construct any combination of mixed level factorial design with minimally changed run sequences. Based on the method, along with total number of changes for a minimally changed run sequences, the general expression has been obtained for calculating factor-wise number of level changes. Since, minimally changed run sequences in factorial design is not unique, thus, an exhaustive search algorithm has been developed to generate all possible minimally changed run sequences for a particular factorial design along with factor-wise number of level changes which would help in selecting any minimally changed run sequence randomly out of all possible minimally changed run sequences and hence can minimize any systematic bias which may be introduced due to the lack of randomization.

The method for constructing minimally changed run sequences under factorial experiment set up may involve theoretical understanding from user point of view. An open access web solution named webFMC (http://webfmc.iasri.res.in.) has been developed to generate any combination of symmetric and asymmetric factorial design with minimally changed run sequences. An online catalogue of such run sequences has also been developed and integrated with webFMC.

AWARDS AND RECOGNITIONS

- Dr. Dinesh Kumar, Dr. Sarika and Dr. M.A. Iquebal received Best Poster Award (3rd Prize) in the 2nd International Symposium on Genomics in Aquaculture organized by the ICAR-Central Institute of Freshwater Aquaculture in collaboration with Association of Aquaculturist and Asian Fisheries Society, Indian Branch during January 28-30, 2016 at Bhubaneswar, India

- Dr. RK Paul received Young Scientist Award by the Society for Application of Statistics in Agriculture and Allied Sciences (SASAA) at National Seminar on "Recent Advances in Statistical Tools for Agriculture and Allied Sciences" held at BCKV, Kalyani, West Bengal during 03-05 March 2016 .

- Dr. Eldho Varghese and Dr. Arpan Bhowmik were awarded with कृषि विज्ञान गौरव (Krishi Vigyan Gaurav) मानद उपाधि (Honorary Title) by भारतीय कृषि अनुसंधान समिति (Bhartiya Krishi Anusandhan Samiti) and कृषि अनुसंधान संचार केन्द [Agricultural Research Communication Center (ARCC)], करनाल (Karnal) for carrying out outstanding research work in official language हिंन्दी (Hindi).

- Dr. Anil Rai, Dr. Dinesh Kumar, Dr. Sarika and Dr. MA Iquebal developed First whole genome putative microsatellite DNA marker database (http://webapp.cabgrid.res.in/sbmdb/) of sugarbeet for bioenergy and industrial applications and listed it has been listed as one of the as Salient Achievement for the year 2015 of Indian Council of Agricultural Research (Department of Agricultural Research and Education) by Secretary, DARE and DG, ICAR (http://www.icar.org.in/files/salient-achievements-2015-DG.pdf)

- 18th Annual Conference of Society of Statistics, Computer and Applications held at University of Jammu, Jammu during February 18-20, 2016.

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- Dr. LM Bhar elected as Joint Secretary of the Society of Statistics, Computer and Applications.
- Dr. Rajender Parsad chaired a Technical Session on Statistical Computing and Big Data Analytics organized during Conference.
- Dr. Hukum Chandra convened and chaired a technical session on "Advances in Sample Surveys".
- Dr. Alka Arora. Convened a Technical Session on "Informatics- Advances and Issues".
- Sh. Samrendra Das presented one paper "Gene selection, module and hub gene detection for gene co-expression network analysis and application to aluminium stress in soybean" in Dr. MN Das Young Scientist Award Session and awarded as runners up and got Appreciation Certificate.

• Dr. UC Sud appointed as Coordinating Editor, Indian Society of Agricultural Statistics.

• Dr. Anshu Bharadwaj got appointed as Editor/Reviewer for the American Research Journal.

• Dr. AR Rao chaired a session Track – I on "Genomics" at the "International Conference on Bioinformatics and Systems Biology" organized at Indian Institute of Information Technology, Allahabad, India during 04 - 06 March 2016.

• Dr. Anil Rai was appointed as Member of Editorial Board of Indian Journal of Agricultural Sciences, ICAR, New Delhi.

• Dr. Anil Rai was invited as Plenary Speaker in 103rd Indian Science Congress and delivered a talk related to Genomic databases and genomic Selection in agriculture on January 06, 2016.

• Dr. KK Chaturvedi was appointed as Member, Editorial Board, International Journal of Current Trends in Engineering & Technology (IJCTET); Member, Editorial Board, International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE, http://www.ijarcce.com). ISSN 2278-1021; Member, Editorial Board, Journal of Computer Science and Engineering (JCSE, www.journalcse.co.uk). ISSN 2043-9091; Member, Editorial Board, International Journal of Emerging Technology & Advanced Engineering (IJETAE, www.ijetae.com). ISSN 2250-2459; Member, Editorial Board, Current Trends in Technology & Sciences (CTTS, http://ctts.in/). ISSN: 2279-0535; Member, Reviewers Board, International Journal of Computer and Information Technology (IJCIT, http://www.ijcit.com/index.php). ISSN 2279-0764 and Member, Reviewers Board, Aloy Journal of Soft Computing and Applications (AJCSA, http://www.ajsca.org).

• Dr. MA Iquebal received Young Scientist Award of the Society for Application of Statistics in Agriculture and Allied Sciences (SASAA) at National Seminar on Recent Advances in Statistical Tools for Agriculture and Allied Sciences at BCKV, Kalyani, West Bengal during March 03-05, 2016. He was also appointed as Executive Member, Indian Society of Agricultural Statistics; Member, Scientific Board, Online Journal of Bioinformatics and Member, Editorial Board, International Journal of Genetics and Genomics.

• Dr. Sarika was appointed as Executive Member, Indian Society of Agricultural Statistics.

• Dr. Monendra Grover performed Editorial duties for SAARC Journal of Biotechnology; International Journal of Computer Applications and Advances in Computational Research.

- Dr. AR Rao was appointed as Member, Editorial Board for the Indian Journal of Genetics and Plant Breeding.
- Mohammad Samir Farooqi was selected as Reviewer for the Journal of Genetics. He was also appointed as Member, Krishi Unnati Mela Organizing Committee of IASRI and Member Executive Committee of The Indian Society of Agricultural Statistics.

VISIT ABROAD

- Dr. UC Sud, Director, ICAR-IASRI and Dr. Tauqueer Ahmad, Principal Scientist & Head visited the National Institute of Statistics of Rwanda (NISR), Kigali, Rwanda as Resource Person for imparting training to Enumerators and Supervisors for primary data collection and supervise live data collection under the project "Research on improving methods for estimating crop area, yield and production under mixed, repeated and continuous cropping" in Kigali, Rwanda during 03-09 January, 2016.
- Dr. UC Sud, Director, ICAR-IASRI and Dr. Tauqueer Ahmad, Principal Scientist & Head visited Jamaica as Resource Person for imparting training to Enumerators and Supervisors for primary data collection and supervise live data collection under the project "Research on improving methods for estimating crop area, yield and production under mixed, repeated and continuous cropping" in Kingston, Jamaica during January 27 to February 04 2016.
- Dr. Hukum Chandra visited Japan to attend Regional Workshop on Training of Trainers for Official Statistics and Second Expert Group Meeting of the Network for the Coordination of Statistical Training in Asia and the Pacific during 29 February - 04 March 2016.
- Dr. Hukum Chandra and Dr. Man Singh visited Jakarta, Indonesia for supervision of data collection work under the Food and Agriculture Organization of United Nations funded project entitled "Research on improving methods for estimating crop area, yield and production under mixed, repeated and continuous cropping" during 13-19 March, 2016.

NEW PROJECTS INITIATED

- Stochastic differential equation models and their applications to agriculture. (Funded by SERB, New Delhi) (AGENIASRICOP201603400071) Ex. Emeritus Scientist, ICAR: Prajneshu, ICAR-IASRI: Himadri Ghosh and Lal Mohan Bhar: 06.11.2015-05.11.2018
- A study on sequence encoding based approaches for splice site prediction in agricultural species. (AGENIASRISIL201603300070) Prabina Kumar Meher, UK Pradhan, SD Wahi and AR Rao: 01.01.2016-31.12.2017
- Knowledge management system for agriculture extension services in Indian NARES. (AGENIASRICOL201603700074) ICAR-IASRI: Alka Arora, AK Choubey, NS Rao, SN Islam, Soumen Pal and Sudeep; Agricultural Extension Division, ICAR: P Adiguru: 04.03.2016-31.03.2017
- Transcriptome and proteome analysis for identification of candidate genes responsible for pistillate nature in castor. (AGENIASRICOP201603600073), IIOR: M Sujatha; ICAR-IASRI: MA Iquebal: 21.01.2016-31.03.2017

HUMAN RESOURCE DEVELOPMENT
Training Programmes/ Workshops Organised

S.No.	Title	Venue	Date	Sponsored by	No. of Participants
	Training Programmes				
1.	Recent Advances in Next Generation Sequencing Data Analysis under network project "Agricultural Bioinformatics and Computational Biology" Course Director: Dr. M Grover Co-Course Director: Dr. DC Mishra	ICAR-IASRI New Delhi	08-18 January 2016	ICAR-IASRI New Delhi	18
2.	Statistical Advances for Technological Enhancement in Agricultural Research under CAFT Cordinator: Dr. Arpan Bhowmik Co-Cordinator: Dr. Cini Varghese	ICAR-IASRI New Delhi	19 January to 08 February 2016	Education Division of ICAR	23
3.	Computational Tools and Techniques for Molecular Data Analysis in Agriculture under CAFT Cordinator: Dr. Dinesh Kumar Co-Cordinator: Dr. Sarika	ICAR-IASRI New Delhi	11 February to 02 March 2016	Education Division of ICAR	25
4.	Recent Advances in Statistical Genetics and Genomics under CAFT Cordinator: Sh. PK Meher Co-Cordinator: Sh. UK Pradhan	ICAR-IASRI New Delhi	04-24 March 2016	Education Division of ICAR	23
5.	Training cum Workshop on MAPI Software for the officials of Uttar Pradesh states DES of Bulandsahr and Pratapgarh for initiation of data entry Cordinator: Dr. Kaustav Aditya	ICAR-IASRI	18-19 March 2016	DES, New Delhi	04
	Workshops				
6.	NISAGENet for Appraisal cum Validation of Data Cordinator: Dr. Alka Arora	MPKV, Rahuri	22-23 March 2016		
7.	Overview of Research in Statistics and Informatics in Last 40 years to felicitate Professor VK Gupta on his superannuation and 66th Birthday Cordinators: Dr. Ramana V Davuluri Dr. A Dhandapani Dr. LM Bhar Dr. Rajender Parsad Dr. Seema Jaggi	ICAR-IASRI	17 March 2016	Students of Dr. VK Gupta	
8.	Hindi Workshos Application of Forecasting Techniques in Agriculture using Advanced Software Packages Cordinators: Dr. Wasi Alam Sh. Kanchan Sinha	ICAR-IASRI	26-31 March 2016	ICAR-IASRI	

PANORAMA OF ACTIVITIES
- 84th meeting of Institute Research Committee was held 05-06 April 2016.
- 17th Research Advisory Committee (RAC) Meeting was held on 15 March 2016.
- Steering Committee Meeting of the ICAR Research Data Repository for Knowledge Management was held on 01 March 2016.

- **Seminars Delivered**

  Seminars in different areas of Agricultural Statistics, Computer Application and Bioinformatics were delivered by the scientists and students of the Institute. The seminars included presentations on salient findings of the completed research projects and new project proposal 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).

  One Guest Seminars by SPSS Team on Demonstration of SPSS Software along with SPSS Online Training for Government Officials was delivered on 21 January 2016.

The Details of Seminars Delivered		
Category	**Type of seminar**	**Number**
Student	Course	17
	ORW	06
Scientist	Project Completion	01
SPSS Team		01
Total		**25**

Technology Assessed /Transferred

- Implementation of MIS/FMS in all ICAR Institutes.
- CBP Vortal.
- Agridaksh on Maize, Mushroom.
- Expert System on Wheat and Seed Spices.

Conferences/ Workshops/ Seminars/ Symposia/Meetings etc. Organized

- Dr. Seema Jaggi organized 17th RAC meeting on 15 March 2016 as Member Secretary.
- Dr. Rajender Parsad organized Steering Committee Meeting of the ICAR Research Data Repository for Knowledge Management on 01 March 2016.
- Dr. Ajit organized 84th meeting of IRC during 05-06 April 2016 as Member Secretary.
- Dr. Dinesh Kumar, Dr. Sarika and Dr. M. A. Iquebal organized third Review Meeting of the collaborators of the DBT funded project entitled 'Whole genome sequencing and development of allied genomic resources in two commercially important fish- Labeo rohita and Clarias batrachus' on January 06, 2016.

PUBLICATIONS

Research Papers

- Ahmad, T, Sahoo, PM and Jally, S. (2015). Estimation of area under agroforestry using high resolution satellite data. *Agroforest. Sys.*, **90(2)**, 289-303.
- Arya, P, Paul, RK, Kumar, A, Singh, KN, Sivaramne, N and Chaudhary, P (2015). Predicting pest population using weather variables: an ARIMAX time series framework. *Int. J. Agril. Statist. Sci.,* **11(2)**, 381-386.
- Bhardwaj, SP (2015). Study of price volatility in pulse crops - A case study of masoor grain. In: *Statistics and Informatics in Agricultural Research*. Indian Society of Agricultural Statistics. ICAR-IASRI Campus, New Delhi, 260-275.
- Bhardwaj, SP, Paul, RK and Singh, KN (2015). Price forecast an instrument for improvement in agricultural production and marketing in Rajasthan- A case study of rapeseed and mustard seeds. *Ind. J. of Agril. Marketing,* **29(2),** 163-171.

- Bhati , J, Chaduvula, PK, Kumar, S, Marla, SS and Rai, A (2016). In-silico prediction and functional analysis of salt stress responsive genes in Rice (Oryza sativa). *J Rice Res.*, **4**, 164. doi:10.4172/2375-4338.1000164

- Bhowmik, A, Jaggi, S, Varghese, C and Varghese, E (2015). Trend free second order neighbour balanced block designs. *J. Ind. Statist. Asso.*, **53 (1 & 2)**, 63-78.

- Biswas, A, Rai, A, Ahmad, T and Sahoo, PM (2015). Spatial estimation approach under ranked set sampling from spatial correlated finite population. *Int. J. Agril. Statist. Sci.,* **11(2)**, 551-558.

- Biswas, A, Rai, A, Ahmad, T and Sahoo, PM (2016). Spatial estimation and rescaled spatial bootstrap approach for finite population. *Comm. Statist.-Theory Methods* (DOI: 10.1080/03610926.2014.995820).

- Chaturvedi, V, Kumar, A, Mishra, IM, Singh, JK, Sahoo, RN, Jha, GK and Lal, SB (2016). Study on interventions to reduce vibration transmission to power tiller operator. *J. Appl. Natural Sci.*, 8 (1), 265 – 272.

- Choudhary, RK, Rao, AR, Wahi, SD and Misra, AK (2016). Detection of biennial rhythm and estimation of repeatability in mango (Mangifera indica L.). *Ind. J. Genet. Plant Breed.,* **76(1)**, 88-97.

- Ganeshan, P, Jain, A, Parmar, B, Rao, AR, Sreenu, K, Mishra, P, Mesapogu, S, Subrahmanyam, D, Ram, T, Sarla, N and Rai, V (2016). Identification of salt tolerant rice lines among interspecific BILs developed by crossing Oryza sativa × O. rufipogon and O. sativa × O. nivara. Austr. *J. Crop Sci.*, **10(2)**, 220-228.

- Gupta, A, Amrapali, S, Kumar, M, Khati, P, Lal, B, Agrawal, PK, Mahajan, V and Bhatt, JC (2016). Distinctness, uniformity and stability testing in maize inbreds. *Natl. Acad. Sci. Lett.* **39(1)**, 5–9

- Kota, S, Singh, SS, Singh, AM, Mohapatra, T, Ahlawat, AK, Brajendra, P and Mandal, BN (2015). The variation and stability analysis of starch pasting properties among new plant type (NPT) wheat derivatives. *J. Agri. Sci. Tech*., **17**, 1887-1902.

- Kumar, M, Sarangi, A, Singh, DK, Rao, AR and Sudhishri, S (2016). Response of wheat cultivars to foliar potassium fertilization under irrigated saline environment. *J. Appl. Natural Sci.*, **8(1)**, 429-436.

- Kumar, S, Tomar, BS, Jain, SK, Singh, N, Parsad, R and Munshi, AD (2015). Effect of planting time and density on plant growth, seed yield and quality attributes in onion (*Allium cepa*) cv. Pusa Riddhi. *Ind. J. Agril. Sci.*, **85(12),** 1578–1585.

- Mandal, BN, Parsad, R and Gupta, VK (2016). Cyclic circular balanced and strongly balanced crossover designs through integer programming. *Comm. Statist.-Theory Methods*, 859-871.

- Meher, PK, Sahu, TK and Rao, AR (2016). Prediction of donor splice sites using random forest with a new sequence encoding approach. *BMC BioData Mining*, **9(4)**, *DOI: 10.1186/s13040-016-0086-4*

- Mohd, H, Varghese, C, Jaggi, S and Varghese, E (2016). Triallel cross designs for comparing a set of test lines with a control line. *Ind. J. Genet. Plant Breed.,* **76(1)**, 84-87.

- Nath, P, Kaur, C, Rudra, SG and Varghese, E (2016). Enzyme-assisted extraction of carotenoid- rich extract from red capsicum (*Capsicum annuum*). *Agric. Res.*, DOI 10.1007/s40003-015-0201-7

- Paul, RK, Bhardwaj, SP, Singh, DR, Kumar, A, Arya, P and Singh, KN (2015). Price volatility in food commodities in India-An empirical investigation. *Int. J. Agric. Statist. Sci.*, **11(2),** 395-401.

- Paul, RK, Rana, S and Saxena, R (2015). Effectiveness of price forecasting techniques for capturing asymmetric volatility for onion in selected markets of Delhi. *Ind. J. Agric. Sci.*, **86(3)**, 303–309.

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- Pradhan, UK, Lal, K, Dash, S and Singh, KN (2016). Design and analysis of mixture experiments with process variable. *Comm. Statist. - Theory Methods,* DOI:10.1080/03610926.2014.990104

- Raman, RK, Paul, AK, Das, S and Wahi, SD (2015). Empirical comparison of the performance of linear discriminant function under multivariate non-normal and normal data. *Int. J. Agril. Statist. Sci.*, **11(2)**, 403-409.

- Rao, NS (2015). MAPRIS: A references information system on medicinal and aromatic plants to serve the researchers. *Int. J. Appl. Res. Infor. Tech. Compu.,* **6(3)**, 154-157.

- Rao, NS, Geetha, KA and Maiti, S (2015). DHMAPI: A knowledge based system for identification of medicinal and aromatic plants. *Int. J. Appl. Res. Infor. Tech. Compu.,* **6(3)**, 177-188.

- Saxena, R, Paul, RK, Rana, S, Chaurasia, S, Pal, K, Zeeshan and Joshi, D (2015). Agricultural trade structure and linkages in SAARC: An empirical investigation. *Agril. Eco. Res. Rev.,* **28(2)**, 311-358.

- Singh, BK, Mishra, DC, Yadav, S, Ambawat S, Vaidya, E, Tribhuvan, KU, Kumar, A, Kumar, S, Kumar, S, Chaturvedi, KK, Rani, R, Yadav, P, Rai, A, Rai, PK, Singh, VV and Singh, D (2016). Identification, characterization, validation and cross-species amplification of genic-SSRs in Indian Mustard (Brassica juncea). *J. Plant Biochem. Biotech*., DOI: 10.1007/s13562-016-0353-y.

- Sundaray, JK, Rasal, KD, Chakrapani, V, Swain, P, Kumar, D, Ninawe, AS, Nandi, S and Jayasankar, P (2016). Simple sequence repeats (SSRs) markers in fish genomic research and their acceleration via next-generation sequencing and computational approaches. *Aquaculture Int.*, 1-14. (*http://link.springer.com/article/10.1007/s10499-016-9973-4*)

- Wani, MH, Paul, RK, Bazaz, NH and Bhat, A (2015). Market integration and causality in pear in India. *Economic Affairs-Quarterly J. Eco.*, **60 (4)**, 735-740.

Book Chapters

- Lal, K, Parsad, R and Gupta, VK (2015). Trend free block designs under a heteroscedastic model. In: *Statistics and Informatics in Agricultural Research*, (Eds. UC Sud, Hukum Chandra, LM Bhar, Susheel Kumar Sarkar), Indian Society of Agricultural Research, New Delhi.

- Rao, NS, Choubey, AK, Arora, A, Marwaha, S, Kumar, M, Chand, S and Saini, RK (2016). Data Center and its services in ICAR. In: *Analytical Techniques for Decision Making in Agriculture.* Astral International Pvt. Ltd., New Delhi, 299-308.

- Angadi, UB and Chaturvedi, KK (2016). ICT in Agriculture. Analytical Techniques for Decision Making in Agriculture. (Eds. Raju, S., Jain, R and Ahuja U). Daya Publishing House, A Division of Astral International Pvt. Ltd., New Delhi, 253-264.

- Angadi, UB, Jash, S, Devi, L, and Anandan, S (2016). Database and Expert System on Animal Feed Resources: A Case Study. In: *Analytical Techniques for Decision Making in Agriculture*, Astral International Pvt Ltd, New Delhi.

Popular Articles

- Majumdar, PG, Rai, N, Mishra, DC, Kumar S, Rai, A, Chaturvedi, KK, Lal, SB, Kumar, A, Archak, S and Farooqi, MS. (2016). Genome analysis of rhizobium species using codon usage bias tools. In: *Proceedings of International Conference on Bioinformatics and Systems Biology organized by IIIT-IEEE #38295, Allahabad* during 4-6 March 2016..

सांख्यिकी विमर्श 2015-16 मे प्रकाशित लेख

Project Reports

- Meher, PK, Wahi, SD and Rao, AR (2015). Development of statistical approach for prediction of Eukaryotic splice sites AGENIASRISIL201301300014. I.A.S.R.I./P.R.-11/2015

- Goyal, RC, Singh, Pal, Malhotra, PK, Marwaha, S and Arora, A (2015). Project information and management system of ICAR. I.A.S.R.I./P.R.-12/2015

Reference Manuals

- Grover, M and Mishra, DC. Recent Advances in Next Generation Sequencing Data Analysis. ICAR-IASRI Publication.

- Bhowmik, A and Varghese, C (2015). Statistical Advances for Technological Enhancement in Agricultural Research. Vol-I and II, IASRI Publication. Available at http://cbp.icar.gov.in/EBook.aspx 13

Technical Reports

- Sud, UC, Ahmad, T, Gupta, VK, Chandra, H, Sahoo, PM, Aditya, K, Singh, M and Biswas, A (2016). Synthesis of Literature and Framework under the project "Research on Improving Methods for Estimating Crop Area, Yield and Production under Mixed, Repeated and Continuous Cropping". Working Paper No. 5. Global Strategy, FAO, Rome Publication. Available at: http://gsars.org/wp-content/uploads/2016/01/WP_Synthesis-of-Literature-and-Framework_Improving-Methods-for-Estimation-of-Crop-Area-190116.pdf.

- Sud, UC, Ahmad, T, Gupta, VK, Chandra, H, Sahoo, PM, Aditya, K, Singh, M and Biswas, A (2015). Gap Analysis and Proposed Methodologies for Estimation of Crop Area and Crop Yield under Mixed and Continuous Cropping under the project "Research on Improving Methods for Estimating Crop Area, Yield and Production under Mixed, Repeated and Continuous Cropping". Working Paper No. 4. Global Strategy, FAO, Rome Publication. Available at: http://gsars.org/wp-content/uploads/2015/12/WP-2-on-Improving-Methods-for-Estimation-of-Crop-Area-and-Crop-yield-under-Mixed-and-Continuous-Cropping-141215.pdf.

- Ahmad, T, Sud, UC and Sahoo PM (2016). Infrastructure report on Organizational structure and man power requirements, their role and functions along with budget requirement for implementation of alternative sampling methodology developed by ICAR-IASRI for estimation of area and production of horticultural crops. ICAR-IASRI, New Delhi Publication.

- Ahmad, T, Sud, UC, Sahoo PM and Singh, M (2015). Schedules for primary data collection for horticulture survey under the project "Study to test the developed alternative methodology for estimation of area and production of horticultural crops: IASRI Component of CHAMAN Program under MIDH". ICAR-IASRI, New Delhi Publication.

- Ahmad, T, Sud, UC, Sahoo PM and Singh, M (2015). Instruction manual for primary data collection for horticulture survey under the project "Study to test the developed alternative methodology for estimation of area and production of horticultural crops: IASRI Component of CHAMAN Program under MIDH". ICAR-IASRI, New Delhi Publication.

- Ahmad, T, Sud, UC, Sahoo PM and Singh, M (2015). Instruction manual (Hindi version) for primary data collection for horticulture survey under the project "Study to test the developed alternative methodology for estimation of area and production of horticultural crops: IASRI Component of CHAMAN Program under MIDH". ICAR-IASRI, New Delhi Publication.

Papers in Conference Proceedings

- Proceedings of the 10th INDIACom-2016; IEEE International Conference on Computing for Sustainable Global Development during 16–18 March 2016 Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi (INDIA).
  - Kumar, M, Gupta, A, Amrapali, S, Agrawal, PK, Mahajan, V, Kant, L and Bisht, JK, eResource for DUS Characterization of Maize Varieties and Inbreds.
  - Bharadwaj, A, Roychoudhury, I, Islam, SN, Chaturvedi, KK, Sahoo, PM and Paul, RK. Interpolating Climate Data using wTICD: A web based tool.

Lecture Delivered

- Executive training program entitled "Applied Statistics for Coffee Research and Development" at Indian Institute of Plantation Management, Bangalore on December 28, 2015.
  - Rai, Anil. Research methodology.
- CAFT training programme on Gender Analysis and Mainstreaming in Agriculture organized by Division of Agricultural Extension, ICAR-IARI, New Delhi from January 02-22, 2016.
  - Jaggi, Seema. Statistical techniques for analysis of gender desegregated data. (two lectures)
- Winter School on Advanced Tools and Techniques for Precise Input Application System organized at CIAE, Bhopal during January 05-25, 2016.
  - Chandra, Hukum. Data management and statistical computing using R software" (two lectures)
- Workshop on Genetical Data Analysis Using R-software in the Division of Plant Breeding and Genetics of CCS University, Meerut, during January 09-10, 2016.
  - Meher, PK. R-software.
- Training programme on Advances in Plant Growth Promoting Rhizobacteria: Diversity to Utility at ICAR-NBAIM during January 11-20, 2016
  - Bhowmik, Arpan. Statistical concepts and tools for data analysis (a) Basic concept and some important terminology, (b) Basic design of experiments including designs for field experiment, (c) Analysis of variance, (d) Comparison of means through DMRT, Tukey's test, (e) Principle component analysis, (f) Cluster analysis and (g) Data diagnostics)
- DBT sponsored Workshop-cum-Training programme on Bioinformatics Techniques for Agricultural Data Analysis at Agricultural Knowledge Management Unit, IARI, PUSA, New Delhi on January 12, 2016.
  - Sarika. Genome annotation.
- Training programme on Website Management and Online Reporting at Rajmata Vijayraje Scindia Krishi Vishwa Vidyalaya, Gwalior, M.P. on during January 15-16, 2016.
  - Sudeep. (a) Online Decision Support System and (b) Expert System in Agriculture
- CAFT training programme on Quantitative Techniques for Agricultural Policy Research at Division of Agricultural Economics ICAR-IARI, New Delhi during February 18 – March 09, 2016.
  - Chandra, Hukum. An Overview of R. (two lectures)
  - Parsad, Rajender. SAS: An Overview (two lectures)

- Training for Trainers (ToT) course on Official Statistics organized by the National Statistical Systems Training Academy (NSSTA), CSO, Noida during February 22-26, 2016.
  - Chandra, H. System of Agricultural Statistics in India and its challenges- Challenges faced and scope of research. (two lectures)
- National Workshop on Bioinormatics-based Genomic and Proteomic Data Analysis in Microbial Domain during March 04-09, 2016
  - Kumar, D. Lecture and conducted hands-on session on Genome Annotation.
  - Iquebal, MA. Lecture and hands-on session on Genome Assembly, Transcriptome Analysis and Metagenomic analysis.
- International Conference on Bioinformatics and Systems Biology organized at Indian Institute of Information Technology, Allahabad, India during 04–06 March, 2016.
  - Rao, AR. Random Forest and its applications in genomics: Few case studies.
- UGC Sponsored National Seminar on A Step Towards Soft Computing: Techniques and Applications at Department of Computer Science, Deen Dayal Upadhyay College (University of Delhi) during 18-19 March 2016.
  - Chaturvedi, KK. Mining Software Engineering Repositories: Issues and Challenges.
- Workshops on ICAR-KRISHI Geoportal for experts organized at ICAR-NBSS&LUP, Nagpur during March 11-12, 2016 and for users organized at ICAR-NBSS&LUP, Nagpur during March 28-30, 2016 and ICAR-NAARM, Hyderabad during March 29-30, 2016.
  - Parsad, Rajender. ICAR Research Data Management Policy and ICAR Research Data Repository for Knowledge Management.
- Training programme on R-software at Chaudhary Charan Singh University, Meerut during January 09-10, 2016
  - Rao, AR and Meher, PK. (i) Use of R for multivariate data analysis (ii) Use of R in genetics and plant breeding and (iii) Use of R in genomics and bioinformatics. (Three lectures)
- Workshop-cum-Training programme on Bioinformatics Techniques for Agricultural Data Analysis funded by Department of Biotechnology (DBT) and organized at Agricultural Knowledge Management Unit, ICAR-Indian Agricultural Research Institute, PUSA, New Delhi from January 11-13, 2016.
  - Rao, AR. Some recent developments in Agricultural Bioinformatics.
  - Iquebal, MA. Tools for SSR mining and its application in variety/breed identification.
- National Conference on Agro technology, Commerce and Sustainable Use of Medicinal and Aromatic Plants at NASC Complex, New Delhi during February 06-07, 2016.
  - Rao, NS. ICT application in medicinal and aromatic plants: Current status and future challenges.
- Second International Conference on Genomics in Aquaculture (ISGA-II-2016) held in collaboration with Association of Aquaculturist and Asian Fisheries Society, Indian Branch at ICAR- Cantal Institute of Freshwater Aquaculture (CIFA), Bhubaneshwar, Odisha during January 28-30, 2016.
  - Kumar, Dinesh. Phenomics for GWAS in domestic animals: Relevance in aquaculture.

- National Workshop on Current Trends in Agricultural Bioinformatics at ICAR-NAARM, Hyderabad during February15-17, 2016.
  - Rao, AR. Agricultural bioinformatics: Few case studies and my experience.
- 18th Annual Conference of Society of Statistics Computer and Applications (SSCA) on Significance of Statistics as Interdisciplinary Sciences organized at Department of Statistics, University of Jammu, Jammu during February 18-20, 2016.
  - Bharadwaj, Anshu* and Jain, Rajni. e-Learning in agricultural education: Current situation and future challenges. (invited talk)
  - Bharadwaj, Anshu. Supply chain management in ICAR: Issues and Challenges. (invited talk)
  - Kumar*, Mukesh, Choubey, AK, Parsad, Rajender, Bhardwaj, Anshu, Dhandapai, A, Obi Reddy, GP, Sehgal, VK and Chand, Subhash. Information flow process for agricultural research data repositories web portal (Invited Talk).
  - Lal, SB. Cloud infrastructure for on-demand bioinformatics computing. (invited talk)
  - Mishra, DC. Genome assembly: A big data perspective. (invited talk)
  - Paul, RK. Statistical models for forecasting volatile crop yield data. (invited talk)
  - Rao, NS* and Choubey, AK. Agricultural expert systems: Current status and future challenges. (invited talk)

Papers presented in Conferences / Workshops/ Seminars/ Symposia etc.

- National Seminar on Plant Genomics and Biotechnology: Challenges and Opportunities in 21st century held at OUAT, Bhubaneswar, Odisha during January 23-24, 2016.
  - Das, Samrendra. Differential gene co-expression network analysis for identification of hub genes and gene modules associated with salinity stress response in rice. (presented in Young Scientist Forum)
- Second International Conference on Genomics in Aquaculture (ISGA-II-2016) held in collaboration with Association of Aquaculturist and Asian Fisheries Society, Indian Branch at ICAR- Cantal Institute of Freshwater Aquaculture (CIFA), Bhubaneshwar, Odisha during January 28-30, 2016.
  - Iquebal, MA*, Nandi, S, Jasrotia, RS, Jaiswal, S, Routray, P, Rai, A, Kumar, D, Sundaray, JK and Jayasankar, P. Computational prediction of putative miRNA controlling reproductive genes in rohu (*Labeo rohita Hamilton*). (oral presentation)
- International Conference on Innovative Research in Biotechnology, Biomedical Sciences, Bioinformatics and Stem Cell Applications (BSC-2016) organised by Krishi Sanskriti at Jawahar Lal Nehru University, New Delhi on January 30, 2016.
  - Sarika. MultiProt: A web based computational tool for protein parameters
- 18th Annual Conference of Society of Statistics Computer and Applications (SSCA) on Significance of Statistics as Interdisciplinary Sciences organized at Department of Statistics, University of Jammu, Jammu during February 18-20, 2016.
  - Aditya, Kaustav*, Sud, UC and Chandra, Hukum. District level crop yield estimation under spatial small area model.

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- − Arora, Alka*, Sudeep, Rao, AR, Wahi, SD, Chinnusamy, Viswwanthan and Jain, Prachi. Multimedia data management system for Agricultural experiments.
- − Das, Samrendra*, Rai, Anil, Meher, Prabina Kumar and Bhar, Lal Mohan. Gene selection, module and hub gene detection for gene co-expression network analysis and application to aluminium stress in soybean. (For Dr.MN Das Young Scientist Award and also awarded as runner up and got appreciation certificate for this.)
- − Grover, M. Quantum computing: A tool to handle big data in biological systems.
- − Gurung, Bishal* and Singh, KN. A Markov chain approach to study the dynamics of area substitution of edible oilseeds in India.
- − Kumar, Raju* and Bhar, LM. Outliers in incomplete multi response experiment.
- − Kumari, Vandita*, Sud, UC and Aditya, Kaustav. Calibration approach based regression analysis.
- − Rathod, S*, Singh, KN, Alam, MW, Ray, M. ARIMA - Genetic Algorithm approach for forecasting of maize yield.
- − Sinha, K* and Gurung, Bishal. Identification of price transmission using threshold cointegration approach.
- 10th INDIACom; INDIACom-2016; IEEE Conference ID: 37465 3rd 2016 International Conference on "Computing for Sustainable Global Development", 16–18 March 2016 Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi.
  - − Kumar, M, Gupta, A, Amrapali, S, Agrawal, PK, Mahajan, V, Kant, L and Bisht, JK, eResource for DUS Characterization of Maize Varieties and Inbreds.
  - − Bharadwaj, A, Roychoudhury, I, Islam, SN, Chaturvedi, KK, Sahoo, PM, R.K.Paul. Interpolating Climate Data using wTICD: A web based tool.
- International Conference on 'Innovative Research in Agriculture, Food Technology, Physical, Chemical Sciences, Ecological, Mathematical/Statistical Applications for Sustainable Development' on March 13, 2016 at Jawahar Lal Nehru University, New Delhi.
  - − Alam, W. Artificial neural network approach for forecasting nonlinear components of linear time series models.
- 35th Annual Convention International Conference of Indian Society for Probability and Statistics (ISPS), held at University of Lucknow during Nov. 28-30, 2015.
  - − Alam, W, Sinha, K, Rathod, S, Singh, KN (2015). Hybrid Univariate Time Series Approach for Forecasting Rice Yield.
- International Conference on 'Innovative Research in Agriculture, Food Technology, Physical, Chemical Sciences, Ecological, Mathematical/Statistical Applications for Sustainable Development held at Jwahar Lal Nehru University, New Delhi on 13 March 2016,
  - − Alam, W*, Sinha, K, Roy, M, Rathod, S and Arya, P (2016). Artificial neural network approach for forecasting nonlinear components of linear time series models.

Participation

Conference/Workshops/Trainings/Seminar/Symposia etc.

- 103rd Indian Science Congress held in Mysuru from January 03-07, 2016 (Dr. Anil Rai)
- 31st Annual Conference of the AICRP on PHT at TNAU, Coimbatore on January 06, 2016. (Dr. AK Choubey)
- ICAR Director's Conference held at NASC Complex, New Delhi on January 23, 2016. (Dr. UC Sud, Dr. AK Choubey, Dr. Rajender Parsad and Dr. Mukesh).
- 54th Convocation programme of PG School, IARI, New Delhi held on February 05, 2016 (All Faculty Members)
- National Workshop on Appraisal cum Data Validation of NISAGENET at Indira Gandhi Krishi Vishwavidyalaya, Raipur during February 18-19, 2016. (Dr. Sudeep and Sh Pal Singh)
- 18th Annual Conference of Society of Statistics Computer and Applications (SSCA) organized at Department of Statistics, University of Jammu, Jammu during February 18-20, 2016. (Dr. UC Sud, Dr. Rajender Parsad, Dr. LM Bhar, Dr. RK Paul, Dr. Mukesh Kumar, Dr. Alka Arora and Dr. Sangeeta Ahuja)
- National Workshop on Strengthening and Sustainability of E-Granth during February 26- 27, 2016 at NASC, New Delhi. (Dr. Rajender Parsad, Dr. Susheel Kumar Sarkar and Dr. Mukesh Kumar)
- National Science Day Celebration at the Institute on February 27, 2016. (Director, All Scientists and Technical Officers)
- International Conference on Informatics, Management and Technology of Solar Energy- Issues and Opportunities (ICIMTSE-2016), organized by MERI College of Engineering and Technology Management Education And Research Institute at IIC, Lodhi Estate, New Delhi during 1-2 March, 2016. (Dr. Anshu Bharadwaj, Dr. Alka Arora and Dr. N Srinivasa Rao)
- Leadership Workshop on Enhancing Organizational Productivity through Management of People at Work organized by NAARM at NASC Complex, New Delhi on 02 March, 2016. (Dr. Seema Jaggi and Dr. AK Gupta)
- National Seminar on Recent Advances in Statistical Tools for Agriculture and Allied Sciences organized by Society for Application of Statistics in Agricultural and Allied Sciences (SASAA) in collaboration with Department of Agricultural Statistics, Bidhan Chadra Krishi Viswavidyalaya, Mohanpur and Indian Institute of Science Education and Research, Kolkata (http://www.iiserkol.ac.in/) during March 03-05, 2016. (Dr. RK Paul and Dr. MA Iquebal)
- Workshop on ICAR-KRISHI Geoportal–Experts organized at NBSS&LUP, Nagpur during 11-12 March, 2016 under KRISHI Project. (Dr. Anshu Bharadwaj)
- 10th INDIACom-2016; IEEE International Conference on Computing for Sustainable Global Development, 16–18 March, 2016 Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi. (Dr. Anshu Bharadwaj, Dr. Mukesh Kumar and Dr. Alka Arora)
- Brainstorming Session on Spreading Quality Teaching organized by INSA, New Delhi on March 29, 2016. (Dr. Seema Jaggi)
- National Workshop on Geospatial Analysis in Agriculture under ICAR-KRISHI, NAARM, Hyderabad during 29-30 March, 2016 under KRISHI Project. (Dr. Anshu Bharadwaj)
- Review workshop of the Network Project on Impact Assessment of Agricultural Research and Development held during 07-09 March, 2016 at NIAP, New Delhi.(Dr. RK Paul)

Meetings

- PMC meeting of the project entitled 'Pilot study for developing State level estimates of crop area and production on the basis of sample sizes recommended by Professor Vaidyanathan Committee report' held on January 01, 2016 under the chairmanship of Director, IASRI. (Dr AK Gupta and Dr Kaustav Aditya)

- Meeting on AGROBASE held at IARI, New Delhi on January 29, 2016 (Dr. Susheel Kumar Sarkar)

- Meeting of the Management Committee organized on January 21, 2016 at the Chamber of Additional Secretary & Financial Advisor, ICAR for Modernization/Strengthening of the National Agricultural Science Museum (NASM) during XII plan period. (Mr. Pal Singh)

- Budget review meeting for KRISHI project and all ICAR Hqrs Scheme under the chairmanship of Honourable DG, ICAR on February 03, 2016. (Dr. Mukesh Kumar)

- Annual review meeting of the project "Modelling Network of Genes Response to Abiotic Stress in Rice" funded by National Fund for Basic Research, ICAR held on February 09, 2016 at NASC complex, New Delhi. (Dr. DC Mishra and Sh. Sanjeev Kumar)

- Meeting with Director, CSO (NAD) at CSO, Sardar Patel Bhawan, New Delhi regarding discussion on the progress of the project "Pilot study for estimation of seed, feed and wastage ratios of major food grains" on February 24, 2016. (Dr AK Gupta)

- 2nd review meeting of "Network Project on Agricultural Bioinformatics and Computational Biology" under CABin Scheme held during February 25-26, 2016 at ICAR-IASRI, New Delhi. (All Scientists of CABin)

- Meeting of Steering Committee to review the progress made and discuss the way forward and for implementation of ICAR Research Data Repository for Knowledge Management (KRISHI) held on 01 March, 2016 at NASC Complex. (Ms. Vandita, K. Choudhary and Sh. Raju Kumar)

- Meeting of the project entitled 'Pilot study for developing State level estimates of crop area and production on the basis of sample sizes recommended by Professor Vaidyanathan Committee report' held on 03 March, 2016 under the chairmanship of Director, IASRI regarding initiation of the data collection work in Gujarat State. The consultants under the project also attended the meeting. (Dr AK Gupta, Dr Kaustav Aditya and Dr Ankur Biswas)

Krishi Unnati Mela

- The Institute participated in the Krishi Unnati Mela 2016 organised by IARI, New Delhi during 19-21 March , 2016 and elevated a stall to exhibit its significant research findings and software. The stall was elevated by division of Forecasting and Agricultural System Modelling and attracted a huge number of visitors including farmers, students and entrepreneurs. Through live demonstrations and posters, the developed technologies were explained to the visitors. The Stall of National Agricultural Science Museum (NASM) was also set up and decorated with various posters of NASM including exhibits on India's position in the world Agriculture.

Consultancy/ Advisory Services Provided:

- Dr. UC Sud provided advisory to Ministry of Health and Family Welfare in pooling of DLHS and DHS data.

- Dr. PK Meher provided data advisory services to Dr .Vandana Jaiswal, Post Doctoral Fellow, National Institute of Botanical Research, Lucknow. Epitasis interaction analysis was performed in genome wide dataset of wheat having 946 markers corresponding to 14 phenotypic traits. The analysis was carried out using R-software.

- Dr Hukum Chandra provided advisory on data analysis to Mr. Chetan Samant, Ph.D student (Ag. Engg.), IARI, New Delhi.

- Sh. Prakash Kumar provided advisory to Dr. Mahesh Kumar Dhakar, Scientist (Fruit Science), ICAR - Research Complex for Eastern Region, Research Centre, Ranchi for Stability analysis for mango hybrids grown in Ranchi

- Mr. Santosha Rathod carried out cluster analysis on area and production of principal crops of Rajasthan, as a part of Ph.D. work of Mr. Lokesh Meena, Asst. Prof (Agril. Econ.), BAU, Sabour.

- Dr. Bishal Gurung advised Dr. Amrit Lamichane, Scientist, IIPR, Kanpur to perform one-way analysis of variance with two factors to compare based on different temperatures and different substrate used. He advised Dr. Ibandalin Mawlongban, Scientist. N*ational Research Centre* on Rapeseed-Mustard (NRCRM) to use one-way analysis of variance and also to perform Tukey's HSD to compare a group of genotypes and Dr. Hemlata Bharti on the use of hierarchical clustering procedure for grouping 52 genotypes based on some morphological characters. He also advised Ms. Mamta Mehar, Research Collaborator, International Food Policy Research Institute on the use of Logistic and Gompertz model for studying the diffusion of Mobile technology.

- Sh. Santosha Rathod carried out correspondence analysis for Ph.D. work of Ms. Jagriti, Ph.D. Scholar, Department of Agricultural Extension, ICAR-IASRI, New Delhi.

PERSONNEL

Congratulations on your Promotion

Name	Designation	Effective Date
Dr. (Smt.) Anshu Bhardwaj	Scientist	17.11.2010
Sh. Sanjeev Kumar	Scientist	21.08.2011
Dr. BN Mandal	Scientist	10.02.1013
Sh. Dilip G. Khapekar	AAO	01.02.2016
Sh. Sanjay Kumar Jain	Assistant	02.01.2016
Sh. Krishan Kumar	Assistant	01.02.2016
Smt. Shashi Dahiya	UDC	22.01.2016
Sh. Ranveer Singh	UDC	22.01.2016
Sh. Shesha Deva Raut	UDC	20.02.2016

Transfer

Name	From/To	Effective Date
Sh. Deepak Singh, Scientist	IIPR, Kanpur to IASRI, New Delhi	02.01.1016
Smt. Uma, ACTO	CAFRI, Jhansi to IASRI, New Delhi	07.01.2016

Wish you Happy Retired Life

Name	Designation	Effective Date
Dr. VK Gupta	National Professor (ICAR)	16.03.2016
Sh. BN Chakraborty	ACTO	31.01.2016
Sh. Pashupati Mahto	SSS	31.01.2016
Sh. Vinod Kumar	Assistant	01.02.2016(VRS)
Sh. Vijay Singh	SSS	31.03.2016

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agri search with a human touch