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

From Director's desk……………

This Newsletter highlights salient features on training programs conducted, workshops organized and other significant activities performed at the Institute during the period under report.

Algorithm for forecasting time series using hybrid model has been developed. The parametric Autoregressive integrated moving average (ARIMA) model and nonparametric Wavelet techniques have been combined for time series forecasting in order to increase the accuracy of the forecast. It has been applied to the real dataset and observed that the proposed algorithm has better performance than that of the ARIMA model. One package in R software namely "WaveletArima" has been developed for forecasting time series using hybrid model and published in https://CRAN.R-project.org/package=WaveletArima

The IVRI-Artificial Insemination App and Landlly Pig App have been designed and developed jointly by ICAR-IVRI, Izatnagar, UP and ICAR-IASRI, New Delhi. The Artificial Insemination App is targeted to impart knowledge and skills to Graduating Veterinarians, Field Veterinary Officers and Paravets about Artificial Insemination (AI) in cattle and buffaloes. The App covers information on various aspects related to AI viz., symptoms of heat, stages of estrus cycle, heat detection, AI kit, proper time of AI, common sanitary measures, thawing, loading of AI gun, semen deposition and post AI advice & follow-up. The basic objective of Landlly Pig App is to impart knowledge about faster growing pig variety namely Landlly developed by ICAR-IVRI, Izatnagar. This App is targeted to provide information on newly developed Pig variety-Landlly to the UG and PG students of Veterinary Sciences, Veterinary professionals and Entrepreneurs.

Dairy Manager App designed and developed jointly by ICAR-IVRI, Izatnagar, UP, NDRI, Karnal and ICAR-IASRI, New Delhi is targeted to impart knowledge and skills to Graduating Veterinarians, Field Veterinary Officers, Developmental Organizations and Entrepreneurs for promoting dairy farming. This is an educational app providing information on breeds and housing, feeding, calf and general management, clean milk production and identification and vices of dairy animals.

A series of GRC designs balanced for spatial indirect effects has been developed for prime number of treatments. The parameters of the developed designs are v, p = v, q = v - 1, k = s(3 ≤ s ≤v - 1) and µ =2(s-1). Another series of GRC designs balanced for spatial indirect effects has been developed using Balanced incomplete block (BIB)(v^*, b^*, r^*, k^*, $λ^*$) design. The parameters of the developed designs are $v= v^*$, $p =b^*$, $q = 2$, $k = k^*$. The developed design is always a partially balanced design following a varying circular association scheme.

One training programme was organized at the Institute during the period from 24.03.2018 to 13.04.2018 under CAFT. During the period under report, the Institute have received six copyrights viz. BuffSatDb: Buffalo Microsatellite Database (http://webapp.cabgrid.res.in/buffsatdb/); PIPEMicroDb: Pigeonpea Microsatellite Database (http://webapp.cabgrid.res.in/pigeonpea); TomSatDb: Tomato Microsatellite Database (http://webapp.cabgrid.res.in/tomsatdb); Antimicrobial Prediction Server for Cattle (http://webapp.cabgrid.res.in/amp/); Antimicrobial Prediction Server for Fish (http://webapp.cabgrid.res.in/fishamp/); TamiRPred: Putative miRNA Discovery Tool in Wheat (*Triticum aestivum* L.) (http://webapp.cabgrid.res.in/tamirpred/).

Scientists of the Institute have provided Consultancy/Advisory services and participated in different Conference/Symposia/Workshop etc. in various capacities and also delivered invited lectures. It is hoped that the contents of the document would be informative and useful. Any suggestion for improving the contents of the newsletter further would be highly appreciated.

(Lal Mohan Bhar)

AWARD(S)

- Dr. Seema Jaggi elected as Fellow, National Academy of Agricultural Sciences with effect from January 1, 2018. Received the award on June 5, 2018 during the Foundation Day and Annual General Body Meeting of NAAS at NASC Complex held on June 4-5, 2018.

RECOGNITIONS

- Dr Tauqueer Ahmad was nominated as Chairman, Screening Committee by the Director of the Institute for conducting screening for the post of 11 MTS and 1 Driver on contract basis through third party to be held on 05 May 2018 at ICAR-IASRI, New Delhi.

- Dr Tauqueer Ahmad was nominated as Chairman, Selection Committee by the Director of the Institute for conducting Walk-in interview for the post of three Research Associates (RAs) under CHAMAN project to be held on 25 April 2018 at ICAR-IASRI, New Delhi.

- Dr Tauqueer Ahmad was nominated as member, Selection Committee by the Director of the Institute for conducting Walk-in interview for the post of Junior Research Fellow (JRF) under DST funded project to be held on 25 April 2018 at ICAR-IASRI, New Delhi.

- Dr Hukum Chandra was Expert Member, Tamil Nadu Household Panel Survey at MIDS, Chennai during 06-07 April, 2018.

- Dr. Anu Sharma became the member of Editorial Review Board of International Journal of Fog Computing (IJFC), IGI Global

- Dr. K.K. Chaturvedi a member of Technical Program Committee, 7th International Conference on. Reliability, Infocom Technologies and. Optimization (ICRITO 2017). (Trends and Future directions) during August 29-31, 2018.

- Dr Hukum Chandra, Expert, meeting on Energy Management in Agricultural scheduled at TNAU, Coimbatore during 02-03 May, 2018.

- Dr. K.K. Chaturvedi a member of Technical Program Committee, 7th International Conference on. Reliability, Infocom Technologies and. Optimization (ICRITO 2017). (Trends and Future directions) during   August 29-312018.

- Dr. Anil Rai a member of the Institute Management Committee of ICAR-INDIAN INSTITUTE OF AGRICULTURAL BIOTECHNOLOGY Ranchi.

- Dr. Anil Rai a member of Expert Advisory Committee (EAC) of "Proof of concept proposal for Digital Agricultural Mission in India" from ICPS Programme of DST.

- Dr. A.R. Rao a member of Task Force on "Theoretical and Computational Biology (TCB)", Department of Biotechnology (DBT), Govt. of India.

- Dr. R.K.Paul presented research achievement in the Scientific Session organized in the Foundation Day Programme of the National Academy of Agricultural Science on 4 June, 2018 at NASC complex.

- Dr. R.K.Paul have been conferred with NAAS Fellowship

- Dr Tauqueer Ahmad: Member, Technical Working Group-1 (TWG-1) constituted by the MoAFW, Govt. of India for technical discussion and future direction on implementation of PMFBY including improvement of methodology for crop insurance using new technology with World bank support.

- Dr Tauqueer Ahmad: Member, Technical Advisory Committee (TAC) for participating in meeting for Crop Insurance relating to PMFBY, Ministry of Agriculture and Farmers Welfare, Govt. of India.

- Dr Hukum Chandra: Expert Member, Madras Institute of Development Studies, Chennai.

- Dr Hukum Chandra: Member, Governing Body (GB) of the Institute of Applied Statistics and Development Studies, Lucknow, 2018-2021.

- Dr Hukum Chandra: Member, Technical Advisory Committee for the Coverage Evaluation Survey, Ministry of Health and Family Welfare, Govt of India, New Delhi.

- Dr Hukum Chandra: Convener, Invited technical session on "Recent Development in Analysis of Complex Survey Data", in the International Conference on Emerging Innovation in Statistics and Operation Research 2018 (EISOR-2018), Maharshi Dayanand University, Rohtak, Haryana, India during 27-30 December, 2018.

- Dr. Anil Rai member of the Institute Management Committee of ICAR-INDIAN INSTITUTE OF AGRICULTURAL BIOTECHNOLOGY Ranchi.

- Dr. Anil Rai Member of Expert Advisory Committee (EAC) of "Proof of concept proposal for Digital Agricultural Mission in India" from ICPS Programme of DST.

NEW PROJECTS/ SCHEMES/ PROGRAMME/ CENSUS/ SAMPLE SURVEYS/ EVALUATION STUDIES/ SOFTWARE DEVELOPED/ INITIATED/ COMPLETED

- The New Project Proposal Seminar of the project entitle "Training Management Information System (TMIS)" for ICAR was given by Dr. Sudeep Marwaha on 5th April, 2018. The project was approved in the seminar.

HUMAN RESOURCE DEVELOPMENT

Training Programmes Organized

S.N.	TITLE	VENUE	PERIOD	NUMBER OF PARTICIPANTS
1.	CAFT programme on "Computational and Statistical Advances for Analysis of Biological Data in Agriculture". *Course Coordinator : Dr. Anu Sharma* *Course Co-Coordinator : Dr. S.B. Lal*	ICAR-IASRI, New Delhi	24.03.2018 to 13.04.2018	20

Conferences/Workshops/Symposia/Meetings/Talks etc. organized

- Meeting organized with scientists from ICAR-NDRI, Karnal regarding discussion on NASF project. (Dr. Dinesh Kumar, Dr. UB Angadi, Dr. MA Iquebal and Dr. Sarika)

- Organized a talk on "Living in the Excellence Zone" by Shri Sanjay Kumar Singh, Founder Director, Consultant and Trainer, Dimension Education on 5th April, 2018. (Dr. S.B. Lal)

- Dr. K.K. Chaturvedi Organized guest seminar entitled "Enablers of Deep Learning: Big Data + Algorithm + Computation Power" of Mr. Vipin Kumar Dubey on 19th June 2018 at 3:00 PM in the institute.

PUBLICATIONS

Research Papers

1. Varghese, C, Bhowmik, A, Varghese, E and Jaggi, S (2018). Web based generation of polycross designs (webPD). *Journal of the Indian Society of Agricultural Statistics*. 72(1): 71–76.

2. Lall, S, Jaggi, S, Varghese, E, Varghese, C and Bhowmik, A (2018). D-optimal designs for exponential and Poisson regression models. *Journal of the Indian Society of agricultural Statistics.* 72(1): 27–32.

3. Kumar, S, Sangeetha, V, Singh, P, Burman, RR, Bhowmik, A and Kumar, SA (2018) ConstraintsFaced by Farmers in Utilizing Rice Related Information through Rice Knowledge Management Portal (RKMP). Indian Journal of Extension Education. 53(1): 84-89.

4. Kumar, S, Sangeetha, V, Singh, P, Burman, RR and Bhowmik, A (2017). Perceived Utility and Users' Satisfaction about Information Provided by Rice Knowledge Management Portal (RKMP). *Journal of Global Communication*. 10(2), 122-127.

5. Dash, Sachikanta and Dash, Sukanta (2018). A New Approach using Template Matching for Recognition of Handwritten Odia Text, *Journal of the Indian Society of Agricultural Statistics*, 72(1), 77–82.

6. Kumar, P, Lal, K, Mukherjee, A, Pradhan, UK, Ray, M and Prakash, O (2018). Advanced Row-Column Designs for Animal feed Experiments. *The Indian Journal of Animal Sciences*.88 (4), 499-503.

7. Aditya, K, Chandra, H, Bharadwaj, A and Rama (2018). Development of Software for Digitization of Collected Data under a Pilot Study to Estimate Crop Area and Production based on the Sample Sizes Recommended by Professor Vaidyanathan Committee Report. *Journal of the Indian Society of Agricultural Statistics* 72(1) : 15–26

8. Chandra, H, Salvati, N and Chambers, R (2018). Small area estimation under a spatially non-linear model. *Computational Statistics and Data Analysis*. 126: 19–38.

9. Basak, P, Sud, UC, and Chandra, H (2018). Calibration Estimation of Regression Coefficient for Two-stage Sampling Design using Single Auxiliary Variable. *Journal of the Indian Society of Agricultural Statistics,* 72 (1): 1-6.

10. Kumar, RR, Goswami, S, Singh, K, Dubey, K, Rai, GK, Singh, B, Singh, S, Grover, M, Mishra D, Kumar, S, Bakshi, S, Rai, A, Pathak, H, Chinnusamy, V, Praveen, S (2018). Characterization of Novel Heat-Responsive Transcription Factor (TaHSFA6e) Gene Involved in Regulation of Heat Shock Proteins (HSPs) — A Key Member of Heat Stress-Tolerance Network of Wheat. *Journal of Biotechnology (2010),* https://doi.org/10.1016/j.jbiotec.2018.05.008

11. Kumar, A, Farooqi, MS, Mishra, DC, Kumar, S, Rai, A, Chaturvedi, KK, Lal, SB and Sharma, A (2018). Prediction of miRNA and Identification of their Relationship Network Related to Late Blight Disease of Potato. Microrna. 7(1):11-19. doi: 10.2174/2211536607666171213123038. PubMed PMID: 29237394.

12. Khatal, S, Ali, Aba, Hasan, S, Singh, M, Mishra, DK, Kumar, A and Iquebal, MA (2018). Assessment of Groundwater Recharge in a Small Ravine Watershed in Semi-arid Region of India. *International Journal of Current Microbilogy and Applied Sciences,* 7(2): 2552-2565.

13. Supriya, P, Rao, AR and Bhat, KV (2018). Transcriptome sequencing of sesame (Sesamum indicum) using Illumina Platform. *Indian Journal of Agricultural Sciences,* 88 (3): 442-446.

14. Shukla, AK, Sinha, NK, Tiwari, PK, Prakash, C, Behera, SK, Babu, SP, Patnaik, MC, Somasundaram, J, Singh, P, Dwivedi, BS, Datta, SP, Meena, MC, Tripathi, R, Nayak, AK, Kumar, A, Shukla, K, Siddiqui, S and Patra, AK (2018). Evaluation of spatial distribution and regional zone delineation for micronutrients in a semiarid Deccan Plateau Region of India. Land Degradation and Development,1–11. https://doi.org/10.1002/ldr.2992.

15. Lall, S, Jaggi, S, Varghese, E, Bhowmik, A and Varghese, C (2018). Designs for fitting Poisson regression model. Journal of Crop and Weed, 14(1), 117-121.

16. Kumar, S, Sangeetha, V, Singh, P, Burman, RR and Bhowmik, A (2017). Stakeholders' perception about content and design of rice knowledge management portal (RKMP). Journal of Pharmacognosy and Phytochemistry. 6(6): 2215-2219.

17. Kumar, S, Sangeetha, V, Singh, P, Burman, RR and Bhowmik, A (2017). Constraints experienced by agricultural scientists and extension personnel in rice knowledge management and delivery: a case of Rice Knowledge Management Portal (RKMP). Indian Journal of Economics and Development. 5(11): 1-8.

18. Verma, RK, Rakhshit, S, Sarkar, S and Bhowmik, A (2017). Information need of rural women in agriculture and their preference of information sources: A case of four villages of Uttar Pradesh. Bulletin of Environment, Pharmacology and Life Sciences. 6(5), 90-94.

19. Aditya, K, Chandra, H, Bhardwaj, A and Dahiya, R (2018). "Development of Software for Digitization of Collected Data under a Pilot Study to Estimate Crop Area and Production based on the Sample Sizes Recommended by Professor Vaidyanathan Committee Report". Journal of the ISAS, 72(1):15-26 .

20. Aditya, K, Bhowmik, A, Biswas, A and Das, S (2017). Calibration Estimators under Two Stage Sampling Design when Population Level Auxiliary Information was not available. Journal of the Society for Application of Statistics in Agriculture and Allied Sciences - Rashi, 2(2): 1-6.

21. Kshandakar, S, Verma, MR, Singh, Y, Kumar, S and Paul, AK (2018). Effect of clinical mastitis on lactation curves of Murrah buffaloes. Indian Journal of Animal Sciences, 88(5): 585-592.

22. Meher, PK, Sahu, TK, Mohanty, J, Gahoi, S, Purru, S, Grover, M and Rao, AR (2018). nifPred: Proteome-Wide Identification and Categorization of Nitrogen-Fixation Proteins of Diaztrophs Based on Composition-Transition-Distribution Features Using Support Vector Machine. Frontiers in Microbiology 9:1100. doi: 10.3389/fmicb.2018.01100

23. Mitra, D, Paul, RK, Paul, AK and Bhar, LM (2018). Forecasting Time-Series Allowing for Long |Memmory and Structural Break. Journal of Indian Society of Agricultural Statistics, 72(1): 49-60.

24. Islam, S, Chandra, H, Aditya, K and Lal, SB (2018). Small Area Estimation under a Spatial Model using Data from Two Surveys. Int. J. Agricult. Stat. Sci. Vol. 14, No. 1.

25. Meher, PK, Sahu, TK, Mohanty, J, Gahoi, S, Purru, S, Grover, M, Rao, AR (2018). nifPred: Proteome-Wide Identification and Categorization of Nitrogen-Fixation Proteins of Diaztrophs Based on Composition-Transition-Distribution Features Using Support Vector Machine. Frontiers in Microbiology, 9, 2018. https://www.frontiersin.org/article/10.3389/fmicb.2018.01100

26. Hukam, C, Rawal, SV, Mithra, A, Arora, K, Kumar, V, Goel, N, Mishra, DC, Chaturvedi, K K, Rai, A, Devi, SV, Sharma, TR and Solanke, AU (2018) . Genome-Wide Analysis in Wild and Cultivated Oryza Species Reveals Abundance of NBS Genes in Progenitors of Cultivated Rice. Plant Molecular Biology Reporter. Pages 1-14, https://doi.org/10.1007/s11105-018-1086-y.

27. Kumar, RR, Goswami, S, Singh, K, Dubey, K, Rai, GK, Singh, B, Singh, S, Grover, M, Mishra, DC, Kumar, S, Bakshi, S, Rai, A, Pathak, H, Chinnusamy, V and Praveen, S (2018) Characterization of Novel Heat-Responsive Transcription Factor (TaHSFA6e) Gene Involved in Regulation of Heat Shock Proteins (HSPs) - a Key Member of Heat Stress-Tolerance Network of Wheat. Journal of Biotechnology. Volume 279, Pages 1-12.

28. Sahu, S, Rao, AR, Pandey, J, Gaikwad, K, Ghoshal, S and Mohapatra, T (2018). Genome-wide identification and characterization of lncRNAs and miRNAs in cluster bean (Cyamopsis tetragonoloba). Gene, 667, 112-121. [† - Joint first authors]

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30. Gopinath, PP, Parsad, R and Mandal, BN (2018) Two-dimensional balanced sampling plans excluding adjacent units under sharing a border and island adjacency schemes, Communications in Statistics - Simulation and Computation, 47:3, 712-720. https://doi.org/10.1080/03610918.2017.1291959. http://krishi.icar.gov.in/jspui/handle/123456789/6079.

31. Gopinath, PP, Parsad, R and Mandal BN (2018). Incomplete row-column designs with factorial treatment structure for estimating main effects with full efficiency, Communications in Statistics - Theory and Methods, 47:18, 4493-4502, DOI: 10.1080/03610926.2017.1376091. http://krishi.icar.gov.in/jspui/handle/123456789/6113.

32. Nigam, AK, Tiwari, N and Mandal, BN (2018). Controlled sampling: A review, Statistics and Applications, 16(1): 145-169.

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36. Hanumanthaiah1, R, Singh, A, Rathod, S and Paul, RK (2018). Wavelet analysis for Forecasting Prices and Arrivals of Black Pepper in Karnataka, India. International Journal of Current Microbiology and Applied Sciences 7(5): 677-687.

37. Singh, S, Singh, KN, Gurung, V, Shekhawat, RS, Pantotra, N and Singh, A (2018). Cointegration and causality analysis of Tur (Pigeon pea) in neighboring states. International Journal of Chemical Studies, 6(3): 715-719.

38. Chandra, H, Aditya, K and Sud, UC (2018). Localised Estimates and Spatial Mapping of Poverty Incidence in the State of Bihar in India-An Application of Small Area Estimation Techniques. PLOS ONE. https://doi.org/10.1371/journal.pone.0198502

39. Islam, S, Chandra, H, Aditya, K and LAL, SB (2018). Small area estimation from a spatial model using data from two surveys. International Journal of Agricultural and Statistical Sciences, 14(1): 231-237. (NAAS:5.13)

40. Dasgupta, P, Ahmad, T, Biswas, A and Rai, A (2018). A dual frame approach for estimating finite population total using ranked set sampling. International Journal of Agricultural and Statistical Sciences, 14(1): 409-418.

41. Farooqi, MS. and Kumar, D (2018) Moment generating functions of generalized exponential distribution based on lower generalized order statistics. International Journal of Agricultural and Statistical Sciences, 14 (1): 165-174

42. Rawal, H, Amitha, MSV, Goel N, Mishra, DC, Chaturvedi, KK, Sharma, TR and Solanke, AU (2018) Genome-wide analysis in wild and cultivated oryza species reveals abundance of NBS genes in progenitors of cultivated rice. Plant Molecular Biology Reporter, 1-14.

43. Som, S, Burman, RR, Sharma, JP, Padaria, RN, Iquebal, MA and Suresh, A (2018). Construction of multi-dimensional scale for measuring perception towards migration. Journal of Community Mobilization and Sustainable Development, 13(2), 279-285.

Popular Articles

1. Varghese, C, Bhowmik, A, Dash, S, Ravisankar, N and Kumar, D(2018). Impact of farming system diversification at farmers' field under All India Coordinated Research Project (AICRP) on Integrated Farming Systems. Biotech Articles. https://www.biotecharticles.com/ Agriculture-Article/Impact-of-Farming-System-Diversification-AICRP-Project-4388.html.

2. Saha, Namita Das, Kaur, R, Singh, Preeti, Bhowmik, Arpan, Gurung, Bishal and Varghese, Eldho (2018). Calcium Alginate Beads Based Biosorption of Heavy Metals from Waste Water. Biotech Articles. Available at https://www.biotecharticles.com/ Applications-Article/Calcium-Alginate-Beads-Based-Biosorption-of-Heavy-Metals-from-Waste-Water-4394.html.

3. Mohd. Harun, Cini Varghese, Seema Jaggi, AninditaDatta and Arpan Bhowmik (2018). Higher Order Crossing Plans for Stable Line Production. https://www.biotecharticles.com/ Agriculture-Article/Higher-Order-Crossing-Plans-for-Stable -Line-Production-PDF-4410. html

4. मोहम्मद हारून, सिनी वर्गीस, सीमा जग्गी, अनिंदिता दत्ता एवं अर्पण भौमिक। संकर उत्पादन के लिए आंशिक त्रि–पथ क्रॉस योजनाएं। भारतीय कृषि अनुसंधान पत्रिका। 32(4), 309–312 ।

5. अनु शर्मा, शशि भूषण लाल, द्विजेश चन्द्र मिश्र, नीरज बुढलाकोटी, कृष्ण कुमार चतुर्वेदी, मोहम्मद समीर फारूकी और संजीव कुमार (2018), मेटाजीनोमीक्स–परिचय और अनुप्रयोग, सांख्यिकी विमर्श, अंक–13, पेज 113–115

6. चतुर्वेदी, के. के., राय, ए., फारूकी, एम. एम,, लाल, एस. बी., शर्मा, ए., अंगडी, यू. बी. एवं मिश्र, विशाल (2018), रैपिड माइनर के द्वारा टेक्स्ट माअनिंग। सांख्यिकी विमर्श, अंक–13, पेज 87–93.

7. मोहम्मद हारून, सिनी वर्गीस, सीमा जग्गी, अनिंदिता दत्ता एवं अर्पण भौमिक (2018) स्थिर लाईनो के उत्पादन के लिए उच्च स्तरीय क्रॉसिंग योजनाएँ। सांख्यिकी विमर्श, अंक 13.109–12 ।

8. अर्पण भौमिक, सीमा जग्गी, एल्दो वर्गीस, सुनील कुमार यादव, मोहम्मद हारून, अनिंदिता दत्ता एवं उदयवीर सिंह (2018), विविधता के दो स्त्रोतों के अंतर्गत पशु परीक्षणों के लिए प्रवित्ति मुक्त अभिकल्पनाएँ। सांख्यिकी विमर्श, अंक–13,28–31 ।

9. वन्दिता कुमारी, हुकुम चंद्रा, सुशील कुमार, प्रदीप बसाक, अंकुर बिश्वास, एवं कौश्तव आदित्य (2018). सर्वेक्षण डाटा विश्लेषण में सर्वेक्षण भार का महत्व., सांख्यिकी–विमर्श, अंक–13, 81–86 ।

10. प्रदीप बसाक, हुकुम चंद्रा, कौश्तव आदित्य, मृन्मय राय, वन्दिता कुमारी, सुशील कुमार एवं ऊषा जैन (2018). विषम चरों के लिए समष्टि योग की प्रागुक्ति. । सांख्यिकी–विमर्श, अंक–13, 96–100 ।

11. हिमाद्रि धोष, सविता वधवा एवं प्रज्ञेषु (2018). विकसित प्रतिमान का आकलन करने के लिए प्रसंभाव्य विभिन्नात्मक समीकरण पद्धति. सांख्यिकी–विमर्श अंक 13, 104–108.

12. दिपांकर मित्रा, रंजित कुमार पाल, लालमोहन भर, ए.के पॉल, हिमाद्रि शेखर राय सविता वधवा एवं ऐ.आर. उदगाता (2018). कृषि में अरफिमा मॉडल और उसके अनुप्रयोग., सांख्यिकी–विमर्श अंक 13, 24–27.

13. ए.के. पॉल, रंजित कुमार पाल, लालमोहन भर, हिमाद्रि, शेखर राय, सविता वधवा एवं सत्य पॉल सिंह (2018). बकरियों में वृद्धि वक्र प्राचलों की आनुवंशिक परिवर्तनशीलताः बूट–स्ट्रेप तकनीकों का अनुप्रयोग., सांख्यिकी–विमर्श अंक 13, 15–23.

14. हिमाद्रि शेखर राय, रंजित कुमार पाल, लालमोहन भर, मृन्मय राय, प्रकाश कुमार, अचल लामा, दिपांकर मित्रा एवं राजू कुमार (2018). कृषि में कीट संख्या की गतिशीलता पर आई.एन.ए.आर (INAR)-मॉडल का अनेप्रयोग., सांख्यिकी–विमर्श अंक 13, 37–44.

15. मृन्मय राय, के.एन.सिंह, प्रकाश कुमार, राजीव रंजन कुमार, संतोष राठोड़, प्रदीप बसाक, हिमाद्रि शेखर राय एवं अचल लामा (2018). ए.एन.एन. का अवलोकन उत्तर प्रदेश के झांसी जिले की मानसून वर्षा की भविष्यवाणी में अनुप्रयोग., सांख्यिकी–विमर्श अंक 13, 50–54.

16. संतोष राठोड़, के.एन.सिंह, प्रकाश कुमार, राजीव रंजन कुमार, सुशील कुमार सरकार, विशाल गुरुंग, मृन्मय राय एवं अचल लामा (2018). सपोर्ट समासश्रण से काल–श्रृंखला आँकड़ो का पूर्वानुमानरू भारतीय तिलहन उत्पादन डेटा में अनुप्रयोग., सांख्यिकी–विमर्श अंक 13, 71–74.

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18. चतुर्वेदल, क. के., राय, ए., फारूकी, एम. एम., लाल, एस. बी., दल, क. के., राय, ए., फारूकी, एम. एम., लाल, एस. बी., शर्मा, ए., अंगडी, यु. बी. एवं मिश्र, विशाल। रैपिड माइनर के द्वारा टेक्स माइनिंग। सांख्यिकी विमर्श, पृष्ठ 87–93.

19. अनु शर्मा, शशि भूषण लाल, द्विलेश चन्द्र मिश्र, नीरज बुडलाकोटी, कृष्ण कुमार चतुर्वेदी, मोहम्मद समीर फारूकी, संजीव कुमार (2018), मेटाजिनोमिक्सः परिचय और अनुप्रयोग, सांख्यिकी विमर्श, पेज संख्या 113–115

20. *मीर आसिफ इकबाल, सारिका, उषा जैन, अनिल राय, दिनेश कुमार (2018) माइक्रोसेटेलाइट डी. एन. ए. मार्कर के प्रयोग से मवेशी नस्ल पहचान हेतु वेब सर्वर, सांख्यिकी विमर्श. पेज संख्या 32–37*

Lecture Note in Training Manual

• Published "ASHOKA: A High Performance Supercomputing platform for Agriculture" in CAFT Training Reference Manual "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" Vol. I during 24th March to 13th April 2018 organized in ICAR-IASRI, New Delhi. pg. 165-171.

• Published "Genomic Data Warehousing" in CAFT Training Reference Manual "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" Vol II during 24th March to 13th April 2018 organized in ICAR-IASRI, New Delhi. pg. 128-133.

Leaflets

- Sharma A. and Lal S. B. (2017). Computational and Statistical Advances for Analysis of Biological Data in Agriculture. CAFT Leaflet. ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

Reference Manual /Manual/ E-manual/Pamphlet

- Sharma A., Lal S. B., Chaturvedi K. K., Farooqi Md. S., Kumar S., Mishra D. C., Kaur M. (2018). Computational and Statistical Advances for Analysis of Biological Data in Agriculture. Training Reference Manual Vol.-II. ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

- Sharma A., Lal S. B., Chaturvedi K. K., Farooqi Md. S., Kumar S., Mishra D. C., Kaur M. (2018). Computational and Statistical Advances for Analysis of Biological Data in Agriculture. E-Reference Manual, ICAR-Indian Agricultural Statistics Research Institute, New Delhi (in the form of DVD)

- Sharma A., Lal S. B., Chaturvedi K. K., Farooqi Md. S., Kumar S., Mishra D. C., Kaur M. (2018). Computational and Statistical Advances for Analysis of Biological Data in Agriculture

Book Chapters

- Anu Sharma and Aarti Singh (2018). Intelligent Semantics Approaches for Adaptive Web. Multidisciplinary Approaches to Service-Oriented Engineering. 201-220, DOI: 10.4018/978-1-5225-5951-1.ch010

- Sharma A., Lal S. B., Chaturvedi K. K., Farooqi Md. S., Kumar S., Mishra D. C., Kaur M. (2018). Computational and Statistical Advances for Analysis of Biological Data in Agriculture. Reference Manual-Vol. I. ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

- Sharma A., Lal S. B., Chaturvedi K. K., Farooqi Md. S., Kumar S., Mishra D. C., Kaur M. (2018). Computational and Statistical Advances for Analysis of Biological Data in Agriculture. Reference Manual-Vol. II. ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

Paper presented in Conferences

- Rajender Parsad (2018).presented a paper entitled "Design and Analysis of Multi-location Varietal Trials". in 61st Annual Maize Workshop (AICRP on Maize) held at Hill Agricultural Research and Extension Center, CSHPKV, Bajaura (HP) during April 07-09, 2018 (Attended on April 09, 2018).

- RamasubramanianV. delivered an oral presentation (contributed paper) entitled "An analysis of students' perception about Indian fisheries education" by Ramasubramanian V., Ananthan, P.S. and K.N. Singh in the 3rd International Symposium on Aquaculture and Fisheries Education (ISAFE3; 16-18 May, 2018) at ICAR- CIFE, Mumbai, during 17-18 May 2018.

- RamasubramanianV. is one of the co-authors in the following two oral presentations (contributed papers)presented by first authors in the 3rd International Symposium on Aquaculture and Fisheries Education (ISAFE3) conference held at ICAR-CIFE, Mumbai during 16-18 May, 2018.

(i) Valuing human capital generated by Universities: A case study of ICAR-CIFE by Sahoo, J., Ananthan, P.S., Ramasubramanian, V. and Qureshi, N.

(ii) Are fisheries graduates of India employable? Results from a cross-country study on career choices and employability by Ananthan P. S., Ramasubramanian, V. , Krishnan, M., Josephine, M., Nisar, U. and Fernando, H.

- Chandra, H. (2018). Crop Yield Estimation Using Small Area Estimation Techniques. Presented in the Conference on "Challenges and Technological Solutions for Enrollment & Loss Assessment

under Pradhan Mantri Fasal Bima Yojna" held at Mussorie, on 18 May 2018. Presented as an invited talk.

- Chandra, H. (2018). Small area estimation of forestry parameters for the state of Maharashtra in India. Presented in the National workshop on Recent Advances in Statistical Methods and Applications in Forestry and Environmental Sciences (RASMAFES), held at Indian Council of Forestry Research and Education, Dehradun, 22-24 May 2018. Presented as an invited talk.

- Kumar, Sushil; Chandra, Hukum; Aditya, Kaustav and Islam, Sadikul (218). "Spatial Disparity in Rural Indebtedness in Bihar- An Application of Small Area Estimation Approach". Presented in National Workshop on "Recent Advances in Statistical Methods and Applications in Forestry and Environmental Sciences (RASMAFES)" at Indian Council of Forestry Research and Education, Dehradun during 23-25 May, 2018.

- Aditya, Kaustav (2018). "MAPI software for collection of survey data-An experience", in the invited paper session on "Recent Advances in Sampling Techniques" at National workshop on "Recent Advances in Statistical Methods and Applications in Forestry and Environmental Sciences (RASMAFES)" at Indian Council of Forestry Research and Education, Dehradun during 23-25 May, 2018. Presented as an invited talk.

- Dr. S.B. Lal presented an invited talk on "Internet of Things (IoT) in Forestry and Environmental sciences" in the session "Modern Developments in Exploratory Data Analysis" held during on 24th May, 2018 at National workshop on "Recent Advances in Statistical Methods and Applications in Forestry and Environmental Sciences (RASMAFES)" at Indian Council of Forestry Research and Education, Dehradun.

- Dr. Seema Jaggi made a presentation on Experimental Designs in the Presence of Neighbour Effects on June 4, 2018 during the Foundation Day and Annual General Body Meeting of NAAS at NASC Complex during June 4-5, 2018.

LECTURE DELIVERED

Institute

1. Delivered two lectures on "JMP Genomics" on CAFT program entitled "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" on 13th April, 2018. (Dr.Sukanta Dash)

2. Delivered two lectures (Molecular Dynamic Simulation and Genomic Selection) on Bioinformatics in Agriculture in CAFT on Computational and Statistical Advances for Analysis of Biological Data in Agriculture from March 24-April 13, 2018 at IASRI New Delhi .(Dr. Anil Rai)

3. Delivered lecture on Application of Bioinformatics in Agriculture in CAFT training program on "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" on April 02, 2018.(Dr. Dinesh Kumar)

4. Delivered lecture and conducted Hands-on session on Molecular Phylogenetics in CAFT training program on "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" on April 03, 2018. (Dr. Sarika)

5. Delivered lectures and conducted Hands-on sessions on Transcriptome Analysis and mining of SSR markers in CAFT training program on "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" on April 02 and 03, 2018.(Dr. M. A. Iquebal)

6. Delivered three lectures on the topics "Unsupervised Machine Learning and Its Application in Bioinformatics", "Next Generation Sequencing Data and its Pre-processing" and "Genome

Assembly: Concepts and Challenges" in the training entitled "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" during 26th March-13th April, 2018 under the aegis of Centre of Advanced Faculty Training (CAFT), Agricultural Education Division, ICAR, New Delhi and held at ICAR-IASRI, New Delhi. (Dr. D.C. Mishra)

7. Delivered lecture and conducted practical on protein structure comparisons and prediction on 10-4-2018 for training program "High computing performance and statistical analysis of Agricultural bioinformatics data" at CABin, IASRI, New Delhi.(Dr. U.B. Angadi)

8. Delivered lecture and conducted practical on protein docking on 11-4-2018 for training program "High computing performance and statistical analysis of Agricultural bioinformatics data" at CABin, IASRI, New Delhi. (Dr. U.B. Angadi)

9. Delivered two lectures in the CAFT training program on Codon Usage Analysis and Metagenomic Data Analysis on 05-04-2018 and 07-04-2018 respectively.(Mohammad Samir Farooqi)

10. Delivered two lectures "ASHOKA: Super Computing Hub" on 9th April and "Genomics Data Warehousing" on 11th April in CAFT training program during March-April 2018.(Dr.K.K.Chaturvedi)

11. Conducted a Practical Hands on in Training Programme "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" on topic R for Biological Data Analysis.(Neeraj Budhalkoti)

12. Conducted two Lecture theory and practical sessions(Genome Annotation and Hands on Genome annotation in the CAFT program during 24 Mar to 13 April 2018 at CABin IASRI. (Dr. Sanjeev Kumar)

13. Delivered three lectures on topics "Introduction to Perl and Bio-perl" (Theory and Practical) , "Linux Overview" (Theory and Practical) and "Biological Database Resources in Agriculture" in Training Programme "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" during 24 Mar -13 April, 2018 at ICAR-IASRI

14. Delivered lectures on topics "Sequence Alignment" and "MicroRNA prediction and Target Identification" in the CAFT program on "Computational and Statistical Advances for Analysis of Biological Data in Agriculture" during 24 March to 13 April, 2018 under the aegis of Centre of Advanced Faculty Training (CAFT), Agricultural Education Division, ICAR, New Delhi.

Out side

1. Deliver invited lectures as a Resource Person on Testing of Hypothesis and Analysis of Variance in a Workshop on Probability and Statistics using R organized by Department of Mathematics, Miranda House, University of Delhi and The Indian Mathematics Consortium at Miranda House College during April 4 - 6, 2018 for Undergraduate third year students of mathematics and research scholars. (Dr. Seema Jaggi)

2. Delivered an invited lecture and conducted a handson training session on "Genome Annotation" in a workshop on "In Silico Prediction of Genes and Their Functional Characterization through Protein Modelling" at Dept. of Genetics and Plant Breeding, Ch. Charan Singh University, Meerut on 12th March 2018. (Dr. Sanjeev Kumar)

3. Delivered an invited talk entitled "MAPI software for collection of survey data-An experience" in the invited paper session on "Recent Advances in Sampling Techniques" hosted by Dr. Krishan Lal, Former, Principal scientist, ICAR-IASRI, New Delhi at National workshop on recent advances in statistical methods and Applications in Forestry and environmental science at ICFRE, Dehradun on 25 May 2018.(Dr Kaustav Aditya)

4. Delivered two lectures on the topic of "Introduction on Statistics" at Institute of Valuer, New Delhi on 15 May, 2018. (Dr Hukum Chandra, As Resource Person)

5. Dr. Ramasubramanian V. delevered guest lectures at ICAR-CIFE, Mumbai during 12-14, June, 2018 in the Ph.D. course entitled "FGB604: Research Methodology in Fish Genetics" on the topics viz., Probability, Binomial distribution, Multinomial distribution, Normal distribution, Chi-square distribution , Student's t distribution, F distribution,Method of Least Squares, multiple regression and correlation; also conducted practical sessions; also sent model question papers on theory/ practical exams for the course on 19.06.2018.

PARTICIPATION

Participation in Conference/ Workshop/ Seminar/ Symposia/ Training/ Foundation Course/ Annual Day/ Lectures etc.

1. Dr. Rajender Parsad attended 61st Annual Maize Workshop (AICRP on Maize) held at Hill Agricultural Research and Extension Center, CSHPKV, Bajaura (HP) during April 07-09, 2018.

2. Dr. Harish Kumar HV completed three month professional attachment training from 4th December, 2017 to 3rd March, 2018 at Department of Agricultural Economics, University of Agricultural Sciences, GKVK, Bengaluru, under the mentorship of Dr. B. V. Chinnappa Reddy.

3. Dr Hukum Chandra participated in the conference on "Challenges & Technological Solutions for Enrolment & Loss Assessment under Pradhan Mantri Fasal Bima Yojna", at Mussorie during 17-19 May, 2018.

4. Dr Hukum Chandra, Dr Kaustav Aditya and Sh. Sushil Kumar participated in National workshop on "Recent Advances in Statistical Methods and Applications in Forestry and Environmental Sciences" at Indian Council of Forestry Research and Education, Dehradun, during 22-24 May, 2018.

5. R.K. Paul attended the Review workshop of NICRA during 12-13 February 2018 at NASC complex.

Participation in International Conference/ Workshop/Symposium etc.

•   Ramasubramanian V. attended the 3rd International Symposium on Aquaculture and Fisheries Education (ISAFE3; 16-18 May, 2018) at ICAR- CIFE, Mumbai during 17-18 May 2018.

CONSULTANCY/ADVISORY SERVICES PROVIDED

•   Dr. B.N. Mandal and Sukanta Dash provided advisory services to Dr CM Parihar, Scientist, Agronomy Division, ICAR-IARI on preparation of side-by-side barcharts along with error bars depicting standard error of means of mainplot treatments and subplot treatments under a split-plot designed experimental data

•   Dr. Achal Lama Provided advisory service factorial and split plot analysis to Pemba Bhutai, PhD scholar of BCKV, Mohanpur using SAS software.

•   Dr. Santosha Rathod advised Ph.D. Student Mr. Vijay Kumar, BHU to carryout modeling and Forecasting of productivity of Ragi, Sorgum and Bajara of Karnataka using Time Series Models in SAS and R on 11.04.2018.

•   Dr. Santosha Rathod advised Dr. Shilpa H B, Scientist, ICAR- National Research Centre on Pomegranate, to carry out D Square analysis of different genotypes based on morphological traits of pomegranate in R on 25.04.2018.

- Ramasubramanian V. provided advisory service by analyzing the data sent by Dr. Purushottama, G.B., Scientist, Mangalore Centre of CMFRI by drawing plots on 95% confidence intervals (CIs) and 95% prediction intervals (PIs) in Length Weight Regression (LWR) models for various species of Shark (Males and Females separately) and sent the results on 19.04.2018.

- Ramasubramanian V. provided advisory service by analyzing the data sent by Mr. N. Daniel, Assistant Professor, Tamil Nadu Fisheries University (TNFU) Chennai Campus relating to "Blood parameters of fish eaters and vegetarians- A study from coastal villages of Ramanathapuram district, Tamil Nadu, India" and sent the results on 23.04.2018.

- Dr. Soumen Pal provided advisory service estimation of compound growth rate using non parametric methodology of area, production and yield of potato at national level and Punjab for Mr. Kapil Sagar, Assistant Chief Technical Officer, ICAR-CPRI, Shimla.

- Dr. Soumen Pal provided advisory service to trend estimation of meteorological data related to crop water availability indicators for rainfed agroecosystem in the New Alluvial Agroclimatic Zone of West Bengal using non parametric methodology for M.Sc. thesis work of Mr. Amit Roy, Department of Agricultural Meteorology, Bidhan Chandra Krishi Viswavidyalaya.

- Dr. Pradip Basak provided advisory service to analyse the data of Ms. Uma Prajapati, Ph.D. student, ICAR-IARI, New Delhi.

- Dr. U.B. Angadi consultancy service project with International Livestock Research Institute (ILRI) is in progress and total consultancy fee is Rs.3,96,750/- for 23 man-days

- Dr. U.B. Angadi new consultancy service proposal "Development database and analysis tool for feed demand-supply assessment in Mali, West Africa" has been prepared with ILRI South_Asia Region, New Delhi and submitted the same for approval. Total consultancy fee is Rs.4,42, 500/- for 25 man-days.

- Dr. M. A. Iquebal and Dr. Sarika advised Dr. Amrita Das, Scientist, IARI, New Delhi regarding population structure and phylogenetics analysis.

- Mohd Harun advised a student of PG-School IARI regarding analysis of data. There were three factors Nitrogen, Phosphrus and Fertilizer application at three, four and two levels respectively. The experimental area allotted was the major concern. Keeping in view both the experimental area and minimum error degrees of freedom factorial experiment in RBD layout was suggested.

- Dr. Anindita Datta provided advisory services to Miss Arya, student from Division of Entomology, PG School, IARI to use Kruskal Walis test for her research data on number of adults attracted, number of adults emerged from rice weevil (Sitophilus oryzae)

- Dr. Rajender Parsad advised to Sh. Samar Kutllehria, M.Sc. Student frrom CSKHPKV, Palampur on analysis of data generated through Augmented Randomized Complete Block Designs with 158 entries and 3 checks arranged in 10 blocks.

- Dr. Rajender Parsad advised to Sh.Gabriel Margarido, Assistant Professor at the University of São Paulo, a major State university in Brazil to use the data of augmented designs, available on Analysis of Experimental data on Design Resources Server, as an exercise for the graduate level course on Biometrical Genetics students. He was allowed to use the data with proper citations.

- Dr. Anil Kumar and Dr. Sukanta Dash consultancy provided to Ms Indu lathwal, a Ph.D. student of NDRI, Karnal. The experiment is a type of animal experiment containing 18 response variable like call duration, mean intensity, minimum intensity, maximum intensity, F1, F2, F3, F4, F5, minimum pitch, maximum pitch, mean pitch, No of pulse, No of periods, mean period, Jitters, Shimmers, and H/N ratio with 4 classification variables viz Animal, Days, Phase coding, and Parity. The objective of the experiment is to find out threshold value at different phase for all response variable and to find out the significant difference between phases.

- Dr. Ramasubramanian V. gave further advisory service by analyzing using SPSS (which was earlier done by MS Excel) to Mr. N. Daniel, Assistant Professor, Tamil Nadu Fisheries University (TNFU) Chennai Campus relating to "Blood parameters of fish eaters and vegetarians- A study from coastal villages of Ramanathapuram district, Tamil Nadu, India" to enable him to repeat the analysis for other dataset combinations (sent on 01.05.2018).

- Dr. Ramasubramanian V. gave further advisory service by analyzing the data sent by Dr. Purushottama, G.B., Scientist, Mangalore Centre of CMFRI by refining the plots drawn on 95% confidence intervals (CIs) and 95% prediction intervals (PIs) in Length Weight Regression (LWR) models for various species of Shark (for Males and Females separately and also taken together) and sent the final results on 08.05.2018.

- Dr. Ramasubramanian V. gave advisory service on 18.05.2018 to Mr. Sutanu Karmakar, Ph.D. (Aquatic Environment Management) scholar, ICAR-CIFE, Mumbai on study of two bacteria with respect to two chemicals' exposure and passages (exposure and withdrawal passage) effecting changes in zone of inhibition of six antibiotics and 'MIC' value.

- Dr. Wasi Alam provided advisory service to Dr. Hassan, Principal Scientist, Division of Agricultural Engineering, IARI about ANOVA analysis and cluster analysis for multivariate data sets under various treatment over multiple years.

- Dr. Achal Lama provided advisory service to Sangeet Chettri, MSc scholar of BCKV, Mohanpur about Factorial RBD analysis using SAS software.

- Dr. Harish Kumar H V advised analysed marginalisation and causative factors in the context of urbanization to Sanjana, M.Sc student of UAS, Bengaluru.

- Dr. Harish Kumar H V advised analysed role of custom hiring service centres in the context of mechanization to Dr. Ranjith Kumar P S, SRF, UAS, Bengaluru.

- Dr. Pradip Basak advised analyzed the data of Mrs. Archana Sanyal, Ph.D. student, ICAR-Indian Agricultural Research Institute, New Delhi.

- Himadri Shekher Roy advised analysis of stability analysis of Atar Singh, Assistant Professor, Department Of Genetics and Plant Breeding, SardarVallabhbhai Patel University of Agriculture and Technology.

- Dr. U.B. Angadi consultancy service provided project with International Livestock Research Institute (ILRI) is in progress and total consultancy fee is Rs.3,96,750/- for 23 man-days

- Dr. U.B. Angadi new consultancy service proposal "Development database and analysis tool for feed demand-supply assessment in Mali, West Africa" has been prepared with ILRI South_Asia

Region, New Delhi and submitted the same for approval. Total consultancy fee is Rs.4,42, 500/- for 25 man-days.

- Dr. M. A. Iquebal advisory service provided to Dr. Amrita Das, Scientist, IARI, New Delhi regarding population structure.

- Dr. Sarika advisory service provided to Dr. Amrita Das, Scientist, IARI, New Delhi regarding phylogenetics analysis.

- Mohd. Harun advised an M. Sc. Soil Science student of PG-School IARI regarding analysis of data from the experiment on Quantification of ABA and GA in different stages of seed development. The measurement was taken on on-set of germination, physiological maturity and harvest maturity, at 10 DAF, 12 DAF, 22DAF and 38 DAF. The experiment was performed in equireplicated CRD set up. Analysis was performed to calculate the, mean along with S.E of means and the CD values.

- Dr. Sukanta Dash Consultancy provide to Mr. Nawal Singh Rawat, a Ph.D. student of NDRI, Karnal. The experiment is a type of animal experiment containing 22 response variable like %N2 bact, yeast mould, cp%, urea g/l,UA, Creat mg/dl, HA, mg/dl, ADL%, Cellulose, Hemicellulose, pH , DM%, moisture%, Ca%, Fe %, Cu ppm, Zn ppm, Mn ppm, P%, S%, As ppm with 4 factors stage(2level), formulation(7level), time(3level) and spray(2 level) with 3 replication each.

- Dr. Achal Lama provided advised to Karma Bhutia, PhD scholar of BCKV, Mohanpur to use Factorial RBD to analyze data on fruits using SAS software.

- Dr. Ramasubramanian V. provided advisory service to Dr. R.N. Sharma, Principal Scientist, Division of Div. of Fruits & Horticultural Technology, IARI, New Delhi on logistic regression & chi-square test for independence of attributes on his data relating to flowering status and enzymes/ chemicals responsible for the same on 20.06.2018.

- Dr. Ramasubramanian V.provided advisory service to Dr. A. Pavan Kumar, Scientist, ICAR-CIFE, Mumbai by using Mann-Whitney U test for testing the differences between the GC content between two fish specieson 08.06.2018.

- Dr. Ramasubramanian V. (along with Dr. Mrinmoy Ray) provided advisory service to Dr. Mahesh Kumar, Professor, RPCAU,Bihar on fitting non-linear growth models for forecasting of wheat yield of Bihar on 05.06.2018

- Dr. U.B. Angadi consultancy service provided project with International Livestock Research Institute (ILRI) is in progress and total consultancy fee is Rs.3,96,750/- for 23 man-days

- Dr. U.B. Angadi new consultancy service proposal "Development database and analysis tool for feed demand-supply assessment in Mali, West Africa" has been prepared with ILRI South_Asia Region, New Delhi and submitted the same for approval. Total consultancy fee is Rs.4,42, 500/- for 25 man-days.

- Dr. M. A. Iquebal advisory services provided to Dr. Amrita Das, Scientist, IARI, New Delhi regarding population structure.

- Dr. Sarika advisory services provided to Dr. Amrita Das, Scientist, IARI, New Delhi regarding phylogenetics analysis.

SOFTWARE(S) DEVELOPED

Statistical and Geographic Information System/ Data bases/mobile apps

Reviewing of tables for updation of tables for ARDB 2018 is in progress.

Dr. U.B. Angadi, Dr. M.A. Iquebal, Dr. Sarika, Dr. Anil Rai and Dr. Dinesh Kumar:

- Updated and finalized miRNA prediction tool for wheat
- Database of space filling OLH designs up to six factors and 20 runs have been developed and embedded in the website. (Dr. Sukanta Dash)

Dr. U.B. Angadi, Dr. M.A. Iquebal, Dr. Sarika, Dr. Anil Rai and Dr. Dinesh Kumar:

- Updated and finalized miRNA prediction tool for wheat
- Chromosomal Location and Homologous miRNA search tool integrated using BLAST
- wheat genome and mirbase in tamirpred web server
- Caster transcriptome database and web resources developed using LAMP
- Vigna-SSR BLAST database search with 6 databases and rectified ssr mining and primer generation web tool.

Dr. U.B. Angadi, Dr. M.A. Iquebal, Dr. Sarika, Dr. Anil Rai and Dr. Dinesh Kumar

- Assisted to develop Black pepper drought transcriptome database and web portal to the student
- Updating SSR web resources of Magur and Rohu fish, and Mango with sequence data.

TECHNOLOGY ASSESSED/TRANSFERRED

Parui, S., Mandal, B.N., Parsad, R. and Dash, S.

- A web resource on "Incomplete block designs for incomplete two-factor factorial experiments" on Design Resources Server has been made available at http://iasri.res.in/design/IFE/IFE.htm.

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