



# IASRI

## NEWS



Volume 19

No. 1

April-June, 2014

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### From Director's Desk . . .

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

Long memory property has been found to be highly significant in the squared return series (which is considered to be a good proxy of volatility) of Gram in Delhi market. Accordingly, Fractionally Integrated Generalized Autoregressive Conditional Heteroscedastic (FIGARCH) model which allows for long memory behaviour and slow decay of the impact of volatility shock, revealed to be appropriate in modelling as well as forecasting the series.

Optimal one-step and two-step ahead forecast of Exponential Smooth Transition Autoregressive (ESTAR) has been derived and applied to forecast oil sardine landings in Kerala.

Polycross nursery is a specific type of field design commonly used in the breeding of wind pollinated species where each genotype gets equal chance of being pollinated by any of the others. Series of polycross designs have been obtained for different experimental situations and an online solution WebPD has been developed for generation of these designs.

Artificial Neural Network approach has been used for breed identification with locus minimization resulting in reduction in cost of genotyping and is applied in breed identification server for goat available at <http://nabg.iasri.res.in/bisgoat>.

ICAR-ERP system has been implemented in Phase 1b institutions. Six institutes (CIAE, CPRI, CRIDA, CSWCRTI, IGFR and IIHR) have gone live from April 07, 2014 and seven institutes (CAZRI, CMFRI, NBSSLUP, NBPGR, CRR, ICAR Research Barapani, NAIP) have gone live from end of April, 2014.

One Training on Data Analysis and Interpretation for ISS Probationers of XXXV Batch sponsored by CSO; One on Forecast Modelling Analytics in Crops under CAFT sponsored by Education Division of ICAR; Five Training Programmes under Establishment of National Agricultural Bioinformatics Grid sponsored by NAIP one each on Basic Training on Discovery Studio Software, High Performance Computing, Oracle Database 11g; Administration Workshop, Six Different Modules of SAS Software and Advance Training on Discovery Studio Software were organized. Apart from these, one Hindi Workshop on Data Analysis using SPSS was also organized. The 63<sup>rd</sup> Meeting of Institute Management Committee was also organized.

During the period, five new projects were initiated. Scientists have visited various countries on different assignments.

Scientists of the Institute have published 25 research papers and 03 reference manual. Besides, 03 invited lectures were delivered and 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

- **Fractionally Integrated Generalized Autoregressive Conditional Heteroscedastic (FIGARCH) model in the presence of long memory in volatility.**

The Geweke and Porter-Hudak (GPH) test for testing long memory to the raw and squared returns of the spot prices of gram has been applied. For the (raw) return series, the test shows no evidence of long memory patterns as the null hypothesis of no persistence is not rejected. The result for squared return is different from that of the returns. Indeed, long memory property is found to be highly significant for the squared returns. Since squared returns are a good proxy for volatility, these findings thus suggest that the conditional volatility of return would tend to be range-dependent, persist and decay slowly. Intuitively, this volatility persistence can be appropriately modeled by a FIGARCH process because it allows for long memory behavior and slow decay of the impact of a volatility shock. It is, however, important to note that the estimate of the long memory parameter  $d$  is less than 0.5 for squared return indicating the stationarity of the process. Accordingly, FIGARCH model has been applied for forecasting the volatility of Gram price. The evaluation of forecasting was carried out with mean squares prediction error (MSPE), mean absolute prediction error (MAPE) and relative mean absolute prediction error (RMAPE). The residuals of the fitted models were used for diagnostic checking. Out-of sample forecast of volatility has also been computed.

- **Optimal one-step and two-step ahead forecast for Exponential Smooth Transition Autoregressive (ESTAR) family of parametric nonlinear time-series models by making recursive use of conditional expectation.**

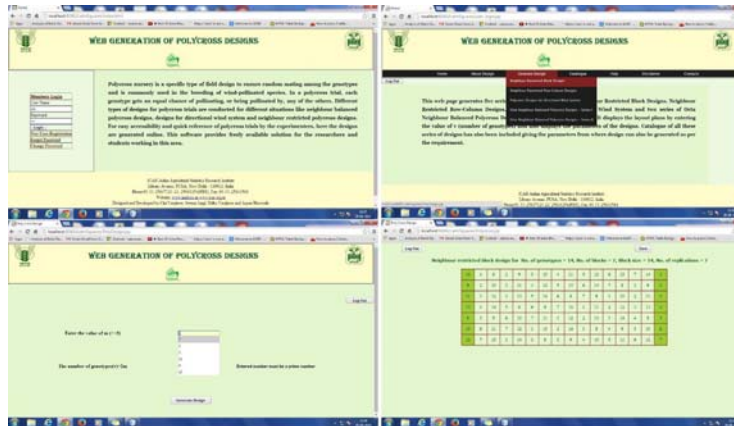
The optimal one-step and two-step ahead forecast for Exponential Smooth Transition Autoregressive (ESTAR) family of parametric nonlinear time-series models has been derived by making recursive use of conditional expectation. Further, multi-step ahead optimal forecast has also been derived for the same model under consideration. The optimal forecast so derived has been applied to obtain the forecast for the Oil sardine landings time-series data in Kerala. The forecast obtained was also compared with forecast from ARIMA models using appropriate measures and it was seen to perform better than ARIMA models.

- **Experimental designs for polycross trials.**

A polycross is the pollination by natural hybridization of a group of genotypes, generally selected, grown in isolation from other compatible genotypes in such a way to promote random open-pollination. A particular practical application of the polycross method occurs in the production of a synthetic variety resulting from cross-pollinated plants. Laying out these experiments in appropriate designs, known as polycross designs, would not only save experimental resources but also gather more information from the experiment. Different situations may arise in polycross nurseries where accordingly different polycross designs may be used. For situations in which some genotypes interfere in the growth or production of other genotypes due to different maturity or plant height, but have to be grown together, neighbour restricted design is a better option. Two classes of polycross designs, one for blocked situation and another for row-column situation, are obtained. Further, for seed orchards known to have a prevailing wind system in a certain direction a family of designs balanced for neighbour effects of genotypes in the direction of prevailing wind system has been constructed. Also, two series of polycross designs have been constructed ensuring the reduction of self occurrence in the nearest neighbourhood for situations wherein genotypes are planted in a small area without leaving much space between rows.

It may not be easy for the experimenters to understand the algorithms behind the construction methods and hence a catalogue of these designs along with layouts has been prepared to enhance the application potential of these designs. Further, SAS macros are developed for the generation of polycross designs.

A software named 'webPD' has been developed for the online generation and cataloguing of polycross designs, facilitating the enhanced utilization of these designs globally.



• **Locus minimization in breed prediction using Artificial Neural Network approach.**

Molecular markers viz. microsatellite and Single Nucleotide Polymorphism (SNP) have revolutionized the breed identification through small biological tissue or germplasm with zero-phenotype like blood / carcass sample/ embryo, ova and semen. Classical tools of molecular data analysis for breed identification have limitations like non-availability of referral breed data causing increased cost of collection each time, compromised computational accuracy and complexity of methodology in use. Use of Artificial Neural Network (ANN) to decrease the cost of genotyping by locus minimization is applied in the breed identification server for goat which is freely accessible (<http://nabg.iasri.res.in/bisgoat>) to research community. The machine learning (artificial neural networks) approach for breed identification is demonstrated which is capable of multi-fold advantage like locus minimization leading to drastic reduction in cost, web availability of reference breed data obviating the need of repeated genotyping each time while investigation of an unknown breed for its identity. In order to develop this model web implementation based on ANN, 51850 allelic data of microsatellite marker based DNA fingerprinting on 25 loci covering 22 registered goat breeds of India were used for training. While minimizing locus up to 9 loci by Multi-Layer Perceptron (355-18-22) (MLP (355-18-22)) model, 96.63% training accuracy was observed. This server can be an indispensable tool for existing breeds and new synthetic commercial breeds' identification, leading to their intellectual property protection in case of sovereignty and bio-piracy disputes. This server can be widely used as a model for cost reduction by locus minimization of various other flora and fauna for variety /breed/ line identification, especially in conservation and improvement programmes.



## HUMAN RESOURCE DEVELOPMENT

### Training Programmes/ Workshops Organised

S.No.	Title	Venue	Date	Sponsored by	No. of Participants
<b>Trainings</b>					
1.	Data Analysis and Interpretation for ISS Probationers of XXXV Batch Course Director: Dr. Rajender Parsad Course Co-Director: Dr. Eldho Varghese	IASRI, New Delhi	05-23 May 2014	Central Statistics Office, Ministry of Statistics & Programme Implementation	21
2.	Forecast Modelling Analytics in Crops under CAFT Course Director: Dr. Prawin Arya Course Co-Director: Dr. Sanjeev Panwar	IASRI, New Delhi	30 May - 19 June 2014	Education Division, ICAR	23
3.	Basic Training on Discovery Studio Coordinators: Dr. MA Iquebal Dr. Sarika	IASRI, New Delhi	01-03 May 2014	NAIP	20
4.	High Performance Computing with the collaboration of C-DAC, Pune Coordinator: Sh. KK Chaturvedi	IASRI, New Delhi	12-17 May 2014	NAIP	20
5.	Oracle Database 11g: Administration Workshop Coordinator: Sh. KK Chaturvedi	KLJ Solution Ltd. Motinagar, New Delhi	19-23 May 2014	NAIP	16
6.	Six Different modules of SAS software Coordinator: Sh Samir Farooqi	IASRI, New Delhi	26 May - 19 June 2014	NAIP	20
	• SAS Data Integration Studio: Fast Track		26-30 May 2014		
	• Data Flux Data Management Studio: Fast Track		02-06 June 2014		
	• Text Analytics Using SAS Text Miner		09-10 June 2014		
	• Managing SAS Analytical Models Using SAS Model Manager		11-13 June 2014		
	• Grid Computing (SAS Enterprise Scheduling with Platform Suite for SAS)		16-17 June 2014		
	• SAS Content Categorization Studio: Building Models		18-19 June 2014.		
7.	Advance Training on Discovery Studio Software Coordinators: Dr. Sarika Dr. MA Iquebal	IASRI, New Delhi	17-21 June 2014	NAIP	20
<b>Hindi Workshop</b>					
8.	एस.पी.एस.एस. द्वारा आंकड़ों का विश्लेषण (Data analysis using SPSS) Coordinators: Dr. Cini Varghese Dr. Arpan Bhowmik	IASRI, New Delhi	24 May 2014	IASRI, New Delhi	20

### VISITS ABROAD

- Dr UC Sud visited Bangladesh to participate in the 5<sup>th</sup> and Final Mission of Dissemination Workshop during June 23-29, 2014.
- Dr. Susheel Kumar Sarkar visited Spain to attend training on Integrated Breeding Multi-Year Course (IB-MYC) Year 3 under Generation Challenge Programme - Integrated Breeding Platform (GCP-IBP) during 09-30 May 2014 at Mediterranean Agronomic Institute of Zaragoza (IAMZ) in Zaragoza, Spain.
- Sh. KK Chaturvedi attended training on "Bioinformatics" at Cornell University, Ithaca, USA during January 28 – April 05, 2014 sponsored by NAIP (ICAR).

## NEW PROJECTS INITIATED

- Estimation of breeding value using longitudinal data. (AGENIASRISIL201400700026) Upendra Kumar Pradhan, Prabina Kumar Meher, AR Rao and AK Paul: 23.04.2014-02.10.2016
- Calibration estimators under twp stage sampling design when study variable is inversely related to auxiliary variable. (AGENIASRISIL201400800027) Ankur Biswas, Kaustav Aditya and UC Sud: 01.05.2014-31.03.2016
- Results framework document management system in ICAR (RFD-MS). (AGENIASRISIL201400900028) N Srinivas Rao, Mukesh Kumar, AK Choubey: 09.05.2014-30.04.2017
- Study on volatility spillover of agricultural commodity prices. (AGENIASRISIL201401000029) Kanchan Sinha, Wasi Alam, Sanjeev Panwar, Bishal Gurung: 12.05.2014-31.03.2016
- Modelling and construction of transcriptional regulatory network using time-series gene expression data. (AGENIASRISIL201401100030) Samrendra Das, Bishal Gurung, Sanjeev Kumar, SD Wahi: 22.05.2014-26.09.2016

## PANORAMA OF ACTIVITIES

- Collaborators meet with partnering PI and Co-PIs of NBFGR, CIFA, AAU Anand and IASRI of multi-institutional DBT Project entitled “Whole genome sequencing and development of allied genomics resources in two commercially important fish-labeo rohita and clarias batrachus” was organized at IASRI on 15 April 2014.
- Meeting of Institute Joint Staff Council was organized at IASRI on 26-27 April 2014 under the Chairmanship of Dr. UC Sud, Director(A).
- Meeting of Women Cell of the Institue was organized at IASRI on 15 May 2014, Dr. Seema Jaggi, Principal Scientist Chaired the meeting.
- 63<sup>rd</sup> meeting of Institute Management Committee was organized at IASRI on 13 June 2014 under the Chairmanship of Dr. UC Sud, Director(A).

## Seminars Delivered

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

One Guest Seminar on Assembling the NSG Data was delivered by Dr. Surya Saha, Cornell University, USA on 13 June 2014.

### The Details of Seminars Delivered

Category	Type of seminar	Number
Scientist	General(RFD)	01
	Foreign Training	01
Student	Course	01
	ORW	06
	Thesis	11
Guest		01
<b>Total</b>		<b>21</b>

## PUBLICATIONS

### Research Papers

- Ahammed Shabeer, Saha, TP, Gajbhiye, VT, Ajoy, Gupta, Suman, Manjaiah, KM and Varghese, Eldho (2014). Simultaneous removal of multiple pesticides from water: Effect of organically modified clays as coagulant aid and adsorbent in coagulation flocculation process. *Environmental Technology*. DOI: <http://dx.doi.org/10.1080/09593330.2014.914573>.
- Ahammed, Shabeer, Saha, TP, Gajbhiye, VT, Ajoy, Gupta, Suman, Manjaiah, KM and Varghese, Eldho (2014). Removal of poly aromatic hydrocarbons (PAHs) from water: Effect of nano and modified nano-clays as a flocculation aid and adsorbent in coagulation-flocculation process. *Polycyclic Aromatic Compounds*, **34(4)**, 452-467.
- Arora, Alka, Javanmard, Maedeh Zirak, Jain, Rajni, Marwaha, Sudeep, Dixit, Anshu (2013). Web based fuzzy C-means clustering software (WFCM). *J. Ind. Soc. Agric. Statist.*, **68(1)**, 93-100.
- Balakrishnan, Renu, Wason, Monika, Padaria, RN, Singh, Premlata and Varghese, Eldho (2013). An assessment of readiness of farmers towards e-learning. *Pusa AgriScience*, **36**, 36-39.
- Berg, E. and Chandra, H. (2014). Small area prediction for a unit level lognormal model. *Computational Statist. Data Analysis*, **78**, 159-175.
- Bhar, Lalmohan, Gupta, VK and Parsad, Rajender (2013). Detection of outliers in designed experiments in presence of masking. *Statist. Applications*, **11(1&2)**, 147-160.
- Gautam, NK, Singh, N, Iquebal, MA, Singh, M, Akhtar, J, Khan, Z and Ram, B (2014). Genetic diversity analysis for quantitative traits in lentil (*Lens Culinaris Medik.*) germplasm. *Legume Res.*, **37 (2)**, 139-144.
- Karak, T, Paul, RK, Sonar, I, Sanyal, S, Ahmed, KZ, Boruah, RK, Das, DK and Dutta, AK (2014). Chromium in soil and tea (*Camellia sinensis L.*) infusion: Does soil amendment with municipal solid waste compost make sense. *Food Res. Int.*, **64**, 114-124.
- Khandelwal, Ashish, Gupta, Suman, Gajbhiye, VT and Varghese, Eldho (2014). Degradation of Kresoxim-methyl in soil: Impact of varying moisture, organic matter, soil sterilization, soil type, light and atmospheric CO<sub>2</sub> level. *Chemosphere*. **111**, 209-217.
- Kulhari, Alpana, Sheorayan, Arun, Bajar, Somvir, Sarkar, Susheel, Chaudhury, Ashok and Kalia, Rajwant K. (2013). Investigation of heavy metals in frequently utilized medicinal plants collected from environmentally diverse locations of north western India. *SpringerPlus*, **2**, 676-679.
- Kumar, D, Kumar, Pradeep, Singh, Pawan, Yadav, SP, Sarkar, Susheel Kumar, Bharadwaj, A, and Yadav, PS (2014) Characteristics of frozen thawed semen in predicting the fertility of buffalo bulls. *Ind. J. Anim. Sci.*, **84 (4)**, 389-392.
- Kumar, Mukesh, Rajput, TBS, Patel, Neelam, Sahoo, RN and Varghese, Cini. (2013). Performance evaluation of drip-tape for irrigation under different operating pressures. *Pusa AgriScience*, **36**, 58-63.
- Mandal, BN, Gupta, VK and Parsad, Rajender (2012). Generation of binary incomplete block design with a specified concurrence matrix. *J. Statist. Applns.*, **7(3-4)**, 121-138.
- Mandal, BN, Gupta, VK and Parsad, Rajender (2014). Efficient incomplete block designs through linear integer programming. *Amer. J. Math. Manag. Sci.*, **33(2)**, 110-124.
- Mandal, BN, Parsad, Rajender and Gupta, VK (2012). Doubly nested partially balanced incomplete block designs. *J. Statist. Applns.*, **7(3-4)**, 153-169.
- Paul, RK, Alam, W and Paul, AK (2014). Prospects of livestock and dairy production in India under time series framework. *Ind. J. Anim. Sci.*, **84(4)**, 130-134.

- Paul, RK, Ghosh, H and Prajneshu (2014). Development of out-of-sample forecast formulae for ARIMAX-GARCH model and their application to forecasting wheat yield volatile data. *J. Ind. Soc. Agril. Statist.*, **68(1)**, 85-92.
- Prabha, Ratna, Singh, Dhananjaya P, Gupta, Shailendra K and Rai, Anil (2014). Whole genome phylogeny of prochlorococcus marinus group of cyanobacteria: Genome alignment and overlapping gene approach. *Interdiscip Sci. Comput. Life Sci.*, **6**, 1-9.
- Rajurkar, G., Patel, Neelam, Rajput, T.B.S. and Varghese, Cini. (2012). Soil water and nitrate dynamics under drip irrigated cabbage. *J. Soil and Water Cons.*, **11(3)**, 196 - 204.
- Rao, AR, Dash, M, Sahu, TK, Wah, SD, Behera, BK, Sharma, AP and Bhatia, VK (2014). Statistical and bio-computational applications in animal sciences. *Ind. J. Anim. Sci.*, **84(5)**, 475-489.
- Sahu, TK, Rao, AR, Dora, S, Gupta, S and Rai, A (2014). In silico identification of late blight susceptibility genes in Solanum tuberosum. *Ind. J. Genet.*, **74(2)**, 229-237.
- Sarkar, RK, Meher PK, Wah, SD, Mohapatra T and Rao AR (2014). An approach to the development of a core set of germplasm using a mixture of qualitative and quantitative data. *Plant Genetic Resources: Characterization and Utilization (first view article)*, **01-08**, DOI: <http://dx.doi.org/10.1017/S1479262114000732>.
- Sharma, Kirti, Rao, Sambasiva N, Islam, SN and Shukla, Mala (2013). Joint action between fraction IX of ethyl acetate extract of custard apple and azadirachtin in controlling rice moth, corcyra cephalonica and khapra beetle, trogoderma granarium in storage. *Pest. Res. J.*, **25 (2)**, 106-111.
- Singh, N. Okendro, Paul, AK, Kumar, Surinder, Alam, Wasi, Singh, N. Gopimohon, Singh, KN and Singh, Pal (2013). Fitting of partial re-parameterized logistic growth model to oil palm yield data. *Int. J. Agril. Statist. Sci.*, **9**, Supplement 1, 55-62.
- Varghese, Cini, Jaggi, Seema and Varghese, Eldho (2014). Generalized incomplete Trojan-type designs with unequal cell sizes. *Int. J. Theo. Appl. Sci.*, **6(1)**, 50-54.

## Reference Manuals

- Parsad, Rajender and Varghese, Eldho (2014). Data analysis and interpretation.
- Panwar, Sanjeev and Arya, Prawin (2014). Forecast Modelling Analytics in Crops.
- वर्गीस, सिनी एवं भौमिक, अर्पण (2014). एस.पी.एस.एस. द्वारा आंकड़ों का विश्लेषण.

## INVITED LECTURES DELIVERED

- Dr. Dinesh Kumar, Invited by Central Institute of Fisheries Education (CIFE), Mumbai to teach Fish Bioinformatics Courses to M.F.Sc and Ph.D. students during April 29-30, 2014.
- Dr. Sudeep delivered a lecture on IPv6 and Migration from Ipv4 to Ipv6 in DARE/ICAR during a Workshop on IPv6 at CSSRI, Karnal on 16 May 2014.
- Dr. Tauqueer Ahmad delivered a lecture on Resampling techniques for complex survey data at Department of Statistics & Operations Research, Aligarh Muslim University (AMU), Aligarh on June 28, 2014 as a visiting faculty.

## PAPERS PRESENTED

- Brainstorming National Workshop on Crop Insurance organized by the Department of Agriculture & Cooperation at Mahalanobis National Crop Forecast Centre, Pusa Campus, New Delhi on 15 May, 2014.
  - Sud, UC - Relevance of small area estimation techniques in the context of crop insurance.

## Participation

### Conferences / Workshops / Trainings/ Seminars / Symposia etc.

- Workshop on National Crop Insurance Programme: Challenges and Opportunities on April 01, 2014 at New Delhi. (Dr UC Sud)
- Workshop on 'Ipv6 Road Show cum Hands-on-Workshop' organized by ERNET India at India Habitat Centre, Lodhi Road, New Delhi on April 15, 2014. (Dr. Mukesh Kumar)
- Workshop on PME in NARS: Status, Experiences and Way Forward organized jointly by NAIP, ICAR and IFPRI on May 27, 2014 at NASC Complex, New Delhi. (Dr. UC Sud and Dr. Seema Jaggi)
- Workshop on All India Coordinated Research Project on Long Term Fertilizer Experiments held at CSK Himachal Pradesh Krishi Viswa Vidyalaya, Palampur during June 02-03, 2014. (Dr. LM Bhar)
- International Workshop sponsored by DST India and National Commission for Scientific and Technological Research CHILE on "Big Data Handling" from June 04-06, 2014 at BITS Pilani, Goa Campus. (Dr. Anil Rai)
- Workshop on Impact of Capacity Building Programme under NAIP at NASC, New Delhi during June 06-07, 2014. (Dr. UC Sud, Sh. SD Wahi and Dr. AK Paul)

## Meetings

- Second Working Group Meeting of All India Survey on Higher Education at Shastri Bhawan, chaired by Joint Secretary, Department of Higher Education, Mr. RP Sisodiya on April 01, 2014. (Dr. Sudeep)
- Mid Term Review meeting on the follow up of Action Taken Report of the XXII Meeting of the ICAR Regional Committee V on April 23, 2014 at CSSRI, Karnal. (Dr. UC Sud)
- Meeting of Ipv6 – Ministry Transition Task Force/Team (DARE/ICAR) at Krishi Bhawan, New Delhi on April 24, 2014. (Dr. Mukesh Kumar)
- Meeting at Mahalanobis National Crop Forecasting Centre (MNCFC) campus, Pusa, New Delhi to discuss the remote sensing issues of IASRI, project proposal relating to horticultural crops and the proposed CHAMAN project to be taken up by MNCFC in order to synergize the two proposals to be funded by Department of Agriculture and Cooperation (DAC), Ministry of Agriculture (MoA), Govt. of India held on April 30, 2014. (Dr. UC Sud and Dr. Tauqueer Ahmad)
- Meeting of the monitoring committee of "Supply and Installation of Wi-fi and wired network" on June 18, 2014 at DKMA, New Delhi. (Dr. Sudeep)
- Meeting on Market Intelligence on June 24, 2014 at NCAP, New Delhi (Dr. RK Paul)
- XXXII Group Meeting of the All India Coordinated Research Project on Vegetable Crops, Varanasi organized at IGKV, Raipur during June 24-27, 2014. (Dr. Rajender Parsad)

## CONSULTANCY /ADVISORY SERVICES PROVIDED

- Sh. Cousin Musvosvi, Ph.D. Student, Department of Genetics & Plant Breeding, University of Agricultural Sciences, Dharwad on the analysis of alpha lattice designs to evaluate 72 maize hybrids in one experiment, and 28 maize hybrids in another experiment. The advice was given regarding the SAS Code to be used for the analysis and how to use Indian NARS Statistical computing Portal.(Dr. Rajender Parsad)
- Shri R. Balaji Naik, Ph.D. (Agronomy), S.V. Agricultural College, Tirupati, ANGRAU, Hyderabad on the analysis of data generated using a Strip -Split Plot Design. and Dr. CM Parihar, Scientist (Agronomy), DMR, New Delhi on how to compute percentage increase or decrease in yield over the years using data



from an experiment conducted using a split plot design with three main plot treatments (Zero tillage, Permanent Bed and Conventional tillage) and four sub treatments (Maize-wheat-mungbean, Maize-chickpea-sesbania, Maize-mustard-mungbean and Maize-maize-sesbania) cropping systems and three replications. (Dr. Rajender Parsad)

- Dr. Sujit Sarkar, Scientist, Division of Agricultural Extension, IARI, New Delhi on the use of logistic regression analysis to study the adaptive behavior of farmers in the state of Himachal Pradesh and Rajasthan respectively by taking into account different structural, socio-cultural, psychological and personality variables. A stepwise logistic regression analysis has been performed to identify the most significant variables affecting the adaptive behavior of farmer. A high percentage of correct classification have been observed in both the states respectively. (Dr. Arpan Bhowmik)
- Ms. Mayanka, a Research Scholar from Lady Irwin College, Delhi University on the use of Kendall's tau correlation coefficient for measuring the relationship between several socio-economic variables like sex, family type, education, age, marital status, employment, income length of stay in the village. (Dr. Arpan Bhowmik and Dr. Eldho Varghese)
- Developed maps for the total population of cattle, buffaloes, yak, mithuns, bovines, sheep, goats, horses & ponies, mules, donkeys, camel, pigs etc for Department of Animal Husbandry, Govt. of India. (Dr Prachi Misra)
- Ms. Meenu Gupta, student M.Sc. (Floriculture) on the use of Repeated Measurement ANOVA for data on different bio-chemical parameters observed over a period of time. (Dr. Susheel Kumar Sarkar)
- Dr. TV Prasad, Senior Scientist, NBPGR on the use of Probit analysis to obtain LD50 and LD99 value of electron beam on pulse beetle. The probit analysis was performed separately for five different insect stages of pulse beetle viz. egg stage, early larva stage, middle larva stage, late larva stage and pupa stage. The experiment consists of seven different doses of electron beam. (Dr. Arpan Bhowmik)

## PERSONNEL

### Congratulations on your Promotion

Name	Designation	Effective Date
Dr. Dinesh Kumar	Principal Scientist	28.08.2012
Sh. Surat Ram	PS	28.05.2014
Sh. Mukesh Kumar	UDC	28.05.2014 (AN)
Sh. Satyavir Singh-I	UDC	28.05.2014 (AN)
Smt. Rakhi Soni	UDC	28.05.2014 (AN)

### Transfer to IASRI

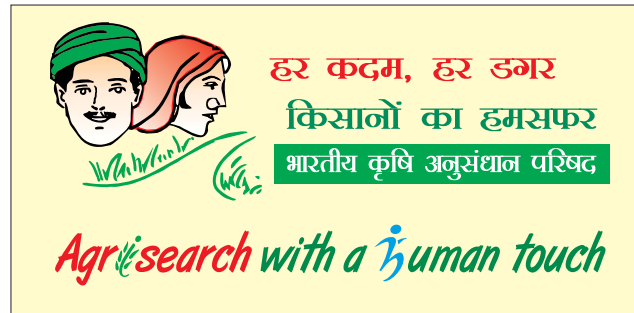
Name	Designation	Effective Date
Sh. AK Manchanda	AO	25.04.2014

### Wish you Happy Retired Life

Name	Designation	Effective Date
Sh. Tribhuvan Rai	Scientist	30.04.2014
Sh. Mahesh Chand	PA	30.04.2014
Smt. Meena Nanda	Chief Technical Officer	31.05.2014
Sh. Surender Singh	Chief Technical Officer	31.05.2014
Sh. Devender Pal Singh	Chief Technical Officer	30.06.2014

### Others

- Dr. AK Chaubey, Head, Computer Application deputed as Warden, IASRI w.e.f. 24 May 2014.
- Sh. Pal Singh, Scientist deputed to look after the work of National Agricultural Science Museum (NASM) w.e.f. 13.05.2014.



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