

# IASRI NEWS

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INDIAN AGRICULTURAL STATISTICS RESEARCH INSTITUTE ( ICAR ), LIBRARY AVENUE, PUSA, NEW DELHI-110 012



## From Director's Desk . . . .

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

In National Agricultural Research System, some experiments are conducted to study the effect of soil erosion on crop yield. In such experiments, the soil erosion is done artificially at different levels in different experimental plots and their effect is seen on the yield. A design in minimal number of experimental units that provides all possible pairwise treatment comparisons called minimally connected design has been developed. Minimally connected designs are also useful for the experimental situations, where the experimental units are scarce. A catalogue of minimally connected designs with some extra observations has been prepared.

Another study is on Semi-Latin squares. Semi-Latin squares are quite useful for the experimental situations, where there are two sources of heterogeneity in experimental units that may influence the response variable and have more than one unit in each row-column intersection. A large number of such experimental situations occur in consumer tasting, glass house crops, residual effect experiments, sugar beet trials, food industry, organoleptic evaluation, etc. Semi-Latin squares are also useful for obtaining fractional factorial plans. A new method of construction of Semi-Latin squares based on initial column solution has been developed.

A twenty one days training programme under Centre of Advanced Studies and an International study tour/training programme on "Development of Agricultural Statistics System" for the participants from Timor Leste was organised, the programme was sponsored by Food & Agriculture Organisation (FAO), Rome. A two days Hindi Karyashala was also organised at the Institute.

The Institute also participated in number of meetings/conferences/symposia/workshops, etc. It is hoped that the contents of this document would be informative and useful for scientists in NARS. Any suggestions for further improving the contents of the newsletter would be highly appreciated.

(SD SHARMA)

## IN THIS ISSUE

- Research Achievements
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### निदेशक की कलम से . . . .

समाचार पत्र के इस अंक में प्रतिवदेनाधीन अवधि के दौरान कुछ विशिष्ट अनुसंधानिक एवं प्रशिक्षण सम्बन्धी उपलब्धियों तथा अन्य महत्वपूर्ण गतिविधियों पर प्रकाश डाला गया है। राष्ट्रीय कृषि अनुसंधान परीक्षणों में फसल उपज पर मृदा अपरदन के प्रभावों का अध्ययन करने के लिए कुछ परीक्षण किए जाते हैं। ऐसे परीक्षणों में विभिन्न परीक्षणात्मक प्लॉटों में विभिन्न स्तरों पर कृत्रिम रूप से मृदा अपरदन किया जाता है और उपज पर उसके प्रभाव देखे जाते हैं। मिनिमली कनेक्टेड डिजाइन द्वारा न्यूनतम परीक्षणात्मक इकाईयों की सहायता से सभी संभावित युगलतः उपचार तुलनाएं की जा सकती हैं। मिनिमली कनेक्टेड डिजाइन उन परीक्षणात्मक परिस्थितियों में भी उपयोगी होती है जिनमें परीक्षणात्मक इकाईयां बहुत ही कम हैं। कुछ अतिरिक्त परीक्षणात्मक इकाईयों सहित मिनिमली कनेक्टेड डिजाइन का एक कैटलॉग भी तैयार किया गया है।

एक दूसरा अध्ययन सेमि-लैटिन स्क्वेयर पर किया गया है। सेमि-लैटिन स्क्वेयर ऐसी परीक्षणात्मक परिस्थितियों में बहुत उपयोगी होते हैं जिनमें परीक्षणात्मक इकाईयों में विषमांगता के दो स्रोत हैं जो अनुक्रिया चरों को प्रभावित कर सकते हैं और जिनमें प्रत्येक पंक्ति-स्तंभ प्रतिच्छेदन (इन्टरसेक्शन) में एक से अधिक इकाई होती है। इस प्रकार की परीक्षणात्मक परिस्थितियां उपभोक्ता टेस्टिंग, ग्लास हाउस फसलों, अवशिष्ट प्रभाव परीक्षणों, चुकन्दर के अभिप्रयोगों, खाद्य उद्योगों, ऑर्गनोलेप्टिक मूल्यांकन इत्यादि में उत्पन्न होती है। सेमि-लेटिन स्क्वेयर बहु-उपादानी क्रमगुणित योजनाएं प्राप्त करने के लिए भी बहुत उपयोगी है। प्रारम्भिक स्तंभ सोल्यूशन पर आधारित सेमि-लेटिन स्क्वेयरों के निर्माण की एक नई विधि विकसित की गई है।

उच्च अध्ययन केन्द्र के अन्तर्गत एक 21 दिवसीय प्रशिक्षण कार्यक्रम और टाइमोर लेस्टे के प्रतिभागियों के लिए “डिवेलपमेन्ट ऑफ एग्रिकल्चरल स्टैटिस्टिक्स सिस्टम” पर खाद्य एवं कृषि संगठन (एफ.पी.ओ.), रोम द्वारा प्रायोजित एक अन्तरराष्ट्रीय अध्ययन दौरा/प्रशिक्षण कार्यक्रम आयोजित किया गया। संस्थान में एक दो दिवसीय हिन्दी कार्यशाला का भी आयोजन किया गया।

संस्थान द्वारा अनेक बैठकों/सम्मेलनों/संगोष्ठियों/कार्यशालाओं इत्यादि में भी सहभागिता की गई। आशा है कि इस अंक की विषयवस्तु एन.ए.आर.एस. के वैज्ञानिकों के लिए सूचनाप्रद एवं उपयोगी होगी। समाचार-पत्र की विषयवस्तु में भावी सुधार लाने के लिए आपके सुझावों का स्वागत है।

  
(सुखदेव शर्मा)

## RESEARCH ACHIEVEMENTS

- In National Agricultural Research System, some experiments are conducted to study the effect of soil erosion on crop yield. In such experiments, the soil erosion is done artificially at different levels in different experimental plots and their effect is seen on the yield. Artificial creation of soil erosion is quite difficult to be made. Moreover, this also amounts to destroying some of the upper layers of the soil from a part of the land. Therefore, it is always better to plan such experiments in the minimum possible number of experimental units. To ensure that all pairwise treatment comparisons are possible in a block design, the minimum number of experimental units required is equal to one less than the sum of the number of blocks and treatments. A design in minimal number of experimental units that provides all possible pairwise treatment comparisons is called a minimally connected design. Minimally connected designs are also useful for the experimental situations, where the experimental units are scarce. The basic objection to the use of minimally connected designs in agricultural experimentation is that they do not provide an estimate of error. Therefore, to get an estimate of error, some modifications in these designs are required to be made, possibly by adding some more experimental units. Keeping these problems in mind, a catalogue of block designs with  $n = v + b - 1 + i$ ,  $i = 1, 2, \dots, 8$  observations has been prepared, where  $v$  is the number of treatments;  $b$  the number of blocks;  $k$  is the block size and  $n$  is the total number of experimental units. Block contents along with lower bounds to A- and D-efficiencies are also given.
- A Semi-Latin square is an arrangement of  $v = nk$  symbols in  $n^2k$  units arranged in  $n$  rows and  $n$  columns, each row-column intersection contains  $k > 1$  units and each symbol occurs exactly once in each row and column. Semi-Latin squares are quite useful for the experimental situations, where there are two sources of heterogeneity in experimental units that may influence the response variable and have more than one unit in each row-column intersection. A large number of such experimental situations occur in consumer tasting, glass house crops, residual effect experiments, sugar beet trials, food industry, organoleptic evaluation, etc. Semi-Latin squares are also useful for obtaining fractional factorial plans. A new method of construction of Semi-Latin squares based on initial column solution has been developed. This method yields semi-regular group divisible designs after



ignoring the row and column classifications. Preece, D.A. and Freeman, G.H. (1983, *J. Royal. Statist. Soc.*, **28**, 154-163) reported that for  $k=2$ ,  $n=6, 8, 10$  could not be obtained by rearrangement in Semi-regular group divisible designs. Three new Semi-Latin squares with  $k=2$ ,  $n=6$ ;  $k=2$ ,  $n=8$  and  $k=2$ ,  $n=10$  which cannot be constructed by rearrangement of the designs given in Clatworthy, W. H. (1973, Table of two-associate partially balanced designs. NBS Applied Maths Series No. **63** Washington D.C.) can be obtained. Further, the Semi-Latin squares with  $k=2$  and  $n>10$  can also be obtained from the proposed method of construction.

#### HUMAN RESOURCE DEVELOPMENT

- An International study tour/Training programme on “Development of Agricultural Statistics System” for the participants from Timor Leste was organised at the Institute during 06-11 March 2006. The programme was sponsored by Food & Agriculture Organisation (FAO), Rome. Dr HVL Bathla was the Course Director.
- A twenty one days training programme on “Development of Portals using LAMP Technology” was organized during 01-21 February 2006. The topics covered were Introduction to Portals, Linux Operating System, Apache Web Server, MySQL Database Server and PHP Server Side Script. The training programme was attended by 15 participants from various ICAR Institutes and State Agricultural Universities. Sh KK Chaturvedi was the Course Director.



#### PANORAMA OF ACTIVITIES

- Two meetings of the Grievance Committee were held on 01 January and 28 February 2006 under the Chairmanship of Prof. SD Sharma, Director, IASRI.
- The meeting of Staff Research Council (SRC) was held on 17 February 2006 to review the progress of ongoing research projects.



- The meeting of the Management Committee was held on 01 March, 2006 under the Chairmanship of Prof. SD Sharma, Director, IASRI.



#### PARTICIPATION OF INSTITUTE IN VARIOUS MEETINGS, ETC.

The Institute participated in the following Conferences/Trainings/Meetings:

- 93<sup>rd</sup> Indian Science Congress at ANGRAU, Hyderabad during 03-07 January 2006.
- Map India 2006 during 30 January to 01 February 2006.
- The International Conference on “Social Science Perspective in Agricultural Research and Development” organized at IARI, New Delhi by Voluntary Action for Research Development & Networking (VARDAN), International Food Policy Research Institute (IFPRI) and Indian Society of Extension Education during 15-18 February 2006.
- Brain storming session on “Low and declining crop response to fertilizers”, held at National Academy of Agricultural Sciences, NASC Complex, New Delhi during 20-21 February 2006.
- National Conference on “Agriculture for Kharif Campaign – 2006” organized by DOAC, Ministry of Agriculture at NASC Complex during 21-22 February 2006.



- National Convention on “Knowledge-Driven Agricultural Development: Management of Change”, organized by ARS Scientists Forum at IARI, New Delhi during 24-26 March 2006.
- 37<sup>th</sup> meeting of the Programme Advisory Committee on Mathematical Sciences of DST to review the progress of ongoing projects funded by DST at B.M. Birla Science and Technology Centre, Jaipur during 03-04 March 2006.
- Training programme on “Net Technologies” organized at IASRI, New Delhi by New Horizons India Ltd.
- Technical Advisory Committee meeting for implementation of NAIS at Krishi Bhawan, New Delhi on 21 March 2006.
- Workshop on “Modern Office Management” at Goa organised by National Productivity Council, New Delhi during 20-24 March 2006.

### हिन्दी कार्यशाला

- संस्थान में दिनांक 27-28 मार्च, 2006 के दौरान “कार्यालय प्रक्रिया और आँकड़ों का खरखाव” विषय पर एक दो-दिवसीय हिन्दी कार्यशाला का आयोजन किया गया। कार्यशाला में कुल 37 प्रतिभागियों ने सहभागिता की। इस कार्यशाला में संस्थान के सहायक प्रशासनिक अधिकारी, श्री डी.एन. भाटिया तथा भारतीय कृषि अनुसंधान परिषद् के निदेशक (राजभाषा), श्री एच.सी. जोशी ने व्याख्यान दिए। कार्यशाला का उद्घाटन एवं समापन संस्थान के निदेशक महोदय द्वारा किया गया।

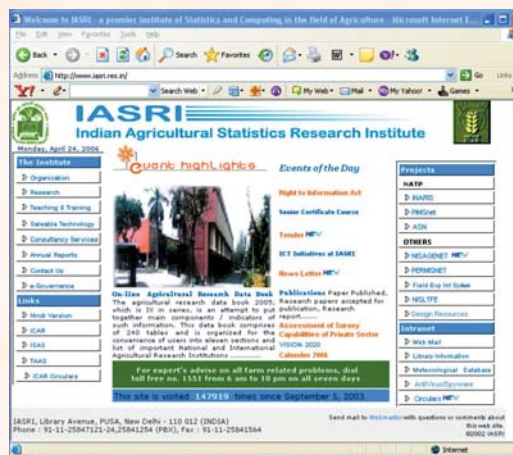


प्रतिवेदनाधीन अवधि के दौरान संस्थान द्वारा एक हिन्दी पत्रिका “सांख्यिकी-विमर्श: 2005-06” का प्रकाशन किया गया।

### COMPUTING FACILITIES

#### Wide Area Network:

- Internet services have been provided to the users and the website of IASRI is being updated regularly. This site has been visited 147919 times since 05 september 2003.



### SEMINARS DELIVERED

22 seminars on different areas of agricultural statistics and computer application were conducted.

Seminars were delivered for presenting the salient findings of the completed research projects. In addition to these seminars, students Outline of Research Work (ORW) seminars, thesis seminars and course seminars were also delivered for their requirement of M.Sc. and Ph.D. (Agricultural Statistics) and M.Sc. (Computer Application) degrees. The one guest speaker was Dr Rajiv L Karandhikar.

#### The details of Seminar Delivered

Category	Number
Student	17
Scientist	04
Outsider(Guest)	01
<b>Total</b>	<b>22</b>

### CONSULTANCY/ADVISORY SERVICES

- Dr. RK Mahajan and Dr Hanuman Lal Raiger from National Bureau of Plant Genetic Resources were advised on the combined analysis of data from augmented designs conducted at different locations and/or years
- A consultancy project for the development of ‘India Protection Index’ by NCAER, New Delhi has been taken by the Institute. A meeting with a team of NIC, New Delhi official was held on 27 February 2006 at IASRI, New Delhi.
- Discussions were held regarding design and development of agricultural data warehouse for Ministry of Agriculture, Government of India.

## AWARDS AND RECOGNITION

Dr VK Gupta was recognised for his contribution to Agricultural Statistics and was awarded the position of ICAR National Professor. In the past, he had occupied the position of Joint Director at Indian Agricultural Statistics Research Institute (IASRI) Head, Division of Design of Experiments, at IASRI; Professor (Agricultural Statistics) of P.G. School, IARI and has been the National Fellow of the ICAR. He has made significant contributions in both theoretical and applied aspects of Agricultural Statistics in general and Design of Experiments and Sampling Techniques in particular. Research carried out by him has received wide appreciation.



Dr Gupta has guided 11 research students of Ph.D. and M.Sc. in the discipline of Agricultural Statistics. He has also provided leadership in dissemination of research findings. These efforts have led to the use of many efficient designs and analytical techniques in the National Agricultural Research System. Not only Dr Gupta has been an outstanding researcher, he has been an outstanding teacher. He has taught several courses to the M.Sc. and Ph.D. students of Agricultural Statistics. He has received 'IARI Best Teacher Award' for excellence in teaching in the discipline of Agricultural Statistics. He also received the first DN Lal Memorial Lecture Award and Prof PV Sukhatme Gold Medal Award from Indian Society of Agricultural Statistics.

He has published more than 80 research papers in International and National Journals of repute, two books on design of experiments, several technical reports, popular articles, book chapters and one electronic book. The books written by Dr Gupta are being used as Text Books in many Universities. He has been an author of three monographs and has handled more than 20 research projects funded by the Institute, AP Cess Fund of the ICAR and the DST. The statistical package for block designs (SPBD) Release 1.0; Statistical Package for Factorial Experiments (SPFE 1.0) and Statistical Package for Augmented Designs (SPAD) developed by him are found to be very useful to research workers.

Director, Scientists, Technical, Administrative, other Staff and Students of Indian Agricultural Statistics Research Institute feel pride in felicitation of Dr Gupta for attaining such an honour. His honour is not only a matter of great achievement for himself but it is great recognition of the subject of Agricultural Statistics in general and Indian Agricultural Statistics Research Institute in particular.

## LECTURES DELIVERED

The Scientists of the Institute delivered the following Invited Lectures at various Institutes

- "Statistical Issues in Genetic Evaluation under Newer Reproductive Technology in Cattle Breeding Improvement Programme" in the National Training Programme on "Molecular and Quantitative Genetic Techniques for Livestock Improvement" at NDRI, Karnal during 03-23 January 2006.
- "Hidden Markov Model in Biological Sequence" at National Workshop cum Training Programme on Bioinformatics Center for Aquaculture at CIFA, Bhubneshwar during 07-10 February 2006.
- "RS and GIS integrated spatial sampling approach for crop acreage and production estimation" in the DOS sponsored Winter School on "Remote sensing with special emphasis on linkage of RS with simulation models for agri-production estimates & land use planning" during 22 March to 15 April 2006.
- SPSS for analysis of large scale survey data at National Council of Applied Economic Research on 22 March 2006.
- "Multivariate Techniques: An Overview", "Time Series Analysis" and "Regression Analysis under Constraints and SPSS: An Overview" in a training course on "Agricultural Development Policy" organized under Centre of Advanced Studies during 24 February to 16 March 2006 at Division of Agricultural Economics IARI, New Delhi.

## PUBLICATONS

### Research Papers Published

- Dash, RC, Sirohi, NPS and Tyagi, KK (2005). Selection of optimum sizes of agricultural machinery- a case study. *J. Agric. Eng.*, **42** (4), 32-41.
- Ghosh, Himadri, Sunilkumar, G and Prajneshu (2005). Mixture non-series analysis: modelling and forecasting. *Cal. Statist. Asso. Bull.*, **57**, 225-226.
- Gupta, AK and Narang, MS (2005). Effect of fertilizer, irrigation and insecticides on the yield of vegetables. *Iaquarius. Int. J. Agril. Statist. Sci.*, Muzaffar Nagar (UP), **1(1&2)**, 35-40.
- Kaur, Rajinder, Kumar, Anil and Farooqui, Samir (2005). Statistical assessment of different rice (*oryza sativa*) varieties-based crop sequences. *Ind. J. Agril. Sci.*, **75** (8), 501-503.
- Kar, Abhijit, Chandra, Pitam, Parsad, Rajender and Dash, SK (2005). Mass transfer during osmotic dehydration of banana slices (Dwarf Cavendish). *J. Agril. Eng.*, **42(3)**, 42- 49.



- Kumar, Amrender and Bhar, Lal Mohan (2005). Forecasting model for yield of Indian mustard (Brassica Junes) using weather parameters. *Ind. J. Agril. Sci.*, **75(10)**, 688-690.
- Narang, MS, Sud, UC and Gupta, AK (2005). Estimation of finite population regression coefficient in repeat surveys. *Int. J. Agril. Statist. Sci.*, Muzaffar Nagar (UP), **1(1&2)**, 1-9.
- Narang, MS, Sud, UC and AK Gupta (2005). Estimation of seemingly unrelated regression in random coefficient model with unequal numbers of observations. *Int. J. Agril. Statist. Sci.*, Muzaffar Nagar (UP), **1(1&2)**, 101-105.
- Parsad, Rajender, Gupta, VK and Gupta, Sudhir (2005). Optimal designs for experiments on two-line and four-lines crosses. *Utilitas Mathematica*, **68**, 11-32.
- Parsad, Rajender and Subrata, Satpati Kumar (2005). Nested block designs for comparing test treatments with a control. *Utilitas Mathematica*, **68**, 271-281.
- सीमा जग्गी, डी.पी. हांडा, ए.एस. गिल एवं एन.पी. सिंह (2005) कृषिवानिकी परीक्षण का सांख्यिकीय मूल्यांकन। *भारतीय कृषि अनुसंधान पत्रिका*, 20( 2 व 3 ), 40-45.
- Sud, UC, Sethi, SC, Mathur, DC and Sharma, SK (2005). A comparative study of crop cut estimates and farmer's estimates in Sirsa district of Haryana state, *Haryana Eco. J.*, **XXV (1-2)**, 77-82.
- Sethi, SC, Mathur, DC and Sharma, SK (2005). Price spread & marketing pattern of vegetable crops in Pune. *Haryana Eco. J.*, **XXV (1-2)**, 137-138.
- Sethi, SC, Das, Bhagwan and Sud, UC (2005). A note on regression estimator, *Haryana Eco. J.*, **XXV (1-2)**, 153-155 .
- Ahmad, T, Singh, R and Rai, A (2006). Comparison of bootstrap methods for missing survey data: A simulation study, *Int. J. Model Assisted Statist. and App.* **1 (1)**.

#### Research Papers Accepted for Publication

- Arora, Alka, Singh, Balbir, Dahiya, Shashi and Farooqi, Mohd.Samir. Planning and Distribution of ICAR manpower through Personnel Management Information System (PERMISnet). *J. Ind. Soc. Agril. Statist.*
- Ghosh, H, Iqbal, M and Prajneshu. Mixture non-linear time series modelling and forecasting for ARCH effects. *Sankhya*.
- Kumar, Amrender and Bhar, Lal Mohan. Forecasting model for yield of India Mustard (Brassica junea) using weather parameters. *Ind. J. Agril. Sci.*
- Prajneshu and Chandran, KP. Computation of compound growth rate in Agriculture: Revisited. *Agric. Eco. Res. Rev.*
- Sarika, Wah, SD and Rao, AR. A study on the robustness of estimates of genetic correlation. *Ind. J. Anim. Sci.*
- Wah, SD, Bhatia, VK and Rao, AR. Study of statistical properties of genetic correlation using bootstrap technique. *Ind. J. Anim. Sci.*

#### Forthcoming International Conference on Statistics and Informatics in Agricultural Research

Diamond Jubilee Celebrations of  
Indian Society of Agricultural Statistics

(27-30 December 2006)

#### The Conference will be Focused on Six Major Themes

- Theme 1:** Statistical Application in Agricultural Research.
- Theme 2:** Emerging Issues in Areas of Basic Statistical Research.
- Theme 3:** Agricultural Informatics.
- Theme 4:** Statistical and Computational Biology in Agriculture.
- Theme 5:** Statistical and Economic Issues for Prosperity of Rural Community.
- Theme 6:** Human Resource Development for Agricultural Statistics and Informatics.

#### Conference Website:

<http://www.iasri.res.in/icsi2006>

#### Saleable Technologies

- Statistical Package for Factorial Experiments (SPFE 1.0)
- Statistical Package for Agricultural Research (SPAR 2.0)
- Statistical Package for Augmented Designs (SPAD)
- Statistical Package for Block Designs (SPBD 1.0)
- Statistical Package for Animal Breeding (SPAB)



A view of the meeting of  
Staff Research Council (SRC)

### Research Paper Presented in the Conference

- Brain storming session on “Low and declining crop response to fertilizers”, held at National Academy of Agricultural Sciences, NASC Complex, New Delhi during 20-21 February 2006.
  - Fertilizer Response Ratios.
- 93rd Indian Science congress held at ANGRAU, Hyderabad, during 03-07 January 2006.
  - Statistical Modelling Techniques for Describing Indian Marine Fisheries Production Data.
  - Some aspects of estimation of heritability of herd life.
  - Forewarning models for pests in cotton.
- Conference of Map India 2006 during 30 January to 01 February 2006.
  - Remote Sensing and GIS based sampling methodology for estimation of crop area in North- Eastern Hilly Region.
- International Conference on Social Science Perspectives in Agricultural Research and Development held during 15-18 February 2006 at IARI, New Delhi.
  - Expert System on Wheat Crop Management: An effective tool for transfer of technology and information on management.
  - Identifying insects through Expert System on Wheat Crop Management.
  - Development of livelihood index for different agro-climatic zones in India.

### PERSONNEL

#### Appointments

- Sh Prem Singh appointed as LDC w.e.f. 03 January 2006.

#### Transfer

- Sh Vinod Kumar, AAO, relieved on 27/02/2006 to join NCAP, New Delhi.

#### Welcome our new colleagues

- Sh MS Vashistha, AAO, joined the Institute after being relieved from NCAP, New Delhi w.e.f. 24/02/2006.

#### Congratulations on your promotion

- Dr Himadri Ghosh, Scientists(SS) w.e.f. 30/09/2003
- Sh Bahvnesh Kumar (T-4) w.e.f. 01/01/03
- Smt Sudershan Chaddha (T-4) w.e.f. 01/01/03
- Sh K K Kesari (T-2) w.e.f. 25/04/03
- Sh Ramesh Chand (T-2) w.e.f. 25/04/03
- Sh Hari Singh (T-2) w.e.f. 25/04/03
- Sh Ramnaresh Yadav (T-2) w.e.f. 25/04/03

#### Deputation

- Sh Anil Kumar Sharma(Assistant), relieved to join Kalawati Saran Hospital as Administrative Officer w.e.f. 06/02/2006

#### We wish you a happy retired life

- Dr Randhir Singh, Principal Scientist, w.e.f. 31/01/2006
- Smt Swatantra Munjal (T-5) w.e.f. 31/01/06
- Sh Daya Chand Dahiya (T-7-8) w.e.f. 28/02/06
- Sh Ramesh Kumar (T-7-8) w.e.f. 31/03/06

फार्म संबंधी सभी समस्याओं पर विशेषज्ञ की सलाह के लिये प्रातः 6.00 बजे से रात 10.00 बजे तक सभी सातों दिन टोल फ्री नम्बर 1551 पर डायल करें।

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Prof. S.D. Sharma  
Director, IASRI (ICAR), Library Avenue, Pusa,  
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