

# IASRI NEWS

Volume 10

No. 1

April – June, 2005



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



## From Director's Desk . . . .

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

In the project "Developing remote sensing based methodology for collection of agricultural statistics in Meghalaya" a pilot study has been conducted to develop a suitable survey methodology for estimation of area under paddy crop in Rhi-boi district of Meghalaya. In this study LISS III images of IRS 1D and IRS P6 satellites have been used.

The design resources server has been initiated and launched on the web site of the Institute. The main objective of this design resources server is to develop a WEB DESIGN in NARS.

For the task force on Balanced use of fertilizers, fertilizer response ratios were obtained using the data pertaining to an experiment conducted to find out the response of N, P and K under different sub agro-ecological zones/NARP zones under the aegis of Project Directorate of Cropping Systems Research, Modipuram.

Two days National Workshop on long term mechanization strategies for different agro-climatic zones/states was organised at NASC Complex, New Delhi.

A Sensitization cum Requirement Analysis Workshop on NISAGENET, for the institutions located in the Northern region of the country was 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
- Human Resource Development
- Panorama of Activities
- Participation of the Institute in Various Meetings
- Awards and Recognition
- Computing Facilities
- Seminars Delivered
- Consultancy/Advisory Services
- Publications
- Personnel

### निदेशक की कलम से . . . . .

समाचार पत्र के इस अंक में प्रतिवेदनाधीन अवधि में प्रमुख अनुसंधानिक एवं प्रशिक्षण संबंधी उपलब्धियों और संस्थान की अन्य गतिविधियों पर प्रकाश डाला गया है।

“मेघालय में कृषि सांख्यिकी एकत्र करने के लिए सुदूर संवेदन आधारित पद्धति का विकास” परियोजना जिसके अन्तर्गत मेघालय के री-बोई जिले में धान की फसल के अन्तर्गत क्षेत्रफल के आकलन हेतु उपयुक्त सर्वेक्षण पद्धति के विकास के लिए एक मार्गदर्शी अध्ययन किया गया। इस अध्ययन में IRS 1D एवं IRS P6 LISS III से प्राप्त चित्रों का उपयोग किया गया है।

डिज़ाइन रिसोर्सेज सर्वर का विकास करके उसे संस्थान की वेब साइट पर डाल दिया गया है। इस डिज़ाइन रिसोर्स सर्वर का मुख्य उद्देश्य नार्स में एक वेब डिज़ाइन का विकास करना है।

उर्वरकों के संतुलित उपयोग हेतु गठित कार्यदल के लिए उर्वरक अनुक्रिया अनुपात प्राप्त किए गए। जिसके लिए फसल प्रणाली अनुसंधान परियोजना निदेशालय, मोदीपुरम के तत्वावधान में विभिन्न उप-सस्य-पारिस्थितिकीय क्षेत्रों/एन.ए.आर.पी. क्षेत्रों के अन्तर्गत N, P और K के प्रभाव का अध्ययन करने के लिए किए गए परीक्षण से प्राप्त आँकड़ों का उपयोग किया गया।

विभिन्न सस्य जलवायवीय क्षेत्रों/राज्यों के लिए दीर्घकालीन यान्त्रिकीकरण नीति पर एन.ए.एस.सी. परिसर, नई दिल्ली में एक दो दिवसीय राष्ट्रीय कार्यशाला आयोजित की गई।

देश के उत्तरी क्षेत्र में स्थित संस्थाओं के लिए निसएजनेट पर सक्रियकरण एवं आवश्यकता विश्लेषण पर संस्थान में एक कार्यशाला आयोजित की गई।

संस्थान द्वारा अनेक बैठकों/सम्मेलनों/संगोष्ठियों/कार्यशालाओं इत्यादि में प्रतिभागिता की गई। आशा है कि इस अंक की विषयवस्तु नार्स में कार्यरत वैज्ञानिकों के लिए सूचनाप्रद एवं उपयोगी होगी। इस समाचार पत्र की विषयवस्तु में भावी सुधार लाने के लिए आपके सुझावों का स्वागत है।



(सुखदेव शर्मा)

## RESEARCH ACHIEVEMENTS

- Under the project “Developing Remote Sensing based Methodology for Collection of Agricultural Statistics in Meghalaya” a pilot study has been conducted to develop a suitable survey methodology for estimation of area under paddy crop in Rhi-boi district of Meghalaya. In this study, LISS III images of IRS 1D and IRS P6 satellites have been used. The area under paddy has been obtained by Maximum Likelihood Classification Method. But due to undulating



topography of the region, misclassification errors, topographic geometry, sun-synchronous sensors, there is significant difference of area under crop in the image and actual area under crop on the ground. In order to rectify the area under paddy crop due to undulating topography and misclassification errors, relationship between area under paddy in the classified image and actual area under paddy crop on the ground has been established. The problem of topographic geometry, sun-synchronous sensors has been tackled by conducting sample survey in the buffer created along selected roads in GIS environment. The roads are conceptually divided into grids of 500 X 500 m<sup>2</sup>, which act as the sampling units. Two estimators have been developed to estimate the area under paddy in this buffer zone. One estimator is based on all surveyed grids (Method I) and the other estimator is based on only those grids, which contain the area under paddy crop (Method II). Further, the vector layer of this buffer was overlaid on the satellite classified image and the corresponding area from the image was extracted. Using these estimates, the area under paddy in the entire district has been estimated as 7204 ha (Method I) and 7215 ha (Method II) with standard error of 5.88 and 9.24, respectively.

- Under the project “Combined Analysis of Experiments on Long-range Effect of Continuous Cropping and Manuring on Soil Fertility and Yields Stability” at Rewa centre, in kharif season (1978-79 to 2003-04), various treatments were tried and out of these NPK(120:80:40) was found to be most productive in terms of grain yield of 41.23 q/ha followed by NPK(120:80:0) (mean yield = 40.06 q/ha). Control treatment gave lowest mean yield (19.3 q/ha). In terms of monetary return, treatment NPK(120:80:0) gave maximum return (Rs.11,510.29) followed by NPK(120:80:40) (Rs. 11,065.35).

In rabi season treatment NPK(120:80:40) gave maximum grain yield of 33.48 q/ha followed by NPK(120:80:0) (30.06 q/ha) with monetary returns as Rs. 11,270.23 and Rs. 10,323.00, respectively.

- The design resources server has been initiated and launched on the web site of the Institute. The main objective of this design resources server is to develop a WEB DESIGN in NARS. At present material on Binary Balanced Block Designs and Designs for making Test Treatments - Control Treatment(s) comparisons along with Electronic Book on Design and Analysis of Agricultural Experiments are available on this site. A discussion board has also been created.
- For the task force on Balanced use of fertilizers, fertilizer response ratios were obtained using the data pertaining to an experiment conducted to find out the response of N, P and K at different sub agro-ecological zones /NARP zones under the aegis of Project Directorate of Cropping Systems Research, Modipuram 1999-2000. The experiment is being conducted with following five treatments:

Treatment Number	Treatment Details
T <sub>1</sub>	Control
T <sub>2</sub>	Recommended Dose of N
T <sub>3</sub>	Recommended Dose of NP
T <sub>4</sub>	Recommended Dose of NK
T <sub>5</sub>	Recommended Dose of NPK

Data generated from this experiment for the years 1999-2000, 2000-2001, 2001-2002 and 2002-2003 has been used for the computation of 8 different Fertilizer Response Ratios viz. N over control; NP over control; NK over control; NPK over control; P over N; P over NK; K over N; K over NP. Response ratios for cereals, pulses, oilseeds and foodgrains at state and country level have been evaluated for different nutrients and their combinations and response ratio at country level is as given in Table 1. The percentage increase in yield were also obtained and are given in Table 2.

- Under Planning, Designing and Analysis of Experiments Planned on Station under PDCSR, at one of the CSR centre Ranchi, experiment was conducted during Kharif 2003-04 to assess the performance of different intercropping systems with a set of 15 treatments. Four crops viz. blackgram,

soyabean, groundnut and rice were sown as intercrops with maize and pigeonpea as main crop. Maize and pigeon pea among themselves were also intercropped. All the six crops were sown as sole crops. Maize + Groundnut with Maize as the main crop also gave maximum net profit of Rs. 19,714 (cost of produce-fertilizer cost) among the five systems. However, when pigeonpea was taken as main crop, it gave the highest net profit of Rs. 28,619.

#### HUMAN RESOURCE DEVELOPMENT

- A training program on SPSS for two persons from NBRI, Lucknow was organised during 13-18 June 2005 under resource generation programme and an earning of Rs.10,000/- was made.
- भारतीय कृषि सांख्यिकी अनुसंधान संस्थान वैज्ञानिक वर्ग के लिये "विशेष हिन्दी प्रशिक्षण कार्यशाला" १६-१८ जून २००५ को आयोजित की गई।

#### PANORAMA OF ACTIVITIES

- Three monthly meetings of Senior Officers of the Institute (SOM) were held on April 06, May 06 and June 13, 2005, respectively under the Chairmanship of the Director to discuss the monthly progress of research activities of the Institute.
- Two days National Workshop on long term mechanization strategies for different agro-climatic zones / states was organised during 15 -16 April 2005 at NASC Complex, New Delhi. Representatives from the State Governments, State Agro Industrial



Table 1 : Response ratios for different crop groups (All India)

Crop Groups	Area 000 ha (2000-01)	Average Control yield (kg/ha)	Average Response Ratio ( kg/ha )							
			N	NP Over Control	NK	NPK	P Over N	NK	K Over N	NP
Cereals	99757	1803	8.56	8.97	8.66	8.63	10.02	11.29	9.16	10.85
Oilseeds	23250	897	8.53	5.19	6.91	5.37	4.48	5.48	6.02	7.88
Pulses	20026	586	8.11	7.53	8.97	7.12	7.22	5.95	12.09	5.32
<b>Food grains</b>		1485	8.50	8.15	8.42	7.89	8.73	9.60	9.06	9.59

Table 2 : Percentage increase in yield for different crop groups (All India)

Crop Groups	Area 000 ha (2000-01)	Average Control yield (kg/ha)	Average Response Ratio ( kg/ha )							
			N	NP Over Control	NK	NPK	P Over N	NK	K Over N	NP
Cereals	99757	18034	6.76	74.27	65.80	96.34	18.38	18.09	12.74	12.51
Oilseeds	23250	897	30.74	63.39	50.59	87.57	24.02	24.17	14.62	14.48
Pulses	20026	586	33.38	99.24	58.08	116.97	48.23	37.75	18.62	9.70
<b>Food grains</b>		1485	42.28	75.99	62.25	97.80	23.48	21.83	13.87	12.44

Corporations, Farm Machinery Testing and Training Institutes, Private Organisations, Award winning Farmers, Farm Mechanisation Experts and officials from the DOAC, Ministry of Agriculture, GOI, participated in the Workshop. Long term mechanization strategies proposed at National as well as Agro Climatic Zone / State level were presented and discussed in the Workshop.

- In order to disseminate the findings of the research project “Modelling for forecasting of crop yield using weather parameters and agriculture inputs” a Dissemination Workshop was organised at the



Institute on 20 May 2005. The participants of the workshop included many eminent research workers. Dr Nawab Ali, DDG(Eng.) was the Chief Guest.

- The fourth Sensitization cum Requirement Analysis workshop on NISAGENET, for the institutions located in the Northern region of the country, was organised, at Indian Agricultural Statistics Research Institute, Pusa, New Delhi during 07-08 June 2005. Nodal Officers of north zone and Scientists from various organizations attended the Workshop. Dr. S.D. Sharma, Director, IASRI, New Delhi presided over the inaugural function. Dr. S. Nagarajan, Director, IARI, New Delhi was the Chief Guest of the inaugural function. Dr VK Gupta, Joint Director, IASRI, New Delhi welcomed the participants to the workshop.



The broad objectives of this workshop were:

- Sensitization of the policy makers, managers and other administrators about the need of timely providing the information as per NSC recommendations.
- Establishing Linkages between Coordinating NISAGENET Unit and participating organizations and their sub-centers.

- Definition of Data requirements of NISAGENET.
- To discuss and finalise the schedules designed for data collection from the basic sources.
- To discuss the requirement analysis document for possible improvements.
- To emphasize on technical support in designing and preparation of annual statistical report publications.
- To emphasize that the Internet connectivity, computers and manpower assistance be provided by the SAU concerned to the local NISAGENET Unit.

The valedictory function was chaired by Dr. HS Nainawatee, ADG(HRD II), ICAR, New Delhi. Dr. RC Goyal, PI, briefly highlighted the key features discussed in the three workshops organised at RAU, Samastipur, MPUA&T, Udaipur and TNAU, Coimbatore.

- The 51<sup>st</sup> meeting of the Management Committee was held on 24 June 2005 under the chairmanship of Prof. SD Sharma, Director, IASRI. The following agenda items were discussed in the meeting:
  - Confirmation of the proceedings of the 50<sup>th</sup> meeting of the management committee held on 17.8.2004.



- Review of action taken on recommendations of the 50<sup>th</sup> meeting of the management committee held on 17.8.2004.
- Allotment of funds for works/equipment to be purchased/executed during 2005-06.
- Airconditioning facilities for Library.

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

- One scientist participated in a meeting with ADG(Engg.) and Dr. S.M. Ilyas, Director, CIPHET regarding a survey to be undertaken on assessment of harvest and post harvest losses under the All Indian Coordinated Research Project on Post Harvest Technology, held on 02 April 2005.
- One scientist participated in the Coordination Committee meeting of the All India Coordinated Research Project on Post Harvest Technology held at CIPHET, Ludhiana during 11-13 April 2005 and also, co-chaired a Technical Session.
- Director, Joint Director and Scientists of the Institute participated in the meeting of the Executive Council of the ISAS held under the Chairmanship of Secretary, DARE and DG, ICAR at ICAR committee room, New Delhi on 26 April 2005.

- One scientist attended a meeting on 25 and 26 April 2005 for discussion on sampling methodology, commodities to be covered and preparation of schedules for proposed All India Survey on assessment of harvest and post-harvest losses by AICRP centers.
- Two scientists from the Institute attended the 4<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> meeting of the Task Force on Balanced Use of Fertilizer held on 05 April, 30 April and 16 May 2005, respectively at Krishi Bhawan, New Delhi. In these meetings the response ratios of N, P, K and micro-nutrients obtained from the experiment conducted on farmers' fields were discussed.
- One scientist attended the meeting of Technical Committee on Progeny Testing at Department of Animal Husbandry, Chandigarh, Punjab.
- Various Scientists of the Institute attended a meeting with DDG (Engg.) for reviewing the progress of Agricultural Research Data Book 2005 on 12 May 2005.
- One scientist from the Institute attended the Meeting of the Committee constituted to finalize evaluation of Bt. Cotton entries into AICRP on 17 May 2005 at NASC complex. The committee was chaired by Dr KC Jain, ADG and other members were Dr OP Dubey, ADG(OP), Dr BM Khadi, Director, CICR, Dr T. P. Rajendran, Project Co-ordinator, AICRP on Cotton, Dr Ananth Kumar, Principal Scientist, IARI. In this meeting resolvable block designs (alpha, lattice, etc.) have been recommended for these trials. For these trials, it was decided that the plot size would be 4 rows of 6 m length. The spacing will depend upon the package of practices for the centre recommended and the experiment will be conducted in 3 replications with atmost 25 entries including 3 checks. There will be two separate experiments one for breeding trials (with regular spray) and other as plant protection trial (without any spray).
- Scientists of the Institute attended the Executive Council Meeting of the Society of Statistics, Computers and Applications held at IASRI, New Delhi on 04 May 2005.
- Various scientists of the Institute attended a three day 'Hindi Prashikshan Karyashala' organized by the Hindi Section of the Institute at IASRI, New Delhi during 16-18 June 2005.
- One scientist attended the meeting at Coconut Development Board, Kochi on 22nd June, 2005 and presented a paper on "Methodology and Other Related Issues in Estimating Cost of Cultivation of Coconut".

#### 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 65254 times since 5 September 2003.

#### SEMINAR DELIVERED

15 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

#### The details of Seminar Delivered

Category	Type of seminar	Number
Student	Course	5
	ORW	1
	Thesis	4
Scientist	Project completion	1
Outsider	Guest	4

were also delivered for their requirement of M.Sc. and Ph.D. (Agricultural Statistics) and M.Sc. (Computer Application) degrees.

#### CONSULTANCY/ADVISORY SERVICES

- The following Consultancy/Advisory services were provided to various Agricultural Universities and ICAR institutes regarding analysis of data:
  - A second order response surface design for 4 factors each at 4 equi-spaced levels in 80 design points has been recommended for an experiment related to development of rotating screen grader for selected orchard fruit crops (Ber, Lemon and Aonla) to obtain the optimum combination of levels of rotating speed, diameter of screen, input and length of screen at Division of Agricultural Engineering, Indian Agriculture Research Institute, New Delhi.
  - Dr Ravinder Kaur, National Fellow, IARI, New Delhi was advised on fitting of exponential decay model and interpretation of results.
  - Dr. S.C. Dube, Senior Scientist, Division of Pathology, IARI, New Delhi was advised on the use of multiple comparison procedure.
  - Dr. B.S. Tomar, Senior Scientist, Division of Seed Technology, IARI, New Delhi was advised on the analysis of data of the experiment conducted to study the effect of season, planting time and plant density on seed yield and quality of cucumber. The experiment was conducted in factorial randomized complete block design (4 dates of planting and 4 plant densities in 3 replications). The experiment was conducted in two seasons viz. spring and summer to study the seasonal variation in seed yield and quality. Observations were recorded on the following 14 characteristics: days to first female flower, number of fruits per plant, fruit weight, fruit length, number of seeds per fruit, seed yield per fruit, seed yield per plot, 1000 seed weight, germination %, root length, shoot length, seedling length, seedling dry weight. First, the data were analyzed for each of the characters in both the seasons separately. Error variances were tested for heterogeneity and data of both the seasons were analyzed as per procedure of analysis of groups of experiments.
  - In the meeting of the Committee constituted to finalize the Bt. cotton entries into AICRP, discussions were held on the problem of using randomized complete block designs in the agricultural experiments. As a follow up action, Dr. B.N. Khadi, Director, CICR, Nagpur asked the

scientists of the Institute to conduct their experiments using resolvable incomplete block designs. As a consequence, Dr. V. Santhy, from Division of Crop Improvement, Central Institute of Cotton Research, Nagpur, was advised on the designing of four experiments to be conducted with cotton varieties.

## PUBLICATONS

### Research Papers Published

1. Choudhary, RK, Bathla, HVL and Sud, UC (2005). Non-response in sampling over two occasions. *J. Ind. Soc. Agril. Statist.*, **53(3)**, 331-343.
2. Jaggi, Seema and Pateria, DK (2005). Multivariate analysis of data from agroforestry experiments. *Proceedings of the National Symposium on Agroforestry in 21st Century*, 71-75.
3. अनुपमा, राजेश कुमार, अनिल कुमार एवं बलताज सिंह परमार (२००५)। "पानी सोखने की अद्भुत क्षमता है हाईड्रोजैल्स में" - कृषि चयनिका, जनवरी-मार्च, (१८-१९)।
4. Kar, Abhijit, Chandra, Pitam, Parsad, Rajender and Dash, SK (2004). Microwave drying of button mushroom (*Agaricus bisporus*). *J. Food Sc. and Tech.*, **41(6)**, 636-641.
5. Menon, Pramila, Gopal, Madhuban and Prasad, Rajender (2005). Effects of chlorpyrifos and quinalphos on dehydrogenase activities and reduction of Fe<sub>3+</sub> in the soils of two semi-arid fields of tropical India. *Agric. Ecosystems Environment*, **108**, 73-83.

### Research Papers Accepted for Publication

1. Varghese, Cini, Jaggi, Seema, Sharma, VK and Singh, UV. On use of partially balanced incomplete block designs in partial diallel crosses. *Ind. J. Genetics*.
2. Rathore, Abhishek, Parsad, Rajender and Gupta, VK. Computer aided search of efficient block designs for making all possible pair-wise treatment comparisons. *J. Statist. and Appli.* A publication of 'Forum of Interdisciplinary Mathematics'.
3. Sarkar, Subhra, Parsad, Rajender and Gupta, VK. Outliers in block designs for diallel crosses. *Metron*.
4. Prasad, Rajender, Kageyama, Sanpei and Gupta, VK. Use of complementary property of block designs in PBIB designs. *ARS Combinatoria*.
5. Devi, Memita, Bathla, HVL, Sud, UC and Sethi, SC. Estimation of finite population regression coefficients. *J. Ind. Soc. Agril. Statist.*, New Delhi.
6. Pateria, DK, Jaggi, Seema, Batra, PK, and Gill, AS (2005). Modeling the impact of fruit trees on crop productivity. *Ind. J. Agric. Sc.*
7. Islam, SN, Farooqi, Mohd. Samir and Agarwal, Hariom. Expert systems: a boon for the farming community. *Agric. Extn. Rev.*
8. Farooqi, Mohd. Samir, Singh, Balbir, Dahiya, Shashi and Arora, Alka. PERMISnet: e-solution for the Management of Agricultural Research Personnel in ICAR. *Agric. Extn. Rev.*
9. Dash, Ch. Jyotiprava, Sarangi, A, Singh, AK, and Dahiya, Shashi. Biodrainage: An Alternative Technique to Control Water logging and Salinity. *J. Soil and Water Cons.*, New Delhi.
10. Kaur, Rajinder, Kumar, Anil and Farooqui, Samir. Statistical assessment of different rice varieties based crop sequences. *Ind. J. Agril. Sc.*
11. Thomas, G, Mohapatra, T, Swain, SC, Rao, AR and Sharma, RP. Discrimination of commercial wheat varieties using RAPD based DNA finger printing. *Ind. J. Biotech.*

## Forthcoming Training Programmes Under Centre Of Advanced Studies

Programme	Course Director
Data-Driven Web Solution using Open Source Technology (17-09-2005 to 07-10-2005)	Vipin Kumar Dubey
Recent Advances in the Analysis of Survey Data (18-11-2005 to 08-12-2005)	K K Tyagi
Statistical Techniques for Agricultural Research with Emphasis on use of Softwares (20-12-2005 to 10-01-2006)	Seema Jaggi
Development of Portals using Lamp Technology (01-02-2006 to 21-02-2006)	K K Chaturvedi

## Saleable Technologies

Statistical Package for Block Designs (SPBD 1.0)

Statistical Package for Factorial Experiments (SPFE 1.0)

Statistical Package for Agricultural Research (SPAR 1.0)

Data Book



Ms. Radha Singh, IAS During National Workshop on long term mechanization strategies for different agro-climatic zones / states

12. Wahi, SD, Singh, Pal and Chand, Lal. An improved measure of distances among different genetic groups of Indian Goats. *Ind. J. Dairy Sc.*

#### PERSONNEL

##### Transfers

- Shri Anil Kumar Agrawal, AF&AO, relieved on 16-04-2005.

##### Welcome to our new colleagues

- Smt. Satyawati Tripathi AF&AO, joined the Institute after being relieved from NRCPB, New Delhi w.e.f. 19-04-2005.
- Sh. Sanjay Kant, SAO, joined the Institute after being relieved from ICAR, Head Quarter, New Delhi w.e.f. 01-06-2005.

#### Congratulations on your promotion

- Dr. (Smt.) Sushila Kaul, Senior Scientist, w.e.f. 29-05-2000
- Dr. AK Gupta, Senior Scientist, w.e.f. 25-04-2004
- Sh. Hukum Chandra, Scientist Senior Scale, w.e.f. 19-12-2002
- Smt. Alka Arora, Scientist Senior Scale, w.e.f. 27-11-2003
- Dr. Dharam Raj Singh, Scientist Senior Scale, w.e.f. 22-01-2004
- Sh. Vinod Kumar, AAO, w.e.f. 29.06.2005
- Sh. Sunil Bahrioke, PA, under ACP scheme of ICAR, w.e.f. 19-12-2004

#### OBITUARY

The Director, Staff and Students of IASRI deeply condole the death of Sh. Balraj Singh, Technical Officer who expired on June 05, 2005.

फार्म संबंधी सभी समस्याओं पर विशेषज्ञ की सलाह के लिये प्रातः ६.०० बजे से रात १०.०० बजे तक सभी सातों दिन टोल फ्री नम्बर १५५१ पर डायल करें ।

For expert's advise on all farm related problems, dial toll free number 1551 from 6 am to 10 pm on all seven days

**Published by RCMU on behalf of :**

Prof. S.D. Sharma

Director, IASRI (ICAR), Library Avenue, Pusa,  
New Delhi-110 012 (INDIA)

**E-mail:** director@iasri.res.in

**Website:** www.iasri.res.in

**Phone:** 011-25841479

**Fax:** 011-25841564