QUARTERLY NEWSLETTER OF INDIAN AGRICULTURAL UNIVERSITIES ASSOCIATION

VOLUME 8 No. 4

CONTENTS

New VC

Dr M.L. Chaudhary, VC, RAU, Pusa

Focus on Universities

Deemed Universities

NDRI, Karnal A profile: NDRI, Karnal

Universities

CCSHAU, Hisar

DBSKKV, Dapoli

DYSPUHF, Nauni, Solan

IGKV, Raipur **JNKVV**, Jabalpur

MPKV, Rahuri

MAU, Parbhani

SDAU, Sardarkrushinagar

SKUAST, Jammu

Awards and Recognition

AAU, Anand **DBSKKV**, Dapoli MAU. Parbhani SDAU, Sardarkrushinagar **SVBPUAT**, Meerut

ADVISORY BOARD

Dr S.A. Patil President

Prof. (Dr) Rajendra B. Lal Vice-President & Secretary-Treasurer

Dr Anwar Alam Member

Dr C. Ramaswamy Member Dr M.L. Madan Member

EDITORIAL BOARD

Dr R.P. Singh **Executive Secretary, IAUA** Dr J.S.P. Yadav Ex-Chairman, ASRB **Dr Baldev Singh** Jt Dir. (Extn), IARI Shri R.S. Gupta Ex-Editor (English), ICAR Shri C. Thomas Editor (English), IARI

NEW VC

Dr M.L. Chaudhary takes over as new VC, RAU, Pusa

Dr M.L. Choudhary, born on 4 January 1953, obtained Doctorate in Horticulture from BHU (1980) with post-Doctorate (1992) from Israel. He started his career as Scientist at ARS, Koobod (1979-1989); Bee and then joined as Assitant Prof. at RAU, Pusa (1980-1986); Senior Scientist (1986-1996); Head, Div. of Olericulture (1996-2000), and Head, Div. of F.L.S. (2000-2005); IARI Horticulture Commissioner GoI; Executive Director, Bee Board; and finally V.C, RAU, Pusa. He has vast administrative and managerial experience as Chairman, MCCIH, CDB, TCNPGOP etc. He received several awards for outstanding contributions to horticultural research and development like FLOREX; Pravasi Ratna Samman; B.P., Gupta Medal, Ayurved Vigyanaharya award; two gold medals; Overseas Fellowship from DBT etc. He is also member of professional societies dealing with horticulture. He has authored more than 226 papers and published 18 books and bulletins



OCTOBER - DECEMBER 2008

Dr M.L. Choudhary

Focus on Universities : Achievements and Events

DEEMED UNIVERSITIES

National Dairy Research Institute, Karnal

Workshop on Patent and IPR Awareness

A workshop on Patent and IPR Awareness was held at NDRI, Karnal on 16 October 2008. More than 100 scientists from ICAR institutions at Karnal and Karnal Regional Station of CCS, HAU (Hisar) participated in the workshop. In his inaugural address Dr Srivastava, Director, NDRI, Karnal, emphasised the importance of patenting and IPR in the modern era of globalization. He regretted that we have not been able to fully protect our traditional knowledge of medicines, biodiversity and Indian heritage due to lack of awareness. Scientists in India do not have the aptitude and training for patenting as they are interested mainly in publishing their research papers in some good journals. He cited the examples of neem, garlic and basmati rice, where patenting has been done on many useful properties by western countries.

Dr A.K. Dhawan, Director (Technical), Patent Information Centre, Haryana, stressed the need to suitably award the inventors of new technologies. Patenting of vaccines and other life-saving drugs should not make them too costly. Dr Y.D. Panwar, Principal Scientific Officer, Patent Facilitation Centre, TIFAC, New Delhi, explained the introduction of patenting systems in India in the wake of WTO, GATT and TRIPS. He also told that 80% of the technical information is published only in the patents and does not appear in scientific journals. Therefore, the scientists must seek information from the published patents also. He told that TIFAC provides free search of patent information to help the scientists in filling their patents. Leading patent lawyers and experts including Mr Gautam Bhattacharya, Dr Usha Rao and Dr (Mrs) L. Balasubramanyam made presentations in their areas of specialization. The speakers covered the issues of procedural requirements for patenting in India, novelty and inventiveness in patents and patenting in biotechnology. The valedictory function was chaired by Dr B.K. Joshi, Director, NBAGR, Karnal. He stressed that this type of programmes should be conducted on regular basis to bring more awareness and update the scientists on various changes introduced from time to time.

Emerging opportunities for commercialization in dairying

A national seminar was inaugurated by Dr V.K. Taneja, VC, GADVASU, Ludhiana on 6 and 7 November 2008, which was organized by NDRI in collaboration with its Alumni Association. More than 400 dairy scientists, teachers, industrialists and entrepreneurs from different parts of the country participated in the seminar. There were four technical sessions. Posters were also presented by the young scientists to showcase and explain their research on emerging technologies and issues pertaining to specialized dairy production, dairy processing and economics including marketing.



Dr. V.K. Taneja releasing the souvenir

In the inaugural address Dr Taneja highlighted the role of buffaloes in milk production in our country. He told that buffalo milk accounts for more than 55% of total milk in the country and hence, buffalo should receive the kind of priority it deserves. Dr N. Balaraman in his keynote address reviewed the scenario of chronic shortage of feeds and fodders in the country. Dr A.K. Srivastava stressed the need to meet the requirement of concentrates in the animal ration. He said that projected demand for the concentrate feed is around 50 million tonnes per annum, but the present market size is around 6 million tonnes only.

Eminent speakers, experts and thinkers included Dr C.S. Prasad, ADG, ICAR, New Delhi; Dr Arun Atre, MD, Sarabhai Zydus, Ahmedabad; Dr P. Ranganathan, GM, NABARD; Prof. (Dr) Subrato Kar, Bharati School, IIT, Delhi;

IAUA Office : 1G-2 CGIAR Block, NASC Complex, Dev Prakash Shastri Marg, Pusa Campus, New Delhi 110 012 For IAUA visit: www.iauaindia.org

Telefax: (0) 011 - 25842422

E-mail: esiaua@yahoo.com.in

Dr Abdul Samad, Dean, Bombay Veterinary College, Mumbai; Mr Mukesh Gupta, MD, Morarka Foundation, Jaipur; Dr S.A. Karim, Director, CSWRI, Avikanagar; Mr Praveen Dang, Sales Manager (South Asia), Orana India, Gurgaon; Mr Devraj Dabas, Britannia and Dr (Mrs) Smita Sirohi, Principal Scientist, NCAP, New Delhi. There were a number of delegates from the dairy industry, viz. Nestle, Mother Dairy, Horlicks, GSK, Wockhardt, Punjab and Haryana Dairy Federations, as well as private dairies. The valedictory function was chaired by Dr N. Balaraman, former VC of TANUVAS, Chennai.

AGROWEB project

A national workshop on Assessment needs of website of animal sciences and dairy science, education and research, along with transfer of technology was organized at NDRI, Karnal during 3-4 October 2008 under the aegis of Agroweb subproject funded by NAIP, It was attended by 75 participants drawn from partner institutes, associate institutes, nominated scientists from various disciplines at the NDRI, Karnal, progressive farmers and representatives from dairy industry besides the project team.

Dr M.J. Modayil, Member, ASRB, inaugurated the workshop as its chief guest, Dr N.T. Yaduraju, National Coordinator, Component-I, NAIP, was the guest of honour. Dr R.C. Agrawal, PI, Agroweb Project, introduced the main objectives and activities of the agaroweb project. Dr A.K. Srivastava, Director, NDRI, welcomed the participants and guests. The

programme included four technical sessions, viz. Issues for web-content development and management; Farmer, industry and institute interface; Content development for agricultural and dairy education; and Web-content development for animal sciences. The plenary session was held at the end. In each session, 4-5 presentations were made. The overall recommendations emerged from the workshop are summarized below.

- 1. All the ICAR institute websites should have uniform URLs and should be affordable and sustainable.
- 2. Databases should be shared through AGROWEB.
- 3. All the university activities should be online with centralized control system in place.
- 4. Information for farmers should be given high priority on the proposed Website of Animal Science and Dairy Research and Education along with Transfer of Technology.
- 5. Information should be made available on latest economically viable technologies along with methodology, package of practices of animal management, information on animals to be auctioned, database on livestock market, success stories, superior germplasm, sources of semen availability, fodder-seed availability, solutions to farmers' problems (between developers, resource persons and stake-holders), milk-product prices, information about progressive farmers, cost of milk production etc., along with forthcoming events such as training, seminar and conferences, products or patents, awards, consultancy etc.

Dairy functional foods and nurtraceuticals

Dairy Microbiology Division of National Dairy Research Institute, Karnal, organized winter school on Advances in microbiology, chemistry and technology of dairy functional foods and nutraceuticals during 1-2 November 2008, to provide advanced training to the scientists and teachers. The school was inaugurated by Dr Nagendra Sharma, former VC, SKAUAT, Jammu, with a keynote address by Dr A.K. Srivastava. The topics dwelt on the production and healthful effects of functional biomolecules such as folate, bacteriocins, bioactive peptides, biothickeners, low-calorie sugars and biosurfactants of lactic acid bacteria. The concept and application of prebiotics, probiotics and synbiotics dominated the proceedings. Technology and chemistry of a number of functional dairy foods developed at NDRI such as low-cholesterol milk products, bioactive cheeses, and probiotic *dahi* was shared with the participants. Dr R.P. Singh, Executive Secretary, Indian Agricultural Universities Association, New Delhi, graced the valedictory function as chief guest and distributed the



Dr R.P. Singh distributing certificates to participants

certificates to participants. He opined that functional dairy foods are a novel concept and is in infancy stage in India. The Indian consumers will be benefited by these functional dairy products, whereas the dairy farmers will get better returns through introduction of such value-added dairy products.

& Profile

NATIONAL DAIRY RESEARCH INSTITUTE: A PROFILE

Historical perspective

The NDRI, Karnal was originally started as Imperial Institute of Animal Husbandry and Dairying in 1923 at Bangalore. It was expanded and renamed Imperial Dairy Institute in 1936, and then National Dairy Research Institute after Independence in 1947. Subsequently, NDRI headquarter was



Administrative block of NDRI

shifted to Karnal in 1956. Facilities at Bangalore were retained to function as a Regional Station to serve the southern states. In 1964, the Eastern Regional Station was established at Kalyani in West Bengal. Both these Regional Stations continue to provide region-specific R&D support for dairy development in these areas. In 1970, NDRI was brought under the wings of ICAR to provide greater operational autonomy to the institute in research-management functions. In 1989, the status of Deemed University was conferred to it for further strengthening the academic programmes for human resource development.

The NDRI, as the premier dairy research institution, undertakes research, teaching and extension activities towards dairy development in the country. Being a national institute, it conducts basic and applied research to improve animal productivity and develop cost-effective technologies for the benefit of the teeming millions. Further, it provides high-quality manpower to help meet the human-resource requirements for the overall dairy development in the country. The institute also undertakes extension programmes for transferring the know-how from the laboratory to the farmers' fields.

Milestones

1923 Established in Bangalore as Imperial Institute of Animal Husbandry and

Dairying.

- 1936 Renamed Imperial Dairy Institute; a 2year Indian Dairy Diploma course was started.
- 1956 National Dairy Research Institute came into existence at Karnal.
- 1961 B.Sc. Dairying bifurcated into two branches, viz. B.Sc. (Dairy Technology) Gandhi ji and Pt Madan Mohan Malviya at NDRI, Bangalore
- and B.Sc. (Dairy Husbandry); M.Sc. Dairying courses commenced at Karnal. 1962 Western Regional Station established at Bombay.
- 1964 Eastern Regional Station established at Kalvani (W.B.).
- 1904 Eastern Regional Station established at Raiyani (W.D
- 1975 Operational Research Project initiated.
- 1985 Farm Advisory Bureau and Industrial Consultancy Cell set up. The institute was recognized as Centre of Excellence in Animal Biotechnology.
- 1987 Embryo Biotechnology Centre established.
- 1989 The institute granted Deemed to be University status; M.Sc. in Biotechnology started.
- 1990 Birth of Pratham, first IVF buffalo calf of the world.
- 1991 A 20-bed hospital complex was set up and made functional; National Agricultural Research Project was funded through World Bank.
- 1994 The institute got recognition as Centre of Advanced Studies in Dairy Technology and Dairy Cattle Breeding.
- 1996 A 2-year National Dairy Diploma (NDD) course introduced at Southern Regional Station of NDRI at Bangalore; the ICAR award (1993-94) for outstanding KVK conferred on the KVK located at NDRI.





Dr M. J. Modayil, Member ASR, Inaugurating of the workshop

1997 A state-of-the-art auditorium made functional, having seating capacity of 950 persons, and conference rooms and meeting rooms.

A commercial Model Dairy Plant with a capacity of 60,000 litres/day commissioned for providing practical training to the students of NDRI university and to serve as an interface between institute and industry.

- 1998 A modern cafeteria with a seating capacity of 150 persons was constructed in front of the institute hostels at the cost of 29 lakhs.
- 1999 Total 9 NATP projects with financial outlay of 266.25 lakhs were initiated.
- 2000 NDRI bagged the Best Annual Report Award for the second time in succession for the years 1996-97 and 1997-98 in the category of Large ICAR institutes.



Declaration of Deemed-to-be-University

status for NDRI (1989)

2002 International Students' Hostel equipped with modern facilities and amenities constructed at NDRI, Karnal.

- 2003 State-of-the-art milking parlour system introduced in cattle section.
- 2004 First IVF goat kid born at NDRI.
- 2006 New Animal Biotechnology Centre commissioned.
- 2007 Creation of Video-conferencing Laboratory and Mini Auditorium.
- 2008 Golden Jubilee of Dairy Science College celebrated.

Eleven NAIP projects were initiated with an outlay of Rs20 crores.

Mandate

- 1. Conducting research in the areas of Dairy Production, Processing and Marketing.
- Demand-driven 'Human Resource Development' to meet the requirements of Dairy Industry and R&D institutions.
- 3. Dissemination of innovative dairy production and processing technologies for socio-economic transformation.

Research divisions or sections

The institute has 3 major areas of R&D activities, viz. (i) Dairy Production, (ii) Dairy Processing, and (iii) Dairy Extension or Management. All the activities are managed through 11 research divisions or sections, viz. Dairy Cattle Breeding, Dairy Cattle Nutrition, Dairy Cattle Physiology, Animal Biochemistry, Animal Biotechnology, Dairy Technology, Dairy



DG, ICAR, appreciating dairy animals

Engineering, Dairy Chemistry, Dairy Microbiology, Dairy Economics, Statistics and Management, and Dairy Extension at the main station; and its two regional stations. Being a national institute, it has mandate to conduct research and teaching programmes that can benefit the entire country. However, its Southern and Eastern Regional Stations are focusing research on region-specific problems in the respective states.

Livestock farm

The institute possesses an elite herd of 1,600 dairy animals including cattle, buffaloes and goats, catering to breed-improvement projects and other research activities. The highest peak yields of 44 and 46.5 kg milk/day have been recorded in Karan Swiss and Karan Fries animals respectively. Through consistent selection, the indigenous cattle breeds Sahiwal



Inauguration of International Conference on Traditional Dairy

and Tharparkar have been improved, giving the highest peak yields of 23 and 19.5 kg milk/ day respectively. In Murrah, the best buffalo breed in the world, the peak milk yield of 22.5 kg/milk/day has been achieved.

Model dairy plant

The Model Dairy Plant with the state-of-the-art equipment and process automation having processing capacity of 60,000 litres milk/day has ISO 9002 and HACCP certifications. The plant has been established with collaboration of NDDB to provide hands-on training facilities to the B. Tech. students of NDRI Deemed University, and for scientists to carry out scaling up of operations for products and processes developed in the research laboratories.

Significant research achievements

Dairy production

Two strains of cattle, Karan Swiss and Karan Fries, developed by cross-breeding,

followed by selection.

 Through scientific breeding and progeny testing programme, Murrah buffalo bulls having superior milk-producing ability have been produced. Under Network Project on Buffalo Improvement, fifth set of 15 Murrah bulls were progeny tested. Bull No. 4,393 from NDRI, Karnal was ranked first with sire index of 3,187 kg, based on daughters' first lactation milk yield.



Dr C. D. Mayee, Chairman, ASRB, inaugurating Reveeroie 2008

- Cytogenetic profiles of various breeds of cattle, buffaloes and goats elucidated.
- Development of Hansa test for detection of adulteration of cow milk with buffalo milk.
- Development of Degcure for curing Degnala disease.
- Urea molasses block lick developed for use as a good source of nitrogen and minerals to cattle during scarcity period.
- Bypass protein technology developed for meeting the nutrient needs of highyielding animals.
- Protocol for induction of lactation in indigenous cows and buffaloes developed.
- Procedures developed and standardized for oestrus synchronization and superovulation using different hormone combinations in cattle and buffaloes.
- Ten calves produced from a single donor cow in 1 year's time through ETT.
- Protocol for embryo-transfer technology standardized for cattle and buffalo.
- The world's first *in-vitro* fertilized buffalo calf Pratham born at NDRI. Since then, more buffalo calves using this technology have been produced.
- Protocols for transferring IVF goat embryos to synchronized recipient goats using laparoscopy standardized, resulting in the birth of first *in-vitro* fertilized goat kid in the country at NDRI.
- The hormones, hormone receptors, growth factors and aromatase genes from buffalo characterized using molecular biology methods.
- A stem-cell like population from buffalo embryos produced.
- Efficacy of ovsynch for oestrous induction in buffalo under field conditions evaluated.
- A large animal treadmill for cattle and buffaloes fabricated for experimentation on work capacity to determine draught animal power in bullocks. This treadmill is the only one of its kind in India and South East Asia.
- Highly sensitive antiserum against progesterone was developed.
- Biochemical processes involved incapacitation, acrosome reaction, and semen freezing and thawing in buffalo characterized.

Dairy processing

- Developed technologies for the manufacture of a variety of indigenous dairy products, viz. *khoa* and *khoa*-based sweets, *chhena* and *chhena*-based sweets, *srikhand*, *rabri*, *paneer* etc.
- Developed several innovative ready-to-reconstitute formulations for the manufacture of *khoa*, *gulabjamun*, *rasogolla*, *kulfi*, *rasmalai*, *basundi*, *kheer*, *dalia* and *paneer* curry for adaptation on industrial scale.
- Developed formulated foods including whey-based *lassi* and flavoured drink, weaning foods based on whey or skim milk, soy-butter milk, malted milk food, whey-based soups and low-fat spreads.
- Developed new functional dairy products such as probiotic cheese, probiotic dahi, sports drinks, low-cholesterol ghee, herbal ghee, ice cream and burfi for diabetes with potential to improve human health.
- A food-grade bacteriocin-based biopreservative formulation developed for enhancing the shelf-life of *paneer* and *khoa*.
- Beneficial effect of Indian dahi validated in stimulating antioxidant status and body's immune system, and protection against enteric infection in mice challenged with Shigella dysenterae.
- A kit for detection of 12 adulterants in milk developed. with Director, NDRI
- A simple platform test for detection of synthetic milk adulteration in milk developed; also a test for establishing presence of soymilk in milk developed.
- A simple test for detection of adulteration of ghee with paraffin oil developed.
- A process for production of low-cholesterol ghee developed.

Mr Bazivamo Christophe a Minister of

Agriculture and Animal, Rwanda,

- Innovations in lactometer design and a formula for estimation of SNF in milk to suit Indian conditions undertaken.
- PCR-based kits developed for detection of food-borne pathogens in milk and milk products.
- Broad-spectrum microbial inhibition-based antibiotic-detection kit developed.
- Development of a process for conversion of ghee into recombined butter (Butter-G).
- Equipments designed for both small-scale dairy operations and mechanized production. Some of the equipments suitable for adaptation by the Indian dairy industry are continuous paneer, ghee, khoa and rasogolla - making machines.
- Designed cream-separator attachment for domestic mixies and food processors.

Dairy management

• A composite management index was developed for bovines as a determinant in enhancing milk production.



Benchmark survey and cost studies using various knowledge and management information systems conducted to estimate cost of milk production, and behaviour of milk producers and consumers.

Visit by Parliamentary Standing Committee on Agriculture

- Database structure for developing a suitable database system was developed using Visual Basic 6.0 as front-end and MS Access 97 as back-end tools.
- Developed, tested and disseminated information package on clean milk production using print media, video film, e-book and interactive multimedia.
- Developed a knowledge test for measuring level of knowledge of dairy farmers on clean milk production.

Study on cost of milk production carried out for indigenous, crossbred and nondescript cows, and buffaloes.

Extension activities

- The institute KVK, IVLP, Network Project on Buffaloes and Extension Division has adopted 35 villages for assessment and refinement of the technologies developed in Animal Breeding, Nutrition, Physiology and Management under field conditions.
- NDRI, using farming-system research approach in adopted villages, has made significant contributions to the economic prosperity of the farming communities. New scientific know-how on animal husbandry, milk and crop production were transferred through Grameen Dairy melas, Calf rallies, Veterinary camps, Women Agriculture days, Field days and various on-farm demonstrations. More than 11,000 milk-producing households under various farm-level programmes have benefited through these continuing activities.
- Krishi Vigyan Kendra and Dairy Training Centre at NDRI conduct regular training programmes for farmers and rural women. Since its inception in 1976, through 4,000 training programmes it benefited more than 60,000 rural youths, school drop-outs, farm women, farmers and ex-servicemen.
- Its Dairy Extension Division has developed ICT- based information packages in the form of video films and multimedia packages on clean milk production, hygienic milk processing and packaging, and scientific calf rearing.
- Agricultural Technology Information Centre has been serving as a single window for all the ICAR institutes located at Karnal. It provides help to farmers and other stakeholders such as entrepreneurs, extension workers, development agencies, non-government organizations and private-sector organizations to provide solutions to their problems in Agriculture and Dairying.

Technologies/Innovations/Research findings Transfer to users

In pursuance of the technology policy of Government of India, which lays stress on the development of indigenous technologies and their effective transfer to industry, a Consultancy Service Board was established at NDRI, Karnal. The Board facilitates transfer of the technologies developed on the basis of R&D work done in various laboratories for infusion of science and technology in areas of Dairy Production,



Felicitation of farmers on World Milk Day, 1 June 2008

Dairy Processing and Dairy Management on professional basis. Some of the technologies transferred to various industries and end-users during 3 years are aiven below.

Technologies Transferred or Commercialized

Agency or Firm

Palada / Payasam mix	Malabar Milk Union (MILMA).
Flavoured milk	M/s SRR, Milk and Food Products,
	Coimbatore
Herbal ghee	Punjab Sind Dairy Products Pvt. Ltd,
	Mumbai
Long-shelflife paneer	Punjab Sind Dairy Products Pvt. Ltd,
-	Mumbai
Whey-tomato soup	Punjab Cooperative Dairy Federation,
	Meerut, and HaryanaDairy Development
	Corporation
Low-cholesterol ghee	Haryana Dairy Development Corporation,
1. Chhena-kneading and ball-	Gujarat Cooperative Milk Marketing
making machine	Federation, Anand (AMUL)
2. Continuous paneer- making	
machine	
3. Rasogolla ball-making	
machine	

Milan Dairy Food (P) Ltd, New Delhi

Dairy education programmes

Acido whey soft drink

Technology

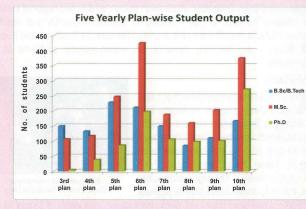
Since 1989 the institute has acquired Deemed University status, NDRI has been the main fountainhead of trained manpower for the country's expanding dairy industry. As an academic institution, the university conducts programmes leading to award of B.Tech., M.Sc. and Ph.D. degrees in 14 disciplines. The B.Tech programme



Felicitation of alumni of first batch of B.Sc. (Dairying)

especially has made significant impact on the Indian dairy industry with majority of top and middle management positions in the organized sector being occupied by the dairy professionals coming out of this institute.

Educational and training opportunities are provided to visiting scholars from various countries. Students and trainees from Nepal, Bangladesh, Afghanistan, Iran, Iraq, Myanmar (erstwhile Burma), Mauritius, Sri Lanka, Vietnam, Ethiopia, Holland, Egypt etc. have been benefited. In-plant and advanced training imparted to the faculty members from SAUs and other institutes has immensely helped in improving the quality of research and teaching in the National Agricultural Research System.



International collaoborations

The institute has linkages with several international organizations such as World Bank, IAEA, UNDP, IDF, DAAD, Volkswagen Foundation, AvH Foundation and several leading institutions in the UK, the USA, Canada, Germany, Netherlands and Australia.

Currently, many of the research programmes have inter-institutional linkages with Dep. of Biotechnology, Dep. of Science and Technology, National Bureau of Agriculturally Important Microorganisms, National Communication to United Nations Framework Convention on Climate Change, Ministry of Food Processing Industries, State Agricultural Universities and State Development Departments.



Murrah buffaloes at NDRI cattle yard

New initiatives

Research

- Genetic improvement of milch animals; development of dairy production packages for small, medium and large producers; clean milk production and quality assurance; value addition to milk and milk products, and promoting dairy enterprise through transfer of technologies.
- World Bank through NAIP has recently funded 11 research projects (with an outlay of 20 crores) in Consortium Mode, wherein NDRI is either a lead institute or a consortium partner.
- To address the burning issue of adaptation of livestock to climate changes through shelter management, an outreach project with an outlay of 9 crores has also been initiated at NDRI.
- A new initiative on collection and conservation of dairy and probiotic microbes is proposed in the XI Plan.

Infrastructure

A new state-of-the-art research facility to house Animal Biotechnology activities at NDRI has been created with a budgetary outlay of Rs 435 lakhs and 60,000 square feet laboratory space. Computerised herdmanagement system and computerized data-management system have been successfully installed at Livestock Farm.



Different dairy products prepared at NDRI

Research scholars working in laboratory

NDRI, Karnal. Video-conferencing facility has been created. Mini auditorium was constructed or renovated and made functional.

• The following laboratories and facilities were upgraded:

Animal genomics, Protein engineering and Central Instrument Laboratories at Animal Biotechnology Centre; Probiotic Starter Genetic Manipulation, Downstream Processing and Real Time PCR Laboratories in Dairy Microbiology Division. Neutraceuticals laboratory in Dairy Cattle Nutrition Division; Reproduction Physiology Laboratory in Dairy Cattle Physiology Division.

Technology Business Incubator was established with the help of Dep. of Science and Technology.

Education

Modernisation of website under NAIP Agro Web Project; Provision of Wi-fi facilities and internet connection for the students in the hostels and academic buildings, Development of education Technology Cell with state-of-the-art lecture rooms using ICT, Expansion of Experimental Dairy to strengthen hands-on training of students.

Future perspective planning till 2025

Through a road map of well-structured research projects to be taken up in basic strategic and anticipatory mode, the following research programmes will be carried out during the next 20 years.

Genetic improvement of milch animals through identification and dissemination of superior germplasm by application of emerging reproductive and molecular technologies; Development of state-of-the-art dairy production systems using better housing and fertility-management practices; Raising productivity of dairy animals through improved feeding strategies, efficient nutrient utilization and use of novel and non-conventional feed resources; Nutraceuticals from milk, functional foods with prebiotics, probiotics, micronutrients and other bioactive compounds for improved human health; Value addition to traditional milk products through application of new processes, biotechnological interventions, packaging and mechanized manufacturing system; Clean milk production with a focus on emerging health concerns and development of new-generation tools for ensuring quality control through application of newer chemical and biotechnological concepts; and Promoting dairy enterprise through transfer of technologies, improved farm financing, supply-chain management, and better market access.

UNIVERSITIES

CHAUDHARY CHARAN SINGH HARYANA AGRICULTURAL UNIVERSITY, HISAR

Extension of accreditation to CCSHAU by ICAR

The ICAR has granted extended accreditation to CCSHAU with its 7 constituent

colleges from the date of expiry of the earlier accreditation for 5 years, i.e. up to 20 August 2011. The CCSHAU is among first 4 agricultural universities that were granted accreditation by the ICAR on 20 August 2001 for a period of 5 years.

Desk for International Affairs

Chaudhary Charan Singh Haryana Agricultural University has established a Desk for International Affairs at its Directorate of Human Resource Management, to facilitate greater exchange of students and staff from CCSHAU with foreign universities. The university has signed MoUs with several foreign universities, including Michigan State University and Maryland State University of the USA and Weningen University of Netherlands. The process of signing MoUs with the research institutes and universities of Germany, France, Netherlands and Poland is in pipeline. The desk would also help in making travel and boarding arrangements for those going on exchange programmes. Two batches of final-year students of Bachelor of Veterinary Sciences (B.V.Sc.) programme have already completed their study tours with the universities of the USA.

Brain-storming on University-Industry Linkage

The IPR Cell, Directorate of Human Resource Management in collaboration with NRDC, New Delhi organized a brainstorming session on University-Industry Linkage on 17.9.2008. In this session over 60 scientists and top functionaries of 22 industries from Haryana, Rajasthan and UP pertaining to seed, malt, guar gum, rice, agricultural engineering etc. participated. Besides, ADVANTA India Ltd, Hyderabad



and DCM-Sri Ram Consolidation Ltd, New Delhi also participated. The day-long session was inaugurated by Dr J.C. Katyal, VC, and presided over by Er. Somenath Ghosh, Chairperson and MD, NRDC. On this occasion, the university technologies were displayed and a booklet *CCSHAU Technologies for Commercialization* compiled and edited by Dr R.B. Srivastava and Dr R.K. Kashyap, was released. The seed, guar gum and malt companies came forward for collaboration in research.

Farm Darshan Fair

A Farm Darshan Fair was held at the university from 18 to 19 September 2008. About 12,000 farmers from Punjab, Rajasthan, Delhi, Uttar Pradesh and Haryana thronged the fair. The farmers were shown the *kharif* crops grown by new agricultural techniques devised by the university scientists. Seeds worth Rs 65 lakhs were sold to the farmers. Besides, agriculture literature



worth Rs 20 lakhs and bio-fertilizers worth Rs 1,10,000 were sold. Thousands of farmers availed of the facility of testing soil and water. *Goshthies* and buzz sessions were organized on both the days, in which university scientists sorted out the problems of the farmers concerning agriculture and animal husbandry.

Training programme for SC youth

Department of Animal Products Technology of College of Animal Sciences conducted a training on 'Processing of meat and meat products' for SC youth of Haryana from 3.7.08 to 9.7.08. In the training, 25 participants from all over Haryana participated, and acquired knowledge on the latest technologies for development of meat and meat products. The aim was to train the students to establish their small-scale entrepreneurships through bank loans.

DR BALASAHEB SAWANT KONKAN KRISHI VIDYAPEETH, DAPOLI Honours to Dr V.B. Mehta

Dr V.B. Mehta, VC, was appointed by Shri Sharadchandraji Pawar, Minister for Agriculture, Government of India, New Delhi as Member of Management Board of Central Institute of Fisheries Education, Mumbai in July 2008. He was also elected Vice-President by the India Society of Coastal Agricultural Research, West Bengal, for a period of 3 years with effect from 30 June 2008.

Vanashri award to Animal Breeding farm

The Animal Breeding Farm, dist. Sindhudurg, a constituent centre of DBSKKV, Dapoli, received the state-level 'Vanashri Award, 2008' (second rank) from Government of Maharashtra on 11.8.2008 for its outstanding contribution in the field of afforestation and environment. Dr V.B Mehta accepted the award from Shri Balasaheb Thorat, Minister for Agriculture, and Shri Babanraoji Pachpute, Minister for Forest, at Pune.

Detection of spongy tissue in Alphonso mango

The problem of spongy tissue in alphanso mango is a major constraint in its export. The university developed a technology for its detection externally through cooperation with Central Electronic Engineering Research Institute, Chennai, and Indian Institute of Horticultural Research, Bangalore. The affected fruits can be separated easily by scanning.

Notable success in JRF 2008

Shri Mohmad Rathar and Shri Triwed Mayekar, students of College of Fisheries, Ratnagiri, ranked first and second respectively in JRF 2008, in Fisheries Faculty at national level, whereas Shri Gajanan Birhane secured first position at national level in Forestry Faculty. Miss Kirti Jalgonkar (SC category) and Shri Rajendra Gawari (ST category) ranked first and second respectively in Agricultural Engineering Faculty at national level. In all, 95 students form the university qualified for the test and 23 students received the fellowship.

DR YASHWANT SINGH PAMAR UNIVERSITY OF HORTICULTURE AND FORESTRY, NAUNI, SOLAN

Dr H.R. Gautam

Dr H.R. Gautam, Scientist (Plant Pathology), Directorate of Extension Education, attended 9th International Congress of Plant Pathology held at Torino in Italy during 24-29 August 2008. He presented a research paper entitled 'Integration of soil solarization with vesicular-arbuscular mycorrhiza and Azotobacter chrococcum for the management of sapling wilt of mango' in a session on 'Innovative methods of disease management'. In this congress, more than 2000 delegates from 80 countries participated.

G.B. PANT UNIVERSITY OF AGRICULTURE AND TECHNOLOGY PANTNAGAR

First buffalo calf born through OPU technology in the country

The first buffalo calf of the country through OPU (Ovum pick-up) technology was born to a buffalo at Instructional Dairy Farm of the university. The surrogate mother delivered a normal male calf weighing 25 kg on 28 September 2008 at 5:00 pm. The mother (M-69) was quite healthy and expelled foetal membranes within 3 hr. The calf was quite active after feeding colostrum 3 hr after birth.

Dr B.S. Bisht, VC, congratulated the team of scientists headed by Dr Shiv Prasad.

Release of new vegetable varieties

New varieties of vegetables, viz. bittergourd and vegetable pea were released by Uttarakhand State Variety Release Committee in its meeting held on 23 July 2008 at Dehra dun.

Bittergourd Pant Karela-3 with yield potential 150-160 q/ha is an early-duration and highyielding variety. It has cylindrical fruits (24 cm) of dark green colour' and is suitable for plain and hilly areas of north India.

Bottlegourd Pant Lauki-4 is a mediumduration and high-yielding variety, with yield potential 350 q/ha. It has long hairy fruits (40 cm) of light green colour with light strips. It bears heavily, and is suitable for plain and hilly areas of north India.

Pea Pant Vegetable Pea-5 is early-maturing. The plant is dwarf, with green foliage. The pods are long, well-filled and slightly curved towards the tip. Seeds are green and wrinkled at maturity. The green seeds are sweet in taste. It is resistant to powdery mildew disease. The first green pods can be picked in 60-65 days and seeds mature in 100-110 days after sowing. Its green-pod yield potential is 90-100 q/ha. The variety is suitable for cultivation in Kumaon hills and plains of Uttarakhand.

Pantvarsity stands second in 9th National Youth Parliament

Students of the university secured second position at national level and first positions at zone level in National Youth Parliament, held on 25 July 2008, at

JANA

Buffalo calf born through OPU technology



Pant Karela-3



Pant Lauki-4



Pant Vegetable Pea-5

Mavlankar Auditorium, New Delhi. Shri P.K. Bansal, Union Minister of State for Finance & Parliamentary Affairs, presented the prizes to Miss Geetika Bhargava (first), Shri Kshitij Srivastava (second), Shri Ashutosh Pant (third), Shri Komaljit Chawala (third), and Shri Gunjan Dua, Shri Manoj Kumar Joshi and Shri Ujjwal Chaube (fourth). At zonal level, Miss Geetika Bhargava received first, Shri Kshitij Srivastava the second, Shri Manoj Kumar Joshi third, and Shri Balram Bhaushan, Shri Akshay Tyagi and Shri Pawan Kumar Sharma the fourth prize.

Dr Surya Rathore, Associate Professor, Agricultural Communication, was the University Coordinator of the National Youth Parliament. The function was organized by Shri R.C. Mohanty, Under Secretary, Government of India. The prize-winning students were also given a chance to visit the Parliament and have a feel of the functioning of democracy. The function was attended by several dignitaries including many MPs and ex-MPs.

INDIRA GANDHI KRISHI VISHWAVIDYALAYA, RAIPUR Inauguration of girl's hostel and community hall



Inauguration of Girls' Hostel and Community Hall by HE. Shri E.S.L. Narasimhan, Governor, Dr C.R. Hazra, VC

H.E. the Governor of Chhattisgarh and Chancellor of the university, Shri E.S.L. Narasimhan, inaugurated the newly constructed Girls' Hostel 'Saraswati' and Community Hall on 14 July 2008. He also planted coconut sapling cv. Kera-Bastar developed by the Jagdalpur centre of the university. Dr C.R. Hazra, VC, acted as Chairman. He informed that this university is working on teaching, research and technology transfer (Extension).

JAWAHARLAL NEHRU KRISHI VISHWA VIDYALAYA, JABALPUR

New crop varieties

The university released several promising crop varieties approved for release by State Seed Sub-Committee, Government of Madhya Pradesh, Bhopal (M.P.), on 5 April 2008.

Soybean JS 97-52

The variety has maturity period 98-102 days with yield potential 25-30 q/ha. Plants attain medium height (58-60 cm) with test weight 9-10 g/100 seeds. Seeds contain balanced amount of quality protein (40%) and edible oil (20%). Seeds possess excellent germinability, field emergence and longevity during storage. The variety shows resistance to yellow mosaic virus disease, root rot, bacterial pustule, charcoal rot,



Soybean JS 97-52

cercospora leaf spot and target leaf spot as well as to insect pests and excessive moisture stress.

Gram JG 14

It matures in 100-105 days and gives an average yield of 18-19 q/ha under late-sown condition. Plant is semi-erect, having attractive pods. Seeds are brown, angular and medium bold (21 g/100 seed). It is better in milling due to its high dal recovery and is resistant to fusarium wilt, moderately resistant to dry root rot, and shows less incidence of pod borer.

Gram JG 6

It matures in 113 days with an average yield of 20-21 q/ha. Seeds are angular, smooth surfaced, dark brown and large (24.9 g/100 seeds). Plant is semi-spreading, semi-dwarf with profuse branching, low anthocyanin content and pink flowers. The variety is resistant to fusarium wilt, moderately resistant to dry root rot, and tolerant to infestation by pod-borer, and resistant to lodging and shattering.



Gram JG 14



IAUA Newsletter, October-December 2008

Wheat JW 3173

It matures in 125 days and is suitable under rainfed as well as limited irrigation and tolerant to drought. Its yield potential is higher than that of C-306 and Lok-1 under rainfed (23-25 q/ha) and limited irrigated conditions (37-40 q/ha). It is non-lodging and non-shattering, and irrigation and responsive to irrigation and fertilizers.

Hybrid Rice JRH 8

It matures in 125 days and gives 40-45% increase. The grains are long and slender, having medium amylose content, and yield 75-80 q/ha. It is best suited to areas growing Kranti and IR 64, and has potential to give higher productivity in irrigated situations, besides having tolerance to stress, resistance to lodging, and fertilizer responsiveness.

Groundnut JGN 23

The variety matures in 140 days and gives 16-18 q/ha dry pod and 11 q/ha kernel as well as 10-15% higher yield than existing varieties. Kernels are cylindrical with tan-coloured seed coat (testa). It is tolerant to tikka disease.

Kodo JK 106

Small millets are predominantly grown in waste land or less fertile land with low-cost input. The variety JK 106 is the selection from local variety, having average grain yield 19.47 q/ha. It is suitable for M.P., particularly tribal areas where kodo is under cultivation. It has 56 cm height, matures in 100 days, has 1,000-grain weight 5.0 - 5.6 g, and is resistant to head smut and shoot fly. Sole crop and intercropping gave respectively 43.5% and 45.2% more yield than the check variety.

Kutki JK 36

Kutki 36 has plant height of 91.7 cm, matures in 76 days, has 1,000-grain weight 2.1 g, and is tolerant to grain smut and shoot fly. This variety is suitable under sole cropping as well as in intercropping, giving average yield 10 q/ha.

MAHATMA PHULE KRISHI VIDYAPEETH, RAHURI

State-level Biotechnology Centre

State-level Biotechnology Centre at Rahuri was inaugurated on 2 September 2008 by Shri Balasaheb Thorat, Minister for Agriculture, Water Conservation and Kharland. Dr R.B. Deshmukh, VC, presided over the function. All the VCs of other 3 agricultural universities of Maharashtra were present as the guests of honour. Shri Thorat emphasized the importance

of biotechnology in agriculture and assured that the university as well as the scientists involved in the novel research should be benefited with the royalty.

On the occasion of inaugural function a seminar on Road-map for biotechnological research in Maharashtra was organized jointly by MPKV, Rahuri and Maharashtra Society of Genetics and Plant Breeding in the morning session.

Business management programme in agriculture

The Master of Business Management (Agriculture), a post-graduate degree programme, was launched on 8 September 2008 at College of Agriculture, Pune. The chief guest, Shri Balasaheb Thorat, in his inaugural speech emphasized the importance of the role of farmers. On this occasion, Shri Vijayroji Kolte, Vice-Chairman, Maharashtra Council of Agricultural Education and Research,



inaugurated the Wi-Fi facility at the college. Dr R.B. Deshmukh, VC, expressed that t

Wheat JW 3173

Hybrid Rice JRH 8

Groundnut JGN 23

Small millet Jk 106

Kutki JK 36

Dr R.B. Deshmukh, VC, expressed that the post-graduate students of this course, with agricultural background, have vast potential in agro-industries, private companies and corporate sectors in the state. The standard of education maintained by MPKV, Rahuri, is outstanding and futuristic in the country, which has been acknowledged through the award of Institute of Excellence with a special grant of Rs 100 crores given by the Government of India.

MARATHWADA AGRICULTURAL UNIVERSITY, PARBHANI

Felicitatation of a student

HE the Governor of Maharashtra, Shri S.C. Jamir, felicitated Shri Sagar Bhanudas Kedare, a student of Food Technology College, for securing highest marks. The student is currently pursuing post-graduate programme at CFTRI, Mysore.

Students' success in competitive examinations

In recently declared results of MPSC examination, 53 students of MAU were selected for various positions in Government service. Dr S.S. Kadam, VC, and Shri Mohan Thombre, District Collector, Parbhani, felicitated the successful students on 26 July 2008.

SARDARKRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY, SARDARKRUSHINAGAR, GUJARAT

Inauguration of new projects or schemes

On the occasion of Independence Day the following projects and schemes were launched by Shri Narendra Modi, CM, Government of Gujarat, on 14 August 2008.

Local area network and video conference facilities

During the current year local area network (LAN) was established, at Sardarkrushinagar. In this network 51 buildings are planed to be connected, including offices, colleges, hostels, public-service centres, research stations and library. The design for this LAN was prepared by IT centre with technical expertise from various network experts. These networks will be helpful to the scientists, professors, employees,



students and farmers in communicating with each other, having good reliability and speed and for atomization of university activities. The video-conferencing facilities will also be made available on newly established LAN of this campus by installing its core equipments. It will provide seamless interaction among officers, scientists and farmers for their problems and conferencing to the residential farmers who are connected with GSWAN. The financial outlay of this project is 217 lakhs.

Micro-irrigation system

The use of modern irrigation methods like drip and sprinkler irrigation is essential for efficient use of surface as well as ground-water resources. Micro Irrigation Demonstration and Training unit at Sardarkrushinagar will provide training to the farmers in utilizing latest recommendations on the judicious use of water through Micro Irrigation Systems. The financial outlav of this



project is Rs 2.12 lakhs at Sardarkrushinagar and Rs 2.50 lakhs at Deesa.

Laying of Foundation Stone

Laboratory - cum- office building, Pulse Research Station

Presently, the university has meagre laboratory facilities for advanced research. A new laboratory building sanctioned with the fund outlay of Rs 100 lakhs will be able to provide different laboratory facilities for biotechnology and advance research, and benefit the pulses-growing farmers of Gujarat state. Its Foundation Stone was laid by Shri Deelipbhai Sanghani, Minister of Agriculture and Cooperation, on 5August 2008.

Veterinary clinic hostel and administrative building at Deesa

In view of the rich animal-genetic resources of north Gujarat, a project under RKVY was sanctioned for veterinary clinical hostel and administrative building at clinical complex, Deesa to provide effective therapeutic aids and expertise to the valuable livestock of north







Gujarat, to improve their productivity. This project will expand clinical services for restoring or maintaining normal health of animals to sustain the animal owner's economy, develop skill confidence of students in promoting livestock entrepreneurship, and increase the awareness for disease prevention to minimize economic losses. The financial layout of the project is Rs. 426.07 lakhs.

Agricultural polytechnic school

To impart technical training in the field of agriculture to the tribal youths in Banaskantha district, an agricultural polytechnic institute is proposed at Amirgadh and Desea. The vocational trainings imparted to the tribal youth will help them acquire technical knowledge in various fields related to horticulture, dairy and farm technology. Such trainings will also provide



job opportunities to the tribal youth and will be helpful in setting entrepreneur enterprises. The financial outlay of the project at Amirgadh is Rs 370.84 lakhs; its foundation stone at Deesa was laid down by Smt. Anandiben Patel, Minister of Revenue, on 4 August 2008, and at Amirgadh by Shri Narendra Modi, CM, on 7 August 2008.

SHER-E-KASHMIR UNIVERSITY OF AGRICULTURAL SCIENCES AND TECHNOLOGY, JAMMU

Post-harvest technologies for value addition

- The quality of guava fruit can be improved and its shelf-life can be prolonged through pre-harvest sprays of boric acid @ 2.0%, whereas the application of calcium nitrate @ 1.5% up to 12 days compared with 6 days of normal shelf-life.
- Four cultivars of strawberry, viz. Addie, Belrubi, Chandler and Gorella, were evaluated for their suitability for processing into jam. Chandler was found the best suited cultivar for jam making. Besides, 20% of unripe fruit could be pocked along with ripe fruit without any deleterious effects on the product quality.
- Strawberry pulp, an important product for processing, could be preserved as a crush in refrigeration, for than 6 months, without losing quality attributes.
- By dipping the litchi fruit in calcium nitrate @ 1.5%/ kg followed by fuming with sulphur @ 0.6g/kg fruit, its shelf-life could be extended by 12 days when stored at room temperature, and by 30 days when stored under refrigerated conditions.
- Blanching of ber fruit with 60 brix sugar syrup followed by steeping for 72 hr and oven drying did not affect their physio-chemical and organoleptic qualities.

AWARDS AND RECOGNITION

Anand Agricultural University, Anand

- The Gujarat Association for Agricultural Sciences, Ahmedabad gave Sadvichar Parivar Awards-2005 to Dr V. R. Bhatt and his co-workers for their contribution in the field of Resource characterization and socioeconomic constraint analysis of productivity in the maize-based crop production' on 18 September 2008 at Gujarat Vidyapeeth.
- Dr N.D. Hirani and his co-workers were conferred Prof. J.P. Trivedi Award . (2008) by Gujarat Association for Agricultural Sciences, on 18 September 2008 for their contribution in Veterinary Parasitology.

Dr B.S. Konkan Krishi Vidyapeeth, Dapoli, Maharashtra

Honours to Dr V.B Mehta

Dr V.B. Mehta, VC, received the late Dr Balasaheb Sawant Acclamation Award, 2008 from Jayhind Foundation, Ratnagiri for outstanding contribution in the field of agriculture, on 20 July 2008 from Shri Udavji Samant, MLA, Ratnagiri.

Marathwada Agricultural University, Parbhani, Maharashtra

Honours to Dr S.D. More

Dr S.D. More, Director of Extension Education, received the prestigious Vasantrao Naik Puraskar in a ceremonial function organized by Vasantrao Naik Memorial Foundation, Pusad, dist. Yeotmal, on 18 August 2008. He was



Hon. Shri Chaganraoji Bhujbal, Minister of Public Works, Govt. of Maharashtra awarding Vasantrao

Nail Krishi Puraskar to S.D. More

presented this award in recognition of his outstanding work in the field of soil-health management, INM and use of organic manures and fertilizers.

ASPEE Gold Medal

At the 42nd Annual Convention of Indian Society of Agricultural Engineers held at Central Institute of Agricultural Engineering, Bhopal during 1-3 February 2008, ASPEE Gold Medal Award for 2008 was given to Dr R.G. Nadre, Associate Dean and Principal and Shri P.A. Munde, Assistant Professor, College of Agricultural. Engineering and Technology, MAU, Parbhani for outstanding contribution in design and development of Agricultural Machinery leading to commercial production and application. They designed bullockdrawn MAU seed-cum-fertidrill, stubble collector, rabi seed-drill, ferti-hoe, turmeric digger-andstripping frame, and modified transmission system of traditional rotavator.



Dr R.G. Nadre



Sardarkrushinagar Dantiwada Agricultural University, Sardar Krushinagar

Dr Veer Singh, Professor and Head, Department of Veterinary. Parasitology, College of Veterinary Science, and Director, Students' Welfare, received the "Bharat Ratna Dr C. Subramaniam Award for Outstanding Teacher for the Biennium 2007" in the field of Veterinary and Animal Science on 16 July 2008 at New Delhi.



Dr Veer Singh

Sardar Vallabh Bhai Patel University of Agriculture and **Technology**, Meerut

Honour to Prof. M. P. Yadav

Prof. M.P. Yadav, VC, received Lakhi Ram Memorial Award-2008 from the Society for Recent Development in Agriculture for his outstanding contributions in the field of Veterinary Science. The award was conferred on 18 October 2008 during National symposium on Scenario of Agriculture in Changing Climate Conditions held at Meerut.

Prof. M.P. Yadav received the National Unity and Secularity Jai Jawan Jai Kisan Lal Bahadur Shastri Honour from Indian Farm Journalist's, Association in view of the recognition of his excellent work in Veterinary virology. The award was conferred to



Prof. M.P. Yaday

him by HE Dr Balram Jakhar, Governor of Madhya Pradesh, on 14 November 2008 at New Delhi.

	Printed Matter BOOK-POST	STAMP
То,		
1995-199 <u>10-0</u> 00	and the second	<u>unita nativi</u> tate Nativitation notici
and a second	anitic of the second	Internet and a second
From:	Sector States and a sector sector	

1G-2, CGIAR Block, NASC Complex, D.P.S. Marg, Pusa Campus, New Delhi 110 012

Published by: Executive Secretary, IAUA + Printed in India at: Printways, New Delhi 110008. Ph.: 25880208, E-mail: printway@del3.vsnl.net.in Editing: Dr R.P. Singh, Executive Secretary, IAUA + Production: IAUA