At the outset, let me thank the Indian Council of Agricultural Research for giving me an opportunity to serve this premier institute. I accept this honour with all humility and assure that with the cooperation of all, we can make IGFRI a much vibrant, visible and pragmatic research institute. Like my predecessors, I would like to focus on creation of more facilities for our research workers in our main campus as well as regional stations and try to get further recognition for our research outputs.

This Institute was established in the Third Five Year Plan (November 1, 1962) to conduct organized research in the field of grasslands, grasses and cultivated fodder crops. In IGFRI, at present, we work on five major areas viz. i) collection, evaluation, documentation and conservation of forage genetic resources, ii) basic and strategic research on improvement, production and utilization of fodder crops and grasslands, iii) forage based economic milk production and conservation / processing of forages iv) technology transfer and human resource development, and v) multi-location testing programmes at the national level for identification of appropriate varieties and production technologies for different agro-ecological conditions. Our endeavor in future will be to strengthen the above five areas of IGFRI research and explore new horizons so that IGFRI takes a quantum jump from the solid foundation laid by our dedicated research workers.

Adequate availability of feed and fodder for livestock – remains an unrealized dream for millions of our livestock owners. The benefits of IGFRI research are yet to reach them. There is huge gap between the demand and availability of green fodder and this becomes a limiting factor for increasing the livestock productivity. Supplementation of minimum amount of green fodder is essential for optimum nutrient utilization and consequent reduction in production cost. Fodder based cheaper feeding strategies are required to reduce the cost of quality livestock product as the feed alone constitutes 70% of the milk production cost. There is a tremendous pressure of livestock on available feed and fodder, as land available for fodder production has been decreasing. The area cultivated under fodder is about 4.6% of the total cultivable area. Exclusive pastures and grasslands are widespread and are grazed by the domestic animals. Total area under permanent pastures and grasslands is about 12.4 million hectares. An area of 15.6 million ha is classified as wasteland and is also available for grazing. However majority of these lands have either been degraded or encroached upon restricting their availability for livestock grazing (DAHD, Annual Report 2011-12). Diverse use of agriculture crop residues, frequent droughts and floods has widened the gap between demand and supply of feed and fodder. As per the study conducted by NABARD Consultancy Services in 2007, a large gap exists between demand and supply of dry fodder (40%), green fodder (36%) and concentrate (57%).

Under this scenario, generating and disseminating technologies for enhanced quality forage production becomes paramount if we want to have sustainable livestock productivity in the country. It is the responsibility of IGFRI to churn out consistently new cultivars and modern technologies which are capable of enhancing forage productivity enormously and which the nation can count for help, guidance and economic uplift of livestock farmers. It is the responsibility as well as the privilege of all who make up the IGFRI “family” – scientist, technical and supporting staff, administrators, the research workers, individually as well as in a group – to work together, each in his or her own way, towards the nurturing the growth of IGFRI. In order to achieve the aims, I had already spoken to the scientists, technicians of each division in turn. We have a one-to-one opportunity to discuss the challenges we are facing. I want to highlight the fact that I have high expectations of every one of IGFRI family and I have no doubt that, together, we can exceed our targets set before us for the year 2012-13.
AICRP on Forage Crops Group Meeting Rabi 2012-13 was organized at IGFR, Jhansi during 14-15, September 2012. Scientists from different coordinated centres across the country participated in this meet. The Meeting was chaired by Dr. P K Ghosh, Director, IGFR, Jhansi & Dr. R P Dua, Assistant Director General (Food and Fodder Crops), ICAR, New Delhi was the Chief Guest in the function. Dr. A K Roy, Project Coordinator convened the meeting and presented the summary of overall achievement of AICRP on Forage Crops for the period Rabi/2011-12.

During the meet, it was felt that due emphasis should be given towards (i) strengthening of germplasm holding by adding new accessions from the unexplored areas; (ii) Create and collect variability for accelerating breeding efforts particularly in Berseem, Cowpea, range grasses and legumes; (iii) Developing suitable technologies for dual purpose crops to meet the demand of food and feed; and (iv) Utilization of non conventional fodder crops as well as resource conservation.

The Principal Investigators who are working on Crop Improvement, Crop Production and Crop Protection, presented the last Rabi trials outcome and formulated the coming Rabi 2012-13 technical programme in consultation with concerned scientists.

Dr. P K Ghosh takes over as Director, IGFR

Dr. Probir Kumar Ghosh joined as Director of Indian Grassland & Fodder Research Institute, Jhansi and took the charge of office on 16th August 2012. After graduation from Visva-Bharati, West Bengal with 70% marks, he completed his Master degree (Agronomy) from G.B.P.U.A. & T., Pantnagar with 90% marks and did his Ph.D. (Agro) from G.B.P.U.A. & T., Pantnagar with 90% marks. Earlier he has held the positions of Scientist at NRCG, Junagadh, Senior Scientist at IJSS, Bhopal and Principal Scientist Agronomy (Cropping System Research, Soil Health, Soil Water Conservation) at IIPR, Kanpur. Awards & Recognition he has bagged are, ICAR Team Research Award – 2012; Dr. K G Tejwani Award – 2012; Ground Water Augmentation Award – 2008; IMPHOS-FAIAward – 2005; Academy for the Advancement of Agricultural Science (Senior Award) – 2004; PPIC-FAIAward – 2003; Best Scientific Oratory Award – 1997. Prestigious fellowships to his credit include, Fellow of National Academy of Agricultural Science, New Delhi; Indian Society of Agronomy, New Delhi; Sectional President, Indian Science Congress Association (Agriculture & Forestry) for 2013 (Centenary Year). Presently he is member of professional societies like Indian Society of Agronomy; Indian Science Congress Association; Indian Society of Soil Science; Indian Society for Plant Physiology; Indian Society of Oilseed Research; Indian Society of Coastal Agricultural Research; Indian Association of Soil and Water Conservation. He has published, 52 International, 100 National research papers and 4 Books.

Dr. Ajoy Kumar Roy takes over as Project Coordinator (Forage Crops)

Dr. Ajoy Kumar Roy joined as Project Coordinator of All India Coordinated Research Project on Forage crops, IGFR, Jhansi on 14th September 2012. Earlier he joined ICAR on 7th August 1989 and held the positions of Scientist, Senior Scientist at Crop Improvement Division, IGFR; Head and Principal Scientist (Genetics), Grassland and Silvopasture Management Division, IGFR, and Vigilance Officer, IGFR, Jhansi. His discipline is Genetics and Cytogenetics with specialization in Forage Crop Improvement; Biodiversity; Biotechnology; Apomixis; Abiotic Stress Tolerance; Genetics; Silvi-Hortipasture; Rangeland Grasses and Legumes. Important Awards & Recognition to his credit include, Fellow, National Academy of Agricultural Sciences (NAAS), New Delhi – 2009; ICAR team award for outstanding multidisciplinary research work awarded in 2010 as team leader; DBT Overseas Associateship, 2008 for Six months in UK on association genetics of abiotic stress; Member of National Academy of Sciences, Allahabad – 2011 and Technical Co-operation Training awards for Molecular aspects of Plant Genetic Resources, 1998, funded by British Council Division, UK. His publications include 84 research articles in referred national and international journals. He has developed eight varieties in Berseem, Oat, Sehima, Chrysopogon, Heteropogon and identified 11 novel genetic stocks.
Seed drill developed for sowing fine fodder seed like berseem

The conceptualized seed drill was manufactured with spring loaded flexible soil opening tines, metering mechanism at a height of 40 cm above the ground level, fine fluted roll metering mechanism, separate seed box for each metering mechanism and a common fertilizer box having agitators. The seed boxes were arranged in two row with metering mechanism fitted below each box. The metering mechanism had provision to adjust the row to row distance of 20, 30 and 40 cm. The power to the two shaft of metering mechanism and one shaft of fertilizer box agitator was given through ground wheel. The berseem seed drill (Fig.) also had provision to replace the fine fluted roll metering mechanism with coarse fluted rolls in order to make seed drill able to sow the coarse grain seeds of crop like wheat, gram and maize. This enables seed drill to be used for general purpose of sowing food grain crops in addition to the main use of berseem sowing, thus increasing the utility of the machine. The seed rate for fine seeds was adjustable in the range of 4 to 30 kg/ha. However, the seed rate for coarse grain like wheat was in the range of 40-100 kg/ha. Depth of sowing was controlled by the hydraulic devise of the tractor.

(C S Sahay, P K Pathak and P N Dwivedi)

Detection of pest-pathogen infestation in seeds by using Soft X-Ray Radiography

Soft X-Ray Radiography Techniques was applied for detection of pest pathogen in structured seeds. In this technique a small amount of seeds were exposed to soft X-Rays beam and their results become visible on the monitor/screen simultaneously. The seeds infested with insect pest were seen as dark or dark brown and the healthy ones as shining white. Both types of seeds were taken from same geometry as shown in X-ray pictures. The infestation and presence of insect in the seeds were also verified with Lacto phenol test. In an average highest numbers of infested seeds were recorded 20.0% in Lucerne (Medicago sativa) and 19.0% in Berseem (Trifolium alexandrinum var. wardan) while minimum 8.0% was observed in Berseem (T. alexandrinum var. JH-B-146) and 10.0% in Neel (Indigofera astragonaloba). Pest infestation in other forage legumes was recorded in between 11.0 to 18.0 percent. Thus X-ray radiography can be utilized as time saving and accurate way of detecting pest/pathogens infestation in stored seeds.

Sesbania sesban

Trifolium alexandrinum var. wardan

X-Ray Radiography of infested and healthy seeds of some fodder legumes

(D Bahukhandi, D R Malaviya, P Saxena and H C Pandey)

Hyperspectral remote sensing for site specific Nitrogen Management (SSNM)

Hyperspectral remote sensing nowadays is being recognized as a valuable tool to assess a wide variety of physiological properties over a large area in a short amount of time. Nitrogen fertilizer rate mainly affects leaf reflectance in the visible range (400-700 nm) and in the red edge (690-710 nm). Generally a strong inverse relation exists between chlorophyll content and reflectance in two wavelength regions 525 to 630 nm and a narrow region around 705 nm. A study on maize using hyperspectral remote sensing has been conducted under two broad range of nitrogen application at C.R. Farm, Jhansi. In the visible region of electromagnetic spectrum, maximum reflectance of 17.8 and 13.6% at 550 nm was observed in fodder maize crop without (N0: 0 kgN/ha) and with (N1: recommended dose 90 kgN/ha) nitrogen, respectively. A reverse pattern was observed in the near infrared domain of light (Fig. A). The wavelength region around 705

3
nm is commonly known as red edge. The location of the red edge is a function of chlorophyll absorption. As stress occurs, the red edge will shift to lower wavelengths. Healthy plants absorb more energy in wavelengths beyond 680 nm, thereby extending the red edge to higher wavelengths. Monitoring the location of this inflection point can provide a measure of stress that result in chlorophyll degradation. The spikes at 525, 575, 610 and 640 to 660 nm appears to show strong relations to the N application in maize crop. The 1st derivative of the reflectance showed that red edge shifted from 721 to 702 nm (Fig. B). Thus, 1st derivative provide a quick, inexpensive and reliable means to precisely in-season crop nutrient assessment and management throughout the growing season under a broad range of management practices.
The Double Humped Camel (Camelus bactrianus) - a pride animal of cold desert

The double humped camel or Bactrian (Camelus bactrianus), habitat of cold and is an invaluable treasure of the Ladakh people of Jammu & Kashmir. These camels have their origin mainly from China, Mongolia (Yarkant), during the silk route. The face of the animal is typical, being long and somewhat triangular, with a split upper lip. There are long eyelashes, which, along with the sealable nostrils, help to keep out dust during sandstorms which occur in their natural range. The camels were important means of transportation of men and material in the hilly areas of Ladakh region where mechanical transportation by motor vehicle is virtually impossible. Now very few people use the animals for transportation. The fancy animal is now used for attracting tourists as camel ride. The animal is heading for extinction and need immediate attention for Conservation. Based on Livestock Census (2007) the population of Bactrian- Double-humped camel (Camelus bactrianus) in India is 563 camels which are available in the Leh and Nubra Valley of Ladakh. Nubra Valley is about 150 km north of Leh the capital town of Ladakh. Development of camel-based livestock system will generate employment and help to improve income of the local rural population. A survey was conducted in the Nubra valley of Ladakh to know about camel production. In the village Hunder of Nubra District each family keep about 4 to 5 camels. The animals mate during the months from January to March. The age of sexual maturity varies, but is usually reached at 3 to 5 years. Bactrian camel mate at an age of about 4 years. Each male served about ten females per year and males during this time are often quite violent and may bite, spit, or attempt to sit on other male camels. The gestation period is 12 to 13 months. The calf's birth weight varied from 30 to 35 kg and per day body weight gain is about is 150-200 gm. Milk feeding is up to the age of 2 months. After feeding on milk animals start feeding grass initially 25-50gm per day. At the age of about 16 months, the animals consume about 10-15 kg of fodder/day. An adult camel can consume grass about 30 to 35kg/day and they are able to eat plants that are dry, prickly, salty and/or bitter and can ingest virtually any kind of vegetation. Their ability to feed on a wide range of foods allows them to live in areas with sparse vegetation. The animals start shedding the fur coat during the months May to June with huge sections peeling off at once and regain the fur during the months of September-October. The animals keep on gaining the weight up to the age of 15 to 16 years. The weight of an adult camel varies from 1 to 2 quintal with males often being much larger and heavier than females. In winter months of Dec, Jan and Feb they live in the jungles of seabuckthorn. The average life span of the animal varies from 35 to 40 years. The average cost of adult healthy camel now ranges from Rs. 20,000 to Rs. 40,000 depending upon age, sex and health.

(Sudesh Radotra, Inder Dev, Suheel Dand, J P Singh and Jigmat Stanzin)
दिनांक 14-20 सितंबर, 2012 तक हिंदी सप्ताह का आयोजन

राष्ट्रीय चरणायक एवं चार अनुमंडल का संस्थान भारत सरकार गृहमंत्रालय की राजभाषा नीति के कार्यनिवास एवं अधिकारियों / कर्मचारियों में हिंदी के प्रति उत्साहकर्षण वातावरण पैदा करने के उद्देश्य से संस्थान में 14-20 सितंबर, 2012 तक हिंदी सप्ताह का आयोजन किया गया। इसका उद्देश्य दिनांक 14.09.2012 को आयोजित 245 वर्षों बाद भारत-अधुना, नई दिल्ली के सहायक महानिदेशक डा. आर.पी. दुआ के मुख्य आयोग एवं संस्थान के निदेशक डा. पी.के. घोष की अध्यक्षता में दौर प्रज्वलित कर दिया गया। कार्यक्रम के मुख्य अतिथि डा. आर.पी. दुआ ने भारत-अधुना में व इसके संस्थानों में हिंदी में किए जा रहे कार्य की प्रशंसा करते हुए इसमें और अधिक गति लाने पर बल दिया। इस हिंदी सप्ताह के दौरान विभिन्न प्रतियोगिताएं— मसिदा एवं टिप्पणी लेखन, निबंध, तात्कालिक भाषण, स्वर्णित कविता पाठ का आयोजन किया गया। दिनांक 19.09.2012 को उक्त हिंदी सप्ताह का विचित्र समापन संस्थान के निदेशक डा. पी.के. घोष की अध्यक्षता में हुआ। हिंदी सप्ताह के दौरान आयोजित विभिन्न प्रतियोगिताओं में विजयी प्रतियोगियों को एवं वर्षमार हिंदी में सराहनीय कार्य करने वाले अधिकारियों / कर्मचारियों को स्मृति दिन व प्रशस्ति पत्र देकर सम्मानित किया गया। उक्त हिंदी सप्ताह कार्यक्रम में संस्थान के अधिकारियों / कर्मचारियों ने बड़—बड़कर हिस्सा लिया।
New Joinings

Dr. Srinivasan R,
Sr. Scientist, (Agricultural Microbiology)
Joined on 10.07.2012

Dr. D.R. Palsanlya
Sr. Scientist (Agronomy)

Published by the Director, Indian Grassland and Fodder Research Institute (Indian Council of Agricultural Research), Jhansi - 284 003
Telephone: 0510-2730666; Fax: 0510-2730833; E-mail:iigfri_jhans@yahoo.co.in, iigfri.director@gmail.com Website:http://www.iigfri.res.in
Printed at Veer Bundelkhand Press, Jhansi

Photographs: AK Singh