From Director’s desk….

The International Grassland Congress is a premier International gathering happening quadrennially, where the current status of global grasslands is updated and the latest themes of grassland research and development are presented. The 23rd Grassland Congress was held for the first time in India in its 88 year old history, with more than 550 delegates from 47 countries across the globe. The main theme of the present congress was “Sustainable use of grassland resources for forage production, biodiversity and environmental protection” with five sub themes viz. grassland resources, grassland production and utilization, sustainability of grassland, biodiversity conservation and genetic improvement of range and forage species and social, policy and environmental issues related to grassland. The scientific programme included seven plenary lectures by eminent scientists and one special guest lecture by Prof. Murli Manohar Joshi, followed by 30 concurrent sessions spread over three days with five sessions in the morning and five sessions in the afternoon each day. A total 53 keynote speakers delivered their lectures in different scientific sessions. In each scientific session, four oral speakers delivered their research outcome and a total of more than 300 abstracts were presented in the form of posters over three days of gathering.

Two concurrent pre-congress workshops were conducted with specific themes namely hot and cold arid grassland resources: production and utilization, and temperate and tropical grassland: social and environmental issues on 20th Nov., 2015 before the inauguration of congress. Similarly on the last day (24th Nov., 2015) two concurrent forums dedicated to the grassland farmers and dairy associations and to foresters and agroforesters were conducted to have a knowledge exchange between the farming and scientific communities.

The 23rd congress was jointly organized by the Range Management Society of India and ICAR- Indian Grassland and Fodder Research Institute, Jhansi in collaboration with International Grassland Congress continuing committee at New Delhi. The Congress was inaugurated by Hon’ble Shri Radha Mohan Singh ji, Minister of Agriculture and Farmers Welfare, Govt .of India at Vigyan Bhavan on 20th Nov., 2015. He emphasized the important role played by fodder and grasslands in traditional Indian system for the overall development of society and wished that during the five days deliberations of congress major recommendations will emerge and which will be helpful to create road map to solve feed and fodder scarcity for the increasing livestock population.

Major recommendations emanated from the congress included formulation of “Indian Grassland Authority” and framing a national policy on feed and fodder for sustenance of grassland resources in India. It was felt that time series remote sensing data should be used to evaluate grassland dynamics and there is need for developing, adopting mechanization for forage production systems, development of forage databases for monitoring and policy development, signaling pathways in grass-herbivory interactions and called for generating new technologies for reducing the emission of GHGs from grassland-livestock systems. This five day mega event was a great success with the huge participation of Foreign and Indian delegates, Farmers, NGOs, various government departments and students. The planning over years and dedication of various committees has resulted in this successful event and brought India in to the frame of world grassland research arena.
Livestock based Integrated Farming System Initiatives at IGFRI

The integrated farming systems approach holds the key for upliftment of rural households as it combines crop, trees, livestock, fishery etc. in a holistic manner and has the potential to meet diverse needs of the farm on sustainable basis. This approach minimizes use of external inputs, provides for recycling of residues or byproducts or wastes, enhances productivity, minimizes risks, optimizes the farm income and provides round the year employment. Keeping above facts in mind, an EFC based Flagship Project entitled “Livestock Based Integrated Farming Systems for Sustainable Productivity and Income of Farmers in Semi-Arid Region of Central India” is initiated at CR Farm, IGFRI to design and develop resource based and situation specific integrated farming system (IFS) models for sustainable productivity and income of semi arid farmers. Accordingly, following farmer specific and resource based five IFS models under rainfed (2 no.) and irrigated (3 no.) conditions and each of 1 hectare size were developed. The five IFS models included rainfed crop dominated IFS (Rainfed crops + agroforestry- agri-horti/ silvi-pasture + livestock + water harvesting and recycling) with greater emphasis on rainfed crops and water harvesting, rainfed livestock dominated IFS (Rainfed crops + forage + livestock + agri-horti/silvi-pasture + water harvesting and recycling) with focus on livestock, rainfed fodder and crops and water harvesting, irrigated intensive IFS with balanced enterprise combinations (Food + vegetables + forage crop + fruits + livestock + fish), irrigated dairy based IFS (Food Crop + forage + livestock + fruits/forage trees) with greater emphasis on milch animals and fodder and high value IFS near cities (Vegetables + food crops + commercial crops like baby corn + Forage + livestock) with emphasis on high value crops viz., vegetables and fruits.

All the project activities are being taken as per plan in different models (Fig.1.). Two 20 m x 25 m ponds have been dug for rainfed models. Work for construction of animal complex has been started. Meanwhile some animals for the project are kept at the animal shed of PAR division. Perennial component has been established as per plan. Guava and Ber sapling were procured from CISTH, Lucknow and CAZRI, Jodhpur, respectively. Round the year fodder production systems both for irrigated and rainfed conditions have been established. One fish pond of 20 m x 25 m dimension has been dug in intensive model. Initial soil analysis indicated that the available N, P and K content were low, medium and medium, respectively. Mid season corrections will be made as per need.

![Fig.1. Glimpses of IFS activities at CR Farm](image-url)

First report of white leaf disease causing phytoplasma in Saen grass (*Sehima nervosum*) from India

*Sehima nervosum* is one of the natural grasses known as Saen grass in India, white grass in Australia; and has also been reported from the Central East Africa and Sudan. White leaf disease is one of the most commonly occurring disease in grass family caused by phytoplasma and was reported by many workers in different hosts from different parts of the world (Marcone *et al.*, 1997; Arocha *et al.*, 2005; Obura *et al.*, 2010). It is mainly transmitted by leaf hopper, vegetative propagation as well as mechanical means. The infected grass becomes stunted, bushy and weak in nature. The name white leaf is mainly due to loss of chlorophyll in the infected leaves. Similar symptoms were observed for the first time in India in Saen grass at research plots of IGFRI, Jhansi (Fig. 2.). The infected *Sehima* plants showed, stunted and bushy growth with proliferation of auxiliary shoots (Fig. 3.). The leaves turned pale greenish yellow to white and partial drying of leaves. The etiology was further confirmed through polymerase chain reaction (PCR) and nested PCR using phytoplasmal universal primers. The PCR product of 1.8kb was amplified using universal primers P1/P7 from diseased sample but not from healthy (Fig. 4.). The samples were reamplified in N-PCR, using primers R16F2n/R16R2 and a DNA fragment of 1.2 kb was obtained (Fig. 5.).

Fig. 2. *Sehima nervosum* phytoplasma incidence observed at IGFRI research plot, Jhansi

Fig. 3. a) Bermuda grass white leaf disease b) Infected *Sehima* grass c) Healthy *Sehima* grass
Berseem (Trifolium alexandrinum L.) is an important leguminous fodder crop widely grown in irrigated cropping systems of west and south Asia. It was grown in nearly 1.9 million ha area in India in 2014. Its productivity is severely affected due to weeds especially during initial growth. Therefore, a field experiment was carried out at Central Research Farm of Indian Grassland and Fodder Research Institute, Jhansi, UP to find out suitable weed management strategy for this crop.

Anagalis arvensis L. and Cichorium intybus L. were the most prominent weeds in berseem and constituted 52.6 and 36.3 % relative density, respectively at 25 days after sowing. The other weeds like Cyperus rotundus, Sonchus oleraceus and Cynodon dactylon constituted to about 5.7, 3.7 and 1.7 % of the total density.

Propaquizafop was found the best herbicide for weed control in Berseem (Fig. 6.). Based on two year average, propaquizafop 0.1 kg a.i./ha as post emergence (20 days after sowing) recorded 75.57 t/ha green fodder yield which was 38.1 % higher over green fodder yield obtained from weedy check. It reduced weed biomass by 94 % compared with the weedy check at 40 DAS. Superior results in weed dry matter and green fodder yield resulted in the lowest weed index and highest weed control efficiency (79%) in post-emergence application of propaquizafop.

Weed Management Technology for Fodder Berseem

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Winter school on “Integration of Conventional and Biotechnological Approaches for Improvement of Dual Purpose Crops and Grasses”

A winter school on “Integration of Conventional and Biotechnological Approaches for Improvement of Dual Purpose Crops and Grasses” sponsored by the Education Division, ICAR was organised by the Crop Improvement Division from 28th January to 17th February, 2016. Twenty candidates, including three women trainees representing eight states viz., Jammu & Kashmir, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh and Tamilnadu, had participated in this training programme (Fig. 7.). Dr NK Krishna Kumar, DDG (Horticultural Science), ICAR, graced the inaugural function as the Chief Guest. He emphasized the importance of achieving sustainability in the context of population surge and mounting pressure on food production by integrating traditional and molecular breeding approaches and management practices across the disciplines in his inaugural address. A total of 45 theory classes, 19 practical sessions and 5 field visits were organized during the course. The faculty consisted of 31 scientists from seven divisions of IGFRI and four guest speakers. The guest lectures were from very learned speakers like Drs Manoj Prasad (NIPGR, New Delhi), SujayRakshit (IIMR, Hyderabad), M. Dutta (NBPGF, New Delhi) and Dr. Nadarajan (TNAU, Madurai). A lot of improvement in the subject knowledge was observed among all participants after the winter school training. They gained basic information about fodder crop improvement methodologies used in conventional and biotechnological approaches.

![Fig.7. Glimpses of winter School](image)

Swachh Bharat Mission

Indian Grassland and Fodder Research Institute (IGFRI) through the headquarter at Jhansi and its RRS’s and AICRP(FC) has continued Swachh Bharat Mission in all its divisions and sections for spreading of awareness about cleanliness. Preparations of compost as waste management in the campus are managed scientifically by campus development unit. A series of cleanliness drives including cleaning and sweeping of offices, corridors and premises, disposing of junk material are continuing under this programme. Scientists of the Institute are spreading awareness about cleanliness in the villages adopted for transfer of technology. An awareness camp was organized in village Pathara District Datia (MP) on 11th March 2016 under MGMG programme to mobilize farmers under the theme ‘clean home clean village’ on bio waste management, environmental safety and personnel hygiene.
Project Monitoring and Evaluation Committee visit (Rabi 2016)
The Project Monitoring and Evaluation Committee visited the institute ongoing projects on 12-13 Feb. 2016. All the members of Research Advisory Committee (RAC) which include Prof. M. C. Saxena, Sr. Advisor to the Director General, ICARDA, Dr. O.P. Chaturvedi, Director CAFRI, Dr. Menhi Lal, Ex. Head, IISR, Dr. J.P. Yadavendra, Ex- Professor, GAU, Anand. Dr. K. T. Sampath, Ex Director NIANP, Bengaluru and Dr. U C Sharma, also joined in the PMC visit. At the outset, Dr P.K. Ghosh, Director, IGFRI, Jhansi first introduced the RAC members to PMC members and scientists of the institute (Fig. 9.). The PMC visited the research programmes/experiments of various divisions to assess and monitor the progress of works conducted during Rabi season 2015-16. The RAC members showed keen interest on development of technology that could be adopted by small farmers to support various animal species under grazing conditions. PMC also visited Adarsh Chara Gaon and CIWA collaborative project (Empowerment of farm women through livestock technologies) on 13.02.2016. The committee appreciated the efforts being carried out to transfer of fodder technologies. Chairman, RAC and PMC thanked all the scientists of IGFRI for their sincere efforts.

Fodder Technology and Machinery Demonstration Mela
Fodder technology and machinery demonstration mela was organized at ICAR - IGFRI, Jhansi on 18th March, 2016 (Fig. 10.). About 600 farmers participated in this meet from different villages of Bundelkhand areas. The farmers were mainly from 72 villages adopted by the Institute under programme ‘Mera Gaon Mera Gaurav’ and 4 villages adopted under the project ‘Adarsh Chara Gaon’. Dr. Gurbachan Singh, Chairman, ASRB was the chief guest on this occasion and Dr. C. L. Acharya former director ICAR – Indian institute of Soil Science Bhopal was guest of owner. On this occasion, representatives from state department of Agriculture, Horticulture, Veterinary, KVKs of nearby areas, Central Soil and Water Conservation Institute centre Datia, Central Agroforestry Research Institute, Jhansi, manufacturers and tractor dealers of this area participated and exhibited.
their technologies in the stalls made for this purpose. Official from department of forest also participated in this meet to gather the technology related to rejuvenation of the grassland in forest area. In this meet, two progressive farmers in adopting fodder technology and promoting machinery through custom hiring were felicitated by the chief guest.

Fig. 10. Fodder Technology and Machinery Demonstration Mela

Organization of 4th National Symposium-IAFNS-2016

IGFRI, Range Management Society of India & Society of Agricultural Professionals (SAP) Kanpur jointly organized 4th National Symposium on “Transforming Indian Agriculture towards Food and Nutritional Security” at ICAR - IGFRI, Jhansi during 20-21 Feb.2016 (Fig. 11.). A total of 8 sessions on thematic areas of ‘Productivity enhancement, Food & Nutritional Security, Resource Management, Innovative Technologies, Frontier Agricultural Management, and Scientists – Farmers – Industry Interface’ were organized. The symposium was attended by more than 200 persons engaged in Agriculture based R & D from SAUs, ICAR Institutes/KVKs, CAUs, Central Universities, NGOs, farm entrepreneurs, progressive farmers of different regions of the country. The symposium has generated important doable recommendations for various stakeholders to make agriculture more rewarding while preserving the natural resource base.

Fig. 11. Glimpses of SAP symposium


The Ministry of Human Resource Development (MHRD) has launched a programme on “Unnat Bharat Abhiyan” (UBA) with an aim to connect institutions of higher education with local communities to address the development challenges of rural India through participatory processes and appropriate technologies for accelerating sustainable growth and upliftment of farming community of rural India. It also aims to provide knowledge and practices for emerging profession
and to upgrade the capabilities of both the public and private sectors. In achieving the goal, the ICAR & IIT Delhi has been identified as the coordinating institute in agriculture and animal husbandry. As part of activities, a three days Workshop with the theme of “Natural/Organic Farming and Rural Economy” at Indian Grassland & Fodder Research Institute (IGFRI) Jhansi was organized during 27-29 March, 2016 in collaboration with Lok Bharti, Uttar Pradesh. The workshop was attended by more than 200 representatives from research institutes /farmers /NGOs /Gaushalas of U.P., M.P., Uttarakhand, Delhi. This occasion witnessed the presence of Swami Kad Sidheswar (Chairman), Sri Hriday Nath Singh (Chief Guest) and Sri K Ram Mohan Rao, Commissioner, Jhansi (Guest of Honour) (Fig. 12.).

![Fig. 12. Inauguration of Unnat Bharat Abhiyan](image)

**Training programme on “Financing Dairy Farming”**
The training programme “Financing Dairy Farming” was organized at IGFRI from, 1-3 March 2016 for 32 bank officers and was sponsored by BIRD, NABARD, Lucknow (Fig. 13.)

![Fig. 13. Training programme on “Financing Dairy Farming”](image)

**Visit of Hon’ble Minister of State for Agriculture, Dr. Sanjeev Kumar Balyan,**
Hon’ble Minister of State for Agriculture, Dr. Sanjeev Kumar Balyan, along with Sri Sukhbeer Singh Juanapuria, MP, Sri Kanhaiya Lal Choudhary, MLA and Dr. H. Rahman, DDG (AS), ICAR, visited the WRRS, IGFRI, Avikanagar on Mar 28, 2016 and appreciated the work of centre.
भारतीय चरागाह एवं चारा अनुसंधान संस्थान के द्वारा पश्चिमिक्सा शिविरों का आयोजन

संस्थान में आयोजित परियोजना के अंतर्गत कुल 11 टीम गठित की गई है, जिसमें हर टीम को 5 गाय दिए गए हैं। इसे 'मेसा गाय मेसा गायव' परियोजना से जोड़कर किसानों को उन्नत तकनीकी, उन्नत बीज एवं अधिक परिक्षण प्रवर्धन के द्वारा उपज बढ़ाने हेतु सभी टीमों प्रवासात्मक है। इसी क्रम में टीम संख्या 8 के द्वारा 5 गाय, (i)गणेशपुरा, (ii)बसरा, (iii)मोडकुर्री, (iv)बलर एवं (v)लियाचे लिए गए हैं।

इन गायों का आयार भूत संक्षेपण पूरा किया जा चुका है। किसानों से चर्चा करने पर यह संज्ञा में आया कि गणेशपुरा एवं बसरा में पश्चिमिक्सा शिविर क्षेत्र में बीमारियों का निरीक्षण आवश्यक है। इस जरूरत को देखते हुए टीम संख्या 8 ने 'जय किसान जय विजय' सावधानी कार्यक्रम के अंतर्गत ग्राम गणेशपुरा तहसील बवीना जिला जौंपुरी में पश्चिमिक्सा शिविर एवं किसान गोष्टी का आयोजन किया। 28 दिसम्बर 2015 को गणेशपुरा में आयोजित पश्चिमिक्सा शिविर में 25 किसानों के कुल 64 पशुओं के परीक्षण किया गया। इनमें 21 मैसैस, 14 मैस पड़ता, 14 मैस के बच्चे, 3 मैस, 2 मैस, एक गाय का बच्चा एवं 10 बकरियाँ थी। इस गाय में पशुओं की मुख्य समस्या दर से गर्म होना एवं अंतजीवी यौगिके, मेटा में पत्ते, पत्ते में चाव, चाव में मरानी थी। इनपर बकरियाँ को द्वारा उपज कराई गई। किसानों ने जीत रोगों के लिए दवा दिखाया और बकरियाँ का रक्षक कराई गई। जो कि गायों ने बाजार से लेकर पशुओं को बताए गए मात्रा एवं विषय अनुसार खिलाया। इसके अलावा पशु पायल व्यवस्थापन से संबंधित समस्याओं एवं पशु व्यवस्थाएं के बारे में जानकारी दी गई।

दिनांक 6 जनवरी 2016 को इसी क्रम में ग्राम बसरा तहसील बवीना जिला जौंपुरी में पश्चिमिक्सा शिविर का आयोजन किया गया। इस शिविर में वांछित भवन के क्षेत्र में 25 किसानों ने कुल 49 पशुओं का परीक्षण किया गया। इनमें 31 मैसैस, 4 मैस पड़ता, 10 मैस के बच्चे, 3 मैस, 2 मैस, एक गाय, एवं 5 बकरियाँ थी। इस गाय में पशुओं की मुख्य समस्या अंतजीवी यौगिके, पत्ते में पत्ते, पत्ते में चाव, चाव में मरानी थी। इन पशुओं का प्रतिरूप करके उन्हें दवा दी गई। इसलिए द्वारा शिविर एवं व्यवस्थापन के लिए आयोजन किया गया। इसके अलावा शिविर में आयोजित किसानों को पशुओं की बीमारियों से संबंधित महत्वपूर्ण सुविधाएं उपलब्ध कराई गई एवं उनके रोकथाम के उपाय बताए गए। इन पशु पक्षीक्सा शिविरों का आयोजन अत्यंत सफलतापूर्वक किया गया जिसमें किसानों में संस्थान के प्रति विश्वास बढ़ा है।

Fig. 14. पश्चिमिक्सा शिविरों का आयोजन
New joinings

Dr. Amit Kumar Singh
Scientist (Ag. Meteorology)
w.e.f. 07.03.2016

Retirements

Sh. Indra Pal Singh, ACTO, 31/01/2016
Sh. Ramesh, SSS 31/01/2016
Smt. Soma, SSS 29/02/2016

Transfers

1. Dr. P Kaushal from ICAR-IGFRI Jhansi to National Institute of Biotic Stress Management
2. Dr. N.S. Ekka ICAR-IGFRI Jhansi to National Institute of Biotic Stress Management