आईजीएफआरआई समाचार-पत्र

IGFRI Newsletter

भाकृअनुप ICAR

भा.च.चा.अ.सं. IGFRI

Vol. 29 (1)
January-June 2023

ISSN 0973-7960

From the Director's desk.....

India's successful hosting of the G20 summit in New Delhi marked a significant milestone in the country's diplomatic endeavours. Under India's leadership, the G20 nations acknowledged that agriculture is not merely an economic activity but a cornerstone of human civilization, shaping societies, cultures, and livelihoods for millennia. In the G20 declaration, member nations pledged to prioritize and implement measures that foster sustainability and climate- resilience of agricultural sector. Promoting agricultural diversity to enhance food security and nutrition, strengthening infrastructure for small and marginal farmers, women, and youth to promote inclusive agriculture value chains, fostering resilient food systems, and leveraging digital technologies to transform agriculture, with a focus on standardizing agricultural data platforms as digital public goods, were some of the prioritized areas of discussion. In this context, it is important to note that livestock-based farm diversification plays central role in providing farmers with alternative income streams and enhancing the overall resilience of the agricultural sector against economic and environmental fluctuations. However, sustainability of the livestock sector is intricately tied to the availability of sufficient feed and fodder. As India is facing deficit in feed and fodder, there is a compelling need for focused research and investment to enhance the fodder resource base.

The collaboration between the private and public sectors through Public-Private Partnerships (PPPs) holds tremendous potential for advancing fodder research and development in India. Private companies bring innovation, technology, and market-driven approaches, while the public sector contributes research expertise, infrastructure, and a focus on broader societal goals. In the context of fodder research, PPPs can leverage the strengths of both sectors to address critical challenges. Private entities can invest in research and development, leveraging their resources to promote improved fodder varieties, efficient cultivation techniques, and innovative forage management technologies. Simultaneously, the public sector can play a pivotal role in establishing a conducive policy environment, providing research institutions with funding, and ensuring that the outcomes of research benefit a larger segment of the population. Collaboration can extend to knowledge sharing, where the private sector can benefit from the research findings of public institutions, while contributing its field-level insights and market-driven perspectives. This synergistic approach not only accelerates the pace of innovation but also enhances the accessibility and affordability of improved fodder technologies for farmers.

Moreover Corporate Social Responsibility (CSR) funding is a unique opportunity to strengthen India's fodder resource base, aligning business interests with sustainable agriculture. By directing funds towards initiatives that improve fodder quality and availability, corporations can significantly benefit rural communities and the livestock sector. These funds can support research for high-yield, climate-resilient forage crops, promote innovation in fodder cultivation, and endorse sustainable practices. Investing in training programs equips farmers with skills for improved fodder management, enhancing livestock feed quality and promoting sustainable agriculture. Additionally, CSR investments can establish fodder banks, ensuring year-round access to quality feed. The CSR fund directed towards restoration of pasture lands could potentially solve the problem of fodder availability as well as environmental issue. Integrating CSR into fodder development contributes to rural development, supports smallholder farmers, and fosters environmental sustainability. This holistic approach showcases the potential for corporate entities to drive positive change in India's agriculture through responsible CSR investments.

Forthcoming events

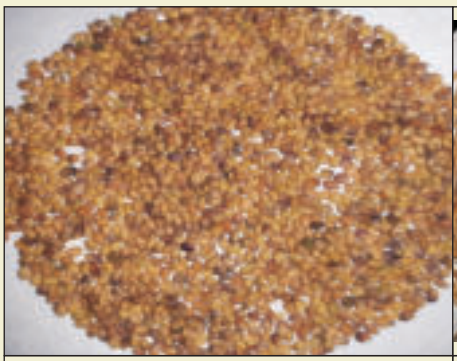
- 62nd Foundation Day (November 01, 2023) of the Institute.
- ICAR-IGFRI in collaboration with RMSI will organise International Conference on "Feeding the future through sustainable eco-friendly innovation in rangeland, forage and animal science" at UAS, GKVK, Bengaluru during December 2-4, 2023.

Salient Research Achievements

Minimum Seed Certification Standards in Temperate Forages

The sustainability of the Himalayan grasslands has significant impacts on both upstream and downstream populations therefore developing resource pool of temperate grasses is the solution. In order to make that change developing suitable varieties, package of practices and post-harvest management are of utmost importance. Quality of seeds of such varieties is established by using certain established standards which are not developed for many temperate grasses which hinder the production of certified seed and its quality control.

The main objective of this investigation was to develop seed standards in five temperate forage crops *viz*., *Trifolium pretense* (Red clover), *Dactylis glomerata* (Cocksfoot), *Festuca arundinacea* (Tall Fescue), *Bromus unioloides* (Brome/Prairie), and *Lolium multiforum* (Annual Rye grass). Basic requirement for optimum germination with different temperatures and light condition was observed in case of all five forage crops under study. Parameters such as test weight, sample sizes, germination, *etc.* showed great variability between the accessions whereas temperature requirement and moisture content were relatively uniform among all the accessions of each particular species. Seed standards have been developed in these species using frequency distribution and a representative value for the seed standards is taken as shown in Table 1.



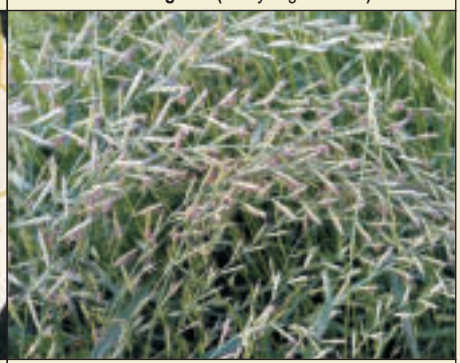
Red clover (*Trifolium pretense*)

Brome (*Bromus unioloides*)

Orchard grass (*Dactylis glomerata*)

Tall Fescue (*Festuca arundinacea*)

Annual rye grass (*Lolium multiforum*), **Lab**



Annual rye grass (*Lolium multiforum*), **Field**

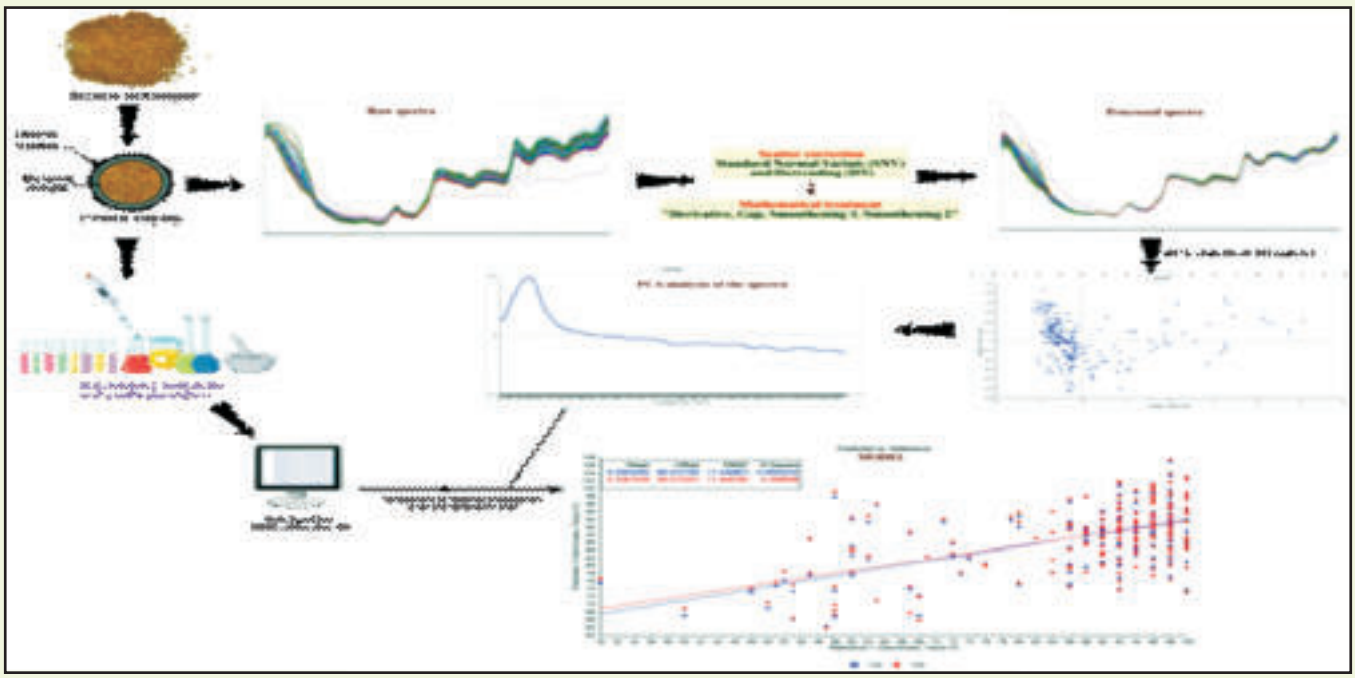
Table 1. Proposed seed standards in temperate forages

Parameters	Red clover (*Trifolium pretense*)	Cocksfoot (*Dactylis glomerata*)	Tall Fescue (*Festuca arundinacea*)	Brome/ Prairie (*Bromus* spp.)	Annual Rye grass (*Lolium multiflorum*)
Pure seed (min.)	75	70	70	90	80
Inert matter (max.)	25	30	30	10	20
OCS (max.)	10/kg	10/kg	10/kg	10/kg	10/kg
Weed seeds (max.)	10/kg	10/kg	10/kg	10/kg	10/kg
ODV (max.)	NA	NA	NA	NA	NA
Germination % (min.)	60	50	60	90	65
Moisture % (max.)	10	8	8	9	10

(Sunil Swami, Vijay Yadav, Sanjay Kumar, Suheel Ahmad and HM Halli)

Assessment of Germination Percentage in Berseem using Near-infrared Spectroscopy (NIRS)-based Prediction Models

Seed quality is a multiple-component characterization of seeds, including varietal and analytical purity, germination capacity, vigour, seed health and uniformity. Hence there is a great need of a quick and effective method to determine the germination condition and viability of seeds before cultivating, selling and planting. Near-infrared spectroscopy (NIRS) is a type of high-energy vibrational spectroscopy performed in the wavelength range from750 to 2500 nm (13,333 to 4000 cm^{-1}). In the present study seed quality trait (germination %) was assessed for 206 diverse berseem lines. The Near-infrared spectra of the seed samples were procured and processed by using Standard Normal Variate (SNV) along with Detrend to circumvent any curvilinearity and noise in the NIRS signal baseline. The spectral data was then further subjected to Principal component analysis (PCA) to explore the direction of the highest variance of the spectral data in a multi dimensional data space, based on the hypothesis that high variability (indicated by a high variance value) corresponds to a high amount of information. This also helped to identify highly variable regions in the spectra. Modified partial least squares (MPLS) regression algorithms based on full-range spectra were used for model calibration. MPLS builds its factors by catching the maximum possible variation in the spectroscopic data by actively utilizing the reference values (physical, chemical, etc.) during spectroscopic data decomposition. This method decreases the effect of irrelevant and large spectroscopic variations in the calibration modelling by counter balancing the biochemical data and spectroscopic information.



(Maharishi Tomar, Prabha Singh, Tejveer Singh and VK Yadav)

Mulberry based Silvipastoral Systems for Augmenting Forage Availability

The interspaces of forest plantations offer scope for raising pasture in order to meet forage requirement of the farmers and pastorals. The silvopasture systems involving suitable multi-purpose tree and grass species provide resilience by ensuring continued and multiple outputs such as, fuel wood, fodder, fibre and industrial raw material, besides other positive environmental effects. In a mulberry based silvopasture study Srinagar, maximum green fodder yield (73.42 t/ha), dry fodder yield (19.09 t/ha) and crude protein yield (3.26 q/ha) were observed under the treatment (*Phalaris* + orchard grass + sainfoin + mulberry) which was followed by (*Phalaris* + sainfoin + mulberry). *Phalaris* + orchard grass + sainfoin + mulberry recorded 225.16% yield increase over control, 36.72% over *Phalaris* + mulberry, 72.38% over orchard grass + mulberry and 64.69% over sainfoin + mulberry systems. The highest number of tillers per square meter (856) were also recorded under the treatment (*Phalaris* + orchard grass + sainfoin + mulberry). The silvopasture system having combination, *Phalaris* + orchard grass + sainfoin + mulberry, is, therefore, recommended for large scale adoption in land-uses, i.e., forest lands, wastelands, canal banks, road sides, farmlands etc.

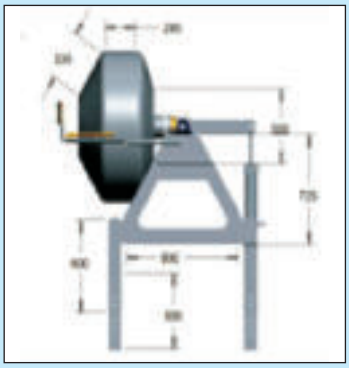
(Suheel Ahmad, Nazim Hamid Mir and Sheeraz Saleem Bhat)

Development of Smoke Water Machine

A smoke water machine was developed for dissolution of smoke derived compounds of different grasses into water. The machine was consisted of smoke-water chamber, grass burning chamber, water recirculation system and air flow control mechanism. Thesmoke-water chamber (600×400×500 mm) fabricated using 2 mm stainless steel sheet was designed for 120 L volume that could able to holdupto72 L of smoke water. The water recirculation system incorporated inside the water chamber comprised of perforated cooling pad (1inch thick) and small submersible pump (40 W, 220V, 3800 L/h) was used for cooling down the smoke temperature as well as the proper scrubbing of smoke with the recirculating water. The grass burning chamber (520×300 mm) was designed for 36.5 L volumethat could able to hold 10-15 kg of grasses depending upon density. Axial Fan (40w, 220V, 0.14A) with rectangular orifice sliding gate type mechanism was used at bottom of burning chamber to control the flow and continuous generation of smoke. The overall dimensions of developed machine were 1100×400×1000 mm. Smoke generated after burning the grasses inside the burning chamber were entering inside the water chamber and then smoke get mixed with water droplets to make it smoke water. This machine could able to prepare 70 L smoke water in one hour by burning 10 kg of grasses.

(Amit Kumar Patil, Prabha Singh, Sanjay Kumar, Ravi Prakash Saini, Anup Kumar and VK Yadav)

Development of IGFRI Grass Seed Pelleting Machine



To improve seed placement, germination and crop stand and to reduce seed rate and to impart protection against various biotic and abiotic stresses in grasses, seed pelleting plays very important role. Seed pelleting involves mixing of fluffed seeds, soil and water at right proportion in a rotating pelleting chamber. To make the pellets of lighter grass seeds *viz.* Dinanath, Cenchrus, guinea and other similar seeds an indigenous IGFRI conical shaped grass seed pelleting machine has been developed. The machine's components consists of machine Frame, pelleting chamber assembly, a variable speed control panel/speed regulator, motor, belt & pulley power transmission unit, gear mechanism and water application system. The pelleting chamber was made of 16 guage MS sheet, weight: 60 kg; dia: 960 mm ϕ; width: 245 mm; central inner circular plate: 400 mm ϕ, slant length of conical outlet: 335 mm; Outlet circular opening: 500 mm ϕ; and Central height: 140 cm.

(Sanjay Kumar Singh, PK Pathak, Amit Kumar Patil, Prabha Singh and Sunil Swami)

Policy Issue

Greening the Gold: The Imperative for Grassland Management in India

Grasslands are contested ecosystems due to our limited comprehension of their ecological and socioeconomic significance and the ambiguity surrounding their defining characteristics. This predicament intensifies in the absence of effective governance. Protected areas cover less than 5% of India's grasslands, and ongoing restoration initiatives tend to favor transforming natural grasslands into plantation forests. Over the past decade and a half, India has witnessed a significant 30% decline in its grassland area. This decline can be ascribed to three interlinked factors. Firstly, there exists a historical bias ingrained in India's natural resource management, influenced by colonial priorities that prioritize forests over other ecosystems. Secondly, a parallel colonial legacy categorizes grasslands and other non-forest ecosystems as "wastelands," assuming their current state is a result of degradation rather than recognizing distinct ecosystem types and conditions. Thirdly, a global environmental science and communication system focused on conservation and restoration tends to prioritize forests over other ecosystems, creating a Biome Awareness Disparity (BAD). This perpetuates India's emphasis on afforestation as part of global environmental commitments, often neglecting the importance of grasslands.

Addressing this challenge requires the establishment of a national policy framework dedicated to the conservation and restoration of grasslands, one that seamlessly incorporates the intrinsic values of grasslands and other non-forest ecosystems. This comprehensive framework should

recognize and emphasize their role in conservation and the diverse benefits they offer to communities within a broader legal context. Additionally, international scientific endeavors and restoration agreements must shift away from their current forest-centric structure. The impact is particularly pronounced when global agreements implicitly endorse forest-centric concepts, influencing countries like India with pre-existing strong biases toward internal forest priorities. Notably, concepts such as "Forest Landscape Restoration," advocated by numerous international organizations as part of global restoration initiatives, should subtly encourage consideration of the entire landscape, including non-forested areas like grasslands. Furthermore, restoration efforts should not solely adhere to ecological principles but should also reflect an understanding of the intricate relationship between society and policy. This approach ensures that interventions are not only ecologically sound but also socially responsible.

(Bishwa Bhaskar Choudhary)

National Group Meet (*Kharif* 2023) of AICRP on Forage Crops and Utilization

National Group Meet (*Kharif* 2023) of AICRP on Forage Crops and Utilization was organized during 15-16 June, 2023 at CSKHPKV, Palampur (HP). Dr. T.R. Sharma, DDG (CS), ICAR was the Chief Guest and Dr. S.K. Pradhan, ADG (FFC), Dr. D.K. Yadava, ADG (Seeds), ICAR New Delhi and Dr. Amaresh Chandra, Director, ICAR-IGFRI were Guest of Honour. The event was chaired by Dr. H.K. Chaudhary, Vice Chancellor, CSKHPKV–Palampur. Dr. V.K. Yadav, Project Coordinator-Forage Crops presented the highlights of research activities carried out in previous year. Detailed discussion and review of center wise activities, FTD and TSP achievements as well as pre-breeding and bio-fortification aspects resulted in future guidelines and directions. During the meeting 11 varieties in 3 fodder crops (fodder maize: AFH-7, DFH-2, PFM-13 and HQPM-28; pearl millet: 16ADV0111 , FBL-4, PHBF-5, TSFB-1610 and JPM-18-37 and BN Hybrid: TSBN-15-15 and BNH-2.) are identified for cultivation in different parts of the country. In crop production, seven technologies *viz.,*nutrient management for forage sorghum hybrid for Himachal

Pradesh, fodder maize in Karnataka, forage sorghum hybrid in J&K and Uttar Pradesh were identified. Similarly, suitable varieties for multicut bajra for Chhattisgarh, Bihar, Punjab with three cutting management schedule coupled with defined nitrogen management were recommended. Management practices for the leaf blast in fodder pearl millet in North-West zone, in North-East and Hill zone were recommended. For the management of fall armyworm (*Spodopterafrugiperda* L.), foliar spray of Emamectin benzoate 5 WG @ 0.5g/L was recommended to manage yield losses at minimum level in North-West, North-East and South zones for forage crop protection,.

Celebration

- ICAR-IGFRI celebrated the 74th Republic Day (January 26, 2023) by hoisting the National Flag by the Director Dr. Amaresh Chandra followed by addressing the staff of the Institute.

- Under International Millet Year 2023, institute demonstrated various millet crops in TD Block and organised “Millet Food Festival” at Jhansi and its regional stations. Staff of the institute virtually participated in “Global Millet Conference” which was inaugurated by Hon'ble PM Shri Narendra Modi Ji, on March 18, 2023. Institute also organised guest lectures on importance of millets, distributed millet based snacks and provided logistic support to the millet promotion programmes of the state and central government.

- ICAR-IGFRI celebrated International Women's Day in the gracious presence of Smt. Kalpana Mohapatra.

- Institute celebrated World Intellectual Property Right day (April 26, 2023) and on this occasion an online lecture was delivered by Prof. Charu Virmani.

- ICAR-IGFRI and its regional stations celebrated World Environment Day 2023 (5 June) and made plantation in the institute.

- ICAR-IGFRI celebrated "International Yoga Day-2023" (June 21, 2023)

Meetings

- Under the Chairmanship of Prof. Panjab Singh, Former Secretary, DARE, GOI and DG, ICAR, New Delhi, QRT meeting was held on January 3-4, 2023 at ICAR-IGFRI Jhansi.

- Research Advisory Committee (RAC) meeting and Launching Ceremony of National Livestock Mission, ICAR-IGFRI was held on March 17, 2023 at Jhansi under the Chairmanship of Dr. P.L. Gautam, Former Chairperson, PVFRA, New Delhi.

- 48th Institute Management Committee (IMC) meeting was held under the Chairmanship of Dr. Amaresh Chandra, Director on February 28, 2023.

- Visit of PMC was conducted under the Chairmanship of Dr. Amaresh Chandra, Director and experts Dr. S.K. Chaturvedi, Dean Agriculture, RLBCAU Jhansi and Dr. A.K. Roy, Principal Scientist, AICRP-FC, IGFRI, on April 04, 2023.

- Under the Chairmanship of Dr. Amaresh Chandra, Director, ICAR-IGFRI meetings of Institute's Rajbhasha Implementation Committee was conducted on February 13, 2023 and May 12, 2023.

Mela/Conference/Workshop/Webinar

- The ICAR-IGFRI, RRS, Srinagar organized one day (January 18, 2023) Workshop on "Development of Fodder Resources for J&K" at District Sheep Husbandry Office, Bandipore and was attended by 25 Officials from the line departments, besides innovative farmers.

- Institute has organised "Technology and Machinery Demonstration Mela" on March 01, 2023: Chief Guest of the occasion was Prof. Pulak Mohan Pandey, Director, BIET, Jhansi and Guest of Honour was Dr. A. Arunachalam, Director, ICAR-CAFRI, Jhansi.

- Institute organised Hindi Workshops on March 15, 2023 and June 13, 2023.

- ICAR-IGFRI, RRS, Srinagar in collaboration with Satya Zero Grazing organized 4 Webinars on Good feed and fodder management practices for goat and sheep farming (Dr. Manpreet Kour, SKUAST-J, 4th June, 2023),

Feed Management of Sheep and Goats (Dr. Nazam Khan, SKUAST-J, 11 June, 2023), Modern goat Farming (Dr. Vandhana Bhagat, FVSc Durg, Chattisgarh, 18 June, 2023) and Process of making cheese and chenna from Goat milk (Dr. Heena Sharma, NDRI Karnal, 24 June, 2023).

Refresher course

❖ ICAR-IGFRI, RRS Srinagar in collaboration with NADCL Baramulla organized 10 days Refresher course 'Advances in Commercial Goat Farming for Enhancement of Livelihood Security' (through Hybrid Mode) during 20th to 29th March, 2023, wherein 71 participants attended.

Trainings/ Kisan Gosthis

I. BAIF-SLD-Banda sponsored training programs at ICAR-IGFRI, Jhansi

Name of the training programme	No. of participants	Duration
Training on improved fodder and livestock technologies for women of Hamirpur district	25	10-1-2023 to farmers 12-01-2023
Training on improved fodder and livestock technologies for women farmers of Banda district	25	18-1-2023 to 20-01-2023
Training on improved fodder and livestock technologies for women farmers of Banda district	25	23-1-2023 to 25-01-2023

ii. Institutional training programs

Name of the training programme	No. of participants	Duration
'Farmers training on improved forage and livestock techniques' under SCSP, ICAR-IGFRI, Jhansi	10	10-1-2023 to 12-01-2023
'Farmers training on improved forage and livestock techniques' under Farmers First Project, ICAR-IGFRI, Jhansi	10	18-1-2023 to 20-01-2023
'Farmers training on improved forage and livestock techniques' under outreach IFS project of ICAR-IGFRI, Jhansi	10	23-1-2023 to 25-01-2023

iii. Training cum awareness programme

Indian Grassland and Fodder Research Institute, Jhansi and its regional centres has kept its doors always open for all those who have keen interest on fodder production and the related activities. During the period a total of 1196 farmers, entrepreneurs, personnel from state and central governments and NGOs visited IGFRI and interacted with the experts in related subject through their 29 visited of ICAR-IGFRI Jhansi. ICAR-IGFRI, RRS, Srinagar also conducted 10 out reach training cum awareness programmes on various aspects of fodder & livestock and distributed agri inputs to a total of 661 participants of J&K.

iv. Other trainings

Biosafety training for handling of hazardous chemicals and biological agents during February 06-09, 2023

Awareness cum Training Programme on Intellectual property: farmers rights and protection on March 13, 2023

MoUs signed

1. MoU between ABI Unit ICAR-IGFRI, Jhansi & Mr. Mahesh Gupta of Beejor, Niwari, M.P. for entrepreneurship development
2. MoU between ABI Unit ICAR-IGFRI, Jhansi & incubatee Mr. Deepak Purohit of M/s Talbehat Adrek evam Haldi Producer Company Limited for entrepreneurship development
3. MoU between ICAR-IGFRI, Jhansi & ICARDA for conducting research activities in cactus
4. MoU between ICAR-IGFRI, Jhansi & APAHD, Govt. of Andhra Pradesh for training/technology dissemination/research

Distinguished Visitors:

- Dr. T.R. Sharma, DDG (Crop Science), ICAR along with Dr. P.L. Patil, Vice Chancellor of UAS, Dharwad and Dr. B.D. Biradar, Director of Research, UAS, Dharwad visited SRRS, ICAR-IGFRI, Dharwad on February 2, 2023.

- Dr. Trilochan Mohapatra, Former Secretary, DARE and DG, ICAR visited institute and interactedwith staff of the institute on March 06, 2023.
- Minister of Agriculture & Farmers Welfare, GOI Hon'ble Shri Narendra Singh Tomer Ji along with Secretary DARE & DG, ICAR, Dr. Himanshu Pathak, RLBCAU Chancellor Prof. Panjab Singh and Vice-Chancellor Dr. A.K. Singh visited ICAR-IGFRI Jhansi and inaugurated newly constructed Seed Processing & Storage Unit and distributed agri inputs to beneficiaries in Labharthi Kisan Sammelan under SCSP on March 11, 2023.

- Minister of Agriculture, UP Govt., Hon'ble Shri Surya Pratap Shahi Ji with Chief Secretary, UP Govt. Sh. Durga Shankar Mishra visited ICAR-IGFRI Jhansi on April 02, 2023.

- Prof. P.V. Vara Prasad, Director, Center for Sorghum Improvement, Department of Agronomy at Kansas State University visited ICAR-IGFRI Jhansi on June 20, 2023, interacted with scientists and delivered his talk.

- Shri Nitin Kumar S Khade (IAS), Joint Secretary, Deptt. of Land Resources, GOI visited CR Farm and interacted with staff of the institute on May 18, 2023.

Awards and Recognitions

- Dr. Maneet Rana, Scientist, Crop Improvement Division has been awarded with INSA Visiting Scientist Fellowship during 2023 under INSA Visiting Scientist Programme 2023 (FY 2023-24).

Promotion of staff

- Sh. Rakesh Kumar Chhipa, Assistant to IIIrd MACP
- Sh. Ravinder Singh Negi, Assistant to Ist MACP
- Sh. Kashi Ram, SSS to Ist MACP
- Sh. Sanjay Kumar Rajak from Assistant to AAO
- Sh. Dinesh Kumar Namdev Assistant to AAO
- Sh. Kumar Vivek, Sr. AO got promoted to CAO.
- Sh. Gautam Saxena, AAO got promoted to the post of AO.

New Joining

Name with designation	Date
Sh. Firoz Khan, CAO (SG)	01.01.2023
Dr. Jeetendra Kumar Soni, Scientist (Agronomy)	11.04.2023
Sh. Tanmaya Kumar Sahu, Scientist (Bioinformatics)	11.04.2023
Sh. Samir Barman, Scientist (Agricultural Statistics)	11.04.2023
Sh. Ravi Bhadra, SFAO	01.05.2023
Dr. V.K. Yadav, PC-FC, AICRP on Forage Crops	25.04.2023
Dr. Sadhana Pandey, Head, Social Science Division	19.06.2023
Dr. D.R. Palsaniya, Head, Crop Production Division	21.06.2023
Dr. Shahid Ahmad, Head, Crop Improvement Division	23.06.2023

Selection of Staff:

1. Dr. Sunil Kumar, Pr. Scientist (Agronomy) selected as Director, ICAR-IIFSR, Modipuram, Meerut.
2. Dr. Limbalkar Omkar Maharudra, Sr. Tech. Officer (T-6) selected as Scientist through ASRB.

Transfer of Staff

Name	Relieved on
Dr. Vinod Kumar Wasnik, Sr. Sci. (Agronomy) transferred to ICAR-NIBSM, Raipur	22.03.2023
Dr. Reetu, Scientist (Plant Biochemistry) transferred to ICAR-DMR, Solan	22.03.2023
Dr. Manjanagouda S. Sannagoudar, Sci. (Agronomy) transferred to ICAR-IISS, RS, Bengaluru	31.03.2023

Retirements

Name with designation	Date
Sh. U.P. Singh, T-7/8 (ACTO)	31.01.2023
Sh. Govind Das, SSS (Cleaner)	30.04.2023
Sh. Raju, SSS (Safai Karmchari)	31.05.2023
Smt. Meena, SSS (Safai Karmchari)	30.06.2023
Smt. Neelam Swankar, Assistant	30.06.2023

Published by :
Dr. Amaresh Chandra
Director
ICAR-Indian Grassland and Fodder Research Institute
Jhansi-284 003, India

Telephone : 0510-2730666
Fax : 05102730833
E-mail : director.igfri@icar.gov.in
Published at : http://www.igfri.res.in, www.icar.gov.in

Agri-search with a human touch

Swachh Bharat Abhiyan
एक कदम स्वच्छता की ओर

Editorial Committee:
A.K. Dixit
Sultan Singh
Avijit Ghosh
K.P. Rao
Pawan Kumar
Shailendra Sinha
Photographs:
Ashok Kumar Singh

Printed at : Classic Enterprises, Jhansi. 7007122381, 9415113108