The Institute hosted a joint field study with the International Centre for Development oriented Research in Agriculture (ICRA), The Netherlands from April 13 to July 10 on "A comparative system analysis of causes and effects of free range grazing and alternative feed supply and grazing regimes in the Bundelkhand region: opportunity for IGFRI research".

Findings

The Bundelkhand region has been classified into four zones based on animal pressure, extent of rainfed and irrigated cropping and forest area. The technological needs of these regions have been assessed as follows:

- The poor rainfed zone is characterized by poor soils, undulating topography, predominantly rainfed agriculture and relatively large availability of wastelands, forests and fallow lands for grazing.

Little potential exists for improving crop production on a significant scale in this zone. Thus, wastelands rehabilitation schemes and grazing land management schemes are required.

- The forest zone is characterized by poor soils, undulating topography, predominantly rainfed agriculture on a smaller proportion and very large available forest areas.

There is potential for dramatically increasing the productivity of the severely degraded forests through Joint Forest Management (JFM) schemes. It requires technologies that improve the nutritive value and palatability of the grasses grown in the forests in combination with low cost silage making.

- The rich rainfed zone is characterized by better soils and relatively flatter topography than the previous two zones.

There is potential for technologies that increase crop production to meet the need of the large animal population in this zone.

- The irrigated zone is characterized by better soils, relatively flatter topography, predominantly irrigated agriculture and very little available land for grazing.

The greatest potential for increasing fodder production should be targeted as such.

The study proposed the following measures:

- Use of participatory methods in planning and implementing R&D activities.
- Strengthening the collaboration both within and between the institutions working in these areas.
- Creating an environment for the beneficiaries to sustain the adoption of technologies.
**INDO-UK Project Activities**

- **Training**: Dr. S.A. Faruqui, Sr. Scientist (Entomology) visited IGER, Northwye, UK from June 8 - Sept. 8, 1998. Dr. D.R. Malaviya (Plant Breeding), Dr. (Mrs.) D.H. Sukanya (Plant Breeding), Dr. A.K. Roy (Generics and Cytogenetics) and Dr. K.K. Singh (Animal Nutrition) also proceeded for 3 months training to IGER, Aberystwyth from Aug. 3, 1998.

- **Visits**: Dr. Rakesh Seth, Scientist (Seed Technology) and Dr. A.K. Samanta, Scientist (Animal Nutrition) visited Kon Kaen Seed Laboratory and Pakchong, Animal Nutrition Research Centre, Thailand from Sept. 27 - Oct. 11, 1998 to get themselves acquainted with seed analysis and techniques of storing fresh grass in mini scale plastic bags, respectively.

Dr. N.C. Verma, Sr. Scientist (LPF) participated in the VIII World Conference on Animal Production during June 28 - July 4, 1998 at Seoul National University, Seoul, Korea.

- **HRD**: Dr. N.K. Sanghi and Dr. B.B. Rai from MANAGE, Hyderabad visited the Institute for consultation with Director and Scientists of the Institute for developing training programme for skills development in different fields as recommended by Mid term Review Team of the INDO-UK Project on Forages. The MANAGE has been contracted by BCD, New Delhi to take up the assignment.

- **Workshop**: A stakeholder planning meeting on nutrient management in mini watershed was organised from Sept. 28 - Oct. 3, 1998 in two phases. The first phase was organised at IGFRI, Jhansi from Sept. 28-30, 1998 in which following scientists participated:

  Prof. R.J. Haggar, Prof. E. Owen, Dr. T. Smith, Dr. S.C. Jarvis, Dr. Mike Theodorou (all from UK), Dr. J. Tanner (ILRI, Nairobi) and the IGFRI Scientists namely Dr. V.C. Pachauri, Dr. M.R. Pahwa, Dr. S.N. Tripathi, Dr. S.B. Tripathi, Sh. O.P.S. Panwar, Dr. N.P. Shukla, Dr. K.C. Sharma, Dr. R.B. Yadav, Dr. Atar Singh, Dr. R.K. Agarwal, Dr. S.K. Sharma, Dr. N.C. Verma, Dr. A.K. Mishra, Sh. R.N. Dwivedi, Dr. (Mrs.) P. Ranjitha and Dr. C.R. Ramesh.

In the second phase the meeting was organised at IGFRI Regional Research Station, Dharwad from Oct. 1-3, 1998. The participants included Prof. R.J. Haggar, Dr. T. Smith, Dr. S.C. Jarvis, Dr. Mike Theodorou, Dr. J. Tanner, Dr. C.R. Ramesh, Dr. V. Ramamurthy, Ms. N.P. Biradar, Dr. B. Gangiah, Dr. K. Sridhar, Dr. Prakash Bhat, Dr. Zaved Mulla, Er. N.L. Joshi, Er. Shmdey, Dr. S.B. Tripathi, Dr. R.B. Yadav, Dr. S.K. Sharma, Dr. R.K. Agarwal, Dr. A.K. Mishra and Dr. (Mrs.) P. Ranjitha.

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**In vitro plantlet regeneration in Cenchrus ciliaris and Panicum maximum**

*Cenchrus ciliaris* (Buffel grass) and *Panicum maximum* (Guinea grass) are important perennial multicut forage grass species with high yield potential. *In vitro* plant regeneration was successfully attempted in these apomictic grass species to address the problem of genetic improvement. The calli were induced from various explants namely, dehusked seeds and immature inflorescence pieces in case of *C. ciliaris* and young leaf base, dehusked seeds and rhizomatous portions in *P. maximum* on nutrient culture medium supplemented with 2,4 D and BAP. Regeneration through shoot bud organogenesis was achieved within 2-3 weeks of the growth of embryogenic calli followed by rhizogenesis. The well developed plantlets with healthy shoots and luxuriant roots were obtained in cultures which were transferred successfully to the culture pots through paper bridge technique.

(M.G. Gupta, B.V. Bhat, V. Bhat, S. Gupta and C.N. Neeraja)
Dear Readers,

The ICAR has reposed a deep faith in me by offering me the post of regular Director which I joined on Nov. 6, 1998. It will be my endeavour to measure up to the high expectations of providing a dynamic leadership to the IGFRI with active cooperation and collaboration of all concerned with brightening the forage scenario in the country. The IGFRI has to gear up to the new challenges of the 21st century knocking the door now. Towards this goal the concept of project based budgeting has been introduced in the Institute as per ICAR directives. I am sure this will go a long way in establishing the accountability and rational use of resources.

The IXth Five Year Plan proposal of the IGFRI has been given a fresh and critical look once again. I am grateful to the Chairman and members of the Research Advisory Committee for IGFRI for their critical appraisal and valuable inputs towards refinement of the Plan proposal. The SRC document has also been looked into and now all the RRC and HQ projects on the same theme have been cross-listed for easy reference.

Greater efforts are now being put on the Participatory Research Approach and more of our scientists are being trained to make use of this approach in their activities. All the ongoing programmes of Kharif and Rabi are in operation as per schedule. The collaborative programmes, both national and international are moving on smoothly.

The drive towards infrastructure build up is on and particularly is now being equipped well with better documentation facilities. I am sure all these efforts would go a long way for creating better working atmosphere at this Institute.

(P.S. TOMER)

IGFRI Welcomes New Director

A man of vast experience and globally acclaimed in the field of Agronomy particularly in forage production, Dr. P.S. Tomer has taken over as regular Director of the Institute on October 6, 1998. He has been serving at this Institute in various capacities since July 7, 1985 as Principal Scientist (S-4) Agronomy and later as Head of Division of Seed Technology, Extension & Training, and Crop Production before assuming the reins of the Institute as Director (Acting) along with charge of Project Coordinator (FC).

Having a brilliant academic record and M.Sc. (Ag.) Agronomy in 1960 from Agra University, he earned his Ph.D. degree from the same University in 1966, in the field of forage Agronomy. He began his service career from the erstwhile B.R. College Agra in the year 1960, working as Research Asstt. and Asstt. Prof. (Agron.) He then shifted to HAU Hisar as Asstt. Prof. (Agron) in 1967 where he was appointed as Agronomist from Feb 18, 1971 and worked as Head, Bajra Section. He entered into ICAR system in 1978 with the joining at NDRI Karnal as Professor of Agronomy (S-3) and Head Forage Section, later promoted as Professor Agronomy (S-4) on July 1, 1984, before being transferred to IGFRI in the same capacity.

Dr. Tomer has more than 37 years experience in the field of research, teaching, extension and research management. He has a good number of publications to his credit that include 227 research papers and book chapters and 4 bulletins. He has guided more than 32 M.Sc. & Ph.D students. He has been actively associated with transfer of technology activities and has to his credit more than 80 Radio/TV talks. He has been abroad for study tour to U.K and The Netherlands.

All of us at this Institute welcome this towering personality as their Head of the family and hope that the Institute would march ahead in its endeavour under his able and dynamic leadership.
### Profile of a Division

#### SOCIAL SCIENCES

The Division of Social Sciences started functioning in 1998 after a review of various divisions by ICAR. Initially a division of Extension and Training was established during VI Plan in the year 1981-82 under the leadership of Dr. M.R. Lokhande. Later on to facilitate multidisciplinary research in the area of transfer of technology for forage production and its utilization to farmers and intermediary agencies, the erstwhile division of Rural Economics and Biometrics was merged in it and was named as Division of Economics and Extension.

At present division is headed by Dr. Atar Singh and has a scientific strength of twelve in the subject matter areas including the disciplines of Agronomy, Agril. Extension, Agril. Economics, Agril. Statistics, Livestock Production & Management and Sociology.

<table>
<thead>
<tr>
<th>UNITS</th>
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<td>• Transfer of Technology</td>
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<td>• Training</td>
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<td>• Socio-economic Analysis</td>
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<td>• Undertake research on various aspects of agricultural extension, economics and statistics in relation to forage production and utilization.</td>
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<tr>
<td>• Imparting training on forage production, its utilization and development of fodder resources.</td>
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<td>• Transfer of technology through various extension activities and obtaining feedback.</td>
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<td>• To develop and strengthen linkages with various Govt. &amp; Non-government developmental agencies.</td>
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### SPECTRUM OF ACTIVITIES

The division is emphasizing on formulating and executing strategies for client oriented and need based research on participatory basis with farmers. The scientists of this division are engaged in the research programmes related to adoption and diffusion of forage innovations and collection of feedback information. The following are the thrust areas:

- To develop appropriate extension techniques for transfer of recommended technology, get feedback information for technology refinement and to disseminate knowledge on the subject.
- To undertake investigations on statistical designs, sampling techniques and economic analysis related to herbage and seed production in forage crops/systems.
- To disseminate the technology developed for effective adoption.
- Technology transfer and HRD
- R&D for optimising the rural resource inputs in achieving an economically viable crop-livestock enterprise.

### ACHIEVEMENTS

#### Transfer of Technology

- The technology developed by the IGFRI has been disseminated and transferred effectively and the feedback information obtained.
- The attitude of farmers has been measured towards adoption of forage crops.
- Training needs of farmers have been assessed/identified.
- Through PRA techniques a large number of Rural Peoples Knowledge (RPK) have been obtained and documented.
- Evaluated forage farming system at farmers field.
- The role of women in agriculture specially in forage crops has been analysed
- Kisan Mela, Kisan Diwas, Kisan Goshthi, Mahila Divas and Exhibitions have been organised with the latest technological advancements on fodder production.

#### Demonstrations on various forage crops/systems and outreach programmes at farmers field have been regularly laid for popularizing Institute technologies and the varieties.
Developed and strengthened the linkages with various Govt. departments/NGOs/developmental agencies/SAUs for effective technology transfer and feedback information.

Providing Farm Advisory Services through postal enquiry, visits, study tours etc.

Established Farmers Service Centre to cater the forage seed requirements of farmers on payment basis.

Training

Over the years, a number of comprehensive trainings on the aspects of forage production and utilization have been conducted through following courses:

* NARP training:

One month NARP training courses on different aspects of forage production have been organised to strengthen regional research capabilities since 1989, on regular basis for teachers of SAUs and so far 17 such training have been organised.

Short Term Courses:

A large number of tailor made short term courses of different durations have been organised, for specific needs of sponsoring agencies for the development officials, extension workers, NGOs and farmers.

Established Farmers Service Centre to cater the forage seed requirements of farmers.

Technology appraisal training:

Organising technology appraisal trainings for farmers, extension workers, forest officials, visitors and other agencies has been a regular practice of the division.

Socio-Economic Analysis

* Economics and cost benefit of various food and forage crops and that of various forage production systems including range grasses have been worked out.

* The optimum plot size under cost considerations for different forage crops has been worked out.

* The scientists at the Institute have been advised on proper planning of the plot size for laying out the field experiments.

किसान बंधु,
बारा उत्पादन तकनीक, बीज उपलब्धि सम्बन्धी अधिक जानकारी हेतु संस्थान से सम्पर्क करें।
Stem borer incidence in *Chrysopogan fulvus*

*Chrysopogan fulvus* (Spreng) Chiov., locally known as *Dhawlu* grass is an important perennial grass and forms one of the principle grasses of *Sesima-Dicanthium* grass cover in the central and southern plateau in the country. It is adaptable to a wide range of habitats, a quick colonizer and is widely used for wasteland development.

This year, for the first time incidence of stemborer *Chilo* spp. (Lepidoptera:Pyralidae) was recorded on this grass species. The damage was as high as 42.65% of the total tillers. The adult moth is a medium sized insect with straw coloured forewings. Eggs are laid in clusters on the underside of the leaves. The larvae that cause damage on hatching, briefly feed on the leaves particularly on the central whorl and then bore into the stem, resulting in dead heart formation. Due to the damage by larvae the number of productive/fertile tillers are reduced resulting in less panicle formation. *C. fulvus* gives the seed yield of 40-45 kg/ha. But due to the stem borer damage this year a drastic reduction in seed yield is expected.

(Ch. Padmavathi, S.A. Faruqui and A.A. Khan)

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Legume tree leaves - as substitute of concentrate mixture for local goats

Legume tree leaves are known for their high protein yield and persistency. They are utilized under grazing as well as mixed farming system for livestock feeding. They are rich in protein, ranging from 18 to 35% and other nutrients like carotene and minerals. The complete replacement of concentrate mixture with fresh *Sesbania* and *Leucaena* leaves on isoionogenous basis (upto 55% of dry matter intake) in local goats fed dry mixed grass did not elicit any adverse effect on feed intake, growth performance, efficiency of nutrient utilization, blood biochemical constituents and rumen fermentation pattern. Goats maintained healthy condition throughout the experimental feeding. Therefore to mitigate the shortage of protein source during scarcity legume tree leaves can be exploited for economic goat production.

(S.K. Mahanta, U.P. Singh, K.K. Singh and V.C. Pachauri)

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Farmers participation in grass seed production

The major determining factor for forage production and transfer of technologies is the availability of quality and adequate amount of seed. Range grass and legume seed systems were neglected from quality seed production, point of view. This system required specific development with respect to quality seed production and distribution. There is need of wide scale seed networking through the involvement of small and intermediate farmers, to meet the gap in requirement and availability of grass seeds. Quality seed production of Dinanath grass (*Pennisetum pedicellatum*) and Anjan grass (*Cenchrus ciliaris*) was taken through the farmers at their field under the participatory seed production programme of the Institute. In this programme farmers were selected from different villages in the Bundelkhand region and ten farmers agreed to grow the grasses at their fields. Sowing and transplanting of these grasses was carried out as per the technical advise. The crop was monitored at different stages of crop growth for maintaining its potential growth, purity and quality. The seed collection of these grasses is under progress. The total grass seed produced will be purchased under buyback guarantee.

The goal of this seed production system is to produce maximum quantity of high quality seeds. The system of seed production of high priority cultivated fodders and range grasses and legumes with the involvement of small farmers at FARMERS FIELD, co-ordinated by IGFRI in collaboration with NGOs (as liaison). This would also assess the potential of IGFRI developed cultivars and technologies for quality seed at farmers field and help in development of human resource and infrastructure for quality seed production.

(R.K. Bhat and Maharaj Singh)
**Sulphur for forage production**

Increasing cropping intensity, higher crop yields and increasing use of S free fertilizers is resulting in the increasing deficiency of sulphur in the soil. Among the soil samples collected from watershed areas of Tejprua (Jhansi), 62% were found to be in low (below 10 ppm S), 34% medium (10-20 ppm S) and 4% high category (above 20 ppm S). The red soils in coarse textured class were more deficient in sulphur nutrient than fine textured red and black soils. The application of sulphur @ 45 kg/ha was found to be beneficial for promoting higher yield and quality of fodder sorghum, particularly in low sulphur containing soil.

(S.B. Tripathi)

**Potassium as a specific nutrient for Panicum seed production in alfisols**

In a field study, it was observed that an increase of 1.5 to 2.0 q/ha in total seed yield of the crop can be achieved with Potassium applied at the rate of 100 kg K2O/ha at the time of flowering. Out of the three seed seasons in a year (August, October and April), October collections contributed 52% to the total annual seed yield. Three seed collections during thirty days in October made at an interval of 10 days could collect only 38% of the total seed produced during this period. Potassium applied in July could neither be retained in exchangeable form, nor was available to the crops during reproductive phase. Reproductive requirements of potassium could only be fulfilled when potassium was applied at the start of reproductive phase. It is concluded from these studies that while growing Panicum as a seed crop, potassium application at flowering stage is must for potential seed yields. The crop should be managed as a seed crop in October-November and as fodder crop during all other months of the year. The studies also indicate a possibility of utilizing large areas of sodic vertisols rich in potassium for Panicum seed production.

(S.M. Misra and G.K. Dwivedi)

**Transfer of Technology**

The Kisan Gosthi at Nimouni district Jhansi organised on Sept. 16, 1998 was graced by Shri Deobrat Dixit, District Magistrate, Jhansi as the Chief Guest and was presided over by Dr. P.S. Tomar, Director, Indian Grassland and Fodder Research Institute, Jhansi. A large number of farmers, farm women, village youth, extension officers, workers of state departments, scientists of IGFR & NRCAP participated and interacted on forage production technology. The seed of Berseem Variety Wardan and Oats Variety JHO-822 was distributed by Chief Guest & Director of IGFR to the farmers for demonstration purpose.

A Kisan Gosthi was organised at Poothkhas village, Rohtak Block in Meerut district on Sept. 25, 1998 for the first time in Western Uttar Pradesh with view to disseminate forage production technologies. Shri Vijay Pal Singh Tomar ex-MLA, Sardhana (Meerut) was the Chief Guest. The function was presided over by Dr. P.S. Tomar, Director, IGFR. This largely attended Gosthi by the farmers of the adjoining districts was addressed by scientists from IGFR, CPRS Modipuram, Project Directorate Cattles, GBPUAT and PDCSR Modipuram. Sample seed of high yielding variety of Berseem (Wardan) and Oats(JHO-822) were distributed by the Chief Guest to popularise these varieties in the region.
हिंदी सप्ताह

राजमान पौरोधक के कार्यान्वयन के लिए उद्योगकर्ता ज्यादातर नग्नताए नुक्सान: नामांकन लागू में, राजमान निर्देशकों के संबंध में टूट दिनांक 14-09-98 से 19-09-98 तक राजमान सप्ताह का आयोजन किया गया जिसका विविधता उद्योगकर्ता संस्थान के निदेशकों की ओर से हुआ। अन्वयरो अध्यक्ष इसर रूप में वी. योशिंदा गुप्ता, रामलाल व जयतमस को आमंत्रित किया गया। आत्मनिर्भर का स्वागत दां. विविध संक्षेप, विभाग वैज्ञानिक, ने अपने स्वागत उद्घोषण से किया एवं अध्यक्षों का संबंध परिषद श्री ओ. पी. एस. पवार, तीनसंक्षेप वैज्ञानिक द्वारा किया गया। समारोह का संचालन व आयोजन के लिए हेमंत देव, सहायक निदेशक, राजमाना संचार किया गया। तत्समान संचार पर विभिन्न प्रतियोगिताए निकाय, महोत्त, दियरामी लेखन, कविता पाठ, हार्दिक आशा, राजमानादृष्टि पर विभाग एवं वैज्ञानिक विवरण पर विद्वान-गोष्टियों ने आयोजित की गई जिसमें कविता पाठ एवं राजमाना निदेशक पर विहार वक्ताओं के विवाह के लिए मुख्य अधिकारी के रूप में प्रमाण: श्री आंबेब वन, निदेशक आ काल्याणी, फरीदपुर श्री राष्ट्र मिला, राजमाना अधिकारी एवं सर्वेक्षण नगर राजमाना कार्यान्वयन समिति, मुख्य नेत्र, फरीदपुर एवं पुढाव वक्ताओं में डॉ. जे.एल. विराट, श्री. फरीदपुर गीताक संस्करण का आमंत्रित किया गया।

सप्ताह का विविध लक्ष्य समारोह दिनांक 19-02-98 को माननीय श्री फरीदपुर राय, ए.एस. एस. दसूरा (फरीदपुर नंबर) श्रीके मुख्य अधिकारी में आयोजित। नक्शे ने अपने उद्घोषण लेखक के लिए भाषण का पत्रम होता है अत: विभाग की अभियांत्रिक जो नातुमाना राजमाना दी जा सकती है वह असक्षम नाथ श्री नाथे से नहीं।

Sh Ghiasi Ram, Armed Guard, an ex-serviceman, who joined this Institute in January 1987, retired after superannuation on September 30, 1998.

We wish them a healthy & happy life

For any further information, you can reach us in person or through mail at:
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