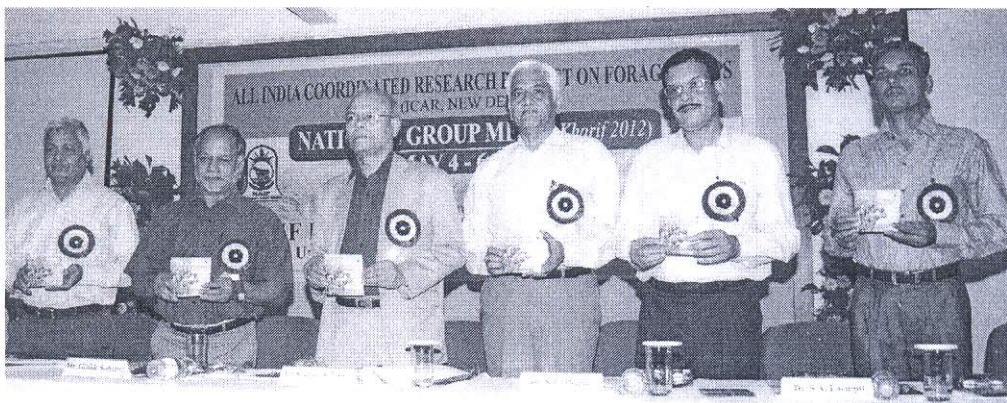


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**ALL INDIA COORDINATED RESEARCH PROJECT
ON
FORAGE CROPS**
(Indian Council of Agricultural Research)



Proceeding of the National Group Meeting- Kharif 2012

held at
BAIF, Pune

during
May 4-6, 2012

Project Coordinating Unit
All India Coordinated Research Project on Forage Crops
IGFRI, Jhansi-284 003 (U.P.)

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Compilation and Editing:

Dr. S. A. Faruqui
Dr. R. V. Kumar
Dr. S. R. Kantwa

Editorial Assistance:

Shri Vijay Kumar Paliwal
Shri Sushil Kumar Khare
Shri O. N. Arya
Shri H. K. Agarwal

Published by:

Project Coordinator (Forage Crops)
AICRP on Forage Crops,
IGFRI, Jhansi- 284 003
Uttar Pradesh

Phone: 0510-2730029
Fax : 0510-2730049
Email : pcforage@gmail.com

June 2012

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PREFACE

The National Group Meet, *Kharif* 2012 of All India Coordinated Research Project on Forage Crops was organized with the objective to review the accomplishments of Technical programme executed during *Kharif* 2011 at different Coordinated and cooperating centres, in-house research activities and forage technology demonstration (FTDs) conducted and also to formulate technical programme for *Kharif* 2012 as well as to discuss future thrust areas for fodder research. The meeting was jointly organized by Indian Council of Agricultural Research and BAIF, Pune during May 4-6, 2012.

The meeting was attended by the scientists mainly engaged in forage research working under coordinated and collaborating centres located at different SAUs, ICAR institutes and NGOs. Representative of NSC, NDDB and private seed companies also participated in the programme and being important stake holders contributed in the development of programme and linkages strengthening future course of action, keeping in view the changing present agricultural needs of the farmers. Besides this, the local participation included scientists and staff members from BAIF, Urulikanchan and electronic and print media of the region.

This compilation contains brief report of National Group Meet, *Kharif* 2012 covering highlights on forage crop improvement (entries identified) and plant protection technology generated, proceedings of different technical sessions and technical programme for the coming *Kharif* 2012. The National Group Meet members discussed and planned future strategies for improving the forage productivity, quality, nutritive value and soil health to address the regional and national forage security with sustainability for the increasing livestock population. The finalized technical programme on forage crop improvement, forage crop production and forage crop protection for *Kharif* 2012 have been given in annexure.

The successful conductance of the programme is attributed to the joint efforts made by the participating scientists, authorities of IGFRI and the Council, the core staff of Project Coordinating Unit, Principal Investigators and other staff. The team of All India Coordinated Research Project on Forage Crops sincerely acknowledge their technical and organizational assistance and cooperation for successful organization of the meeting.

S A Faruqui
Project Coordinator

INAUGURAL SESSION

The inaugural session of the National Group Meet, *Kharif* 2012 of AICRP on Forage Crops was organized at BAIF, Pune (Maharashtra) during May 4-6, 2012. The meeting was inaugurated by Dr. G. G. Sohani, President & Managing Trustee, BAIF, and chaired by Dr. Swappan K. Datta, DDG (CS), ICAR, New Delhi. The other dignitaries on the dais included Dr. N. G. Hegde, Advisor and Trustee to BAIF and Dr. A. B. Pande, Vice-President, BAIF, Urulikanchan. Dr. A. B. Pande, Vice- President, BAIF, Urulikanchan (Pune) extended welcome to the chief guest, dignitaries, participating scientists, team of NGM organizers, BAIF staff, representative of press and media, and farmers of the region.

Dr. S. A. Faruqui, Project Coordinator (Forage Crops) and Director, IGFR, Jhansi presented the Coordinator's Report for *Kharif* 2011. He highlighted the progress of research activities and the targets achieved as per the technical programme under the project. During *Kharif* 2011, the research activities were conducted at 42 centres located in Five Zones i.e., Hill, North-West, North-East, Central and South Zone, on aspect of forage crop improvement, forage crop production and plant protection. In *Kharif* 2011, sixteen breeding trials of four annuals and six perennials forage species including test entries with their checks were conducted at 42 centres located in Five Zones. The forage species evaluated were pearl millet, cowpea, rice bean and soybean in annual and guinea grass, *Cenchrus ciliaris*, BN hybrid, *Setaria anceps*, *Lasiurus indicus* and *Cenchrus setigerus* in perennials. Thirteen forage crop production trials at 21 locations were under taken to generate forage crop production technologies and improved forage varieties. Forage crop protection trial in major *Kharif* forages included pest occurrence, evaluation of breeding material to pest and disease resistance and pest management were conducted at Anand, Bhubaneswar, Hisar, Hyderabad, Jhansi, Ludhiana, Palampur and Rahuri centres.

Dr. N. G. Hegde, Advisor and Trustee to BAIF, Urulikanchan highlighted the importance of cooperative, NGO's and institutes in the development of forage varieties and fodder production technologies for ultimate stake holders (farmers). He also gave the statistical data (estimated) of fodder requirement and its availability.

Dr. G. G. Sohani, President & Managing Trustee, BAIF gave inaugural address. He highlighted the importance of green fodder for increasing the milk production and livestock products for increasing the socio-economic status of the dairy farmers. He urged the scientists to develop the fodder varieties which give higher production with nutritional value.

Dr. Swappan K. Datta, DDG (CS), ICAR, New Delhi in his chairman's remarkshighlighted the over all scenario of the fodder production and suggested that we should select 10-20 major forage crops, develop road map for whole country for round the year green fodder production. He also emphasized the use of biotechnological tools for genetic improvement of forage crops as done in other countries.

The inaugural function ended with vote of thanks by Dr. P. S. Takawale, Centre I/C, AICRP-FC, BAIF to the dignitaries and participants for their valuable presence in inaugural session. He also extended gratitude to the faculty to the faculty members and staff of BAIF, Urulikanchan for their support in organization of NGM Meet of AICRP on Forage Crops.

Highlights: Technology Generated

A. Forage Crop Improvement

Entries identified for release as variety

1. Bajra Napier Hybrid BNH-10

The committee considered the proposal of Bajra Napier hybrid namely BNH-10 submitted by BAIF, Urulikanchan. Based on its performance over the years, it was observed that the BNH-10 have performed consistently superior to the checks namely NB-21, CO-3 and PNB-233 for green forage, dry matter yield and per day productivity across the four zones i.e. North West, North East, Central and South zones. Considering the superiority and adaptability of the hybrid BNH-10 in four zones, it is identified for four zones viz., i.e. North West, North East, Central and South zones.

2. Bajra Napier Hybrid TNCN 074

The committee considered the proposal of another Bajra Napier hybrid TNCN 074 submitted by Tamil Nadu Agricultural University, Coimbatore. The hybrid TNCN 074 had shown superiority for green forage and dry matter Yield and per day productivity over checks and qualifying entries at all India level over the years of testing. Considering the superiority and adaptability of the hybrid TNCN 074 at all India level, it is identified for all India.

3. Cowpea: IL 1177

The committee considered the proposal of cowpea variety namely IL 1177 submitted by IGFR, Jhansi. It was observed that the variety IL 1177 had shown consistent superiority for green fodder , dry matter and crude protein yield as well as per day productivity over the zonal check (UPC-622), national checks (UPC 5286 and BL-1) and qualifying variety (MFC-08-14) in North Eastern zone. Based on its superiority and adaptability in North East zone, the variety is identified for North East zone.

4. Cowpea: MFC-08-14

The committee considered the identification proposal of cowpea variety namely MFC-08-14 submitted by UAS, Mandya. It was observed the MFC-08-14 was found superior in green forage and dry matter yield over the zonal check (UPC-622), national checks (UPC 5286 and BL-1) and qualifying variety (IL-1177) over the years and locations in South zone (Karnataka, Kerala, Andhra Pradesh, Tamil

Nadu and Pondicherry). Considering the adaptabilities of the variety, MFC-08-14 in the states of South zone, it is identified for South zone.

5. Setaria Grass: S-18

The committee considered the release proposal of Setaria grass variety S-18 submitted by CSKHP, Palampur. The variety showed its consistent superiority for green forage and dry matter yield over the checks and qualifying entries over the locations and years in states of Himachal Pradesh and Utrakhand. This variety is found resistant to cold, drought and frost. Hence the variety is identified for the states of Himachal Pradesh and Utrakhand.

6. Guinea Grass : JHGG 08-1

The committee considered the release proposal of guinea grass variety JHGG 08-1 submitted by IGFR, Jhansi. The variety showed its consistent superiority for green forage, dry matter yield and crude protein yield over checks through out the country over the years and has shown adaptability to rain fed condition. It remains green through out the year under irrigated condition. Hence the variety is identified for all India.

B. Forage Protection Technology:

The plant protection trial (PPT-12) "A validation of effective treatments for the management of sucking pests and yellow mosaic virus in cowpea seed crop" has been completed three years of testing (at six locations) and one more year of validation in larger plots at five locations. Two sprays of imidacloprid 17.8 SL @ 0.3 ml/ L at 15 days interval (best among all the three treatments) significantly reduced the sucking pest and yellow mosaic virus incidence followed by two sprays of *Verticillium leccani* @ 5g/ l at 10 days interval as non-chemical management and recommended for management of sucking pests and yellow mosaic virus in cowpea seed crop.

TECHNICAL SESSION – I
REVIEW OF RESEARCH ACTIVITIES: CENTRE WISE PRESENTATION.

Chairman : Dr. S. A. Faruqui, PC (FC) and Director, IGFRI, Jhansi
Rapporteurs : Drs. J.K.Bisht & S.K.Bilaiya

The Session started with introductory remarks by the Chairman. It has been advised that the respective centre should come out with the salient achievements. Project Coordinator discussed about the Forage Technology Demonstration (FTD) conducted by different coordinated centers. It was decided that all the centers will take up the FTDs for newly released varieties related to the AICRP on Forage Crops. Data should be recorded properly for these FTDs. The Project Coordinator stressed that every centre has to inform about the status and characterization of germplasm available with them. After this, center wise presentation was held. In all, 24 centers have presented their reports. This includes 3 from Hill zone, 4 from N - West zone, 7 from N -East zone, 5 from Central zone and 5 from South zone.

- Palampur centre has a good collection of *Setaria* grass. Out of which two (S-20 & S-21) were found frost tolerant and 9 were having low oxalate content.
- Srinagar center had collected maize germplasm from different locations.
- Almora center has shown the utilization of waste land for fodder production
- Bikaner centre is having good number of *Lasiurus indicus* germplasm It was also suggested by the Chairman to review the literature for the utilization of its drought hardiness to other crops.
- Pantnagar centre is having good collection of forage cowpea.
- In eastern region, Faizabad centre highlighted the characters of promising bajra variety.
- Good number of rice bean germplasm are being maintained at Kalyani centre.
- So far no variety has been developed by the Ranchi centre. Therefore, the centre was suggested to go for the collection of good germplasm.
- Jabalpur center has identified distinguishing characters of different soybean germplasm.
- It was advised to Anand center that there should be separate programme under states scheme and AICRPFC.
- For Rahuri, it was suggested that they should give more emphasis on maize and pearl millet.
- Transfer of technology programme of BAIF centre was appreciated.

- Coimbatore centre has a good programme on bajra Napier hybrid. Some of the important recommendations emerged out after thread bear discussion:
- All the germplasm available with different centers need to be characterized and IC numbers should be obtained from NBPGR.
- All the center has to make a compilation regarding the entries submitted by them to IVTs.
- To strengthen the forage improvement programme emphasis should be given to germplasm collection from different sources
- It was also decided that the cadre strength on newly created three centers i.e. Imphal, Srinagar and Raipur will be reviewed properly and strength of non performing center should reduced accordingly.

The session was concluded with the thanks to Chair.

**TECHNICAL SESSION II (CONCURRENT)
FORMULATION OF THE TECHNICAL PROGRAMME
FORAGE CROP IMPROVEMENT**

Convener: Dr. J. S. Verma, Dr. H.C. Lohithaswa and Dr. Shahid Ahmed
Rapporteurs: Drs. C. Babu and T. Sashikala

Crop improvement scientists of the Forage group discussed in detail the results of the last Kharif season along with the on going technical programme. Based on the discussions and suggestion of the scientists the following recommendation emerged out.

- In *Kharif* 2011, sixteen breeding trials involving four annuals and six perennial forage species were conducted at 42 centres located in five zones. The forage species evaluated were pearl millet, cowpea, rice bean and soybean as annuals and guinea grass, *Cenchrus* spp., BN hybrids, *Setaria* and *Lasiurus* as perennials.
- Among the perennial trials conducted, four trials one each in BN hybrid, *Setaria* sp., Guinea grass and *Cenchrus* sp. have completed their final year of evaluation while in annuals, one trial on cowpea has been completed.
- From IVT pearl millet, two entries viz., RBB 2 and AFB 6 have been promoted for testing in first Advanced Varietal Trial. Similarly from AVT-I in pearl millet, three entries viz., PAC 981, RBB 1 and NDFB 904 were advanced to second Advanced Varietal Trial.
- From IVT in cowpea, three entries viz., UPC 1101, UPC 1102 and Culture 1 were forwarded to AVT I in cowpea. From first Advanced Varietal Trial, two entries MFC 09-1 and RR 3 have been promoted to second Advanced Varietal Trial.
- In Rice bean, two entries viz., BFRB 15 and JRBJ 0504 were promoted from AVT I to AVT II.
- In case of soybean, all four entries tested in AVT 2 will be tested for seed production ability in AVT 2 (Seed).
- For, *Kharif* 2012, six new trials have been formulated one each in pearl millet, cowpea, rice bean and BN hybrid while for maize, two trials were formulated for varieties (IVTM) and hybrids (IHTM) separately.

The session ended with formal vote of thanks.

**TECHNICAL SESSION II (CONCURRENT)
FORMULATION OF THE TECHNICAL PROGRAMME
FORAGE CROP PRODUCTION**

Convener : Dr. Sunil Kumar and Dr. S.R. Kantwa
Rapporteurs : Dr. N.S. Yadava and Dr. K.K. Sharma

Session began with the introductory remarks of Dr. Sunil Kumar, Head, Crop Production Division, IGFRI, Jhansi. He expressed satisfaction over on-going agronomic programme and opened discussion on new trials, which were proposed by the different centres for *kharif* 2012. He further requested all the agronomist to send the data of trials conducted in system mode as per schedule already finalized. The technical programme for coming *Kharif* 2012 has been finalized after thorough discussion and highlighted as follows.

- Two new coordinated trials have been formulated for different zones.
- Six new location specific trials have been formulated for different centres
- In addition to these, four Advanced Varietal Trials (AVT) on cowpea, pearl millet, ricebean and soybean have also been allotted to different centres for agronomic evaluation.

Small groups consisting of Drs. J.K. Bisht, Naveen Kumar, U.S. Tiwana and Ansar Ul Haq for Hill zone; Drs. N.S. Yadav, U.S. Tiwana, Kewalanand and S.M. Kumawat for North-west zone; Drs. B.K. Sahu, K.K. Sharma, A.S. Panwar, Birendra Kumar and Joseph for North-east zone; Drs, B.G. Shiv kumar, Velayudham, B.G. Shekhara, V. Chandrika and S.R. Sharu for South zone were constituted for formulation and fine tuning of experiments for the respective zones. The groups were also entrusted the responsibility of developing suitable exploratory trials for their zones. Their drafts were thoroughly reviewed and discussed for finalization of the programme.

The following exploratory trials were proposed by the concerned groups:

- Interactive effect of nutrient and irrigation management in hybrid napier for north-west and southern zone.
- Nitrate accumulation studies in hybrid napier bajra as influenced by sources and levels of nitrogen in conjunction with irrigation levels for Kerala.
- To test the performance of forage crops including range grasses and legumes, observation trials have been suggested for the centres approved in XIth plan viz., Raipur, Srinagar, and Imphal

Modification: In AST-6 trial, among N levels control (0), 50%, 75 %, 100 % and 125 % of RDN is to be taken instead of control, 25 %, 50 %, 100 % and 125 % RDN.

Meeting ended with vote of thanks to the Chair

**TECHNICAL SESSION II (CONCURRENT)
FORMULATION OF THE TECHNICAL PROGRAMME
FORAGE CROP PROTECTION**

Chairman : Dr. S.A. Faruqui, Project Coordinator (FC)
and Director, IGFRI, Jhansi
Convener : Dr. R. B. Bhaskar, PI (Plant Protection)
Rapporteurs : Drs. D.K. Banyal and A.B. Tambe

Crop Protection Scientist of the Forage group discussed in detail the results of the last Kharif season along with on going technical programme. Scientist of the group appraised the chairman regarding the results of last Kharif season along with the technical programme. The Chairman appreciated the work done by this small group and gave valuable suggestions. Based on the discussions and advices of the chairman the following recommendations emerged.

1. The trials PPT-1, 2, 10 and 13 will be continue in *Kharif* 2012.
2. The PPT-7 and 9 has been completed for three years and best treatment will be validated in large plots for one season. The best treatments are:
 - a. PPT-7: Seed treatment with Vitavax powder @2g/ kg seed followed by two sprays of mancozeb @ 0.25% and
 - b. PPT-9: Seed treatment with Thiomethoxam @ 2g / kg seed
3. A new experiment PPT-14 entitled "Management of foliar diseases of forage sorghum" is proposed to be conducted at Palampur, Ludhiana, Bhubaneswar and Jhansi.
4. Based on the validation on large plots (PPT-12) for the management of sucking pest and yellow mosaic virus in cowpea seed crop, the following recommendations was emerged:
 - a. Two sprays of *Verticillium leccani* @5g/ l at 10 days interval as non-chemical management
or
 - b. Two sprays of imidacloprid 17.8 SL @ 0.3 ml/ L at 15 days interval as chemical management

(Centres: Bhubaneswar, Hyderabad, Rahuri, Ludhiana and Palampur)

The session ended with vote of thanks to the chair.

**TECHNICAL SESSION-II (CONCURRENT)
FORAGE QUALITY (BIOCHEMISTRY)**

Chairman : Dr. S.A. Faruqui, PC & Director, IGFRI, Jhansi
Rapporteurs : Dr. M. Shanti, Dr. S.V. Dammame, Dr. G. J. Mistry

The house under the Chairmanship of the Project Coordinator thoroughly discussed the technical programme for *Kharif* and has come up with following recommendations:

1. The following two trials initiated during last *Kharif* would be continued. They are as follows:
 - AST-6 (NT) – Effect of growing environments and nitrogen levels on production and quality of BN hybrid
 - PPT-13 – Effect of foliar diseases and insect-pests on quality parameters of forage cowpea (Var. UPC 5286).
2. The group requested the Chairman to identify a Principal Investigator exclusively for Biochemistry (Forage quality), so that all the quality data with reference to breeding and agronomy trials will be presented separately in the Annual report.
3. After detailed discussion, the group decided to initiate work on the quality trials on following areas viz., Abiotic stresses due to drought, salinity and micronutrient deficiencies with a proposal from Rabi 2012-13.

Crop Protection: The report on plant protection was presented by Dr. R.B. Bhaskar, Sr. Scientist (PP). Information on pest and diseases in *Kharif* crops was received from 8 centres. The most prevalent pest and diseases in *Kharif* forage crops reported through the monitoring trials was presented. In PPT-7 i.e., integrated disease management of fodder maize, seed treatment with vitavax @ 2g/ kg of seed + mancozeb spray @ 0.25% provided maximum diseases control. In PPT-9, management of shoot fly in forage sorghum, application of imidacloprid as foliar spray @ 0.3 ml/ l at 10 days after sowing provided maximum control.

In location specific trial for root rot of cowpea at Bhubaneswar, seed treatment with *Trichoderma viride* @ 5g/ kg seed + FYM @ 2 tonne/ ha provided minimum diseases incidence.

The session ended with a thank you note by the chairman.

TECHNICAL SESSION-III PRESENTATION OF DISCIPLINE WISE REPORT

Chairman: Dr. S.A. Faruqui, Project Coordinator (FC) and
Director, IGFRI
Rapporteurs: Dr. K. Velayudham & Dr. M. Shanti

Crop Improvement: The crop improvement report was presented by Dr. Shahid Ahmed, Scientist from Jhansi. A total of sixteen breeding trials including 4 annuals and 6 perennials were conducted during Kharif 2011 at 42 centres located in five zones with a success rate of 94.92%.

In IVT pearl millet, RRB-2 and AFB-6 exhibited superiority over the check Giant bajra and are promoted to AVT. In AVT pearl millet, PAC 981, RBB-1 and NDFB-904 are promoted to AVT-2. In cowpea, UPC-1101, UPC-1102 and Culture-1 are promoted to AVT-2. Entry MFC-08-14 performed better regarding fodder and seed yields in both AVTs, respectively. In rice- bean evaluation trial none of the entry was found superior to the national checks. Entries BFRB-15 and JRBJ-05-4 deserved testing in AVT-2.

Soybean entries JS-07-21-7 and JS-07-24-13 exhibited their superiority in fodder traits and were promoted for seed testing. Guinea grass JHGG-08-1, RSDGG-2 and TNGG-061 were found promising after 4th year of testing. In varietal trial on B x N hybrids TNCN-074 and BNH-3 were superior over others. Three entries in varietal trial in *Setaria* viz., PSS-1, S-20, S-18 and S-21 were found very promising.

Crop Production: Dr. S.R. Kantwa, Sr. Scientist (Agronomy) presented the report. A total of thirteen trials were conducted at 21 locations with major areas of research viz., resource conservation, nutrient management, inter cropping, waste water with varied nutrient levels, weed management, tillage and crop production in sodic soils etc.

In trial optimization of N for sorghum in different cropping system, at Pantnagar, berseem-sorghum system was found better giving maximum monetary returns. Among the N levels, application of 125% N was found to be significantly superior over other levels. In AST-3 i.e., Multi-cut sorghum with forage legumes, at Ludhiana sorghum + 100% cowpea seed rate cropping system, at Bikaner sorghum + 100% gaur and at Pantnagar sorghum + 50% cowpea seed rate proved to give maximum monetary returns. At Palampur sorghum + 75% rice bean seed rate inter-cropping system fetched highest monetary returns.

At Ludhiana, application (Pre-emergence) of atrazine @ 0.75 kg/ ha + stomp @2.5lit/ ha was found efficient in controlling weeds in fodder sorghum. The *Setaria* entry S-20 was found to be the best entry and responded significantly up to 120 kg N/ ha. In AST-13 i.e., 'Effect of P

levels on forage yields of promising cowpea entries', none of the entry was found superior to national check, however, the response to P was found linear up to 90kg P₂O₅/ ha.

Crop Protection: The report on plant protection was presented by Dr. R.B. Bhaskar, Sr. Scientist (PP). Information on pest and diseases in Kharif crops was received from 8 centres. The most prevalent pest and diseases in Kharif forage crops reported through the monitoring trials was presented. In PPT-7 i.e., integrated disease management of fodder maize, seed treatment with vitavax @ 2g/ kg of seed + mancozeb spray @ 0.25% provided maximum diseases control. In PPT-9, management of shoot fly in forage sorghum, application of imidacloprid as foliar spray @ 0.3 ml/ l at 10 days after sowing provided maximum control.

In location specific trial for root rot of cowpea at Bhubaneswar, seed treatment with *Trichoderma viride* @ 5g/ kg seed + FYM @ 2 tonne/ ha provided minimum diseases incidence.

The session ended with a thank you note by the chairman.

TECHNICAL SESSION –IV BREEDER SEED PRODUCTION

Chairman : Dr. S.A. Faruqui, PC (FC) & Director, IGFR, Jhansi
Rapporteurs : Drs. V.K. Sood & T. Shashikala

Dr. S.A. Faruqui, PC (FC) presented an overview of breeder seed produced during *Kharif* 2011 for different forage crops. However, he indicated shortfall against allocated quantity of breeder seed production.

1. Allotment of breeder seed production as per BSP-I for *Kharif* 2012 with respect to different forage crops was discussed by PC with respective crop breeders/ in-charges of different centers and finalized.
2. The total quantity of breeder seed indented and allocated for *Kharif* 2012 is 218.85 q. in five different crops namely Maize (99.38 q), Cowpea (28.95 q), Pearl millet (5.47 q), Sorghum (76.65 q) and cluster bean (8.40 q).
3. PC informed the house that there is a provision of advance money payment at the time of indenting breeder seed. The papers regarding this policy will be communicated by PC shortly.
4. The breeder seed production of Sorghum variety Punjab Sudex Chari-1 is different due to its hybrid nature. Project Coordinator advised the concerned breeder to inform the same in written to the PI (Plant Breeding) and/ or DAC.

The session ended with vote of thanks to the chair.

TECHNICAL SESSION –V STRENGTHENING FORAGE RESOURCES

Chairman : Dr. Swanpan K. Datta, DDG (CS), ICAR
Rapporteur : Dr. Naveen Kumar
Speaker : Dr. Narayan G. Hegde, Principal Advisor, BAIF

The session started with introductory remarks of the chairman. Dr. Narayan G. Hegde, Principal Advisor, BAIF delivered a talk on 'Strategy for improving forage production in India'. The scenario of livestock population, milk production and demand in the country was presented. There exists a huge deficit in green and dry fodder availability in the country. Among different forage resources crop residues constitutes major source of fodder to the livestock in the country, however, occasionally in some parts of the country major portion of the crop residues in particular of wheat and paddy straws goes to commercial industries instead of being used as fodder, which is a matter of concern. It was emphasized upon that animal husbandry has significant contribution in country growth rate among different farming component but out lay in this sector is not appreciable which needs more strengthening . Various reasons of forage and feed shortage were also discussed. It was worth mentioning that 30 % of high yielding livestock contributes 95 % in value chain and remaining 70 % of low yielding livestock contributes 5 % in the value chain, hence there is need to improve yielding livestock population in the country. Following strategies for the improvement of fodder production were suggested.

1. Management of common land for fodder production
2. Promotion of forage crops under different conditions
3. Strengthening of fodder seed production
4. Efficient use of crop residues
5. Balance feeding to the livestock
6. Better extension and technology transfer efforts
7. Effective coordination among different schemes, programmes, projects and sectors involved in fodder production and livestock management activities.

The session ended with vote of thanks to the chair.

RECOMMENDATIONS OF THE VARIETY IDENTIFICATION COMMITTEE

The meeting of the Varietal Identification Committee of the AICRP-FC was held under the Chairmanship of Dr. Swapan K. Datta, DDG (CS), ICAR, New Delhi on May 04, 2012 at BAIF, Pune during the AICRP-FC, National Group Meet, Kharif-2012.

Six proposals of four forage crops viz., Guinea grass, BN hybrid, Setaria grass and Cowpea were submitted to the committee for identification. The proposals were discussed thoroughly. The recommendations of the committee are as following:

1. Bajra Napier Hybrid BNH-10

The committee considered the proposal of Bajra Napier hybrid namely BNH-10 submitted by BAIF, Urukanchan. Based on its performance over the years, it was observed that the BNH-10 have performed consistently superior to the checks namely NB-21, CO-3 and PNB-233 for green forage, dry matter yield and per day productivity across the four zones i.e. North West, North East, Central and South zones. Considering the superiority and adaptability of the hybrid BNH-10 in four zones, it is identified for four zones viz., i.e. North West, North East, Central and South zones.

2. Bajra Napier Hybrid TNCN 074

The committee considered the proposal of another Bajra Napier hybrid TNCN 074 submitted by Tamil Nadu Agricultural University, Coimbatore. The hybrid TNCN 074 had shown superiority for green forage and dry matter Yield and per day productivity over checks and qualifying entries at all India level over the years of testing. Considering the superiority and adaptability of the hybrid TNCN 074 at all India level, it is identified for all India.

3. Cowpea: IL 1177

The committee considered the proposal of cowpea variety namely IL 1177 submitted by IGFRI, Jhansi. It was observed that the variety IL 1177 had shown consistent superiority for green fodder , dry matter and crude protein yield as well as per day productivity over the zonal check (UPC-622), national checks (UPC 5286 and BL-1) and qualifying variety (MFC-08-14) in North Eastern zone. Based on its superiority and adaptability in North East zone, the variety is identified for North East zone.

4. Cowpea: MFC-08-14

The committee considered the identification proposal of cowpea variety namely MFC-08-14 submitted by UAS, Mandya. It was observed the MFC-08-14 was found superior in green forage and dry matter yield over the zonal check (UPC-622), national checks (UPC 5286 and BL-1) and qualifying variety (IL-1177) over the years and locations in South zone (Karnataka, Kerala, Andhra Pradesh, Tamil Nadu and Pondicherry). Considering the adaptabilities of the variety, MFC-08-14 in the states of South zone, it is identified for South zone.

5. Setaria Grass : S-18

The committee considered the release proposal of Setaria grass variety S-18 submitted by CSKHP, Palampur. The variety showed its consistent superiority for green forage and dry matter yield over the checks and qualifying entries over the locations and years in states of Himachal Pradesh and Uttrakhand. This variety is found resistant to cold, drought and frost. Hence the variety is identified for the states of Himachal Pradesh and Uttrakhand.

6. Guinea Grass : JHGG 08-1

The committee considered the release proposal of guinea grass variety JHGG 08-1 submitted by IGFR, Jhansi. The variety showed its consistent superiority for green forage, dry matter yield and crude protein yield over checks through out the country over the years and has shown adaptability to rain fed condition. It remains green through out the year under irrigated condition. Hence the variety is identified for all India.

- **It is mandatory to include report of DNA fingerprinting of entries before final submission of variety release proposal to CVRC.**

TECHNICAL SESSION -VI PLENARY SESSION

Chairman : Dr. Narayan G. Hegde, Advisor and Trustee to BAIF, Pune
Convener : Dr. S. A. Faruqui, PC (FC) & Director, IGFR, Jhansi
Rapporteur : Dr. S. R. Kantwa

The session started with introductory remarks of the chairman. He invited the rapporteurs of different technical sessions for presentation of proceedings. The aspects and major issues related to Kharif-2011-12 programme in specific and forage research in general were discussed. The recommendation of technical session were discussed and accepted after approval of the house. Keeping in view the future challenges, some specific recommendations were also made for strengthening of forage research and development in the country.

- All biochemists are advised to formulate biochemistry trials for basic and applied research from Rabi 2012-13.
- Joint efforts of BAIF and AICRP-FC/IGFR may prove effective in transfer of technology to the farmer's fields in a better way across the country as BAIF has its strong net work of services in sixteen states.
- All the germplasm available at AICRP-FC Centres need to be characterized and information/data submitted to NBPGR for allotment of IC number.
- It is mandatory to include report of DNA fingerprinting of entries before final submission of variety release proposal to CVRC.
- For the protection of the released varieties, these should be registered under PPV& FR Authority, New Delhi.

Dr. P. S. Takawale, OIC, AICRP-FC, BAIF, Urulikanchan extended vote of thanks to the ICAR authorities, Project Coordinator and his team, participants, local team and media for successful conductance of National Group Meet at the end of Session.

Dr. S. A. Faruqui, Project Coordinator (Forage Crops) and Director, IGFR, Jhansi also expressed thanks on behalf of ICAR authorities, and the Coordinating Unit to President, BAIF, Urulikanchan and members of organizing committee and all the other staff involved in organization of this meeting for providing all facilities and support for successful conductance of the meeting.

The session ended with vote of thanks to the chair

AICRP ON FORAGE CROPS

FINALIZED TECHNICAL PROGRAMME FOR KHARIF - 2012

(A) FORAGE CROP IMPROVEMENT (PLANT BREEDING)

(a) COORDINATED TRIALS

Abbreviations:

HZ= Hill Zone, NWZ= North West Zone, NEZ =North East Zone,
CZ= Central Zone, SZ= South Zone

1. IVTM: Initial varietal trial in Forage Maize (NEW)

Entries No. : 5 + 2 checks
 Entries Name : (2-Anand, 1-Mandya, 1- Jhansi, 1-Palampur)
 Checks : African Tall, J 1006
 Design : RBD with 3 replications
 Plot size : 4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
 Seed rate : 75 kg/ha (75 g /plot)
 Fertilizers : 40: 20 kg/ha (N: P) basal
 Seed requirement from contributors: 5.00 Kg /entry

Location: (21): HZ – Palampur, Srinagar, Almora NWZ- Ludhiana, Hisar, Udaipur, Pantnagar NEZ- Faizabad, Bhubaneswar, Ranchi, Jorhat CZ- Anand, Raipur, Jabalpur, Rahuri, Urulikanchan, Jhansi, SZ- Hyderabad, Coimbatore, Mandya, Karaikkal

2. IHTM : Initial Hybrid trial in Forage Maize (NEW)

Entries No. : 6 + 2 checks
 Entries Name : 1-Hyderabad , 1-Advanta , 2-Ludhiana
 Checks : African Tall, J 1006
 Design : RBD with 4 replications
 Plot size : 4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
 Seed rate : 75 kg/ha (75 g /plot)
 Fertilizers : 40: 20 kg/ha (N: P) basal
 Seed requirement from contributors: 7.50 Kg /entry

Location: (19): HZ – Palampur, Srinagar, Almora NWZ- Ludhiana, Hisar, Udaipur, NEZ- Faizabad, Bhubaneswar, Ranchi, Jorhat CZ- Anand, Raipur, Jabalpur, Rahuri, Urulikanchan, Jhansi, Aurangabad (Advanta) SZ- Hyderabad, Karaikkal

3. IVTPM : Initial varietal trial in Forage Pearl millet (NEW)

Entries No. : 5 + 3 checks
 Entries Name : 1- Anand, 1- Bikaner, 1- Faizabad, 1- Hisar, 1- Hyderabad
 Checks : Raj Bajra Chari-2, Giant Bajra , AVKB-19
 Design : RBD with 3 replications
 Plot size : 4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
 Seed rate : 15 kg/ha (15 g /plot)
 Fertilizers : 40 : 20 kg/ha (N : P) basal

Seed requirement from contributors : 1.25 Kg /entry

Location: (19): NWZ- Ludhiana, Hisar, Bikaner, Jalore NEZ- Faizabad, Pusa, Bhubaneswar, Ranchi CZ- Anand, Jabalpur, Rahuri, Urulikanchan, Jhansi, Jamnagar SZ- Hyderabad, Dharwad (IGFRI-RRS), Coimbatore, Mandya, Karaikkal.

4. AVTPM -1: First Advanced Varietal Trial in Forage Pearl millet

Entries : 2+ 3 checks

Checks Raj Bajra Chari-2, Giant Bajra, AVKB-19

Entries Promoted from IVT : RBB-2, AFB-6

Design : RBD with 4 replications

Plot size : 4 m x 3.0 m accommodating 4 m long 10 rows at 30 cm.

Seed rate : 15 kg/ha (20 g /plot)

Fertilizers : 40 : 20 kg/ha (N : P) basal

Seed requirement from contributors : 1.75 Kg /entry

Location: (19): NWZ- Ludhiana, Hisar, Bikaner, Jalour, Bawal NEZ- Faizabad, Pusa, Bhubaneswar, CZ- Anand, Raipur, Jabalpur, Rahuri, Urulikanchan, Jhansi, Jamnagar SZ- Hyderabad, Dharwad (IGFRI-RRS), Coimbatore, Mandya

5. AVTPM -2: Second Advanced Varietal Trial in Forage Pearl millet

Entries : 3+ 2 checks

Checks Raj Bajra Chari-2, Giant Bajra

Entries Promoted from AVTPM-1: PAC-981, RBB-1, NDFB-904

Design : RBD with 4 replications

Plot size : 4 m x 3.0 m accommodating 4 m long 10 rows at 30 cm.

Seed rate : 15 kg/ha (20 g /plot)

Fertilizers : 40: 20 kg/ha (N : P) basal

Seed requirement from contributors : 1.75 Kg /entry

Location: (18): NWZ- Ludhiana, Hisar, Bikaner, Jalour NEZ- Faizabad, Pusa, Bhubaneswar, CZ- Anand, Jamnagar, Jabalpur, Rahuri, Urulikanchan, Jhansi, Dhari SZ- Hyderabad, Dharwad (IGFRI-RRS), Coimbatore, Mandya

6. AVTPM -2 (Seed): Second Advanced Varietal Trial in Forage Pearl millet (Seed)

Entries : 3+ 2 checks

Checks Raj Bajra Chari-2, Giant Bajra

Entries Promoted from AVTPM-1: PAC-981, RBB-1, NDFB-904

Design : RBD with 4 replications

Plot size : 4 m x 3.0 m accommodating 4 m long 10rows at 30 cm.

Seed rate : 15 kg/ha (20 g /plot)

Fertilizers : 40 : 20 kg/ha (N : P) basal

Seed requirement from contributors: 1.75 Kg /entry

Location: (18): NWZ- Ludhiana, Hisar, Bikaner, Jalore NEZ- Faizabad, Pusa, Bhubaneswar, CZ- Anand, Jamnagar, Jabalpur, Rahuri, Urulikanchan, Jhansi, Dhari SZ- Hyderabad, Dharwad (IGFRI-RRS), Coimbatore, Mandya

Agronomy Trial: Seed requirement – 3.5 kg/entry

7. IVTC– Initial Varietal Trial in Forage Cowpea (New)

Entries No. : 5 + 2 (NC) +1 (ZC)
Entries Name : 1- Mandya, 1-Hyderabad, 1-Pantnagar, 1- Coimbatore, 1- Ludhiana
Checks : National checks- Bundel Lobia -1, UPC- 5286
Zonal checks : Bundel Lobia -2 (NWZ); UPC - 622 (NEZ/HZ); UPC 9202 (CZ/SZ)
Design : RBD with 3 replications
Plot size : 4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm.
Seed rate : 35.0 kg/ha (30 g /plot)
Fertilizers (N : P) : 20:40 kg/ha basal
Seed requirement from contributors: 2.25 kg /entry

Location : (23): HZ – Palampur, Srinagar NWZ - Ludhiana, Hisar, Pantnagar, Bikaner, Udaipur NEZ- Faizabad, Ranchi, Kalyani, Bhubaneswar, Jorhat, CZ- Anand, Jhansi, Rahuri, Urulikanchan, Kanpur SZ- Coimbatore, Vellayani, Mandya, Hyderabad, Dharwar, Karaikkal.

8. AVTC-1: First Advanced varietal trial in Forage Cowpea

Entries No. : 3 + 2 (NC) +1 (ZC)
Checks : National checks- Bundel Lobia -1, UPC- 5286
Zonal checks : Bundel Lobia -2 (NWZ); UPC - 622 (NEZ);UPC 9202 (CZ/SZ)

Entries promoted from IVTC- UPC-1101, UPC-1102, Culture-1

Design : RBD with 4 replications
Plot size : 4 m x 3 m accommodating 4 m long 10 rows at 30 cm.
Seed rate : 35.0 kg/ha (45 g /plot)
Fertilizers (N : P) : 20:40 kg/ha basal
Seed requirement from contributors: 4.50 kg /entry

Location : (23): NWZ - Ludhiana, Hisar, Pantnagar, Bikaner, NEZ- Faizabad, Ranchi Kalyani, Bhubaneswar, Jorhat, Pusa, Shillong CZ- Anand, Jhansi, Jabalpur, Rahuri, Urulikanchan, Kanpur SZ- Coimbatore, Vellayani, Mandya, Hyderabad, Dharwad, Karaikkal

9. AVTC- 2: Second Advanced Varietal Trial in Forage Cowpea

Entries : 2+2 (NC) +1 (ZC)
Checks : NC- Bundel Lobia -1, UPC- 5286
Zonal checks : Bundel Lobia -2 (NWZ); UPC - 622 (NEZ/HZ); UPC 9202 (CZ/SZ)

Entries promoted from AVT-1: MFC-09-1, RR-3

Design : RBD with 4 replications
Plot size : 4 m x 3 m accommodating 4 m long 10 rows at 30 cm.
Fertilizers (N :P) : 20 : 40 kg/ha basal
Seed rate : 35.0 kg/ha (45 g /plot)
Seed requirement from contributors: 4.50 kg/entry

Location : (23): **HZ-** Almora **NWZ** - Ludhiana, Hisar, Pantnagar, Bikaner, **NEZ-** Faizabad, Ranchi, Kalyani, Bhubaneswar, Jorhat, Pusa, Shillong **CZ-** Anand, Jhansi, Jabalpur, Rahuri, Urulikanchan, Kanpur **SZ-** Coimbatore, Vellayani, Mandya, Hyderabad, Dharwad

10. AVTC- 2 (Seed): Second Advanced Varietal Trial in Forage Cowpea (Seed)

Entries : 2+2 (NC) +1 (ZC)
Checks : NC- Bundel Lobia -1, UPC- 5286
Zonal checks : Bundel Lobia -2 (NWZ); UPC - 622 (NEZ/HZ);
UPC 9202 (CZ/SZ)

Entries promoted from AVT-1: MFC-09-1, RR-3

Design : RBD with 4 replications
Plot size : 4 m x 3 m accommodating 4 m long 10 rows at 30 cm.
Fertilizers (N :P) : 20 : 40 kg/ha basal
Seed rate : 35.0 kg/ha (45 g /plot)
Seed requirement from contributors: 4.50 kg/entry

Location : (23): **HZ-** Almora **NWZ** - Ludhiana, Hisar, Pantnagar, Bikaner, **NEZ-** Faizabad, Ranchi Kalyani, Bhubaneswar, Jorhat, Pusa, Shillong **CZ-** Anand, Jhansi , Jabalpur, Rahuri, Urulikanchan, Kanpur **SZ-** Coimbatore, Vellayani, Mandya, Hyderabad, Dharwad

Agronomy Trial: Seed requirement – 12 kg/entry

11. IVT (R. bean): Initial Varietal Trial in Rice bean (New)

Entries No. : 4+3 (NC)
Check : K-1 (Bidhan-1), Bidhan-2, RBL-6
Entries name : 1- Jabalpur, 1-Jorhat, 1-Kalyani
Plot size : 4mx 1.8 m accommodating 4 m long 6 rows at 30 cm
Design : RBD with 4 replications
Seed rate : 35 kg/ha (35 g/ Plot)
Fertilizers (N : P) : 20 : 40 kg/ha Basal

Seed Requirement from Contributors: 1.75 kg / entry
Location – (11) :Kalyani, Ranchi, Bhubaneswar, Jorhat, Pusha, Vellayani, Jabalpur, Shillong, Imphal, Raipur, Palghar(dapoli)

12. AVT-2 (R. bean) : Second Advanced Varietal Trial in Ricebean

Entries : 02 +1NC
Entries Promoted from AVT-1 : BFRB-15, JRBJ-05-4
Check : K-1 (Bidhan-1)
Plot size : 4 x 3 m accommodating 4 m long 10 rows at 30 cm

Design : RBD with 7 replications
Seed rate : 35 kg/ha (45 g/ Plot)
Fertilizers (N : P) : 20 : 40 kg/ha Basal

Seed Requirement from Contributors: 2.750 kg / entry.

Location – (8) :Kalyani, Ranchi, Bhubaneswar, Jorhat, Pusa, Vellayani, Jabalpur, Shillong

13. AVT-2 (R. bean) (seed): Second Advanced Varietal Trial in Rice bean (seed)

Entries : 02 +1NC

Entries Promoted from AVT-1 : BFRB-15, JRBJ-05-4

Check : K-1 (Bidhan-1)

Plot size : 4 x 3 m accommodating 4 m long 10 rows at 30 cm

Design : RBD with 7 replications

Seed rate : 35 kg/ha (45 g/ Plot)

Fertilizers (N : P) : 20 : 40 kg/ha Basal

Seed Requirement from Contributors: 2.750 kg / entry.

Location – (8) :Kalyani, Ranchi, Bhubaneswar, Jorhat, Pusa, Vellayani, Jabalpur, Shillong

Agronomy Trial : Seed requirement – 4 kg/entry

14. AVT - 2 (Soy) (seed) – Second Advanced Varietal Trial in Forage Soybean

Entries : 4

Entries :JS07-21-7, JS07-24-13, JS07-24-1, JS07-24-8

Design : RBD with 5 replications

Plot size : 4.0 m x 3.0 m accommodating 4 m long 6 rows at 30 cm.

Seed rate : 80.0 kg/ha (1 00g /plot)

Fertilizers (N : P) : 20:40 kg/ha basal

Seed requirement from contributors : 3.0 kg /entry

Location : (7): Ranchi, Pusa, Imphal, Hisar Jhansi, Jabalpur, Rahuri

Agronomy Trial : Seed requirement – 7.2 kg/entry

15. VT Sewan-2010 (3rd Year): Varietal Trial in Sewan Grass (*Lasiurus indicus*)

Entries No. 7

Design : RBD with 3 replications

Plot size : 4.0 m x 4.5 m accommodating 4 m long 6 rows at 75 cm.

Location : (5): Jodhpur, Jaisalmer, Bikaner, Jalore, Fatehpur Shekhawati

Location : (15): Vellayani, Rahuri, Mandya, Hydeabad, Coimbatore, Palampur, Faizabad, Dharwad, Almora, Ludhiana, Ranchi, Urulikanchan, Bhubneshwar, Anand, Pantnagar)

(This trial will be continued in Kharif 2012)

16. VT *Cenchrus setigerus* – 2010 (3rd Yr): Varietal Trial in *C. setigerus*

(Perennial)

Entries No. : 7+1 (Check)
National Check : CAZRI-76
Location : (9): NWZ – Jalore, Pali Jodhpur Bikaner CZ- Jhansi , Rahuri, Dhari,
Anand SZ- Coimbatore,
(This trial will be continued in Kharif 2012)

17. VTGG – 2009 (4th Yr) Varietal Trial in *Guinea grass* (Perennial)

Entries No. : 7
Location : (11): Faizabad, Bhubaneswar, Urulikanchan, Mandya, Coimbatore,
Dharwad, Anand, Ranchi, Hyderabad, Vellayani, Jhansi
(This trial will be continued in Kharif 2012)

18. VTBN – 2012 (1st year) Varietal Trial in Bajra Napier hybrid (Perennial) (NEW)

Entries No. : 7
Checks : CO 3, NB-21, PNB-233
Entries name : 1- Coimbatore, 2-Ludhiana, 3-Rahuri, 1- Dharwad
Design : RBD with 3 replications
Plot size : 4 x 3 m (50 rooted slips)/ 60 x 50 cm
Seed rate : 50 rooted slips /rep/ entry
Fertilizers : 150:50:40 kg N,P₂O₅, K₂O /ha
Seed requirement from contributors: 3000 /entry
Location: (17): HZ – Palampur, Almora NWZ- Ludhiana, Hisar, Bikaner NEZ-
Bhubaneswar, Ranchi, Jorhat CZ- Anand, Rahuri, Urulikanchan,
Jhansi, Jabalpur, Palghar (Dapoli) SZ- Hyderabad, Coimbatore,
Mandya

CHARACTERS TO BE OBSERVED

(A) GENERAL : FOR EACH TRIAL

1. Days to 50% flowering
2. Green fodder yield (q/ha)
3. Dry matter yield (q/ha)
4. Production efficiency (q/ha/day)
5. Dry matter percentage (DM%)
6. Seed yield (q/ha) of AVT-2 (Seed) trials. In perennial crops seed yield is to be recorded only in final year.
7. Plant height (cm)[In case of Ricebean and Cowpea, vine length should be recorded)
8. Leaf/ Stem ratio
9. Quality attributes
 - (a) Crude protein yield (q/ha)
 - (b) Crude protein content (%)
 - (c) ADF and NDF estimates (%)
 - (d) IVDMD%

Note. The cut for green forage is to be taken at 50% flowering stage and per day productivity of each entry is to be reported.

(B) IN GUINEA GRASS

Days to cutting should be recorded instead of days to 50% flowering. Cuts are to be taken at 12.5 cm height

Note:

1. Green fodder yield data are to be recorded at 50% flowering stage for all the forage crops except guinea grass.

2. All Kharif trials except seed trials are to be conducted strictly under rain-fed conditions.

3. Any Breeding trial comprising of the lesser entries due to missing of seed packets/ damage of seed etc. should be compensated by increasing of replication or inclusion of the local checks/variety/ strain so that the Degree of Freedom may not be less than 12.

4. Yield conversion Factor :

$$\text{Yield (q/ha)} = \frac{\text{Yield (Kg /plot)}}{\text{Net plot size (m}^2\text{)}} \times 100$$

$$\text{Yield q/ha/day} = \frac{\text{Yield (q/ha)}}{\text{No. of days to harvest}}$$

(C) 1. The Centres are expected to provide experimental details as per format given herewith.

2. Each Centre must communicate trials at a glance as per columns given below:

AICRP ON FORAGE CROPS			
FORAGE BREED TRIALS/RANGE GRASSES & LEGUMES EVALUATION TRIALS AT A GLANCE			
S. No.	Trials allotted (No. & Name)	Trials conducted (No. & Name)	Trials not conducted/failed, also give reasons for not conducting the trials/failure (No. & Name)
1.			
2.			

(D). For biochemical analysis of the AVT-2 materials, please supply grinded sample, properly tagged and packed, well in time, to the centres identified. These are as follows:

S. No.	Centre identified for biochemical analysis	Centres to supply AVT-2 materials for analysis
1.	Rahuri, MPKV	Rahuri, MPKV; Ranchi, BAU; Jorhat, AAU
2.	Anand, GAU	Anand, GAU; Bhubaneswar, OUAT ; Bikaner, RAU
3.	Hyderabad, APAU	Hyderabad, APAU; Mandya, UAS(B); Coimbatore, TNAU; Vellayani, KAU
4.	Palampur, HPKV	Palampur, CSK HPKV; Pantnagar, GBPUAT; Jabalpur, JNKVV
5.	Ludhiana, PAU	Ludhiana, PAU; Hisar, CCS HAU; Faizabad, NDUAT
6.	Urulikanchan, BAIF	Urulikanchan, BAIF, Kalyani, BCKV
7.	Jhansi, IGFRI (PAR Division)	Jhansi (IGFRI), Avikanagar IGFRI RRS

The Centres identified for biochemical analysis are requested to supply data (entry-wise) timely to the Project Coordinator (FC) and also to the Centre-concerned. This must be practiced strictly. In case, if any centre can do biochemical analysis at its own, it can be done, and the data must be reported timely to the Project Coordinator (FC).

DATA SHEET FOR PROVIDING POOLED DATA (OVER CUTS) OF THE BREEDING TRIALS

Name of the Trial : _____
 Location : _____
 Soil type : _____
 Date of sowing : _____
 Plot size (Unit) : Gross : _____ Net : _____
 Replications (No.) : _____ Design : _____
 Character : _____

Entry Code	R ₁	R ₂	R ₃	R ₄	Total	Mean	Rank

Mean =

SE(m) ± =

CD at 5% =

CV% =

Note :

Data for each character and trial must be provided in separate sheet.

For green fodder and dry matter yield, data for all the cuts taken must be provided replication-wise in the format. A Table showing summation over the cuts replication-wise is also required. For other characters, such as plant height, etc. average of cuts taken must be provided.

Please also provide data cut-wise in case of multicut entries as per date a sheet given separately.

For quality parameters, data for crude protein (%) and crude protein yield (q/ha) must be supplied replication-wise for one cut only & for second cut in multicut crops. For IVDMD, NDF & ADF, a composite sample of all the replications may hold good for the cut specified above.

WORKING SCHEDULE FOR KHARIF -2012

1. Seed supply from contributors to PC Unit, Jhansi : Before May 20, 2012
2. Trials seed dispatch from PC Unit Jhansi : Before June 05, 2012
3. Trials sowing report to PC (FC) : Within 7 days of sowing
4. Information on trials failure, etc. be communicated immediately to PC (FC) through the Director of Research / Director ICAR Institute
5. Submission of *Kharif* trials analyzed data (except seed and quality traits) before December 25, 2012, however, data on seed and quality are to be submitted before January 10, 2013.
6. Reporting of Breeder seed (BSP-IV) : January 10, 2013.

AICRP ON (FORAGE CROPS), IGFRI, JHANSI 284003

SEED
REQUIREMENT OF
THE CHECK
VARIETIES FOR
KHARIF - 2012
TRIALS

S. No.	CROP	VARIETY	QUANTITY REQUIRED (kg)		TOTAL (kg)
			Breeding	Agronomy	
1.	Pearl millet	Raj Bajra chari-2	4.00	-	4.00
		Giant bajra	4.00	-	4.00
		AVKB-19	1.25		
3.	Cowpea	Bundel Lobia -1	14.00	4.00	18.00
		UPC-5286	14.00	4.00 + 7.50 (PPT)	25.50 kg
		Bundle Lobia-2	2.00	-	2.00
		UPC-622	5.00	3.00	8.00
		UPC-9202	5.00	3.00	8.00
4.	Rice bean	Bidhan-1	4.00	-	4.00
		Bidhan-2	1.50	-	1.50
		RBL-6	1.50	-	1.50

SOURCE OF SEED MATERIALS TO BE SUPPLIED AS LISTED

1. **Dr. A.H. Sonane**
Sr. Forage Breeder &
I/C AICRP (FC)
MPKV Rahuri- 413722
Forage Crop Variety : Giant Bajra
2. **Dr. U.S. Tiwana**
OIC- Forage Section
PAU Ludhiana 141004
Forage Crop Variety : RBL-6
3. **Dr. N.S. Yadav**
Assoc. Prof. (Agronomy) &
OIC Forage Section
Rajasthan Agricultural University,
Bikaner – 334002 (Rajasthan)
Forage Crop Variety : Raj Bajra Chari-2
5. **Dr. M.G. Gupta**
Head & Nodal Officer –AICRP Works
Div. of Crop Improvement
IGFRI Jhansi – 284 003
Forage Crop Variety : Bundel Lobia-1, Bundel lobia-2
6. **Dr. Y.P. Joshi**
Sr. Agronomist & OIC
AICRP (FC)
GBPUAT, Pantnagar
Forage Crop Variety : UPC-5286, UPC-622, UPC-9202
7. **Dr. S. S. Meena**
Principal Scientist (Plant Breeding)
IGFRI, RRS, Avikanagar
Forage Crop Variety : AVKB-19
8. **Dr. D.K. De**
Sr. Forage Breeder &
OIC- Forage Section
B.C.K. V., Kalyani – 741235
Dist. NADIA (W B)
Forage crop variety: Bidhan-1, Bidhan-2

**AICRP ON FORAGE CROPS
TECHNICAL PROGRAMME FOR FORAGE CROP PRODUCTION
(KHARIF – 2012)**

AST-1: Influence of resource conservation techniques on forage production and physico-chemical status of soil

Objectives:

- To study the effect of resource conservation techniques (RCT) on forage yield of the system
- To study the effect of RCT on physico - chemical properties of soil.
- To study the economics of the system.

Year of start : **Kharif 2009 (Establishment)**

Duration : **Five years**

Methodology

Phase I : (2009)

Studies on initial physico-chemical status of the soil i.e., WHC, Infiltration rate, pH, OC (%), available N,P & K and microbial population .

Formulation of zone specific resource conservation techniques through forage crops in Pilot trial mode.

Phase II : (2010-2011)

Execution of the experiments as per the technical programme in the respective zone
Recording observation on growth, yield and quality in different seasons of the system in each year

Recording observation on soil fertility status after end of the in each year.

Phase III : (2013-14)

Recording final physico-chemical soil status after completion of the study

Computation of data and analysis and preparation of the report

Observations:

Crop growth:

Plant / shoot population at harvest (per m²)

Plant height at harvest

Leaf : stem ratio

B) Yield (q/ha) :

Green fodder

Dry matter

Grain

Straw

Forage equivalent yield

C) Quality:

Crude protein content (%)

Crude protein yield (q/ha)

D) Economics:

Cost of cultivation (Rs./ha)
Gross monetary return (Rs./ha)
Net monetary return (Rs./ha)
Benefit : cost ratio

E) Soil studies:

- Soil fertility status before and after completion of the sequence, i.e., pH, OC (%), EC, available NPK.
- Microbial population before and after completion of experiment.

F) Soil moisture conservation studies:

- Soil moisture data from 0-15 and 15-30 cm depth at initial, 15 days after germination and later on every 30 days interval.

NOTE: Specific observations will be recorded as per experimental need and data will be reported in rabi

1. Hill Zone : (Rainfed conditions)

Subtitle: Effect of vegetative barriers and improved forage species on conservation of degraded grassland

Design : Split
Replication (s) : 3
Treatments :

Main plot -Vegetative barriers

- No vegetative barrier
- Napier Bajra Hybrid
- Setaria*

Sub plot - Species

Local grass
Setaria
Desmodium
Setaria + Desmodium

Location (1): Palampur

2. North-West Zone

(a) Irrigated conditions

Subtitle: Effect of different tillage practices on productivity of forage crop in the prevalent crop sequence

Design : RBD
Replication(s) : 3

Treatments

T₁-Conventional tillage – 3 cultivation – disc harrow + 2 cultivator
T₂-2 cultivation – 1 disc harrow + 1 cultivator

T₃-2 cultivation - rotavator
T₄-1 cultivation – disc harrow
T₅-1 cultivation – rotavator
T₆-Broadcast seed before T-3
T₇-Broadcast seed before T-5
T₈-No cultivation (zero tillage)

Locations (3): Ludhiana, Hisar and Pantnagar

3. Central Zone:

Sub title: Effect of planting methods and forage crop combinations on fodder productivity through moisture conservation

Design : RBD

Replication(s) : 3

Treatments :

A. Main plot- Moisture conservation techniques

Ridge and furrow

Flat bed

B. Sub plot -Combination of grasses and legumes

Cenchrus + Desmenthus

Cenchrus + Stylosanthes

Dicanthium + Desmenthus

Dicanthium + Stylosanthes

Location (4): Rahuri, Jabalpur, Anand and Urulikanchan

4. North East Zone:

Sub title: Effect of moisture conservation practices on production of perennial grasses

Design : RBD

Replication(s) : 3

Treatments

A. Perennial grasses

Brachiaria brizantha

Guinea grass/ Napier *Bajra* Hybrid

Setaria grass

B. Moisture conservation

Control (Without mulch)

Soil mulch

Live mulch with legume (cowpea / ricebean/berseem)

Location (5): Jorhat, Faizabad, Ranchi, Bhubaneswar and Kalyani

5. South Zone:**(a) Sub title: Intensive forage production through silvipasture system under rainfed ecosystem**

Design : RBD
Replication(s) : Three

Treatments

- T₁ – Subabool + *Cenchrus ciliaris*
- T₂ – Subabool + *Stylosanthes*
- T₃ – Subabool + *Desmenthus*
- T₄ – Subabool + *Cenchrus ciliaris* + *Stylosanthes* (3:1)
- T₅ – Subabool + *Cenchrus ciliaris* + *Desmenthus* (3:1)
- T₆ – Subabool + Sorghum + Horse gram (2:1)
- T₇ – Subabool + Pearl millet + horse gram (2:1)
- T₈ – Subabool (Sole)

Note: Spacing of subabool – 3 m x 2 m

Locations (3): Hyderabad, Coimbatore and Mandya

(b) Sub title: Cassava based sustainable alley farming system for rainfed areas of the humid tropics

Design : RBD
Replication : 3

Treatments**(A) Grasses**

- BN Hybrid
- Brachiaria brizantha*
- No grass

(B) Legumes

- Fodder cowpea
- No fodder legume

(C) Biofertilizer

- VAM
- No biofertilizer

Location: Vellayani

AST-2 : Optimization of nitrogen for sorghum in different cropping systems

Year of start : Rabi-2009-10 (Hisar centre – Kharif 2011)
Duration : Three years
Design : Split plot
Replications : 3
Plot size : 5mx4m

Treatments: 6x4=24

(a) Cropping System (6)

- Wheat – Sorghum (F)
- Wheat – Maize (F)– Sorghum (F)
- Wheat – Cowpea (F) – Sorghum (F)
- Berseem – Sorghum (F)
- Oat – Maize (F) – Sorghum (F)
- Oat – Cowpea (F) – Sorghum (F)

(b) Nitrogen Levels (4)

- 50% of Recommended dose of N
- 75% of Recommended dose of N
- 100% of Recommended dose of N
- 125% of Recommended dose of N

Note: N levels treatments will be applied to sorghum. Other crops of the sequence will be grown with recommended NPK doses and other packages. Data will be reported after the completion of the sequence in Rabi.

Observations:

A. Crop Growth

- Plant Population/m²
- Growth parameters (Plant height and leaf stem ratio)
- Green fodder, dry matter, forage equivalent and crude protein yield (q/ha)

B. Economics (₹/ha/year)

- Cost of cultivation
- Gross monetary returns
- Net monetary returns
- Benefit : Cost ratio

C. Nutrient Studies

- Nitrogen uptake by each crop and entire system
- Nitrogen use efficiency
- Soil fertility status before and after completion of sequence

Locations (3): Ludhiana, Hisar, Pantnagar

AST-3: Forage production potential of Sorghum hybrid with forage legumes under varying seed rates of intercrop

Objectives

To access the effect of seed rate of intercrops on sorghum

Replications : 3
Design : RBD

Year of start : Kharif 2010

Duration : Three years

Treatments =9

(a) Legumes (2)

Cowpea

Ricebean/guar

(b) Seed rates of legumes (4)

25% of recommended seed rate

50% of recommended seed rate

75% of recommended seed rate

100 % of recommended seed rate

Treatments will comprise all possible combinations of (a) and (b) plus sole stand of Sorghum

Observations:

- Plant height (cm)
- Plant population/ shoot number (per m²)
- Green and dry fodder yield (q/ha)
- Crude protein content (%) and yield (q/ha)
- Economics of production
- Land equivalent ratio (LER)

Note: Seed rate of each crop will be used on the basis of seed ratio in respective treatment. Data will be reported in kharif

Locations (4) : Palampur, Ludhiana, Pantnagar, Bikaner

AST-4: Performance of Forage crops raised through waste water under varied nutrient levels

Objectives

To assess the production and quality of various forage crops raised through waste water under varied nutrient level

To workout the economics

Year of Start : Kharif 2010

Duration : 3 years

Design : Split Plot

Replications : Three

Treatments

Main Plot -Forage Crops – 4

C₁ – Cumbu Napier Hybrid grass - CO (CN) 4/ APBN-1

C₂ – Guinea Grass - CO (GG) 3

C₃ – Multicut fodder sorghum - CO(FS)29 / Para grass

C₄ – Lucerne - CO 1

Sub Plot -Nutrient Levels – 5

- S₀. Control
- S₁- 25% RDF
- S₂ – 50% RDF
- S₃– 75% RDF
- S₄ – 100% RDF

Observations:

- Plant population / m row, Plant height at harvest, Leaf stem ratio
- Green fodder and dry matter yield (q/ha)
- Crude protein content (%) and Crude protein yield (q/ha)
- Economics (Rs/ha/yr)
- Chemical analysis of waste water, soil and fodder for heavy metals
- Soil fertility at initial and at end of the year

Note: **Data will be reported in Rabi**

Locations (2): Coimbatore and Hyderabad

AST-5: Effect of tillage and nutrient management on productivity of rice – oat cropping system

Objective:

- To study the effect of tillage and nutrient management in oats on the productivity of the system

Design	:	Split plot
Replication	:	3
Plot size	:	4m x 3m
Year of start	:	<i>Kharif 2010</i> (Raipur and Jabalpur - <i>Kharif 2011</i>)
Duration	:	Three years

Treatment: 12

Main plot – Tillage practices (3)

- S₁. Zero tillage
- S₂. Minimal tillage
- S₃. Conventional tillage

B) Sub Plot - nutrient management (4)

- M₁ – 75 % Recommended Dose of NPK (RD)
- M₂ – 75 % RD + Biofertilizers (*Azotobactor* + PSB)
- M₃ – 100 % RD
- M₄ – 100 % RD + Biofertilizers (*Azotobactor* + PSB)

Note: **Tillage and nutrient management will be done in oat crop and residual effect of the treatments will be studied on *Kharif* rice. Data will be reported in Rabi.**

Observations:

- Initial and final status of soil fertility and microbial population
- Yield of grain and straw for rice
- Yield of green and dry matter of oat

- Weed studies
- CP% and CP yield of oat
- Economics.

Locations (6): Bhubaneswar, Ranchi, Kalyani, Jorhat, Raipur and Jabalpur

AST 6: Effect of growing environment and nitrogen levels on production and quality of BN Hybrid

Objectives : To study the effect of shade and N levels on yield, quality and anti-nutritional components

Design : RBD
Replications : Three
Year of start : Kharif 2011 (Establishment year)
Duration : 3 years
Treatments : 10

Growing environments:

1. Shaded
2. Unshaded

Nitrogen levels :

1. 50% of recommended dose of N
2. 75% of recommended dose of N
3. 100% of recommended dose of N
4. 125% of recommended dose of N
5. Control

Observations:

Crop growth and development

- Plant height, shoot no./tussock, leaf stem ratio
- Green fodder and dry fodder yields (q/ha)

Quality studies

- Crude protein content and yield
- NDF and ADF content
- Nitrate and Oxalate contents

Soil studies

- Available NPK , pH and OC content –initial and after completion of each season

Economic studies

- Net returns (₹/ha)
- B:C ratio

Locations (5): Palampur, Ludhiana, Anand, Rahuri, Hyderabad

Note: Package of practices i.e. variety, spacing and fertilizers (NPK), etc. to be followed as per location specific recommendations, data will be reported in kharif.

Initially with respect to layout and planting the experiment will be managed by Agronomist and thereafter further samplings etc for analysis will be managed by the concerned biochemist of the centre.

AST - 7 (NT): Performance of dual purpose pearl millet as influenced by different cutting management practices and nitrogen levels

Objectives:

- To study the effect of cutting management on green fodder and grain yield
- To study the economics of the system

Treatments

(a) Varieties (3)

1. BAIF Bajra-1
2. AVKB 19
3. GFB-1

(b) Cutting management (3)

1. No cutting
2. First cut (50 DAS) for green fodder & leave for grain production
3. Two cuts for green fodder (1st at 50 DAS, 2nd 40 days after 1st cut) & leave for grain production

(c) Nitrogen levels (2)

1. 100 % of RDN
2. 150% RDN

- *N will be given in three splits (40 % basal, 30 % at 30 DAS, and remaining 30 % at 60 DAS)

Design : FRBD
Replications : Three
Year of start : Kharif 2012
Duration : 3 years
Treatments : 18
Plot size : 4 x 3.60 m

Observations to be recorded:

(a) Crop growth and development

1. Plant height
2. Leaf stem ratio
3. No. of tillers/ m row length
4. Green fodder yield
5. Dry matter yield
6. Grain yield
7. Stover yield

(b) Quality studies

1. Crude protein content
2. Crude protein yield

(C) Economics:

Net monetary returns, benefit cost ratio and cost of cultivation

(d) Soil studies: Soil fertility status before and after crop season and N uptake by the crop

Locations (6): Anand, Urulikanchan, Bikaner Mandya, Hyderabad and IGFRI RRS Dharwad

Data will be reported in Kharif

AST - 8 (NT): Effect of nutrient management on productivity of perennial grasses under lowland condition

Objectives:

1. To evaluate the performance of lowland perennial grasses in relation to crop establishment and forage productivity
2. To study the response of different lowland grasses over nutrient management.

Treatments (12):

A. Main plot- Grasses

- G₁-Para grass (*Brachiaria mutica*)
- G₂-Humidicola (*Brachiaria humidicola*)
- G₃-Predominant Local grass

B. Sub-plot- Nutrient management

- M₁-100% NPK (Inorganic fertilizer)
- M₂-50% NPK through inorganic fertilizer + FYM @ 5 t ha-1
- M₃- FYM @ 10 t ha-1
- M₄-Farmer's practice (No nutrient- control)

Note: Dol grass for Jorhat, Bhubaneswar and Kalyani. Ranchi and Jabalpur centre will take Predominant local grass suited for low land condition

Design : FRBD
Year of start : Kharif 2012(establishment year)
Duration : Three years
Replication : 3
Plot size : 4 m X 5 m
Spacing : 50 cm X 50 cm

Observation to be recorded

- (a) Initial and final fertility status of the soil after each season
- (b) Green fodder yield and dry fodder yield
- (c) Crude protein yield and crude protein content (%)
- (d) Economics: Net returns, BC ratio and cost of cultivation
- (e) Nutrient uptake (NPK) by the grasses

Location (5): Bhubaneswar, Jorhat, Kalyani, Ranchi and Jabalpur

B- LOCATION SPECIFIC TRIALS

AST- 9 (AST-7): Optimization of nitrogen for maize in different forage based cropping systems

Year of start	:	Kharif-2011
Duration	:	3 years
Design	:	Split plot
Replications	:	3
Plot size	:	5m x 4m
Treatments	:	4x4=16

(a) Cropping System (4)

Maize	– Cowpea	– Oat
Maize	– Ricebean	– Oat
Maize	– Cowpea	- barley
Maize	– Rice bean	- barley

(b) Nitrogen Levels (4)

- 50% of Recommended dose of N
- 75% of Recommended dose of N
- 100% of Recommended dose of N
- 125% of Recommended dose of N

Observations:

A. Crop Growth

- Plant Population/m²
- Growth parameters (Plant height and leaf stem ratio)
- Green fodder, dry matter, forage equivalent and crude protein yield (q/ha)

B. Economics (₹/ha/year)

- Cost of cultivation
- Gross monetary returns
- Net monetary returns
- Benefit : Cost ratio

C. Nutrient Studies

- Nitrogen uptake by each crop and entire system
- Nitrogen use efficiency
- Soil fertility status before and after completion of sequence

Note: N levels treatments will be applied to maize. Other crops of the sequence will be grown with recommended NPK doses and other packages. Data will be reported in Rabi.

Locations (1): Shillong

AST- 10 (AST-8): Effect of soil amendments on productivity of rice-berseem and changes in soil properties of sodic soil

Year of start	:	<i>Kharif</i> 2009		
Duration	:	Five years		
Plot size	:	4m x 3m		
Design	:	RBD	Replication	: 3

Treatments:

- T1- RDF= Recommended dose of fertilizer
- T2- RDF + FYM 10 t/ha
- T3- RDF + gypsum @ 75 % GR
- T4- RDF + gypsum @ 50 % GR
- T5- RDF + Pressmud @ 75 % GR
- T6- RDF + Pressmud @ 50 % GR
- T7- RDF + gypsum @ 75 % GR + FYM 10 t/ha
- T8- RDF + gypsum @ 50 % GR + FYM 10 t/ha
- T9- RDF + Pressmud @ 75 % GR + FYM 10 t/ha
- T10- RDF + Pressmud @ 50 % GR + FYM 10 t/ha

Note: 1. All the soil amendment treatments will be applied to rice only. Hence, berseem crop will be grown with recommended fertilizer dose.

1. Calculation of doses of soil amendments will be based on gypsum requirement.
2. Data will be reported in Rabi

Observations

- Plant /shoot population at harvest (per m²) , Plant height at harvest, grain and straw yield and Harvest index (Rice).
- GFY, DMY, Forage equivalent yield, CP % and CPY (Berseem)
- Net monetary return (Rs/ha/yr)
- Uptake of N, P and K (kg/ha) by each crop and entire system
- Initial soil fertility status viz., pH, EC, Exch. Na, OC and available NPK
- Soil fertility status after completion of sequence i.e. pH, EC, OC, available NPK and exchangeable sodium percentage

Location: Faizabad

AST-11 (AST- 9): Banana based fodder intercropping in the homesteads of Kerala

Objectives: To evaluate the production potential, quality and economics of fodder crops in banana based production system

Year of Start	:	<i>Kharif</i> 2010
Duration	:	3 years
Design	:	RBD

Replication : 3
 Plot size : 5.8 m x 5.4 m

Treatments : 12

- T₁ –Banana+ Guinea grass
- T₂ – Banana + Hybrid Napier
- T₃ – Banana + Congo signal
- T₄ – Banana + cowpea
- T₅ – Banana sole
- T₆ – Guinea grass sole
- T₇ – Hybrid Napier sole
- T₈ – Congo signal sole
- T₉ – Cowpea sole

Observations:

Banana

- Bunch yield (q/ha)

Fodder Crops

- Plant height at harvest (cm), plant population , Leaf stem ratio
- Forage yield and forage equivalent yield(q/ha)
- Economics (Gross Returns, Net Returns and BC Ratio)
- Crude protein content (%) and Crude protein yield (q/h)
- Crude fibre content (%) and Crude fibre yield (q/ha)

D. Nutrient studies

- NPK uptake by each crop and entire system
- Nutrient use efficiency of NPK by each crop and entire system
- Soil fertility status before and after completion of the sequence i.e., pH, OC (%)
- EC, available NPK before and after completion of experiment

Note: Data will be reported in Rabi

Location: Vellayani

AST 12 (AST- 10): Chemical control of *Acrachne racemosa* weeds in sorghum fodder

Objective: To find out the suitable herbicide for the control of *Acrekny (Acrachne racemosa)* weed in sorghum

Year of Start : Kharif 2010
 Duration : Three years
 Design : RBD
 Replications : 3

Treatments:

1. Control (weedy check)

2. Atrazine 1kg/ha PE
3. Stomp 2.5 lit/ha PE
4. Treflan 2.5 lit/ha PE
5. Lasso 2.5 lit/ha PE
6. Atrazine 0.75 kg + Stomp 2.5 lit/ha PE
7. Atrazine 0.75 kg + Treflan 2.5 lit/ha PE
8. Atrazine 0.75 kg + Lasso 2.5 lit/ha PE
9. Atrazine 1.0 + Stomp 2.5 lit/ha PE
10. Atrazine 1.0 kg + Treflan 2.5 lit/ha PE
11. Atrazine 1.0 kg + Lasso 2.5 lit/ha PE

Observations:

- Plant Height at Harvest, Leaf Stem Ratio
- Green fodder and Dry matter yield
- Crude protein content and yield
- Weed population
- Weed dry weight
- Economics (Gross Returns, Net Returns and BC Ratio)

Note: Data will be reported in *kharif*

Location: Ludhiana

AST 13 (AST-11): Effect of levels of nitrogen on productivity of perennial grasses with and without tree shade

OBJECTIVES:

- To study the effects of levels of nitrogen on productivity of perennial grasses under open and under tree shade conditions.
- To study the economics & quality of perennial grasses as influenced by varying levels of nitrogen under open and under tree shade conditions.

Year of start : *Kharif* 2011 (Establishment year)

Duration : Three years

Design : Split - Plot

Replication : 3

Plot size (Gross) : 5 m x 3 m

Treatments:

A. Main Plot - (S-2)

S1- Open Condition

S2-Under Tree Shade

B. Sub Plot:

(a) Grass (2)

P1. *Setaria (Setaria anceps)*

P2. *Congosignal (Brachiaria brizantha)*

(b) Fertilizer level (3)

F₁ – 25% less than recommended dose of N

F₂ – Recommended dose of N

F₃ – 25% higher than recommended dose of N

(Recommended dose of fertilizer for perennial grass: N: P₂O₅: K₂O, 120:60:40)

Total treatment combination 2 x 2x3 = 12

Observations:

- Initial fertility status of soil and fertility status at final harvest.
- Yield attributes- Plant height, tiller/tussock
- Leaf - stem ratio
- Green forage and dry matter yield (q/ha)
- Crude protein content and crude protein yield (q/ha)
- Economic indices.

Data will be reported in kharif

Location-Jorhat

AST – 14 (NT): Effect of time of sowing and seed rate on performance of fodder maize (*Zea mays* L.) under rainfed condition

Objectives:

1. To standardize the seed rate of fodder maize in the hill areas of Manipur state
2. To identify the suitable date of sowing of fodder maize for maximization of green fodder yield

Design of experiment : FRBD

Year of start : Kharif 2012

Duration : 3 years

Treatments: **(A) Date of sowing (3)**

D₁-26 May, D₂- 4th June and D₃-14th June

(B) Seed rate (3) (kg ha⁻¹)

S₁-60, S₂-70 and S₃-80.

Number of replication : 3 (three)

Number of Treatments : 9 (nine)

Plot size : 5.5 m x 5.0 m

Spacing : 30 cm (R x R)

Manure and fertilizer : (as per recommended dose)

Observation to be taken (Harvest stage)

I. Growth & Yield parameters

Plant height (cm)

Plant population (per row meter length)

Leaf-Stem ratio

Green forage yield (q ha⁻¹)

Dry matter yield (q ha⁻¹)

II. Quality

Crude protein content (%)

Crude protein yield (kg ha⁻¹)

Crude protein content (%) and CP yield (kg ha⁻¹)

**III. Economics- net returns, BC ratio and cost of cultivation
Data will be reported in Kharif**

Location: Imphal

AST-15 (NT): Performance of fodder rice bean as influenced by dates of sowing and spacing

Objective:

- To standardize the suitable date of sowing and spacing for maximization of fodder yield of rice bean

Design of experiment : FRBD
Year of start : Kharif-2012
Duration : 3 years

Treatments :

(A) Date of sowing (3):

D₁-26 May, D₂- 4th June and D₃-14th June

(B) Spacing (3):

S₁-farmer practice, S₂-30 cm and S₃-40 cm

Number of replication : 3
Number of Treatments : 9
Plot size : 4.5 m x 4 m
Seed rate : 35 kg ha⁻¹

Manure and fertilizer application: N: P₂O₅: K₂O @ 20 kg/ha, 60 kg/ha and 20 kg/ha, respectively.

Observation to be taken (Harvest stage)

I. Growth and yield parameters

- Plant height (cm)
- Plant population (per row metre length)
- Leaf-Stem ratio
- Green forage yield (q ha⁻¹)
- Dry matter yield (q ha⁻¹)

II. Quality

- Crude protein content (%)
- Crude protein yield (kg ha⁻¹)
- Crude protein content (%) and yield (kg ha⁻¹)

III. Economics

- Net returns
- Cost of cultivation
- BC ratio

Data will be reported in Kharif

Location: Imphal

AST-16 (NT): Enhancing the production potential of various forage crops in coconut gardens through nutrient management

Objectives:

- To know the performance of different forage crops in coconut garden under different nutrient levels
- To Identify suitable forage crop.

Year of start	:	Kharif 2012 (Establishment year)
Duration	:	Three years
Location	:	ZARS, V.C. Farm, Mandya
Design	:	RCBD
Replication	:	Three
Treatments	:	9
Fertilizer	:	As per treatments
Plot size	:	5.4 m × 4.0 m

Treatment details

1. Hybrid napier bajra + 100% RDF
2. Hybrid napier bajra + 125% RDF
3. Hybrid napier bajra + 150% RDF
4. Guinea grass + 100% RDF
5. Guinea grass + 125% RDF
6. Guinea grass + 150% RDF
7. Signal grass + 100 % RDF
8. Signal grass + 125 % RDF
9. Signal grass + 150 % RDF

Observations to be recorded

1. Plant height (cm)
2. Leaf stem ratio
3. Green forage yield (q/ha)
4. Dry matter yield (q/ha)
5. Crude protein yield (q/ha)
6. Light interception studies
7. Economics: Net returns, cost of cultivation and BC ratio
8. Initial and final fertility status (OC, pH, EC and NPK) of soil before and after completion of the experiment

Data will be reported in Kharif

Location: Mandya

AST- 17 (NT): Cropping system studies in fodder maize with legume intercropping

Objectives:

- To evaluate forage production potential of maize and legume intercropping in terms of total dry matter production and maize forage quality.

Treatment details:

- T1 - Sole maize (30cm spacing)
- T2 - Sole cowpea (30cm spacing)
- T3 - Sole soybean (30cm spacing)
- T4 – Maize + cowpea (1:1)
- T5 - Maize + cowpea (2:1)
- T6 - Maize + soybean (1:1)
- T7 - Maize + soybean (2:1)
- T8 - Maize + cowpea mixed cropping
- T9 - Maize + soybean mixed cropping

Note:

Seed rate for sole crops:

- 80 kg/ha for maize
- 40 kg/ha for cowpea
- 60 kg/ha for soybean

Mixed cropping:

- 50% less seed rate for both the crops

Inter cropping:

- Recommended seed rate for sole crops

Technical details:

Design – RBD

Replication – 04

Year of start – Kharif 2012

Duration - 3 Years

Observation to be recorded:

A. Crop Growth

1. Plant population at harvest/m²
2. Plant height at harvest
3. Leaf stem ratio

B. Yield (q/ha)

1. Green fodder
2. Dry fodder
3. Forage equivalent yield

C. Quality Parameters

1. Crude protein content (%)
2. Crude protein yield (q/ha)

D. Nutrient studies:

1. Nitrogen content and uptake by each crop.
2. Soil fertility states before and after completion of system.

Data will be reported in Kharif

Location: Srinagar

AST – 18 (NT): Effect of varying seed rate of forage legumes on productivity of fodder maize

Treatment details:

- T1 - Sole maize (30cm spacing)
- T2 - Sole cowpea (30cm spacing)
- T3 - Sole soybean (30cm spacing)
- T4 – Maize + cowpea @ 20kg/ha
- T5 - Maize + cowpea @ 40kg/ha
- T6 - Maize + cowpea @ 60kg/ha
- T7 - Maize + soybean @ 40kg/ha
- T8 - Maize + soybean @ 60kg/ha
- T9 - Maize + soybean @ 80kg/ha

Note: Recommended seed rate of maize is 80 kg/ha. However the seed rate of maize will be adjusted as per the row proportion i.e. being replacement series the seed rate will be 40 kg/ha.

Fertilizer for sole crops:

- 100 kg/ha for maize
- 25 kg/ha for cowpea
- 25 kg/ha for soybean

Inter cropping:

- N @ 80 kg/ha, P₂O₅ @60 kg/ha and K₂O @ 40 kg/ha

Technical details:

Design – RBD
Replication – 04
Year of start – Kharif 2012
Duration - 3 Years

Observation to be recorded:

A. Crop Growth

- Plant population at harvest/m²
- Plant height at harvest
- Leaf stem ratio

B. Yield (q/ha)

- Green fodder
- Dry fodder
- Forage equivalent yield

C. Quality Parameters

- Crude protein content (%)
- Crude protein yield (q/ha)

D. Nutrient studies:

- Nitrogen uptake by each crop.
- Soil fertility states before and after completion of experiment

E. Economics: Net returns, BC ratio and cost of cultivation

Data will be reported in Kharif

Location: Srinagar

AST – 19 (NT): Performance of Bajra Napier hybrid grass as influenced by micronutrients under irrigated conditions

Objectives:

- To study the effect of conjoint application of organic manure, inorganic fertilizers and micronutrients on forage yield, economics of production and soil properties.

Technical detail:

Treatments details: (9)

T₁- NPK alone

T₂ - NPK + FeSO₄ @50 kg/ha

T₃ - NPK + FeSO₄ @100 kg/ha

T₄ - NPK + ZnSO₄ @25 kg/ha

T₅ - NPK + ZnSO₄ @50 kg/ha

T₆ - NPK + FeSO₄ @50 kg/ha + ZnSO₄ @25 kg/ha

T₇ - NPK + FeSO₄ @100 kg/ha + ZnSO₄ @25 kg/ha

T₈ - NPK + FeSO₄ @50 kg/ha + ZnSO₄ @ 50kg/ha

T₉- NPK + FeSO₄ @ 100kg/ha + ZnSO₄ @ 50 kg/ha

Design : RBD

Replications : Three

Year of start : Kharif 2012 (as establishment year)

Duration : 3 Years

- NB:-
1. N & K– Basal and split as per recommendation
 2. P -Basal
 3. Micronutrients- Basal and split application
 4. FYM @ 25 t/ha as basal in the first year only.

Observations to be recorded

- Plant population at harvest (Per m²)
- Plant height at harvest
- Leaf stem ratio at harvest
- Green fodder and dry matter yields (q/ha)
- Crude protein content (%) and crude protein yield (q/ha)
- Gross and net return (Rs./ha)
- Benefit cost ratio
- Soil fertility status before and after completion of field trial i.e., pH, OC, EC, available NPK and Fe and Zn.

(NOTE: During kharif 2011, micronutrient analysis of soil was completed. The experiment will be conducted under Zn and Fe deficit soils)

Data will be reported in *kharif*

Location: Coimbatore

AVT BASED TRIALS**AST-20: Effect of phosphorus levels on forage yield of promising entries of cowpea (AVTC-2)**

Year	:	<i>Kharif</i> 2012
Design	:	FRBD
Replications	:	Three
Plot Size	:	4m x 3m (RXR = 30 cm)
Seed rate	:	35.0 kg/ha (45g/plot)

Treatments

- (A) Entries: 5 (2+2+1)
 2 (MFC 09-1, RR – 3)
 2 (UPC 5286, Bundel Lobia 1 - NC)
 1 (BL 2 for NWZ and HZ, UPC 622 for NEZ and UPC 9202 for CZ and SZ – Zonal checks)

- (B) P-levels: 3 (30, 60 and 90 kg P₂O₅/ha)

Observations:

- Plant population/m², Plant length and Leaf: stem ratio
 Green fodder, dry matter yields (q/ha)
 Crude protein content and crude protein yield (q/ha)

Locations (20): **NWZ**- Ludhiana, Hisar, Pantnagar and Bikaner

NEZ – Faizabad, Ranchi, Kalyani, Bhubaneswar, Jorhat, and Shillong

SZ – Coimbatore, Vellayani, Mandya, Dharwad and Hyderabad;

CZ – Anand, Jhansi, Jabalpur, Rahuri and Urulikanchan

(Seed requirement per entry = 12.0 kg seed of each entry will be supplied by contributing centre to coordinating unit. Seed of zonal checks = 4.0 kg per entry)

AST-21: Effect of nitrogen levels on forage yield of promising entries of pearl millet (AVTPM-2)

Year	:	<i>Kharif</i> 2012
Design	:	FRBD
Replications	:	Three
Plot Size	:	4m x 3m (RXR = 30 cm)
Seed rate	:	15 kg/ha (20 g/plot)

Treatments

- (A) Entries: 5 (3+2)
 3 (PAC-981;RBB-1 and NDFB-904)
 2 (Raj Bajra Chari-2 and Giant bajra) – checks
 (B) N levels: 4 (0,30, 60 & 90 kg /ha)

Observations:

- Plant population/m², Plant length and Leaf: stem ratio
 Green fodder, dry matter yields (q/ha)
 Crude protein content and crude protein yield (q/ha)

Locations (13):

NWZ-Ludhiana, Hisar, and Bikaner

NEZ – Faizabad, Bhubaneswar,

SZ – Coimbatore, Mandya, Dharwad and Hyderabad;

CZ – Anand, Jabalpur, Rahuri and Urulikanchan

(Seed requirement per entry = 3.5 kg seed of each entry will be supplied by contributing centre to coordinating unit)

AST-22: Effect of phosphorus levels on forage yield of promising entries of Ricebean (AVTR-2)

Year	:	<i>Kharif</i> 2012
Design	:	FRBD
Replications	:	Three
Plot Size	:	4m x 3m (RXR = 30 cm)
Seed rate	:	35 kg/ha (45 g/plot)

Treatments

(A) Entries: 2 (1+1)

1 (JRBJ – 05-4)

1 (Bidhan Ricebean – 1) - NC

(B) P-levels: 4 (0,30, 60 and 90 kg P₂O₅/ha)

Observations:

Plant population/m², Plant length and Leaf : stem ratio

Green fodder, dry matter yields (q/ha)

Crude protein content and crude protein yield (q/ha)

Locations (7):

NEZ –, Ranchi, Kalyani, Bhubaneswar, Jorhat, and Shillong

SZ – Vellayani

CZ – Jabalpur

(Seed requirement per entry = 3.5 kg seed of each entry will be supplied by contributing centre to coordinating unit)

AST-23: Effect of phosphorus levels on forage yield of promising entries of soybean (AVTS-2)

Year	:	<i>Kharif</i> 2012
Design	:	FRBD
Replications	:	Three
Plot Size	:	4m x 3m (RXR = 30 cm)
Seed rate	:	80 kg/ha (100 g/plot)

Treatments

(A) Entries: 4 : JS 07-21-7; JS 07-24-13; JS 07-24-1 and JS 07-24-8

(B) P-levels: 4 (0, 30, 60 and 90 kg P/ha)

Observations:

- Plant population/m², plant height and leaf: stem ratio
- Green fodder, dry matter yields (q/ha)

- Crude protein content (%) and crude protein yield (q/ha)

Locations (6):

NWZ –Hisar

NEZ – Ranchi, Shillong and Imphal

CZ – Jabalpur and Rahuri

(Seed requirement per entry = 6.5 kg seed of each entry will be supplied by contributing centre to coordinating unit)

GENERAL SUGGESTIONS

- The technical programme must not be changed without prior approval of the Project Coordinator (FC). The data are to be recorded as per technical programme and reported to the Project Coordinator (FC) accordingly well in time scheduled. A hard copy with CD in MS-Word 2003 and also through E-mail must be provided to the Project Coordinator (FC). In case of location – specific trials, the text of the trial should also be supplied by the Centre concerned.
- Data must be analyzed factor-wise statistically (with two-way tables) having SEm_{\pm} , CD at 5% and CV %. In case of interaction, two-way tables must be reported.
- Following (statistically analyzed) data with yield data must be reported for comparisons and making valid conclusions.
- Net monetary return (Rs./ha/yr) of the complete sequence (Crop sequences trial).
- Component-wise and total green fodder and dry matter yield (q/ha), net monetary return (Rs./ha/yr) and Land Equivalent Ratio (LER) (Intercropping trial)
- Component-wise and total crude protein yield (q/ha) as well as crude protein (%)
- Initial and final fertility status of the soil, i.e., after completion of trial which should essentially include pH, EC, OC (%), available N, P & K (Crop sequences and fertility trials).
- In trials on problematic soils, initial and final fertility status of the soil, i.e., after completion of trial and uptake of NPK by the crop(s) in each season is to be provided.
- In multi-cut crop(s)/variety(s), data on growth and quality parameters (i.e., plant population / m row length, L:S ratio, No. of tillers / m row length, No. of branches/plant and crude protein content (%) are to be recorded as per schedule given below :
- In Cereals and grasses, growth observations, in general, are to be recorded for first and last harvest. However, in cutting management trials or in trials with split application of N, the observations are to be taken for each cut.
- Data on dry matter estimation and crude protein analysis are to be recorded for each cut
- Centres / Locations are advised to send complete information on soil characteristics, variety (ies), agronomic recommendations, No. of cuts, etc., for the experiments in the prescribed format.
- **Submission of Kharif trials analyzed data before December 25, 2012**
- In case of net monetary return, current market price (Rs./q) must be indicated.
- Centres /Locations are advised to provide trials at a glance in one sheet mentioning trials allotted, trials conducted, data reported (character-wise-analyzed) and trials not conducted (with valid reasons) while supplying data to the Project Coordinator (FC). The format is attached herewith.

AICRP ON FORAGE CROPS AGRONOMY TRIALS AT A GLANCE

Year: Kharif 2012 Centre/Location:

Trials Allocated (No. & Name)	Trials conducted No. & Name	Trials not conducted/failed, also give reason for not conducting the trial/failure (No. & name)
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**FORAGE CROP PROTECTION COORDINATED TRIALS
TECHNICAL PROGRAMME FOR KHARIF 2012**

PPT1: Monitoring of diseases, insect-pests and nematodes in cowpea, maize, pearl millet and sorghum ecosystem.

Observation to be recorded:

1. All insect-pests including natural enemies
2. Pathogens and other micro-flora
3. Nematode population

Locations: Bhubaneswar, Hyderabad, Jhansi, Palampur, Rahuri and Ludhiana

PPT 2: Evaluation of Kharif breeding materials of cowpea, maize, pearl millet and sorghum for their resistance to diseases, insect and nematodes.

Locations: Bhubaneswar, Hyderabad, Jhansi, Palampur, Rahuri and Ludhiana

PPT-7A: Validation of effective treatment for the management of diseases in fodder maize.

Plot size 500 m²

Treatments:

1. Seed treatment with Vitavax powder @2g/kg seed followed by two sprays of mancozeb @ 0.25%.
2. Control

Locations: Palampur and Ludhiana

Observations to be recorded:

1. Diseases severity/ incidence at weekly interval
2. Note: 3 sprays will be given at 10 days interval, 1st spray being at appearance of the disease.

PPT-9A: Validation of effective treatment for the management of shoot fly in forage sorghum.

Plot size: 500 m²

Variety: Local susceptible variety

Treatments:

1. Seed treatment with Thiomethoxam @ 2g/ kg of seed.
2. Untreated control.

Observation to be recorded:

1. Percentage of dead hearts at 14 and 28 days after sowing.
2. Green forage yield (GFY) in q/ha.
3. Dry matter yield (DMY) in q/ha.
4. Net monetary return (NMR) Rs./ha/yr.

Locations: Hyderabad, Anand, Rahuri and Jhansi

PPT-10: Management of root rot disease in cowpea

Design: RBD

Plot size: 4x3 m²

Replication: 4

Variety: EC 4216

Treatments:

1. Seed treatment with *Trichoderma viride* @ 5g/kg seed + FYM @ 2 t/ ha.
2. Seed treatment with *Pseudomonas fluorescens* @ 5g/kg seed + FYM 2t/ ha.
3. Seed treatment with Neem seed kernel powder @ 50g/ kg of seed.
4. Seed soaking in solution of gum of Asafoetida @ 0.4% for 4 hrs.
5. Seed treatment with carbendazim @ 2g/kg of seed.
6. Soil drenching with 3% pitcher compost at the time of sowing.
7. Untreated control

Observation to be recorded:

1. Percentage germination (*In-vitro* and in field)
2. Vigour index of seedling (*In-vitro*)
3. Green forage yield
4. Dry matter yield
5. Net monetary return (NMR)

Location: Bhubaneswar

PPT-13: Effect of foliar diseases and insect-pests on quality parameters of forage cowpea

Design: Paired plot design

Variety: UPC-5286

Plot size: 100 m²

Locations: Anand, Rahuri, Hyderabad, Palampur and Ludhiana

Treatments:

1. Protected: Seed treatment with imidacloprid 70 WS @5g/ kg seed + carbendazim @2g/ kg seed followed by foliar sprays of imidacloprid 17.8 SL @ 0.3ml/lit at 15 days interval for the management of insects and alternate foliar spray of mancozeb and metalaxyl + mancozeb @ 2.5g/ lit at 10 and 15 days interval for the management of diseases.
2. Unprotected

Observations to be recorded:

- i. No. of insect-pest per plant
- ii. Diseases severity at 15 days interval
- iii. Chlorophyll content (A, B and total), crude protein content, crude fibre and total phenolic content

Sampling for biochemical analysis:

30 and 60 days after sowing

Note: Seed will be supplied by Dr. J.S. Verma, GBPUAT, Pantnagar @ 1.5 kg per location

(Total 7.5 kg)

PPT-14: Management of foliar diseases of forage sorghum

Design: RBD

Replication: 3

Plot size: 2x2 m²

Treatments:

T₁ = Seed treatment with carbendazim @2g/ kg seed

T₂ = Seed treatment with *T. viride* @5g/ kg

T₃ = Two foliar sprays of *T. viride* @0.5%

T₄ = Two foliar sprays of propiconazole @ 0.1%

T₅ = Two foliar sprays of copper oxychloride @ 0.3%

T₆ = T₁+Two foliar sprays of propiconazole @ 0.1%

T₇ = T₂+Two foliar sprays of propiconazole @ 0.1%

T₈ = T₁+Two foliar sprays of copper oxychloride @ 0.3%

T₉ = T₂+Two foliar sprays of copper oxychloride @ 0.3%

T₁₀ = Control

Observations:

1. Incidence and severity of diseases will be recorded.
2. Recording of yield at 50% flowering

Note:

1. Spray the crop at 30 and 45 DAS
2. Seed of highly susceptible variety SL-44 will be supplied by DR. Upasana Rani, PAU, Ludhiana.

Locations: Palampur, Ludhiana, Bhubaneswar and Jhansi

Annexure-II

List of Participants
ALL INDIA COORDINATED RESEARCH PROJECT ON FORAGE CROPS
 (Indian Council of Agricultural Research)
NATIONAL GROUP MEET – Kharif-2012

Date : May 4-6, 2012

Venue : BAIF, Pune

Sl.No.	Name and address
	India Council of Agricultural Research, Krishi Bhavan, New Delhi-110 001
1.	Dr. S. K. Datta, DDG (Crop Sciences)
	AICRP on Forage Crops, Project Coordinating Unit, IGFR, Jhansi
2.	Dr. S.A. Faruqui, Project Coordinating, (Forage Crops)
3.	Dr. R.V. Kumar, PS & PI (Plant Breeding)
4.	Dr. S.R. Kantwa, Sr. Sci. (Agronomy)
	Indian Grassland and Fodder Research Institute, Jhansi-284 003 (U.P.)
5.	Dr. R.B. Bhaskar, Sr Scientist & PI (Plant Path.)
6.	Dr. S.K. Tiwari, Head, CP Division
7.	Dr. S. Ahmed, CI Division
8.	Dr. Geetanjali Sahay, CI Division
9.	Dr. Kumar Durgesh, CI Division
10.	Dr. K. Sridhar, SRRS, Dharwad
11.	Dr. BG Shivkumar, SRRS, Dharwad
	AICRP ON FORAGE CROPS CENTRES
	CCS on Haryana Agriculture University, Hisar-125 004 (Haryana)
12.	Dr. R.K. Yadav, Head, Forage Section
13.	Dr R. N. Arora, Sr. Forage Breeder
14.	Dr. L. K. Midha, Sr. Scientist (Agronomy)
15.	Dr. D. S. Phogat, Assistant Scientist (Plant Breeding)
	SK Rajasthan Agriculture University, Bikaner-334 02 (Rajasthan)
16.	Dr. S.M. Kumawat, Sr. Sci. (Agronomy) & AICRP (FC)
17.	Dr. S. S. Shekhawat, Assoc. Prof. & OIC
18.	Dr. N. S. Yadava, Agronomist
	N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224 001 (U.P.)
19.	Dr. D.N. Vishwakarma, Sr. Forage Breeder & OIC
20.	Shri M. L. Maurya, Jr. Soil Scientist
	G.B. Pant University of Agriculture & Technology, Pantnagar-263 145 (Uttra khand)
21.	Dr. Y.P. Joshi, Professor of Agronomy & OIC
22.	Dr. J.S. Verma, Professor and Sr. Forage Breeder (Plant Breeding)
23.	Dr. Kewaland, Professor of Agronomy
	Birsa Agricultural University, Kanke, Ranchi-824 007 (Jharkhand)
24.	Dr (Mrs.) A. Tuti, Forage Breeder & OIC
25.	Dr. Birendra Kumar, Assistant Professor (Agronomy)
	Assam Agricultural University, Jorhat-785 013 (Assam)
26.	Dr. K.K. Sharma, Principal Scientist (Agronomy) & OIC
27.	Dr. S. Bora Neog, Principal Scientist (Plant Breeding)
	CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur-176 062 (Himachal Pradesh)
28.	Dr. Naveen Kumar, Sr. Agronomist & OIC
29.	Dr. V.K. Sood, Sr. Forage Breeder
30.	Dr. D.K. Banyal, Sr. Scientist (Plant Pathology)
	J.N. Krishi Vishwavidyalaya, Jabalpur-482 004 (M.P.)
31.	Dr. Raghuvanshi
32.	Dr. S.K. Biliaya, Forage Breeder
	Acharya N.G. Ranga Agricultural University, Hyderabad-500 030 (AP)
33.	Dr. K. Loka Reddy, Sr. Scientist (Entomology) & OIC
34.	Dr. T. Sasikala, Sr. Scientist (Plant Breeding)
35.	Dr. V. Chandrika, Sr. Scientist (Agronomy)
36.	Dr. M. Shanti, Scientist (Soil Science)

- Kerala Agricultural University, Vellayani, Thiruvananthapuram-695 522 (Kerala)
37. Dr. D.I. Suma Bai, Assoc. Prof. (Plant Breeding) & OIC
38. Dr. S.R. Sharu, Asstt. Professor (Agronomy)
- University of Agricultural Sciences, Bangalore (Campus Mandya)-572 202 (Karnataka)
39. Dr. H.C. Lohithaswa, Sr. Breeder & OIC
40. Dr. B.G. Shekara, Scientist (Agronomy)
- Mahatma Phule Krishi Vishwavidyalaya, Rahuri-413 722, Ahmednagar (Maharashtra)
41. Dr. A.H. Sonane, Sr. Forage Breeder & OIC
42. Dr. A.B. Tambe, Scientist (Entomology)
43. Sh S.H. Pathan, Scientist (Agronomy)
44. Dr. S.V. Damame, Scientist (Bio Chemistry)
45. Dr. Surana, Research Officer, Grass Breeding Scheme
46. Dr. G. C. Shinde, SRA, Grass Breeding Scheme
- Anand Agricultural University, Anand-388 110 (Gujarat)
47. Dr. H.P. Parmar, Res. Scientist (Plant Breeding) & OIC
48. Mr. P.M. Patel, Asstt. Res. Scientist (Agronomy)
49. Dr. G.J. Mistry, Jr. Scientist (Biochemistry)
- Punjab Agricultural University, Ludhiana-141 004 (Punjab)
50. Dr. U.S. Tiwana, Sr. Forage Agronomist & OIC
51. Dr. Upasana Rani, Assistant Plant Pathologist
52. Dr. Rahul Kapoor, Sr. Forage Breeder
- Tamil Nadu Agricultural University, Coimbatore-641 003 (TN)
53. Dr. K. Vellaydham, Professor (Agronomy) and OIC
54. Dr. C. Babu, Assoc. Prof. (Plant Breeding)
- Orissa University of Agric. & Technology, Bhubaneswar-751 003
55. Dr. B.K. Sahoo, Sr. Agronomist & OIC
- Bidhan Chandra Krishi Viswavidyalaya, Kalyani-741 235 (West Bengal)
56. Dr. C. K. Kundu, Agronomist & OIC
- BAIF Development Research Foundation, Urulikanchan-412 202, Pune (Maharashtra)
57. Mr. P.S. Takawale, Forage Breeder & OIC
58. Mr. V.K. Kauthale, Scientist (Agronomy)
59. Prof. J. S. Desale, Advisor, BAIF
60. Ms. Surekha Kale, RO
- S.K. University of Agricultural Scientist & Technology, Srinagar-190 121 (J&K)
61. Dr. Ansar- ul- Haq, Jr. Agronomist
- Indira Gandhi Krishi Vishwavidyalaya, Krishiak Nagar, Raipur-492 012
62. Dr. G. P. Banjara, Agronomist
- Central Agricultural University, Imphal
63. R. Joseph Koireng, Jr. Agronomist
- Collaborating Centres**
- Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora-263 601 (Uttarakhand)
64. Dr. J.K. Bisht, Principal Scientist (Agronomy)
- ICAR Research Complex for NEH Region, Umroi Road (Umiam) Barapani-793 103 (Meghalaya)
65. Dr. A.S. Panwar, PS & Head, Agroforestry
- PAJANCOA & Research Institute
66. Dr. S. Mala, Associate Professor, Agronomy
- Agricultural Research Station, Mahim Road, Palighar
67. Dr. A. V. Dahiphale, Jr. Agronomist & OIC
- Other participating institutes/organizations**
- National Dairy Development Board, Anand 388001 (Gujarat)
68. Dr. Anil Kumar Garg, DGM
- Advanta India Ltd., Secunderabad
69. Mr. G. Prabhakar Babu, Marketing Manager
70. Mr. Narayan Koleker, Breeder
- National Seed Corporation, Pune
71. Mr. S. K. Yerawar, Assistant Manager

Glimpses of Media Coverage

Six improved varieties of fodder crops identified

TIMES NEWS NETWORK

Pune: Six improved varieties of fodder crops have been identified for release by a committee headed by Swapan Kumar Datta, deputy director general (crop sciences) of the Indian Council of Agricultural Research (ICAR), New Delhi. The varieties will help in increasing fodder production in the country.

"The improved varieties are of guinea grass, setaria grass, two varieties each of hybrid napier (cross between napier grass and bajra) and cowpea," said Datta.

Speaking at the national group meet 'Kharif - 2012' organised by ICAR and BAIF Development Research Foundation in the city, Datta said that a public-private partnership model was required for production of quality seed and fodder and for adoption of technologies.

He said that livestock is highly neglected in the country. "Good governance and management is most critical for improving the forage production in the country," he said.

BAIF trustee and principal adviser Narayan G Hegde said that there had been a shortage of green fodder for the last 40 years. "Prosperity in dairy can only be through green fodder. With the correct extension strategy, one can popularise forage crops. The livestock sector contributes a lot to the gross domestic product (GDP) — 4.7% — which is more than that of rice production," he said.

Hegde said that although Rs 15 crore were allotted for animal husbandry extension in the last five-year Plan, only Rs 3 crore

Prosperity in dairy can only be through green fodder. With the correct extension strategy, one can popularise forage crops. The livestock sector contributes a lot to the GDP — 4.7% — which is more than that of rice production

Narayan G Hegde | BAIF TRUSTEE AND PRINCIPAL ADVISER

has been spent so far. According to him, the forage varieties, which have been recommended for release at the national level, need to be popularised at the farmer level. He said that fodder needed to be the main player in the dairy value chain.

BAIF president Girish G Sohani highlighted the drought situation in various parts of the country, which, along with shortage of fodder, was affecting the farming community. "Promotion of food and fodder crops, innovation of a package of practices, genetic viability, mechanisation in fodder cultivation and harvesting, availability of seeds, and promotion of tree-fodder crops are the new directions for the research community," he added.

About 70 scientists in the areas of forage-breeding, agronomy, plant protection and biochemistry from coordinated and voluntary centres of the All-India Coordinated Research participated in the three-day meet, which concluded on May 6.

Times of India, 8 May, 2012

पुणे ■ मंगळवार, ८ मे २०१२

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चारा उत्पादनात वाढीसाठी व्यवस्थापनाची गरज

म. टा. प्रतिनिधी ■ पुणे
matapune@indiatimes.com

'चाराविकासासाठी दर्जेदार विद्याणे, उत्पादन वाढीसाठी तंत्रज्ञानाची मदत घेणे आवश्यक आहे. स्थानिक गरजा लक्षात घेत चारा पिकांच्या जातींमध्ये सुधारणा करण्यासाठी कालबद्ध कार्यक्रम तयार करणे आवश्यक आहे,' अशी अपेक्षा भारतीय कृषी संशोधन परिषदेचे उपमहासंचालक डॉ. स्वप्नकुमार दत्ता यांनी नुकतीच व्यक्त केली.

भारतीय कृषी संशोधन परिषद आणि बाएफ डेव्हलपमेंट अँड रिसर्च फाउंडेशनतर्फे समन्वयी चारा संशोधन प्रकल्पावरील राष्ट्रीय कार्यशाळेच्या उद्घाटनप्रसंगी डॉ. दत्ता बोलत होते. बाएफचे अध्यक्ष गिरीश सोहनी, उपाध्यक्ष डॉ. अशोक पांडे,

विश्वस्त डॉ. नारायण हेगडे, चारा संशोधन प्रकल्पाचे समन्वयक डॉ. एस. ए. फारुकी, पी. एस. ताकवले आदी उपस्थित होते.

'चान्याच्या उत्पादनात वाढ होण्यासाठी उत्तम प्रशासन आणि व्यवस्थापनाची गरज आहे. देशात मोठ्या प्रमाणावर पशुधन उपलब्ध असताना चारा उत्पादनाकडे दुर्लक्ष होत आहे. स्थानिक गरजा लक्षात घेत चान्याच्या नव्या दहा ते पंधरा जाती विकसित करणे आवश्यक आहे. त्यासाठी देशपातळीवर कृती आराखडा तयार केला जाईल,' असे डॉ. दत्ता यांनी सांगितले. 'दुष्कालामध्ये चारा व्यवस्थापन हा महत्त्वाचा मुद्दा ठरतो. अशावेळी चारा व धान्य अशा दुहेरी गरजा भागविणाऱ्या जाती विकसित करण्यावर भर देण्याची गरज आहे,' असे सोहनी यांनी सांगितले.

**डॉ. दत्ता यांचे
प्रतिपादन**