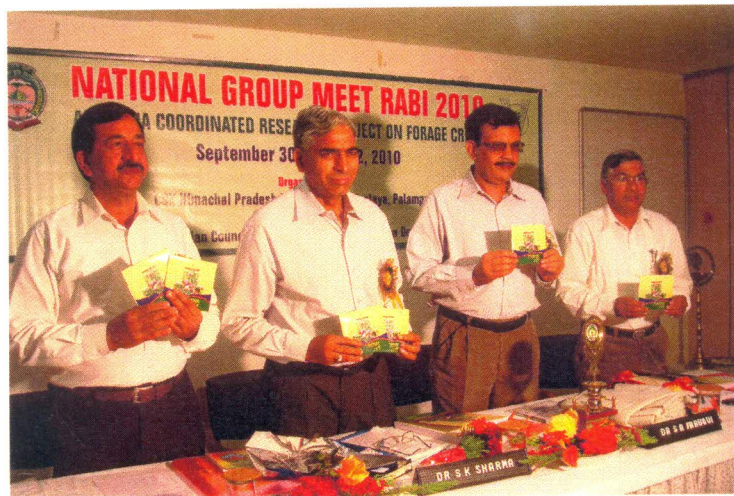




**ALL INDIA COORDINATED RESEARCH PROJECT ON FORAGE CROPS**  
(Indian Council of Agricultural Research)

**PROCEEDINGS OF THE NATIONAL GROUP MEETING**

Held at  
**CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur**  
During Sept 30- Oct2, 2010



**PART II : RABI 2010-11**

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

November 2010



## **PROCEEDINGS OF THE NATIONAL GROUP MEETING**

**ALL INDIA COORDINATED RESEARCH PROJECT ON FORAGE CROPS  
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)**

**Held at**

**CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur  
During Sep 30- Oct 2, 2010**

**PART II : RABI 2010-11**

**Project Coordinating Unit  
All India Coordinated Research Project on Forage Crops  
Indian Grassland and Fodder Research Institute, Jhansi – 284 003 (U.P.)**

**November 2010**

**AICRP ON FORAGE CROPS**  
**Tech. Pub. Number – 5/2010**

**Proceedings of the National Group Meeting: Rabi 2010-11**  
**(Held at CSKHPKV, Palampur during Sept 30- Oct 2, 2010)**

This document is meant for official use only of the AICRP (FC) Centres, Coordinating Unit, Forage Scientists and Officials of ICAR at Headquarter.

**Compilation and Editing:**

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

**Editorial Assistance:**

Shri O. N. Arya  
Shri Vijay Kumar Paliwal  
Shri Sushil Kumar Khare

**Published by:**

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

Phone: 0510-2730029  
Fax : 0510-2730049  
E-mail: pcforage@gmail.com, pcfc@igfri.ernet.in

**November 2010**

## CONTENTS

Preface	:		i
Inaugural Session	:		ii
Highlights	:	Technology Generated	1
Technical Session-I	:	Breeder Seed Production of Forage Crops	3
Technical Session-II		Review of Research Activities	5
Technical Session-III	:	Formulation of Technical Programme :	
-III.a	:	Crop Improvement	8
-III.b	:	Crop Production	10
-III.c	:	Crop Protection	11
Technical Session-IV	:	Special Session: Strengthening Forage Resources	12
Technical Session-V	:	Discipline-wise Presentation	13
		Recommendations of Varietal Identification Committee Meeting	15
Technical Session-VI	:	Plenary Session	17
Annexure-I	:	Discipline wise Technical Programme :	
	:	<i>I.i</i> Technical Programme of Forage Crop Improvement Research	19
	:	<i>I.ii</i> Technical Programme of Forage Crop Production Research	26
	:	<i>I.iii</i> Technical Programme of Forage Crop Protection Research	39
Annexure-II	:	List of Participants	42
Annexure-III		AST-12 & AST 13	47
Annexure-IV	:	Glimpses of Media Coverage	50



## PREFACE

The National Group Meet, *Rabi* 2010-11 of All India Coordinated Research Project on Forage Crops was organized with the objective to review the accomplishments of Technical Programme executed during *Rabi* 2009-10 at different Centres, in-house research activities and FTDs; and also to formulate Technical Programme for *Rabi* 2010-11 as well as to suggest future thrust areas. The meeting was jointly organized by Indian Council of Agricultural Research and CSK HPKV, Palampur, during September 30 – October 2, 2010.

The meeting was attended by the scientists mainly engaged in forage research working under coordinating and collaborating Centres located at different SAUs, ICAR Institutes and NGOs. Dr. R. P. Dua, ADG (FFC) along with Dr. J. S. Sandhu, ADG (Seed), Indian Council of Agricultural Research and Dr K. A. Singh, Director, IGFRI, Jhansi, graced the occasion for guidance and future course of action keeping in view the changing agricultural scenario. Besides this the local participation included faculty from CSK HPKV, Palampur, officials from Department of Animal Husbandry, National Dairy Development Board, representatives from Industries and farmers of the region.

This compilation contains brief report of National Group Meet, *Rabi* 2010-11 covering highlights on varieties identified; and forage production and protection technology generated, proceedings of different technical sessions and technical programme for the coming *Rabi* season. The deliberations and discussions on the various aspects of forage improvement have added aspects of future research for addressing of national and regional problems pertaining to forages. The finalized technical programme on forage crop improvement, forage crop production and forage crop protection for the *Rabi* 2010-11 have been given in annexure(s).

The successful conductance of programme is attributed to joint efforts made by the participating scientists, authorities of CSK HPKV, Palampur and 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 acknowledges their technical and organizational assistance and cooperation for successful organization of this meeting.

S A Faruqui  
Project Coordinator (FC)

## Inaugural Session

The inaugural session of the National Group Meet, Rabi 2010-11 of AICRP on Forage Crops was organized at CSKHPKV, Palampur during September- 30 October 02, 2010. The meeting was inaugurated by Dr. S.K. Sharma, Hon'ble Vice-Chancellor, CSKHPKV, Palampur, the Chief Guest of the function. The other dignitaries on the dias were Dr. S.P. Sharma, Director Research, CSKHPKV, Palampur, Dr. B.C. Sood, Director Extension, CSKHPKV, Palampur and other Head of Divisions. The welcome address was given by Dr. S.P. Sharma, Director Research to the Chief Guest, dignitaries, participating scientists and team of NGM organizers, University staff, representatives of press and media, NGO's and farmers of the hill region.

Dr. S.A. Faruqui, Project Coordinator (Forage Crops) presented the Coordinator's Report for Rabi 2009-10. He highlighted the progress of research activities and the targets achieved as per the Technical Programme under the project. In Rabi 2009-10, eight breeding trials of two annuals and two perennial forage species comprising 41 entries alongwith their respective checks were conducted at 26 locations located in five zones. The forage species evaluated were Berseem and Oat (Single and Multi cut) in annuals and Lucerne and Tall Fescue in perennials. In addition, special breeding programme with specific aim was carried out at identified centres. The programme on forage crop production was undertaken at 27 sites in different agro-climatic zones of the country. Research aspects consisted: Integrated nutrient management in food/ forage based systems; optimization of S and Zn levels in forage-based cropping system; resource conservation; evaluation of forage production potential of maize grown for baby corn and green cob; influence of macro and micro nutrients on Lucerne fodder yield and quality; seed cum fodder yield of Lucerne in relation to sowing methods and cutting management; remunerative forage based cropping systems for sustained productivity under irrigated conditions; management of sodic soil through amendment and advanced agronomical trials of tall fescue grass and oats. The Forage Crop Protection trials included monitoring of pests and diseases, screening for disease and pest resistance in improved breeding materials and disease and pest management.

In the inaugural address, Dr. S.K. Sharma Hon'ble Vice-Chancellor, CSKHPKV, Palampur highlighted the importance of fodder crop and mentioned that nation needs higher fodder production in terms of quantity and quality to fetch the requirements of milch animal. He also emphasized on the availability of good quality seeds to the user so that higher fodder production can be achieved.

Inaugural Session ended with vote of thanks by Dr. B.C. Sood, Director Extension, CSKHPKV, Palampur to the dignitaries and participants for their valuable presence in the session. He also extended gratitude to the faculty members and staff of CSKHPKV, Palampur for their support in team spirit towards successful organization of National Group Meet of AICRP on Forage Crops.



## Highlights: Technology Generated

### A. Entries Identified for release as Variety :

#### 1. Pearl millet : Entry NDFB-3

The proposal for forage Pearl millet entry NDFB-3 was submitted by NDUAT, Faizabad for North East and North West Zones. The committee examined the proposal and observed that entry has shown consistent superiority over the check variety in North East Zone. Therefore this entry was identified for North East Zone.

#### 2. Forage Oat : Entry- JO-03-93

The proposal for forage Oat entry- JO-03-93 was submitted by JNKVV, Jabalpur for Central Zone. The proposed entry was considered by the committee. The entry has shown consistent superiority over the check in Central Zone hence identified for this zone.

#### 3. Forage Oat : Entry- SKO-90

The proposal for forage Oat entry- SKO-90 was submitted by SKUAST, Srinagar for Hill Zone. It was found that the entry SKO-90 is superior to other proposed variety as well as the check variety over the years with consistent performance. Hence, SKO-90 was identified for Hill Zone.

### B. Forage Production Technology :

Following recommendations were emerged out:

1. On long term basis, FYM 25 % N + 75 % NPK through inorganic fertilizers in Sorghum + Cowpea – Berseem/Lucerne system was more beneficial than 100 % NPK through inorganic fertilizers in Central Zone (Jabalpur, Rahauri, Anand, Jhansi and Urulikanchan).
2. In NE Zone (Ranchi, Bhubaneshwar, Kalyani, Jorhat and Faizabad), FYM 50 % N + 50 % NPK through inorganic fertilizers in Rice – Berseem/Oat + Lathyrus system was more profitable than 100 % NPK through inorganic fertilizers.
3. At Jabalpur and Bikaner centre, 20 kg S through gypsum and 10 kg Zn/ha through ZnSO<sub>4</sub> applied every year to Maize/ PM (S) + cowpea (F)-berseem/barley (S) cropping system was superior than control (no S and Zn).
4. Maize (baby corn) + cowpea – berseem – maize (baby corn) + cowpea cropping sequence were the most remunerative in NEZ (Ranchi and Raipur).

5. In NW (Pantnagar) and South Zones (Coimbatore, Mandya and Hyderabad), the most remunerative cropping system was maize (baby corn) + Cowpea – maize (baby corn) – maize (baby corn) + cowpea.
6. RDF + FYM 10 t/ha + S + Mo + B applied to lucerne in Central Zone (Rahuri and Urlikanchan) was superior in fodder yield and quality than RDF.

**C. Forage Protection Technology :**

1. Plant protection measures namely seed treatment with Vitavax @ 2.5 g/kg seed + *Trichoderma viridae* @ 5 g/kg followed by foliar spray with propiconazol @ 0.01% effectively brought down powdery mildew in oat.
2. Organic amendments i.e., neem cake (soil application) followed by foliar spray of pitcher compost effectively controlled root rot in oat besides giving maximum green fodder yield.



## Technical Session- I Breeder Seed Production

**Chairman :** Dr. D.K. De  
**Rapportuers :** Dr. P.S. Takawale & Dr. T. Shashikala

At the outset, the chairman of the session welcomed all the participants. Dr. R.V. Kumar, Principal Investigator (Plant Breeding) presented the status of Breeder Seed Production in forage crops for Rabi 2009-10.

- Against a target of 277.59q of breeder seed production for 22 varieties of forage crops viz., Oat, Berseem, Lucerne and Gobhi Sarson, the actual production was 439.29q that indicates a surplus of 161.7q i.e. 58.25%. In general there was no shortfall of breeder seed production except in Bundel Berseem-3 (-3.5q) and T-9 (-1.20q).
- Dr. R.V. Kumar also presented the breeder seed production targets for Rabi 2010-11. The total quantity allotted for production is 287.5q for Rabi crops.
- In case of Berseem, the allotment of breeder seed for BL-10 variety has been indented to the tune of 28.90q. However, with the available amount of nucleus seed at PAU Ludhiana, only 15 quintal of breeder seed of BL-10 can be produced. Therefore, the house resolved that the remaining indent of BL-10 can be substituted by getting the indent for any other Berseem variety.
- The indent of 139.6 q for Kent variety of oat was distributed to PAU, Ludhiana (57.1 q); IGFRJ Jhansi, (40.0 q); AAU, Anand, (20 q) SKRAU, Bikaner (12.5q) and JNKVV, Jabalpur 10.0q . An amount of 40 kg nucleus seed of Kent variety will be provided by Hisar centre to Bikaner centre.
- In case of Lucerne, the Anand centre has confirmed the house to produce 4q of breeder seed of AL-3.
- In response to concern of the house regarding non-lifting of breeder seed and no indent for newly released varieties, Dr. J.S. Sandhu, ADG (Seeds), ICAR realized the difficulty and assured the house to discuss the matter with the concerned authorities in due course of time.
- During the session, a presentation on status of forage genetic resources at NGB and related IPR issues was given by Dr. J.C. Rana, PS and OIC, NBPGR, Regional Station, Phagli, Shimla. He suggested to undertake germplasm exploration by the scientists of AICRP centres and committed cooperation from the NBPGR, Regional Stations for the purpose.

- Dr. Rana also mentioned about PGR management system of NBPGR. He informed the house the status of forage crops in gene bank which is 4966 accessions for 189 species.
- The Chairman requested to take measures for faster registration of farmer's varieties.
- Shri G. Prabhakar Babu, Business Development Manager briefed about the work on forage crop improvement and highlighted the salient features of hybrids of Advanta India Ltd.

The session ended with thanks to the chair.

## TECHNICAL SESSION - II REVIEW of RESEARCH ACTIVITIES

**Chairman** : Dr. S. A. Faruqui, Project Coordinator (FC)  
**Rapporteurs** : Dr B. K. Sahoo and Dr. A.K. Mehta

With the formal welcome to all the delegates, the Chairman invited the Officer-in-Charge of the centres for presentation of their activities conducted during *Rabi* 2009-10.

**Hill Zone:** Palampur and Srinagar centre presented their activities in this zone. At Palampur, attempts have been made to generate new genetic material for Oat, Lotus and Clover. They have also collected local germplasm of White clover from the Kangra valley. In Berseem, inter-specific crosses between *T. alexandrium* and *T. vesiculosum* *IT. lappaceum* were attempted using embryo rescue technique. A Variety of Tall Fescue (*Festuca arundinaceae*) EC-178182 has been released for the zone by CVRC. Srinagar Centre initiated the breeding work on Oat and collected exotic germplasm of Oat and Alfalfa.

**North Western Zone:** Out of six centres in the zone, Ludhiana, Hissar, Pantnagar, Bikaner and Meerut presented their activities. The Ludhiana centre has attempted crosses in Oat using diverse parents and wild species. The centre was advised to complete the assigned work on sick plot at the earliest. The Hisar centre was advised to collect local germplasm of Berseem from the traditional growing areas of the zone. The centre has attempted to generate breeding materials of Berseem through mutation breeding and poly cross nursery and in Oat crosses was made using diverse parents. Variety OS-346 of Oat has been released by the centre and notified by CVRC. The centre was advised to take up plant protection trials. The Pantnagar centre was advised to strengthen their work on *Rabi* forages. The Bikaner centre was advised to take up the station trial on Lucerne before proposing their entry in IVT and strengthen in house breeding programme as per mandate. The Meerut centre has initiated breeding work on Oat and Berseem.

**North Eastern Zone:** Out of nine centres in the zone, seven centres *viz.* Faizabad, Ranchi, Kalyani, Bhubaneswar, Jorhat, Imphal and Raipur presented their activities. The Faizabad centre has collected germplasm of Oat and Berseem and has attempted new crosses in Oat using diverse parents. The centre has also released NDFB-2 (Fodder Bajra) and NDO-1(Oat) for both normal and salt affected soils of the zone. The Chairman appreciated the work of the



centre despite of adverse situation faced by the centre. The Ranchi centre was advised to test the available NBhybrid (Kamdhenu) at the centre along with national checks in different locations of the State to judge its superiority. In maize breeding, the inbreds should be tested along with national checks. Kalyani, Bhubaneswar and Jorhat centre were advised to initiate work on *Rabi* breeding programme of the mandated crops. The newly started Coordinated centre viz. Imphal and Raipur were advised to start the *Rabi* programme and identify the feasibility of different *rabi* crops.

**Central Zone:** Five out of eight centres in the zone, viz. Anand, Jabalpur, Jhansi, Rahuri and Urulikanchan presented their activities. The Anand centre has collected land races of Lucerne and Sorghum and generated breeding material in Lucerne by Poly cross. The Chairman entrusted the centre to conduct the plant protection trials with the Scientists from other projects and the need based contingency will be provided separately for this work. The Jabalpur centre has collected germplasm of Berseem and oats and generated breeding materials of the mandated crops through mutation, hybridization and poly cross. In Oat, Variety JO-03-91 of the Centre has been identified by CVRC for notification and release. The Jhansi centre has collected and maintained germplasm of four *Rabi* crops viz. Oat, Berseem, Lucerne, Shaftal. The Chairman advised the centre to give more emphasis on quality parameters. The Rahuri and Urulikanchan centres have developed segregating population of Lucerne through poly cross.

**South Zone:** Five out of seven centres in the zone, viz. Hyderabad, Mandya, Vellayani, Coimbatore and Dharwad presented their activities. At the outset the Chairman expressed his concern about none reporting of the in-house *Rabi* breeding program by the first three centres and advised to strengthen the breeding activities. The Coimbatore centre has generated the segregating population of Lucerne by poly cross. Besides, 52 crosses of Bajra Napier Hybrid have been generated by the centre through national crossing programme and supplied to 12 different centres for further testing. The IGFRI RRS, Dharwad has initiated breeding activities in Lucerne and other annual *Medicago spp.* through poly cross.

The results of the concluding trials of Crop Production and Crop Protection were presented by various centres. The Chairman desired to know about the acceptance of the generated technology and advised the centres for validation of the same.



Some of the general recommendations emerged out were:

- All the centres should concentrate their efforts on *Rabi* breeding programme of the mandated crops.
- In-house breeding programme including germplasm collection must be a part of the annual report of the centre.
- All the scientists and technical staff of the centre are to be involved for the FTD programme.
- The actual designation of the scientists and staff as per ICAR sanction should be reported in the report.

The session was concluded with a vote of thanks to the Chair.

**TECHNICAL SESSION-III  
FORMULATION OF TECHNICAL PROGRAMME (CONCURRENT)  
FORAGE CROP IMPROVEMENT**

**Convener** : Dr. R.V. Kumar, P.S. and PI (Plant Breeding)  
**Rapporteurs** : Dr. R.N. Arora & Dr. D.I. Suma Bai

The session started with introductory remarks by Dr. R.V. Kumar, Principal Scientist and Principal Investigator (Plant Breeding). Dr. Kumar highlighted the results of eight breeding trials conducted during *Rabi* 2009-10 on two annuals namely berseem and oat and perennials namely lucerne and tall fescue. The trial on lucerne has completed third and final year of evaluation. Dr. Kumar also urged upon all the concerned breeders:

- 1) To send the seed material to PC (FC) by 12.10.2010 positively.
- 2) Data of per day production must be provided by all centres for all the single cut and multi cut trials.
- 3) In Initial trials, the data for CP % and CPY shall be provided cut wise.
- 4) In Advance trials, the data on all the quality parameters be provided cut wise.

The breeding trials were formulated as per the details given below:

**A. Berseem**

- In IVT Berseem, two entries HFB 6-6 and HFB-30 exhibited significant superiority in hill zone. Therefore, these two entries were promoted to AVT-1 Berseem for Hill zone only.
- Fresh IVT Berseem was constituted by having five new entries from centres i.e. Jhansi (2), Hisar (1), Ludhiana (1) and Jabalpur (1).
- In oat , eight entries namely UPO 09-1, UPO 09-2, JHO-2009-1, JHO 2009-2, SKO-156, SKO-148, OS 363 and JO 03-95 have been promoted from IVT (SC) to AVT-1 (SC) on the basis of their superiority.
- Fresh IVT on oats (SC) has been constituted by having 13 new entries from centre i.e. Jhansi (2), Faizabad (2), Hisar (1), Pantnagar (2), Anand (1), Srinagar (2), Ludhiana (1) and Jabalpur (2).
- Three entries of oats namely JO 03-91, SKO-133 and SKO-96 were promoted from AVT oat (SC-1) to AVT oat (SC-2) on the basis of their superiority for fodder yield.
- The same entries will be evaluated for seed potential under AVT oat (SC-2) (Seed) which have been promoted to AVT oats (SC-2) as given above.

- Four entries including three entries namely UPO 09-3, JO 03-307 and JHO 2009-3 from IVTO (MC) whereas one entry JO 03-301 which could not be included last year due to being single entry to be promoted ( hence trial not constituted last year) was also included in this trial.
- Fresh IVT oats (MC) was constituted by having 6 new entries from centres Jhansi (2), Hisar (1), Ludhiana (1), Pantnagar (1) and Jabalpur (1).

#### **B. Lucerne**

- New VTLP-2010 was constituted by having nine entries from centres i.e. Anand (3), Rahuri (4), Coimbatore (1) and Bikaner (1). The earlier trial on lucerne VTLP-2007 was concluded since it had completed three years of experimentation.

#### **C. Tall Fescue**

- The ongoing trial VTTF (2009) which is already in progress will continue in second year also.

Seed of check varieties required :

- For breeding and agronomy trials during 2010-11, the seeds of check varieties to be supplied by the concerned breeder to PC (FC) was also finalized.  
The detailed finalized technical programme alongwith seed of check varieties required is circulated separately.

The session ended with vote of thanks to the chair.



**TECHNICAL SESSION-III  
FORMULATION OF TECHNICAL PROGRAMME (CONCURRENT)  
FORAGE CROP PRODUCTION**

**Convener** : Dr. U.S. Tiwana and Dr. Naveen Kumar  
**Rapporteurs** : Dr. N.S. Yadava and Dr. S. Karmakar

Session began with introductory remarks of Dr. U.S. Tiwana. He emphasized up on that while sending the data uniformity should be maintained for compilation. Technical programme was discussed in detail. A total of four trials have been concluded this year. Dr. S.A. Faruqi, Project Coordinator also joined the session and gave valuable suggestions for finalization of the technical programme. Eight ongoing trials will be continued and two location specific trials have been formulated for Mandya centre. An exploratory trial has also been decided to be conducted at Bikaner, Jalore, and Udiapur centres.

Following recommendations were emerged out:

1. On long term basis, FYM 25 % N + 75 % NPK through inorganic fertilizers in Sorghum + Cowpea – Berseem/Lucerne system was more beneficial than 100 % NPK through inorganic fertilizers in Central Zone (Jabalpur, Rahauri, Anand, Jhansi and Urulikanchan).
2. In NE Zone (Ranchi, Bhubaneshwar, Kalyani, Jorhat and Faizabad), FYM 50 % N + 50 % NPK through inorganic fertilizers in Rice – Berseem/Oat + Lathyrus system was more profitable than 100 % NPK through inorganic fertilizers.
3. At Jabalpur and Bikaner centre, 20 kg S through gypsum and 10 kg Zn/ha through ZnSO<sub>4</sub> applied every year to Maize/ PM (S) + cowpea (F)-berseem/barley (S) cropping system was superior than control (no S and Zn).
4. Maize (baby corn) + cowpea – berseem – maize (baby corn) + cowpea cropping sequence were the most remunerative in NEZ (Ranchi and Raipur).
5. In NW (Pantnagar) and South Zones (Coimbatore, Mandya and Hyderabad), the most remunerative cropping system was maize (baby corn) + Cowpea – maize (baby corn) – maize (baby corn) + cowpea.
6. RDF + FYM 10 t/ha + S + Mo + B applied to lucerne in Central Zone (Rahuri and Urulikanchan) was superior in fodder yield and quality than RDF.

Meeting ended with vote of thanks to the chair.



**TECHNICAL SESSION- III**  
**FORMULATION OF TECHNICAL PROGRAMME (CONCURRENT)**  
**FORAGE CROP PROTECTION**

**Convener** : Dr. R.B. Bhaskar, PI (Plant Protection)  
**Rapporteurs** : Dr. Ch. Chiranjeevi and Dr. A. B. Tambe

Forage Scientists of Plant Pathology and Entomology disciplines discussed in detail the achievements of the last *Rabi* season along with the ongoing technical programme. The Convener gave valuable suggestions for further improvement of the technical programme. Based on the discussion and suggestions made by the Convener, the following recommendations were emerged.

1. The trials PPT-1, PPT-2: A&B, will continue as they are of continuous nature. PPT-10, PPT-11 and PPT-12 will also continue in the *Rabi* 10-11 because this was the first year of the trial.
2. PPT-8 and PPT-9 trials have been conducted for 3 years. Therefore, the results of these trials should be validated on the large farm area and farmer's field during *Rabi* 10-11.
3. A new trial i.e. Effect of foliar diseases on the quality of oat varieties (PPT-15) was proposed to be conducted at 3 locations (Palampur, Ludhiana and Bhubaneswar).
4. It was suggested to have provision of Rs. 50,000/- as annual contingencies for the maintenance of the sick plots.

The meeting ended with vote of thanks to Chair.

### **Technical Session: IV Strengthening of Forage Resources**

- Chairman** : Dr. R.P. Dua, ADG (FFC), ICAR, New Delhi  
**Co-Chairmen** : Dr. J.S. Sandhu, ADG (Seeds), ICAR, New Delhi  
Dr. K.A. Singh, Director, IGFRI, Jhansi
- Rapporteurs** : Dr. R.V. Kumar and Dr. H.C. Lohithaswa

Dr. Naveen Kumar, Agronomist and OIC of AICRP on Forage crops, Palampur, made a presentation on "Forage resources management in relation to livelihood improvement in North-Western Himalayas". Indian Himalayan Region comprising of 12 states is characterized by range lands with intense grazing. Three states viz., Jammu and Kashmir, Himachal Pradesh and Uttarakhand contribute to 62.1% of geographical region with major area in Himachal Pradesh (27.19%). Farming system is mainly integration of livestock with forestry/horticulture. Dairying is the one of the major economic activity with around 56% contribution followed by Agriculture (18%). Major fodder resources in the region are pasture and rangelands, barren and uncultivable land, field bunds and fodder trees. The major factors responsible for reduced milk yield in the region are low yield potential of cultivable forages, more dependence on pasture / grazing land and weak seed production programmes. The speaker also stressed on the promotion of improved grass species for different hill zones including legumes, remunerative forage based cropping systems and transplanting techniques for higher green forage yield. He also presented the impact of technology interventions on milk yield based on sample data. The Chairman suggested him to provide data or parameters for assessment of impact of technologies. At last Dr. Naveen Kumar concluded that major thrust should be on integration of improved forage resources with good cattle breeds for increasing the milk production in the region.

## TECHNICAL SESSION : V DISCIPLINE WISE PRESENTATION

<b>Chairman</b>	: Dr. R.P. Dua, ADG (FFC), ICAR, New Delhi
<b>Co-Chairmen</b>	: Dr. J.S. Sandhu, ADG (Seeds), ICAR, New Delhi Dr. K.A. Singh, Director, IGFRI , Jhansi
<b>Rapporteurs</b>	: Dr. K.Velayudham and Dr.M.Shanti

The Project Coordinator Dr.S.A.Faruqui welcomed the dignitaries in the session and requested the Principal Investigators of the three disciplines to present their reports.

### FORAGE CROP IMPROVEMENT:

Dr.R.V.Kumar, PI (Plant Breeding) presented report on four *Rabi* forage crops viz., Berseem, Oat, Lucerne and Tall fescue conducted at 26 locations with trial success rate of 95%. The results obtained and the entries identified were presented in all trials location wise.

Dr.R.P.Dua, ADG intervened by stressing that there should be no fixed criteria of 10 percent superiority over national/zonal check for GFY/DMY all the time for promotion to AVTs and flexibility should be there. If certain entries are having superiority of 6-8% over national/zonal checks both for GFY and DFY should also be promoted to AVTs.

### FORAGE CROP PRODUCTION:

Dr.U.S.Tiwana, Senior Agronomist presented the agronomy trials under four heads viz., on-going trials, location specific trials, AVT trials and new /exploratory trials. Fourteen trials had been conducted at 24 locations covering 5 zones.

In the concluded trial on Integrated Nutrient Management in food-fodder based cropping system, the treatment where 25% of N was supplemented through FYM was found to be significantly superior over other treatments in Central Zone while the treatment 50% N through FYM performed better in North Eastern Zone. In trial viz., Optimization of sulphur and zinc for improved seed production conducted, the treatment receiving 20kg S and 10 kg Zn ha<sup>-1</sup> had the highest seed yields at all locations.

Forage production potential of maize was evaluated and in NEZ the sequence of maize (baby corn)+cowpea-berseem-maize (baby corn)+cowpea gave highest net returns while in



NWZ and SZ, sequence comprising of maize(baby corn) + cowpea –maize(baby corn)-maize (baby corn)+ cowpea gave the highest returns besides fodder.

Chairman suggested that all the field trial results complete in all aspects (yield, net returns and B:C ratio) should be promoted as recommendations at state level. In AVT trials performance of the entries should be evaluated at RDF in addition to other nutrient levels.

#### **FORAGE CROP PROTECTION:**

Dr.R.B.Bhaskar, PI (Crop Protection) expressed that trials on crop protection were conducted at 8 locations by either Entomologist, Pathologist or Nematologist successfully with the cooperation of concerned State Agricultural Universities. He highlighted that the incidence of leaf blight and aphids in Oat, stem rot/root rot in Berseem and Alfalfa mosaic in lucerne have become serious threat. Plant protection measures namely seed treatment with Vitavax @ 2.5 g/kg seed + *Trichoderma viridae* @ 5 g/kg followed by foliar spray with propiconazol @ 0.01% effectively brought down powdery mildew in oat. Organic amendments i.e., neem cake (soil application) followed by foliar spray of pitcher compost effectively controlled root rot in oat besides giving maximum green fodder yield.

The concluding remarks were offered by Dr.K.A.Singh, Director, IGFRI, Jhansi as under

- the scientists should rigorously pursue variation in forage crops and release new varieties
- the scientists were appreciated for meeting demands of Breeder Seed Production.
- FTDs may be increased at each AICRP centre.
- KVKs may be provided with planting material to promote the cause of fodder.

The session ended with vote of thanks proposed by the Project Coordinator Dr.S.A Faruqi. He profusely thanked the ADG (FFC) for enthusiastic listening of all presentations and for valuable suggestions. The ADG (seeds) and Director IGFRI, Jhansi were also thanked for their august participation.



## RECOMMENDATIONS OF THE VARIETAL IDENTIFICATION COMMITTEE

The meeting of the Varietal Identification Committee of the AICRP-FC was held under the Chairmanship of Dr. R. P. Dua, ADG (FFC), ICAR, New Delhi on October 1, 2010 at CSKHPKV, Palampur during the AICRP-FC, National Group Meet, Rabi, 2010.

Ten proposals of seven forage crops *viz.*, Pearl millet, *Stylosanthes seabrana*, *C. ciliaris*, White Clover, Oat, Lucern and Teosinte were submitted to the committee for identification. The proposals were discussed thoroughly. The recommendation of the committee is as following:

### 1. Pearl millet : Entry NDFB-3

The proposal for forage Pearl millet entry NDFB-3 was submitted by NDUAT, Faizabad for North East and North West Zones. The committee examined the proposal and observed that entry has shown consistent superiority over the check varieties in North East Zone. Therefore this entry was identified for North East Zone comprising eastern Uttar Pradesh, Bihar, Orissa, Jharkhand and West Bengal.

### 2. *Stylosanthes seabrana*: Entry STY-06-7

The proposal for *Stylosanthes Seabrana* entry STY-06-7 was submitted by IGFR, Jhansi for all India. The committee felt that pedigree of the entry is not properly mentioned and testing of this entry has not been done adequately for all India release. Therefore, the entry is not identified. The committee felt that it should be tested at all zones where this crop can be successfully grown. Moreover, one or two accessions of other suitable species of Stylo should be included in this trial.

### 3. *Cenchrus ciliaris* : Entry- CAZRI-585

The proposal for *Cenchrus ciliaris* entry CAZRI-585 was submitted by CAZRI, Jodhpur for arid and semi-arid areas of the country. The proposal was considered and it was felt that the proposed entry has not shown consistent superiority over check, hence not recommended for identification.

### 4. *Cenchrus ciliaris* : Entry- RCCB-2 (Bikaneri Dhaman)

The proposal for *Cenchrus ciliaris* entry RCCB-2 (Bikaneri Dhaman) was submitted by SKRAU, Bikaner for North West Zone. The committee observed that the proposal is not in order and is also not signed by the appropriate breeder and the authority. Also it was observed that the entry is not superior to the check variety CAZRI-75, hence not identified.

### 5. White Clover : Entry- L-19

The proposal for White Clover entry L-19 was submitted by IGFR, RRS, Palampur for Hill Zone. The proposed entry L-19 of White Clover was considered by the committee and it

was found that the performance of the entry was not consistent over the years, hence not identified.

#### **6. Forage Oat : Entry- JO-03-93**

The proposal for forage Oat entry- JO-03-93 was submitted by JNKVV, Jabalpur for Central Zone. The proposed entry was considered by the committee. The entry has shown consistent superiority over the checks hence identified for Central zone comprising states of Southern part of Uttar Pradesh, Madhya Pradesh, Gujarat and Maharashtra.

#### **7. Forage Oat : Entry- SKO-90 and SKO-105**

The proposal for forage Oat entry- SKO-90 was submitted by SKUAST, Srinagar for Hill Zone. It was found that the entry SKO-90 is superior to other proposed variety as well as the check variety over the years with consistent performance. Hence, SKO-90 was identified for release in Hill Zone comprising of states of Himachal Pradesh, Uttarakhand and J & K.

#### **8. Lucerne : Entry : BAIF Lucerne-1**

The proposal for Lucerne entry- BAIF Lucerne-1 was submitted by BAIF Development Research Foundation, Urulikanchan for all India. The proposal was considered by the committee. It was found that the proposed entry has not performed significantly better than the check variety, hence not identified.

#### **9. Teosinte : Entry-JHTT-04-2**

The proposal for Teosinte entry-JHTT-04-2 was resubmitted by IGFR, Jhansi. This committee felt that the decision taken by earlier Variety Identification Committee stands as such.



## Technical Session: VI Plenary Session

**Chairman** : Dr. R.P. Dua, ADG (FFC), ICAR, New Delhi  
**Co-Chairmen** : Dr. J.S. Sandhu, ADG (Seeds), ICAR, New Delhi  
**Rapporteurs** : Dr. R. V. Kumar & Dr. Rahul Kapoor

The session started with introductory remarks of the chairman. He invited the rapporteurs of different technical sessions for presentation of proceedings. The aspects and issues pertaining to Rabi-2009-10 programme in specific and forage research in general were discussed. The recommendations of Technical sessions were discussed and accepted after approval of the house. Looking to future challenges, some specific suggestions and recommendations were also made for strengthening the forage research and development in the country.

- Chairman critically emphasized the role of enhanced breeding activities in strengthening the ongoing Coordinated programme on Forage Crops. He emphasized on the exchange of breeding material within the zone as well as between the zone so that germplasm reservoir can be enriched with potential materials. He mentioned that at the time of release of varieties, credit can be shared among contributing partners.
- During the national group meet, it should be clearly discussed that which coordinating centre has not reported the assigned trial data of that particular season and whether the work of that centre with respect to breeding and other assigned activities are satisfactory or not.
- While proposing the entry in Variety Identification Committee for release, proposal should be prepared for all India as well as zone wise. Proposal should have fodder production potential with green forage as well as dry matter yield. Proposal should have data for other qualifying varieties too. It was also mentioned that variety having superiority of 7-8 percent but having consistence performance should also be taken into consideration for identification. Proposal must be submitted in prescribed proforma.
- Chairman showed his pleasure on the ongoing activities under the AICRPFC programme and appreciated the compilation and presentation of data in the Annual Report Rabi-2009-10. With this, he suggested that breeding activities in the field of hybridization should get momentum as this is the need of the hour.

- It was emphasized that technology/variety developed must reach to the farmers field. It was also suggested that State Agricultural Universities must take seed production programme on their farm.
- To assess the impact analysis of technology generated, certain index/parameter is required. Success storey may be one of the parameter.
- Coming to the agronomical aspect of the project, it was discussed that agronomical trials should focus on climate change, zero tillage, cropping system, inclusion of legume component etc. to make it more worthy.

At the end of the plenary session, Dr. Naveen Kumar, OIC, AICRP-FC, CSKHPKV, Palampur extended vote of thanks to the Chairman, Dr. R.P. Dua, ADG (FFC), Co-Chairman Dr. J.S. Sandhu, ADG (Seeds), Project Coordinator and his team, participants and local team for successful conductance of National Group Meet.

Dr. S.A. Faruqui, Project Coordinator (Forage Crops) also expressed thanks to the Chairman, Co-Chairman and ICAR authorities for guidance; and Vice Chancellor, Dean Agriculture, Director Research, CSKHPKV, Palampur; Chairman and members of organizing committee for providing all facilities and support for successful conductance of the meeting.



**FINALIZED TECHNICAL PROGRAMME  
FORAGE CROP IMPROVEMENT  
RABI 2010-11**

**Abbreviations:**

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

**1. IVT Berseem : Initial Varietal Trial in Berseem**

No. of Entries : 5 + 2 NC +1 ZC  
Name of Entries : Jhansi-2, Ludhiana-1, Hisar-1, Jabalpur-1  
National check : Wardan, Mescavi  
Zonal check : BL- 22 (HZ), Bundel Berseem-2 (NWZ & CZ), Bundel Berseem- 3 (NEZ)  
Design : RBD with 3 replications  
Plot size : 3.0 x 3.0 m  
Spacing : Row to row - 30 cm (each plot accommodating 10 rows of 3 m length)  
Seed rate : 25 g per plot (approx. 25 kg/ha)

**Seed requirement from contributors : 1.5 kg /entry**

Nutrients : N-20 kg, P-80 kg/ha

Irrigation, inter-culture and other agronomic practices as per agronomic norms and requirements of the crop.

Location (20): **HZ-** Rajouri, Palampur, Srinagar **NWZ-** Pantnagar, Ludhiana, Hisar, Jalore, Udaipur, Meerut **NEZ-** Kalyani, Ranchi, Faizabad, Bhubaneswar, Pusa **CZ-** Jhansi (IGFRI), Rahuri, Jabalpur, Urulikanchan, Karjat, Kanpur

**2. AVT-1 Berseem : First Advanced Varietal Trial in Berseem**

No. of Entries : 2+ 2 NC +1 ZC  
Name of Entries : HFB 6-6, HFB-30  
National check : Wardan, Mescavi  
Zonal check : BL- 22 (HZ)  
Design : RBD with 4 replications  
Plot size : 4.0 x 3.0 m  
Spacing : Row to row - 30 cm (each plot accommodating 10 rows of 4 m length)  
Seed rate : 30 g per plot (approx. 25 kg/ha)

**Seed requirement from contributors : 400 g /entry**

Nutrients : N-20 kg, P-80 kg/ha

Location (3): **HZ-** Rajouri, Palampur, Srinagar

**3. IVT Oat (SC): Initial Varietal Trial in Oat (Single cut)**

No. of Entries : 13 + 2 NC +1 ZC  
 Name of Entries : Faizabad-2, Jhansi-2, Pantnagar-2, Srinagar-2, Jabalpur-2, Anand-1, Hisar-1, Ludhiana-1  
 National checks : Kent and OS-6  
 Zonal check : Palampur-1(HZ), OL-125 (NWZ), JHO-99-2 (NEZ), JHO-822 (CZ) , JHO- 2000-4 (SZ)

Design : RBD with 3 replications  
 Plot size : 3.0 x 3.0 m  
 Spacing : Row to row : 25 cm (each plot accommodating 12 rows of 3 m length)  
 Seed rate : 100 g per plot (approx. 100 kg/ha)

**Seed requirement from contributors: 8.50 kg/entry**

Nutrients : N- 80 kg, P-40 kg/ha

Location (28): **HZ-** Palampur, Srinagar, Rajouri, **NWZ-** Bikaner, Jalore, Hisar, Ludhiana, Pantnagar, Udaipur, Meerut **NEZ-** Jorhat, Kalyani, Bhubaneswar, Ranchi, Pusa, Faizabad, CAU Imphal **CZ-** Jhansi, Rahuri, Urulikanchan, Karjat, Kanpur, Anand, Jabalpur, Raipur **SZ-** Hyderabad, Mandya, Coimbatore (Ooty)

**4. AVT Oat (SC)-1: First Advanced Varietal Trial in Oat (Single cut)**

No. of Entries : 8+ 2 NC +1 ZC  
 Name of Entries : UPO-09-1, UPO-09-2, JHO-2009-1, JHO-2009-2, SKO-156, SKO-148 OS-363, JO-03-95,  
 National checks : Kent and OS-6  
 Zonal check : Palampur-1(HZ), OL-125 (NWZ), JHO-99-2 (NEZ), JHO-822 (CZ) , JHO- 2000-4 (SZ)

Design : RBD with 3 replications  
 Plot size : 4.0 x 3.0 m  
 Spacing : Row to row- 25 cm (each plot accommodating 12 rows of 4 m length)  
 Seed rate : 120 g per plot (approx. 100 kg/ha)

**Seed requirement from contributors : 9.00 kg /entry**

Nutrients : N- 80 kg, P- 40 kg/ha

Location (25): **HZ-** Palampur, Srinagar, Rajouri, **NWZ-** Bikaner, Jalore, Hisar, Ludhiana, Pantnagar, Meerut **NEZ-** Jorhat, Kalyani, Bhubaneswar, Ranchi, Pusa, Faizabad, CAU Imphal **CZ-** Jhansi, Rahuri, Urulikanchan, Kanpur, Anand, Jabalpur, **SZ-** Hyderabad, Mandya, Coimbatore (Ooty)

**5. AVT Oat (SC)- 2 : Second Advanced Varietal Trial in Oats (Single cut)**

No. of Entries : 3+ 2 NC +1 ZC  
 Name of Entries : JO-03-291, SKO-133, SKO-96  
 National checks : Kent and OS-6  
 Zonal check : Palampur-1(HZ), OL-125 (NWZ) JHO-99-2 (NEZ), JHO-822 (CZ) ,  
 JHO- 2000-4 (SZ)  
 Design : RBD with 4 replications  
 Plot size : 4.0 x 3.0 m  
 Spacing : Row to row- 25 cm (each plot accommodating 12 rows of 4 m length)  
 Seed rate : 120 g per plot (approx. 100 kg/ha)

**Seed requirement from contributors: 12 kg /entry**

Nutrients : N- 80 kg, P-40 kg/ha  
 Location (25): **HZ-** Palampur, Srinagar, Rajouri, **NWZ-** Bikaner, Jalore, Hisar, Ludhiana, Pantnagar, Meerut **NEZ-** Jorhat, Kalyani, Bhubaneswar, Ranchi, Pusa, Faizabad, CAU Imphal **CZ-** Jhansi, Rahuri, Urulikanchan, Kanpur, Anand, Jabalpur, **SZ-** Hyderabad, Mandya, Coimbatore (Ooty)

**6. AVT Oat (SC)-2 (Seed): Advanced Varietal Trial –2 in Oats (Single cut) for Seed**

No. of Entries : 3+ 2 NC +1 ZC  
 Name of Entries : JO-03-291, SKO-96, SKO-133  
 National checks : Kent and OS-6  
 Zonal check : Palampur-1(HZ), OL-125 (NWZ), JHO-99-2 (NEZ), JHO-822 (CZ) ,  
 JHO- 2000-4 (SZ)  
 Design : RBD with 4 replications  
 Plot size : 4.0 x 3.0 m  
 Spacing : Row to row- 25 cm (each plot accommodating 12 rows of 4 m length)  
 Seed rate : 100 g per plot (approx. 80 kg/ha)

**Seed requirement from contributors: 7.25 kg /entry****Seed requirement for Agronomy trial : 10 kg/entry**

Nutrients : N- 80 kg, P-40 kg/ha  
 Location (25): **HZ-** Palampur, Srinagar, Rajouri, **NWZ-** Bikaner, Jalore, Hisar, Ludhiana, Pantnagar, Meerut **NEZ-** Jorhat, Bhubaneswar, Ranchi **CZ-** Jhansi, Urulikanchan, Jabalpur, **SZ-** Hyderabad, Mandya, Coimbatore (Ooty)

**Location (8) Agronomy : HZ-** Palampur, Srinagar, Rajouri, **NWZ-** Bikaner, Jalore, Hisar, Ludhiana, Pantnagar



**7. IVTO (MC): Initial Varietal Trial in Oats (Multi cut)**

No. of Entries : 6+ 3 NC +1 ZC  
 Name of Entries : Jhansi-2, Ludhiana-1, Pantnagar-1, Jabalpur-1, Hisar-1  
 National checks : Kent, UPO-212 and RO-19  
 Zonal check : Palampur-1(HZ), JHO- 2000-4 (NW and NEZ), JHO-822 (CZ)  
 Design : RBD with 3 replications  
 Plot size : 3.0 x 3.0 m  
 Spacing : Row to row-25 cm (each plot having 12 rows of 3.0 m length)  
 Seed rate : 90 g per plot (approx. 100 kg/ha)

**Seed requirement from contributors: 5.25 kg /entry**

Nutrients : N-80 kg, P- 40 kg/ha

Locations (19): **HZ-** Palampur, Rajouri, Srinagar **NWZ-** Pantnagar, Hisar, Jalore, Ludhiana, Udaipur **NEZ-** Ranchi, Pusa, Faizabad, Jorhat, Bhubanewar **CZ-** Jhansi, Anand, Jabalpur, Rahuri, Urulikanchan, Karjat

**8. AVT Oat (MC)-1: First Advanced Varietal Trial in Oat (Multi cut)**

No. of Entries : 4+ 3 NC +1 ZC  
 Name of Entries : UPO-09-3, JO-03-307, JHO-2009-3, JO-03-301  
 National checks : Kent, UPO-212 and RO-19  
 Zonal check : Palampur-1(HZ), JHO-822 (CZ)  
 Design : RBD with 3 replications  
 Plot size : 4.0 x 3.0 m  
 Spacing : Row to row-25 cm (each plot having 12 rows of 4.0 m length)  
 Seed rate : 90 g per plot (approx. 100 kg/ha)

**Seed requirement from contributors: 2 kg /entry**

Nutrients : N-80 kg, P- 40 kg/ha

Locations (7): **HZ-** Palampur, Srinagar **CZ-** Jhansi, Anand, Jabalpur, Rahuri, Urulikanchan

**9. VT Lucerne (P) - 2010: Varietal Trial in Lucerne (Perennial)-1<sup>st</sup> year**

No. of Entries : 9 + 2 NC

Name of Entries : Rahuri-4, Anand-3, Coimbatore-1, Bikaner-1

National checks : Ananad-2, RL-88

Design : RBD with 3 replications

Plot size : 4.0 x 3.0 m

Spacing : Row to row : 30 cm (each plot accommodating 10 rows of 4.0 m length)

Seed rate : 30.0 g per plot (Approx. 25 kg/ha)

**Seed requirement from contributors : 1 kg/entry**

Nutrients : N-80kg, P-40 kg/ha

Location (10): **NWZ-** Ludhiana, Bikaner, Udaipur **CZ-** Rahuri, Urulikanchan, Anand, **SZ-** Hyderabad, Coimbatore, Mandya, dharwad.

**10. VTTF (2009)- 2<sup>nd</sup> Year : Varietal Trial In Tall Fescue Grass Under Sub-Temperate & Temperate Himalayan Rangelands**

No. of Entries : 2+ 2 NC

Name of Entries : Hima-14, Hima-15

National checks : Hima-1 and Hima-4

Design : RBD with 5 replication

Plot size : 2.1m x 1.5m

Spacing : slip to slip- 15 cm and row to row- 30 cm

No. of rows per plot-7

No. of hills per row-10, Root slips per hill-3

Sowing method : By rooted slips

Fertilization (kg/ha) : NPK 40:40:30 kg/ha at the time of sowing in the first year

NPK 80:60:30 kg/ha in subsequent years. Half of N will be applied in the month of November and remaining half in equal splits after each cut

Harvesting : Green forage cuts should be take after 40 to 50 days interval (three to four cuts)

Locations (3) : (CSKHPKV, Palampur, VPKAS, Almora, SKUA&T, Srinagar)

**( Being perennial in nature, trial will be continued in Rabi 2010-11)**

**DATA TO BE RECORDED ON BREEDING TRIALS**

- GFY, DMY and DM% cut-wise in case of multi cut.
- Production potential of the entries for green fodder yield (q/ha/day) in case of single cut Oats.
- Ancillary characters, like plant height, leafiness (Leaf / Stem ratio), and DM%.
- Seed yield in case of Seed trial.
- In IVT trials, only CP (%) and CP yield will be taken in all the cuts.
- In AVT trials, CP(%), CP yield, NDF (%), ADF (%) and IVDMD (%) will be taken in all the cuts.

**Note :** In case of Single cut, data are to be recorded at 50% flowering stage. In case of multi-cut, data are to be recorded cut wise.

$$\text{Yield Conversion Factor : } \text{Yield (q/ha)} = \frac{\text{Yield (kg. /plot)}}{\text{Net plot size (m}^2\text{)}} \times 100$$

**Important**

- ❖ Seed of checks and entries are to be supplied by contributors to AICRP (FC) unit, Jhansi by 12.10. 2010.
- ❖ Seed for trials will be dispatched by AICRP (FC) unit, Jhansi to the testing locations/centers by 17.10. 2010.
- ❖ Rabi trial's data are to be submitted by testing centres to PC (FC) Jhansi upto June 30, 2011. In case of seed yield and quality traits upto 15<sup>th</sup> July 2011.



**IMPORTANT & URGENT**

For Breeding trials during Rabi 2010-11, seed of the check varieties are to be supplied by the source to PC (FC) upto October 12, 2010.

S. No.	Crop & variety	Quantity required	Seed source
<b>1.</b>	<b>Berseem</b>		
	Mescavi	2 kg	<b>Dr. B.S. Jhorar</b> Head, Forage Section CCS HAU, Hisar
	BL-22	700 g	<b>Dr. U. S. Tiwana</b> OIC- Forage Section Dept. of Plant Breeding PAU, Ludhiana
	Bundel Berseem-2 Bundel Berseem-3 Wardan	1 kg 500 g 2 kg	<b>Dr. D.R. Malviya</b> Head, Div. of Seed Technology IGFRI, Jhansi
<b>2.</b>	<b>Oat</b>		
	Kent JHO- 2000-4 JHO- 822 JHO-99-2	45+10 kg 10 kg 15 kg 10 kg	<b>Dr. D.R. Malviya</b> Head, Div. of Seed Technology IGFRI, Jhansi
	UPO-212	10 kg	<b>Dr. Y.P. Joshi</b> OIC – AICRP (Forage Section) GBPUAT, Pantnagar
	OS-6	40+10 kg	<b>Dr. B.S. Jhorar</b> Head, Forage Section CCS HAU, Hisar
	OL-125	9+6 kg	<b>Dr. U. S. Tiwana</b> OIC – AICRP (Forage Section) Dept. of Plant Breeding PAU, Ludhiana
	Palampur-1	8+4 kg	<b>Dr. Naveen Kumar</b> In-charge AICRP-FC CSK HPKV, Palampur
	RO-19	12 kg	<b>Dr. A.H. Sonone</b> Forage Breeder & OIC Forage Crops, PMKV, Rahuri
<b>3.</b>	<b>Lucerne</b>		
	Ananad-2	1 kg	<b>Dr. H.R. Kher</b> Principal Scientist (Forage Breeding) & OIC <b>AAU, Ananad</b>
	RL-88	1 kg	<b>Dr. A.H. Sonone</b> Forage Breeder & OIC Forage Crops, <b>PMKV, Rahuri</b>

**FINALIZED TECHNICAL PROGRAMME  
FORAGE CROP PRODUCTION TRIALS  
RABI 2010 – 2011**

**(A) ON-GOING COORDINATED TRIALS**

**AST 1 (AST-5) : EFFECT OF SOWING METHODS AND CUTTING MANAGEMENT  
ON GREEN FODDER AND SEED YIELD IN LUCERNE**

Year : Rabi-2008-09  
Duration : Three years  
Design : Split plot  
Replications : Five  
Treatments : Combinations: 4x3=12  
Plot size : Main plot – 8 x 3 m  
              : Sub plot-4 x 3m

Treatments : 2 x 3=6

- a. Main plot treatments: Sowing methods (Two)  
    (i.) Broadcasting  
    (ii.) Line sowing
- b. Sub plot treatment: Cutting management ( Three)  
    (i) Regular cutting at 25 days interval and leaving for seed production in second week of February every year.  
    (ii) Regular cutting for one and half years and leaving for seed production second week of February every year.  
    (iii) Regular cutting for two and half years and leaving for seed production at the end.

**Note:** Basal application of FYM @ 10/ha and 15:80:40kg NPK/ha  
50 kg P/ha at end of every year (In the month of October)

**Observations to be recorded:**

**A. Growth parameters**

- i. Plant height
- ii. Leaf stem ratio
- iii. No. of tillers/m row

**B. Yield parameters**

- i. 1000 seed weight
- ii. Seed yield
- iii. Green Fodder Yield
- iv. Dry Matter Yield
- v. Crude Protein Yield

**C. Economics**

- i. Cost of cultivation
- ii. Gross & net monetary returns
- iii. Benefit cost ratio

**Location:** Urulikanchan and Rahuri

## AST 2 (AST-6): RESOURCE CONSERVATION THROUGH FORAGES

### Objectives:

- To study the effect of resource conservation techniques (RCT) on forage yield of the system
- To study the effect of resource conservation through forages(RCT) on physico - chemical status 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: (2012-13)**

- Recording final physico-chemical soil status after completion of the study
- Computation of data and analysis and preparation of the report

Observation to be recorded:

### A. Crop growth:

- Plant / shoot population at harvest (per m<sup>2</sup>)
- 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 i.e., pH, OC (%), EC, available NPK and 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.

## 1. Hill Zone :

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

Design : Split

Replication (s) : Three

Treatments :

### A. Vegetative barriers

- i. No vegetative barrier
- ii. Napier Bajra Hybrid
- iii. Setaria

### B. Planting of improved species

- i. Local grass
- ii. Setaria
- iii. Desmodium
- iv. Setaria + Desmodium

**Location ( 3 ) :** Palampur, Rajouri and Srinagar

## 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) : Three

Treatments :

T<sub>1</sub>-Conventional tillage (1 Disc harrow + 2 Cultivator)

T<sub>2</sub>-2 Cultivation( 1 Disc harrow + 1 Cultivator)

T<sub>3</sub>-2 cultivation ( Rotavator)

T<sub>4</sub>-1 cultivation ( Disc harrow)

T<sub>5</sub>-1 cultivation ( Rotavator)

T<sub>6</sub>-Broadcasting of seed before T-3

T<sub>7</sub>-Broadcasting of seed before T-5

T<sub>8</sub>-No cultivation (zero tillage)

**Location (3) :**Ludhiana, Hisar and Pantnagar

**b) Rainfed conditions**

**Subtitle: Conservation of rangelands by incorporating grass species in alleys of improved variety of Khejri (*Prosopis cineraria*)**

Design: Split plot

Replications: 3

Treatments

A. Alley foliage utilization (main plot)

- i. 100 % foliage as fodder
- ii. 100 % foliage incorporation as litter
- iii. 50 % foliage as fodder + 50 % foliage as litter incorporation

B. Grass species (sub plot)

- i. *Lasiurus indicus*
- ii. *Cenchrus ciliaris*
- iii. *Cenchrus setigerus*
- iv. *Panicum antidotale*

Specific observation:

1. Rate of decomposition of litter

**Location (2):** Bikaner and Jalore

**3. Central Zone:**

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

Design : RBD

Replication(s) : Three

Treatments :

A. Moisture conservation techniques (main plot)

- i. Ridge and furrow
- ii. Flat bed

B. Combination of grasses and legumes

- i. Cenchrus + Desmanthus
- ii. Cenchrus + Stylosanthes
- iii. Dicanthium + Desmanthus
- iv. Dicanthium + Stylosanthes

**Location (4) :** Rahuri, Jabalpur, Anand, Urulikancha and Dapoli - Plaghar (from 2010-11)

**4. North East Zone :**

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

Design : RBD

Replication(s) : Three

Treatments :

**A. Perennial grasses**

- i. Brachiaria
- ii. Guinea grass/Hybrid Napier
- iii. Setaria grass

**B. Moisture conservation**

- i. Control (Without mulch)
- ii. Soil mulch
- iii. Inter cropping with legume (Cowpea/Rice bean - Berseem/Ricebean-Cowpea)

**Location (6) :** Jorhat, Faizabad, Raipur, 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 : 8

T<sub>1</sub> – Subabool + *Cenchrus ciliaris*

T<sub>2</sub> – Subabool + *Stylosanthes*

T<sub>3</sub> – Subabool + *Desmenthus*

T<sub>4</sub> – Subabool + *Cenchrus ciliaris* + *Stylosanthes* (3:1)

T<sub>5</sub> – Subabool + *Cenchrus ciliaris* + *Desmenthus* (3:1)

T<sub>6</sub> – Subabool + Sorghum + Horse gram (2:1)

T<sub>7</sub> – Subabool + Pearl millet + horse gram (2:1)

T<sub>8</sub> – Subabool ( Sole)

Note : Spacing of subabool – 3 m x 2 m

**Location (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: 12

(A) Grasses

- i. BN Hybrid
- ii. Brachiaria brizantha
- iii. No grass

(B) Legumes

- i. Fodder cowpea
- ii. No fodder legume

(C) Biofertilizer

- i. VAM
- ii. No biofertilizer

**Location :** Vellayani

**AST 3 (AST 1.1 (NT)): INFLUENCE OF NUTRIENTS (MACRO & MICRO) ON FORAGE PRODUCTION AND QUALITY OF BERSEEM IN NORTH WEST ZONE (EXPLORATORY)**

Year of Start : Rabi 2009 - 10

Duration : Three Years

Design : RBD

Replications : Three

Plot Size : 3m x 3m

Treatments : 15

- i. Absolute control
- ii. RDF
- iii. FYM @ 5 t/ha
- iv. FYM @ 10 t/ha
- v. RDF + FYM @ 5 t/ha
- vi. RDF + FYM @ 10 t/ha
- vii. RDF + S + Mo + B
- viii. FYM @ 5 t/ha + S + Mo + B
- ix. FYM @ 10 t/ha + S + Mo + B
- x. RDF + FYM @ 5 t/ha + S + Mo + B
- xi. RDF + FYM @ 10 t/ha + S + Mo + B

Rate of application:

S = 30 kg/ha (elemental Sulphur)

B = 4 kg/ha (Borax)

Mo = 1 kg/ha (Sodium molybdate)

RDF = As per recommendation

**Observations to be recorded:**

GFY, DMY CP yield, CF Yield, Plant height and Leaf : Stem ratio

Initial and final fertility status

**Location:** Ludhiana, Hisar, Pantnagar and Dapoli - Plaghar (from 2010-11)

## AST 4 (AST- 1.2 (NT)): OPTIMIZATION OF NITROGEN FOR MAIZE IN DIFFERENT FORAGE BASED CROPPING SYSTEMS

**Year of start** : Rabi-2009-10  
**Duration** : Three years  
**Design** : Split plot  
**Replications** : Three  
**Plot size** : 5mx4m

**Treatments** : 4x4=16

### (a) Cropping System (4)

- i. Oat – Maize – Cowpea
- ii. Oat – Maize – Ricebean
- iii. Barley – Maize – Cowpea
- iv. Barley – Maize – Rice bean

### (b) Nitrogen Levels (4)

- i. 50% of Recommended dose
- ii. 75% of Recommended dose
- iii. 100% of Recommended dose
- iv. 125% of Recommended dose

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

### Observations to be recorded:

#### A. Crop Growth

- i. Plant Population/m<sup>2</sup>
- ii. Growth parameters (Plant height and leaf stem ratio)
- iii. Green fodder, dry matter, forage equivalent and crude protein yield (q/ha)

#### B. Economics (Rs./ha/year)

- i. Cost of cultivation
- ii. Gross monetary returns
- iii. Net monetary returns
- iv. Benefit : Cost ratio

#### C. Nutrient Studies

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

**Location:** Shillong and Imphal

**B- ONGOING LOCATION SPECIFIC TRIALS****AST 5 (AST 7.1): REMUNERATIVE FORAGE BASED CROPPING SYSTEM FOR SUSTAINED PRODUCTIVITY UNDER IRRIGATED CONDITIONS****Objectives**

1. To find out the most remunerative forage based cropping system
2. To identify the biologically suitable cropping system for the region on sustainable basis

Year of start	: Kharif 2006
Duration	: Five years
Design	: RBD
Replications	: 3
Plot size	: 5 X 4 m <sup>2</sup>

Treatments	Kharif	Rabi	Summer
T <sub>1</sub>	Ragi (G)	Field bean (G)	Sunflower (G)
T <sub>2</sub>	Sorghum (F) (MC)	-Lucerne-	
T <sub>3</sub>	Maize (F) + Cowpea (F)	Sunflower (G)	Ragi (G)
T <sub>4</sub>	Maize (G)	Maize (F)+Cowpea (F)	Groundnut (S)
T <sub>5</sub>	Sunflower (G)	Cowpea (S)	Maize (F)+Cowpea (F)
T <sub>6</sub>	- Napier X Bajra hybrid (P) -		

**Observations:**

- i. Initial and final fertility (after completion of sequence) status of the soil
- ii. Plant population /m row length, plant height and Leaf: Stem ratio
- iii. Yield attributes in case of grain and seed crops
- iv. Seed and Stover yield (q/ha)
- v. Green fodder, Dry matter yield (q/ha) and forage equivalent yield
- vi. Crude protein content (%) and Crude protein yield (q/ha)
- vii. Net monetary return (Rs./ha/yr)

**Location: Mandya****AST 6 (AST- 7.2): OPTIMIZATION OF NITROGEN FOR SORGHUM IN DIFFERENT CROPPING SYSTEMS**

Year of start	:Rabi-2008-09
Duration	: Three years
Design	:Split plot
Replications	:Three
Plot size	:5mx4m

Treatments : 6x4=24

(a) Cropping System (6)



- i. Wheat – Sorghum (F)
- ii. Wheat – Maize (F)– Sorghum (F)
- iii. Wheat – Cowpea (F) – Sorghum (F)
- iv. Berseem – Sorghum (F)
- v. Oat – Maize (F)– Sorghum (F)
- vi. Oat – Cowpea (F)– Sorghum (F)

(b) Nitrogen Levels (4)

- i. 50% of Recommended dose
- ii. 75% of Recommended dose
- iii. 100% of Recommended dose
- iv. 125% of Recommended dose

**Note:** N levels treatments will be applied to sorghum. Other crops of the sequence will be grown with recommended NPK doses and other packages.

**Observations to be recorded:**

**A. Crop Growth**

- i. Plant Population/m<sup>2</sup>
- ii. Growth parameters (Plant height and leaf stem ratio)
- iii. Green fodder, dry matter, forage equivalent and crude protein yield (q/ha)

**B. Economics (Rs./ha/year)**

- i. Cost of cultivation
- ii. Gross monetary returns
- iii. Net monetary returns
- iv. Benefit : Cost ratio

**C. Nutrient Studies**

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

**Location: Ludhiana**

**AST 7 (AST 7.4) : EFFECT OF SOIL AMENDMENTS ON PRODUCTIVITY OF RICE-BERSEEM AND CHANGES IN SOIL PROPERTIES OF SODIC SOIL**

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

Treatments:

T1 = RDF (Control)  
 T2 = RDF + FYM 10 t/ha  
 T3 = RDF + Gypsum @ 75 % Gypsum Requirement (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.
2. Calculation of doses of soil amendments will be based on gypsum requirement.

**Observations to be recorded:**

- i. Plant /shoot population at harvest (per m<sup>2</sup>) , Plant height at harvest, grain and straw yield and Harvest index (Rice).
- ii. GFY, DMY, Forage equivalent yield, CP % and CPY (Berseem)
- iii. Net monetary return (Rs/ha/yr)
- iv. Uptake of N, P and K (kg/ha) by each crop and entire system
- v. Initial soil fertility status viz., pH, EC, Exch. Na, OC and available NPK
- vi. Soil fertility status after completion of sequence i.e. pH, EC, OC, available NPK and exchangeable sodium percentage

**Location : Faizabad**

**AST 8 (AST 1.3 (NT)): EFFECT OF SOIL AMENDMENTS ON PRODUCTIVITY OF RICE BASED CROPPING SYSTEM IN ACIDIC SOIL**

Year of start : Rabi 2009  
 Duration : Five years  
 Plot size : 4m x 3m  
 Design : Split Plot  
 Replication : 3

**Treatments:**

Main Plot (2): Cropping System

- i. Pea (F) – Rice
- ii. Lathyrus (F) – Rice

Sub Plots (6) : Amendments

- i. RDF= Recommended dose of fertilizer (control)
- ii. RDF + FYM 10 t/ha
- iii. RDF + Lime @ 75 % LR
- iv. RDF + Lime @ 50 % LR
- v. RDF + Lime @ 75 % LR + FYM 10 t/ha
- vi. RDF + Lime @ 50 % LR + FYM 10 t/ha

- Note:** 1. All the soil amendment treatments will be applied to rabi crops only.  
2. Calculation of doses of soil amendments will be based on lime requirement.

**Observations to be recorded:**

- i. Plant /shoot population at harvest (per m<sup>2</sup>) , Plant height at harvest, grain and straw yield and Harvest index (Rice).
- ii. GFY, DMY, Forage equivalent yield, CP % and CPY (Fodder crops)
- iii. Net monetary return (Rs/ha/yr)  
Uptake of N, P and K (kg/ha) by each crop and entire system
- iv. Initial soil fertility status viz., pH, EC, OC and available NPK
- v. Soil fertility status after completion of sequence i.e. pH, EC, OC, available NPK

**Location:** Shillong

**C : AVT – 2 BASED AGRONOMY TRIALS**

**AST 9 (AST- 7.3): EFFECT OF NITROGEN LEVELS ON FORAGE YIELD OF PROMISING ENTRIES OF TALL FESCUE**

Year : Rabi 2008-09  
Duration : Four years  
Design : Split plot  
Replications : Three  
Plot Size : 4m x 3m

Treatments : Combinations: 3x 4=12

(A) Entries: 1+2( EC-178182, Hima-1(ZC) and Hima-2(ZC)

(B) N-levels: 4 (0, 40, 80 and 120 kg N/ha) in three splits i.e; half as basal, ¼ th at first cut and ¼ th at second cut

**Observations to be recorded**

- i. Plant population/m<sup>2</sup>
- ii. Growth parameters ( Plant height and Leaf : stem ratio)
- iii. Green fodder, dry matter and crude protein yield (q/ha)

**Location:** Palampur: Srinagar from Rabi 2010

**AST 10: EFFECT OF NITROGEN LEVELS ON FORAGE YIELD OF PROMISING ENTRIES OF OATS (AVT-2)**

Year : Rabi 2010-11  
Design : Split plot  
Replications : Three  
Plot Size : 4m x 3m  
Treatments : Combinations: 6 x 4 = 24



- (A) Entries: 6 (3+2(NC)+1(ZC)) (JO-203-91, SKO – 96, SKO - 133, OS-6 (NC), Kent (NC), Palampur 1 (ZC - HZ) and OL 125 (ZC - NWZ)  
 (B) N-levels: 4 (0, 40, 80 and 120 kg N/ha) in three equal split as basal, after 25 and 50 DAS)

**Observations to be recorded:**

- i. Plant population/m<sup>2</sup>
- ii. Growth parameters (Plant height and Leaf: stem ratio)
- iii. Green fodder, dry matter and crude protein yield (q/ha)

**Seed Requirement**

<u>Entries</u>	<u>Seed Quantity</u>	<u>Seed Source</u>
JO-203-91	1.20 kg/location	Jabalpur
SKO-96	1.20 kg/location	Shrinagar
SKO 133	1.20 kg/location	Shrinagar
Kent (NC)	1.20kg/location	PC, Unit
OS-6(NC)	1.20kg/location	HAU, Hisar

**Seed Distribution:** Project Coordinating Unit, AICRP-FC, Jhansi

**Location (8):** HZ- Shrinagar, Palampur, Rajouri, NWZ - Hisar, Pantnagar, Ludhiana, Bikaner and Udaipur

**D : NEW RESEARCH TRIALS**

Location specific

**AST 11: EFFECT OF SOIL AMENDMENTS ON YIELD OF FODDER SORGHUM IN SALINE ALKALI SOIL****Objectives:**

1. To know the effects of soil amendments on fodder yield
2. Enhancing productivity, Water and land use efficiency
3. To work out economics

**Technical details:**

Treatments: Eight

Design: RCBD

Replication: Three

**Treatment details:**

1. Rec. NPK alone through inorganics
2. Rec. NPK + FYM 10t ha<sup>-1</sup>
3. Rec. NPK + Press mud 10t ha<sup>-1</sup>
4. Rec. NPK + Vermi compost 5t ha<sup>-1</sup>
5. Rec. NPK + FYM 10t ha<sup>-1</sup> + Elemental sulphur 25 kg ha<sup>-1</sup>

6. Rec. NPK + FYM 10t ha<sup>-1</sup> + Gypsum 500 kg ha<sup>-1</sup>
7. Rec. NPK + FYM 10t ha<sup>-1</sup> + ZnSO<sub>4</sub> 20 kg ha<sup>-1</sup>
8. Rec. NPK + FYM 10t ha<sup>-1</sup> + ZnSO<sub>4</sub> 20 kg ha<sup>-1</sup> + Gypsum 500 kg ha<sup>-1</sup>.

**Observation to be recorded**

**a. Observation on plant characters**

1. plant height
2. number of tillers
3. leaf:stem ratio
4. Green fodder yield
5. Dry msatter yield
6. Crude protein yield

**b. On soil properties**

1. Soil pH , OC%. And NPK status before and after experimentation

**Location : Mandya**





**PPT-11 : ASSESSMENT OF LOSSES DUE TO RUST DISEASE IN LUCERNE SEED CROP****Location:** Anand, Hyderabad, and Rahuri**Design :** Paired block      **Replication :** 20 (1 sq. m./replication)**Variety :** Anand-2**Treatments :**

T<sub>1</sub> – Protected : Alternate spray of Mancozeb @ 2.5 g/l and Tebuconazole @ 0.5 ml/l at 10 and 15 days interval, respectively

T<sub>2</sub> – Unprotected

**Observations :**

1. Disease severity

1. Seed yield (q/ha)

**PPT-12 : DISEASE MANAGEMENT IN WHITE CLOVER****Location :** Palampur**Design :** RBD      **Replication :** 3      **Plot size :** 2 x 2 m<sup>2+</sup>**Treatments :**

T<sub>1</sub> = Seed treatment with carbendazim @ 2 g/kg seed

T<sub>2</sub> = Seed treatment with *T. viride* @ 5g/kg

T<sub>3</sub> = T<sub>1</sub> + Foliar spray of carbendazim @ 0.1 %

T<sub>4</sub> = T<sub>2</sub> + Foliar spray of carbendazim @ 0.1 %

T<sub>5</sub> = T<sub>1</sub> + Foliar spray of hexaconazole @ 0.05 %

T<sub>6</sub> = T<sub>2</sub> + Foliar spray of hexaconazole @ 0.05 %

T<sub>7</sub> = T<sub>1</sub> + Foliar spray of carbendazim @ 0.1 % + Foliar spray of hexaconazole @ 0.05 %

T<sub>8</sub> = T<sub>2</sub> + Foliar spray of carbendazim @ 0.1 % + Foliar spray of hexaconazole @ 0.05 %

T<sub>9</sub> = T<sub>1</sub> + T<sub>2</sub> + Foliar spray of carbendazim @ 0.1 % + Foliar spray of hexaconazole @ 0.05 %

T<sub>10</sub> = Control

**Observations :**

1. Disease severity of powdery mildew

2. Disease incidence of clover rot

3. Seed yield (q/ha)

**PPT-13: VALIDATION OF RECOMMENDED TREATMENT FOR DISEASE MANAGEMENT TECHNOLOGY IN OAT SEED PRODUCTION****Location –** Palampur and Ludhiana**Design :** Paired plot design      **Replication :** 3**Plot Size :** 50 m<sup>2</sup>**Treatments:**

T<sub>1</sub> - Seed treatment with Vitavax @ 2.5 g /kg seed+ Seed treatment with *Trichoderma viride* @ 5g/kg seed followed by foliar sprays of propiconazole @ 0.01% at an appearance of the disease,

T<sub>2</sub> - Untreated control

**Observations :**

- Percent incidence of the disease should be recorded before and after treatments
- Seed yield. (kg/ha)

## PPT-14: VALIDATION OF RECOMMENDED TREATMENT FOR THE MANAGEMENT OF ROOT ROT IN OAT

**Location :** Bhubaneswar

**Design :** Paired plot design                      **Replication :** 3

**Plot Size :** 100 m<sup>2</sup>                                      **Variety :** JHO – 822

### **Treatments :**

T<sub>1</sub> = Soil application of pitcher compost @ 3 %

T<sub>2</sub> = Untreated control.

### **Observation :**

- Percentage affected plants due to the disease should be recorded before and after treatments
- GFY and DMY ( q/ha)

### **Preparation of pitcher compost:**

Add 1 kg of cow dung + 1 l cow urine + 1 kg neem leaves + 1 kg karanj leaves + 1 kg calotropis leaves + 50 g jaggery ( gur ) – fermented for 7- 10 days and strained through four layered muslin cloth – diluted to 3 % and sprayed / applied to soil.

## PPT 15: EFFECT OF FOLIAR DISEASES ON THE QUALITY OF OAT VARIETIES

Replications: 3                      Design : RBD                      Plot size: 3x2 m<sup>2</sup>

**Location :** Palampur , Ludhiana and Bhubaneswar

### **Treatments:**

T<sub>1</sub>. Kent (protected)

T<sub>2</sub>. Kent (unprotected)

T<sub>3</sub>. PLP-1 (protected)

T<sub>4</sub>. PLP-1 (unprotected)

T<sub>5</sub>. OL-9 (protected)

T<sub>6</sub>. OL-9 (unprotected)

T<sub>7</sub>. OL-125 (protected)

T<sub>8</sub>. OL-125 (unprotected)

T<sub>9</sub>. OS-6(protected)

T<sub>10</sub>. OS-6 (unprotected)

\*Protected with chemicals (foliar sprays of Hexaconazole/Propiconazole @0.05% at 15 day interval from the appearance of powdery mildew/leaf blight disease, respectively)

### **Diseases of Oat**

Palampur (Powdery mildew), Ludhiana (Powdery mildew and Leaf blight) and Bhubaneswar (Leaf Blight)

### **Observations:**

- i. Disease severity (%)
- ii. Quality analysis (CP %, CF %, ADF, NDF and chlorophyll content)
- iii. Yield(q/ha)

**Seed will be shared among three centres.**

**List of Participants**  
**ALL INDIA COORDINATED RESEARCH PROJECT ON FORAGE CROPS**  
**(Indian Council of Agricultural Research)**  
**NATIONAL GROUP MEET- RABI- 2010**

**Date: Sep. 30- Oct. 2, 2010**

**Venue: CSK HPKV, Palampur**

Sr. No	Name & Address
	Indian Council of Agricultural Research, Krishi Bhavan, New Delhi- 110001
1	Dr. R. P. Dua, ADG (FFC)
2	Dr. J. S. Sandhu, ADG (Seed)
	AICRP ON FORAGE CROPS CENTRES
	CCS Haryana Agricultural University, Hisar 125 004 (Haryana)
3	Dr. R. N. Arora, Sr. Forage Breeder
4	Dr. Bhagat Singh, Scientist (Agronomy)
5	Dr. Ram Avtar Singh
	Rajasthan Agriculture University, Bikaner 334 002 (Rajasthan)
6	Dr. N. S. Yadav, Sr. Sci. (Agronomy) & OIC, AICRP- FC
7	Dr. S. S. Shekhawat, Asst. Forage Breeder
	N. D. University of Agriculture & Technology, Kumarganj, Faizabad 224 001 (U. P.)
8	Dr. Sushant Saxena, Jr. Agronomist
	G. B. Pant University of Agriculture & Technology, Pantnagar 263 145 (Uttaranchal)
9	Dr. J. S. Verma, Sr. Scientist (Plant Breeding)
	Birsa Agricultural University, Kanke, Ranchi 834 007 (Jharkhand)
10	Dr. S. Karmakar, Sr. Scientist (Agronomy) & OIC, AICRP- FC
11	Dr. Surya Prakash, Jr. Forage Breeder
	Assam Agricultural University, Jorhat 785 013 (Assam)
12	Dr. K. K. Sharma, Senior Scientist (Agronomy) & OIC, AICRP- FC
13	Dr. S. Bora Neog, Sr. Sci. (Plant Breeding)
	CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur 176 062 (Himachal Pradesh)
14	Dr. Naveen Kumar, Sr. Agronomist & OIC, AICRP- FC
15	Dr. V. K. Sood, Sr. Forage Breeder
16	Dr. R. Katoch, Sci. (Biochemistry)
17	Dr. D. K. Banyal, Sr. Sci. (Plant Pathology)
18	Dr. J.C. Bhandari, Sr. Plant Breeder
	J. N. Krishi Viswavidyalaya, Jabalpur 482 004 (M. P.)
19	Dr. A. K. Mehta, Sr. Forage Breeder & OIC, AICRP- FC
20	Dr. S. K. Bilaiya, Sr. Sci. (Plant Breeding)
	Acharya N. G. Ranga Agricultural University, Hyderabad 500 030(AP)
21	Dr. Ch. Chiranjeevi, Sr. Scientist (Entomology), & OIC, AICRP- FC
22	Dr. T. Shashikala, Sr. Scientist (Plant Breeding)
23	Dr. V. Chandrika, Agronomist



- 24 Dr. M. Shanti, Scientist (Soil Science)  
Kerala Agricultural University, Vellayani, Thiruvananthapuram 695 522(Kerala)
- 25 Dr. D. I. Suma Bai, Assoc. Prof. (Plant  
Breeding) & OIC, AICRP- FC
- 26 Dr. S. R. Sharu, Asstt. Professor (Agronomy)  
University of Agricultural Sciences, Bangalore (Campus Mandya) 572 202  
(Karnataka)
- 27 Dr. H. C. Lohithaswa, Sr. Breeder & OIC,  
AICRP- FC
- 28 Dr. B. G. Shekara, Scientist (Agronomy)  
Mahatma Phule Krishi Viswavidyalaya, Rahuri 413 722, Ahmednagar (Maharashtra)
- 29 Dr. A. H. Sonane, Sr. Forage Breeder &  
OIC, AICRP- FC
- 30 Dr. A. B. Tambe, Sci. (Entomology)
- 31 Sh. S. H. Pathan, Sci. (Agronomy)
- 32 Dr. S.V. Damame, Scientist (Bio Chemistry)  
Anand Agricultural University, Anand 388 110 (Gujarat)
- 33 Dr. H. R. Kher, Res. Scientist (Plant  
Breeding) & OIC, AICRP- FC
- 34 Mr. N. N. Patel, Assoc. Res. Sci. (Plant  
Pathology)
- 35 Mr. P. M. Patel, Assoc. Res. Sci.  
(Agronomy)
- 36 Mr. R. M. Patel, Jr. Scientist (Bio  
Chemistry)  
Punjab Agricultural University, Ludhiana 141 004 (Punjab)
- 37 Dr. U. S. Tiwana, Sr. Forage Agronomist &  
OIC, AICRP- FC
- 38 Dr. Ajaiv Singh Nutritious
- 39 Dr. Rahul Kapoor, Sr, Forage Breeder  
Tamil Nadu Agricultural University, Coimbatore 641003 (TN)
- 40 Dr. K. Velavydham, Sr. Scientist  
Agronomy, & OIC, AICRP- FC
- 41 Dr. C. Babu, Sr. Scientist (Plant Breeding)  
Orissa University of Agriculture & Technology, Bhubneshwar 751 003
- 42 Dr. B. K. Sahoo, Sr. Agronomist & OIC,  
AICRP- FC
- 43 Dr. S. S. Mahapatra, Jr. Pathologist
- 44 Dr. G. B. Das, Jr. Forage Breeder  
Bidhan Chandra Krishi Viswavidyalaya, Kalyani 741 235 (West Bengal)
- 45 Dr. D. K. De, Sr. Forage Breeder  
BAIF Development Research Foundation, Urulikanchan 412 202, Pune (Maharashtra)
- 46 Mr. P. S. Takawale, Forage Breeder & OIC,  
AICRP- FC
- 47 Mr. V. K. Kauthale, Scientist (Agronomy)  
S. K. University of Agricultural Sciences & Technology, Srinagar 190 121 (J & K)
- 48 Dr. S. A. Zeerak, Professor & Head, Div. of  
Plant Breeding & Genetics
- 49 Dr. Gul Zafar, Sr. Scientist (Plant Breeding)  
Central Agricultural University, PO Box 23, Imphal, 795 004, Manipur
- 50 Dr. Edwin Luikham, Assoc. Professor

- (Agronomy)  
 Indira Gandhi Kirshi Vishavaidyala Krishiak Nagar Raipur 492012
- 51 Ambika Tandon, Asstt. Professor  
 Rajasthan Agric. University, Agricultural Research Station Jalore/Durgapura
- 52 1. Dr. M Shrimali Res., Agril.  
 Research Station, Durgapura,  
 Jaipur (Raj.)
- Dr. B.S. Kokan Krishi Vidyapaath Agriculture Research Station Palghar Distt. Thane  
 Maharashtra
- 53 Dr. A.V. Dahiphale  
 54 Dr. M.P Pimple  
 Dr. B.S. Kokan Krishi Vidyapaath Agriculture Research Station Karjat Distt.  
 Raigad Maharashtra
- 55 Dr. M.P. Gawai  
 Directorate of Wheat Research Karnal Haryana
- 56 Dr. A.K. Khasmb  
 57 Dr. R.P.S. Verma  
 59 Mr. A. K. Garg, Senior  
 Manager (PE)
- Indian Grassland and Fodder Research Institute, Jhansi 284 003 (U. P. )
- 60 Dr. K. A. Singh, Director  
 61 Dr. R.B. Bhaskar  
 62 Dr. M. G. Gupta, PS & Nodal  
 Officer
- 63 Dr. Shahid Ahmed, Sr.  
 Scientist
- 64 Dr. M. Charkavarti, Scientist  
 65 Dr. Inder Dev, Sr. Scientist  
 66 Dr. S. Radotra, Sr. Scientist  
 67 Dr. Karthekey
- AICRP on Forage Crops, Project Coordinating Unit, IGFRI, Jhansi
- 68 Dr. S. A. Faruqui, Project  
 Coordinator
- 69 Dr. R. V. Kumar, PS & PI  
 (Plant Breeding)
- 70 Shri V.K. Paliwal Asstt. PC  
 Unit
- Local Participants
71. Dr. S.K. Sharma, Vice-Chancellor, CSKHPKV, Palampur  
 72. Dr. S.P. Sharma, Director of Research  
 73. Dr. P.K. Sharma, Dean, College of Agriculture  
 74. Dr. A.C. Varshney, Dean, DGCN, COVAS, Palampur  
 75. Dr. R.G. Sood, Dean, College of Basic Sciences  
 76. Dr. (Mrs.) Shubhangna Sharma, Dean, College of Home Science  
 77. Dr. R.K. Sharma, Dean, Postgraduate Studies  
 78. Smt. Lalita Sharma, Students Welfare Officer  
 79. Dr. Kahan Bassi, Librarian  
 80. Dr. B.C. Sood, Director, Extension Education  
 81. Sh. S.N. Tiwari, Comptroller, CSKV, Palampur



82. Shri, Neeraj Kumar, CSKHPKV, Palampur
83. Estate Officer, CSKHPKV, Palampur
84. Dr. P.K. Mehta, Head, Entomology
85. Dr. R.P. Kaushal, Head, Plant Pathology
86. Dr. N.N. Angiras, Head, Agronomy, Forages & GM.
87. Dr. K.K. Katoch, Head, Soil Science
88. Dr. S.R. Thakur, Head, Agril. Biotechnology
89. Dr. N.K. Pathania, Head, Vegetable Science & Flori.
90. Dr. D.R. Thakur, Head, Agril. Economics, EE & RS
91. Dr. D.K. Vatsa, Head, Agril. Engineering
92. Dr. Dinesh Badiyala, Head, Seed Science & Technology
93. Dr. Jagmohan Badyial, Head, Horticulture
94. Dr. P.S. Ahuja, Director, IHBT (CSIR)
95. Incharge, IVRI, Regional , Station, Palampur
96. Dy. Director, Animal Husbandry, Palampur
97. Dr. S. Randhotra, Incharge, IGFRI, (Holta) Palampur
98. Dr. N.R. Kalia, Sr. Plant Breeder (Retd.) Neugal Café, Palampur
99. Dr. L.N. Singh, Director Ext. Edu. (Retd.)
100. Dr. S.C. Sharma, Director of Research (Retd.)
101. Dr. O.P. Sood, Sr. Plant Breeder (Retd.) Arya Smaj Mandir , Palampur
102. Dr. B.S. Kanwar, Director, Ext. Edu. (Retd.) Palampur
103. Dr. G.S. Sethi, Director, Ext. Edu. (Retd.)
104. Dr. D.C. Katoch, Sr. Forage Breeder (Retd.) Palampur
105. Dr. (Mrs.) S. Bhateria, Sr. Plant Breeder (Retd.)
106. Dr. Ranjodh Singh, Director of Research (Retd)
107. Dr. P.K. Sharma, Dean (Retd.) COA, Palampur
108. Dr. P.C. Katoch, Dean, (Retd.), COA, Palampur
109. Dr. S.L. Sharma, Sr. Rice Breeder (Retd.) VPO, Banuri
110. Dr. K.K. Dogra, Professor, COVAS
111. Dy. Director of Agriculture, Palampur
112. Dr. B.K. Misri, Sr. Scientist (Retd.) IGFRI, VPO Chimbhar
113. Head, Organic Agriculture
114. Head, Tea Husbandry & Technology
115. Dr. K.C. Sood, Sr. Plant Breeder, Crop Improvement
116. Dr. H.K. Chaudhary, Sr. Plant Breeder, Crop Improvement
117. Dr. Satish Paul, Sr. Scientist, Crop Improvement
118. Dr. R.K. Mittal, Professor, Crop Improvement
119. Dr. Jai Dev, Associate Professor, Crop Improvement
120. Dr. (Mrs.) Vedna Kumari, Associate Professor, Crop Improvement
121. Dr. (Mrs.) Swarn Lata, Associate Professor, Crop Improvement
122. Dr. (Mrs.) Rama Kalia, Sr. Scientist, Crop Improvement
123. Dr. Gopal Katna, Asstt. Scientist, Crop Improvement
124. Dr. (Mrs.) Neelam Bhardwaj, Asstt. Scientist, Organic Agriculture
125. Dr. Kapil Saroch, Sr. Agronomist, Soil Science



126. Dr. Suresh Gautam, Sr. Agronomist , Agronomy
127. Dr. R.K. Chahota, Scientist (Plant Breeding)
128. Dr. (Mrs.) Sonia Sood, Scientist, Veg. Science & Floriculture
129. Dr. J.K. Sharma, Sr. Seed Technologist, Seed Sci. & Tech.
130. Dr. Suresh Upadhaya, Horticulture
131. Dr. Hirday Paul Singh, PRO
132. DR. G.D. Sharma, Scientist (Agronomy)
133. Dr. M.C. Rana, Scientist, Agronomy
134. Dr. R.S. Rana, Asstt. Scientist (Agronomy)
135. Dr. S. Shankhyan, Asstt. Scientist, Soil Science

## AST 12: PRODUCTION POTENTIAL OF FORAGE CROPS IN RICE FALLOWS UNDER VARIED NITROGEN LEVELS

### Objectives:

1. To identify suitable crops in rice fallow.
2. To identify optimum dose of nitrogen for sustained yield

### Technical Details:

Design : Split Plot  
Replication : 4  
Treatments : 9  
Plot size : 3m X 3.6 m

### Treatments Details:

#### A. Main plot (Crops- 3)

1. Sorghum+ cowpea (3;1)
2. Maize + Cowpea (3:1)
3. Pearl millet + Cowpea (3:1)

#### B. Sub plot (Nitrogen levels – 3)

N1 : 50% RDN  
N2: 75% RDN  
N3: 100% RDN

- FYM 10 ton / ha. is common for all treatment
- P&K is recommended dose

Observation to be recorded

#### B) Observation on plant characters

1. plant height
2. leaf:stem ratio
3. Green fodder yield
5. Dry matter yield
6. Crude protein yield

#### C) On soil properties

1. Soil pH, OC%. And NPK status before and after experimentation

#### D) Economics

Location: Mandya

### AST 13: RESPONSE OF FODDER OAT TO THIOUREA UNDER VARYING IRRIGATION SCHEDULES (Exploratory trial)

Year of start : Rabi 2010 (Exploratory)  
 Plot size : 4m x 3m  
 Design : Split Plot  
 Replication : 3

#### Treatments

##### A. IW/CPE (Main Plots)

1. 1.0
2. 0.8
3. 0.6

##### B. Thiourea treatments

1. Control
2. Seed soaking with water for 6 hrs
3. Seed soaking with thiourea (500 ppm) for 6 hrs
4. Two sprays of thiourea at 40 days after sowing and 10 days after first cut
5. Seed soaking with thiourea (500 ppm) + Two sprays of thiourea at 40 days after sowing and 10 days after first cut

#### Observations to be recorded

In addition to growth and yield parameters  
 Fodder quality parameters\*

\*For fodder quality analysis, Bikaner center will send plant samples to Palampur, Jalore to Hyderabad and Udaipur to Anand.

**Location: Bikaner, Udaipur and Jalore**

#### 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 2000 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.
- 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: Rabi 2009-10      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)



# चारा फसलों पर हो शोध : कुलपति

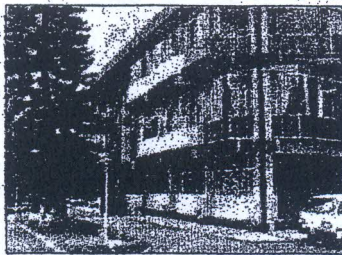
## कृषि विवि में चारा फसलों पर तीन दिवसीय कार्यशाला शुरू

चरिष्ठ संवाददाता, पालमपुर : कृषि विश्वविद्यालय पालमपुर में चार फसलों पर अखिल भारतीय समन्वित शोध परियोजना के तहत वैज्ञानिकों की तीन दिवसीय कार्यशाला प्रारंभ हुई।

विवि च भारतीय कृषि अनुसंधान परिषद की ओर से संयुक्त रूप से आयोजित कार्यक्रम में देशभर से आए करीब सौ वैज्ञानिकों को संबोधित करते हुए मुख्यातिथि विवि के कुलपति डॉ. एसके शर्मा ने कहा कि पिछले चार दशकों में इस परियोजना में अच्छा शोध कार्य हुआ है। उन्होंने कहा कि दूध उत्पादन के लिहाज से भारत विश्व में प्रथम है, लेकिन प्रति व्यक्ति दूध उपलब्धता अर्द्धाई सौ ग्राम प्रति व्यक्ति से लगभग आधी है। कम उत्पादकता का कारण अच्छी किस्म के पशु आहार व हर चारा नहीं मिलना है।

कुलपति ने कहा कि जैव विविधता के बावजूद कम चारा उत्पादन चिंता का विषय है। इसके लिए समन्वित प्रयासों की जरूरत है। चारा फसलों के उत्पादन में कुछ गंभीर समस्याएँ हैं इसके लिए पौध प्रजनक को धैर्य व कठिन परिश्रम से शोध करना होगा। कुलपति ने जर्म प्लास्म में सुधार, संकर किस्मों का विकास, गुण सूत्रों की

देशभर से सौ वैज्ञानिक कर रहे हैं शिरकत



पहचान कर इनका चारा फसलों में समावेश, जैव तकनीक का इस्तेमाल, जिन जैविक जैसी आधुनिक वैज्ञानिक विधियों का उपयोग करने की सलाह दी। उन्होंने घासनियों व चरागाहों में सुधार व बेहतर प्रबंधन की भी वकालत की। इससे अच्छी किस्म का ज्यादा चारा

उपलब्ध रहेगा। परियोजना समन्वयक डॉ. एसके फारूखी ने इस अखिल भारतीय परियोजना की रपट प्रस्तुत करते हुए बताया कि रबी मौसम में देशभर में फसल सुधार बचाव आदि पर व्यापक शोध कार्य किए गए हैं।

उन्होंने बताया कि चारा फसलों का पर्याप्त मात्रा में बीज उत्पादन किया गया है। देश में तीन नए केंद्र स्थापित किए गए हैं। डॉ. फारूखी ने कहा कि देश के सभी परियोजना केंद्रों में उत्कृष्ट कार्य जारी है, उन्होंने कार्यशाला आयोजित करने लिए विवि का आभार जताया।

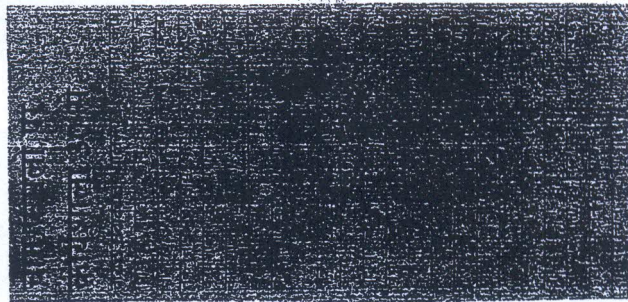
विवि कि शोध निदेशक डॉ. एसपी शर्मा ने कहा कि विवि में चारा फसलों पर उल्लेखनीय कार्य हुए हैं और बारह उन्नत चारा किस्में विकसित की गई हैं क्योंकि प्रदेश में दूध गंगा परियोजना आरंभ हुई है इसलिए उच्च चारा फसलों का महत्व और भी बढ़ गया है।

प्रसार निदेशक डॉ. बीसी सुद ने विवि में चारा फसलों से संबंधित प्रसार गतिविधियों की जानकारी दी। इस मौके पर मुख्यातिथि डॉ. एसके शर्मा ने विभिन्न पुस्तिकाओं का भी विमोचन किया। कार्यक्रम में संविधिक अधिकारियों, विभागाध्यक्षों, वैज्ञानिकों व कुछ प्रगतिशील किसानों ने भी भाग लिया।

शुभ्र उजाला



शुभ्र उजाला



✓ पंजाब कैसरी

### पशुचारे की समस्या पर होगा मथन

पालमपुर (कंगड़ा)। कृषि विद्यालय पालमपुर में चारा फसल पर चारवार की वैज्ञानिकों की तीन दिवसीय कार्यशाला शुरू हुई। विश्वविद्यालय और भारतीय कृषि अनुसंधान परिषद की ओर से संयुक्त रूप से आयोजित इस कार्यशाला में देश भर से 100 वैज्ञानिकों ने भाग लिया। मुख्य अतिथि विवि के कुलपति डा. एसके शर्मा ने कहा कि पिछले चार दशक से इस परियोजना में अच्छा शोध कार्य हुआ है। दूध उत्पादन के लिहाज से भारत विश्व में प्रथम है। लेकिन प्रति व्यक्ति दूध उपलब्धता लगभग आधी है। जिसका कारण अच्छ पशु आहार और चारे की पर्याप्त उपलब्धता न होना है। डा. शर्मा ने कहा कि जैव विविधता के बावजूद कम चारा उत्पादन चिंता का विषय है। चारा फसलों के उत्पादन में समस्याओं के निदान के लिए उन्होंने वैज्ञानिकों को आधुनिक विधियों का उपयोग करने की सलाह दी। परियोजना समन्वयक डा. एसके फारूखी ने कहा कि रबी मौसम में देश

✓ शुभ्र उजाला  
आधुनिक तकनीक अपनाएं  
अच्छे पशु आहार और चारे की कमी : कुलपति



भर में फसल सुधार बचाव आदि पर व्यापक शोध कार्य किए गए हैं। चारा फसलों का पर्याप्त मात्रा में बीज उत्पादन किया गया है। विवि के शोध निदेशक डा. एसपी शर्मा ने कहा कि विवि में चारा फसलों पर उल्लेखनीय कार्य हुए हैं और 12 उन्नत चारा किस्में विकसित की गई हैं। प्रसार निदेशक डा. विपिन चंद्र सुद ने भी विवि में चारा फसलों से संबंधित प्रसार गतिविधियों की जानकारी दी। कुलपति ने कई पुस्तकों का विमोचन किया।



# आधुनिक वैज्ञानिक विधियों का प्रयोग करें

पालमपुर में तीन दिवसीय कार्यशाला आयोजित, मुख्यातिथि ने किया पुस्तिकाओं का विमोचन

पालमपुर, 30 सितम्बर (संजीव): चौधरी सरवन कुमार हिमाचल प्रदेश कृषि विश्वविद्यालय में चार फसलों पर अखिल भारतीय समन्वित शोध परियोजना के तहत वैज्ञानिकों की तीन दिवसीय कार्यशाला वीरवार को शुरू हुई जिसमें देश व प्रदेश के लगभग 100 वैज्ञानिकों ने भाग लिया।

मुख्यातिथि डा. श्याम कुमार शर्मा ने कहा कि वर्ष 1970 से शुरू इस परियोजना ने पिछले चार दशकों में अच्छा शोध कार्य किया। उन्होंने कहा कि दूध उत्पादन के क्षेत्र में भारत विश्वभर में प्रथम है मगर प्रति व्यक्ति दूध उपलब्धता में 250 ग्राम के बजाय 170 ग्राम प्रति व्यक्ति मिलना चिंता का विषय है। उन्होंने इसका कारण अच्छी किस्म के पशु आहार



पालमपुर, चौधरी सरवन कुमार हिमाचल प्रदेश कृषि विश्वविद्यालय में वैज्ञानिकों की तीन दिवसीय कार्यशाला को संबोधित करते मुख्यातिथि

व चार की पर्याप्त मात्रा का न होना बताया। उन्होंने कहा कि देश में जैव विविधता के बावजूद कम चार उत्पादन के लिए समुचित प्रयासों की आवश्यकता है। चार फसलों के उत्पादन में कुछ गंधार समस्याएं हैं जिन्हें पौध प्रजनक को धैर्य और कठिन परिश्रम से शोध करना होगा। कुलगुरु ने जर्म-पलाज्म में सुधार, संकर किस्मों का विकास, गुण सूत्रों की पहचान कर इनको चार

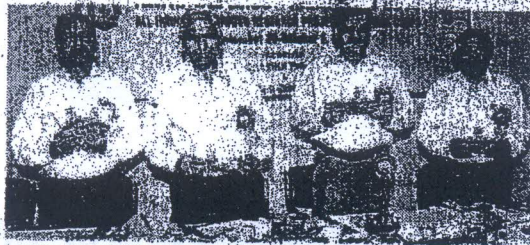
फसलों में समावेश, जैव तकनीक का इस्तेमाल, जीन-गैपिंग जैसी आधुनिक वैज्ञानिक विधियों का उपयोग करने की सलाह दी। उन्होंने घासनिशों व चारागाहों में सुधार व बेहतर प्रबंधन की वकालत की। वि.वि. शोध निदेशक डा. सूर्य प्रकाश शर्मा ने कहा कि वि.वि. में स्थापित देश के सबसे पहले पशुचारा शोध केंद्र ने उल्लेखनीय कार्य करते हुए 12 उन्नत चार किस्में विकसित की हैं। प्रदेश में दूध गंगा योजना शुरू होने से चारे का महत्व और बढ़ गया है। वि.वि. प्रसार शिक्षा निदेशक डा. विपिन चंद्र मुद ने वि.वि. में चार फसलों से संबंधित प्रसार गतिविधियों की जानकारी दी। इस अवसर पर मुख्य अतिथि ने विभिन्न पुस्तिकाओं का विमोचन भी किया।

द्विजित मास्कर

## चारा उत्पादन बढ़ाने पर बल दिया

भास्कर न्यूज़ | पालमपुर

चौधरी सरवन कुमार हिमाचल प्रदेश कृषि विश्वविद्यालय पालमपुर में चार फसलों पर अखिल भारतीय समन्वित शोध परियोजना के तहत वैज्ञानिकों की तीन दिवसीय कार्यशाला वीरवार को आरंभ हुई। कार्यशाला में उपस्थित वैज्ञानिकों को संबोधित करते हुए विश्वविद्यालय के वाइस चांसलर डा. एसके शर्मा ने जानकारी देते हुए बताया कि वर्ष 1970 से शुरू इस परियोजना ने पिछले चार दशकों में अच्छा शोध कार्य हुआ है। दूध उत्पादन के क्षेत्र में भारत विश्वभर में प्रथम है, लेकिन प्रति व्यक्ति दूध उपलब्धता में 250 ग्राम के बजाय 70 ग्राम प्रति व्यक्ति मिलना चिंता का विषय है। अच्छी किस्म के पशु-आहार व चार की पर्याप्त मात्रा न होने से दूध उत्पादन में कमी आई है। देश



कृषि विश्वविद्यालय पालमपुर में चारा फसलों पर वीरवार से आरंभ तीन दिवसीय वैज्ञानिक कार्यशाला में भाग लेते वाइस चांसलर डा. एसके शर्मा और अन्य।

में जैव विविधता के बावजूद कम चार उत्पादन के लिए समुचित प्रयासों की आवश्यकता है। चार फसलों के उत्पादन में कुछ गंधार समस्याएं हैं जिन्हें पौध प्रजनक को धैर्य और कठिन परिश्रम से शोध करना होगा। उन्होंने जर्म-पलाज्म में सुधार, गुण सूत्रों की पहचान कर इनको चार फसलों में समावेश, जैव तकनीक का इस्तेमाल,

जीन-गैपिंग जैसी आधुनिक वैज्ञानिक विधियों का उपयोग करने की सलाह देते हुए घासनिशों व चारागाहों में सुधार व बेहतर प्रबंधन की वकालत की। परियोजना समन्वयक डा. एसए फारुखी ने रिपोर्ट प्रस्तुत करते हुए बताया कि खी के मौसम में चारों फसलों में फसल सुधार, जैव तकनीक का कार्य किए गए हैं।

## चारागाहों के सुधार प्रबंधन पर बल

दिल्ली हिमाच्छ

कार्यालय संवाददाता, पालमपुर

चारा फसलों पर अखिल भारतीय समन्वित शोध परियोजना के तहत देश भर से आए विशेषज्ञों को संबोधित करते हुए कुलगुरु डाक्टर श्याम कुमार शर्मा ने कहा कि पिछले चार दशकों में इस परियोजना के तहत अच्छा कार्य हुआ है। प्रदेश कृषि विश्वविद्यालय पालमपुर में तीन दिवसीय कार्यशाला के दौरान विशेषज्ञों से कुलगुरु डाक्टर श्याम कुमार शर्मा ने कहा कि जैव विविधता के बावजूद कम चार उत्पादन चिंता का विषय है। इसके लिए समन्वित प्रयासों को जरूरत है। चार फसलों के उत्पादन में कुछ गंधार समस्याएं हैं, इसलिए पौध प्रजनक को धैर्य व कठिन परिश्रम से शोध करने की आवश्यकता है। डाक्टर शर्मा ने विशेषज्ञों को जर्म-पलाज्म में सुधार, संकर किस्मों का विकास, गुण सूत्रों

की पहचान कर इनको चारा फसलों में समावेश, जैव तकनीक का इस्तेमाल, जीन गैपिंग जैसी आधुनिक वैज्ञानिक विधियों का उपयोग करने की सलाह दी। उन्होंने घासनिशों व चारागाहों में सुधार व बेहतर प्रबंधन की भी वकालत की। इससे अच्छी किस्म का ज्यादा चारा उपलब्ध होगा। परियोजना समन्वयक डाक्टर एसए फारुखी ने परियोजना की रपट को प्रस्तुत करते हुए बताया कि रबी मौसम में देशभर में फसल सुधार, बचाव आदि पर व्यापक शोध कार्य किए गए हैं। चारा फसलों का पर्याप्त मात्रा में बीज उत्पादन किया गया है। देश में तीन नए केंद्र स्थापित किए गए हैं। डाक्टर फारुखी ने कहा कि देश के सभी परियोजना केंद्रों में उत्कृष्ट कार्य जारी है। उन्होंने कार्यशाला आयोजित करने के लिए पालमपुर विश्वविद्यालय का आभार जताया।