

For Official Use Only

dk zük
 [Hr]v axó á ¥Šü 9 [Ëç 1/08-1/
 ú€ Tš ú;úú ;*ú úúúú+úúúú
 y † ú# 2/-20+1/08



Proceedings
National Group Meeting: Rabi 2019-20
Central Agricultural University, Imphal
August 30-31, 2019

v[ly Hljrh l eúf; r vuhúku ij; kú uk
pljkQl ys, camí; kúrk
úúúúú Nrkvuhúku ij 'n'ú

All India Coordinated Research Project
on Forage Crops & Utilization
(Indian Council of Agricultural Research)

Project Coordinating Unit
ICAR-IGFRI, Jhansi-284 003 (U.P.)
<http://www.aicrponforagecrops.res.in>

AICRP FC & U
 Proceedings of the National Group Meeting: Rabi 2019-20

All India Coordinated Research Project
on Forage Crops & Utilization
(Indian Council of Agricultural Research)



Proceedings of the National Group Meeting: Rabi 2019-20
held at
Central Agricultural University, Imphal
August 30-31, 2019

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

September, 2019

AICRP on Forage Crops and Utilization
Tech. Pub. Number- 7/2019

Proceedings of the National Group Meeting: Rabi 2019-20
(Held at CAU, Imphal during August 30-31, 2019)

Compilation and Editing:
 Dr. A. K. Roy
 Dr. R. K. Agrawal
 Dr. N. R. Bhardwaj
 Dr. Subhash Chand

Editorial assistance
 Sh. H.K. Agrawal
 Sh. Ratnakar Patel

Published by:
Project Coordinator
AICRP on Forage Crops & Utilization,
ICAR-IGFRI, Jhansi- 284 003
Uttar Pradesh

Phone/Fax: 0510-2730029
 Email: pcforage@gmail.com
 Web site: <http://www.aicrponforagecrops.res.in>

September, 2019

PREFACE

The National Group Meet, *Rabi* 2019-20 of 'All India Coordinated Research Project on Forage Crops and Utilization' was organized with the objectives to review the accomplishments of technical programme executed during *Rabi* 2018-19 at different Coordinating and Cooperating centres, In-house research activities, Breeder Seed Production, Forage Technology Demonstrations (FTDs), Tribal sub-plan (TSPs) and other activities carried out towards development and promotion of forage resources. The formulation and finalisation of technical programme for *Rabi* 2019-20 was successfully done during the meet. The meeting was jointly organized by Indian Council of Agricultural Research (ICAR) and CAU, Imphal during 30-31 August, 2019 at Imphal.



The meeting was attended by the scientists engaged in forage research and development working under coordinating and collaborating centers located at different SAUs, ICAR institutes and NGOs. Representatives of NDDDB, Regional fodder stations of DAHD&F, Government of India, seed companies, private companies, state Department of Animal Husbandry and other related departments also participated in the programme and being important stakeholders contributed in the development and refinement of programme and strengthening linkages for future course of action. Members of electronic and print media of the region also participated in the meet.

This compilation contains brief report of National Group Meet, *Rabi* 2019-20 covering highlights on forage crop improvement, forage crop production and forage crop protection technology generated, proceedings of different technical sessions and technical programme for the coming *Rabi* season 2019-20. The finalized technical programme on forage crop improvement, forage crop production and forage crop protection for *Rabi* 2019-20 have been given in annexure.

The successful conductance of the event is attributed to the joint efforts made by the ICAR/IGFRI authorities, authorities of CAU, Imphal, participating scientists, Principal Investigators and staff of the Project Coordinating Unit and IGFRI, Jhansi. The team of All India Coordinating Research Project on Forage Crops & Utilization sincerely acknowledges their active involvement, suggestions and cooperation for successful organization of the meeting.

We sincerely thank the authorities at ICAR, New Delhi, particularly Dr. T. Mohapatra, Secretary, DARE and Director General, ICAR; Dr. A. K. Singh, Deputy Director General (Crop Science); Dr. Dinesh Kumar, Assistant Director General (F&FC); Dr. D. K. Yadava, Assistant Director General (seed); Dr. P.R. Chowdhury, Principal Scientist (F&FC) and other members of Crop Science Division for their guidance, support and encouragement. The authorities and organizing committee of CAU, Imphal, are especially thanked for successful and smooth conductance of the meeting.

A.K. Roy
Project Coordinator

CONTENTS

Item	:	Details	Pages
Recommendations	:	Major Recommendations	1-2
Technologies Developed	:	Technologies Developed	3
Inaugural Session	:	Inaugural Session	4
Technical Session-I	:	Interactive Session with Stakeholders	5
Technical Session-II	:	Breeder Seed Production	6
Technical Session-III	:	Discipline-Wise Report	7-8
Technical Session-IV	:	Formulation of Technical Programme	9-13
	:	Crop Improvement	9-10
	:	Crop Production	11-12
	:	Crop Protection	13
Technical Session-V	:	Review of Centre-Wise Activities	14
Technical Session-VI	:	FTD & TSP Formulation	15
Technical Session –VII	:	PGR/Breeding/Production/Protection Issues	16
Technical Session –VIII	:	Scientific , Administrative and Financial Issues	17
VIC Meeting	:	Varietal Identification Committee Meeting	18-19
Technical Programme	:	Discipline-wise Technical Programme	20-44
Annexure - A	:	Forage Crop Improvement Trials	20-30
Annexure - B	:	Forage Crop Production Trials	31-41
Annexure - C	:	Forage Crop Protection Trials	42-44
Annexure - D	:	NGM Programme Meet Rabi-19-20	45-47
Annexure - E	:	List of Participants	48-51
Annexure - F	:	Glimpses of Media Coverage	52

**AICRP on Forage Crops and Utilization
National Group Meeting
Rabi 2019-20
CAU, Imphal
30-31st August 2019**

Major Recommendations

VARIETIES IDENTIFIED

- **Oat Single Cut entry OL-1869-1:** Submitted by PAU Ludhiana and was identified for the states of Rajasthan, Haryana, Punjab, Terai region of Uttarakhand, Western Uttar Pradesh, Maharashtra, Gujarat, Madhya Pradesh and Chhattisgarh.
- **Oat Single Cut entry HFO-607:** Submitted by CCS HAU, Hisar and was identified for the states of Rajasthan, Haryana, Punjab, Terai region of Uttarakhand and Western Uttar Pradesh.
- **Oat Single Cut entry OL-1861:** Submitted by PAU, Ludhiana was identified for the all India except Hill Zone.
- **Lolium (annual Rye Grass) entry PBRG-2:** Submitted by PAU, Ludhiana and was identified for the states of Himachal Pradesh, Uttarakhand, Punjab and union territory of Jammu & Kashmir.
- **Lolium (annual Rye Grass) entry Palam Rye Grass-1:** Submitted by CSK HPKV, Palampur and was identified for the states of Himachal Pradesh, Uttarakhand, Punjab and union territory of Jammu & Kashmir.
- **Vicia sativa entry JVS-1:** Submitted by JNKVV, Jabalpur and was identified for the states of Madhya Pradesh, Uttar Pradesh, Chhattisgarh and Maharashtra.
- **Perennial Lucerne entry Alamdar 51:** Submitted by M/S Khoja Habib Mamad, Kutchh, Gujarat and was identified for the states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.
- **Perennial Lucerne entry TNLC 15 as Co-4:** Submitted by TNAU, Coimbatore and was identified for the states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.

CROP PRODUCTION TECHNOLOGIES

- For southern part of Karnataka under irrigated situations, year round fodder production system of BxN Hybrid + Lucerne (BN hybrid in 60 cm apart paired rows and eight rows of lucerne in 2m space between two paired rows) is recommended for economical and sustainable yields. The system recorded higher green forage yield (1696 q/ha), DMY (378 q/ha) and CPY (40 q/ha).
- For Rajasthan state, it is recommended to sow combination of 20 kg Lucerne +30 kg oats seed ha⁻¹ at 30 cm distance rows. The technology produced up to 465 q green fodder, 54 q dry matter or 7.6 q quality green fodder (CP Content- 16.5%).

- For Maharashtra state, application of silicon dioxide @ 300 kg ha⁻¹ and cutting of oat crop at 45 DAS and thereafter leaving for seed is recommended. The technology has potential to produce 14.92 q seed along with 107 q straw and 224 q green fodder per hectare.
- For Chhattisgarh, planting of fodder maize at 75 cm x 20 cm planting geometry with application of 160 kg ha⁻¹ nitrogen is recommended for higher seed production. The technology produced higher seed yield (29.9q) with 135 q straw per hectare besides improvement in yield attributing parameters like plant height, no of cob per plant, cob length (cm), cob girth (cm), no of grain per cob and 100 seed weight.
- In states of Jharkhand and West Bengal, it is recommended to grow Oat+ Lathyrus in 3:2 row proportions in 30 cm apart lines. The technology has potential to produce upto 350q green fodder (75.0 q dry matter) equivalent to 8.42 q crude protein per hectare.

CROP PROTECTION TECHNOLOGIES

- At Ludhiana and Bhubaneswar, Seed treatment with carbendazim 50WP @ 2g/kg seed + foliar application of propiconazole 25 EC @ 1ml/lit after 21 days after sowing is recommended for management of foliar diseases in fodder Oat.

MAJOR RECOMMENDATIONS

- Each center should supply sample seeds of their new varieties to DADF, RFS farms and NDDDB for demonstrations. They should also organize at least 20 FTDs of their newly released varieties.
- Regarding outreach activities under NEH, TSP, FTDs etc., all the centers should also record and report data on Horizontal Transmission. These should be conducted in the new villages every year so that the technologies can be spread in large areas.
- Centers were told to generate Breeder seed demand of the newly released variety by approaching NDDDB, Government & private agencies.
- Each center should share information regarding forage seed availability on web site of AICRP on FC & U.
- The period of SFC 2017-2020 is ending in March 2020 and every centre should send their salient achievements for 3 years in bullet forms (3-4 pages) with good quality photographs.
- Each center should also prepare draft for the focus areas of research, targets, output, milestone for the next projected plan, 2020-25. The tentative financial and personnel demand should also be prepared. It should be ready by the end of October 2019.
- All Scientists should identify germplasm with unique traits and get them registered with NBPGR.
- Criteria of developing suitable silage type materials for Oat and Maize should be developed.

TECHNOLOGIES DEVELOPED

Varieties Identified

- **Oat Single Cut entry OL-1869-1:** Submitted by PAU Ludhiana and was identified for the states of Rajasthan, Haryana, Punjab, Terai region of Uttarakhand, Western Uttar Pradesh, Maharashtra, Gujarat, Madhya Pradesh and Chhattisgarh.
- **Oat Single Cut entry HFO-607:** Submitted by CCS HAU, Hisar and was identified for the states of Rajasthan, Haryana, Punjab, Terai region of Uttarakhand and Western Uttar Pradesh.
- **Oat Single Cut entry OL-1861:** Submitted by PAU, Ludhiana was identified for the all India except Hill Zone.
- **Lolium (annual Rye Grass) entry PBRG-2:** Submitted by PAU, Ludhiana and was identified for the states of Himachal Pradesh, Uttarakhand, Punjab and union territory of Jammu & Kashmir.
- **Lolium (annual Rye Grass) entry Palam Rye Grass-1:** Submitted by CSK HPKV, Palampur and was identified for the states of Himachal Pradesh, Uttarakhand, Punjab and union territory of Jammu & Kashmir.
- **Vicia sativa entry JVS-1:** Submitted by JNKVV, Jabalpur and was identified for the states of Madhya Pradesh, Uttar Pradesh, Chhattisgarh and Maharashtra.
- **Perennial Lucerne entry Alamdar 51:** Submitted by M/S Khoja Habib Mamad, Kutchh, Gujarat and was identified for the states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.
- **Perennial Lucerne entry TNLC 15 as Co-4:** Submitted by TNAU, Coimbatore and was identified for the states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.

Crop Production Technologies

- For southern part of Karnataka under irrigated situations, year round fodder production system of BxN Hybrid + Lucerne (BN hybrid in 60 cm apart paired rows and eight rows of lucerne in 2m space between two paired rows) is recommended for economical and sustainable yields. The system recorded higher green forage yield (1696 q/ha), DMY (378 q/ha) and CPY (40 q/ha).
- For Rajasthan state, it is recommended to sow combination of 20 kg Lucerne +30 kg oats seed ha⁻¹ at 30 cm distance rows. The technology produced up to 465 q green fodder, 54 q dry matter or 7.6 q quality green fodder (CP Content- 16.5%).
- For Maharashtra state, application of silicon dioxide @ 300 kg ha⁻¹ and cutting of oat crop at 45 DAS and thereafter leaving for seed is recommended. The technology has potential to produce 14.92 q seed along with 107 q straw and 224 q green fodder per hectare.
- For Chhattisgarh, planting of fodder maize at 75 cm x 20 cm planting geometry with application of 160 kg ha⁻¹ nitrogen is recommended for higher seed production. The technology produced higher seed yield (29.9q) with 135 q straw per hectare besides improvement in yield attributing parameters like plant height, no of cob per plant, cob length (cm), cob girth (cm), no of grain per cob and 100 seed weight.
- In states of Jharkhand and West Bengal, it is recommended to grow Oat+ Lathyrus in 3:2 row proportions in 30 cm apart lines. The technology has potential to produce upto 350q green fodder (75.0 q dry matter) equivalent to 8.42 q crude protein per hectare.

Crop Protection Technologies

- At Ludhiana and Bhubaneswar, Seed treatment with carbendazim 50WP @ 2g/kg seed + foliar application of propiconazole 25 EC @ 1ml/lit after 21 days after sowing is recommended for management of foliar diseases in fodder Oat.

INAUGURAL SESSION

The Inaugural session of National Group Meeting of All India Coordinated Research Project on Forage Crops and Utilization was chaired by Prof. M. Premjit Singh, Hon'ble Vice Chancellor, CAU, Imphal. Dr. Dinesh Kumar, Assistant Director General (Food and Fodder Crops), ICAR was Chief Guest. Dr. V. K. Yadav, Director, ICAR-IGFRI, Jhansi was guest of honour. The participants included representatives from ICAR, IGFRI, SAUs, CAUs, NGOs, VPKAS, NBPGR, DADH, ICRISAT, Universities, Private companies, state government departments, farmers, livestock keepers, dairy owners etc.

Dr. Indira Sarangthem, Dean, College of Agriculture, CAU, Imphal welcomed the delegates and presented activities and achievements of University for the development of farming community of NEH region.

Dr. A. K. Roy, Project coordinator, presented the brief introduction of the project, salient achievements during last 5 years period and summary of activities carried out during Rabi 2018-19 and results. He also presented the fodder and livestock scenario of all NEH states and talked about the course of action to enhance the fodder scenario in these states.

Dr. V. K. Yadav, Director, ICAR-IGFRI, Jhansi stressed on more active collaboration among various stakeholders of NEH region and informed about the various new initiatives being taken by IGFRI to augment the fodder resources in the country. He suggested state level coordination meeting with all stakeholders like farmers, livestock keepers, veterinarians, state government department and CAU etc. to address the issues concerning the dairy owners, livestock keepers and fodder farmers.

Dr. Dinesh Kumar, ADG (F&FC), ICAR highlighted the need of forage crops technologies to enhance the farmers income and increase the livestock productivity. He suggested effective dissemination of technologies and exhorted the project scientists to come out with new innovative technologies for increasing the income of farmers. He also indicated that NEH region needs a special thinking and attention as scenario is quite different than other parts of the country in terms of food habit, animal species and climatic variability of hilly terrain.

Prof. M. Premjit Singh, Vice Chancellor, CAU, Imphal, highlighted the importance of forages and animal husbandry. He discussed the issues of livestock species and informed that farmers are more inclined to piggyery based on food habit and asked for ways to reduce the feed cost to make the piggyery profitable. He also informed that dairies with exotic as well as improved indigenous cattle species are coming up in big ways in recent years in Manipur and called upon scientists to work out suitable varieties and technologies for them. He also highlighted the various activities of University which is unique in the sense of having jurisdiction over 7 states.

Various publications were released during the occasion. One book by AICRP coordinating unit entitled "Indian Fodder Scenario: Redefining State Wise Status" was also released. One mobile app Forage seed was released which deals with availability and marketing of forage seeds across the country. Certificates of appreciation were awarded to AICRP forage crops centre BAIF, Uralikanchan, Pune. Dr. Joseph Koireng, Organizing secretary and Scientist, AICRP forage center, CAU, Imphal presented the vote of thanks.

TECHNICAL SESSION - I

INTERACTIVE SESSION WITH STAKEHOLDERS

Chairman	:	Prof. M. Premjit Singh, Hon'ble, Vice Chancellor, CAU, Imphal
Co-Chairman		Dr. Dinesh Kumar, ADG (FFC), ICAR
Rapporteur	:	Dr. R. Joseph Koireng, CAU, Imphal

At the outset, the chairman welcomed the different stakeholders. About 40 stakeholders comprising of farmers, livestock keepers and animal husbandry group participated in this interactive session. The following were the feedbacks given by the different stakeholders:

- Farmers wanted to know about schemes providing financial assistant to them for fodder cultivation. Chairman informed that financial assistant may not be possible from the university, but farmers can be informed about the various schemes of central and state governments. The technical help and training regarding fodder cultivation can be provided to them through KVKs and extension education unit of the University.
- Farmers wanted to know more about the fodder and livestock related technologies so that they can get more profit from dairy. They informed about high cost of feed in the market, non availability of fodder seeds, non-awareness about fodder cultivation technologies etc. They were informed about the role of green fodder in reducing the cost of milk production which can replace costly feeds. For forage seeds, it was requested to contact AICRP forage unit at CAU, Imphal and also IGFRI, Jhansi. It was also suggested that various crops and suitable varieties are available which can be grown in limited moisture conditions, on bunds and non-cultivable areas and rice fallow areas such as single cut berseem cultivation, perennial BxN hybrids, Guinea grass, Setaria grass, oats etc.
- Some farmers wanted financial assistants from Government for fencing around the field to avoid stray cattle. It was informed that details about various government financial schemes can be provided in the training and they can approach state government officials for these. Planting of bio-fencing as well as cattle proof trenches were also the low cost alternate options. Farmers can be given training and material on bio-fencing. Cattle proof trenches are also other options.
- Farmers enquired about substitution of concentrated feed by green forages. It was informed that that 70-80% substitution can be made by suitable grass legumes mixture in lactating animals and up to 90% during dry period.
- Farmers requested for technical guidance for fodder production. VC has agreed for extending all technical help from the university. The training can be arranged through AICRP forage and CAU funds.

The session ended with vote of thanks to the Chairman.

TECHNICAL SESSION II

BREEDER SEED PRODUCTION

Chairman	:	Dr. P. R. Chowdhury, PS, ICAR
Convener	:	Dr. Subhash Chand, AICRP on FC & U, ICAR-IGFRI
Rapporteurs	:	Dr. Kalyan Jana and Dr. Yogendra Kumar

Production report: Indent year 2019-20 Production year 2018-19

The indent for Breeder Seed Production was received from DAC, GOI for 27 varieties in three forage crops viz., Oat (12), Berseem (12), Lucerne (3). The quantity allocated was 352.36 q. The production target was assigned to thirteen Breeder Seed producing centres of the different SAUs/ NGO/ ICAR institutes. Among quantity indented for different forage crops, the maximum was for Oat (303.05 q) followed by Berseem (41.91 q) and Lucerne (7.40 q).

The final Breeder Seed Production Report (BSP-IV) received from different seed producing centres revealed that in all three crops Berseem, Oat & Lucerne, the overall breeder seed production was more than the allocated quantity.

In Oat, the production was 405.5 q and 42.00 q of previous year is also available. It makes a total of 447.5 q against the allocation of 303.05 q making a surplus of 144.55 q. The production was 102.45 q or 33.81% higher than the indent. There was surplus production in all 12 varieties indented.

In Berseem, the production was 47.31 against the indent of 41.91 q making a surplus of 5.4 q. There was indent of 12 varieties and were allocated to 4 centers. In three varieties viz. BL-1, Mescavi and JB-5, the production was less than the indent, whereas it was surplus in other 09 varieties. 3.0 q of breeder seed of newly released variety JBSC-1 is also available.

In Lucerne, the target of (7.40 q) was allotted to two centers in two states. The total production was 8.95 q which was 1.55 q or 20.94% higher than the indent. MPKV Rahuri was net surplus producer whereas AAU, Anand achieved the target.

The overall breeder seed production was 461.76 q and considering the previous year seed of 42.00 q thus making a total of 503.76 q against the indent of 352.36 q, which is 34.3% more 151.4 q surplus. There was surplus breeder seed available in many centers of other improved varieties. The overall production was 461.76 q which was 109.4 q (31.05%) higher than the indented target. Out of 27 varieties indented, only in 03 varieties the production was less than indent. Besides previous year seed of 42 q of indented varieties and 30.08 q seed of 08 Oat and 01 Berseem variety (Newly released) produced this year is also available.

Indent allocation: Indent year 2020-21 Production year 2019-2

DAC indent was received for total of 444.58q comprising of 409.15q for 23 varieties of Oat; 29.23q for 11 varieties of in Berseem; 4.20q for 04 varieties of Lucerne and 2.0q for 01 variety of Teosinte. The indent was allocated to different centers and accepted by them. The indents were allotted to 10 centers for oat, 04 centers for Berseem, 03 centers for Lucerne and 01 center for Tesointe.

The session ended with vote of thanks to the Chair

TECHNICAL SESSION -III

DISCIPLINE WISE REPORT

Chairman	:	Dr. V. K. Yadav, Director, IGFR
Rapporteurs	:	Dr. G. Gayathri and Dr. Usha C. Thomas

Crop Improvement

Dr. Subhash Chand, Scientist (Plant Breeding) presented the results of Forage Crops Breeding and Quality Evaluation Trials conducted during *Rabi 2018-19*. Total 16 trials at 36 locations on annual and perennial crops were conducted. The summary of trials is as follows.

- In **IVTB**: Berseem, five entries *i.e.*, JHB 18-2, JHB-18-1, JB-06-11, BM-12 and HFB-15-5 were proposed for promotion to AVT-1.
- In **AVTB-1**: Berseem, three entries *i.e.*, JHB-17-2, PC-91 and JHB-17-1 were proposed for promotion to AVT-II.
- In **IVTO (SC)**: Forage Oat, seven entries *i.e.*, UPO-18-1, HFO-806, RO-11-1-3, OL-1874-1, HFO-818, JO-06-23 and SKO-241 were proposed for promotion to AVT (SC)-1.
- In **AVTO (SC)-1**: Forage Oat, five entries *i.e.*, SKO-240, OL-1896, HFO-529, JO-05-09 and HFO-718 were proposed for promotion to AVT (SC)-2.
- In **AVTO (SC)-2** and **AVTO (SC-SEED)-2** : Forage Oat- Trials completed and three proposals for variety identification were submitted.
- In **IVTO (MC)**: Forage Oat, three entries *i.e.*, HFO-707, OL-1882 and HFO-716 were proposed for promotion to AVT (MC)-1.
- In **AVTO (MC)-1**: Forage Oat, two entries *i.e.*, OL-1874 and JO-05-304 were proposed for promotion to AVT (MC)-2.
- In **IVTO (DUAL)**: Forage Oat, seven entries *i.e.*, RO-11-2-6, RO-11-2-2, OL-1766-2, OL-1874-2, JO-11-507, HFO-816 and JHO-18-3 were proposed for promotion to AVTO-1 (DUAL).
- In **AVTO-1 (DUAL)**: Forage Oat, five entries *i.e.*, OL-1876-2, OL-1906, HFO-611, JHO-17-4 and JO-10-506 were proposed for promotion to AVTO-2 (DUAL).
- In **VT Lucerne (Perennial)-2016**, Trial completed and four proposals for variety identification were submitted.
- In **AVT-2: Vicia** and **AVT-2 (SEED): Vicia**- Trials completed and one proposal for variety identification was submitted.
- In **AVT-2: Lolium** and **AVT-2 (SEED): Lolium** –Trials completed and two proposals for variety identification were submitted.
- **VT Red Clover (2016)** and **VT White Clover (2016)**, will be continued in coded form.
- In **IVT (MC) Bajra**, two entries *i.e.*, BAIF Bajra-6 and TSFB-18-1 were proposed for promotion to AVT-1.
- In **AVT-1(MC) Bajra**, three entries *i.e.*, HTBH-4902, ADV0061 and AFB-37 were proposed for promotion to AVT-2.

Chairman suggested that possibility should be explored for replacing Oat variety Kent with some other high yielding variety.

Crop Production

Dr. R. K. Agrawal, Principal Scientist and PI (Agronomy) presented the detailed report of 21 experiments conducted at 22 locations on different crops and cropping systems including resource use optimization, carbon sequestration, organic nutrient management, hydroponic fodder production, varietal evaluation and AVT trials etc. The results of various experiments were presented and following five recommendations were given.

- For southern part of Karnataka under irrigated situations, year round fodder production system of BxN Hybrid + Lucerne (BN hybrid in 60 cm apart paired rows and eight rows of lucerne in 2m space between two paired rows) is recommended for economical and sustainable yields. The system recorded higher green forage yield (1696 q/ha), DMY (378 q/ha) and CPY (40 q/ha) as well as net monetary returns (Rs 146464/ha) and B:C ratio (3.0).
- For Rajasthan state, it is recommended to sow combination of 20 kg Lucerne +30 kg oats seed ha⁻¹ in 30 cm apart rows. The technology produced up to 465 q green fodder, 54 q dry matter or 7.6 q quality green fodder (CP Content- 16.5%). This gave net return of Rs.70000/ha with B:C ratio of 3.01.
- For Maharashtra state, application of silicon dioxide @ 300 kg ha⁻¹ and cutting of oat crop at 45 DAS and thereafter leaving for seed is recommended. The technology has potential to produce 14.92 q seed along with 107 q straw and 224 q green fodder per hectare. It also demonstrated lower lodging percent (42.4) and higher net return (Rs. 54527/ ha) and B: C Ratio.
- For Chhattisgarh, planting of fodder maize at 75 cm x 20 cm planting geometry with application of 160 kg ha⁻¹ nitrogen is recommended for higher seed production. The technology produced higher seed yield (29.9q) with 135 q straw per hectare besides improvement in yield attributing parameters like plant height, no of cob per plant, cob length (cm), cob girth (cm), no of grain per cob and 100 seed weight. The technology also recorded high gross return (Rs 100650), net return (Rs 63529) and B:C Ratio (2.7).
- In states of Jharkhand and West Bengal, it is recommended to grow Oat+ Lathyrus in 3:2 row proportions in 30 cm apart lines. The technology has potential to produce upto 350q green fodder (75.0 q dry matter) equivalent to 8.42 q crude protein per hectare. This recorded net monetary return of Rs 46000/ha with BC Ratio of 1.99.

Chairman suggested to include observations on pest and disease incidence in all crop production trials and also to undertake trials on nanoparticles and biofortication in fodder crops

Crop Protection

Dr. N.R. Bhardwaj, Scientist and PI (Crop Protection), presented the salient achievements of crop protection trials conducted during *Rabi 2018-19*. He presented the detailed report of 9 trials conducted at 6 locations on survey of pathogens, insect pests and nematodes associated with Berseem and Oats ecosystems, field screening of *rabi*-breeding materials for resistance to diseases and insect- pests, biological management of oat aphid *Rhopalosiphum padi* on oats etc. The results of various experiments were presented and following recommendation was given.

- Seed treatment with Carbendazim 50WP @ 2g/kg seed + foliar application of Propiconazole 25 EC @ 1ml/lit after 21 DAS can be recommended for management of foliar diseases in oat at Ludhiana and Bhubaneswar.

The session ended with Vote of Thanks to the Chair.

TECHNICAL SESSION IV A (CONCURRENT)
FORMULATION OF TECHNICAL PROGRAMME
FORAGE CROP IMPROVEMENT

Chairman	:	Dr. Dinesh Kumar, ADG (FFC), ICAR, New Delhi
Co-Chairman	:	Dr. A.K. Roy, PC (FCU), IGFRI, Jhansi
Rapporteurs	:	Dr. P. Mahadevu and Dr. S. V. Damane
Finalization of varietal Trials	:	Dr. Subhash Chand, IGFRI, Jhansi

At the outset, the chairman welcomed the delegates and Dr. Subhash Chand, presented the breeding trial report of *Rabi* 2018-19 to the house for finalization of the technical programme for *Rabi* 2019-20. A total of twenty four breeding trials were decided to be conducted by the house for *Rabi* 2019-20 in six different crops viz; Berseem, Oat, Lucerne, Red clover, White clover, Lathyrus and Bajra (summer). Following were the suggestions and recommendations:

- In IVTB, four entries were proposed from HAU (2), PAU (1) and JNKVV (1). All together 21 locations in four zones were decided for this trial.
- Five entries viz, JHB 18-2, JHB-18-1, JB-06-11, BM-12 & HFB-15-5 were promoted to AVT-1 Berseem from IVT Berseem and trial will be conducted in fifteen locations in HZ, NWZ and NEZ only.
- Three entries viz., JHB-17-2, PC-91 & JHB-17-1 were promoted to AVT-2 Berseem from AVT-1 Berseem and trial will be conducted in twelve locations in HZ, NWZ and NEZ only.
- Three entries viz., JHB-17-2, PC-91 & JHB-17-1 will be evaluated for AVT-2 (seed) Berseem and trial will be conducted in six locations in NWZ & NEZ only
- Ten entries have been proposed for IVTO SC by different centres viz; PAU (2), Rahuri (2), HAU (2), IGFRI (1), GBPUAT (1), NDUAT (1), JNVV (1). Totally 29 testing locations were proposed for conducting the trial in all the five zones.
- Ten entries viz; UPO-18-1, HFO-806, HFO-818, RO-11-1-3, RO-11-1-2, OL-1874-1, OL 1876-1, JO-06-23, NDO-1802 & SKO-241 were promoted to AVTOSC-1 from IVTO (SC). This trial will be conducted in fifteen locations in HZ, CZ and SZ.
- Five entries viz; SKO-240, OL-1896, HFO-529, JO-05-09 & HFO-718 were promoted to AVTO-SC-2 from AVTO-SC-1 and will be conducted in seventeen locations in HZ, NWZ and CZ. Simultaneously, Agronomy and AVTOSC-2 seed trials have been also formulated for the same entries.
- Seven entries have been proposed for IVTO MC by different centres viz; PAU (2), MPKV (1), JNKVV (1), CSK HPKV (1) and HAU (2). This trial will be conducted in 19 locations in four zones.
- Three entries viz; HFO-707, OL-1882 & HFO-716 were promoted to AVTO-1 MC from IVTO MC. This trial will be conducted in nine locations in NWZ and CZ zones only.
- Two entries viz; OL-1874 & JO-05-304 were promoted to AVTO-2 MC from AVTO-1 MC. This trial will be conducted in nine locations in NWZ and CZ zones only. Simultaneously, AVTO-2 (MC) seed trial has been also formulated for the same entries.
- IVTO dual trial has been formulated with nine entries contributed by different centres viz; **PAU (2), MPKV (2), GBPUAT (1), IGFRI (1), JNKVV (1) and HAU (2)**. This trial will be conducted in fifteen locations with Pusa as new centre.

- AVTO-1 dual was formulated with seven entries promoted from IVTO dual viz., RO-11-2-6, RO-11-2-2, OL-1766-2, OL-1874-2, JO-11-507, HFO-816 & JHO-18-3 and trial will be conducted in fourteen locations.
- AVTO-2 dual was formulated with five entries promoted from AVTO-1 dual viz., OL-1876-2, OL-1906, HFO-611, JHO-17-4 & JO-10-506 and trial will be conducted in fourteen locations. AVTO-2 dual (seed) and Agronomy trials were also formulated for the same five entries.
- A new trial IVT Lucerne (Annual) was constituted with five entries from different organizations viz., Alamdar (2), AAU Anand (2) and PAU (1). This trial will be conducted in thirteen locations in NWZ, CZ and SZ zones.
- VT red clover (perennial) had earlier been constituted with the entries viz., RC -2016-1, RC -2016-2, RC -2016-3, RC -2016-4, RC -2016-5 & RC -2016-6. The trial will be continued in coded form.
- VT White clover (perennial) had earlier been constituted with the entries viz PWC-25, PWC-26, JHWC-16-1, JHWC-16-2 & JHWC-16-3 and the trial will be continued in coded form in HZ.
- A new trial IVT Summer Bajra has been constituted with four entries from Advanta (1) and SIRA seeds (2), PAU (1). Some more companies and SAUs have shown interest and their contribution will be incorporated if they fulfill the criteria.
- AVT -1 Summer Bajra has been constituted with four entries BAIF Bajra-5, BAIF Bajra-6 TSFB-18-1 & TSFB 18-2.
- AVT -2 Summer Bajra has been constituted with three entries HTBH-4902, ADV0061, & AFB-37 and the trial will be conducted. AVT-2 seed trial of summer bajra will be conducted for the same entries. Agronomy trials will also be conducted.
- An IVT trial on Lathyrus has been constituted with five entries viz., BCKV (1) and AAU, Jorhat (4) to be conducted at 07 locations.

At the end chairman and co chairman of this session emphasized on contribution of good material for IVTs by each centre.

The session ended with vote of thanks to the chairman.

TECHNICAL SESSION-IV B (CONCURRENT)
FORMULATION OF TECHNICAL PROGRAMME
FORAGE CROP PRODUCTION

Chairman	:	Dr. R. K. Agrawal, P.I. Crop Production, AICRP Forage Crops
Finalization of Trials	:	
Rapporteurs	:	Dr. Birendra Kumar & Dr H.K Patel

The session was chaired by Dr. R. K. Agrawal, P.I. Crop Production, AICRP Forage Crops and Utilization. During the session, different aspects of forage crop production were discussed thoroughly. Ten new proposals (Five AVT based, four coordinated and one location specific) were discussed in the session. After thorough discussion and suggestions the following experiments were formulated.

New experiments

Coordinated Trials

- Effect of cutting and splitting of nitrogen doses on growth, yield and quality of fodder oat cultivars. **(Raipur, Ranchi and Faizabad).**
- Effect of different potassic fertilizer sources on production, productivity and quality of fodder maize. **(Anand and Hyderabad)**
- Evaluation of *Moringa* under different plant density for quality fodder production. **(Raipur, Ranchi, Hyderabad, Mandya, Dharwad and Pusa).**
- Screening of herbicides for control of *Cuscuta* in lucerne crop. **(Bikaner, Jhansi Mandya Coimbatore and Rahuri)**

Location specific trials

- Standardization of Magnesium nutrition in Bajra-Napier Hybrid. **(Vellayani)**

Trials concluded and recommendations

The following four trials were concluded

K-15-AST-1L: Studies on different models for year round green fodder production under irrigated condition (Mandya).

Recommendation: For southern part of Karnataka under irrigated situations, year round fodder production system of BxN Hybrid + Lucerne (BN hybrid in 60 cm apart paired rows and eight rows of lucerne in 2m space between two paired rows) is recommended for economical and sustainable yields. The system recorded higher green forage yield (1696 q/ha), DMY (378 q/ha) and CPY (40 q/ha) as well as net monetary returns)Rs /146464ha) and B:C ratio (3.0).

R-15-AST-4: Study on lucerne + oats /sarson fodder production system at variable seed rates of mixed crop under irrigated condition (Bikaner)

Recommendation: For Rajasthan state, it is recommended to sow combination of 20 kg Lucerne +30 kg oats seed ha⁻¹ in 30 cm apart rows. The technology produced up to 465 q green fodder, 54 q dry matter or 7.6 q quality green fodder (CP Content- 16.5%). This gave net return of Rs.70000/ha with B:C ratio of 3.01.

R-17-AST-5: Seed yield maximization in Oat cv. RO-19 (Phule Harita) Rahuri.

Recommendation: For Maharashtra state, application of silicon dioxide @ 300 kg ha⁻¹ and cutting of oat crop at 45 DAS and thereafter leaving for seed is recommended. The technology has potential to produce 14.92 q seed along with 107 q straw and 224 q green fodder per hectare. It also demonstrated lower lodging percent (42.4) and higher net return (Rs. 54527/ ha) and B: C Ratio.

R-15-AST-1: Productivity of oat - *Lathyrus* intercropping system as influenced by integrated nutrient management (Kalyani and Ranchi)

Recommendation: In states of Jharkhand and West Bengal, it is recommended to grow Oat+ *Lathyrus* in 3:2 row proportions in 30 cm apart lines. The technology has potential to produce upto 350q green fodder (75.0 q dry matter) equivalent to 8.42 q crude protein per hectare. This recorded net monetary return of Rs 46000/ha with BC Ratio of 1.99.

K-17-AST-2: Standardization of seed production techniques in fodder Maize (Raipur)

Recommendation: For Chhattisgarh, planting of fodder maize at 75 cm x 20 cm planting geometry with application of 160 kg ha⁻¹ nitrogen is recommended for higher seed production. The technology produced higher seed yield (29.9q) with 135 q straw per hectare besides improvement in yield attributing parameters like plant height, no of cob per plant, cob length (cm), cob girth (cm), no of grain per cob and 100 seed weight. The technology also recorded high gross return (Rs 100650), net return (Rs 63529) and B:C Ratio (2.7).

General points

- In trial (K-18, AST-3: Bio-fortification of annual cereal fodder crops for enhancing Zink and Iron content) it was suggested to reduce foliar application of ZnSO₄ from 1% to 0.5% in treatment as 1% concentration creates scorching of leaves.
- Ranchi centre is recommended to be included in trial K-17 AST-2: Evaluation of fodder value of maize varieties as influenced by nitrogen levels and de-topping before physiological maturity.
- In trial K-18 AST-2: Studies on organic sources of nutrient on green forage yield and quality of rice bean-oat under irrigated situation, addition of PJTSAU, Hyderabad and RPCAU, Pusa Centres is proposed.
- In trial R-18-AST-7: Effect of intercropping on seed setting and seed yield in lucerne, it was suggested to replace Bajra crop by Fennel due to very slow growth of Bajra in *Rabi* season.
- It was proposed to initiate a new coordinated trial on Effect of organic amendment and its supplement on production and quality fodder maize from next Kharif season

The session ended with vote of thanks to the Chair.

**TECHNICAL SESSION IV C (CONCURRENT)
FORMULATION OF TECHNICAL PROGRAMME
FORAGE CROP PROTECTION**

Chairman	:	Dr. D. K. Banyal, Principal Scientist, CSKHPKV, Palampur
Rapporteurs	:	Drs. Ashlesha and Arabinda Dhal
Finalization of trials	:	Dr. N. R. Bhardwaj, PI (Crop Protection)

Crop Protection Scientists of the Forage group discussed in detail the results of the last *Rabi* season along with the ongoing technical programme. Scientists appraised the Chairman, regarding the results of last *Rabi* season along with the technical programme of *Rabi* 2019-20. Based on the discussion and suggestions made by the Chairman, the following recommendations emerged.

- The trial PPT-1 (Monitoring of diseases and insect pests in *Rabi* forage crops ecosystem) will continue as it is of continuous nature.
- The trial PPT-2 (Evaluation of *Rabi* breeding materials for their resistance to diseases and insect pests) will continue and one new center Hisar was also added.
- The trial PPT-17 (To study the pathogenic variability of *Bulmeria graminis* f. sp. *avenae* on oat), PPT-26 (Biological management of Oat aphid *Rhopalosiphum padi* on Oat) and PPT-30 (Biological management of powdery mildew of oats caused by *Blumeria graminis* f. sp. *avenae*) will also continue in the *Rabi* 2019-20.
- The trial PPT-31 (Eco-friendly pest management techniques in berseem ecosystem) will now be conducted at two centers i.e, Ludhiana and Rahuri.
- The trial PPT-32 (Validation of best treatment of trial entitled “Management of soil borne and powdery mildew diseases in red clover seed crop”) will be validated in larger plot at Palampur center.
- The trial PPT-34 (Integrated disease management in berseem) will continue as such in four locations (Jhansi, Ludhiana, Palampur and Bhubaneswar).

The trial PPT-33 was validated on large area and following recommendation emerged:

- At Ludhiana and Bhubaneswar, Seed treatment with carbendazim 50WP @ 2g/kg seed + foliar application of propiconazole 25 EC @ 1ml/lit after 21 days after sowing is recommended for management of foliar diseases in fodder Oat.

The meeting ended with vote of thanks to the Chair

TECHNICAL SESSION V

REVIEW OF CENTER WISE ACTIVITIES

Chairman	:	Dr. Dinesh Kumar, ADG (F&FC), ICAR
Convener	:	Dr. A.K. Roy, Project Coordinator
Rapporteurs	:	Dr. B. Murali & Dr. Birendra Prasad

The session started with the introductory remarks by the Chairman. Twenty two centers from five zones presented the highlights of the activities especially in house breeding, technologies developed, technologies in pipeline, outreach and HRD activities, publications etc. carried out by them in previous rabi season. Suitable advices were given during the presentation for further improvement.

The centers are as follows

- **Hill Zone:** CSK HPKV, Palampur
- **North West Zone:** PAU, Ludhiana; CCS HAU, Hisar; SKRAU, Bikaner; GBPUAT, Pantnagar
- **North East Zone:** BAU, Ranchi; NDUAT, Ayodhya; OUAT, Bhubaneswar; BCKV, Kalyani; RPCAU, Pusa; CAU, Imphal; AAU, Jorhat
- **Central Zone:** AAU, Anand; JNKVV, Jabalpur; IGKV, Raipur; BAIF, Uralikanchan; MPKV, Rahuri
- **South Zone:** TNAU, Coimbatore; PJTSAU, Hyderabad; KAU, Vellyani; UAS(B) ZRS Mandya

The following recommendations emerged after discussed.

- HPKV Palampur center was advised to screen and identify powdery mildew resistant genotypes in oat as it is the hot spot for the disease.
- All the scientists were advised to generate Breeder Seed demand from State departments for notified forage crop varieties
- SKRAU Bikaner center was advised to do exploration to enrich germplasm holding.
- Over all the presentations by centres were satisfactory.
- Centers were advised to send germplasm status report to Project coordinating unit within a month.

The session ended with thanks to the Chairman.

TECHNICAL SESSION VI

FTD & TSP FORMULATION

Chairman	:	Dr. A. K. Roy, Project Coordinator, AICRP on FC & U, IGFR
Convener	:	Dr. R. K. Agrawal, PS, AICRP on FC & U, IGFR
Rapporteurs	:	Dr. Maninder Kaur

At the outset, the chairman welcomed all the participants. Dr. R. K. Agrawal presented the status of FTD's allotted to AICRP (FC) centres for Rabi 2019-20. A total of 570 FTD's were allotted to 21 AICRP centres for Rabi crops. It included 90 FTDs to berseem, 60 to lucerne, 250 to oat (Single cut), 65 to oat (Multicut), 10 to cowpea, 95 to other crops viz., lathyrus, rye grass, guinea grass, bajra napier hybrid etc.

Crop-wise FTDs to be conducted during Rabi 2019-20

SN	Centre	Berseem	Lucerne	Oat (SC)	Oat (MC)	Cowpea	Other crops	Total
1.	AAU, Jorhat				20		Rye grass: 20, Lathyrus: 10	50
2.	OUAT, Bhubaneswar			10			Rye grass: 5	15
3.	BCKV, Kalyani	10		20			Lathyrus: 20	50
4.	BAU, Ranchi	25		25				50
5.	NDUAT, Faizabad			10				10
6.	JNKVV, Jabalpur	10		05				15
7.	AAU, Anand		10	10				20
8.	BAIF, Urulikanchan	05		15				20
9.	MPKV, Rahuri	10		10				20
10.	SKRAU, Bikaner		05	05				10
11.	PAU, Ludhiana			50				50
12.	CCS HAU, Hisar	15		10	05			30
13.	GBPUAT, Pantnagar	10			10			20
14.	TNAU, Coimbatore		05			05	Guinea grass: 05	15
15.	PJTSAU, Hyderabad		10	10				20
16.	ZRS, UAS (B), Mandya		30	45				75
17.	CSK HPKV, Palampur				20		Rye grass: 10	30
18.	KAU, Vellayani					05	BNH: 10, Guinea grass: 10	25
19.	IGKV, Raipur	05		05			Lathyrus: 05	15
20.	CAU, Imphal			10	10			10
21.	Pusa, Bihar			10				10
Total		90	60	250	65	10	95	570

The following decisions were taken regarding FTDs and TSP after the discussion:

- Minimum twenty demonstrations should be conducted on newly released varieties.
- All the centres should send result of the demonstrations along with beneficiaries' details.
- Efforts should be made to select new farmers and villages every year. The report along with good photograph and relevant data should be sent for compilation.
- Regarding TSP, it was suggested that beneficiaries should be selected preferably in 39 districts under TSP as identified by the Govt. of India. However on-going programme in other districts notified by Government of India may continue at lower scale.
- The centres should submit plan and budget required within a week. TSP progress report should be submitted every month by the centres in the given proforma.

The session ended with vote of thanks to the chair.

TECHNICAL SESSION VII

PGR/Breeding /production /protection issues

Chairman	:	Dr. Dinesh Kumar, ADG (FFC), ICAR
Convener	:	Dr A.K. Roy, Project Coordinator
Rapporteurs	:	Dr. S.K.Jha and Dr. R.C. Bairwa

The session started with the introductory remark by the chairman. In this session five presentations were made in different aspects *i.e.* NBPGR issues, forage pearl millet breeding programme, fodder production in Northern-East region and silage making procedure, forage seed chain.

1. Dr Anjali Kaul Kak, ICAR-NBPGR, New Delhi presented a talk on forage germplasm issues and future strategies. She informed that 5950 accessions on 235 species are available with NBPGR and detail procedure for allotment of accession number and registration of trait specific germplasm. She invited the scientist to participate in the field day to identify the forage type character in evaluation programme of NBPGR. Dr. A. K. Roy discussed the process to get accession number of vegetatively propagated material.
2. Dr. S. K. Gupta, ICRISAT, Hyderabad discussed on the topic "Genetic improvement of grain legumes and dry land cereals for improved adaptation, yield potential and quality traits". He presented the detail roadmap on forage pearl millet breeding programme. He offered pearl millet nurseries to interested Centre.
3. Dr. A. K. Mishra, IGFRI presented the details on silage fermentation, preservation and technique. He presented various steps, requirements and quality of silage.
4. Dr. Sunil Kumar, IGFRI, Jhansi presented on the topic "fodder production in North hill region". He presented present scenario, constraints and strategies along with possible forage production technologies for North Eastern hill region.
5. Dr. B. Koli, Director, RFS, Kalyani, DADH Govt. Of India presented activity of regional Fodder Station and their role in strengthening the fodder seed chain scenario.

During discussion following remarks will made:

- All should submit germplasm along with passport data to NBPGR for getting IC no.
- All Scientists should identify germplasm with unique traits and get its registered with NBPGR.
- Centre should take advantage of DNA finger printing facility offered by NBPGR for identified varieties
- Criteria of developing suitable silage type materials for Oats and maize should be developed.
- ICRISAT will communicate to IGFRI & AICRP forage about forage type pearl millet nursery.
- More active collaboration with RFS, DADH is needed.

The session ended with the vote of thanks to the chair.

TECHNICAL SESSION VIII

Scientific, Administrative and Financial issue

Chairman	:	Dr. Dinesh Kumar, ADG (FFC), ICAR
Convener	:	Dr. A. K. Roy, Project Coordinator (FCU)
Rapporteurs	:	Dr. Meenakshi Goyal, Dr. Naveen Kamboj

Scientists from different centres appraised the Chairman, regarding the Scientific, Administrative and Financial issue of the upcoming years. Suggestions were made by the Chairman and the following recommendations emerged.

Recommendations:

- Many centers raised the issue of enhancing the recurring contingency fund as the labour wages have increased and there is problem in meeting the experimental needs. It was informed that revised budget SFC is pending and the budget as per allocation will be provided.
- Centers were told to Generate Breeder seed demand of the newly released variety by approaching NDDB, Government & private agencies.
- All the centers were told to generate information about state wise area, production, productivity of different forage crops.
- The period of SFC 2017-2020 is ending in March 2020 and every centre should send their salient achievements for 3 years in bullet forms (3-4 pages) with good quality photographs.
- Each center should also prepare draft for the focus areas of research, targets, output, milestone for the next projected plan, 2020-25. The tentative financial and personnel demand should also be prepared. It should be ready by the end of October 2019.
- Regarding outreach activities under NEH, TSP, FTDs etc., all the centers should also record and report data on Horizontal Transmission.

The meeting ended with vote of thanks to the Chair

Proceedings of Varietal Identification Committee Meeting

The meeting of Varietal Identification Committee of AICRP on Forage Crops and Utilization was held under the Chairmanship of Dr Dinesh Kumar, Assistant Director General (Food and Fodder Crops), ICAR, New Delhi on 30-08-2019 at CAU, Imphal. Ten proposals in four crops were presented before the committee and after deliberations and discussions following decisions were taken.

Oat Single Cut entry OL-1869-1: The proposal was submitted by PAU Ludhiana for North West Zone and Central Zone. The committee considered the proposal and found that the entry has shown superiority for green fodder yield, dry matter yield, per day productivity and is moderately resistant to leaf blight. Therefore, it was identified for release in the states of Rajasthan, Haryana, Punjab, Terai region of Uttarakhand, Western Uttar Pradesh, Maharashtra, Gujarat, Madhya Pradesh and Chhattisgarh.

Oat Single Cut entry HFO-607: The proposal was submitted by CCS HAU, Hisar for North West Zone. The committee considered the proposal and found that the entry has shown superiority for green fodder yield, dry matter yield, per day productivity and is moderately resistant to leaf blight. Therefore, it was identified for release in the states of Rajasthan, Haryana, Punjab, Terai region of Uttarakhand and Western Uttar Pradesh.

Oat Single Cut entry OL-1861: The proposal was submitted by PAU, Ludhiana for all India. The committee considered the proposal and found that the entry has shown superiority for green fodder yield, dry matter yield, per day productivity. However committee observed that in Hill Zone it is susceptible to biotic stress especially powdery mildew. Therefore, it was identified for release in the all India except Hill Zone.

Lolium (annual Rye Grass) entry PBRG-2: The proposal was submitted by PAU, Ludhiana for Hill Zone and Punjab. The committee considered the proposal and found that the entry has shown superiority for green fodder yield, dry matter yield, per day productivity, crude protein yield. Therefore, it was identified for release in the states of Himachal Pradesh, Uttarakhand, Punjab and union territory of Jammu & Kashmir.

Lolium (annual Rye Grass) entry Palam Rye Grass-1: The proposal was submitted by CSK HPKV, Palampur for hill zone. The committee considered the proposal and found that the entry has shown superiority for green fodder yield, dry matter yield, seed yield, crude protein content, per day productivity, crude protein yield in hill zone and also Punjab. Therefore, it was identified for release in the states of Himachal Pradesh, Uttarakhand, Punjab and union territory of Jammu & Kashmir.

Vicia sativa entry JVS-1: The proposal was submitted by JNKVV, Jabalpur for central zone. The committee considered the proposal and found that since there is no variety in this crop and it has potential in limited irrigated condition, the best entry among the trial JVS-1 was identified for release in the states of Madhya Pradesh, Uttar Pradesh, Chhattisgarh and Maharashtra.

Perennial Lucerne entry Alamdar 51: The proposal was submitted by M/S Khoja Habib Mamad, Kutchh, Gujarat for North West Zone and South Zone. The committee considered the proposal and found that in North West Zone, sufficient data is not available about the perenniality of the crop. In South Zone it has performed well and shown superiority for green and dry matter yield, and at par with check for quality parameters like crude protein and dry matter digestibility. It was identified for release in the states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.

Perennial Lucerne entry TNLC 15 as Co-4: The proposal was submitted by TNAU, Coimbatore for South Zone. The committee considered the proposal and found that it has performed well and shown superiority for green and dry matter yield. It was also resistant to downy mildew, aphids and weevil. It was identified for release in the states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.

Perennial Lucerne entry DL-5: The proposal was submitted by IGFRI, Jhansi for South Zone. The committee considered the proposal and found that it has shown superiority to some extent for green and dry matter yield; however it was inferior to the qualifying entries. Hence the entry was not recommended for release.

Perennial Lucerne entry BAIF Lucerne -4: The proposal was submitted by BAIF Development Research Foundation, Urulikanchan, Pune for North West Zone, Central Zone and South Zone. The committee considered the proposal and found that in North West Zone, sufficient data is not available about the perenniality of the crop. The entry has not performed well in comparison to national checks and qualifying entries in South Zone and Central Zone. Hence the entry was not recommended for release.

**AICRP on Forage Crops and Utilization
Technical Programme Crop Improvement
Rabi 2019-20**

Annexure A

1. IVTB: Forage Berseem (New)

Entries	:	4+ 1 (NC) + 1 (ZC)
Entries	:	BM 14 (PAU, Ludhiana); HFB-16-1, HFB-16-10 (CCS HAU, Hisar); JB-07-15 (JNKVV, Jabalpur)
Checks	:	Wardan (NC), BL-22 (HZ), Bundel Berseem-2 (CZ & NWZ), Bundel Berseem-3 (NEZ)
Design	:	RBD with 4 replications
Plot size	:	3 m x 3 m accommodating 3m long 10 rows at 30 cm
Seed rate	:	25 Kg/ha (22 g per plot)
Fertilizers	:	N-20 Kg, P ₂ O ₅ 80 Kg/ha
Seed	:	2.0 Kg/entry & NC; BL-22 (HZ) – 0.5 kg; Bundel Berseem-2 (CZ & NWZ) -1.0 kg; Bundel Berseem-3 (NEZ) – 0.75 kg
Locations (20)	:	HZ- Palampur, Srinagar, Rajouri, Almora NWZ- Pantnagar, Bikaner, Hisar, Ludhiana, Udaipur, Meerut NEZ- Kalyani, Ranchi, Faizabad, Bhubaneswar, Pusa CZ- Jhansi, Rahuri, Jabalpur, Urulikanchan, Raipur

2. AVTB-1: Forage Berseem (HZ, NWZ and CZ)

Entries	:	5+ 1 (NC) +1 (ZC)
Entries	:	JHB 18-2, JHB-18-1 (IGFRI, Jhansi), JB-06-11 (JNKVV, Jabalpur), BM-12 (PAU, Ludhiana), HFB-15-5 (CCS HAU, Hisar)
Checks	:	Wardan (NC), BL-22 (HZ), BB-2 (NWZ, CZ)
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 10 rows at 30 cm
Seed rate	:	25 Kg/ha (30 g per plot)
Fertilizers	:	N-20 Kg, P ₂ O ₅ 80 Kg/ha
Seed	:	1.5 Kg/entry & NC; BL-22 (0.5 kg), BB-2 (NWZ, CZ) -1.5 kg
Locations (15)	:	HZ- Palampur, Srinagar, Rajouri; NWZ- Pantnagar, Bikaner, Hisar, Ludhiana, Udaipur, Meerut, Jalore; CZ- Jhansi, Rahuri, Jabalpur, Urulikanchan, Raipur

3. AVTB-2: Forage Berseem (NWZ and NEZ)

Entries	:	3+ 1 (NC) +1 (ZC)
Entries	:	JHB-17-1, JHB-17-2 (IGFRI, Jhansi), PC-91 (PAU, Ludhiana)
Checks	:	Wardan (NC), BB-2 (NWZ), BB-3 (NEZ)
Design	:	RBD with 4 replications
Plot size	:	4 m x 3 m accommodating 4m long 10 rows at 30 cm
Seed rate	:	25 Kg/ha (30 g per plot)
Fertilizers	:	N-20 Kg, P ₂ O ₅ 80 Kg/ha
Seed	:	1.7 Kg/entry & NC; BB-2 (1.0 kg), BB-3 (1.0 kg)
Locations (12)	:	NWZ- Pantnagar, Bikaner, Hisar, Ludhiana, Udaipur, Meerut, Jalore; NEZ- Kalyani, Ranchi, Faizabad, Bhubaneswar, Pusa

4. AVT-2 (Seed): Forage Berseem (NWZ and NEZ)

Entries	:	3 + 1 (NC) + 1 (ZC)
Entries	:	JHB 17-1, JHB-17-2 (IGFRI, Jhansi), PC-91 (PAU, Ludhiana)
Checks	:	Wardan (NC), BB-2 (NWZ), BB-3 (NEZ)
Design	:	RBD with 4 replications
Plot size	:	4 m x 3 m accommodating 4m long 10 rows at 30 cm
Seed rate	:	20 Kg/ha (24 g per plot)
Fertilizers	:	N-20 Kg, P ₂ O ₅ 80 Kg/ha
Seed	:	1.0 Kg/entry & NC; BB-2 (0.5 kg), BB-3 (0.5 kg)
Locations (6)	:	NWZ- Pantnagar, Hisar, Ludhiana NEZ- Kalyani, Ranchi, Bhubaneswar

5. IVTO: Forage Oat (single cut)

Entries	:	11 + 2 (NC) + 1 (ZC)
Entries	:	OL-1960, OL-1963 (PAU, Ludhiana); UPO-19-1 (GBPUAT, Pantnagar), RO-11-1-8, RO-11-1-12 (MPKV, Rahuri), NDO-1807 (NDUAT); JO-07-28 (JNKVV, Jabalpur); HFO-904, HFO-906 (CCS HAU, Hisar); SKO-243 (SKUAST-K); JHO-19-1 (IGFRI, Jhansi)
Checks	:	Kent, OS-6 (NC), OS-403 (NWZ, NEZ, SZ), SKO-96 (HZ), RO-11-1 (CZ)
Design	:	RBD with 3 replications
Plot size	:	3 m x 3 m accommodating 3 m long 10 rows at 30 cm
Seed rate	:	100 Kg/ha (90 g per plot)
Fertilizers	:	N- 80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	8.50 Kg/entry & NC; SKO-96 (1.0 kg), RO-11-1 (2.50 kg), OS-403 (6.0 kg)
Locations (29)	:	HZ -Palampur, Srinagar, Rajouri; NWZ -Bikaner, Hisar, Ludhiana, Pantnagar, Udaipur, Meerut; NEZ -Jorhat, Kalyani, Bhubaneswar, Ranchi, Pusa, Faizabad, Imphal; CZ -Jhansi, Rahuri, Urulikanchan, Palgarh, Anand, Jabalpur, Raipur, Dhari; SZ -Hyderabad, Tirupati/ Guntur, Mandya, Coimbatore (Ooty), Mattupetty

6. AVTO-1 (single cut): Forage Oat (HZ, CZ& SZ)

Entries	:	10 + 2 (NC) + 1 (ZC)
Entries	:	UPO-18-1 (GBPUAT, Pantnagar); HFO-806, HFO-818 (CCS HAU, Hisar); RO-11-1-3, RO-11-1-2 (MPKV, Rahuri); OL-1874-1, OL-1876-1 (PAU, Ludhiana); JO-06-23 (JNKVV, Jabalpur); SKO-241 (SKUAST-K, Srinagar), NDO-1802 (NDUAT, Ayodhya)
Checks	:	Kent, OS-6 (NC); SKO-96 (HZ), OS-403 (SZ), RO-11-1 (CZ)
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (120 g per plot)
Fertilizers	:	N- 80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	6.0 Kg/entry & NC; SKO-96 (1.5Kg), RO-11-1 (3.0Kg), OS-403 (2.0Kg)
Locations (15)	:	HZ -Palampur, Srinagar, Rajouri CZ -Jhansi, Rahuri, Urulikanchan, Palgarh, Anand, Jabalpur, Raipur SZ -Hyderabad, Tirupati/ Guntur, Mandya, Coimbatore (Ooty), Mattupetty

7. AVTO-2 (single cut):Forage Oat (HZ, NWZ and CZ)

Entries	:	5+ 2 (NC) + 1 (ZC)
Entries	:	SKO-240 (SKUAST, Srinagar); OL-1896 (PAU, Ludhiana); HFO-529, HFO-718 (CCS HAU, Hisar); JO-05-09 (JNKVV, Jabalpur)
Checks	:	Kent, OS-6 (NC); SKO-96 (HZ), JHO-2009-1 (CZ), RO-11-1(NWZ)
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (120 g per plot)
Fertilizers	:	N- 80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	7.0 Kg/entry & NC; SKO-96 (1.5Kg), RO-11-1 (3.0Kg), JHO-2009-1 (3.5Kg)
Locations (17)	:	HZ -Palampur, Srinagar, Rajouri; NWZ -Bikaner, Hisar, Ludhiana, Pantnagar, Udaipur, Meerut; CZ -Jhansi, Rahuri, Urulikanchan, Palgarh, Anand, Jabalpur, Raipur, Dhari

8. AVTO-2: (single cut) (Seed):Forage Oat (HZ, NWZ and CZ)

Entries	:	5+ 2 (NC) + 1 (ZC)
Entries	:	SKO-240 (SKUAST, Srinagar); OL-1896 (PAU, Ludhiana); HFO-529, HFO-718 (CCS HAU, Hisar); JO-05-09 (JNKVV, Jabalpur)
Checks	:	Kent, OS-6 (NC); SKO-96 (HZ), JHO-2009-1 (CZ), RO-11-1(NWZ)
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (120 g per plot)
Fertilizers	:	N- 80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	5.0 Kg/entry & NC; SKO-96 (1.00 Kg), RO-11-1 (1.50 Kg), JHO-2009-1 (2.50 Kg)
Locations (11)	:	HZ -Palampur, Srinagar, NWZ - Hisar, Ludhiana, Pantnagar, CZ -Jhansi, Rahuri, Urulikanchan, Anand, Jabalpur, Raipur

9. IVTO (Multi cut): Forage Oat (New)

Entries	:	7+ 2 (NC)
Entries	:	OL-1919, OL-1924 (PAU, Ludhiana); RO-11-1-13 (MPKV, Rahuri); JO-07-310 (JNKVV, Jabalpur); HFO-918, HFO-921 (CCS HAU, Hisar); PLP-24 (CSK HPKV, Palampur)
Checks	:	UPO-212 and RO-19 (NC)
Design	:	RBD with 3 replications
Plot size	:	3 m x 3 m accommodating 3 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (90 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	6.0 Kg/entry & national check
Locations (18)	:	HZ : Palampur, Srinagar, Almora NWZ : Pantnagar, Hisar, Jalore, Ludhiana NEZ : Ranchi, Pusa, Faizabad, Jorhat, Bhubaneswar, Imphal, CZ : Jhansi, Anand, Jabalpur, Rahuri, Uralikanchan

10. AVTO-1 (Multi cut): Forage Oat (NWZ and CZ)

Entries	:	3 + 2 (NC)
Entries	:	HFO-707, HFO-716 (CCS HAU, Hisar); OL-1882 (PAU, Ludhiana)
Checks	:	National checks: UPO-212 and RO-19
Design	:	RBD with 4 replications
Plot size	:	3 m x 3 m accommodating 3 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (90 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	4.0 Kg/entry & national check
Locations (9)	:	NWZ: Pantnagar, Hisar, Jalore, Ludhiana ; CZ: Jhansi, Anand, Jabalpur, Rahuri, Uralikanchan

11. AVTO-2 (Multi cut): Forage Oat (NWZ and CZ)

Entries	:	2 + 2 (NC)
Entries	:	OL-1874 (PAU, Ludhiana); JO-05-304 (JNKVV, Jabalpur)
Checks	:	UPO-212 and RO-19 (NC)
Design	:	4 m x 3 m accommodating 4 m long 12 rows at 25 cm
Plot size	:	RBD with 5 replications
Seed rate	:	100 Kg/ha (90 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	4.5 Kg/entry & national check
Locations (9)	:	NWZ: Pantnagar, Hisar, Jalore, Ludhiana; CZ: Jhansi, Anand, Jabalpur, Rahuri, Uralikanchan

12. AVTO-2 (Multi cut) (Seed): Forage Oat (NWZ and CZ)

Entries	:	2 + 2 (NC)
Entries	:	OL-1874 (PAU, Ludhiana); JO-05-304 (JNKVV, Jabalpur)
Checks	:	UPO-212 and RO-19 (NC)
Design	:	4 m x 3 m accommodating 4 m long 12 rows at 25 cm
Plot size	:	RBD with 5 replications
Seed rate	:	100 Kg/ha (90 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	4.0 Kg/entry & national check
Locations (8)	:	NWZ: Pantnagar, Hisar, Ludhiana; CZ: Jhansi, Anand, Jabalpur, Rahuri, Uralikanchan

13. IVTO (Dual): Forage Oat (New)

Entries	:	9 + 2 (NC)
Entries	:	OL-1934, OL-1954 (PAU, Ludhiana); RO-11-2-8, RO-11-1-13 (MPKV, Rahuri); JO-12-509 (JNKVV, Jabalpur); HFO-901, HFO-902 (CCS HAU, Hisar); JHO-19-2 (IGFRI, Jhansi); UPO-19-2 (GBPUAT, Pantnagar)
Checks	:	UPO-212 and JHO-822 (NC)
Design	:	3 m x 3 m accommodating 3 m long 12 rows at 25 cm
Plot size	:	RBD with 3 replications
Seed rate	:	100 Kg/ha (90 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	4.5 Kg/entry & national check
Locations (15)	:	NWZ- Bikaner, Hisar, Ludhiana, Pantnagar; NEZ- Jorhat, Bhubaneswar, Ranchi, Faizabad, Pusa; CZ- Jhansi, Rahuri, Uralikanchan, Anand, Jabalpur, Raipur

14. AVTO-1 (Dual): Forage Oat (NWZ, NEZ and CZ)

Entries	:	7 + 2 (NC)
Entries	:	RO-11-2-6, RO-11-2-2 (MPKV, Rahuri); OL-1766-2, OL-1874-2 (PAU, Ludhiana); JO-11-507 (JNKVV, Jabalpur); HFO-816 (CCS HAU, Hisar); JHO-18-3 (JNKVV, Jabalpur)
Checks	:	:UPO-212 and JHO-822 (NC)
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (120 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ 40 Kg/ha
Seed	:	5.5 Kg/entry & national check
Locations (14)	:	NWZ -Bikaner, Hisar, Ludhiana, Pantnagar; NEZ -Jorhat, Bhubaneswar, Ranchi, Faizabad; CZ -Jhansi, Rahuri, Uralikanchan, Anand, Jabalpur, Raipur

15. AVTO-2 (Dual): Forage Oat (NWZ, NEZ and CZ)

Entries	:	5 + 2 NC
Entries	:	OL-1876-2, OL-1906 (PAU, Ludhiana); HFO-611 (CCS HAU, Hisar); JHO-17-4 (IGFRI, Jhansi); JO-10-506 (JNKVV, Jabalpur)
Checks	:	National Check :UPO-212 and JHO-822
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 3 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (120 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	5.5 Kg/entry & national check
Locations (14)	:	NWZ -Bikaner, Hisar, Ludhiana, Pantnagar; NEZ -Jorhat, Bhubaneswar, Ranchi, Faizabad; CZ -Jhansi, Rahuri, Uralikanchan, Anand, Jabalpur, Raipur

16. AVTO-2 (Dual) Seed: Forage Oat (NWZ, NEZ and CZ)

Entries	:	5 + 2 (NC)
Entries	:	OL-1876-2, OL-1906 (PAU, Ludhiana); HFO-611 (CCS HAU, Hisar); JHO-17-4 (IGFRI, Jhansi); JO-10-506 (JNKVV, Jabalpur)
Checks	:	National Check :UPO-212 and JHO-822
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 3 m long 12 rows at 25 cm
Seed rate	:	100 Kg/ha (120 g per plot)
Fertilizers	:	N-80 Kg, P ₂ O ₅ -40 Kg/ha
Seed	:	4.0 Kg/entry & national check
Locations (9)	:	NWZ - Hisar, Ludhiana, Pantnagar; NEZ - Bhubaneswar, Ranchi; CZ -Jhansi, Rahuri, Uralikanchan, Jabalpur

17. IVT Lucerne: Annual Lucerne (New)

Entries	:	5 + 2 NC
Entries	:	Alamdar-1, Alamdar-21 (Alamdar Seed); AI-62, AI-66 (AAU, Anand); LLC-6 (PAU, Ludhiana)
Checks	:	Anand-2, RL-88
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 10 rows at 30 cm
Seed rate	:	25 kg/ha (30.0 g per plot)
Fertilizers	:	N-20kg, P ₂ O ₅ -80 kg/ha)
Seed	:	1.20 kg/entry & national check
Locations (11)	:	NWZ - Ludhiana, Bikaner, Jalore, Udaipur; CZ - Rahuri, Uralikanchan, Anand, SZ - Hyderabad, Coimbatore, Mandya, Dharwad

18. IVT Summer Bajra: (New)

Entries	:	4+ 3 NC
Entries	:	2 (SIRA seed); 1 (Advanta Seed), FBL-4 (PAU, Ludhiana)
Checks	:	National Check: Giant bajra, Moti bajra, BAIF Bajra 1
Design	:	RBD with 3 replications
Plot size	:	4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
Seed rate	:	12 Kg/ha (10 g per plot)
Fertilizers	:	N-40 Kg, P ₂ O ₅ -20 Kg/ha
Seed	:	400g/entry and 400 g for each national check
Locations (7)	:	CZ - Rahuri, Uralikanchan, Anand, Jabalpur SZ -Hyderabad, Bangalore, Vellayani

19. AVT-1 Summer Bajra: CZ

Entries	:	3 + 3 (NC)
Entries	:	Bajra-5, BAIF Bajra-6 (BAIF, Uralikanchan); TSFB-18-1 (PJ TSAU, Hyderabad)
Checks	:	National Check: Giant bajra, Moti bajra,BAIF Bajra 1
Design	:	RBD with 4 replications
Plot size	:	4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
Seed rate	:	12 Kg/ha (10 g per plot)
Fertilizers	:	N-40 Kg, P ₂ O ₅ -20 Kg/ha
Seed	:	300g/entry and 300 g for each national check
Locations (4)	:	CZ - Rahuri, Uralikanchan, Anand, Jabalpur

20. AVT-2: Summer Bajra (CZ and SZ)

Entries	:	3+ 3 (NC)
Entries	:	HTBH-4902, ADV0061, AFB-37
Checks	:	National Check: Giant Bajra, Moti Bajra, Raj Bajra
Design	:	RBD with 4 replications
Plot size	:	4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
Seed rate	:	12 Kg/ha (10 g per plot)
Fertilizers	:	N-40 Kg, P ₂ O ₅ -20 Kg/ha
Seed	:	400g/entry and 400 g for each national check
Locations (7)	:	CZ - Rahuri, Uralikanchan, Anand, Jabalpur SZ -Hyderabad, Bangalore, Vellayani

21. AVT-2 (Seed): Summer Bajra (CZ and SZ)

Entries	:	3+ 3 (NC)
Entries	:	HTBH-4902, ADV0061, AFB-37
Checks	:	National Check: Giant Bajra, Moti Bajra, Raj Bajra
Design	:	RBD with 4 replications
Plot size	:	4 m x 1.8 m accommodating 4 m long 6 rows at 30 cm
Seed rate	:	12 Kg/ha (10 g per plot)
Fertilizers	:	N-40 Kg, P ₂ O ₅ -20 Kg/ha
Seed	:	400g/entry and 400 g for each national check
Locations (7)	:	CZ- Rahuri, Uralikanchan, Anand, Jabalpur SZ- Hyderabad, Bangalore, Vellayani

22. IVT-Lathyrus: (New)

Entries	:	5 + 3 (NC)
Entries	:	KL-5 (BCKV, Kalyani); JCL-19-1, JCL-19-2, JCL 19-3, JCL-19-4 (AAU, Jorhat)
Checks	:	National Check: Ratan, Mahateora, Prateek
Design	:	RBD with 3 replications
Plot size	:	3m x 3 m accommodating 3 m long 10 rows at 30 cm
Seed rate	:	36.0 g per plot (Approx. 40 kg/ha)
Fertilizers	:	N-20kg, P ₂ O ₅ -40 kg/ha
Seed	:	1.00 kg/entry from each contributor; 1.00 kg for each national check
Locations (7)	:	Jorhat, Kalyani, Ranchi, Pusa, Jhansi, Jabalpur, Raipur

CHARACTERS TO BE OBSERVED

(A) GENERAL: FOR EACH TRIAL

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

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

Note:

1. Green fodder yield data to be recorded at 50% flowering stage in single cut trials.
2. For multi cut perennial crops it has to be recorded as per local agronomic practice (first cut at 50 days, subsequent cuts at 40 days).
3. All Kharif trials except seed trials are to be conducted strictly under rain-fed conditions.

(B) Yield conversion Factor:

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

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

- (C) 1. The Centres are expected to provide experimental details as per format given herewith.
 2. Each Centre must communicate trials at a glance as per columns given below:

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

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

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

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

Mean = _____
 SE (m) ± = _____
 CD at 5% = _____
 CV% = _____

Note:

1. Data for each character and trial must be provided in separate sheet.
2. For green fodder and dry matter yield, data for all the cuts taken must be provided replication-wise in the format. A Table showing summation over the cuts replication-wise is also required. For other characters, such as plant height, etc. average of cuts taken must be provided.
3. Please also provide data cut-wise in case of multicut entries as per data sheet given separately.
4. For quality parameters, data for crude protein (%) and crude protein yield (q/ha) must be supplied replication-wise for one cut only & for second cut in multicut crops. For IVDMD, NDF & ADF, a composite sample of all the replications may hold good for the cut specified above.

WORKING SCHEDULE FOR Rabi-2019-20

1. Seed supply from contributors to PC Unit, Jhansi: Before September 25, 2019
2. Trials seed dispatch from PC Unit Jhansi: Before October 20, 2019
3. Trials sowing report to PC (FC): Within 7 days of sowing
4. Information on trials failure, etc. be communicated immediately to PC (FC) through the Director of Research/ Director ICAR Institute
5. Submission of *Rabi* trials analyzed data (except seed and quality traits) before March 31, 2020; however, data on seed and quality are to be submitted before May 30, 2020.
6. Reporting of Breeder seed (BSP-IV): June 15, 2020.

Seed Requirement of the Check Varieties and entries for Kharif 2019 Trials

Seed should be dispatched by speed post / TCI Express to reach Jhansi before 30th April, 2018. Seeds must be untreated. Any colour, chemical etc. must not be used for seeds. Please do not send rooted slips of BN hybrid. Date for this will be communicated later.

For breeding trials, seed of the check varieties and test entries are to be supplied by the concerned scientists/ center so as to reach PC (FC&U) before September 25, 2019.

SN	Crop & Variety	Quantity Required (in Kg)	Seed Source
1.	Berseem		
	Wardan	2.0 (IVT)+1.5 (AVT-1)+1.7 (AVT-2)+ seed-1.0+1.8 kg for agronomy = 8.0 kg	Dr. Vijay Yadav, Head Seed Tech Div., IGFR, Jhansi
	Bundel Berseem-2	1.0 (IVT)+1.5 (AVT-1)+ 1.0 (AVT-2)+ seed-0.5+1.0 kg for agronomy = 5.0 kg	
	Bundel Berseem-3	0.75 (IVT)+1.0 (AVT-2)+seed-0.5+1.0 kg for agronomy = 3.25 kg	
	BL-22	0.5 (IVT)+0.5 (AVT-1) = 1.0 kg	Dr Rahul Kapoor, PAU, Ludhiana
	IVT entries	2.0 kg	Respective breeders
	AVT-1 entries	1.5 kg	Respective breeders
AVT-2 entries	1.7 (breeding) + 1.0 (seed) + 1.8 (agronomy) = 4.5Kg	Respective breeders	
2.	Oat		
	Kent	8.5 (IVT SC) +6.0 (AVT SC-1) + 7.0 (AVT-SC-2) + 5.0 (AVT-SC-2 seed) + 11.5 (agron) = 38.0 kg	Dr. Vijay Yadav, Head Seed Tech Div, IGFR, Jhansi
	JHO-2009-1	3.5 (AVT SC-2) +2.5 (AVT2-SC-2 seed)+ 4.2 (agron) = 10.2 kg	
	JHO-822	4.5 (IVTO-D) + 5.5 (AVT-1-D)+ 5.5 (AVT-2-D)+ 4.0 (AVT-2-D seed)+ 11.5 (agron) = 31.0 kg	
	OS-6	8.5 (IVTO SC) +6.0 (AVT SC-1) + 7.0 (AVT-SC-2) + 5.0 (AVT2-SC-2 seed) + 11.5 (agron) = 38.0 kg	Dr. D. S. Phogat, CCS HAU, Hisar
	OS-403	6.0 (IVTO SC) + 2.0 (AVTO SC-1)+ = 8.0 kg	
	SKO-96	1.0 (IVTO SC) + 1.5 (AVTO SC-1) + 1.5 (AVT-SC-2)+ 1.0 (AVTO SC-2-seed)+ 3.0 (agron) = 8.0 kg	Dr. Salim Khuroo, SKUAST, Srinagar
	UPO-212	6.0 (IVT MC) + 4.0 (AVT-1 MC) + 4.5 (AVT-2 MC)+ 4.0 (AVT-2 MC seed)+ 7.0 (agron)+ 4.5 (IVTO-D) + 5.5 (AVT-1-D)+ 5.5 (AVT-2-D) + 4.0 (AVT-2-D seed)+ 11.5 (agron) = 56.5 kg	DR M S Pal/ Dr Birendra Prasad GBPUA&T, Pantnagar
	RO-19	6.0 (IVT MC) + 4.0 (AVT-1 MC)+ 4.5 (AVT-2 MC)+ 4.0 (AVT-2 MC seed)+ 7.0 (agron)= 25.5 kg	Dr. P. P. Surana MPKV, Rahuri
	RO-11-1	2.5 (IVTO SC) + 3.0 (AVTO SC-1) + 3.0 (AVT-SC-2)+1.5 (AVTO SC-2-seed)+ 4.2 (agron) = 14.2 kg	
	IVT entries - SC	8.5 kg	Respective breeders
	AVT-1 entries-SC	6.0kg	Respective breeders
	AVT-2 entries-SC	7.0 (breeding) + 5.0 (seed) + 11.5 (agronomy) = 23.5Kg	Respective breeders
	IVT entries - MC	6.0 Kg	Respective breeders

AVT-1 entries - MC	4.0Kg	Respective breeders
AVT-2 entries - MC	4.5 (breeding) + 4.0 (seed) +7.0 (agronomy) = 15.5 Kg	Respective breeders
IVT entries - Dual	4.5Kg	Respective breeders
AVT-1 entries-Dual	5.5Kg	Respective breeders
AVT-2 entries-Dual	5.5 (breeding) + 4.0 (seed) + 11.5 (agronomy) = 21 Kg	Respective breeders
Lucerne (annual)		
Anand-2	1.25 (IVT)= 1.25 kg	Dr. D P Gohil, AAU, Anand
RL-88	1.25 (IVT)= 1.25 kg	Dr P P Surana, MPKV, Rahuri
IVT entries	1.25 (IVT)= 1.25 kg	Respective breeders
Summer Bajra		
Giant bajra	0.4 (IVT)+ 0.3 (AVT-1) +0.4 (AVT-2) +0.4 (AVT-2 seed) + 0.9 (agronomy) = 2.4 Kg	Dr P P Surana, MPKV, Rahuri
Moti bajra	0.4 (IVT) +0.3 (AVT-1) +0.4 (AVT-2) +0.4 (AVT-2 seed)) + 0.9 (agronomy) = 2.4 kg	Dr T. Shashikala, PJTSAU, Hyderabad
BAIF Bajra-1	0.4 (IVT)+ 0.3 (AVT-1)= 0.7 Kg	Dr P Takawale, BAIF, Uralikanchan
Raj bajra	0.4 (AVT-2) +0.4 (AVT-2 seed)) + 0.9 (agro) = 1.7 Kg	SKRAU, Bikaner
IVT entries	0.4 Kg	Respective breeders
AVT-1 entries	0.3 Kg	Respective breeders
AVT-2 entries	0.4 (breeding)+ 0.4 (seed)+ 0.9 (agronomy)= 1.7 Kg	Respective breeders
Lathyrus		
Control	Nirmal/Ratan, Mahateora, Prateek	BCKV/AAU/MuLLARP
VT	1.2 kg	Respective breeders

**AICRP on Forage Crops and Utilization
Technical Programme- Forage Crop Production
Rabi 2019-20**

R-19 AST 1: Effect of cutting and splitting of nitrogen doses on growth, yield and quality of fodder oat cultivars.

Locations (3): Raipur, Ranchi, Ayodhya	Data Reporting: Rabi
Year of Start: Rabi 2019-20	Concluding Year: Rabi 2019-20

Treatment details:

Main plot: Variety	Sub plot: Cutting management & Splitting of nitrogen doses
V ₁ : RO-19	▪ Two cut + 60% Basal+40% at 1 st cut
V ₂ : JHO-851	▪ Two cut + 50% Basal+50% at 1 st cut
V ₃ : UPO-212	▪ Three cut + 50% Basal+25% at 1 st cut+25% at 2nd cut
	▪ Three cut + 40% Basal+30% at 1 st cut+30% at 2nd cut

Two cut -1st cut at 50DAS +2nd cut at 50% flowering

Three cut -1st cut 50DAS+2nd cut 35 days after 1st cut+3rd cut 50% flowering

Technical program

Season	: Rabi	Design	: Split plot
Treatment	: 12	No. of factors	: 2
Replications	: 3	Gross plot size	: 4x3m
Total no. of plots	: 36		
Fertilizer Details	: 140 N: 60 P ₂ O ₅ and 40 K ₂ O kg ha ⁻¹	Cutting (Stubble) height	: 10 cm from ground level

Observations to be recorded:

Crop studies

- Plant height at each cut
- Number of shoots (tiller) before cutting (per m row length)
- No. of leaves before cutting (per m row length)
- Days to 50% flowering
- Leaf : stem ratio at each cut

Yield study

- Green fodder yield at each cut & total -q/ha
- Dry matter yield at each cut & total -q/ha
- Crude protein yield at each cut & total -q/ha
- Dry matter content at each cut & total -q/ha
- Crude protein content at each cut & total -q/ha
- Per day productivity (Green & Dry fodder-q/ha)

Economics

- Cost of cultivation (Rs. ha⁻¹)
- Gross monetary return (Rs. ha⁻¹)
- Net monetary returns (Rs. ha⁻¹)
- B:C ratio (Rs./Re)

R-19 AST 2: Effect of different potassic fertilizer sources on green fodder production and quality of fodder maize

Locations (2): Anand, Hyderabad	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi 2019</i>	Concluding Year: <i>Rabi 2021</i>

Technical programme

Treatment details:

T ₁	Control (Only N and P applied)
T ₂	1% schoenite foliar spray (at 30 and 45 DAS)
T ₃	100 % RDK through KCL
T ₄	100 % RDK through KCL + 1 % schoenite foliar spray (at 30 and 45 DAS)
T ₅	75 % RDK through KCL + 1 % schoenite foliar spray (at 30 and 45 DAS)
T ₆	100 % RDK through K ₂ So ₄
T ₇	100 % RDK through K ₂ So ₄ + 1 % schoenite foliar spray (at 30 and 45 DAS)
T ₈	75 % RDK through K ₂ So ₄ + 1 % schoenite foliar spray (at 30 and 45 DAS)
T ₉	100 % RDK through potassium schoenite
T ₁₀	100 % RDK through potassium schoenite + 1% schoenite foliar spray (at 30 and 45 DAS)
T ₁₁	75 % RDK through potassium schoenite + 1 % schoenite foliar spray (at 30 and 45 DAS)

Note:

- Foliar application: 100g schoenite / dissolved in 10 l of water applied at 30 and 45 DAS.
- Soil application: 124.0 kg schoenite per ha.
- Remaining nutrients except potassium will be applied as per recommendation

Experimental details:

Recommended Fertilizers dose		90:40:40 kg NPK /ha	
Spacing	: 30 cm X 10 cm	Replication & Design	: 4 RBD
Plot size	: 4.20 m X 6.00 m (Gross)	Treatment combinations	: 11
Duration	: 3 years	Year of start	: <i>Rabi-2019</i>
Seed rate	: 75 kg ha ⁻¹	Crop and variety	: <i>Maize African tall</i>

Observations to be recorded:

- Plant population in meter row length
- Periodical plant height (at 30, 45 DAS and at harvest)
- No of leaves per plant (at 30, 45 DAS and at harvest)
- Green fodder yield (q/ha)
- CP, CF and DM in plant at harvest
- K content and uptake in plant at harvest
- Net returns and B:C ratio

R-19 AST 3: Fodder productivity of Moringa (*Moringa oleifera*) as influenced by planting geometry, nitrogen nutrition and cutting regimes

Locations (6): Raipur, Ranchi, Hyderabad, Mandya, Dharwad and Pusa).	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi 2019 -20</i>	Concluding Year: <i>Rabi 2020-21</i>

Treatment details:

I. Planting geometry	II. Nitrogen doses	III. Cutting regimes
i. 22.5 cm x 15 cm	i. 100 kg N/ha/annum	i. 45 days interval
ii. 30 cm x 30 cm	ii. 150 kg/ha/annum	ii. 60 days interval
iii. 45 cm x 30 cm		iii. 75 days interval

Experimental Design: Factorial RBD

Plot size: 4 m x 3.6 m

Total no. plots: 54 plots

Notes:

- The *Moringa* variety which is more popular in the region may be used
- The saplings may be raised in the polythene packets and 1 month old saplings may be transplanted as per the geometry in the experimental field
- An uniform dose of 10 t/ha of FYM may be given to the experimental field along with final land preparation before layout
- A basal dose of 20% N as per doses and 100% phosphorus (75 kg P₂O₅)+100 potassium (50 kg K₂O) may be applied at the time of transplanting
- A general cut in all the geometries may be given at 45 days after transplanting for uniformity at 60 cm height and thereafter the cutting regimes may be followed at 60 cm height
- The remaining dose of 80% N as per the doses may be given in equal splits after each cut in all the cutting regimes viz. 8 splits in 45 days cutting regime; 6 splits in 60 days cutting regime and 4 splits in 75 days cutting regime

Observations to be recorded:

- Initial status of organic carbon content, available N, P and K in soil
- Height of the fresh grown plant above 60 cm (uniform basal cut height)
- GFY /plant & DFY /plant
- GFY /ha & DFY /ha
- Crude fiber content (%) and yield (q/ha)
- Crude protein content (%) and yield (q/ha)
- Status of organic carbon content, available N, P and K after each year in soil
- Gross expenditure, net return, B:C ratio.

R-19 AST 4: Screening of herbicides for control of *Cuscuta* in Lucerne crop.

Locations (5): Bikaner, Jhansi, Mandya, Coimbatore and Rahuri	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi</i> 2019 -20	Concluding Year: <i>Rabi</i> 2019-20

Objectives:

- To screen effective herbicide for control of cuscuta in lucerne crop.
- To find out effect of herbicides on crops.
- To see the effect of herbicides on other weeds.

Treatment details:

T ₁	Pendimethalin 0.75 kg ha ⁻¹ (Pre-emergence)
T ₂	Diclosulam 20 g ha ⁻¹ (Pre-emergence)
T ₃	Diclosulam 30 g ha ⁻¹ (Pre-emergence)
T ₄	Diclosulam 30 g ha ⁻¹ (Post emergence After each cut)
T ₅	Fenoxaprop 50g ha ⁻¹ (Post emergence at 40-45 DAS)
T ₆	Imazethapyr 50 g ha ⁻¹ (Post emergence at 25 DAS)
T ₇	Imazethapyr 100 g ha ⁻¹ (Post emergence After each cut)
T ₈	Imazethapyr + pendimethalin (Ready mixer) 0.70 kg ha ⁻¹ (Pre-emergence)
T ₉	Imazethapyr + pendimethalin (Ready mixer) 0.90 kg ha ⁻¹ (Pre-emergence)
T ₁₀	Imazethapyr + Imazamox 75 g ha ⁻¹ (Post emergence at 40-45 DAS)
T ₁₁	Paraquat 100 g ha ⁻¹ (Post emergence After each cut)
T ₁₂	Weed free
T ₁₃	Weedy check

Design : RBD

Replications : Three

Plot size : 3.0 m x 3.0 m (9.0 m²)

Crop : Lucerne

Cutting management: one cut at 50-55DAS, 2nd cut at 30 days after first cut and harvest.

Duration : One year

Observations to be recorded

- Fresh and dry weight of *Cuscuta* and other weeds at 40, 80, 120 DAS and at harvest
- Days to germination of *Cuscuta* after sowing of crop
- Plant height at each cut and harvest of Lucerne
- Fresh and dry weight of Lucerne at 1st cut and at harvest of Lucerne (kg ha⁻¹)
- Seed yield (kg ha⁻¹)
- Economics (Cost of cultivation, Gross return, Net return and B:C ratio)

Location specific trials

R-19 AST 5: Standardization of Magnesium nutrition in Bajra Napier Hybrid

Location (1): Vellayani	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi</i> 2019 -20	Period : 3 years

Objective:-To assess the impact of varying doses and frequency of application of MgSO₄ on the growth, yield and quality attributes of hybrid Napier.

Crop	:	Bajra Napier hybrid	Variety	:	Suguna
Design	:	Factorial RBD	Replications	:	3
Plot size	:	4 x 4m	Period	:	3 years

Treatment details:

MgSO ₄ levels (M)- 3	Frequency of Application (F)-3
M ₁ - 80 kg/ha	F ₁ - 2 (once in 6 months)
M ₂ - 100 kg/ha	F ₂ - 3 (once in 4 months)
M ₃ - 120 kg/ha	F ₃ - 4 (once in 3 months)

The crop will be raised as per the POP recommendations of KAU, Vellayani (25 t/ha FYM and 200:50:50 kg/ha NPK spitted in 7 each applied after cut- 7)

Observations to be recorded

1. Growth and Yield attributes

- Plant height at each harvest (cm)
- Leaf: stem ratio at each harvest
- Number of tillers per hill at each harvest
- Green fodder yield (t/ha)
- Dry fodder yield (t/ha)

2. Quality characters

- Crude protein content (%)
- Crude fibre content (%)

3. Nutrient Analysis

- Soil analysis:- pH, EC, Organic carbon, Mg, and NPK status before and after the conduct of the experiment
- Plant analysis:- N,P,K, Mg

4. Economics of cultivation

- Benefit: cost ratio

AVT Based trials

R-19 AST 6: Effect of P levels on forage yield of promising entries of Berseem (AVTB2-MC)

Location (6): NWZ- Pantnagar, Hisar, Ludhiana, NEZ- Ranchi, Ayodhya, Pusa	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi</i> 2019 -20	Concluding Year: <i>Rabi</i> 2019-20

Objective:

To study the response of phosphorus levels on yield and quality of promising entries of Berseem

Technical programme

Treatments:

Main plot: Entries (5)	JHB-17-1, JHB-17-2, PC-91, Wardan (NC) BB-2 (NWZ), BB-3 (NEZ)
Sub plot: P₂O₅-levels (3)	60, 80 and 100 Kg /ha

Entries No.	:	3+ 1 (NC) +1 (ZC)
Entries Name	:	JHB-17-1, JHB-17-2 (IGFRI, Jhansi), PC-91
Checks	:	National Checks: Wardan (NC) Zonal Checks: BB-2 (NWZ), BB-3 (NEZ)
Design	:	Split plot
Replications	:	Three
Plot size	:	4 m x 3 m
Seed rate	:	30 g per plot (approx. 25 Kg/ha)
Spacing	:	Row to row-30
Treatment Combinations	:	5x 3=15
Total plots	:	5x3x3=45
Fertilizer	:	20 Kg N/ha as basal
Seed requirement	:	270g/entry/location
Entry	:	1.7 Kg/entry from each contributor
Zonal checks	:	900 g /ZC
National check	:	1.70 kg /check

Observations to be recorded

- Plant population/ m row length
- Growth parameters (Plant height and Leaf: stem ratio)
- Green fodder, dry matter and crude protein yield (q/ha)
- Dry matter and crude protein content
- Per day productivity (Green fodder, dry fodder)

Note: 1st Cut has to be taken at 60 Days after sowings

R-19 AST 7: Effect of N levels on forage yield of promising entries of single cut oat (AVT-2 SC)

Location (8): HZ-Palampur, Srinagar, NWZ- Hisar, Ludhiana, Pantnagar, CZ- Urulikanchan, Anand, Raipur,	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi</i> 2019 -20	Concluding Year: <i>Rabi</i> 2019-20

Objective: To study the response of nitrogen fertilizer on yield and quality of promising entries of oat under single cut system.

Treatment details:

Main plot: Total Entries (8)	5+ 2 (NC) + 1 (ZC)
Sub plot: N- levels: 4	30,60,90, and 120 kg N /ha (Split application of nitrogen- 60% as basal +40 at 40 DAS)

Entries No.	:	5+ 2 (NC) + 1 (ZC)
Entries Name	:	SKO-240 (SKUAST, Srinagar); OL-1896 (PAU, Ludhiana); HFO-529, HFO-718 (CCS HAU, Hisar); JO-05-09 (JNKVV, Jabalpur)
Checks	:	National Checks: Kent, OS-6; Zonal Checks: SKO-96 (HZ), JHO-2009-1 (CZ), RO-11-1 (NWZ)
Design & Replications	:	Split plot - Three
Plot size:	:	4 m x 3 m
Seed rate:	:	120 g/plot (100 kg/ha)
Treatments Combinations	:	8x 4=32
Total plots	:	8x4x3=96
Fertilizer	:	P ₂ O ₅ -40 Kg/ha basal
Spacing	:	R x R-25 cm
Seed requirement	:	1.44 kg/entry/location
Entry	:	11.5 Kg/entry from each contributor
Zonal checks : SKO-96 (HZ)	:	3.0 kg Kg/ZC
Zonal checks : JHO-2009-1 (CZ), RO-11-1 (NWZ))	:	4.20 kg /ZC
National check	:	11.5 Kg/NC

Observations to be recorded:

- Tiller number /m row,
- Growth parameters (Plant height (cm) and leaf: stem ratio)
- Green fodder, dry fodder yields (q/ha)
- Crude protein content (%) and CP yield (q/ha)
- Per day productivity (Green fodder, dry fodder)

R-19 AST 8: Effect of N levels on forage yield of promising entries of Multi cut oat (AVT-2 MC)

Objective: To study the response of nitrogen fertilizer on yield and quality of promising entries of oat under multi cut system.

Location (5): NWZ: Pantnagar, Hisar, Ludhiana CZ: Anand, Rahuri,	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi 2019 -20</i>	Concluding Year: <i>Rabi 2019-20</i>

Treatment details:

Main plot: Entries (4)	2 + 2 (NC)
Sub plot: N- levels (4)	35,70,105, and 140 kg N /ha (Split application of nitrogen- 50% as basal + 25% at 40 DAS+25% after 1 st cut)

Entries No.	:	2 + 2 (NC)
Entries Name	:	OL-1874 (PAU, Ludhiana); JO-05-304 (JNKVV, Jabalpur)
Checks	:	National Check: UPO-212 and RO-19
Design	:	RBD
Replications	:	Three
Plot size	:	4 m x 3 m
Seed rate	:	120 g/plot (100 kg/ha)
Treatments	:	Combinations: 4X 4=16
Total plots	:	4X4X3=48
Fertilizer	:	P ₂ O ₅ -40 Kg/ha basal
Spacing	:	R x R-25 cm
Seed Requirement	:	1.44 kg/entry/location
Entry & National check	:	7.0 Kg/entry or check

Observations to be recorded:

- Tiller number /m row,
- Growth parameters (Plant height (cm) and leaf: stem ratio)
- Green fodder, dry fodder yields (q/ha)
- Crude protein content (%) and CP yield (q/ha)
- Per day productivity (Green fodder, dry fodder)

R-19 AST 9: Effect of N levels on forage yield of promising entries of Dual cut oat (AVT-2 Dual cut)

Objective: To study the response of nitrogen fertilizer on yield and quality of promising entries of oat under dual cut system.

Location (8): NWZ- Ludhiana, Pantnagar; NEZ-Jorhat, Ranchi, Ayodhya; CZ- Uralikanchan, Anand, Raipur	Data reporting: <i>Rabi</i>
Year of Start: <i>Rabi 2019 -20</i>	Concluding Year: <i>Rabi 2019-20</i>

Treatment details:

Main plot: Entries (4)	5+ 2 (NC)
Sub plot: N- levels (4)	35,70,105, and 140 kg N /ha (Split application of nitrogen- 50% as basal + 25% at 40 DAS+25% after 1 st cut)

Entries No.	:	5+ 2 (NC)
Entries Name	:	OL-1876-2, OL-1906 (PAU, Ludhiana); HFO-611 (CCS HAU, Hisar); JHO-17-4 (IGFRI, Jhansi) JO-10-506 (JNKVV, Jabalpur)
Checks	:	National Check: UPO-212 and JHO-822
Design	:	RBD
Replications	:	Three
Plot size	:	4 m x 3 m
Seed rate	:	120 g/plot (100 kg/ha)
Treatments	:	Combinations: 7x 4=28
Total plots	:	7x4x3=84
Fertilizer	:	P ₂ O ₅ -40 Kg/ha basal
Spacing	:	R x R-25 cm
Seed Requirement	:	1.44 kg/entry/location
Entry & National check	:	11.5 Kg/entry or check

Observations to be recorded:

- Tiller number /m row,
- Growth parameters (Plant height (cm) and leaf: stem ratio)
- Green fodder, dry fodder yields (q/ha)
- Crude protein content (%) and CP yield (q/ha)
- Per day productivity (Green fodder, dry fodder)

R-19 AST 10: Second Advanced Varietal Trial in Forage Pearl millet (AVTPM-2-1 Agronomy)

Objective: To study the response of nitrogen fertilizer on yield and quality of promising entries of forage pearl millet under summer sown multi cut system.

Locations (5) CZ- Rahuri, Anand, Jabalpur SZ-Hyderabad, Bangalore	Data Reporting : Summer 2020
Year of Start: 2020 (1 year)	Concluding Year: Summer 2020

Treatment details:

Main plot: Entries (6)	3+ 3 (NC)
Sub plot: N- levels (4)	0, 40, 80 and 120kg/ha N /ha (Split application of nitrogen- 50% as basal + 50% at 40 DAS)

Total Entries No. (6)	:	3+ 3 (NC)
Entries Name	:	HTBH-4902, ADV0061, AFB-37
Checks	:	Giant Bajra, Moti Bajra, Raj Bajra
N Levels	:	Four (0, 40, 80, 120kg/ha)
Design	:	RBD with 3 replications
Plot size	:	4 m x 3 m accommodating 4 m long 10 rows at 30 cm
Seed rate	:	12 kg/ha (15g/plot)
Fertilizers	:	40:40 kg/ha (P:K) basal
Total plots	:	6x4x3 = 72
Seed requirement /Centre	:	180g /location
Seed requirement	:	900 g for entry and NC both

Observations to be recorded:

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

On- Going trials

S N	Trial Name	Title of trial	Location	Season/ Year	Concluding Year
1	PS-14-AST-4	Studies on the effect of planting geometry of tall fescue grass and seed rates of white clover in wet temperate conditions	Palampur and Srinagar	Rabi	Rabi-2019-20
3	K-15-AST-11 C	Studies on carbon sequestration in perennial grass based cropping systems	Hyderabad, Coimbatore, Vellayani, Ranchi, Jabalpur	Rabi	Rabi-2019-20
4	K-15-AST-12 C	Studies on the productivity and carbon sequestration of silvipastoral systems in hills of north western Himalayas	Palampur and Srinagar	Rabi	Rabi-2019-20
5	K-16-AST-1	Feasibility of Hydroponics fodder production system- A Quantitative and Qualitative study	Mandya, Ludhiana	Rabi	Rabi-2019-20
6	R-16-AST-2	Enhancing seed setting in Lucerne through foliar spray	Coimbatore, Ludhiana, Hyderabad, Bikaner, Anand	Rabi	Rabi-2018-19
7	K-16-AST-6	Organic nutrient management in sorghum-berseem cropping sequence for sustainable fodder production	Hisar	Rabi	Rabi-2021
8	K-16-AST-8	Resource management in rice-oat cropping system under sodic soils	Faizabad	Rabi	Rabi-2019-20
9	R-18-AST-8	Feasibility studies of growing different oat (<i>Avena sativa</i> L.) cultivars s fodder crop on hilly terraces of Nagaland under rainfed conditions	Nagaland University, Medziphema	Rabi	Rabi-2019-20
10	R-18-AST-7	Effect of intercropping on seed setting and seed yield in Lucerne	Bikaner	Rabi 2018-19	Rabi 2020-21
11	R-18-AST-4	Nutrient management for productivity enhancement in dual purpose oats	Kalyani, Jorhat, Imphal, Ayodhya, Jabalpur and Imphal	Rabi 2018-19	Rabi 2020-21
12	R-18-AST-5	Studies on effect of varieties and cutting management on productivity, quality and seed production of berseem	Pantnagar & Ranchi	Rabi 2018-19	Rabi -2020-21

**AICRP on Forage Crops and Utilization
Technical Programme
Forage Crop Protection
Rabi 2019-20**

PPT-1: Monitoring of diseases and insect pests in *Rabi* forage crops ecosystem.

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

PPT-2: Evaluation of *Rabi* breeding materials for their resistance to diseases and insect pests.

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

PPT-17: To study the pathogenic variability of *Blumeria graminis* f. sp. *avenae* on oat

Location: Palampur

- Refinement of differential set
- Inheritance of powdery mildew in oat

PPT-26: Biological management of Oat aphid *Rhopalosiphum padi* on Oat

Locations: Rahuri, Ludhiana, Dharwad

Plot size: 3 x 4 m²

Replication: 03

Design: RBD

Treatments:

- T1:** Foliar application of *L. lecanii* @ 1x10⁸ CFU/g (5 g/lit)
- T2:** Foliar application of *L. lecanii* @ 1x10⁸ CFU/g (7.5 g/lit)
- T3:** Foliar application of *M. anisopliae* @ 1x10⁸ CFU/g (5 g/lit)
- T4:** Foliar application of *M. anisopliae* @ 1x10⁸ CFU/g (7.5 g/lit)
- T5:** Commercial neem product (Azadirachtin – 10000 ppm) @ 2ml/lt
- T6:** NSE @ 5%
- T7:** Untreated control

Observations:

- Precount and post treatment count of larvae will be taken at 5 and 7 DAS.
 - Natural enemy count.
 - Green fodder yield (q/ha).
 - Economics.
- *Bioagents will be supplied by Rahuri centre
 - Seeds of oat variety Kent will be supplied by Ludhiana centre.

PPT-30: Biological management of powdery mildew of oats caused by *Blumeria graminis* f. sp. *avenae*

Location: Palampur

Treatments: 10

Replications: 3

Design: RBD

Plot size: 3x2 m²

- T1: Three foliar spray of *Trichoderma viride* @ 0.5%
- T2: Three foliar spray of *Trichoderma harzianum* @ 0.5%
- T3: Three foliar spray of *Pseudomonas fluorescens* @ 0.5%
- T4: Three foliar spray of extract of *Eupatorium adenophorum* @ 10%
- T5: Three foliar spray of Azadirachtin 3000 ppm @ 0.3%
- T6: Three foliar spray of NSE 5%
- T7: Three foliar spray of Eucalyptus @ 10%
- T8: Three foliar spray of Vitex @ 0.1%
- T9: Three foliar spray of hexaconazole @0.1% (Chemical control)
- T10: Control

Observations:

- Powdery mildew severity (%)
- Seed yield (q/h)

PPT-31: Eco-friendly pest management techniques in berseem ecosystem

Location: Ludhiana and Rahuri

Design: RBD

Replication: 3

Plot size: 5x5 m²

Treatments:

T ₁	Seed treatment of <i>Trichoderma viride</i> @5g/Kg+foliar spray of NSE @ 5%
T ₂	Soil application of <i>Trichoderma viride</i> @ 1kg/25kg FYM/acre + foliar spray of NSE @ 5%
T ₃	T1+Chickpea as trap crop on border row + Bird perches
T ₄	T2+Chickpea as trap crop on border row + Bird perches
T ₅	T1+Sunflower as trap crop on border row + Bird perches
T ₆	T2+Sunflower as trap crop on border row + Bird perches
T ₇	Farmer's Practice (Spray of Carbendazim on fodder as well as seed crop + Malathion on fodder crop and Chlorantraniliprole 18.5 SC on seed crop)
T ₈	Control

Observations:

- Number of larvae (*H. armigera* or other lepidopteran larvae) per meter row length on berseem crop.
- Number of larvae/ plant on trap crop.
- Activity of natural enemies on trap as well as berseem crop.
- Disease severity.
- Green fodder yield and seed yield.

PPT-32: Validation of best treatment of trial entitled “Management of soil borne and powdery mildew diseases in red clover seed crop”

Location: Palampur

Plot size: 100 m²

Treatments:

- T1: Seed treatment with *Trichoderma* @ 5g/kg seed + three foliar spray of *Trichoderma* @ 0.5%
- T2: Seed treatment with Carbendazim @ 2 g/kg seed + three foliar spray of Hexaconazole @ 0.1 %
- T3: Control

Observations:

- Disease severity of powdery mildew.
- Disease incidence of soil borne diseases.
- Seed yield (q/ha).

PPT-34: Integrated disease management in berseem

Location: Jhansi, Ludhiana, Bhubaneswar, Palampur

Design: RBD

Replication: 3

Plot size: 3x2 m²

Treatments:

- T1 : Seed treatment with Chitosan @ 0.05 %
- T2 : Seed treatment with *Trichoderma* @ 0.05 %
- T3 : Seed treatment with carbendazim @ 0.02 %
- T4 : Seed treatment with Chitosan @ 0.05 % + *Trichoderma* @ 0.05%
- T5: Seed treatment with Chitosan @ 0.05 % + carbendazim @ 0.01%
- T6 : T1 + foliar spray of Chitosan @ 0.05%
- T7: T2+ foliar spray of Chitosan @ 0.05 %
- T8: T3 +foliar spray of Chitosan @ 0.05 %
- T9 : T3 + foliar spray of carbendazim @ 0.01 %
- T10 : control

Target disease: root rot, stem rot, leaf blight

Observations:

- Severity/ incidence of diseases.
- Green fodder yield and seed yield.

ALL INDIA COORDINATED RESEARCH PROJECT ON FORAGE CROPS & UTILIZATION**(Indian Council of Agricultural Research)****NATIONAL GROUP MEET: Rabi 2019-20****Date: 30-31 August, 2019****Venue: CAU, Imphal****TENTATIVE PROGRAMME****30th August, 2019**

08:00-9:30	REGISTRATION
-------------------	---------------------

9:30-11:00	INAUGURATION
Chief Guest	Dr. Dinesh Kumar, ADG (FFC), ICAR
Chairman	Prof. M. Premjit Singh, Vice Chancellor, CAU, Imphal
Guest of Honour	Dr. V. K. Yadav, Director, ICAR-IGFRI, Jhansi
Welcome Address	Dr. Indira Sarangthem, Dean, College of Agriculture, CAU, Imphal
Project Coordinator's Report	Dr. A. K. Roy, Project Coordinator
Remarks	Dr. V.K. Yadav, Director, ICAR-IGFRI, Jhansi
Chief Guest's Address	Dr. Dinesh Kumar, ADG (FFC), ICAR
Felicitation, awards Release of publications	
Chairman's Address	Prof. M. Premjit Singh, Vice Chancellor, CAU, Imphal
Vote of Thanks	Dr. Joseph Koireng, OIC AICRP Forage Crops & Utilization, CAU, Imphal
11:00-11:30	High Tea

11:30-12:15 TECHNICAL SESSION-I: INTERACTIVE SESSION WITH STAKEHOLDERS	
Chairman	Dr. Dinesh Kumar, ADG (FFC), ICAR
The session will be held with 2-3 lectures on technical aspects and ready to share technologies by SAU/ICAR. It will also showcase advances made by certain centers at farmer's field. Different stakeholders like Animal husbandry group, livestock keepers, dairy personnel, fodder growers, forage seed growers will present their expectations and problems in this session.	
Rapporteurs	Dr. Joseph Koireng, Scientist, CAU, Imphal

12:15-13:00 TECHNICAL SESSION-II: BREEDER SEED PRODUCTION	
Chairman	Dr. P. R Chowdhury, PS ICAR,
BSP Report & Allocation	Dr. Subhash Chand, Scientist AICRP FC&U
Rapporteurs	Dr. Yogendra Kumar, Dr. Kalyan Jana
13:00-13:30	LUNCH

13:30-15:00 TECHNICAL SESSION-III: DISCIPLINEWISE REPORT	
Chairman	Dr V K Yadav, Director, IGFRI
Forage crop Improvement	Dr. Subhash Chand
Forage crop Production	Dr. R. K. Agrawal
Forage crop Protection	Dr. N. R. Bhardwaj
Rapporteurs	Dr. Gayathri G & Dr. Usha Thomas

15:00-16:30 TECHNICAL SESSION-IV (concurrent sessions) - FORMULATION OF TECHNICAL PROGRAMME	
TECHNICAL SESSION-IV (Concurrent)-FORAGE CROP IMPROVEMENT	
Chairman	Dr. Dinesh Kumar, ADG (FFC), ICAR
Co-Chairman	Head, Crop Improvement Division, CAU, Imphal
Rapporteurs	Dr. P. Mahadevu & Dr. S V Damame
Finalization of varietal trials	Dr. Subhash Chand

TECHNICAL SESSION-IV (Concurrent)–FORAGE CROP PRODUCTION	
Chairman	Head, Crop Production Division, CAU, Imphal
Rapporteurs	Dr. H. K. Patel&Dr. Birendra Kumar
Finalization of trials	Dr. R. K. Agarwal

TECHNICAL SESSION-IV (Concurrent)–FORAGE CROP PROTECTION	
Chairman	Head, Crop Protection Division, CAU, Imphal
Rapporteurs	Dr. Ashlesha&Dr. A. B. Tambe
Finalization of trials	Dr. N. R. Bhardwaj
16:30-16:45	Tea

16:45-18:00	TECHNICAL SESSION V: REVIEW OF CENTRE-WISE ACTIVITIES
Chairman	Dr. Dinesh Kumar, ADG (FFC), ICAR
Co-Chairman	Dr. V. K. Yadav, Director, ICAR-IGFRI, Jhansi
Convener	Dr. A. K. Roy, Project Coordinator (FCU)
Rapporteurs	Dr. B. Murali & Dr. Birendra Prasad
Hill Zone	CSK HPKV Palampur ; SKUAST (K) Srinagar; VPKAS Almora
North West Zone	PAU Ludhiana, CCS HAU Hisar, GBPUAT Pantnagar, SKRAU, Bikaner, IGFRI-RRS Avikanagar, CAZRI Jodhpur, SKRAU-RRS Jalore, MPUAT Udaipur, IIW&BR (dual purpose barley) Karnal
North East Zone	NDUAT, Faizabad ; BAU Ranchi ; BCKV Kalyani; OUAT Bhubaneswar ; AAU Jorhat ; CAU Imphal ; RPCAU Pusa
Central Zone	AAU Anand ; JNKVV Jabalpur ; IGFRI Jhansi ; MPKV Rahuri ; BAIF Urulikanchan ; IGKV Raipur ; CSAUAT Kanpur ; Dhari/Dapoli
South Zone	PJTSAU Hyderabad ; UAS (B) ZRC Mandya ; TNAU Coimbatore ; KAU Vellayani ; IGFRI-RRS; Dharwad

18:00 - 19:00	VARIETAL IDENTIFICATION COMMITTEE MEETING
----------------------	--

31st August, 2019

9:00-11:00	TECHNICAL SESSION V: REVIEW OF CENTRE-WISE ACTIVITIES – contd.
-------------------	---

11:00-11:30	TECHNICAL SESSION-VI: FTD & TSP FORMULATION
Chairman	Dr. A. K. Roy, Project Coordinator
Convener	Dr. R. K. Agrawal, PS AICRP forage
Rapporteurs	Dr. Maninder Kaur, Dr. R. Katoch
11:30-11:45	Tea

11:45-12:45	TECHNICAL SESSION VII:PGR/breeding/production/protection issues
Chairman	Dr. Dinesh Kumar, ADG (FFC), ICAR
Co-Chairman	Dr. V. K. Yadav, Director, ICAR-IGFRI, Jhansi
Convener	Dr. A. K. Roy, PC
Rapporteurs	Dr. Santosh Jha & Dr R C Bairwa
06 lectures on various aspects; Future programme/thrust areas/identification Dr Anjali Kaul Kak , NBPGR : Forage Germplasm Issues and future strategies Dr S K Gupta , ICRISAT : Forage pearl Millet Dr Sunil Kumar , IGFRI: Fodder production in NE region- Insights & way forward Dr A. K. Mishra , IGFRI : Silage Fermentation and processing: A natural way of conserving forages Dr Digvijay Singh, NDDB : NDDB role in forage resources especially forage seed Director RFS, DADH : DADH and RFS role in forage seed resources.	

12:45-13:30	TECHNICAL SESSION-VIII: Scientific, Administrative and financial issues
Chairman	Dr. Dinesh Kumar, ADG (FFC), ICAR
Convener	Dr. A. K. Roy, Project Coordinator (FCU)
Rapporteur	Dr. Meenkashi Goyal, Dr. Naveen Kamboj
13:30-14:30	Lunch

14:30-17:00	TECHNICAL SESSION-IX: PLENARY SESSION
Chairman	Prof. M. Premjit Singh, Vice Chancellor, CAU, Imphal
Co-Chairman	Dr. Dinesh Kumar, ADG (FFC), ICAR
Co-Chairman	Dr. V. K. Yadav, Director, ICAR-IGFRI, Jhansi
Convener	Dr. A. K. Roy, Project Coordinator (FCU)
Rapporteurs	Dr. R. K. Agrawal & Dr. Rahul Kapoor

Presentation of the recommendations by respective Rapporteurs	
Technical session – I Interactive session with stakeholders	Dr. Joseph Koireng
Technical session – II Breeder Seed Production	Dr. Kalyan Jana
Technical session – III Discipline-wise presentation	Dr. Usha Thomas
Technical session - IV Forage Crop Improvement	Dr. P. Mahadevu
Technical session - IV Forage Crop Production	Dr. H. K. Patel
Technical session – IV Forage Crop Protection	Dr. Ashlesha
Technical session – V Centre wise activities	Dr. B. Murali
Technical session – VI FTD & TSP formulation	Dr. R. Katoch
Technical session-VII PGR/breeding/production/protection issues	Dr. R C Bairwa
Technical session – VIII – Scientific/ administration/ financial issues	Dr. Meenkashi Goyal
Varietal Identification Committee Meeting Report	Dr. A. K. Roy
Co chairman's remarks	Dr. D. K. Yadav
Co-Chairman's Remarks	Dr. Dinesh Kumar
Chairman's Remarks	Dr. A. K. Singh
Vote of Thanks	Dr. Joseph Koireng & Dr. A. K Roy

**AICRP ON FORAGE CROPS AND UTILIZATION
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)**

**NATIONAL GROUP MEET– RABI-2019-20
LIST OF PARTICIPANTS**

SN	Name	Affiliations
A.	Participants from ICAR	
1.	Dr. Dinesh Kumar	ADG (FFC), ICAR, New Delhi
2.	Dr. P.R. Chaudhary	PS, ICAR, ICAR, New Delhi
B.	Participants from SAUs/CAUs/ NGOs of coordinating / voluntary centers	
3.	Dr. B.G. Shekara	ZARS, VC Farm, Mandya-571405, Karnataka
4.	Dr. P. Mahadevu	Sr. Scientist (GPB), ZARS UAS (B), VC Farm, Mandya-571405
5.	Dr. Naveen Kumar	Principal Scientist cum OIC, CSK HPKV, Palampur-176062
6.	Dr. V.K. Sood	Principal Scientist, CSK HPKV, Palampur-176062
7.	Dr. D.K. Banyal	Principal Scientist, CSK HPKV, Palampur-176062
8.	Dr. R.C. Bairwa	Asst. Prof., Agricultural Research Station, SKRAU ,Bikaner-334006
9.	Dr. A.S. Godara	Agricultural Research Station, SKRAU ,Bikaner-334006
10.	Dr. Rahul Kapoor	Asst. Forage Breeder, PAU, Ludhiana-141027
11.	Dr. Ashlesha Dhingra	Asst. Plant Pathologist, PAU, Ludhiana-141027
12.	Dr. Meenakshi Goyal	Asst. Biochemist, PAU, Ludhiana-141027
13.	Dr. Maninder Kaur	Asst. Agronomist, PAU, Ludhiana-141027
14.	Dr. Usha C. Thomas	Asst. Prof., AICRP on FC&U, College of Agriculture, Vellayani-695522
15.	Dr. Gayathri G.	Asst. Prof. (PBG), AICRP on FC&U, College of Agriculture, Vellayani-695522,
16.	Dr. Hiren K. Patel	Asst. Research Scientist, Anand Agricultural University, Anand-88110
17.	Dr. Paresh H. Rathod	Asst. Research Scientist, Anand Agricultural University, Anand-88110
18.	Dr. D.P. Gohil	Research Scientist, Anand Agricultural University, Anand-88110
19.	Dr. Anshuman Dalpatrai Rathod	Assoc. Research Scientist, Grassland Research Station, Junagadh Agricultural University, Dhari-365640
20.	Dr. S.D. Sivakumar	Assoc. Prof. (Agronomy), TNAU, Coimbatore-641003
21.	Dr. Ramesh Singh Yadav	Jr. Forage Agronomist, NDUAT, Kumarganj, Ayodhya-224229
22.	Dr. Arabinda Dhal	Pathologist & OIC, OUAT, Bhubaneswar- 751003
23.	Mr. P.S. Takawale	Forage Breeder & OIC, BAIF Development Research Foundation, Central Research Station, Urulikanchan, Pune-412202
24.	Mr. R.V. Kale	Scientist (Agronomy), BAIF CRS, Urulikanchan, Pune-412202
25.	Dr. Sandip Ananda Landge	Scientist-I (Entomology), MPKV, Rahuri- 413722
26.	Dr. Damame S.V.	Scientist-I (Biochemistry), MPKV,, Rahuri- 413722
27.	Dr. Danawale Niteen Janardhan	Scientist-I (Agronomy), Mahatma Phule Krishi Vidyapeeth, Rahuri- 413722
28.	Dr. P. P. Surana	Scientist-I (Breeder), MPKV, Rahuri- 413722
29.	Dr. Yogendra Prasad	Jr. Scientist cum Asst. Prof., BAU, Ranchi- 834006
30.	Murali Bellamkonda	Scientist (Agronomy), AICRP on Forage Crops, Agricultural Research Institute, PJTSAU, Rajendranagar, Hyderabad-500030
31.	Shailaja Kola	Scientist (Biochemistry), AICRP on Forage Crops, Agricultural Research Institute, PJTSAU, Rajendranagar, Hyderabad-500030
32.	Dr. Kalyan Jana	Asst. Prof. & OIC, BCKV, Kalyani-741235
33.	Dr. (Mrs) Seuji Bora Neog	Principal Scientist, AICRP on FC&U, Assam Agricultural University, Jorhat
34.	Dr. K.K. Sharma	Principal Scientist, AICRP on FC&U, Assam Agricultural University, Jorhat
35.	Dr. J.P. Singh	Professor cum Chief Scientist , Department of Agronomy, Institute of Agricultural Sciences, BHU, Varanasi-221005
36.	Dr. Mayuri Sahu	Scientist (Plant Breeding), IGKV, Raipur- 492012
37.	Dr. D. S. Phogat	Pr. Scientist-cum-Head, Forage Section, CCS HAU, Hisar- 125004
38.	Dr. Naveen Kumar	Asst. Scientist (Agronomy), CCS HAU, Hisar- 125004
39.	Dr. Minakshi Devi	Asst. Scientist (PB), CCS HAU, Hisar- 125004
40.	Dr. Dalvinder Pal Singh	Asst. Scientist (Plant Pathology), CCS HAU, Hisar- 125004

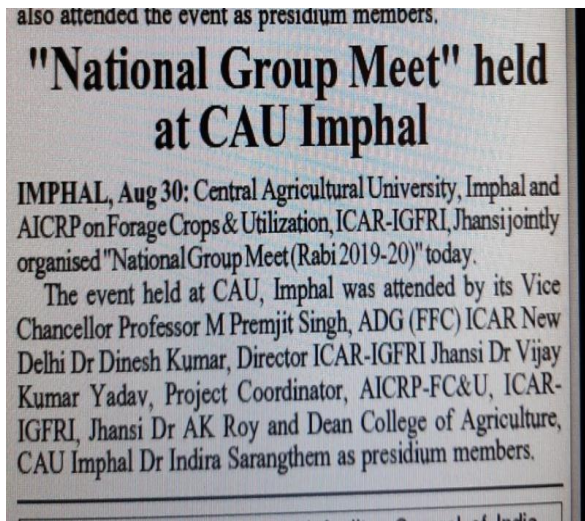
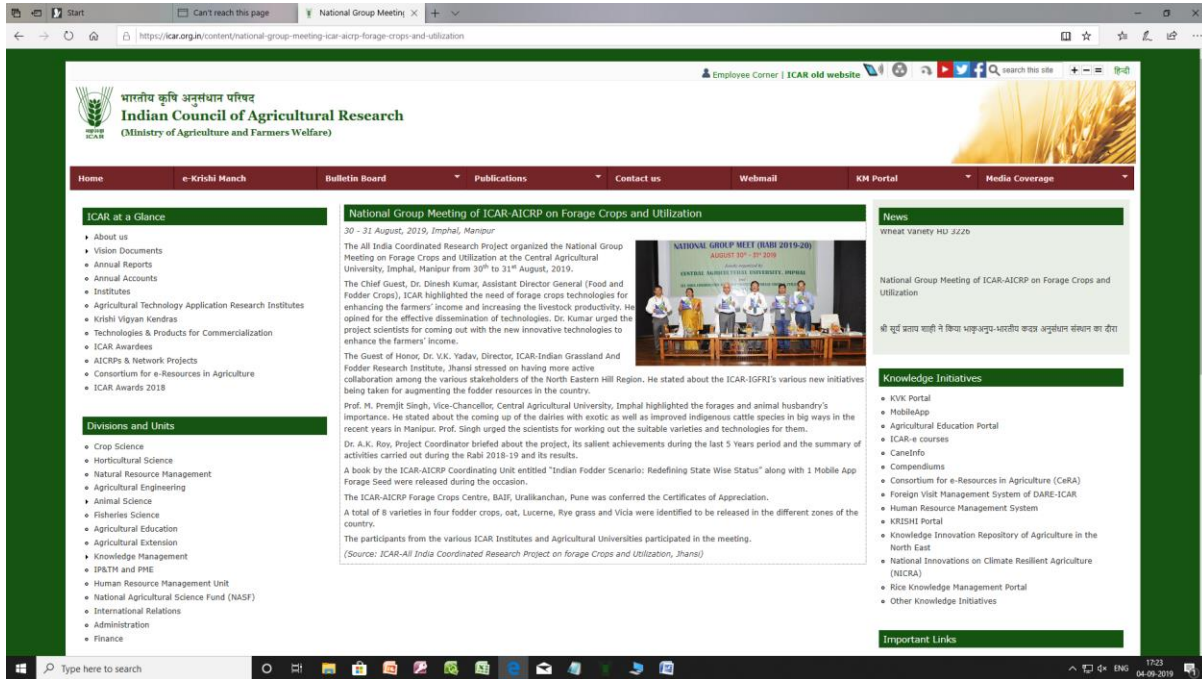
41.	Dr. S.K. Jha	Senior Scientist, IGKV, Raipur- 492012
42.	Dr. Shrikrishna Bilaiya	Principal Scientist (Plant Breeding), AICRP-FC&U, JNKVV, Jabalpur- 482004
43.	Dr. Anoop Kumar Mehta	Principal Scientist (Plant Breeding), AICRP-FC&U, JNKVV, Jabalpur- 482004
44.	Dr. Birendra Prasad	Prof. (Plant Breeding), GBPUAT, Pantnagar- 263153
45.	Dr. Mahendra S. Pal	Professor (Agronomy), GBPUAT, Pantnagar- 263153
46.	Dr. Birendra Kumar	Asst. Prof. (Agronomy), BAU, Ranchi- 834006
47.	Dr. Nilanjaya	Asst. Prof. (Plant Breeding), RPCAU, Pusa- 848125
48.	Dr. Gangadhar Nanda	Asst Prof. (Agronomy), RPCAU, Pusa- 848125
49.	Ankur S. Dhane	Jr. Entomologist , ARS, Phalgar, BSKKV, Dapoli, Maharashtra
50.	Dr. S. Tirumala Reddy	Scientist (Agronomy), Regional Agricultural Research Station, Tirupati-517502
51.	Dr. Tankeswar Gohain	Assoc. Prof. (Agron.), School of Agri Sci & Rural Develop, Medziphema- 797 106
C. Participants from Regional Fodder Station, DADH, Government of India		
52.	Shri. B. Singh	Director, Regional Fodder Station, Hyderabad-501510, Telangana
53.	Brijendra Koli	Director i/c, Regional Fodder Station, Kalyani, West Bengal
54.	Dr. P.S. Mahesh	Director, Regional Forage Station, Bengaluru-560088, Karnataka
55.	Ajai Kumar Yadav	Director, Regional Fodder Station, Chennai- 600052, Tamil Nadu
56.	Yogendra Kumar	Director I/c, Regional Fodder Station, Srinagar- 180004, Jammu & Kashmir
57.	Dr. P.P. Singh	Director i/c, Regional Fodder Station, Hisar-125001, Haryana
D. Participants from ICAR/International Research Institutes		
58.	Dr. Anjali Kak Koul	Principal Scientist, ICAR-NBPGR, Pusa Campus, New Delhi-110 012
59.	Dr J.K. Bisht	Principal Scientist & Head CPD, ICAR - VPKAS, Almora- 263 601,
60.	Dr. R.P Yadav	Scientist (Agroforestry), CP Division, ICAR-VPKAS, Almora-263601
61.	Dr. S.K. Gupta	Principal Scientist, ICRISAT, Patancheru- 502324, Hyderabad, Telangana
E. Participants from private companies/NSC		
62.	Mr. ASN Reddy	COO-SIRA Seeds, M/s. Rasi Seeds (P) Ltd., Station Masaipet, Veldurthymandal, Medak-502334
63.	Mr. Bramareswara Rao	Senior Breeder, M/s. Rasi Seeds (P) Ltd., Station Masaipet, Medak-502334
64.	Mr. Vishnu	Assistant Breeder, M/s. Rasi Seeds (P) Ltd., Station Masaipet, Medak-502334
65.	Dr. Aditya Sharma	Sr. Breeder-Forage Millet ,UPL Limited
66.	Gopal Bele	Crop Lead- Pearl Millet, Hytech Seed
67.	Akbarali Bhimani	M/s Khoja Habib Mamad & Alamdar Seeds
68.	Zahid Husain Bhimani	M/s Khoja Habib Mamad & Alamdar Seeds
69.	Shikha Verma	UPL Limited, Hyderabad
70.	S.V. Bemalgi	Director of Research, Eco Agriseeds Pvt Ltd, Hyderabad
71.	Sanjeev Kumar	Production Manager, National Seed Corporation, Regional Office, Guwahati
F. Participants from ICAR-IGFRI / AICRP Coordinating Unit		
72.	Dr. Vijay Kumar Yadav	Director, ICAR-IGFRI, Jhansi- 284003, Uttar Pradesh
73.	Dr. A.K. Mishra	Head, Plant Animal Relationship Division, ICAR-IGFRI, Jhansi
74.	Dr. S. Ahmed	Head, Crop Improvement Division, ICAR-IGFRI, Jhansi
75.	Dr. Sunil Kumar	Head, Crop Production Division, ICAR-IGFRI, Jhansi
76.	Dr. K. Sridhar	Principal Scientist, SRRS, Dharwad ICAR-IGFRI, Jhansi
77.	Dr. B.G. Shivakumar	Principal Scientist, SRRS, Dharwad ICAR-IGFRI, Jhansi
78.	Dr. Mukesh Choudhary	Scientist (Agronomy), ICAR-IGFRI, Jhansi
79.	Dr. A.K. Roy	Project Coordinator, AICRP on FC&U, ICAR-IGFRI, Jhansi
80.	Dr. R.K. Agrawal	Principal Scientist (Agronomy), AICRP on FC&U, ICAR-IGFRI, Jhansi
81.	Dr. N.R. Bhardwaj	Scientist (Plant Pathology), AICRP on FC&U, ICAR-IGFRI, Jhansi
82.	Dr. Subhash Chand	Scientist (Genetics & Plant Breeding), AICRP on FC&U, ICAR-IGFRI, Jhansi
83.	Shri. H.K. Agrawal	Chief Technical Officer, AICRP on FC&U, ICAR-IGFRI, Jhansi
84.	Shri. R.S Patel	Technical Officer, AICRP on FC&U, ICAR-IGFRI, Jhansi
G. Participants form CAU, Imphal		
1.	Prof. M. Premjit Singh	Vice Chancellor, CAU, Imphal
2.	Prof. Indira Sarangthem	Dean, COA, CAU, Imphal
3.	Prof. Jekendra	Dean, COFT, CAU, Imphal
4.	Dr. A.K. Mishra	Deputy Director Research, CAU, Imphal

5.	Dr. Th. Robindro	Deputy Director Research, CAU, Imphal
6.	Prof. Ph. Ranjit Sharma	HOD, Plant Breeding and Genetic, COA
7.	Prof. M. Somortjit	Dept. of Agronomy, CAU, Imphal
8.	Prof. Edwin Luikham	Dept. of Agronomy, CAU, Imphal
9.	Prof. K. Nandini	Dept. of Agronomy, COA, CAU, Imphal
10.	Prof. R.K. Dilip Singh	Dept. of Horticulture, COA,CAU, Imphal
11.	Prof. U. Chouba Singh	Dept. of Horticulture, COA,CAU, Imphal
12.	Dr. Bireswor Sinha	Dept. of Pathology, COA,CAU, Imphal
13.	Dr. Nongrin Khonba	Dept. of Pathology, COA,CAU, Imphal
14.	Prof. Kunjaraj	Dept. of Agriculture Extension, COA,CAU, Imphal
15.	Dr. Dayaram	Dept. of Agriculture Extension, COA,CAU, Imphal
16.	Dr. Deepa	Dept. of Agriculture Extension, COA,CAU, Imphal
17.	Prof. A. Herojit	Dept. of Soil Science, COA,CAU, Imphal
18.	Dr. Surbala	Dept. of Soil Science, COA,CAU, Imphal
19.	Dr. Shastri	Dept. of Plant Breeding and Genetic, COA
20.	Dr. Renuka Devi	Dept. of Plant Breeding and Genetic, COA
21.	Dr. K. Ibohal Singh	HOD, Dept of Entomology, COA, COU, Imphal
22.	Dr. Joykumar	Dept. of Agricultural Engineering, COA, CAU
23.	Dr. P.T. Sharma	Dept. of Agricultural Engineering, COA, CAU
24.	Dr. Okendro Singh	Dept. of Statistics, COA, CAU, Imphal
25.	Mr. Gopimohan Singh	Dept. of Statistics, COA, CAU, Imphal
26.	Dr. Meghachandra	SWO, COA, CAU, Imphal
27.	Dr. Pramesh Kh	Scientist, AICRP on Ground nut
28.	Mrs. Jamini Devi	AICR Ground nut
29.	Dr. Nanita Devi	Scientist, AICRP on Soybean
30.	Dr. L. Sophia Devi	Scientist, AICRP on Soybean
31.	Dr. Nilima Karam	Scientist, AICRP on Soybean
32.	Dr. T. Sunanda	Scientist, AICRP on Soybean
33.	Mr. Lalit Singh	AICRP on Soybean
34.	Mr. Subash	AICRP on Soybean
35.	Mr. Sarat Singh	AICRP on Soybean
36.	Mr. Daya	AICRP on Soybean
37.	Dr. Jeti Konsam	Scientist, AICRP on Maize
38.	Dr. N. Nabakeshore	Scientist, AICRP on Maize
39.	Dr. Dayananda	Scientist, AICRP on Maize
40.	Dr. Samuel Jimberson	Scientist, AICRP on MuLLarP
41.	Dr. Ksh. Shasidhar	Scientist, AICRP on MuLLarP
42.	Mr. Birla Singh	AICRP on Soybean
43.	Dr. Pushpa Rani	Scientist, AICRP on Rapeseed Mustard
44.	Dr. Diana devi	Scientist, AICRP on Rapeseed Mustard
45.	Mr. Ingojouba	AICRP on Rapeseed Mustard
46.	Dr. Anand	Scientist, AICRP on Post Harvest & Technology
47.	Mr. Angouba	AICRP on Post Harvest & Technology.
48.	Mr. Sourav Das	AICRP on Post Harvest & Technology
49.	Dr. R. Joseph Koireng	Scientist, AICRP on Forage Crops
50.	Mr. N. Rakesh Singh	AICRP on Forage Crops
51.	S. Zimik	AICRP on Forage Crops
52.	Mr. Kenedy Singh	AICRP on Forage Crops
53.	Mr. R. Risan	AICRP on Forage Crops
54.	Dr. Sumita Devi	Scientist, AICRP on Nematods
55.	Mrs. Kh. Priya	AICRP on Mango
56.	Miss. Megna Gogoi	Dept of Agronomy, COA, CAU.
57.	Mr. Depak Singh	ICAR Seed Project, DOR, CAU
58.	Mr. Jiten Singh	DOR, CAU, Imphal
59.	Mr. Sanajouba	DOR, CAU, Imphal
60.	Mr. Chingkhei	DOR, CAU, Imphal
61.	Mr. Ibochaoba	DOR, CAU, Imphal
62.	Mr. Suresh Singh	Computer operator DOR, CAU, Imphal

H.	Farmers participants	
1.	Brojen Sinam	Thangmeiband
2.	S. Romesh Singh	Teckcham
3.	N. Joychandra Singh	Meitram
4.	N. Thoiba Singh	Kwakta
5.	M. Mangolei Devi	Keibul Lamjao
6.	Ng Romen Singh	Tangkham
7.	N. Mani Meitei	Ishikha
8.	K. Joy Singh	Sawombung
9.	S. Bojoy Singh	Sawombung
10.	O. Mangi Meitei	Chana
11.	Th. Ojit Meitei	Chana
12.	H. Herojit Singh	New Keithelmanbi
13.	L. Paosat Khonsai	H. Phailen
14.	P. Ranapratap Singh	Potshangbam
15.	Th. Sarat Singh	Potshangbam
16.	P. Gyral Singh	Potshangbam
17.	S. Arunkumar Singh	Ithai Wapokpi
18.	N. Indrabhushan	Oinam
19.	A. Kishan Singh	Bishnupur
20.	H. Kerani Singh	Palace Compound
21.	Soibam Sanatomba	Tekcham
22.	Soibam Jayenta Singh	Tekcham
23.	L. Laingam Singh	Thoubal
24.	K. Devendra	Chingamakha
25.	S. Nandakumar	Tekcham
26.	S. Rabi Singh	Sapam
27.	S. Thoiba Singh	Tekcham
28.	Prasenjit Paonam	Sapam
29.	Vungzaming	Churachandpur
30.	Lamkholhing	Churachandpur
31.	Ngamkhohao	Churachandpur
32.	S. Momo Meitei	Bishnupur
33.	S. Anan Singh	Bishnupur
34.	L. Anita Devi	Naransena
35.	Th. Medha Devi	Thinungei
36.	Ch. Manikumar Singh	Keinou
37.	H. Inaoba Singh	Keinou
38.	M. Kiran Singh	Kakching
39.	S. Romesh Singh	Laphupat Tera
40.	H. Biramani Singh	Moidangpok

Glimpses of Media Coverage

Annexure F



Sangai Express 31st August 2019



Poknapham (Manipuri news paper) 31st August 2019

The event was also covered in Local TV channels (like ISTV, TOM TV, IMPACT TV, DDK Imphal) and also AIR Imphal for both days (30-31st August, 2019).