ALL INDIA COORDINATED RESEARCH PROJECT ON CASHEW

PROCEEDINGS OF THE ANNUAL GROUP MEETING OF SCIENTISTS OF AICRP-CASHEW

6-8th December 2018

Venue : Cashew Research Station,
Orissa University of Agriculture & Technology
CRS, BHUBANESWAR

ICAR - DIRECTORATE OF CASHEW RESEARCH
PUTTUR-574 202, D.K., KARNATAKA

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ACKNOWLEDGEMENTS

The Annual Group Meeting of All India Coordinated Research Project on Cashew was held at this Directorate from 6th to 8th December 2018. AICRP research workers, and progressive farmers have participated in this meeting.

I express my deep sense of gratitude to Dr. A.K. Singh, Deputy Director General (Hort.), ICAR for his kind advice in organizing this Annual Group Meeting of Scientists of AICRP on Cashew-2018. I place on record my thanks to the authorities of the ICAR, New Delhi for their support in conducting meeting.

I am thankful to Prof. S. Pashupalak, the Hon'ble Vice Chancellor, OUAT, Bhubaneswar for inaugurating the AGM Meeting 2018. My thanks are due to Dr. S.P. Ghosh, QRT Chairman and Dr. W.S. Dhillon, ADG (Hort.) for their active participation and guidance during the deliberations. I am thankful to Dr. P.K. Das, Former Dean of Research, OUAT, Bhubaneswar for chairing the Crop Improvement Session, Dr. P.C. Lenka, Former Professor, OUAT, Bhubaneswar for chairing the Crop management and Dr. Chitta Ranjan Satapathy, Former Professor, OUAT, Bhubaneswar for chairing the Crop Protection and Dr. Venkatesh Hubballi for chairing the Interactive Session. Special thanks to Dr. S.K. Mukherjee, Dr. P.K. Panda, Dr. Kabita Sethi and their team in supporting for the successful conduct of AGM at OUAT, Bhubaneswar. My thanks are also due to all the rapporteurs of different sessions.

I thank the members of various committees who have worked tirelessly for the successful conduct of this Annual Group Meeting, and all the scientific colleagues from the Coordinating Centers for their participation and cooperation. My thanks are also due to Dr. Mohana G.S., Scientist-in-charge (PC Cell) & Smt. Reshma K, PA for the support extended in organizing this group meeting.

[M.G. NAYAK]

Acting Director &

Project Coordinator (Cashew)

Puttur

Date : 13.2.2019

PROGRAMME DETAILS

Venue: OUAT, Bhubaneswar
Date: 6 – 8th December 2018

06.12.2018, 11. 00 AM

INAUGURAL SESSION

Invocation	:	Invocation
Lighting of the Inaugural Lamp	**:**	By dignitaries on the dias
Welcome	**:**	Dr. L. M. Garnayak, Dean of Research, OUAT, Bhubaneswar
Project Coordinator's Report	**:**	Dr. M.G. Nayak, Director(Acting), DCR, Puttur
Launching of webpage of AICRP-Cashew and Release of publications		By the dignitaries
Chief Guest's address	**:**	Dr. W. S. Dhillon, ADG(HS-I),ICAR, New Delhi
Address by Guest of Honour		Dr. B. K. Upadhaya, Director of Horticulture, Govt. of Odisha
Presidential Address	**:**	Prof. S. Pasupalak Hon'ble Vice Chancellor, OUAT, Bhubaneswar
Vote of Thanks	**:**	Dr. S. K. Mukherjee OIC, AICRP on Cashew
Rapporteurs		Dr.(Mrs). Shobhana and Vikas Ramkete

TECHNICAL SESSIONS

12.30 Noon -2.00PM		
Presentation of Action Taken Report	**:**	Dr. Mohana G. S., Sr. Scientist (Gen. & Cytogen.) and Scientist-in-charge (PC Cell), ICAR-DCR, Puttur
2.00PM – 3.00PM		**Lunch break**
3.00PM -6.00PM		**TECHNICAL SESSION-I**
TECHNICAL SESSION-I		**CROP IMPROVEMENT**
Chairman	**:**	Prof. P. K. Das Former Dean of Research, OUAT, Bhubaneswar
Co-Chairman	**:**	Dr.(Mrs.) Sashikala Beura. Prof. and Head, Dept. of Floriculture and Landscaping, OUAT, Bhubaneswar
Rapporteurs	**:**	Mr. Eradasappa and Mrs. Meera Manjusha

Presentation of Reports on Crop Improvement by Scientists of AICRP on Cashew

1. Bapatla 2. Barapani 3. Bhubaneswar 4. Darisai 5. Goa 6. Hogalagere 7. Jagdalpur 8. Jhargram 9. Kanbargi 10. KRCCH- Arabhavi 11. Madakkathara 12.Paria 13.Pilicode 14. Vengurla 15.Vridhachalam

7.00PM		**Cultural Programme**
9.00PM		**Dinner**
07.12.2018, 9.30AM – 1.30PM	**:**	**TECHNICAL SESSION - II**
TECHNICAL SESSION - II		**CROP MANAGEMENT**
Chairman	**:**	Prof. P. C. Lenka, Former Director, PME, OUAT, Bhubaneswar
Co-Chairman	**:**	Dr. G. C. Acharya, Head, CHES(ICAR-IIHR) Aiginia, Bhubaneswar
Rapporteurs	**:**	Dr. Preethi P. and Dr. Vimala B.

Presentation of Reports on Crop Management by Scientists of AICRP on Cashew

1. Bapatla 2. Barapani 3. Bhubaneswar 4. Darisai 5. Goa 6. Hogalagere 7. Jagdalpur 8. Jhargram 9. Kanabargi 10. KRCCH- Arabhavi 11. Madakkathara 12.Paria 13.Pilicode 14. Vengurla 15.Vridhachalam

1.30PM – 2.30PM		**Lunch break**
2.30PM- 5.0PM	**:**	**TECHNICAL SESSION - III**
TECHNICAL SESSION - III	**:**	**CROP PROTECTION**
Chairman	**:**	Dr. C. R. Satapathy, Former Prof. Entomology , OUAT, Bhubaneswar
Co-Chairman	**:**	Dr. L. N. Mohapatra, Prof. , Dept. of Entomology, OUAT, Bhubaneswar
Rapporteurs	**:**	Dr. B. Nagendra Reddy and Mr. S.G. Parmar

Presentation of Reports on Crop Protection by Scientists of AICRP-Cashew

1. Bapatla 2. Barapani 3. Bhubaneswar 4. Darisai 5. Goa 6. Hogalagere 7. Jagdalpur 8. Jhargram 9. Kanabargi 10. KRCCH- Arabhavi 11. Madakkathara 12.Paria 13.Pilicode 14. Vengurla 15.Vridhachalam

Day-3

08.12.2018	**:**	**Field Visit to Cashew Research Station,**
9.00AM -11.00PM		**OUAT, Bhubaneswar**
11.00AM-1.00PM		**TECHNICAL SESSION-IV**
TECHNICAL SESSION-IV	**:**	**Interaction between Development Departments, Research Centers and Farmers**
Chairman	**:**	Dr. Venkatesh N. Hubballi , Director, DCCD, Kochi, Kerala
Co-Chairman	**:**	Dr. M.G. Nayak, Director(Acting), ICAR-DCR
Co-Chairman	**:**	Mr. S. Nayak, Managing Director, OSCDC Ltd.
Rapporteurs	:	Dr. Subash Chandra Swain and Dr. Kabita Sethi

Discussion by participants of various development departments

1.00 – 2.00 PM		**PLENARY SESSION**
Chairman	**:**	Dr. W.S. Dhillon, ADG(HS-II), ICAR, New Delhi
Co- Chairman	**:**	Dr. M.G. Nayak, Acting Director, DCR, Puttur
Co- Chairman		Dr. L.M. Garnayak, Dean of Research, OUAT, Bhubaneswar
Co- Chairman	**:**	Dr. P.K. Roul, Dean, Extension Education, OUAT, Bhubaneswar
Rapporteurs		Dr. P.K. Panda and Dr. (Mrs.) Kabita Sethi
Presentation of Rapporteur's reports	**:**	By Rapporteurs
Vote of Thanks	**:**	Dr. Mohana G.S., Scientist-in-charge, PC Cell, ICAR-DCR,Puttur
2.00PM – 3.00PM	**:**	Lunch break
3.00PM – 5.00PM	**:**	Field visit

INAUGURAL ADDRESS

PROF. S. PASHUPALAK
Hon'ble Vice- Chancellor, OUAT, Bhubaneswar

The first day of the AGM-2018 witnessed the opening ceremony with the lighting of holy lamp by Prof. S. Pashupalak, the Hon'ble Vice- Chancellor, OUAT, ADG (Hort.) Dr. W.S. Dhillon, Director (Acting), DCR, Puttur, Dr. M.G. Nayak and Dean of Research of OUAT, Dr. L. M Garnayak. Welcome address was delivered by Dean of Research, OUAT. Dr. M.G. Nayak, Director (Acting), DCR, Puttur, presented project co-ordinator's report and provided a general view of the issues and challenges pertaining to cashew research and development. He stated that there are 1726 germplasm of cashew being maintained and promising types have been used for hybridization programmes, 43 high yielding cashew varieties have been released in AICRP system. He focused on some important points like high density planting, canopy management for harvesting solar energy, promotion of intercrops in new plantations and management of CSRB and TMB.

Honorable Vice-Chancellor OUAT Professor Dr. S. Pashupalak in his presidential address mentioned cashew is a prominent cash crop and focused on public-private partnership for market intervention. In Odisha, nut quality is on par with national level, however farmers are not getting good price for kernels. He also stated that low yield in Odhisa is due to lack of nutrition, old and senile orchard and lack of pruning practices. He also focused on development of varieties with tolerance to pests, suitable for high density planting and with good processing qualities. Chief guest address was given by Dr. W.S.Dhillion, ADG I (Horticulture) ICAR. He stated cashew is a very important cash crop; out of total export of horticultural crops one third is contributed by cashew. He further opined that, horticulture progressed tremendously, In 2012 horticulture production was suppressed for first time food grain production and it is 300 million tonnes with 2.7% growth rate and maximum share in agricultural GDP is contributed by horticulture. He focused on value addition aspects and the post-harvest losses is estimated to be around 20-25% in horticultural crops *i.e.,* 60 million tones accounting for 1 lakh crore rupees. He suggested five approaches for increasing productivity under fruit crops including cashew.

1. Providing quality planting material to the farmers as 40 crore planting material is required and presently 5 crores is being produced
2. Rootstock improvement programme for identification of tolerant type to CSRB,TMB, water and salt tolerance and resistance
3. Promotion of HDP to increase productivity and also by adopting new training systems like Y- trellising and use of growth retardants *etc*.
4. Transfer of technology need to be intensified as only 17% of technology is disseminated to the farmers at present
5. Generation of innovative ideas by students and practical approach through research guidance, RAWE and other activities

Dr. S.K. Mukherjee, *in-charge* AICRP-Cashew, CRS, Bhubaneshwar, proposed the vote of thanks.

The dignitaries released the following publications & website :

1. AES, Paria

   Three folders have been published by Paria in vernacular language.

   - Management of Tea mosquito bug in cashew by Dr. S.G. Parmer and Dr. J.P. Makati.
   - Scientific farming in cashew by Dr. J.P. Makati.
   - Management of cashew stem and root borer in cashew by Dr. S. G. Parmer, Dr. J.P. Makati and Dr. D.K. Sharma

2. CRS,Madakkathara
   - Good agricultural practices in Cashew(In Malayalam) by Dr. A. Shobana, Dr. M.S. Smitha, P.S. Sarath and T. Reshma
3. CRS, Bhubaneshwar
   - Minimal descriptor of cashew germplasm accessions by Dr. K. Sethi, Dr. S.K. Mukherjee, Dr. P. Tripathey, Dr. P.K. Panda.
   - Insect pests of cashew and their control (In Odia language) by Dr. S.K. Mukherjee, Dr. P.K. Panda and Dr. K. Sethi.
   - Hi-tech cashew cultivation: An option to enhance the production by Dr. P.K. Panda, Dr. K. Sethi and Dr. S.K. Mukherjee.
4. Status export on cashew published by ICAR-DCR, Puttur.
5. AICRP-Cashew website was launched in this occasion which covers the details on history, mandates, research centres, achievements *etc.* This website is designed by Mr. Muthuraju and Dr. G.S. Mohana at ICAR-DCR, Puttur.

PROJECT COORDINATOR'S REPORT

Dr. M.G. NAYAK

Director (Acting), ICAR-DCR and Project Coordinator, AICRP-Cashew

Respected Dr. S. Pasupalak, Hon'ble Vice-Chancellor of OUAT, President of today' s function, Chief Guest of the Inaugural Session, Dr. W. S. Dhillon, ADG (Hort-I); the guest of honor Dr. B.K. Upadhya, Director, Horticulture Govt. of Orissa, Dr L. M.Garanayak, Dean of Research, OUAT, Bhubaneswar and, distinguished delegates, scientists from OUAT and AICRP-Cashew, invitees, media persons, ladies & gentlemen.

I would like to express my sincere gratitude to all the dignitaries on the dais, delegates and invitees for making it convenient to be here for the inaugural function of the Annual Group Meeting of AICRP on Cashew. I take this opportunity to express my gratefulness to the Dr. A.K. Singh, DDG (Hort.) ICAR New Delhi for permitting us to host this Annual Group Meeting of AICRP on Cashew – 2018 at OUAT, Bhubaneshwar.

On this occasion, I am happy to present the Project Coordinator's Report. An independent All India Coordinated Research Project on Cashew was established in the year 1986 with its headquarters at the National Research Centre for Cashew at Puttur, which has been renamed as ICAR-Directorate of Cashew Research during the year 2009. At present, AICRP on Cashew has 14 Centres, of which Bapatla (Andhra Pradesh), Bhubaneswar (Odisha), Jhargram (West Bengal) and Vridhachalam (Tamil Nadu) are located on the eastern coast; Madakkathara and Pilicode (Kerala), Vengurla (Maharashtra) and Paria (Gujarat) are situated on the western coast. Further, three centres are located in non-traditional areas, at Hogalagere (in plains of Karnataka), Jagdalpur (Chattisgarh) and at Darisai (Jharkhand). Apart from these, three voluntary centres are also functioning under AICRP-Cashew at Kanabargi in Karnataka, Ela Farm, Goa and Barapani in Meghalaya. The Project Coordinator and the Scientist in charge, PC cell have visited Paria, Pilicode, Madakkathara, Bhubaneshwar, Bapatla and Vridhachalam centers and reviewed the progress of those centers during the year.

All the centers of AICRP on Cashew have Regional Cashew Field Gene Banks (RCFGBs) wherein germplasm accessions are being maintained and their performance are being evaluated. The total germplasm collection till date is 1726. Efforts are being made to intensify hybridization programmes by some Centres of AICRP Cashew to produce hybrids suitable for high density planting. The Centres of AICRP on Cashew along with other centers working on cashew have so far developed and released 43 high yielding cashew varieties for commercial cultivation in different agro-eco-regions. Recently, a bold nut hybrid H-130 with the yield potential of more than 2 t/ha has also been considered for release by the ICAR- Directorate of Cashew Research, Puttur. The production potential of these varieties and hybrids is very good and they have played a significant role in improving production of raw cashew nut in the country.

Technologies developed by the centres have been well accepted by the farmers and played a major role in augmenting their income. Plantations developed with high yielding varieties of cashew grafts and adoption of technologies developed by the Centres of AICRP on

Cashew has helped in enhancing production and productivity of cashew. Lakhs of cashew grafts of high yielding varieties are being produced by different coordinating centres to meet the growing demand of farmers and developmental agencies. The extension activities undertaken by the centers have helped the farmers in cultivating cashew in a scientific way to fetch more income.

High density planting system has been found to be a promising technology in order to enhance productivity of cashew. This occupies a special significance in view of doubling the farmers' income. Canopy management by adopting region specific and variety specific pruning methods to maintain optimum canopy in the high density planting and ultra-high density planting systems would be more beneficial in realizing higher yields by harnessing solar energy in early part of orchard life. Integrated nutrient and water management are crucial in cashew orcharding for improving productivity of quality nuts. In order to enhance the returns from unit cultivated area, different crops such as vegetables, tuber crops and pulses as well as medicinal plants have been evaluated over the years in different centres as intercrops in cashew orchards in the early stages of orchard life. Tea Mosquito Bug (TMB) and Cashew Stem and Root Borers (CSRB) are the two major pests affecting the production and productivity of cashew. Intensification on management of tea mosquito bug and other foliage pests using newer molecules, feasible management strategies for Cashew Stem and Root Borers as well as evaluation of cashew germplasm tolerant to major pests are the need of the hour.

The National Horticulture Mission and Directorate of Cashewnut and Cocoa Development, Kochi are playing a pivotal role in cashew expansion programme in the country in addition to state development departments. The Cashew Export Promotion Council of India is striving for export related activities. In this Annual Group Meeting, we will be reviewing the results obtained in various experiments under AICRP Cashew for the preceding year and formulate research programmes for the ensuing year to address the region specific problems in cashew cultivation. I would like to emphasize some of the salient results and also point out some of the issues which need our attention.

CROP IMPROVEMENT

As for as cashew germplasm accessions are concerned, during the year, 15 new accessions for yield and yield attributing characters have been collected by different centers. Further, 125 accessions are in various stages of characterization and evaluation. A new trial on CNSL free accessions (6) has been initiated at RFRS, Vengurle with the aim of identifying best CNSL free accession for local market where demand is high for tender nuts for use in curry preparation. In the multilocation trial –III which aims at evaluation of promising hybrids, H-662 showed highest cumulative yield (34.76 kgs in fifth harvest) at Vengurle center and H14 at Vridhachalam center (22.62 kgs in fifth harvest). In the trial on performance of released varieties, BPP-8 at Darisai, NRCC Selection-2 at Hogalagere, Bhubaneshwar-1 at Jhargram, Priyanka at Pilicode, VRI-3 at Vridhachalam were found to be superior.

In the trial on hybridization and selection, 16 new hybrid combinations were tried at Bhubaneshwar and 18 at Goa. Furhter, 14 hybrids seems to be promising at Bapatla center, two hybrids showed consistent performance at Goa, one at Vridhachalam. In addition to these, evaluation of 18 promising hybrids has been initiated at Vengurle. Further, rapid clonal hybrid evaluation trial which aims at bringing desirable characters from promising germplasm accessions has been initiated at Bhubaneshwar, Madakkathara and Vengurle centers. For initiation of new trial on evaluation of promising bold nut and high yielding genotypes, the scion sticks of identified accessions from Bubhaneshwar, Jagadalpur, Goa, Bapatla and Vengurle have been supplied to ICAR-DCR and grafts will be distributed during the planting season.

CROP MANAGEMENT

In the trial on nutrient management for yield maximization in cashew, recommended dose of fertilizers with FYM and foliar spray of major and minor nutrients gave best results in Bubhaneshwar and in Hogalagere. In drip irrigation trial, irrigation at 80% cumulative pan evaporation was found to be the best in Hogalagere center. In the high density planting – observation trial, it was found that BC ratio goes on decreasing as the years advance in high density (4m x 4 m) and the reverse is true in case of normal planting (8 m x 8m) .

The intercrop China aster at Bapatla, Tomato at Darisai, cluster bean at Jahrgram, amaranthus at Madakkathara, Bhendi at Vridhachalam centers gave highest net returns in the intercropping experiment. In organic management trial, 100% N as vermicompost and biofertilizers gave highest nut yield in Bapatla center. Whereas recommended dose of fertilizer with 10 kg FYM gave highest benefit ratio in Bhubneshwar, Darisai, Vridhachalam and Hogalagere. However, in Vengurle center, 100% N as vermicompost and biofertilizer combination gave highest net returns. Further, a new trial on ultra high density planting which was standardized at ICAR-DCR, Puttur has been initiated at Vengurle this year.

CROP PROTECTION

Cashew is affected with two major pests i.e. TMB and CSRB. *Lamda*-Cyhalothrin (0.6 ml/litre) found to be more effective compared to other insecticides against TMB, Shoot tip caterpillar, Apple and nut borer, leaf miner in Bapatla, Bhubaneshwar, Vridhachalam Jagadalpur and Madakkathara. However, Thiomethoxam(0.2g/l) was found to be effective in Hogalagere center. In Vengurle center, *Lambda*-Cyhalothrin and Buprofezin found to be effective. As for as CSRB is concerned, Chloropyriphos (10ml/l) was found to be effective in Bhubaneshwar, Vridhachalam and Jagadalpur. However, Imidachloprid (2ml/l) was effective in Bapatla center. In Hogalagere, Madakkathara and Vengurle centers, Fipronil gave the best results.

The incidence of Shoot tip caterpillar was positively correlated with weather parameters at Bhubaneshwar. However, TMB incidence was negatively correlated with minimum temperature in Vengurle, Madakkathara, Hogalagere and Vridhachalam centers. Many germplasm accessions were screened against pests at Bapatla , Bhubaneshwar, Hogalagere, Jagadalpur and some promising accessions are identified.

TRANSFER OF TECHNOLOGY

The coordinating centers of AICRP are also involved in transfer of technology activities and have produced more than Rs.3.95 lakh cashew grafts during 206-17 which were distributed to cashew farmers, government and non-government organizations. Frontline demonstration plots have been laid out by different centres to disseminate the recent production techniques with backup of necessary technical guidance. It is worth mentioning that the Centres of AICRP on Cashew have conducted 43 training programmes on different aspect of cashew cultivation and management practices in which around 1000 farmers have participated. The centers have also taken up 13 trianing and 8 awareness camps in addition to frontline demonstrations in 46 ha area under Tribal Sub Plan project.

I trust that all the delegates will agree that the efforts put in by scientists of AICRP Cashew Centres in terms of producing quality planting material, conducting training programmes on various themes including crop production, and plant protection activities and post harvest management have led to a wider awareness and helped in popularizing the cashew technology among farmers. I sincerely hope that all scientists of AICRP-Cashew will be earnestly implementing the approved technical programmes for their centres as well as, the decisions that will be taken in this Annual Group Meeting. I would like to express my deep sense of gratitude to the Hon'ble Deputy Director General (Hort.) Dr. A.K. Singh and Dr. W.S. Dhillon, Assistant Director General (Hort. Science) for their continued guidance and support from the Council. I also wish to thank Dr. S. Pasupalak, Vice Chancellor, OUAT for kindly agreeing to host this Annual Group Meeting at OUAT, Bhubaneshwar and all his colleagues for extending necessary support for organizing this Group Meeting. Thanks are also due to and all the guest and experts who are supporting me in different ways.

Before I conclude my report, I would like to thank all my scientific colleagues of the coordinating centres of AICRP on Cashew; Directors of Research, Deans and other University authorities for extending cooperation for the effective functioning of the AICRP work in their respective centres. The financial assistance and timely help extended by Director, DCCD-Cochin Dr. Venkatesh N. Hubballi in conducting cashew extension and development activities is gratefully acknowledged. I sincerely acknowledge the cooperation and technical support received from my colleagues at DCR, Puttur particularly Dr. Mohana G.S., Senior Scientist & Scientist-in-charge of PC Cell and Mrs. Reshma K., Personal Assistant which has enabled me to smoothly run the day-to-day work of the Project Coordinator's Cell.

Thank you

ACTION TAKEN REPORT ON THE DECISIONS OF AGM-2017

Action taken report on major recommendations of the Annual Group Meeting held at OUAT, Bhubaneswar, Odisha was presented by Dr. Mohana G.S., Sr. Scientist (Gen. & Cytogen.) & Scientist-in-charge, PC Cell, ICAR-DCR, Puttur.

CROP IMPROVEMENT

Recommendations		Action Taken
General Recommendations :		
1.	Title of the newly formulated project involving hybridization of polyclonal parents may be changed as "**Rapid Polyclonal hybrid evaluation trial**". Further, it was decided that atleast 100 nuts/ parent and total of atleast 500 nuts from 5 parents used in the experiment were to be raised and evaluated for yield traits in this trial.	**Bhubaneswar** As per suggestion of AGM-2017, title of the project has been changed to "Rapid Polyclonal hybrid evaluation trial". Nuts will be collected during 2018-19 fruiting season. **Vengurle** Noted and followed.
2.	The GPS data points and photo/ video documentations to be made while collecting the germplasm.	**Bhubaneswar** GPS data point and photo have been taken during collection of germplasm **Jagdalpur and Vengurle** Noted and Followed **Jhargram** Photos and videos were taken while collecting the germplasm. **Pilicode** Photo of the farmer and GPS coordinates are being recorded. **Kanabargi** GPS photo documentation will be made
3.	While collecting the germplasm from the farmers field due credit should be given to the farmers	**Bhubaneswar, Jagdalpur, Jhargram, Kanabargi, Vengurle, Vridhachalam** Noted and Followed **Pilicode** Attempts were made to highlight the conservation activities of the farmers at the National level.

4.	While collecting, recording and presentation of data, uniform terminology to be used as per the experimental manual provided by DCR, Puttur.	**Bhubaneswar, Jagdalpur, Jhargram, Kanabargi, Pilicode, Vengurle** Experimental manual published by DCR, Puttur has been referred for collection, recording and presentation of data.
5.	Characterization of accessions is to be carried out by following cashew descriptor.	**Bhubaneswar, Jagadalpur, Jhagram, Pilicode, Vengurle** Characterization of accessions has been done following cashew descriptor published by Bioversity International, Italy
6.	Spacing decided in the group meeting should be followed across all the centers for enabling better interpretation of results.	**Bhubaneswar, Jhargram, Kanabargi, Pilicode, Vengurle, Vridhachalam** Followed as decided in the group meeting.
7.	Proper statistical details such as Mean, SEm, CD and CV are to be shown in the results.	**Bhubaneswar, Jagdalpur, Jhargram, Pilicode, Vengurle, Kanabargi and Vridhachalam** Mean, SEm, CD and CV are shown in the results table.
8.	Performance of hybrids or varieties need to be compared with check varieties should be considered in all MLTs.	**Bhubaneswar** Performance of hybrids or varieties are compared with the national check variety BPP-8 at the centre. **Jhargram** At Jhargram centre, the check varieties planted with MLTs or any other varietal trial are BPP - 8, Jhargram - 1 and Bidhan Jhargram - 2. **Pilicode** Check variety Madakkathara-1 included in the trial itself.

9.	Application of biotechnological tools such as molecular markers in evaluating the breeding and germplasm material can improve the efficiency of the cashew breeding programmes.	**Bhubaneswar** Centre is planning to go for molecular marker evaluation of cashew germplasm maintained at the centre. **Jhargram** At present at Jhargram Centre this kind of facility is not available; therefore, the centre has taken initiative to do this kind of work at the main campus of BCKV. **Vengurle** Noted. However, the facility for molecular marker analysis is not available in RFRS, Vengurle.
	Centre -wise Recommendations	
	Bapatla Centre **Gen1. Germplasm-CECC** Characterization of yield and related parameters in the germplasm collected by the centre should be done by planting new grafts rather than depending on the source collection.	Planting of the new germplasm was completed. Plants are in vegetative stage. Characterization will be done according to the descriptions of DCR Manual.
	Darisai centre **Gen1. Germplasm-CECC** 1. Power point slides with appropriate font size and colors should be prepared for presentation of results. 2. Data with proper statistical analyses including CD and CV values should be presented.	Will be followed and presented in the AGM
	Jhargram centre 1. As pruning followed by irrigation may help to rejuvenate cashew plants damaged by hail storms, the same may be adopted in future to revive the plants damaged by unexpected hail storms. 2. The area under cashew in Jhargram region has increased in the past one	The plants damaged by hail storm were pruned during August, 2017 and trenches were made in between the rows of the plants to conserve the run - off water and the plants were revived. The photographs will be presented during the AGM, 2018. Grafts are produced at the AICRP on Cashew nursery in limited scale because of lack of

	decade but the planting material used by farmers is seedlings rather than the grafted plants. Hence the centre was asked to promote grafted high yielding varieties in their area.	revolving fund and skilled manpower. This year a project proposal has been made and sent to DCR, Puttur for producing grafts through PPP model for increasing graft production of the centre under TSP.
	Gen 4. Hybridization and Selection 1. Nut weights of some of the popular varieties recorded were low and hence data need to be checked.	Taken care and will be presented with nut weights.
	Vengurle centre **Gen 1. Germplasm CECC** 1. The nutritive value and CNSL content in the RFRS-195, a CNSL free-type accession is to be evaluated.	The facility for nutritive value and CSNL content analysis is not available at AICRP-Cashew, Vengurle centre. Hence this centre has called the quotation for said laboratory analysis during January, 2018. However, only two quotations were received in time frame period hence the analysis was not done during cashew season 2017-18. Furthermore, the overall yield of cashew during 2017-18 was very low due to adverse weather conditions. In current year (2018-19) Vengurle centre has again called the quotation for said analysis. The nutritive value and CNSL content in the RFRS-195 will be completed shortly.
	Gen4. Hybridization and Selection 1. The centre has developed numerous hybrids (58) and 18 of which are under replicated trials at the centre.	The replicated trial of top performing 18 promising hybrids along with check (V-9) is already initiated at Vengurle centre during the year 2016. The vegetative growth observations were also presented in last AGM-2017.
	2. Inheritance of CNSL free character may be studied by crossing CNSL free genotypes with high CNSL containing genotypes.	The hybridization programme include cross between CNSL free genotypes with high CNSL containing genotypes will be initiated in cashew season 2018-19. For this, the cross combination i.e. RFRS-195 X Vengurla-3 will be tried at Vengurle centre.
	3. The yield level of one of the interspecific hybrids (H2917) involving *A. microcarpum* was very high which	The facility for molecular markers analysis is not available at RFRS, Vengurle centre. For molecular marker analysis; the plant sample of H-2917 and

	is generally not observed in similar crosses. Hence, the purity of hybrid H2917 has to be ascertained using molecular markers at Vengurle/DCR.	their parents (Nanoda and A. microcarpum) are submitted to the In-charge, Biotechnology Laboratory, Dr.BSKKV, Dapoli. Presently work is in progress and will be completed shortly.
	Vridhachalam centre **Gen3. Varietal Evaluation Trials** 1. Nut weight of various popular varieties was low and hence, the data may be checked along with proper statistical analyses. 2. Data on number of inflorescences per m^2, number of nuts per m^2 and number of nuts per inflorescence in MLT V needs to be recorded. **Gen 5.** 1. VRI(CW)H-1, the color of the apple should be recorded as per the descriptors given in the experimental manual	Data on nut weight of cashew varieties were verified and analyzed the data statistically. Recorded and will be presented in the AGM Noted and followed
	Pilicode centre **Gen3. Varietal Evaluation Trials** 1. Proof in the form of photos and video clippings should be provided to substantiate high yields observed in Kanaka variety. 2. Terminology used should be as per the experimental manual provided by DCR, Puttur 3. Shelling percentage is to be worked out by following the procedure given in the experimental manual. **Gen5. Characterization of germplasm for cashew apple** 1. Cashew germplasm accessions should be evaluated for apple characteristics like vitamin-c, tannins and other nutraceutical parameters.	Photos have been included in the presentation for this year. Terminology has been verified with experiment manual and has been followed. Last year kernel out turn was worked out and presented as shelling percentage wrongly which has been corrected this year adopting experimental manual. Vitamin C and tannin percentage has been worked out. Samples have been sent to College of Horticulture, Vellanikkara for nutraceutical analysis did not give accurate results due to spoilage in long distance transport. Hence this

		will be repeated this year after taking proper care for avoiding spoilage.
	Paria centre **Gen1. Germplasm - CECC** 1. This centre has not completed the planting of germplasm accessions and special MLT VI varieties due to unknown reasons. Hence, the project coordinator may visit the centre to know the problems in the centre and discuss with the Director of Research (DR) of the NAVSARI University. Although the centre was started eight years ago, no much progress is made by the centre in establishing the allotted trials. 2. The centre needs to collect at least 20 germplasm accessions from the nearby centres like Vengurle and Goa and also from the forest area of Gujarat and plant them at the earliest. 3. Technical programme should be implemented scrupulously without fail. **Gen3**. **Varietal Evaluation Trials** 1. MLT VI (special) should be taken up immediately. (evaluation of released varieties in new centers formed in 2009)	The Director (Acting) and the PC cell In-charge visited the center on 27-28th February, 2018. The establishment of cashew plants is poor due to poor soil, nutrient deficiency and water shortage. They were advised to provide sufficient nutrients and water. Also advised to take up gap filling. The improvement of the center was discussed with the Director of Research and ADR and elaborate list of suggestions were given. We have confirmed 20 cashew germplasm to be collected from RFRS, Vengurle. Four germplasm were identified in nearby area and its propagation will be done shortly Agreed Agreed .
	Kanabargi centre **Gen 1. Germplasm CECC** 1. Germplasm accessions may be collected from Khanapur and nearby regions as there is a lot of area under cashew. 2. As major cashew area expansion is taking place in the regions nearby Kanabargi, multiple high yielding varieties should be encouraged for	3 accessions were collected from Belegavi area. This year (2018-19) will be collected from Khanapur area. MLT IV is under progress. best variety will be multiplied and supplied to farmers based on demand

	planting.	
	Tura centre **Gen 1. Germplasm CECC** 1. The centre was asked to provide scion sticks of Baramashi-type accessions to DCR at the earliest.	Information not provided
	Goa Centre **Gen 1. Germplasm CECC** 1. Cashew genotypes with higher nut yields and high juiciness and TSS apple characters may be identified. 2. Volpoi 2, a genotype with better fruit set and bold nut-type may be distributed to other centres. 3. Evaluation of promising bold nut, bigger size apple types and high yielding cashew genotypes – Supply of 200 scion sticks of H-22/05, Tiswadi-3 and Tudal-1 to DCR, Puttur for grafting and coding.	Bardez-9, Goa Cashew-2 (Tiswadi-3) and Valpoi-1 recorded higher nut yield coupled with higher TSS levels and juice contents. The following action was already executed and presented during AGM-2017 at Puttur: "Scion sticks of Valpoi-2 (Bold nut accession) have been sent during Sept 2017, to AICRP Centres viz.- 1.RFRS,Vengurla (Dr.BSKKV, Dapoli), 2.CRS, Madakkathara (KAU), 3.CRS, OUAT, Bhubhaneshwar, 4.RRS, Vridhachalam, TNAU, 5.CRS, Bapatla, (DR YSR Hort. Univ. AP)" Besides the above, as per the request from Bapatla Centre, again the scion sticks were sent on 11.10.2018. 200 scion sticks each of H-22/05, Tiswadi-3 and Tudal-1 were supplied to DCR, Puttur on 29.10.2018

CROP MANAGEMENT

General Recommendations :		
1.	Soil and water analysis should be conducted in all the centers before initiating a new experiment.	**Bhubaneswar** Soil and water analysis will be conducted at the time of initiating the new experiments i.e. Ultra

		High Density cum drip irrigation trial and intercropping in cashew **Jagdalpur** Soil samples of different land grids of Upland Research Station, Lamker Dist. Bastar has been analysed. **Madakkathara** Soil analysis done for new experiment ultra high density planting trial. **Vengurle** Noted and followed. The data on soil of newly initiated trials were recorded and included in the Summary Report-2018. The water analysis will be carried out before the actual application of irrigation to the experimental graft.
2.	Leaf and soil analysis should be carried out in organic management trial.	**Bhubaneswar, Jhargram, Madakkathara, Vengurle, Vridhachalam** Leaf and soil analysis carried out in organic management trial. **Kanabargi** Will be done
3.	Land equivalent ratio and cashew equivalent yield should be calculated for intercropping trial before concluding the trial.	**Bhubaneswar, Jagdalpur, Jhargram, Madakkathara, Vengurle, Kanabargi Vridhachalam,** Will be followed by centers
4.	Microbial population should be studied in organic management trial.	**Bhubaneswar, Jhargram, Madakkathara, Vengurle, Vridhachalam** The population of microbes in organic management trial has been studied and will be presented during AGM, 2018. **Kanabargi** Yes
5.	High density observational trial should be concluded after 10^{th} harvest.	**Bhubaneswar** High density observational trial at Bhubaneswar Centre has been concluded. **Jhargram** High Density Observational trial was started in 2010, therefore, will be concluded in 2023.

		Vengurle The trial is already concluded by AICRP-Cashew, Vengurle Centre during the year 2015-16. **Vridhachalam** Trial was concluded **Kanabargi** Will be followed
6.	All the centers should include high resolution photographs or video clips of their experimental plots during presentation.	**Bhubaneswar, Jagdalpur, Jhargram, Madakkathara, Vengurle, Kanabargi, Vridhachalam** Photographs of different activities in the experimental plots have been taken and will be included in the presentation.
7.	Quality parameters of nut and cashew apple under organic management of cashew should be studied before concluding the experiment.	**Bhubaneswar, Jhargram, Kanabargi, Madakkathara, Vengurle, Vridhachalam** Before conclusion of organic management trial, the quality parameters of nut and cashew apple will be studied.
8.	Economics should be worked out during compilation of the concluded experiments.	**Bhubaneswar, Jhargram, Kanabargi, Madakkathara, Vengurle, Vridhachalam** Economics of each concluded trial will be worked out.
	Centre-wise Recommendations	
	Bhubaneswar I. The soil pH is very low, therefore the soil should be examined for micro-flora population particularly VAM and Endophytic bacteria and management should be done accordingly.	The process of examining the soil for micro-flora population particularly VAM and Endophytic bacteria has been initiated and continuing at Department of Soil Science and Agricultural Chemistry, OUAT, Bhubaneswar and management will be done accordingly.
	II. The critical difference for annual nut yield should be rechecked.	The critical difference for annual nut yield has been rechecked and corrected.
	III. Intercropping trial should be initiated with new set of crops.	Cashew plants in the existing intercropping experiment are already over matured (15 years) and to start the experiment with new intercrops require new planting. This will be done after cleaning of area. The process has already been started.

	Hogalagere 1. The statistical analysis should be rechecked.	Checked and corrected
	Darisai 1. Intercropping should be conducted with rainfed crops and economics should be worked out. 2. Status report of Jharkhand should be sent within a month time to DCR, Puttur.	Information not provided Information not provided
	Jagdalpur 1. NRCC Sel-2 variety can be included in high density observational trial. 2. It was suggested to carry the experiment on "Screening of cashew apple varieties for RTS and Jam" with released varieties instead of germplasm accessions.	High density plantation trial was laid using Vengurle-4 during 2017 at Upland Research Station, Lamker (Bastar District). Plants are now 2 years of age, replacement of variety is a hard task as plants are established. Experiment on preparation of RTS and Jam using released varieties will be conducted in summer 2018.
	Jhargram 1. Intercropping trial under 6m x 6m spaced plants should be concluded and compiled report should be sent to DCR, Puttur. **2.** Intercropping trials should be initiated with new set of intercrops under 4m X 4m spacing.	The compiled report has already been sent to DCR, Puttur during 2017. This has been initiated during 2017
	Kanabargi 1. Intercropping trial should be concluded and compiled report should be sent to DCR, Puttur. While analyzing the data the comparison of yield of cashew should be carried out among the treatments. 2. Intercropping trials should be initiated	Compiled data will be sent to DCR During 2018-19 new set of intercrops Viz. cauliflower, cabbage, knoll khol,

	with new set of intercrops (flowers and vegetables) under 6m x 4m spacing.	chrysanthemum, china aster and gaillardia has been planted and observation is being recorded.
	Paria 1. Decision was taken that the Project Coordinator and PC Cell In-charge of AICRP on Cashew will visit Paria centre to review the experiments where conduct of trials and presentation were below expectation.	Visited and given the suggestions to improve further.
	Madakkathara 1. Vegetable crops including one leguminous crop should be taken in the intercropping experiment. 2. If pepper is taken as intercrop, zero tillage has been recommended. 3. Lime application is recommended as the pH of the soil is too low in the organic trial.	A legume crop has been included in the intercropping experiment. Noted. Pepper was not included in the trial. Applied lime as per the soil test data in the organic trial.
	Vengurle 1. The drip irrigation trial is concluded and consolidated report should be sent to DCR, Puttur. 2. Intercropping trial should be initiated with new set of crops.	The trial was concluded by AICRP-Cashew, Vengurle centre during 2017 and final concluded report submitted to the Director and PC, ICAR-DCR, Puttur vide office letter No. DBSKKV/RES-II/600/1851/2018 dated 12th March, 2018. Trial on "Intercropping in Cashew" with new set of intercrops is initiated at AICRP-Cashew Vengurle centre during Rabi season, 2018.
	Vridhachalam **I.** The statistical analysis should be rechecked	Data were analyzed

CROP PROTECTION

General Recommendations		
1.	Pests and natural enemies reported by the AICRP centres should properly get identified at NBAIR, Bengaluru or IARI, New Delhi.	**Bhubaneswar** Pests and natural enemies have been already correctly identified in the department of Entomology By Dr H.P Patnaik, Professor and Ex. Head of the Department. **Jagdalpur, Madakkathara, Pilicode and Vengurle** Will be followed in future experiment. **Vridhachalam** Collected the foliage pests and reared and will be sent for identification.
2.	Photos taken from the respective centers need to be acknowledged.	**Bhubaneswar, Madakkathara, Pilicode, Vengurle and Vridhachalam** Agreed and followed
3.	Germplasm screening for pests collected over years may be pooled. To confirm the resistance of the promising germplasm for pest resistance, challenging of specific pests is required on selected shoots / inflorescences. Help from DCR may be taken for this.	**Bhubaneswar** Pooled data over Past five year prepared and submitted. No conclusion could be derived due to low pest pressure. **Jagdalpur** Will be followed in future experiment. **Madakkathara** Concluded and final report will be sent **Pilicode** Noted **Vengurle** To find out the resistance of the promising germplasm to tea mosquito bug; the data for 11 years was compiled and included in the Summary Report 2017-18 of AICRP-Cashew, Vengurle centre. **Vridhachalam** Screening of pest data was collected and pooled.

4.	Germplasm screening data need to be recorded in comparison with released variety as a check.	**Bhubaneswar, Jagdalpur and Madakkathara** Followed **Vengurle** Release varieties Vengurla-7 and Vengurle-9 already included in the screening trial as a check along with other germplasm. **Vridhachalam** VRI2 and VRI3 were taken as a check
5.	While recording observations, procedure mentioned in experimental manual need to be adopted strictly and data must be reported uniformly among the centres.	**Bhubaneswar, Jagdalpur, Madakkathara, Vengurle and Vridhachalam** Noted and followed.
6.	For the insecticides trials, yield need to be recorded and cost-benefit ratio to be worked out.	**Bhubaneswar, Jagdalpur, Madakkathara, Vengurle and Vridhachalam** Followed
7.	Based on the data generated over the past years on influence of weather factors on pest complex, prediction models may be developed.	**Madakkathara** Developing a prediction model in consultation with meteorologist, Dr.Sunil Mukundan, Asst.Professor, KVK, Pattambi. **Vengurle** This centre has already developed prediction model for tea mosquito bug and thrips. **Vridhachalam** Pooled three years data on influence of weather factors on pest complex and initiated the work.
8.	Influence of biotic factors on pest incidence need to be quantified and subjected to correlation analysis with pests as dependant factor.	**Bhubaneswar** Predatory potential (Biotic Factors) on different pests is difficult to quantify under natural (field conditions). **Jagdalpur** Will be followed in future experiment. **Madakkathara** Noted

		Vengurle Noted. This centre has studied the predatory spider of Tea mosquito bug and their feeding potential. From the study, it was observed that spider have very low feeding potential. **Vridhachalam** Quantified the influence of biotic factors on pest incidence and carried out correlation analysis with pest as a dependent factor.
9.	For curative trial on CSRB, two-way table analysis may be followed to see the influence of stem girth and age of trees, using Chi-Square test. "Insect Ecology" by T.R.E. Southwood may be referred for this.	**Bhubaneswar** Followed two way table presentation. Analysis protocol needed. **Jagdalpur** Will be followed in future experiment. **Madakkathara, Vengurle and Vridhachalam** Noted
10.	Data should be properly analyzed with required transformation in consultation with statistician.	**Bhubaneswar, Jagdalpur and Vengurle** Followed **Vridhachalam** Data were analyzed with respective transformation consulted with statistician.
11.	When pre-treatment count has significant difference, required corrections to be applied while data analysis, or ensure homogeneity of population.	**Bhubaneswar, Jagdalpur, Vengurle** Followed **Vridhachalam** Homogeneity of population was maintained for pretreatment count while analyzing data.
12.	Quality of neem oil tested against CSRB need to be verified or possibility of using commercial azadirachtin may be looked into.	**Bhubaneswar** Commercial source of neem oil used. **Jagdalpur, Vengurle and Vridhachalam** Followed
13.	PC Cell has to take steps for getting label claims for the insecticides found effective across centres from CIB, so as to include in recommendations for pest management.	Once the conclusive results are obtained regarding specific insecticides in the trials on TMB and CSRB, efforts will be initiated to get the label claim.
14.	All SAU's must intimate the PC regarding transfer of AICRP (cashew) scientists or the scientist may be transferred after training the new scientist.	**Bhubaneswar** Already informed to Dean of Research

	Centre-wise Recommendations:	
	Bapatla 1. Number of trees for different treatment may be kept uniform for insecticides trial and treatment size may be enhanced for observations on physical parameters for CSRB. 2. Data on germplasm evaluation over years may be pooled for pest resistance. Germplasm data should be rearranged and pest data to be presented in single table.	Followed and number of trees for different treatments kept uniform. Followed and data were presented in single table.
	Bhubaneswar 1. Pruning may be adapted in old trees under insecticides trial of TMB to facilitate pest observations. The expertise of DCR may be taken for rejuvenation.	Pruning of trees done in consultation with visiting scientist (Dr. J.D. Adiga) from DCR.
	Hogalagere 1. Significance of 'r' values to be indicated in correlation table. 2. Species of thrips to be ascertained from NBAIR, Bengaluru.	Significance has been indicated in correlation table and submitted to DCR, Puttur Specimen has been submitted to ZSI, Kolkata and report is awaited
	Jagdalpur 1. Observations on coccinellids predating on insect pests need to be visually documented. 2. Species of mealy bug should be identified from NBAIR, Bengaluru.	Recommendation will be followed in future experiment. Infestations of mealy bug have not been reported in this season. However if during studies and field visit any species will be reported then centre will send it for identification from NBAIR, Bengaluru.
	Paria 1. Germplasm screening for pest incidence to be taken up.	Information not provided
	Kanabargi 1. Entomology trials may be kept in abeyance until an Entomologist joins or PC may explore possibilities to engage entomologists from nearby centres of UHS, Bagalkot.	Information not provided

RECOMMENDATIONS OF AGM – 2018

The major recommendations of the Annual Group Meeting of AICRP-Cashew held during 6th to 8th December 2018 at OUAT, Bhubaneswar are presented below.

CROP IMPROVEMENT

General decisions/recommendations to all the centres

- All the centers should collaborate with biotechnology departments of university for marker assisted breeding in cashew.
- While selecting any genotype for the breeding purpose, innovative thinking is required.
- All the centers are not required to maintain cashew field gene banks. It is suggested to maintain one each at west coast region, east coast region and plain region.
- Germplasms collection should focus on salient horticultural traits.

CROP MANAGEMENT

General recommendations

1. For organic cultivation trial, all the AICRP centres are advised to prepare report on benefit-cost ratio (B:C) by taking the help of soil scientist at ICAR-DCR, Puttur.
2. The statistical analysis of data can be done using DMRT tool for better comparison of treatments under organic management experiment.
3. All the AICRP centres are directed to submit the pooled data of organic experiment to the DCR, Puttur and the experiment will be validated in the next year.
4. The selection of intercrops should be regional specific and the risk of introducing new pest and disease from intercrops to cashew should be take care well in advance.
5. Care should be taken to protect the experimental plots by proper fencing to check the attack of wild animals and other pest
6. The experimental data should be statistically analysed. The effect of intercrop on main crop yield should be reflected.
7. Newly joined scientists of different centres of AICRP are suggested to undergo training at ICAR-DCR, Puttur on cashew research and extension activities.
8. The experimental plot should be annually pruned and trained for canopy management for recording biometrical observations.
9. The centres allotted with UHDP experiment should start the experiment in the upcoming season. In this regard, the planting material should be multiplied and preserved to take up planting in coming seasons.

CROP PROTECTION

General recommendations:

1. The diameter instead of stem girth while collecting the data on Post extraction Prophylaxis experiment on CSRB should be mentioned.

2. The occurrence of the insect pest recorded over years in respective centers and the insect pest occurring now with change of age of the trees in the plantation and changing climatic conditions to establish the changing scenario of the pests in cashew should be compiled. Newly appearing pests need to be recorded.
3. Screening of germplasms to locate tolerant / resistant types to major pests of the region should also be done in new MLTs upto ten years age of the plant for foliage pests and these plants should be maintained with prophylactic method recommended for CSRB to record the rate of protection from CSRB infestation.
4. While collecting the data on pests, apart from environmental conditions crop age, crop stage should be mentioned
5. While presenting the data insect pests of regional importance (Major and Minor) should be given.
6. An experiment with botanicals to control TMB NSKE, Deshi Cow urine, Local botanicals, Standard Check (Lamda Cyhalothrin) and untreated check should be initiated as a new trial in all the centres.
7. For control of CSRB entire orchard should be considered and the entire trees are to be divided into three categories
   a. Trees with trunks without branching from the base. Branches are above 1.0-1.5 m above the ground
   b. Trees trunk with branching close to the ground level and free from CSRB infestation.
   c. Trees trunk with branching close to the ground level and with CSRB infestation

   Application of plaster of paris followed by painting up to 1m in the month of October / November (After cessation of rain) should be followed. About 100 plants of almost same age group should be selected under each category.
8. Branching should not be allowed below 1m height of the plants in any newly raised to prevent CSRB infestation in future plantations, particularly in tribal areas.
9. For correlation experiment, data of several years should be used.
10. Pest forecasting modules should be developed by taking into consideration data of previous years.

TECHNICAL SESSION I : CROP IMPROVEMENT

Chairman	:	Prof. P.K. Das, Former Dean of Research, OUAT Bhubaneswar
Co- Chairman	:	Dr. (Mrs.) Shashikala Beura, Prof. and Head, Dept of Floriculture and Landscaping, OUAT, Bhubaneswar
Rapporteurs	:	1. Mr. Eradasappa, E, scientist (Plant breeding) ICAR-DCR, Puttur 2. Mrs. Meera Manjusha, Jr. Horticulturist, RARS, Pilicode

Hybrid H-130 Release Proposal

- The variety was accepted for release in coastal zone of Karnataka.
- Data of yield obtained in farmer's field should be included.
- Scientist's contribution should be given separately as scientists involved in hybridization and scientists involved in evaluation of the hybrid.

Revised procedure for evaluation and release of variety

- The minimum yield advantage of the new variety should be 5-10% over the check variety.
- Scientists contribution should be mentioned clearly.
- Special traits of the new variety should be highlighted.

Center wise recommendations

Bapatla

Germplasm trial

- Spacing of 6m x 6m should be followed instead of 4m x 4m
- Small nut varieties (<5g) should be removed from the evaluation
- Conclusion should be given clearly.

Bhubaneswar

Germplasm trial

- Core collection should be identified
- Outliers of PCA should be used for breeding purpose

Hybridization and selection trial

- 100% nut set observed in crosses made should be checked for the data accuracy.
- Graphical representation of data should be proper.
- Higher sex ratio (0.46) observed in hybrid BH-26 should be checked.
- Hybrid BH-26 data should pooled and proposed for release.

Darisai

- Emphasis should be given for production of planting material and area expansion.
- Awareness programmes for farmers should be conducted to increase the success of establishment of grafts in the field.

Hogalagere

Germplasm trial

- Higher shelling percentage reported should be checked.

MLT-5

- Data should be analyzed statistically.

Hybridization and selection trial

- Wind breaks should be provided for the field experiment.

Jagadalpur

- Efforts should be made to get land for conducting experiments.

Jhargram

Germplasms trial

- Newly developed F_1 progenies should not be included in the germplasm collections.
- Jhargram-2 should be tried at Tura center.

MLT-5

- Data of CD, CV and SEm± should be checked.
- Correlation and regression should be worked out for nut weight with RH and temperature.

Hybridization and selection

- BPP-8 should be mentioned as check in the Tables.

Madakkathara

Germplasms trial

- Trial should be continued with collection of germplasm.

Paria

Germplasms trial

- Germplasms collected (No.2) should not be included in the dwarf category.

MLT-6

- Phtographs should be included in the presentation.

Pilicode

MLT-5

- Data should be presented in the table while giving presentations in AGM.
- Cashew apple evaluation should be done only for the varieties of the center.

Vengurle

Germplasms trial

- Newly developed F_1 progenies should not be included in the germplasm collections.

Hybridization and selection

- Data of Nanoda *x A.microcarpum* should be checked and the cross should be subjected for molecular analysis to confirm the parentage.

MLT-2

- H-662 can be proposed for release if it shows 10% higher yield advantage over highest yielding varieties and other verified features.

Vridhachalam

Trial on CNSL free types

- Genotypes should be collected from ICAR-DCR at the earliest for initiating the trial.
- MLT-2 and MLT-5 trials should be concluded.

Tura

- Initiative should be taken for evaluation and release of Baramashi type.
- Training and awareness programmes for farmers for production of planting material should be conducted.

Programmes allotted to different Centers of AICRP on Cashew
for the year – 2019-20

Programmes		Centres
Gen.1.	Germplasm collection, conservation, evaluation, characterization and cataloguing.	Bapatla, Bhubhaneswar, Darisai, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Paria, Pilicode, Vengurle, Vridhachalam, Kanabargi, Tura and Goa.
Gen.1a.	Evaluation of germplasm accessions for CNSL content	Bapatla, Hogalagere, Vengurla and Vridhachalam
Gen. 3.	Varietal evaluation trial	
	Multilocation trial–III (earlier MLT–2002) (Planted during 2003) (Experiment above 10 years may be concluded)	Bapatla, Hogalagere, Vengurla and Vridhachalam.
	Multilocation trial–V (performance of released varieties) (To be concluded after 6 harvests)	Bapatla, Hogalagere, Jagdalpur, Jhargram, Pilicode and Vridhachalam.
	Multilocation trial–VI (Special MLT)	Darisai, Paria, Kanabargi and Tura
Gen. 4.	Hybridization and selection	Bapatla, Bhubhaneswar, Goa, Hogalagere, Jhargram, Vengurla and Vridhachalam.
	Rapid polyclonal hybrid evaluation trial	Bapatla, Bhubhaneswar, Madakkathara, Vengurla and Vridhachalam
Gen. 5.	Characterization of germplasm for cashew apple (Experiments above 10 years may be concluded)	Bapatla, Jagdalpur, Pilicode and Vridhachalam
Gen. 6	Evaluation of promising bold nut, bigger size apple types and high yielding cashew genotypes	Bapatla, Bhubaneswar, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Pilicode, Goa, Vengurle and Vridhachalam

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TECHNICAL SESSION II : CROP MANAGEMENT

Chairman : Prof. P.C. Lenka, Former Director, OUAT, Bhubaneshwar
Co- Chairman : Dr. G.C. Acharya, Head (CHES), IIHR, Bhubaneshwar
Rappouteurs : Dr. Preethi P., Scientist (Fruit Science), ICAR- DCR, Puttur

The QRT secretary of ICAR-DCR, Puttur Dr. S.P. Ghosh emphasized that the experiments with the superior results should be executed in farmers' field with the help of KVKs and state departments.

Center wise recommendations

Bapatla

- The implementation of proper and recommended pruning techniques for rejuvenation should be adapted in future.

Bhubaneshwar

- The organic cultivation experiment can be concluded and recommended to come up with publications

Darisai

- The planting material of promising varieties should be multiplied and supplied to the farmers. In this regard, training and orientation of technical staff should be provided and an exposure visit to Jhargram station is also recommended.

Hogalagare

- The SEm±, CD, CV values should be removed from cumulative yield. The results can be represented in two way table for spacing and nutrient trial. For all experiments, the yield parameter should be recorded after 3 days of nut drying without any apple residues

Jagdalpur

- Training on cashew apple cultivation to tribals is recommended.

Jhargram

- The possibilities of using legumes as intercrop can be explored.

Kanabargi

- The performance of high yielding trees in organic experiments can be verified in subsequent years. In this regard, the Project Coordinator can visit the station during fruiting or harvest season

Paria

- The possibilities of laying out the boldnut and high yielding experiment can be explored. The data of all experiments can be statistically verified.

Vengurle

- The nut size of V-4 on organic experiment trial should be verified.

Vridhachalam

- The cost benefit ratio (C:B) on intercropping trial need to be verified.

Programmes allotted to different AICRP Cashew centers
for the year – 2019-20

Programmes		Centres
Hort.1.	Nutrient management for yield maximization in cashew.	Bhubhaneswar, Hogalagere and Paria
Hort.2.	Fertilizer application in high density cashew plantations	Bapatla and Hogalagere
Hort.3.	Drip irrigation trials	Hogalagere and Jagdalpur
Hort.4.	High density planting - observational trials	Bapatla, Jagdalpur, Jhargram and Vridhachalam.
Hort.6.	Intercropping in cashew	Bapatla, Darisai, Jhargram, Kanabargi, Madakkathara, Paria, Vengurla and Vridhachalam
Hort.7.	Organic management of cashew	Bapatla, Bhubaneswar, Darisai, Hogalagere Jhargram, Kanabargi, Madakkathara, Vengurla and Vridhachalam
Hort.8.	Spacing cum Fertilizer Trial	Darisai, Paria, Kanabargi and Tura.
Hort.9.	Evaluation of production potential of newly developed variety Jhargram-2 at different spacings.	Jhargram and Darisai
Hort.11.	Ultra High density cum Drip Irrigation	Bapatla, Bhubaneswar, Jhargram, Madakkathara, Paria and Vengurla

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TECHNICAL SESSION III : CROP PROTECTION

Chairman	:	Dr. C.R. Satapathy, Former Professor Entomology, OUAT, Bhubaneswar
Co-Chairman	:	Dr. L.N. Mohapatra, Professor Dept of Entomology, OUAT, Bhubaneswar
Rapporteurs	:	1. Dr. B. Nagendra Reddy, Entomologist, CRS, Bapatla 2. Mr. S.G. Parmar, Entomologist, AES, Paria

The session was chaired by Dr. C.R. Satapathy, Former Professor Entomology, OUAT, Bhubaneswar and co-chaired by Dr. L.N. Mohapatra, Professor Dept. of Entomology, OUAT, Bhubaneswar, in the presence of Dr. M. G. Nayak, Director (Acting) and Project coordinator, AICRP on Cashew and the scientist in charge PC cell, Dr. G.S. Mohana, Senior Scientist, DCR, Puttur. The following centres presented the experimental results. Bapatla, Bhubaneshwar, Vridhachalam, Madakkathara, Vengurle, Hogalagere, Jagdalpur, Paria, Kanabargi.

CENTRE WISE RECOMMENDATIONS:

Bapatla & Bhubaneswar

- In Screening of germplasm to locate tolerant / resistant types to major pests of the region trial the centers were suggested to identify the accessions less susceptible to the pests by comparing previous years data**.**

Jagadalpur

- In Evaluation of insecticides for the control of Tea Mosquito Bug and other insect pests trial, the centre was suggested to recheck the data of leaf miner damage in the Buprofezin treatment and also in trial Influence of biotic and abiotic factors on the incidence of pest complex of cashew.

Madakkathara

- The Centre was suggested to re-check the data in their experiments and plan experiment according to the limitations of their state in consultation with the DCR.

Programmes allotted to different AICRP Cashew centers for the year – 2019-20

Programmes		Centres
Ent.1. Chemical Control of pest complex in cashew.		
Expt 3. Evaluation of insecticides for the control of TMB and other insect pests		Bapatla, Bhubhaneswar, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Paria, Vengurla and Vridhachalam.
Ent. 2. Control of Cashew Stem and Root Borers		
Expt. 2. Curative trials		Bapatla, Bhubhaneswar, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Vengurla and Vridhachalam.
Ent. 3.	Influence of biotic and abiotic factors on the incidence of pest complex of cashew	Bapatla, Bhubhaneswar, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Paria, Vengurla, Vridhachalam and Kanabargi.
Ent. 4.	Screening of germplasm to locate tolerant / resistant types for major pests of the region	Bapatla, Bhubhaneswar, Hogalagere, Jagdalpur, Jhargram, Vengurla and Vridhachalam.

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TECHNICAL SESSION – IV : INTERACTION BETWEEN DEVELOPMENT DEPARTMENTS & RESEARCH CENTRES

Chairman	:	Dr. V.N. Hubballi, Director, DCCD, Kochi
Co-Chairman	:	Dr. M.G. Nayak, Director(Acting), ICAR-DCR, Puttur Mr. S. Nayak, Managing Director, OSCDC Ltd., Bhubaneswar
Rapporteur	:	Dr. Subash Chandra Swain, Associate Professor (Horticulture), AICRP on MAPB Dr. (Mrs.) Kabita Sethi, Jr. Horticulturist, CRS, Bhubaneswar

The technical session (farmers - scientists interaction) was started at 10 am with the introductory remarks by the Chairman, Director, DCCD, Kochi, Kerala. The session was co-chaired by Director (Acting), Directorate of Cashew Research, Puttur, Karnataka and Managing Director, OSCDC Ltd., Govt. of Odisha. In this session, the officers of line Dept., Govt. of Odisha, cashew entrepreneurs, farmers participated and presented their views and suggestion for development of Cashew sector in the country. The general recommendation emerged out of the session are as follows:

1. Forty per cent of the existing cashew plantations are old, senile and non productive. Hence, more emphasis should have to be given for new plantations with recommended variety as per suitability to different agro-ecological situation.
2. More focus should be given for scientific cultivation of cashew in the tribal pockets of the country in order to harness higher production and productivity.
3. Cashew plantations need to be undertaken in cluster approach for area expansion in new area.
4. Cashew can be successfully cultivated in elephant prone area instead of other perennial crops.
5. The strategy has to be taken to meet the 50% shortage of raw material of cashew to run the processing industries successfully.
6. The productivity of cashew is low because of large chunk of existing plantations having seedling origin. Hence, rejuvenation and top working technology needs to be popularized and adopted in more area to increase the productivity.
7. The grafted planting material of cashew should be promoted for cultivation in NE states and tribal pockets of different states to increase the production.
8. The steps have to be taken to strengthen and development the nursery system in the country for production of more QPM in cashew.
9. More concerted efforts need to be taken by the scientists of AICRP on Cashew to develop suitable control measures for CSRB in cashew.
10. The high density planting (HDP) in cashew with suitable variety and recommended package of practices needs to be promoted on large scale in the country to increase the production and meet the internal demand.
11. The cashew entrepreneurs have to take initiative to utilize the cashew apples for development of value added products such as fenni, liquor, soft drink, health drink, RTS etc. to meet the internal demand.

12. The cashew growers, nurseryman may be trained for their skill up gradation through skill development programmes.
13. All the research centres of AICRP on Cashew should adopt a village for transfer of technologies in cashew.
14. The mass dissemination of technologies and success stories relating to cashew needs to be popularized by all the centers of AICRP on Cashew for wider dissemination.

PLENARY SESSION

Chairman	**:**	Dr W.S. Dhillon, ADG(HS-II),ICAR, New Delhi
Co- Chairman	**:**	Dr. M.G. Nayak, Acting Director, DCR, Puttur Dr. L.M. Garnayak, Dean of Research, OUAT, Bhubaneswar Dr. P.K. Roul, Dean, Extension Education, OUAT, Bhubaneswar
Rapporteur	**:**	Dr. P. K. Panda, Horticulturist, AICRP on Cashew Dr. (Mrs.). Kabita Sethi, Jr. Horticulturist, AICRP on Cashew

The chairman of the session invited rapporteurs for presentation of proceedings of different technical session of the Annual Group Meeting-2018.

Following suggestions came from Chairman and Co-chairman of the session

- Chairman suggested to initiate experiments on cashew rootstock as it has impact on scion behavior.
- It was suggested to present the recommendations of various experiments instead of presenting the whole proceeding of various technical sessions. He suggested to present only the recommendations of the AGM in future.
- The technologies generated from the various concluded experiments should be demonstrated in the farmers field in collaboration with the extension functionaries like KVK's of the SAU and State Department of Agriculture and Horticulture.
- It was suggested to remove the plants from hybridization block which have already been screened out.
- The best centre award was given to Cashew Research Station, Jhargram, West Bengal
- The chairman also suggested for best scientist award in future AGM, to be conducted.
- All the proceedings presented by rapportures of different session were accepted by the chairman.
- The Chairman expressed his satisfaction over presentations made by different centers in different technical session.

The meeting ended with vote of thanks given by Dr. Mohana G. S., In-charge PC Cell, DCR, Puttur.

PHOTOGRAPHS OF AGM – 2018 OF AICRP-CASHEW

Lightening of lamp by the dignitaries

Dignitaries on the dias

Release of Publications

Technical Sessions

Best Award – RRS, Jhargram

Participants in the AGM-2018

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