ALL INDIA COORDINATED RESEARCH PROJECT ON CASHEW

PROCEEDINGS OF THE ANNUAL GROUP MEETING

OF

SCIENTISTS OF AICRP-CASHEW

Online meeting through Zoom

18-19th, DECEMBER 2020

ICAR - DIRECTORATE OF CASHEW RESEARCH

PUTTUR-574 202, D.K., KARNATAKA

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ACKNOWLEDGEMENT

The Annual Group Meeting of All India Coordinated Research Project on Cashew was held virtually from 18 to 19th December 2020. AICRP research workers and progressive farmers have participated in this meeting.

I express my deep sense of gratitude to Dr. A.K. Singh, DDG (Hort.), ICAR for his kind advice in organizing this Annual Group Meeting of Scientists of AICRP on Cashew-2020. I place on record my thanks to the authorities of the ICAR, New Delhi for their support in conducting meeting.

I am thankful to Dr. B.K. Pandey, ADG (Hort.), ICAR for inaugurating the AGM Meeting 2020. My thanks are due to Dr. V.S. Korikanthimath, Former Director, ICAR-CCARI for chairing and Dr. J.D. Adiga, Principal Scientist, ICAR-DCR for co-chairing the Crop Management Session, Dr. Niral V., Principal Scientist, ICAR-CPCRI for chairing and Dr. M.S. Aneesa Rani, Professor, Dept. of Fruit Science, TNAU for co-chairing the Crop management session and Dr. Kesavan Subaharan, Principal Scientist (Ento.), NBAIR for chairing and Dr. Joseph Rajkumar A, Principal Scientist, ICAR-CPCRI for co-chairing the Crop Protection session and Dr. Venkatesh Hubballi, Director, DCCD, Kochi for chairing the Interactive Session. My thanks are also due to all the rapporteurs of different sessions.

I thank all the scientific colleagues from the Coordinating Centers and ICAR-DCR for their participation and cooperation in making this Annual Group Meeting a success. 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.

[ANITHA KARUN]

Acting Director &

Project Coordinator (Cashew)

Puttur

Date : 5.1.2020

PROGRAMME DETAILS

ANNUAL GROUP MEETING OF AICRP ON CASHEW-2020

Venue : Virtual Meeting through Zoom
Date: 18-19th December, 2020

18.12.2020 (9.30 AM)

INAUGURAL SESSION

Welcome & Project Coordinator's Report	:	Dr. Anitha Karun, Director (Acting), ICAR-DCR, Puttur
Chief Guest's Address	:	Dr. B.K. Pandey, ADG (Hort-II.), ICAR, New Delhi
Rapporteur	:	Dr. Mini Poduval, Horticulturist, RRS, Jhargram

TECHNICAL SESSIONS

10.00 AM

Presentation of Action Taken Report	:	Dr. Mohana G.S., Pr. Scientist (Gen. & Cytogen.) and SIC (PC Cell), ICAR-DCR, Puttur
TECHNICAL SESSION-I	:	**CROP IMPROVEMENT**
Chairman	:	Dr. Niral V, Pr. Scientist, ICAR-CPCRI, Kasaragod
Co-Chairman	:	Dr. M.S. Aneesa Rani, Professor, Dept. of Fruit Science, TNAU, Coimbatore
Rapporteur	:	Dr. Kabita Sethi, Horticulturist, CRS, Bhubaneswar

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

18.12.2020 (2.00PM)

TECHNICAL SESSION II	:	**CROP MANAGEMENT**
Chairman	:	Dr. V.S. Korikanthimath, Former Director, ICAR-CCARI, Goa
Co-Chairman	:	Dr. J.D. Adiga, Pr. Scientist, ICAR-DCR
Rapporteur	:	Dr. Jaleja Menon, Horticulturist, CRS, Madakkathara

Presentation of Reports on Crop Management by Scientists of AICRP Cashew

19.12.2020 (9.30AM)

TECHNICAL SESSION III	:	**CROP PROTECTION**
Chairman	:	Dr. K. Shubhaharan, Pr. Scientist, NBAIR
Co-Chairman	:	Dr. Joseph Rajkumar A, Pr. Scientist, ICAR-CPCRI
Rapporteur	:	Dr. Vanitha K, Scientist (Ento.), ICAR-DCR

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

19.12.2020 (1.30 Noon)

TECHNICAL SESSION-IV

Interaction between Development Departments, Research Centers and Farmers

Chairman	**:**	Dr. Venkatesh Hubballi, Director, DCCD, Kochi
Co-Chairman	**:**	Dr. Anitha Karun, Director (Acting), ICAR-DCR
Rapporteur	:	Dr. R.C. Gajbhiye, Horticulturist, RFRS, Vengurla

Discussion by participants of various development departments

VARIETY RELEASE AND PLENARY SESSION

Chairman	**:**	Dr. A.K. Singh, DDG (Hort. Sci.), ICAR, New Delhi
Co-Chairman	**:**	Dr. Anitha Karun, Director (Acting), ICAR-DCR
Presentation of Rapporteur's reports	**:**	By Rapporteurs
Vote of Thanks	**:**	Dr. Mohana G.S., Scientist-in-charge, PC Cell, ICAR-DCR, Puttur

INAUGURAL ADDRESS

Dr. B.K. Pandey
Assistant Director General (Hort. Sci.), ICAR, New Delhi

Distinguished experts, invitees and scientists from different centres of AICRP-Cashew, I feel privileged to inaugurate the Annual Group Meeting – 2020 online. It is inevitable in the times of Corona that we need to do this meeting through virtual platform.

The ICAR-DCR, being the nodal agency for cashew research in the country, has been guiding the research programmes going on in the Coordinating Centers of Cashew spread across the states of the country. The research efforts have resulted in releasing 43 high yielding cashew varieties and technologies which in turn have helped for enhancing raw nut production in the country and good ensuring returns to the farmers.
The Indian Council of Agricultural Research is giving more importance in increasing production and productivity of horticultural crops including cashew as it is an important foreign exchange earning crop. Over the past 10 – 15 years rapid progress have been made in horticulture production, however, there is a considerable prospect to enhance the production in case of cashew keeping in view of the huge demand by processing sector. Further, cashew being a nutritious nut can contribute substantially in ensuring nutritional security. Development of cashew apple based products is the need of the hour as million tons of cashew apple is wasted every year. Efforts are being made by our scientists to develop suitable acceptable products from cashew apple.

India is still the country maintaining its supremacy in international trade in cashew. India was leading in cashew production, processing and international trade till recently but its productivity is less than 800 kg/ha compared to African or cashew growing countries in Asia which is really a matter of concern. The countries like Vietnam, Ivory Coast and Tanzania are giving stiff competition to India in this Sector. In the area of production and productivity of cashew, Vietnam has made exceptional progress in raw nut production. I learnt that of late cashew producing countries are also establishing processing units and hence India is gradually facing shortage of raw nuts.

Our domestic requirement of raw nuts for processing at present is about 15-20 lakh tones but the production is only 7-8 lakh tones. The demand is growing every year and we should be prepared to fulfill the huge requirement in a shorter period as import of raw nuts is dwindling and may stop after a few years. Further, the quality of imported nuts is poor compared to Indian origin nuts. Hence we need to gear up for increasing production and productivity to retain our supremacy in international trade. I hope that implementing high density planting system and by following recommended package of practices we can become self-sufficient to meet the growing demand for raw nuts by our processing industry. It is necessary to concentrate on developing more hybrid varieties to overcome the shortage of raw nut in coming years. Developing dwarf and high

yielding cashew varieties suitable for high density and ultra high density planting system is to be looked into. There is huge demand for organic cashew in international market as the customers abroad are very health conscious people. We should give adequate impetus in control of Tea Mosquito Bug (TMB) and Cashew Stem and Root Borer (CSRB) the two major pests affecting cashew plant as they are affecting the production of raw cashew nuts. Genetic mapping to identify the linkages related to biotic and abiotic stress needs immediate attention. To overcome the pest menace, we should concentrate our efforts in developing pest resistant varieties, bio-control methods or pheromone technology which can boost productivity.

Our research priorities should be streamlined to address regional short falls by establishing necessary collaboration with advanced laboratories and development agencies. The schemes and programmes under NHM and DCCD will also support the production of quality planting materials, after care activities and area expansion. Accreditation of Cashew Nurseries is a must for a perennial crop like cashew. There is a huge demand for quality planting material from farmers and development agencies. The nurseries in the Govt. Sector should take the lead in generating quality planting materials as farmers are looking at us for genuine quality planting material. The activity will also help to generate revenue to the organization which is also mandatory for ICAR & SAU'S. Production and supply of quality planting material be given utmost importance by all AICRP Cashew Centres. When the country is looking for doubling the farmer's income, the crop is a right choice which has minimum pest and diseases, dry land crop with less usage of irrigation and power, low requirement of inputs and labour. Farm level processing, utilization of cashew apple on development of acceptable and marketable products, market research, establishment of cashew farmers clusters and co-operatives need to be looked into and encouraged.

The AICRP has a location specific approach and is being evaluated on an annual basis, so that those problems could get more attention. I hope that the technical sessions will help in accurately outlining the work schedule for crop improvement, crop management and crop protection. I am confident that this Annual Group Meeting of AICRP-Cashew will come up with good technical programmes through detailed discussions for the benefit of cashew farmers. I take this opportunity to express my thanks the Director, ICAR-DCR for inviting me and giving me an opportunity to inaugurate this Annual Group Meeting of AICRP on Cashew.

PROJECT COORDINATOR'S REPORT

Dr. Anitha Karun
Director (Acting), ICAR-DCR and Project Coordinator, AICRP-Cashew

Respected Chief Guest of the today's function, the Guest of Honor and distinguished experts, scientists from AICRP-Cashew and other invitees,

I would like to express my sincere gratitude to all the dignitaries, experts and invitees for making it convenient to be here for the Annual Group Meeting of AICRP on Cashew online. I take this opportunity to express my gratefulness to Dr. A.K. Singh, DDG (Hort.) ICAR New Delhi for permitting us to host this Annual Group Meeting of AICRP on Cashew – 2020 through virtual platform.

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 centers spread across the country in east coast, west coast and plain regions. During the year, we could not visit the AICRP centers due to COVID. However, they have been in touch regularly through telephones and WhatsApp groups.

The centers of AICRP on Cashew along with other centers working on cashew have so far developed and released 34 high yielding cashew varieties for commercial cultivation in different agro-eco-regions. The production potential of these varieties is very good and they have played a significant role in improving production of raw cashew nut in the country. The AICRP centers are working on crop management aspects such as nutrient requirement, irrigation and high density planting systems. They also work on management aspects of pests such as TMB and CSRB in addition to their enumeration with respect to seasonal variations and made significant achievements.

I would like to emphasize some of the salient results of the work done during the year.

CROP IMPROVEMENT

The total germplasm accessions conserved at various centers is 1594. A total of 17 new germplasm accessions have been collected by different centers during the year. As for as evaluation of germplasm accessions are concerned, during the year, 95 accessions for yield and yield attributing characters have been evaluated by different centers. A new trial on CNSL free accessions was fully initiated at Vengurle where tender cashewnuts are in demand for culinary purposes. In the trial on performance of released varieties, BPP-4 at Bapatla, BPP-8 at Darisai were found to be superior.

In the trial on hybridization and selection, 49 hybrids were evaluated at Bapatla, 48 at Bhubaneshwar, 7 new combinations at Jhargram, 18 at Vengurle and 6 hybrid combinations at Hogalagere. A total of 12 new combinations have been tried at

Jagdalpur to generate hybrid progenies and many promising progenies have been identified. Further, rapid clonal hybrid evaluation trial which aims at bringing desirable characters from promising germplasm accessions is under progress at Bhubaneshwar, Madakkathara, Vridhachalam and Vengurle centers.

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 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 marigold at Bapatla, Tomato at Darisai, Turmeric at Jhargram, Chrysanthemum at Kanabargi, Chilli at Madakkathara, Coriander at Paria, Yardlong bean at Vengurle 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 Vridhachalam Vengurle and Hogalagere. Further, the trial on ultra high density planting is under progress in Bapatla, Bhubaneshwar, Jhargram, Madakkathara and Vengurle centers.

CROP PROTECTION

L-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 Jagdalpur and Vridhachalam and Thiomethoxom (0.1 g/l) in Madakkathara. However, Thiomethoxam (0.2g/l) was found to be effective in Hogalagere and Vengurle centers and Buprofezin in Paria center. As for as CSRB is concerned, Chloropyriphos (10ml/l) was found to be effective in Madakkathara, Vridhachalam and Jagdalpur. However, Imidachloprid (2ml/l) was effective in Bapatla center. In Hogalagere, and Vengurle centers, Fipronil gave the best results. In the trial on management of TMB through regional botanicals, no botanical formuation in any center performed better than the chemical control. However, Datura seed extract @5 % gave good results at Vengurle, Datura decoction @ 3% at Jagadalpur, Kasargod cow urine spray 10% at Pilicode and leaf extracts of Adathoda, Datura, Vitex, Calotripis and neem at Vridhachalam gave initial good results.

TRANSFER OF TECHNOLOGY

The coordinating centers of AICRP are also involved in transfer of technology activities and have produced more than Rs.5.54 lakh cashew grafts during 2019-20 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 93 training

programmes on different aspect of cashew cultivation and management practices in which around 5724 farmers have participated.

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 are 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. B.K. Pandey, Assistant Director General (Hort. Science-II) for their continued guidance and support from the Council.

Before I conclude my report, I would like to thank all my scientist 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., Principal 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-2019

Action taken report on major recommendations of the Annual Group Meeting held at UHS, Bagalkote, Karnataka 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.	All the Centres are requested to acknowledge and recognize the role of ICAR while releasing variety/technology etc.	All centers : Noted and will be given
2.	While presenting the results the mean, CV, S.Em and CD values should be included to quantify the results.	All centers : The said parameters are included.
3.	Different species of cashew other than *Anacardium occidentale* may be collected for further crop improvement programme.	Madakkathara : The wild relatives of cashew *viz., Semicarpus prainii* and *Semicarpus kurzii* were collected. Vengurle : In addition to *Anacardium occidentale*, AICRP-Cashew, Vengurla centre has *Anacardium microcarpum* species of cashew which is being utilized in cashew hybridization programme of this center.
4.	In rapid polyclonal hybrid trial, minimum training and pruning should be done along with observation on precocity of flowering.	All centers : Noted and followed
5.	Season of flowering and precocity of flowering should be recorded in trial on evaluation of promising bold nut and high yielding cashew genotypes	All centers : Noted and followed
6.	In all the experiments sex ratio should be calculated by dividing no. of bisexual flowers/ total no. of flowers.	All centers : Noted and followed
7.	Year wise incremental values for growth attributing characters should be presented and correlated with weather parameters to draw suitable conclusions.	Bhubaneswar: Can't present the incremental values for growth attributing characters because all the experimental plants were severely damaged due to cyclonic storm "FANI" on 03.05.2020. Vengurle : Most of the trials under crop improvement programme of AICRP-Cashew, Vengurla centre are in initial stage (recently planted). However, year wise incremental

		values for growth attributing characters of accessions and their correlation with weather factors of Gen. 1 and Gen. 4 trials will be presented in AGM-2020 of AICRP-Cashew. All other centers: Noted and followed.
8.	The GPS location should be recorded while collecting germplasm	All centers : Noted and followed
9.	Modern technology tools should be used in breeding programmes (like gamma irradiation etc.).	All centers : Noted and will be followed suitably based on the need.
10.	The cashew varieties should be grouped on the basis of flowering and fruiting times across the country.	All centers : Noted and followed
	Centre - wise Recommendations	
	Bapatla Centre • It is suggested to verify the data related to cashew apple weight, nut weight, shelling percentage and nut yield per tree.	Noted and Followed
	• Yield data should be present year wise along with cumulative yield.	
	• In dwarf genotype collections, the unique characters related to its dwarfness shall be mentioned.	
	• In CNSL free trial, the local CNSL free germplasm should be used as a check.	
	• It is suggested to avoid the repetition of old results; photographs and indicate date and year.	
	Bhubaneswar • It is suggested to take the help of DCR Puttur for identification of core collection using advanced techniques and further utilization in rapid polyclonal hybridization programme.	Core collections have been formed with the help of DCR Puttur and will be utilized in hybridization programme
	• Rejuvenate the damaged cashew germplasm block by following recommended techniques.	Partially rejuvenated

	Darisai centre • It is suggested to present results with good photographs in regards to vegetative and yield parameters with proper labels. • Year wise data should be presented	Followed
	Hogalagere • Photographs should have scientific scale. • It is suggested to verify the data related to nut weight and shelling percentage. • Analyzed results of the experiment should be presented by following suitable statistical tools. • Evaluation of promising bold nut and high yielding cashew genotype trials should be laid out at the centre.	Followed Not taken up in this year
	Jagdalpur • Instead of mentioning late season variety it is suggested to mention the time/month of flowering and fruiting. • Conclude the varietal screening trial on cashew apple RTS & Jam by evaluating post harvest qualities.	Noted and followed Trial concluded and results will be presented in AGM - 2020.
	Jhargram centre • Use appropriate graphs while presenting the results. • To study the relationship of nut weight with weather parameters, consider *in-situ* soil moisture status.	It will be followed This year it could not be done due to lock down, next season this will be followed.
	Madakkathara : Germplasm trial • The evaluation trial should be conducted upto 6 harvests before conservation of germplasm and continuation or conclusion of trials.	The identified germplasm are under evaluation

	Paria	
	• Good quality photographs should be included in the presentations.	Suggestion incorporated
	• Exploration in cashew growing area and recording of GPS locations while collecting germplasm is required.	Suggestion incorporated while collecting germplasm
	Pilicode	
	• Give concrete recommendation on evaluation of promising bold nut and high yielding cashew genotype trials.	The trial has been started and first year data have only been recorded which will be presented in the AGM
	• Compile the data of dwarf germplasm (PLD-50) along with check variety and present in next AGM.	Will be presented in the AGM
	• Recommended to conclude the varietal screening trial on cashew RTS & Jam	Trial has been concluded
	Vengurla	
	• In germplasm trial, verify the data on annual nut yield and cumulative yield.	The data on annual nut yield and cumulative yield of germplasm trial is being verified and found correct.
	• Collect only unique germplasm and conclude the trial after six harvests if the performance of genotype is not found promising over existing varieties.	Noted and followed. Only unique germplasm is being collected during 2019-20. AICRP-Cashew, Vengurla centre has earlier concluded the trial after six harvests if the performance of genotypes is not found promising over existing varieties.
	• Verify the data of H-3043 for nut size.	The data on nut weight of H-3043 for the year 2018-19 is being verified and found correct (16.7g). However, the last eight years average nut weight of H-3043 for is 15.4g.
	Vridhachalam	
	• Conclude the results of existing germplasm trial and start new germplasm collection and evaluation.	New germplasm collection is under progress.
	• Submit the report of trial on MLT-III to DCR Puttur.	Submitted the report
	• Start the rapid polyclonal hybridization programme at an earliest.	The trial has been initiated during September 2018
	• The CNSL free germplasm trial should be maintained properly.	The trial will be initiated.

	Tura Record the season of flowering and fruiting during germplasm evaluation. It is suggested to shift the experiments to Tripura centre, and Tura centre will conduct only trainings.	Season of flowering and fruiting recorded during germplasm evaluation for the year 2019-20. Four training and awareness programmes were organized in four different villages of West Garo Hills district benefitting a total of 61 farmers in which 31 were women farmers.
	Kanabargi Conduct exploration for germplasm collection with clear objectives. Cashew nut shell liquid should be one of the important parameter in cashew trials.	Germplasm collection in and around Belagavi district, Karnataka is carried out based on the objectives like bold nuts early bearing, cluster bearing habits and high yielding with lesser CSNL content

CROP MANAGEMENT

General Recommendations :		
1.	The trials which have completed 10 years with 6 harvest data may be concluded.	Bhubaneswar : The trial on Organic Management in Cashew have been concluded The data will be compiled and sent to DCR, Puttur. Jagdalpur : Noted and followed Jhargram: Two trials MLT- V and organic management trial were concluded and data was sent to DCR. Madakkathara : The organic management trial will be concluded with current season data Pilicode : Trials have been concluded Vengurle : The trials which have completed 10 years with 6 harvest data at AICRP-Cashew, Vengurla centre has already concluded and final concluded report submitted to the Director, ICAR-DCR, Puttur.
2.	While reporting the cost economics for intercropping trails, the selling price of intercrops need to be given.	Jhargram : It is always been presented. Madakkathara : Cost economics for intercropping trials was reported with the selling price of intercrops Pilicode : Will be given Vengurle : Noted and followed. Vridhachalam : Adhered with
3.	Each centre should include weather data in their presentation	All centers : Noted and followed
4.	Presentation and quality of slides needs to be improved.	All centers : Noted and followed
5.	The presentation should include the latest photographs.	All centers : Noted and followed

6.	All the data should be statistically analyzed and statistical parameters should be included.	All centers : Noted and followed
7.	The ICAR contribution should be properly acknowledged.	All centers : Noted and followed
8.	A new trial on pruning response of varieties developed at AICRP Centres was proposed by Dr. Mohana G.S., PC Cell I/c and it was accepted by the house. The trial details will be formulated by ICAR-DCR and circulated to AICRP Centres for initiating the trial during 2020.	Circular on new trial on pruning response of varieties has been circulated by DCR, Puttur to all AICRP centres. Because of shortage of trees in many centers, the trial details are under revision. It will be finalized soon and the trial will be initiated during 2021.

	Centre-wise Recommendations	
	Bapatla	
	• In the high density planting, early yield is the main advantage; therefore data on yield should be recorded right from the initial years.	Collected the data from initial years
	• The data on shelling percentage need to be rechecked in organic management of cashew trial.	Checked and presented in the table
	• Closer spacing of 4 x 4 m can be followed in scion bank.	Followed and planted in 4 x4 m spacing
	• In slides, along with the University logo, the ICAR logo also needs to be included.	Followed
	Bhubaneswar	
	• For the trials on nutrient management for yield maximization, the data should be reported with statistical parameters. The BC ratio and the percentage of TMB incidence also need to be included.	The data with statistical parameters has reported on nutrient management for yield maximization trial. BC ratio and percentage of TMB incidence has also included in the report.
	• For the trial under ultra high density planting, make uniform plot size, and consult Vengurla and Jhargram centres for guidance.	Uniform plot size under Ultra high density planting trial has taken and consulted with Vengurla and Jhargram centres
	• Action needs to be initiated to allot land for planting reference varieties for DUS testing.	Allotment of land for planting reference varieties for DUS testing has initiated. Planting of reference varieties will be done after clearing the old plantation. So more budget provision under Recurring contingencies is required.

	• The centre requested to include one intercropping trial.	The centre has requested to allot one intercropping trial during the year 2021-22.
	Hogalagere • A crop management experiment should not be more than 10 years, with maximum of 6 harvests. • CV should be mentioned in %.	Will conclude the experiments once they are 10 years old or have 6 harvests Followed
	Jagdalpur • Appropriate action is required to avoid experimental error in high density planting. • The ultra high density planting will be a viable option for Bastar region due to shallow soil. • In water application using drip system, the treatment imposition should be carefully be done to correctly apply the water as per the treatment.	Experiment has been framed as per the suggestion of AGM. Experiment will be conducted after allotment of necessary funds, site has been selected. Dripper of low discharge rate (2 lph) has been placed in experimental plants for precise application of irrigation water which is already standardized as per 30 years CPE data.
	Madakkathara • The height of cashew trees under UDP should be maintained at 1.5 m. • In farmers field the inter crops such as vegetables are not popular. The popular intercrops may be taken up for feasibility evaluation.	Maintained. Popular annual intercrops like aromatic spices and medicinal plants were taken for feasibility evaluation.
	Paria • While presenting and reporting, photographs are required and statistical analysis of the data also need to be performed.	Suggestion incorporated
	Jhargram • Severe gummosis has been observed in trees and care needs to be taken to manage.	Care has been taken discussing with Dr. Loganathan, but still the problem persists.
	Vengurla • Cost of all the materials used in organic farming trials should be included in benefit cost calculation, even if it is produced in the farm.	Noted and followed.

	Vridhachalam • Follow the common treatment details suggested for all the centres in all trials.	Noted and followed
	Kanabargi • Organic farming trials may be continued for one more year. • In spacing trials, while calculating the cost economics, the yield per unit area basis needs to be taken.	7th year yield data (2019-20) from organic trial is collected and will be presented during this year AGM

CROP PROTECTION

General Recommendations		
1.	The seasonal incidence data of current year and previous year level of incidence for the important pests to be compared and presented in the results.	All centers: Noted and Followed
2.	Develop a common IPM package for pest complex in cashew.	Bapatla : Developed for Andhra Pradesh State Jagdalpur : Noted and followed Madakkathara : Ad hoc IPM package for pest complex in cashew will be prepared Pilicode : Role of botanicals in managing TMB is being taken up which will contribute to the information for IPM Vengurle : Noted Vridhachalam : Developed and included in the report
3.	Some newer molecules of insecticides to be included in the experiment.	Jagdalpur : Experiment will be framed in students P.G. research Madakkathara : Two newer molecules of insecticides will be included based on the market availability Vengurle : Noted and followed The new chemical betacyfluthrin 90% + imidachloropid 210% included as a new chemical in Expt. 3: Evaluation of insecticides for control of TMB and other insect pests in cashew. Vridhachalam : Followed and included in the report
4.	The CSRB control trial, two way table and Chi-square data to be given and presented.	Jagdalpur : Noted and followed Madakkathara : Two way table and chi-square data were prepared and included in the result. Vengurle : Noted The two way table for CSRB included in the report. Vridhachalam : Attempt was made but two way table not formed.

5.	The correlation and regression analysis of seasonal incidence of pest with environmental factors to be presented.	Jagdalpur : Noted and followed Madakkathara : The correlation and regression analysis of seasonal incidence of pest with environmental factors are presented Vengurle : Noted and followed The correlation and regression analysis of seasonal incidence of pest with environmental factors calculated and included in report. Vridhachalam: Correlation and regression analysis of seasonal incidence of pest with environmental factors was carried out and included in the report.
6.	The botanicals to be applied before reaching ETL instead of schedule based sprays with minimal period of interval between the sprays.	Jagdalpur : Noted and followed Madakkathara : The botanicals will be sprayed based on the incidence of pest before reaching ETL. Pilicode : Has been done in this year Vengurle : Noted and followed Vridhachalam : Followed and included in the report
7.	The regression model is to be developed based on ten season's data and to be tested for its feasibility.	Jagdalpur : Noted and followed Madakkathara : The regression model was developed and validated Pilicode : NA Vengurle : Noted Vridhachalam : The data is being collected for developing pest forecasting modules
8.	Include botanical pesticide formulation of Ajith Paul in new botanical trial as one of the treatments.	Jagdalpur : Noted and followed Madakkathara : Botanical pesticide formulation of Ajith Paul was included in botanical trial Pilicode : Has been included in the trial Vengurla : Noted The last year this centre has requested Ajith Paul to send the formulation. However, the formulation not received to this centre. This year Ajith Paul ready to send the formulation in advance Vridhachalam : Botanical pesticide formulation of Ajith Paul in new botanical trial as one of the treatments and included in the report
9.	Yield data should be recorded and presented in the tables.	All centers : Noted and Follwed.

	Centre-wise Recommendations:	
	Bapatla • The data has to be transformed appropriately, before statistical analysis. • The transformed data has to be mentioned in the table. • The dose of the Azadiractin (1%) may be used at 1 ml/lit. of water. • Research activities have to be focused on major insect pests compared to minor pests. • Correlation studies for natural enemies should be carried out.	Followed.
	Hogalagere • The data has to be transformed appropriately, before statistical analysis. • Neem oil (2%) + Pongamia oil (2%) combination trial may be included in new botanical trials. • Correlation studies for natural enemies should be carried out.	Followed
	Paria • Recheck the efficiency of carbosulfan treatment against TMB.	Suggestion incorporated
	Vengurla • The tabulated results have to be presented for all the experiments. • The natural enemies population should be recorded even if the TMB population is low. • The CSRB incidence has to be recorded in ultra high density plantations and high density plantations.	Noted and followed. Noted and followed. Noted and followed. In ultra high density plantation trial plants are two years old and there is no incidence of CSRB observed.
	Kanabargi • Get the assistance of scientists of RHREC, Dharwad for conducting experiment on Crop Protection.	As there is no entomologist at HREC, Kanabargi, Belagavi, the Crop Protection experiments will be carried out at College of Horticulture Bagalkote under the guidance of Entomologist as per the suggestion of Director of Research UHS, Bagalkote, during 2020-21

RECOMMENDATIONS OF AGM – 2020

The major recommendations of the Annual Group Meeting of AICRP-Cashew held during 18 and 19th December 2020 are presented below.

CROP IMPROVEMENT

General decisions/recommendations to all the centres

1. Uniform format of data recording and reporting across the centers to be followed.
2. Experiment numbers should be uniform for all the centers for a particular experiment.
3. Follow the DUS descriptor for reordering data in new germplasm/hybrid trials.
4. Descriptors of the local germplasm conserved at respective centers may be developed and accessions with unique traits may be shortlisted for MLT/registration as trait specific germplasm with NBPGR.
5. Centers may take up evaluation of CNSL free genotype including RFRS 195.
6. Thirty seed nuts to be harvested from each of the genotypes of polyclonal breeding trial to account for maximum diversity.
7. While evaluating cashew apple parameters, the juice quality may also be assessed. The number of fruits per panicle may also be recorded while sampling for quality studies.
8. MLT on evaluation of dwarf genotypes should be initiated across the centres.

CROP MANAGEMENT

General recommendations

1. It is required to assess constraints in production in each centre and to get reasons for low yield
2. It was suggested to negotiate for a moderate spacing rather than a higher or lower spacing
3. The possibility of rejuvenating or replanting the senile plantation of cashew is to be worked out taking proper care in management of CSRB and TMB under top working and limb pruning
4. The possibility of expansion of cashew is nontraditional area needs to be assessed.
5. The potential of planting of three "C" s Casuarina, Cashew and Coconut to alleviate natural calamities like cyclone in the east and west coastal area was elaborated. Hence trials of longer perspective by DCR in coastal area will be effective
6. DCR may initiate trials in the sloppy areas on a longer perspective to use cashew for soil and moisture conservation by resorting to bio engineering measures
7. Drip irrigation trial can be taken up in representative areas only, as cashew in general is not an irrigated crop
8. Dynamics of microbial load at regular interval need to studied especially in organic trials
9. DCR has to take policy decision in consultation with respective states for production of cashew apple beverage similar to fenny in Goa
10. Precision farming trials in cashew on holistic approach for effective utilization of natural resources may be initiated

11. Collaboration with other national and international institutions is necessary for effective research output
12. In irrigation trial all the characters pertaining to nut yield and other attributes need to be included
13. In HD and UHD, application of fertilizer should be in a scientific way. The performance of border and inner plants should be recorded
14. A trial involving pruning response of released varieties in different centres to be taken up.

CROP PROTECTION

General recommendations:

1. Uniformity of templates for data recording across AICRP centres is to be maintained. Doses, frequency of sprays, observation intervals, recording of data (percentage/grade/numbers) should be uniform. Methodology explained in the experimental manual of ICAR-DCR should be followed.
2. Attempts may be made to have online entry of experimental data (Decision to be taken based on the AICRP- PC cell convenience).
3. Details on methodology of extraction of botanicals should be provided in the reports. Addition of surfactants, if any in spray solutions need to be included in reports. Besides the crude extracts of plants, the plant extracts obtained using different polar and nonpolar solvents may also be tested against pests. The procedure may be finalized upon discussion with Entomologists at ICAR-DCR.
4. Commercial formulations of important botanicals if available (like *Acorus calamus*) excepting neem may also be tested for its efficacy against tea mosquito bug (TMB).
5. A formulation of *Metarhizium anisopliae* available at ICAR-CPCRI, Kasaragod can be tested for TMB in the AICRP centres. Availability of the strain for field testing has to be checked (Action: ICAR- DCR, Puttur).
6. The influence of insecticides and botanicals on the pollinators of cashew has to be documented in the respective trials.
7. Field efficacy of insecticides can be analyzed using Henderson Tilton formulae, which gives information on per cent reduction over control.
8. The insecticides proposed to be banned need to be removed from the experiments/recommendations and alternate insecticides to be included. This may be finalized upon discussion with Entomologists at ICAR-DCR, Puttur.
9. Suitable transformations need to be applied for the data while analyzing. The data should be subjected to Post Hoc Test and the results need to be inferred accordingly.
10. Reaction of plant germplasm to TMB over the years needs to be analyzed and presented. Promising ones, if any must be tested across the centres and included in resistance breeding programmes.
11. Pest distribution map (over years) for cashew pests may be developed at respective centres and across the country based on available data to understand the changing pest scenario. Biodiversity indices can be worked out for cashew pests.
12. Additionally, information on influence of different TMB damage grades (1-4) on yield of cashew can be worked out. (Action: ICAR-DCR, Puttur)

TECHNICAL SESSION I: CROP IMPROVEMENT

Chairman	:	Dr. Niral. V, Principal Scientist, ICAR-CPCRI
Co- Chairman	:	Dr. Aneesa Rani, Professor, Dept. of Hort, TNAU
Rapporteurs	:	Dr. Kabita Sethi, Jr. Horticulturist, CRS, Bhubaneswar

The technical session-I started at 10 AM with the introductory remarks by the Chairman and Co-chairman. The scientists of different centres of AICRP on Cashew presented the progress report on various crop improvement projects. There were twelve presentations in the session. The center wise recommendation emerged out of the session are as follows:

Center wise recommendations

Bapatla

- While presenting evaluation data, information on experimental design and population size should be provided.
- Canopy characters may be recorded as per standard procedures.
- Research results should be presented with more clarity to avoid confusion in Poly clonal breeding trial.

Bhubaneswar

- Since descriptors of conserved germplasm has been published, the center may list out trait specific lines for registration/MLT.
- Care may be given to ensure proper rejuvenation of the cyclone damaged germplasm blocks.
- Possibility of establishing a core germplasm conservation block may be examined.
- Possibility of planting wind breaks in the boundary of the farm may be explored to reduce damage due to cyclone.

Darisai

- Since cashew is a potential plantation crop of the region and has scope for area expansion, there should be greater focus on identification of varieties suitable for the region.
- Incidence of damage to foliage during cold season in the conserved germplasm may be documented along with the actual time of flowering initiation.
- Data should be presented with information on experimental design, population size and appropriate statistical analysis in each experiment.

Hogalagere

- Data should be presented with appropriate statistical analysis in each experiment.
- Data on vegetative growth parameters, yield attributing traits and nut yield should be recorded as per standard procedure. Cumulative yield data should also be presented.
- More emphasis should be given on research activities, including local germplasm collection and recording of research data.
- Additional experiments, including trial on bold nuts and polyclonal breeding may be initiated.

Jagdalpur

- Compact types may be used as male parent in breeding. Genotype, HC-6 may be considered in place of VRI-1 for use in breeding programme to induce compact canopy behaviour in the hybrid progeny.
- Cold tolerant genotypes may be used in the breeding programme to induce cold tolerance in the F_1 progeny. Possibility of evaluating hybrid progenies for cold tolerance in farmers field may be explored.
- Characterization of cashew germplasm for apple utilization should be concluded and the results should come out as recommendation.
- Evaluation of CNSL free genotypes may be taken up.

Jhargram

- Data should be presented with information on experimental design, population size and appropriate statistical analysis in each experiment.
- Two times pruning are to be imposed (1^{st} : in the month of July & 2^{nd} : in the month of September) instead of one time pruning in the month June in UHDP.
- Relative incidence of damage following hailstorm in different germplasm may be critically looked in to identify suitable lines for such conditions.
- Possibility of collecting local germplasm from areas with low winter temperature may be explored.

Kanabargi

- Data should be presented with information on experimental design, population size and appropriate statistical analysis in each experiment.
- More emphasis should be given on research activities, including local germplasm collection and recording of research data.
- Trial on UHDP may be initiated.

Paria

- The center should focus on establishment of evaluation trials, and undertake germplasm collection activities, record scientific data and present the research results to improve the performance of the center.

Pilicode

- Care should be taken while drawing inference on quality parameters and health benefit of cashew apple juice.
- Hybridization programme may be initiated, utilizing superior lines identified at the center for desirable traits.
- Evaluation of CNSL free genotypes may be taken up.

Madakkathara

- Evaluation of hybrids shouldn't be reported under Gen. 1 Germplasm collection, conservation, evaluation, characterization and cataloguing.
- Hybrids identified for specific traits and suitable for registration as superior genetic stock with NBPGR, can be given a separate accession identity and included in the germplasm block.
- *A. semicarpus* and *A. reniforme* may be planted at 10mx10m / 15mx15m, instead of 4mx 4m spacing.
- Hybridization programme to be initiated by selecting diverse germplasm/best performers as parents. Due consideration may be given for the characters like bold nut, cluster bearing and high yield while selecting germplasm as parents.

Tura

- Carry forward the research work initiated by the scientists as the center is strategically very important for cashew research in NE region.
- Recording of damage to foliage during cold season in the conserved germplasm may be explored.

Vengurla

- F_1 progenies shouldn't be included in germplasm conservation block, unless they are given a unique identity and identified for registration as superior genetic stock with NBPGR.

Vridhachalam

- Trial on CNSL free genotypes may be taken up.
- The local germplasm conserved at the center may be explored for identification of trait specific parental lines.
- Hybrid HC-6 with semi-dwarf habit may be taken up for high density planting.
- Hybrid HC-10 may be considered for varietal release/MLT at different centers.

Programmes allotted to different Centers of AICRP on Cashew
for the year – 2021-22

Programmes		Centres
Gen.1.	Germplasm collection, conservation, evaluation, characterization and cataloguing.	Bapatla, Bhubhaneswar, Darisai, Goa, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Paria, Pilicode, Vengurle, Vridhachalam, Kanabargi and Tura.
Gen.1a.	Evaluation of germplasm accessions with low CNSL content	Bapatla, Hogalagere, Jagdalpur, Madakkathara, Pilicode, Vengurla and Vridhachalam
Gen. 3.	Varietal evaluation trial	
	Multilocation trial–III (earlier MLT–2002) (Planted during 2003) (Experiment above 10 years may be concluded)	Hogalagere
	Multilocation trial–V (performance of released varieties) (To be concluded after 6 harvests)	Bapatla, Hogalagere and Jagdalpur
	Multilocation trial–VI (Special MLT)	Darisai, Paria, Kanabargi and Tura
Gen. 4.	Hybridization and selection	Bapatla, Bhubhaneswar, Darisai, Goa, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Pilicode, Vengurla and Vridhachalam
	Rapid polyclonal hybrid evaluation trial	Bapatla, Bhubhaneswar, Hogalagere, Madakkathara, Vengurla and Vridhachalam
Gen. 5.	Characterization of germplasm for cashew apple (Experiments above 10 years may be concluded)	Bapatla and Pilicode
Gen. 6	Evaluation of promising bold nut, bigger size apple types and high yielding cashew genotypes	Bapatla, Bhubaneswar, Goa, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Pilicode, Vengurle and Vridhachalam
Gen. 7	Trial on Dwarf genotypes in cashew	Bapatla, Bhubaneswar, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Pilicode, Madakkathara, Vengurle and Vridhachalam

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TECHNICAL SESSION II : CROP MANAGEMENT

Chairman : Dr. V.S. Korikanthimath, Former Director, ICAR-CCARI, Goa
Co- Chairman : Dr. J.D. Adiga, Principal Scientist, ICAR-DCR, Puttur
Rappouteurs : Dr. Jalaja S. Menon, Horticulturist, CRS, Madakkathara

In his formal address, Dr. V.S. Korikanthimath elaborated the genesis of cashew research in India and the effort made by ICAR-DCR, Puttur and AICRP on Cashew in improving the yield of cashew. He mentioned that there is a wide gap between the realized (actual) and realizable (Potential) yield in cashew. Though the crop has the potential to yield 2.5 t/ha, only an average productivity of 670 kg/ha (national average) is being realized by farmers. Hence, effort must be made by research centers to improve productivity of cashew. The cashew production and productivity in Maharashtra (1.3/ha) is high and the reason for the same has to be analyzed.

Eleven AICRP centers on cashew presented the progress of research accomplishment in nine ongoing experiments.

Center wise recommendations

Bapatla

- Explore the reason for low yield in cashew in treatment with cashew as a sole crop in the intercropping trial.
- In high density trial indicate the pruning operations undertaken and how long the experiment on high density can be prolonged.

Madakkathara

- The initial and final soil properties, nutrient status and microbial load are to be studied in intercropping and organic management trials.
- Since trial on organic management has completed seven years, the experiment can be concluded.
- In Ultra High Density planting trial, incidence of pest needs to be observed. The canopy spread may be studied in detail. Pruning may be extended up to August to skip the pest attack.
- Since the stomatal density is more in lower surface of leaves, cashew cannot be considered as water mining crop. An observational trial may be initiated in pot culture to study the moisture extraction pattern of cashew.

Vridhachalam

- In intercropping trial, go for pooled analysis of yield and morphological data after 3-4 years.
- Since eight year yield (harvest) data is available, the organic management trial can be concluded.
- Initiate the ultra high density trial.

Vengurla

- It was recommended to conclude the organic management trial after recording one more year's yield and other growth parameter.
- In intercropping trial correlate the pre planting nutrient status and the soil fertility status after the harvest of crop in each year.

Hogalagere

- Estimate the leaf fall and nutrient content in atleast two plants in the nutrient management trial.
- Initiate the trial on ultra high density planting.

Jhargram

- Record the crop phenology data in ultra high density planting during flowering and fruiting period and also record the B:C ratio.

Kanabargi

- Conclude organic and spacing trials
- Initiate ultra high density trial
- Promote planting of cashew grafts and discourage the farmers to plant seedling progeny

Bhubaneswar

- Initiate drip irrigation trial considering soil moisture status.
- Propose intercropping trial based on consumer preference and local market demand.

Jagdalpur

- The proposed intercropping trial can be taken up with locally important vegetable, flower, pulses etc.
- Initiate the trial on Ultra High Density.

Paria

- The trial on cashew in black cotton soil may be shifted to red/ sandy loam soil
- While presenting the results, field photographs of experimental trials should be included along with appropriate tables and graphs
- A letter may be addressed to VC/DR to shift the cashew centre to appropriate place with sandy loam soil
- One young scientist may be posted to facilitate to undertake proper field trial efficiently

Darisai, Jharkhand

- The experiments should be carried out in a systematic way and need to be presented in detail.

A Progressive farmer from Hulkoti, Gadag district , Karnataka, Sri. Gurunath, Odugouar joined during the online presentation and shared his experience of planting Vengurla 4 and 7 cashew and the possibilities of enhancing the crop area in his locality. He has also appreciated the efforts taken by KVK Hulkoti, Gadag and DCCD, Cochin. Further he expressed that though the ultra high density planting in cashew is good, too much exercise is required to control the vegetative growth. It is interesting to know that more than thousands of acres of cashew orchard have come up with in a short span of 6-8 years in Gadag districts, Karnataka.

The Chairman appreciated the effort taken by DCR, Puttur in formulating and implementing nationwide research on cashew in an effective way. He also congratulated all scientists who were involved in cashew research and came up with good results. The chair also suggested that all the scientists should take earnest effort to motivate the farmers to take up cashew cultivation, so that India can attain self sufficiency in the raw nut production of cashew to retain the premier position in production, processing and export. The Co-Chairman appreciated all centers for their good effort in presenting the research results.

In the concluding remarks it was informed that the DCR, Puttur will come out with an online data submission form and that will ensure uniformity in templates and presentation of scientific data.

Programmes allotted to different AICRP Cashew centers
for the year – 2020-21

Programmes		Centres
Hort.1.	Nutrient management for yield maximization in cashew.	Bhubhaneswar, Hogalagere and Paria
Hort.2.	Fertilizer application in high density cashew plantations	Hogalagere
Hort.3.	Drip irrigation trials	Bhubaneswar, Hogalagere and Jagdalpur
Hort.4.	High density planting - observational trials	Bapatla, Jagdalpur and Vridhachalam.
Hort.6.	Intercropping in cashew	Bapatla, Bhubaneswar, Darisai, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Paria, Vengurla and Vridhachalam
Hort.7.	Organic management of cashew	Bapatla, Hogalagere and Vridhachalam
Hort.8.	Spacing cum Fertilizer Trial	Darisai and Paria
Hort.9.	Evaluation of production potential of newly developed variety Jhargram-2 at different spacings.	Darisai and Jhargram
Hort.11.	Ultra high density cum Drip irrigation	Bapatla, Bhubaneswar, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Pilicode, Vengurle and Vridhachalam
Hort.12. New Trial	Pruning response of different cashew varieties	Hogalagere, Jhargram, Madakkathara, Vengurle and Vridhachalam

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TECHNICAL SESSION III : CROP PROTECTION

Chairman	:	Dr. Keshavan Subaharan, Principal Scientist (Ento.), ICAR-NBAIR, Bengaluru.
Co-Chairman	:	Dr. Joseph Rajkumar A, Principal Scientist, ICAR-CPCRI, Kasaragod
Rapporteurs	:	Dr. K. Vanitha, Sr. Scientist (Ent.), ICAR-DCR, Puttur

Totally 9 number of AICRP on Cashew centres presented the results of Crop Protection.

CENTRE WISE RECOMMENDATIONS:

Hogalagere

- The centre has reported sudden incidence of chaffer beetles on cashew apples. In this regard, the information on incidence of Chaffer beetles on other crops in nearby regions may be collected to understand the reason for upsurge of its population.
- Damage levels of apple and nut borer (ANB) have to be worked out. Detailed accounts of its biology, alternate hosts if any, scout for natural enemies can be recorded.
- Preliminary trials on insecticides efficacy on ANB need to be conducted at laboratory for ANB before taking up as field trial with many treatments. Effective ones may be tested later in other centres as well wherever apple and nut borer incidence is high.

Paria

- The centre has reported high efficacy of NAU formulation (Navsari Agricultural University, Gujarat) against TMB. Hence, the possible causes or the novelty of the NAU formulation over the existing formulation can be shared as it would benefit the other centres to think on these lines.

Pilicode

- Grading of TMB has to be rechecked for pre and post treatment observations.
- Information on constituents of Kasaragod dwarf cow urine related to pest management may be collected or analyzed.

Vengurla

- Data on different natural enemies under treatments have to be recorded and presented.

Vridhachalam

- Data transformation needs to be checked.
- Availability of effective botanical mixture (T1) for TMB may be studied, to understand its availability to the farmers.

Programmes allotted to different AICRP Cashew centers for the year – 2021-22

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, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Paria, Vengurla and Vridhachalam.
Expt 4. Evaluation of Botanicals for the control of Tea Mosquito Bug and other insect pests		Bapatla, Hogalagere, Jagdalpur, Kanabargi, Madakkathara, Paria, Pilicode, 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, Kanabargi, Madakkathara, Paria, Vengurla and Vridhachalam.
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. Venkatesh N. Hubballi, Director (DCCD), Kochi
Co-Chairman	:	Dr. Anitha Karun, Director (Acting), ICAR-DCR, Puttur
Rapporteur	:	Dr. R.C. Gajbhiye, Horticulturist, RFRS, Vengurla

The technical session on interaction between farmers and scientists started with the introductory remarks by the Chairman, Dr. Venkatesh N. Hubballi, Director (DCCD), Kochi. The general recommendation emerged out of the session are as follows:

Recommendations:

- Brain Storming Session on utilization of cashew apple for ethanol production is to be taken up. The Director, ICAR-DCR, Puttur should make arrangements for the conduct of brain storming session by inviting Hon. DDG (Hort.), ICAR, New Delhi and all the experts in this field of research.
- Regarding the cashew mortality in Jharkhand – Hon. DDG (Hort.) has pointed out that it is problem related to State Govt. However, DCCD, ICAR-DCR, Puttur, AICRP-Cashew centre should take a plan for dissemination of technologies so that problem of mortality of grafts can be solved. Further, Hon. DDG (Hort.) recommended that there should be a MoU between Jharkhand Agriculture University and ICAR-DCR, Puttur in order to solve the issue.
- Dr. V. N. Hubballi, Director, DCCD, Kochi and the Chairman of the session mentioned that around 4.5 lakh ha has been brought under cashew plantation with high yielding variety however the growth rate is very slow for which studies should be conducted in this regard. He also emphasized on the point that when farmers have more productivity why the national productivity is less.
- He also mentioned that 15,000 ha area was brought under cashew plantation in Jharkhand by DCCD but so far results are not available due to huge mortality of cashew grafts. The development department of the state and AICRP-Cashew scientists of Jharkhand centre should look in to the matter to reduce huge mortality of the cashew grafts.
- Dr. V. N. Hubballi has also pointed out that Cashew variety Vengurla-4 of 1.5 years old yielded to the tune of 5kg/tree in Godavari district of Andhra Pradesh which needs to be thought of. He also mentioned that about 31 lakh cashew grafts was produced in Orissa during 2020-21, out of which 28 lakh cashew grafts are of Vengurla-4 variety and remaining are of cashew varieties like Balabadra, H 2/16 etc. which means that there is huge demand for a single cashew variety "Vengurla-4" for which study needs to be taken up. He also mentioned that about 5.4 lakh farmers are involved in cashew farming and 78% farmers in cashew have land less than 4 ha which indicates the need for high density planting. However since VRI-3 is only suitable for high density planting, there is a need to develop other variety/ies suitable for high density planting with accommodation of 400

plants/ha instead of 200 plants.

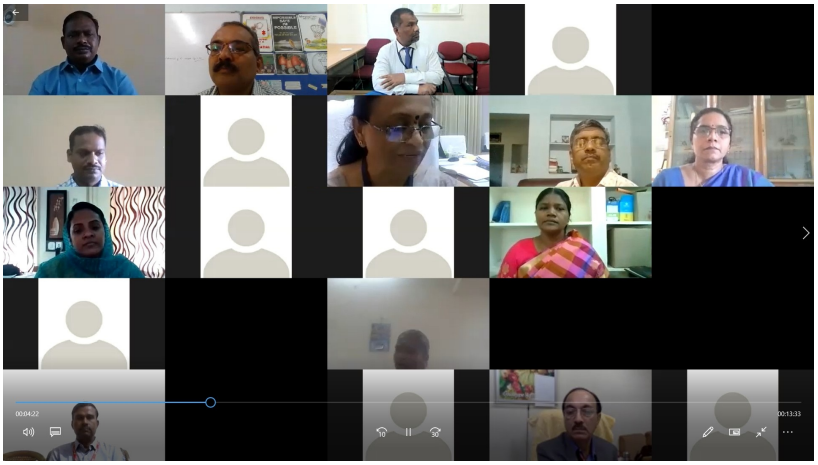
- Dr. Anand K. Singh, Hon. DDG (Hort.) ICAR, New Delhi informed the scientists of AICRP-C Centres that if any damage occurred to field or centre due to cyclone affect, the demand proposal in detail with the damage caused due to cyclone and budgetary requirement may be sent to ICAR.
- Further Dr. V. N. Hubballi, Director, DCCD, Kochi and the Chairman of the interaction session has informed that in non tradition area like Meghalaya, Tripura, Jharkhand; about 3000 ha area has been covered with cashew however the mortality of grafts is very high after planting. He further requested to the scientists to look into the matter and help the farmers to solve these mortality and save lively hood of cashew farmers.
- Hon. DDG (Hort.) asked to the delegates regarding contract farming in cashew in the country wherein Director, DCCD, Kochi, Kerala mentioned that Orissa cashew development agency had earlier initiated the contract farming in cashew but it was not successful.
- Shri. Gurunath Odugowder, progressive farmer from Karnataka informed to the delegates that ICAR–DCR, Puttur has been promoting cashew in plain zone of Karnataka and there is a 20 cluster villages and they wanted financial support for small cashew processing units which would be profitable to the farmers. Dr. Vikramaditya Pandey, ADG (Hort.) informed that under National Horticulture Mission Board is sanctioning funds for processing units for which proposal needs to be sent for approval. Further, Hon. DDG (Hort.) supported the statement saying National Horticulture Board provides 35% subsidy for establishment of processing unit. He also mentioned that a project may be prepared with the help of expert scientists from ICAR-DCR, Puttur.
- Shri. Gurunath Odugowder pointed out that research on production of ethanol from cashew would be supportive to cashew growers.
- Shri. Deviprasad, Cashew Grower Association, India who has been doing UHDP in cashew informed that the rate of cashew graft is Rs. 50 to Rs. 70/- which needs to reduced to help farmers group. MSP of the RCN needs to be fixed to Rs. 120/- per kg and rate of imported RCN. Hon. DDG informed that this is problem in the domain of respective state.
- Dr. V. N. Hubbali, Chairman of session pointed out that only VRI-3 variety is suitable and best for UHDP but it is reported that its performance is not good in all the states. He also suggested that research should be carried out to procure dwarf varieties from other countries for which Dr. Mohana, PC Cell In-charge, ICAR-DCR, Puttur informed that a dwarf variety NRC-492 – A dwarf accession PLD – 42 have been identified and a dwarf variety trial shall be constituted as MLT trial and seedling selections will be done in these genotypes which may give high yielding dwarf accessions.
- Hon. DDG (Hort.) has informed that Govt. giving MSP to 33 commodities. The fixing the cashew MSP is the problem in domain of State Govt. However, Cashew manufacture association should send the proposal to ICAR will help to pushing and forward the proposal to the Commerce Ministry.

VARIETY RELEASE AND PLENARY SESSION

Chairman : Dr. AK Singh, DDG (Hort. Sci.), ICAR, New Delhi
Co- Chairman : Dr. Anitha Karun, Acting Director, ICAR-DCR, Puttur

The session on variety release proposal was chaired by Dr. A. K. Singh, Deputy Director General (Horticulture), ICAR, New Delhi. He reiterated the importance of cashew research and called for improving the productivity. Further he suggested the formation of FPOs in cashew. During the session, Dr. M.G. Nayak, Principal Scientist (Horticulture) presented the proposal on a new dwarf variety NRC-492 and after thorough discussion, it was approved for release. Later on, the rapporteurs of different technical sessions presented the proceedings of the sessions.

The AGM was concluded with vote of thanks by Dr. Mohana G.S. Principal Scientist and Scientist-in-charge, PC Cell, ICAR-DCR, Puttur.



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