For internal circulation only

ALL INDIA COORDINATED RESEARCH PROJECT ON CASHEW

PROCEEDINGS OF THE

ANNUAL GROUP MEETING OF SCIENTISTS

OF AICRP on CASHEW - 2024

16 – 18th JANUARY, 2025

College of Horticulture, (UHS; Bagalkot)

G.K.V.K., Bengaluru Campus, Bengaluru

ICAR - DIRECTORATE OF CASHEW RESEARCH

PUTTUR - 574 202, D.K., KARNATAKA

ALL INDIA COORDINATED RESEARCH PROJECT ON CASHEW

ICAR - DIRECTORATE OF CASHEW RESEARCH

PUTTUR-574 202, D.K., KARNATAKA

ACKNOWLEDGEMENT

The Annual Group Meeting of All India Coordinated Research Project on Cashew was held from 16 to 18th January, 2025 at College of Horticulture, (UHS; Bagalkot), GKVK Bengaluru campus. The research workers of various AICRP Centers, cashew processors, entrepreneurs and progressive farmers participated in this meeting.

I hereby express my deep sense of gratitude to Dr. Sanjay Kumar Singh, Hon'ble DDG (Hort. Sci.), ICAR for his kind advice and suggestions in organizing this Annual Group Meeting of Scientists of AICRP on Cashew-2024. I herein place on record my thanks to Dr. V. B. Patel, ADG (Fruits& Plantation Crops) and the authorities of the ICAR, New Delhi for their support in conducting meeting.

I express my sincere thanks to Dr. Sanjay Kumar Singh, DDG (Hort. Sci.), ICAR for inaugurating the AGM 2024 as well as, advising the refinement in research programmes of AICRP-Cashew through various sessions. My thanks are due to Dr. H.B. Lingaiah, Former VC, UHS, Bagalkot, for chairing the Crop Improvement session, Dr. D. P. Kumar, Former Director of Education, UAS, Bangalore for chairing the Crop Management session and Dr. Venkateshalu, B., Dean, College of Horticulture, Kolar for chairing the Crop Protection session and Dr. Femina, Director, DCCD, Cochin for chairing the interactive session and also to Dr. P.C Tripathi, Prin.Scientist , Hort. Sci. Division, ICAR, New Delhi for chairing the plenary session. My heartfelt thanks are also due to all the co-chairmen and rapporteurs of different sessions.

I thank all the scientific colleagues from the coordinating centers, ICAR-DCR, UHS, Bagalkot and all supporting personnel for their participation and cooperation for the successful conduct of this Annual Group Meeting. My sincere thanks are also due to Dr. T.N. Raviprasad, Scientist-in-charge (PC Cell) & PC Cell team members; Dr. V. Thondaiman, Dr. E. Eradasappa, Dr. Rajashekara. H., Dr. Bhagya, H.P. and Kum. Kavyashree P.R., Young Professional-I [PC Cell] and Smt. Reshma, K, PS to Director for their efforts and timely support extended in holding the Annual Group Meeting of Scientists of AICRP Cashew - 2024.

[J. DINAKARA ADIGA]
Director &
Project Coordinator (Cashew)

Puttur
Date : 14.02.2025

ANNUAL GROUP MEETING OF AICRP ON CASHEW – 2024

Venue: College of Horticulture, Bengaluru

Date: 16th -18th January, 2025

PROGRAMME SCHEDULE

Time	16.01.2025		
	INAUGURAL SESSION		
9.30 AM	Invocation song – ICAR & UHS-B	:	
	Welcome Address	:	**Dr. B. Fakrudin, B.,** Director of Research, UHS, Bagalkot
9.40 AM	Inauguration by lighting of lamp	:	All dignitaries
9.45 AM	Project Coordinator's Report	:	**Dr. J. Dinakara Adiga**, Project Coordinator, ICAR-DCR, Puttur
10.00 AM	Address by Guests of Honor	:	**Dr. V. B. Patel,** ADG (Hort.-II), ICAR, New Delhi **Dr. Femina**, Director, DCCD, Kochi
10.20 AM	Presidential address	:	**Dr. Vishnuvardhana**, Hon'ble VC, UHS, Bagalkot
10.35 AM	Inaugural address by Chief Guest and release of publications	:	**Dr. Sanjay Kumar Singh**, DDG (Hort.), ICAR, New Delhi
11.00 AM	Vote of thanks	:	**Dr. T.N. Raviprasad**, Sci-in-charge(PC Cell) & Prin. Scientist, ICAR-DCR, Puttur
	Rapporteurs	:	**Dr. Mini Poduval**, Horticulturist & PI, AICRP-C, Jhargram
		:	**Dr. Umamaheshwara Rao**, Horticulturist & PI, AICRP-C, Bapatla
11.05 AM	***HIGH TEA***		

11.30 AM	**TECHNICAL SESSIONS**		
11.30 AM - 12.00PM	Presentation of Action Taken Report	:	**Dr. T.N. Raviprasad**, Sci-in-charge(PC Cell) & Prin. Scientist, ICAR-DCR, Puttur
12.00 PM - 5.30 PM	**Technical Session - I**		**CROP IMPROVEMENT**
	Chairman	:	**Dr. H.B. Lingaiah**, Former VC, UHS, Bagalkot
	Co-Chairman	:	**Dr. B. Fakruddin**, Director of Research, UHS, Bagalkot
	Rapporteurs	:	**Dr (Mrs) Kabita Sethi**, Jr. Horticulturist & OIC, AICRP on Cashew, Bhubaneshwar **Dr. Asna, A. C.,** Jr. Breeder, AICRP on Cashew, Madakkathara
	1)Presentations of Reports on Crop Improvement by Scientists of AICRP-Cashew **2)Variety Release proposals**		

	17.01.2025 (2nd Day)		
9.30 AM - 1.30 PM	**TECHNICAL SESSION – II (Morning)**	:	**CROP MANAGEMENT**
	Chairman	:	**Dr. D. P. Kumar**, Former Director of Education, UAS, Bangalore
	Rapporteurs	:	**Dr. Meera Manjusha, A.V.,** Scientist (Hort.) & OIC, AICRP on Cashew, Pilicode, Kerala **Mr. Vikas Ramteke**, Scientist (Hort.) & OIC, AICRP on Cashew, Jagadalpur, Chattisgarh
	Presentations of Reports on Crop Management by Scientists of AICRP on Cashew		
2.30 PM – 5.30 PM	**TECHNICAL SESSION – III (afternoon)**	:	**CROP PROTECTION**
	Chairman	:	**Dr. Venkateshalu, B.,** Dean, College of Horticulture, Kolar
	Co-Chairman	:	**Dr. T.N. Raviprasad**, Sci-in-charge(PC Cell) & Prin. Scientist, ICAR-DCR, Puttur
	Rapporteurs	:	**Dr. V. S. Desai**, Jr Entomologist, AICRP on Cashew, Vengurla **Dr. Sravanthi, G.,** Jr Entomologist, AICRP on Cashew, Bapatla
	Presentation on Cashew diseases by Dr. Rajashekara H, Sr. Scientist, Plant Pathology, ICAR -DCR, Puttur		
	Presentations of Reports on Crop Protection by Scientists of AICRP on Cashew		

9.30 AM - 3.30 PM	**18.01.2025 (3rd Day) – Forenoon**		
	TECHNICAL SESSION -IV	:	**Farmer Scientist – Stake holders Interaction "Revival of cashew sector"**
	Chairman	:	**Dr. Femina**, Director, Directorate of Cashewnut and Cocao Development, Kochi, Kerala
	Co-Chairman	:	**Dr. Umesh,** Former Dean, College of Horticulture, Bangalore (UHS, Bagalkot)
	Rapporteurs	:	**Dr. Jalaja S Menon**, Horticulturist & OIC, AICRP on Cashew, Madakkathara, Kerala **Mr. L.S. Khapare**, Scientist (Hort.), AICRP on Cashew, RFRS, Vengurla
	PLENARY SESSION 18.01.2025 (3rd Day) – Afternoon		
	Chairman	:	**Dr. P.C Tripathi**, Prin.Scientist, Hort. Sci. Division, ICAR, New Delhi
	Presentation of Rapporteurs reports		By Rapporteurs
	Vote of Thanks	:	**Dr. T.N. Raviprasad**, Sci-in-charge(PC Cell) & Prin. Scientist, ICAR-DCR, Puttur
	Rapporteurs	:	**Dr. Anasubai**, Jr. Horticulturist & PI, AICRP on Cashew, Kanabargi **Dr. Rajabaskar**, Jr. Entomologist, AICRP on Cashew, Vridhachalam, Tamil Nadu

SUMMARY OF THE ANNUAL GROUP MEETING OF AICRP ON CASHEW-2024

The Annual Group Meeting of the AICRP on cashew was held at College of Horticulture, (UHS; Bagalkot), GKVK Bengaluru campus during 16th – 18th January 2025. The inaugural session was presided Dr. Vishnuvardhana, Hon'ble VC, UHS, Bagalkot. The chief guests included Dr. Sanjay Kumar Singh, DDG (Hort.), ICAR, New Delhi, Dr. V. B. Patel, ADG (Hort.), ICAR, New Delhi, and Dr. Fakruddin, B., Director of Research, UHS, Bagalkot. Issues such as development and evaluation of hybrids, evaluation of bold nut and big apple genotypes, pruning response, cropping systems, management of pests and documentation of pollinator complex in cashew eco system were highlighted during the deliberations. Further, publications on cashew germplasm descriptors, package of practices, improved varieties and intercropping and thrips infesting cashew were released.

The technical session on crop improvement was chaired by Dr. H.B. Lingaiah, Former VC, UHS, Bagalkot and co-chaired by Dr. E. Eradasappa E., Senior Scientist, DCR, Puttur. Registration of germplasm with unique traits, obtaining approval of PC cell for the variety release, evaluation of selected F1s with checks, as well as, evaluation of new released varieties and elite genotypes (MLT VII) was approved. The variety release proposals viz., RFRS 195 from Vengurla and CARS 3 from Jagdalpur were approved.

The session on crop management was chaired by Dr D.P. Kumar, Former Director of Education, UAS Bangalore and co- chaired by Dr. Mini Poduval, Horticulturist and PI, AICRP on Cashew, RRS, Jhargram. Recommendations pertaining to pruning at early years for HDP trial, selecting dwarf and pruning responsive varieties for HDP trial, initiation of fertigation trail for drip irrigated cashew plants, factors to be considered for selection of intercrops and new treatments for organic cultivation trial were provided.

The technical session on crop protection was chaired Dr. Venkateshalu B. Dean, College of Horticulture, Kolar and co-chaired by Dr. T.N Raviprasad, Prin. Scientist & Scientist-In -charge (PC Cell), ICAR-DCR, Puttur. Recommendations on evaluation of effective insecticides and botanicals against TMB, CSRB and other emerging pests of regional importance, cost effectiveness of the treatments, accurate recording and identification of pollinators were given. In the technical session, presentation on diseases of cashew and their status in India was made and new trial on "Documentation of diseases of cashew in different cashew growing regions of India" was approved to be initiated in all AICRP Centers.

A session on interaction between development departments and research centers was conducted which was chaired by Dr. Femina, Director, DCCD and Dr. Umesh, Former Dean, COH, Bangalore acted as the Co-chairmen. It was suggested that action should be strengthened for technology dissemination through frontline demonstration, replanting of senile plantations, inclusion of newly released varieties in area expansion and supporting private nurseries for production of improved varieties were suggested.

The plenary session was chaired by Dr. P.C Tripathi, Principal Scientist, Hort. Sci. Division, ICAR, New Delhi and the recommendations of each session were presented by the rapporteurs. Project specific recommendations and suggestions for altering certain ambiguous recommendations were given by the Chairman. The session was concluded with the vote of thanks from Dr. T.N. Raviprasad, Scientist-in-charge, PC cell, ICAR-DCR, Puttur.

INAUGURAL SESSION

Rapporteurs: Dr. Mini Poduval, RRS, BCKV, Jhargram

Dr. Umamaheswara Rao, CRS, Bapatla

After the ICAR Geeth and Raitha Geethe were played as per the custom, the inaugural session started with the welcome address by Dr. B.Fakrudin, Director of Research, UHS, Bagalkot, wherein he suggested prioritized attempts for genomic selection in cashew.

Dr. J. Dinakara Adiga, Project coordinator, AICRP on Cashew presented the project coordinator's report. He mentioned about 66 high yielding varieties developed by different centres for different agro - ecological regions of the country, the total number of germplasms collected and briefly stated the centre-wise results of each experiment during the past one year. He also reported about different extension activities of AICRP on cashew.

Dr. V.B. Patel, ADG (Horticulture), ICAR emphasized on the following aspects

- Cashew has to play a vital role to contribute in country's economy by 2027.
- Low productivity of cashew in India is one of the main issues which should be focused on priority basis to meet the shortfall in import of raw cashewnut in the coming years and increase in the domestic demand. Therefore, need of the hour is to rejuvenate old plantation of known origin otherwise replace with new high yielding varieties. Some of the potential varieties which are having more than 3 tones/ha yield should be multiplied on priority basis by regional nurseries to meet the requirement of 15 million grafts per year and to achieve this universities can emphasize on outsourcing graft production activity.
- Collaborative efforts are necessary among researchers, farmers, Directorate of Cashew and Cocoa Development, other development departments, KVKs and FPOs working in the field of cashew to standardise the production technology to ultimately increase the total production of the country.
- Collaborative research is necessary between AICRP on Cashew and other institutes to standardise the regeneration protocol in cashew.

The Hon'ble Vice Chancellor of UHS, Bagalkot Dr. Vishnuvardhana delivered the presidential address. He mentioned about the research programmes of UHS, Bagalkot on cashew and emphasized on developing climate resilient varieties of cashew, mechanisation in orchard management, promoting intercropping and post-harvest challenges in cashew.

The Hon'ble DDG (Hort.Sci.), ICAR, Dr. Sanjay Kumar Singh mentioned about the vision of AICRP on cashew. He suggested to the AICRP centres to adopt 5 progressive farmers as ambassador farmers /Mitra - Kissan, every year and scientifically develop cashew orchards with region - specific remunerative intercrops to showcase all the standardized technologies. He also emphasized about expanding cashew cultivation in non -traditional areas and community approach for cashew pest and disease management.

Several publications on cashew production technologies compiled by different centers of AICRP on Cashew in English and local languages were also released during the Session.

1. "Calendar of operation for cashew for the state of West Bengal" both in English and Bengali by AICRP on Cashew, RRS, BCKV, Jhargram, West Bengal.

2. Scientific cultivation of cashew in Gujarati : "Kajuni Vaignanik kheti" by AICRP on Cashew, NAU, Paria centre.

3. AICRP on Cashew HRS, (UHS), Hogalagere, Karnataka has released two Technical bulletins
   i) Integrated nutrient management in cashew
   ii) Integrated Crop protection techniques in cashew.

4. AICRP on Cashew, CRS, Dr. YSRHU, Bapatla, Guntur District, Andhra Pradesh has released two publications in Telugu.
   i) Jeedimamidilo komma Kathirimpulu mariyu Poshakala yajamanyamu (Pruning and nutrient management in cashew)
   ii) Jeedimanaidini asinchu kandam mariyu veru toluchupurugu yajamanyam (Management of cashew stem and root borers)

5. Technical Bulletin on "Commercial products of cashew apple" by AICRP on Cashew, CRS, Madakkathara, KAU, Kerala.

PROJECT COORDINATOR'S REPORT - 2024

Dr. J. Dinakara Adiga
Director, ICAR-DCR and Project Coordinator, AICRP-Cashew

Respected Chief Guest of the today's function, the Guests of Honor and distinguished experts, scientist colleagues from AICRP-Cashew as well as DCR 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. I take this opportunity to express my gratefulness to DDG (Hort.Sci.), ICAR, New Delhi for permitting us to host this Annual Group Meeting of AICRP on Cashew – 2024 at UHS, GKVK Campus, Bengaluru and to the Vice Chancellor, UHS, Bagalkot for facilitating this AGM.

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 was 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.

The centers of AICRP on Cashew along with other centers working on cashew have so far developed and released 66 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 cashewnuts in the country. The AICRP centers are working on crop management aspects such as nutrient requirement, irrigation, and high and ultra-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 highlight some of the salient results of the work done during the year 2024.

CROP IMPROVEMENT

The total germplasm accessions conserved at various centers is 1450. A total of 35 new germplasm accessions have been collected by different centers during the year. As far as evaluation of germplasm accessions is concerned, during the year, 150 accessions for yield and yield attributing characters have been evaluated by different centers. In Bapatla, the germplasm Gopalapuram-1 collected from farmer's field is identified as high yielder. The Paria center identified one bold nut germplasm. In Madakkathara center, 2 bold nut type and one purple colour nut has been identified.

The trial on CNSL free accessions is under progress at Bapatla, Vengurla and Madakkathara centers to evaluate different varieties for tender cashewnuts for culinary purposes. Under multi location trial – V, the performance of released varieties is being studied at Hogalagere and Jagdalpur center. Under this trial, the varieties Ullal 3 and Vengurla 7 recorded the highest cumulative yield at Hogalagere and Vengurla -1 performed better in Jagdalpur center.

In the trial on hybridization and selection, around 1026 F1 progenies were evaluated at different centers and many promising types having bold nut, early bearing, cluster bearing and nut yields higher than the local checks have been identified. In the trial on Characterization of germplasm for cashew apple conducted at Pilicode center, the highest apple weight observed in PLD 104 (123.50g) with the juice recovery of 61.80%

Further, the trial on evaluation of promising bold nut, bigger size apple types and high yielding cashew genotypes is under progress in eleven centers. In Bapatla center 3 bold nut genotypes (12.77 to 13.59 g) are identified. The Bhubaneswar center, one big apple genotype with 189.63 g was identified. In Kanabargi center, 2 bold nut (15.17 & 14.83 g) and one big apple (295.83g) genotypes were identified. Madakkathara center identified 5 bold nut genotypes (12.12 to 13.68 g). The Pilicode center identified 2 bold nut type (13.8 and 12.55 g) and one high shelling percentage (31.80 %) genotype. Vengurla center identified 5 bold nut types with the weight ranged from 12.2 to 15.75 g, one big apple type (192.5 g) and 2 high shelling percent types (33 % & 31.70%).

The trial on dwarf genotypes for yield and growth characters to facilitate high density plantation is under progress in 10 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 maximum cumulative yield of 84.27 kg/tree in 8 harvests at Hogalagere.

In Fertilizer application in high density cashew plantations trial at Hogalagere, the wider spacing (S1- 10 x 5m) and higher dose of fertilizer (M3 - 225kg N:75 kg P2O5:75kg K2O per ha) recorded better yield (6.9 kg/tree in current year and 33.63 kg/ tree cumulative yield in 8 harvests)

In drip irrigation trial, irrigation at 80% cumulative pan evaporation was found to be the best at Jagdalpur center. In the intercropping trial, the intercrops marigold, China aster at Bapatla, cowpea and marigold at Bhubaneswar, ginger and Colocasia at Darisai, cluster bean, kodo millet at Jhargram, Colocasia at Jagdalpur, Gaillardia at Kanabargi, arrowroot and aromatic turmeric at Madakkathara, coriander at Paria, yard long bean at Vengurla centers gave highest net returns. In organic management trial, 100% N as vermicompost and biofertilizers gave highest nut yield at Bapatla and Hogalagere center. Further, the trial on ultra-high-density planting is under progress at 10 centers.

The trial on pruning response of different varieties has been initiated at five centers which indicated 50% lateral shoot pruning in June recorded highest cumulative yield at Jhargram; In Vridhachalam, pruning of 25% leader shoot in August and 25% lateral shoot in August recorded higher cumulative nut yield; no significant results were obtained in Madakkathara center. In Vengurla center, 25% leader shoot pruning in August recorded the highest cumulative yield and in Hogalagere, 25% & 50% lateral shoot pruning in August recorded more cumulative yield per tree. Besides, development of cashew based cropping system was initiated at 9 centers.

CROP PROTECTION

Thiamethoxam (0.3 g/l) was found to be more effective against TMB, shoot tip caterpillar, apple and nut borer and leaf miner in Bhubaneswar. In Madakkathara, the highest average reduction in TMB damage, thrips and leaf miner over control was observed in Thiamethoxam 25WG (0.2g/L), followed by T4 (Thiacloprid 1.5 ml/L). The λ cyhalothrin 5 EC @ 0.6 ml/l) was found significantly superior for TMB and for thrips, Thiamethoxam 25 WG @ 0.2 g/l and Thiacloprid 25 SC @ 1.5 ml/l) were found significantly superior at Vengurla and Jagdalpur. Thiamethoxam 25WG @ 0.2g/L showed better results at Kanabargi.

UHS-POP treatment combination of Thiamethoxam 25 WG - Lambda Cyhalothrin 5EC - Carbosulfan 25EC had shown better results in Hogalagere. Adopting three spraying cycles, the POP

recommendation (Thiamethoxam 25 WG @ 0.2 g/ L (I spray), Lambda-Cyhalothrin 5 EC @ 0.6 ml/L (II spray), and Carbosulfan 25 EC @ 2 ml/L (III spray) was the most effective treatment in Vridhachalam.

As far as botanicals are concerned, Azadirachtin 1% (1 ml/l) was found effective at Vengurla, *Datura metel* decoction @ 5 % at Jagdalpur, Novel plus 1 % (NAU Product) at Pilicode and Paria, NSKE 5% (Aqueous extract) at Madakkathara and combination of Azadirachtin 1% - NSKE 5% - Neem Soap@10g/litre at Hogalagere. As far as Cashew Stem and Root Borer is concerned, Fipronil (2ml/litre) was found to be effective in Madakkathara, Vengurla and Hogalagere centers. However, in Jagdalpur, Chlorpyriphos 10ml/litre was effective. On the other hand, Imidacloprid (2ml/l) was effective in Bapatla center.

TRANSFER OF TECHNOLOGY

The coordinating centers of AICRP are also involved in transfer of technology activities and have produced about 3.09 lakh cashew grafts during 2023 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 32 training programmes on different aspect of cashew cultivation and management practices under SCSP, TSP and other programs in which more than 2000 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. Sci.) and Dr. V.B Patel, Asst. Director General (Fruits and Plantation crops) for their continued guidance and support from the Council. I would like extend my gratitude to the Vice Chancellor, UHS, Bagalkot for his support in conducting AGM at UHS, Bengaluru campus.

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. Femina, 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. T.N. Raviprasad., Principal Scientist & Scientist-in-charge of PC Cell and Scientist Members of PC Cell, Dr. Thondaiman, V., Dr. E. Eradasappa, Dr.Rajashekhara, H. Dr. Bhagya.H .P., and Kum. Kavyashree P.R., Young Professional-I; and Smt. Reshma.K., PS (Dir)which has enabled smooth functioning of the day-to-day work of the Project Coordinator's Cell.

JAI HIND

ACTION TAKEN REPORT ON THE DECISIONS OF AGM -2023

Action taken report on the recommendations ensuing the deliberations of the Annual Group Meeting held during 17th -19th January 2024 was presented by Dr. T.N.Raviprasad, Scientist-in-charge, PC Cell, & Principal Scientist (Agrl. Entomology), ICAR-DCR, Puttur.

CROP IMPROVEMENT

General Suggestions	Action Taken
In each experiment yield needs to be recorded in metric tons per hectare and crop efficiency in terms of yield per cubic meter of canopy volume.	**BAPATLA** Yield was recorded in metric tonnes/ha and crop efficiency in yield per cubic meter of canopy volume **BHUBANESWAR** Yield expressed in metric tons and crop efficiency per cubic meter of canopy volume has been calculated and reported **HOGALAGERE** In all the experiments yield has been recorded as metric tons per hectare and crop efficiency as Yield in kilogram per cubic meter of canopy volume **JAGDALPUR** As per the recommendation the yield data in each experiment has been recorded in metric tons per hectare and crop efficiency in terms of yield per cubic meter of canopy volume. **JHARGRAM** Calculation has been followed as per recommendation. **MADAKKATHARA** The yield parameters have been recorded and presented as suggested **PILICODE** Data is being reported as per the instructions and experimental manual provided by DCR Puttur. crop efficiency in terms of yield per cubic meter of canopy volume has been calculated and reported **VRIDHACHALM** Yield was recorded in metric tons per hectare. **TURA** Noted and followed
Identify at least two trait−specific unique germplasm from each Center which must be reported in ensuing AGM−2024.	**BAPATLA** Identified unique germplasm (Amalapadu- 1 - Dwarf in nature) & (Gopalapuram -1- High yielding type) and same will be presented in AGM-2024 **BHUBANESWAR**

	One germplasm has been identified form the existing collections **HOGALAGERE** Two germplasms have been identified for their yield traits **JAGDALPUR** One bold nut and one cluster bearing germplasm has been collected from Darbha Block of Bastar District. **JHARGRAM** Evaluation is under process. **MADAKKATHARA** Three trait specific unique germplasm accessions having bunch bearing habit, bold nut and purple-coloured nuts have been identified from Kannur district of Kerala **PILICODE** One germplasm with less CNSL content and other germplasm with big cashew apple and nut (135.5g and 14.5g respectively) from Mayyil and Kudiyanmala has been collected **VRIDHACHALAM** The trait-specific unique germplasm having cluster bearing and medium bold nut size has been identified and is being evaluated in the current season **TURA** Germplasm collections made has cluster bearing habit however novel traits has not been observed.
A minimum of 1 kg seed nut should be used for estimation of shelling percentage; as per approved procedure.	For estimation of shelling % procedure indicated in Experimental Manual was followed and as per approved procedure 1 kg seed nut has been used **BAPATLA, BHUBANESWAR, HOGALAGERE, JAGDALPUR, JHARGRAM, KANABARGI, MADAKKATHARA, PILICODE, VRIDHACHALAM, TURA**
The trial on rapid polyclonal hybrid evaluation should be discontinued in all the centers	The trial has been discontinued. **BAPATLA, BHUBANESWAR, HOGALAGERE, JAGDALPUR,** **JHARGRAM, MADAKKATHARA, VRIDHACHALAM**

CENTER WISE RECOMMENDATION

BAPATLA

Data on shelling percentage (Code –F) in the bold nut trial needs to be rechecked as 45% is too high.	Shelling percentage in (Code –F) in the bold nut trial was rechecked and corrected value (Shelling percentage - 24.92).

DARISAI

Crop improvement experiments evaluated for a period of 6 years need to be concluded	The experiments have been concluded after collecting six years of data

Hogalagere

Bold nut types should be included as parents in future hybridization programme	Bold nut types included as parents in hybridization programme
The data of past 4 years should be rechecked for nut weight and shelling percentage in MLT-III	Nut weight and shelling percentage has been rechecked with proper drying of the nuts

JAGDALPUR

The data on flowering duration needs to be rechecked in hybridization and selection experiment	Data has been rechecked and found correct for the flowering duration with first 50 % flowering observed in the month of November to December and after again new flush observed with last 50 % flowering in February to March.

PARIA

Efforts should be made for collection of higher number of germplasm with unique /desirable traits in Gen.1	Germplasm collection for bold nut done and one accession has been collected. More than 95 % plantations are of V-4 variety, and survey has been initiated in forest plantations.

PILICODE

Performance of F1 should be compared with other commercial varieties in comparative yield trial using softwood grafts of the hybrid.	Grafts of the hybrid have been prepared and will be planted for evaluation during the next season.

VARIETY RELEASE PROPOSAL

General recommendations	Action Taken
AICRP, Vengurla and Goa Center should collect all requisite data as suggested in house at the earliest and complete proposals of variety release be submitted to DCR, Puttur.	The variety release proposal will be submitted shortly to DCR, Puttur.
DCR Puttur shall arrange an on-line meeting of revised variety release proposal within six months for deciding about release of these varieties.	Based on online discussions, proposal for submission of new varieties has been confirmed.

VENGURLA

Recommendations	Action Taken
DNA finger printing of proposed variety; Vengurla-10 (RFRS-195) should be done preferably at DCR, Puttur.	DNA finger printing of proposed variety has been done. Details will be presented in current AGM.
It should be submitted for registration to NBPGR.	The proposed variety has been submitted for registration with the NBPGR.
IC number should be obtained from NBPGR.	IC number IC0651994 has been allotted by NBPGR.

Present the data on what percentage of tender cashew kernel gets sold in the market.	The data regarding percentage of tender cashew kernel sold in the market (35 to 40 tons in Raigad, Ratnagiri and Sindhudurg district) is included in the Variety release proposal.
Organoleptic analysis should be done for assessment of suitability of tender cashew kernel for culinary purpose.	Based on organoleptic analysis, by the experts of Post Harvest Technology, Department of College of Horticulture, Dr. BSKKV, Dapoli. Vengurla-10 MB has been identified as a most suitable variety for tender kernels.

GOA

Yield data should be indicated harvest-wise and not year-wise as the yield indicated for the first harvest are too high.	Action taken and yield data reported accordingly
Details of planting and year of harvesting should be re-checked for Goa-5 (Tudal-1) and Goa-6 (H – 21/05) and should be submitted to PC Cell.	Details checked and action taken accordingly
DNA finger printing of varieties to be released should be done.	Action initiated

CROP MANAGEMENT

BAPATLA

General Suggestions	**Action Taken**
One lead presenter should be identified to compile the various Centers experiment results and present the same in the ensuing AGM.	One lead presenter has been identified to compile the experiment results of various Centers and will be presenting them.
Yield should be expressed on per hectare basis in all experiments, including high density and ultra−high−density experiments.	Suggestion has been followed; yield was expressed on per hectare basis in all experiments **BAPATLA, BHUBANESWAR, HOGALAGERE, JAGDALPUR, JHARGRAM, MADAKKATHARA VENGURLA, VRIDHACHALAM**
The treatment schedule involving three sprays of urea 3 % should be verified in the nutrient management experiment.	**BAPATLA, BHUBANESWAR,** The experiment has been concluded after 7th harvest during 2023-24 and final report will be submitted with all details of the nutrients applied in the experiment **HOGALAGERE** Treatment schedule of sprays with 3 % urea has been verified in the nutrient management experiment no ill effect such as scorching were observed
Nutrient management experiments (Hort 1 and Hort 7) should be continued for one more year for analysing the nutrient status in soil and plants before concluding these experiments and	**BAPATLA** **E**xperiment was continued during the year 2023-2024 and nutrient status in soil and leaf were analyzed at College of Agriculture, Bapatla.

nutrient budgeting should be done.	**BHUBANESWAR** In Nutrient Management experiment the nutrient status of soil and leaf have been analysed and the concluded report will be submitted. Hort. 7 has been concluded in the year 2016 **HOGALAGERE** As per recommendation, continued for one more year and analysis the nutrients status
Centers should explore the option of mechanized pruning operation in pruning trials to reduce the cost of pruning.	**BAPATLA** Mechanised pruning equipment not available. **HOGALAGERE** General machineries are not suitable for pruning so hand held tools are used for pruning of cashew plants **JAGDALPUR** This trial has not been allotted. However, mechanized pruning is being followed in other experiments. **JHARGRAM** Mechanical pruning could not be done due to lack of skilled workers and lack of proper implements **MADAKKATHARA** The pruning operation in the pruning experiment trial has been done using power operated pole pruner and it also showed high efficiency. **VENGURLA** Mechanical pruning has been adopted. **VRIDHACHALAM** Mechanized pruning operation was found to be tedious due to thick branch size, hence need to recheck for its feasibility during the current season
In the experiment on organic management of cashew; soil multi parameters and soil micro biome analysis should be done and best treatments should be analysed and published in journals having good impact factor.	**BAPATLA** Soil parameter analysis s was done at Agriculture college, Bapatla and soil microbial analysis was done at Agricultural Research Station, Amaravati, ANGRAU, Guntur district and analysed. **BHUBANESWAR** The experiment has been concluded during the year 2016. **HOGALAGERE** Soil sample sent for microbial analysis to Dept. of microbiology, UAS, Bengaluru results are awaited.
In intercropping experiments, soil nutrient status should be analysed to estimate the nutrient	**BAPATLA** Soil nutrient status analysis was done before taking

buildup and nutrient depletion due to intercropping.	up the intercrop trial. **BHUBANESWAR** Soil analysis has been done before growing intercrops. Nutrient build-up and depletion will be determined after completion of harvest of inter crops. **JAGDALPUR** soil nutrient status has been analyzed to estimate the nutrient buildup and nutrient depletion due to intercropping **JHARGRAM** Initial soil nutrient status has been analyzed. **MADAKKATHARA** The nutrient status of the soil will be analysed after the harvest of the intercrop in January 2025 **VENGURLA** soil nutrient status has been analyzed to estimate the nutrient buildup and nutrient depletion due to intercropping **VRIIDHACHALAM** Soil nutrient status was analysed for major nutrients at KVK, Vridhachalam and for micro nutrients at TNAU, Coimbatore
In Hort. 12 experiment, the growth parameters before and after imposing the treatments should be recorded and percentage increase in growth parameters should be presented.	**HOGALAGERE** Growth parameters before pruning have been recorded and after taking pruning the relavent growth parameters recorded subsequently **JHARGRAM** Growth parameters prior to pruning and after second year of pruning will be compared and presented. **MADAKKATHARA** The growth parameters before and after the imposition of treatments have been recorded and will be presented **VENGURLA** The parameters have been recorded and percentage increase in growth parameters will be presented during this AGM. **VRIDHACHALAM** Before and after pruning, the growth parameters was recorded and was found to be non-significant among the treatments.

CENTER WISE RECOMMENDATION

BAPATLA

Soil properties as well as nutrient status should be analyzed in nutrient management trial.	Soil properties and soil nutrient status were analyzed and will be presented

BHUBANESWAR

Recommendations	**Action Taken**
Soil properties as well as nutrient status should be analyzed in nutrient management trial	Soil properties and nutrient status analysis have been done. The information will be submitted with the concluded report.
Before concluding the Hort. 1 experiment, soil and leaf analysis should be undertaken to monitor the effect of various treatments on the nutrient status of soil and trees	Soil and leaf analysis have been done. The information will be submitted with the concluded report.
The B: C ratio in intercropping experiment should be checked	B:C ratio has been checked, rectified and will be presented in AGM,2024.

HOGALAGERE

Recommendations	**Action Taken**
Statistical analysis of the data of Hort. 7 experiment should be rechecked	The data has been reanalysed, CV (%) values were found to be confirmed
The premium price for organically grown cashew in local market is to be considered while working out the B:C ratio	There is no certified organic market facility in the local area hence it cannot be incorporated for calculation of B:C ratio

DARISAI

Recommendations	**Action Taken**
Soil properties as well as nutrient status should be analyzed in nutrient management trial.	Soil properties and nutrient status analysis in nutrient management trial are being carried out.
In Intercropping trial, local market price of the products should be considered while calculating B:C ratio. More than two crops can also be recommended for the region considering the yield performance and B:C ratio.	B:C ratio of the produce of inter-cropping trial has been calculated as per local market price. Three intercrops *viz.*, ginger, elephant foot yam and Colocasia has been recommended for the region considering B:C ratio of the corresponding intercrops
Detailed analysis of the causes of low productivity of cashew in the region is to be undertaken to re-assess the feasibility of cashew cultivation in Jharkhand.	Detail analysis of the causes of low productivity of cashew in the region is being carried out.

JAGDALPUR

Intercropping trial with same set of shade loving tuber crops should be continued for one more year.	Intercropping with same set of tuber crops has been undertaken during 2024-25.

JHARGRAM

Mechanical pruning should be explored to impose treatments in ultra-high density planting trial and subsequent pest and disease incidence should be monitored.	In ultra-high-density planting, pruning has been followed with looper and secateurs as the plant height is amenable for manual pruning.

KANABARGI

Continue the intercropping trial for the ensuing year.	For 2023-24 the intercropping studies could not be taken up as the scientist was transferred and will be initiated during the ensuing season.

MADAKKATHARA

Centre wise recommendation	**Action taken**
The economics of cultivation of aromatic turmeric and other crops in intercropping trial needs to be verified.	The B:C ratio of intercrops have been verified and corrected

PARIA

Ensure that the experiments are laid out following statistical principles.	The experiments are further laid out following statistical principles.
The original yield data in the intercrops trials is to be provided for verification to DCR.	The original yield data of intercrops submitted to DCR, Puttur.

VENGURLA

Recheck the data on yield levels in Hort. 11 experiment	Data has been rechecked and found to be correct.

CROP PROTECTION

BAPATLA

General Suggestions	**Action Taken**
Maintain uniformity in treatment details and ensure uniformity in presentation across the centers (slide numbering, super script, treatments, CB ratio)	Treatments are uniformly numbered in accordance with other centers. The presentation will be prepared as per the instructions **BAPATLA, BHUBANESWAR, HOGALAGERE, JAGDALPUR, MADAKKATHARA, PILICODE VENGURLA, VRIDHACHALAM**
In the trials on screening of pollinators, contribution to pollination by different insect species is to be assessed	**BAPATLA** Due to Michaung cyclone flowering was delayed by two months. Pollination fauna was very less.

	BHUBANESWAR Will be followed from 2025 fruiting season, as no entomologist is posted **HOGALAGERE** Pollinators fauna was found very less due to severe flower drying and the contribution to pollination by different insect species could not be assessed properly and it will be followed from next year. **JAGADALPUR** Noted and due to low density of pollinators as well as visits by various pollinators on a same flower assigning individual species contribution is not possible **MADAKKATHARA** Due to the low pollinator density, assessing the contribution of individual species is tedious under field situation **VENGURLA** The species of pollinators and its contribution was assessed and will be presented in this AGM **VRIDHACHALAM** In the trials on screening of pollinators, contribution to pollination by different insect species was overlapping and assigning the pollination efficacy of individual specie was not possible for particular species.
One scientist should be assigned to present the pooled data of single experiment of all the centers.	This has been followed to present pooled data of single experiment of all the centres
In Ent−3, mention standard weeks instead of months for data on seasonal incidence of cashew pests.	Suggestion was followed by adopting standard meteorological weeks for data recording on seasonal incidence of cashew pests BAPATLA, BHUBANESWAR, HOGALAGERE, JAGDALPUR, MADAKKATHARA, VENGURLA, VRIDHACHALAM
Consult the statistician to analyze experimental data of CSRB trial due to lesser number of trees to draw valid conclusions.	Consulted the statistician to analyse experimental data of CSRB trial through RBD. BAPATLA, BHUBANESWAR, HOGALAGERE, VRIDHACHALAM **JAGDALPUR** Sufficient number of trees were available for each treatment (15) the data was analysed by RCBD.

	MADAKKATHARA The experiment was conducted with sufficient number of trees as per the instruction **VENGURLA** Chi square analysis of CSRB data was done with the help of university statistician and will be presented in this AGM

CENTRE-WISE RECOMMENDATION

BAPATLA

Consult the Statistician to analyze CSRB trial experimental data to draw validconclusions.	Consulted the statistician and followed the regular RBD
Consider each plant as one replication in cashew for better statistical analysis.	Suggestion was followed

BHUBANESWAR

Initiate Ent-1 &2 trials with new set of treatments as per the proceedings of the zoom meeting. Data should be analyzed by adjusted means because means are different.	New set of treatment adopted and data analysed as per suggestion
In Ent 1&2 experiments, record the observations for TMB and other pest as per the cashew experimental manual.	Observations have been recorded as suggested referring Experimental manual.
Consider only the insects / bees which actually are visiting cashew flowers as flower visitors / pollinators and not otherwise, if resting on foliage	The pollinators which are actively involved have been recorded
Categorization of pollinators included parasitoid and others which needs to be deleted.	Only actual pollinators have been reported

HOGALAGERE

Integrate effective treatments both in insecticides and in botanical trials as a single trial to workout integrated management program against TMB and other insect pests	Integrated effective treatments both in insecticides and in botanical trials has been taken as university project

JAGDALPUR

In botanical trial, Novel plus treatment concentration should be 1% instead of 10%	In botanical trial, Novel plus treatment concentration has been taken 1% instead of 10%
The frequency of treatment application in CSRB trial should be thrice instead of one.	Treatments were given as need based
In Ent-3, mention standard weeks instead of months for data on seasonal incidence of cashew pests.	Standard weeks were adopted for analysis of seasonal incidence of cashew pests

In Ent 1 & 2 cost of the treatment imposed should be mentioned in the table for calculating the B: C Ratio	Cost of the treatment imposed in Ent 1 & 2 has been mentioned in the table for calculating the B: C Ratio

KANABARGI

In Ent-3, mention standard weeks instead of months for data on seasonal incidence of cashew pests.	Standard weeks are utilized for data collection and analysis on seasonal incidence of cashew pests.
The calculation of B: C ratio must be rechecked	The B:C ratio has been checked and corrected
In Expt. Ent-1, the efficacy of Profenophos 50EC insecticide against TMB over Lamda cyhalothrin must be re-assessed.	New molecules has been introduced as per the suggestions made at last AGM and comparative efficacy has been re-assessed.

MADAKKATHARA

Centre wise recommendations	**Action taken**
In Ent 1 & 2 trials, the observations should be recorded at a day before spray, 7 and 15 days after each spray.	The observations were recorded before spray, 7 and 15 days after each spray as suggested
In Ent 1, T6 (KAU POP) comprising of Lambda cyhalothrin 5 EC – Quinolphos 25 EC – Thiamethoxam 25WG, Thiamethoxam 25WG should be used in 1st spray instead of third spray to avoid residual toxicity in final produce.	The treatment T6 was followed as per KAU-POP recommendation
Chi-square analysis for CSRB data is irrelevant hence need not be done.	Chi square analysis for CSRB experiment have not attempted

PARIA

Initiate Ent 1 & 2 trials with new set of treatments as per the proceedings of the zoom meeting.	New treatments already imposed in trials as per the proceedings.
Interaction effects in statistical analysis of Ent 1& 2 should be avoided.	Suggestion has been followed.
In Ent 4, the weather parameters like rainfall and number of rainy days should also be considered for statistical analysis.	During the pest occurrence period no rainfall occurred hence these parameters are not included.
Cross check the B:C ratio for the traits Ent 1 & 2.	Corrected the B:C ratio , and will be presented

PILICODE

In Ent 2 trial, the observations should be recorded at a day before spray, 7 and 15 days after each spray. The data to be reanalyzed statistically.	Observations have been recorded according to the instructions. Rechecked and analyzed and no variation has been obtained.

VENGURLA

Recommendations	Action Taken
Initiate Ent 1 & 2 trials with finalized new set of treatments as per the proceedings of the zoom meeting.	Trial done as per new set of treatments.
In CSRB (Ent -3) trial untreated control need not be adopted.	Untreated control has been deleted.
In Ent-3, mention standard weeks instead of months for data on seasonal incidence of cashew pests.	The metrological week and concurrent pest population has been corelated.

VRIDHACHALAM

In CSRB (Ent -3) trial untreated control need not be adopted.	Untreated control is deleted.
The visiting Apis mellifera honeybees on cashew flowers need to be collected and sent to DCR, Puttur for confirmation of species as reported.	No Apis mellifera bees could be encountered during the season.

TECHNICAL SESSION I - CROP IMPROVEMENT

Chairman: Dr. H.B. Lingaiah, Former VC, UHS, Bagalkot

Co-Chairman: Dr. E. Eradasappa, Senior Scientist, DCR, Puttur

Rapporteurs: Dr. L. S. Khapre, Scientist (Hort.), AICRP on Cashew, RFRS, Vengurla

Dr. Asna A.C., Jr. Breeder, AICRP on Cashew, Madakkathara

General recommendations:

- Coding of experiments in each discipline should be done uniformly
- Categorization of genotypes as bold for nut weight from 8-12 g and as jumbo for nut weight above 12g must be followed
- While reporting data in tables, year of planting (YOP) must be indicated in title
- Any variety release proposal submitted to CVRC should have the approval of PC Cell or have been presented in the AGM.
- Accession number of germplasm may be designed uniformly including year and place of collection
- The promising genotypes identified in the germplasm evaluation should be used for hybridization programmes
- In hybridization and selection experiment, statistical analysis must be done among the hybrids planted in the same year
- After preliminary evaluation, the F1s must be evaluated in RBD or augmented design along with the check
- In hybridization and selection experiment, number of crosses per combinations must be increased rather than the number of combinations
- The proposal for new experiment on MLT VII has been approved and allotted to six centres: Paria, Madakkathara, Bapatla, Jhargram, Jagdalpur, Hogalagare

Centre wise Recommendations

JAGDALPUR

- In view of the high shelling % mentioned, double-check the shelling percentage of VRI-3 in the trial MLT-V.

DARISAI

- Verify the shelling percentage and nut weight in the experiment MLT VI as it was found to be very low

KANABARGI

- In MLT VI Trial, the shelling percentage of NRCC Sel-2 should be reviewed and corrected. The reason for the low yield in MLT VI has to be reported to the PC cell

VENGURLA

- Recheck the nut yield/m^3 of canopy volume in bold nut trial in view of high values for the genotypes

VRIDHACHALAM

- The reason for not recording the reproductive parameters in the bold nut trial has to be reported to the PC cell
- As the height recorded for dwarf genotypes were high, send the filed photo of NRC 492 to the PC cell

TURA

- Recheck the shelling percentage of VRI-3. Send the picture of cross section of nut to PC Cell

VARIETY RELEASE PROPOSAL

RECOMMENDATIONS

PILICODE

The genotypes must be evaluated in RBD and compared with superior check for releasing of variety. The proposal for KAU - Neha was deferred and it was suggested to collect relevant information as per the format.

VENGURLA

The variety release proposal of RFRS 195 Has been approved. Proposal to be submitted for CVRC with the approval of PC cell.

JAGDALPUR

The variety release proposal of CARS 3 has been approved. Proposal to be submitted for CVRC with the approval of PC cell.

Programmes allotted to different Centers of AICRP on Cashew for the year – 2025-26

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 with low CNSL content	Bapatla, Hogalagere, Madakkathara, Vengurla and Vridhachalam
Gen. 3.	Varietal evaluation trial	
	Multilocation trial–III (earlier MLT–2002) (Planted during 2003) (To 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
	Multilocation trial–VII	Bapatla, Bhubhaneswar, Darisai, Goa, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Paria, Pilicode,Tura, Vengurla and Vridhachalam ,
Gen. 4.	Hybridization and selection	Bapatla, Bhubhaneswar, Goa, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Pilicode, 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, Hogalagere, Jagdalpur, Jhargram, Goa, Kanabargi, Madakkathara, Pilicode, Goa, Vengurle and Vridhachalam
Gen. 7	Trial on Dwarf genotypes in cashew	Bapatla, Bhubaneswar, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Pilicode, Madakkathara, Vengurle and Vridhachalam

TECHNICAL SESSION II: CROP MANAGEMENT

Chairman: Dr. D.P. Kumar, Former Director of Education, UAS Bangalore

Co-chairperson: Dr. Mini Poduval, Horticulturist and PI, AICRP on Cashew, RRS, Jhargram

Rapporteurs: Dr. Meera Manjusha A V, Jr. Entomologist,AICRP on Cashew, Pilicode
Dr. Vikas Ramteke, Jr. Entomologist,AICRP on Cashew, Jagadalpur

General recommendations

- Powdery mildew affected samples should be sent to DCR for analysis
- Pruning should be done in the initial year itself to properly maintain high density trials
- Only dwarf varieties and those varieties responsive to pruning should be included on the high-density experiments
- Fertigation trail can be initialed in drip irrigation trial after concluding the experiment
- Observations like number of flowering laterals/m^2 can be recorded to know the effect of drip irrigation on flowering and fruiting in cashew.
- In initial years of plantation, green manure crops should be selected for intercropping experiment.
- Yield should be expressed in tonnes per ha instead of quintal per ha.
- Yield and income should be presented in the same slide for better understanding in intercropping trial.
- While selecting intercrops, factors like, the selected crops being alternate hosts to cashew pest and diseases, whether they are interfering with flowering and fruiting of cashew, market demand etc. should be considered.
- New set of intercrops were approved for Jagdalpur and Kanabargi centers.
- For the first three years short stature crops should be selected as intercrops.
- Centres which conducted experiment with same set of crops for three harvests can change set of crops.
- While giving recommendations based on the organic trials, changes in soil organic carbon, soil structural changes and soil microbial load changes may be indicated as the benefits of the organic management.
- The trial Hort. 7: Organic management of cashew may be continued for one more year for calculating soil enzymatic activity, soil nutrients for comparison among the centers.
- Those centers who conducted soil enzymatic analysis for nutrient management/organic management trails should present the results in next AGM.
- New organic trial may be initiated with newer set of treatments.
- Quantity of FYM and vermicompost applied should be mentioned in the organic trial.
- Hort 11: Pruning response of cashew varieties, the trial may be continued up to 6 harvests in all centers
- Hort 12: Development of cashew based cropping system: All centers should complete planting in June.

Centre wise recommendations:

Hort 1: Nutrient management for yield maximization

- HOGALAGARE: Pooled analysis of all harvest data including vegetative and reproductive parameters should be performed and per cent increase over and above the recommended practice should be mentioned in the completion report

Hort 2: Fertilizer trial in high density plantations

- HOGALAGARE: BC ratio should be calculated and submitted to PC Cell along with pooled analysis of all harvest data including vegetative and reproductive parameters. In recommendation, pruning practices to be followed in high density should be included.

Hort 3.: Drip irrigation trial

- JAGDALPUR/ BHUBANESWAR: No recommendations

Hort 4: High density planting observation trial

- JAGDALPUR: No recommendations

Hort 6: Intercropping in Cashew

- BHUBANESWAR: Recheck data on yield of cashew including CV, CD and trial may be continued for 2 more years with same set of crops.
- BAPATLA: As the trees in the trial are old, recommendation based on the trial can be made for older plantations.
- DARISAI: Light pruning should be done for cashew to open the canopy.
- JAGDALPUR: For calculating cost of cultivation State declared rates of labour should be included.
- VENGURLA: Current year cost should be included in the calculation of cost of cultivation. Economist should be consulted for calculating the cost of cultivation.

Hort 7: Organic management of cashew

- HOGALAGERE: Recheck the data regarding nut yield, CD. and CV.

Hort 8: Spacing cum fertilizer trial

- DARISAI: No recommendation

Hort 9: Evaluation of production potential of Bidhan Jhargram 2 at different spacing

- DARISAI: No recommendation

Hort 11: Ultra high-density planting system

No recommendation

Programmes allotted to different AICRP Cashew centers for the year – 2025-26

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 trial	Bhubaneswar and Jagdalpur
Hort.4.	High density planting - observational trial	Jagdalpur
Hort.6.	Intercropping in cashew	Bapatla, Bhubaneswar, Darisai, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Paria, Vengurla and Vridhachalam
Hort.7.	Organic management of cashew	Bapatla, Darisai and Hogalagere
Hort.8.	Spacing cum Fertilizer Trial	Darisai 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, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Pilicode, Vengurle and Vridhachalam
Hort.12.	Pruning response of different cashew varieties	Hogalagere, Jhargram, Madakkathara, Vengurle and Vridhachalam
Hort. 13	Development of Cashew based cropping system	Bapatla, Bhubaneshwar, Hogalagere, Jagdalpur, Jhargram, Madakkathara, Pilicode, Vengurla and Vridhachalam

TECHNICAL SESSION III: CROP PROTECTION

Chairman: Dr. Venkateshalu B. Dean, College of Horticulture, Kolar
Co-chairman: Dr. T.N. Raviprasad, Principal Scientist &SIC, PC Cell, ICAR-DCR, Puttur
Rapporteurs: Dr. V. S. Desai, Jr. Entomologist,AICRP on Cashew, Vengurla
Dr. G. Sravanthi, Jr. Entomologist, AICRP on Cashew, Bapatla

At the outset Director, DCR Puttur welcomed Chairman, Co-Chairman and Rapporteurs. Six lead presenters presented their centre-wise reports and one presentation on 'Diseases of cashew and their status in India' was given by Dr. Rajashekara H. Scientist, Plant Pathology, DCR, Puttur.

Ent.1. Chemical control of pests complex in cashew

Expt.3. Evaluation of insecticides for the control of tea mosquito bug and other insects

Compiled data of nut yield and % reduction in pest damage over control of all the centres should be compared to derive at valid conclusion.

Ent.1. Expt. 4. Evaluation of botanicals for the control of Tea Mosquito Bug and other insect pests

.

- Madakkathara centre should recheck raw nut yield data and analyse it and should submit it to the PC Cell as yield in botanical treatment T5 was more than standard check.
- Calculate economics and B:C ratio of the experiment and submit it to PC Cell.
- T4 and T5 should be renamed as region specific "First Best" botanical and Region specific "Second Best" botanical.
- Centre-wise data on effect of botanicals should be pooled so as to find best botanical treatment.
- DCR, Puttur will conduct a "Brainstorming session on botanical insecticide evaluation procedure" to finalize time of application based on initial pest symptoms, number and frequency of botanical sprays, effective botanical to be included, residual toxicity of different botanicals, cost of application and availability of botanicals and economics.

Ent. 2: Efficacy of the different treatments as post extraction prophylaxis (PEP) against cashew stem and root borer: Expt. 2. Curative control trial

- Per cent re-infestation of all the centres be compiled to draw a conclusion.
- In economics of the treatments, give cost of insecticide and labour charge
- Residue estimation should be done after imposing treatments.
- Compile the data of physical parameters favouring less reinfestation for last 5 years and these observations may be discontinued.

Ent.3: Influence of biotic and abiotic factors on the incidence of pest complex of Cashew

- The data on incidence of leaf thrips and specimens of leaf thrips should be sent to DCR Puttur by Vridhachalam centre.
- Progressive regression analysis including previous years should be calculated by all the centres.

Ent.4 : Screening of germplasm to locate tolerant / resistant types to major pests of the region

- Data on thrips should be recorded on number basis per panicle or shoot and percent damage.
- Categorization of the germplasms should be done using standard units for individual pests.
- Total number of germplasms screened by the centre should be included in the report.
- First 5 tolerant and last 5 susceptible germplasms should be presented in AGM for each pest.
- Presentation should be self-explanatory and slides should be legible & appealing aesthetically.

Ent.5 : Observations on region-specific pollinators on cashew

- Survey of bee flora in adjoining area of the centre should be done during flowering season of cashew and specimens should be collected and submitted to PC cell.
- The scientific name of stingless be should be modified as *Tetragonula* sp. in all the centres.

General decision:

PC cell, DCR Puttur will provide whole body extract samples of tea mosquito bug (TMB) to all those centres reporting TMB incidence in the forthcoming season; for confirming the attraction of TMB males to determine possibility of any "geotypes".

Presentation on diseases of cashew and their status

Dr. Rajashekara H., Sr. Scientist, Plant Pathology, DCR, Puttur delivered lecture on diseases of cashew. The following decisions were taken.

- A new trial on "Documentation of diseases of cashew in different cashew growing regions of India" is allotted to be initiated at all centres.
- All the centres should collect information in detail on diseases recorded on cashew in their vicinity in the prescribed format.
- PC Cell will provide format for recording relevant information for nursery and field situations.

Programmes allotted to different AICRP Cashew centers for the year – 2025-26

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, 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 Borer		
Expt. 2. Curative trials		Bapatla, Bhubhaneswar, Hogalagere, Jagdalpur, Madakkathara, Vengurla and Vridhachalam.
Ent. 3.	Influence of biotic and abiotic factors on the incidence of pest complex of cashew	Bapatla, Bhubhaneswar, Hogalagere, Jagdalpur, 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, Vengurla and Vridhachalam.
Ent. 5.	New experiment on pollinators on cashew.	Bapatla, Bhubaneswar, Vridhachalam, Madakkathara, Paria, Kanabargi, Hogalagere, Vengurla, Jagdalpur.
Ent. 6.	Documentation of diseases of cashew in different cashew growing regions of India	Bapatla, Bhubhaneswar, Darisai, Goa, Hogalagere, Jagdalpur, Jhargram, Kanabargi, Madakkathara, Paria, Pilicode,Tura, Vengurla and Vridhachalam

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

Chairman : Dr. Femina, Director, DCCD

Co-Chairman : Dr. Umesh, Former Dean, COH, Bangalore

Rapporteurs : Dr. Jalaja S Menon, Horticulturist, OIC., AICRP on Cashew, Madakkathara

Dr. Suvarna Patil, Entomologist, RHREC, Dharwad

Recommendations

- Region wise state specific strategy has to be formulated to enhance the area and production of cashew
- A road map of cashew sector and a status report on cashew need to be prepared by formulating a suitable working committee.
- For the horizontal expansion of the crop, the nurseries have to be supported with scion banks of good performing jumbo varieties and the crop has to be popularised in non-traditional areas.
- Technology dissemination through frontline demonstration with the support of DCCD is to be conducted in a large scale.
- Activities for replanting senile plantations especially in the states of Karnataka, Kerala and parts of Goa have to be initiated with the support of DCCD.
- The cashew processing sector has to be supported by DCCD by supply of advanced machineries for small scale processing.
- Intercropping and mixed cropping in cashew have to be promoted in farmer's field according to the proposal of respective AICRP centres and with the support of DCCD.
- The private nurseries involved in graft production of improved varieties has to be supported by DCCD for licensing the newly released varieties
- Incorporation of more varieties according to the cropping systems in a cashew plantation has to be popularised for assured production.
- The varieties tested across the state should be popularised in area expansion programme.

PLENARY SESSION

Chairman	:	Dr. P.C Tripathi, Prin.Scientist, Hort. Sci. Division, ICAR, New Delhi
Rapporteur	:	Dr. Rajabaskar, Jr.Entomologist, AICRP on cashew, Vridhachalam, Dr. Anasubai S.H, AICRP on cashew, HREC, Kanabargi

The plenary session of the Annual Group Meet-2024 focused on AICRP cashew that commenced with a warm welcome to the distinguished guests : Dr. S.B. Dandin (Former Vice Chancellor, UHS, Bagalkot), Dr. Femina (Director, Directorate of Cashew and Cocoa Development, Kochi, Kerala), Dr. G.S.K. Swamy (Dean, COH, Bengaluru), Dr. PC. Tripathi (PS, ICAR, New Delhi), Dr. K. Umesh (Former Dean, COH, Bengaluru), and Dr. Kulapati Hipparagi (Dean, COH, Alamel).

Dr. S.B. Dandin subsequently called upon the rapporteurs to deliver their overall presentations on AGM 2024, which addressed subjects including Crop Improvement, Crop Management, and Crop Protection.

He highlighted the critical nature of complying with the recommendations established during the Annual Group Meeting (AGM) 2024 at the center level, emphasizing that the Annual Technical Report (ATR) should be concluded with satisfactory outcomes. In relation to the evaluation of soil enzymatic activities and microflora, he remarked that centers without the necessary infrastructure could consider outsourcing. Should budget constraints arise; sending samples to the DCR PC cell for analysis could be a viable alternative.

He emphasized that DCCD ought to be recognized as a invitee member of DCR for important meetings. Furthermore, it is essential to compile a comprehensive list of all subsidy schemes available for cashew development on a single platform. The exploration of chemical-free natural farming practices in cashew cultivation should also be prioritized. Additionally, a strategic roadmap should be developed to enhance cashew production, productivity and quality over the next 10 to 15 years, following the melody-remedy approach.

Dr. Tripathi extended his congratulations to the organizers of AGM-2024 from the AICRP Cashew team for their successful execution of the event and acknowledged the active participation of the scientists. He emphasized the significance of the Annual Technical Report (ATR), highlighting its role as a critical basis for formulating national-level recommendations. It is essential for all participants to diligently attend to their individual experiments.

He recommended following established protocols for the Committee on Variety Release and Certification (CVRC), emphasizing that all varieties should be processed through the PC cell. It is essential to submit the proposal well ahead of time to allow for thorough review. In the context of intercropping studies, he suggested utilizing varieties that have been released by ICAR or State Agricultural Universities (SAUs) that are pertinent to the specific geographical area.

He emphasized the importance of organic or natural farming practices in the cultivation of cashew, highlighting their critical role in the management of perennial crops. He advocated for the adoption of POP to enhance natural farming and encouraged the registration of organic cashew farmers.

Regarding staffing considerations, Dr. Tripathi recommended minimizing the frequent reassignment of personnel by the State Agricultural Universities (SAUs) and discouraged the movement of staff between different crops within the framework of the All-India Coordinated Research Project (AICRP). Additionally, he highlighted the critical need to fill any vacant positions. He proposed the early utilization of funds on a quarterly basis and emphasized the importance of

submitting the Utilization Certificate (UC) in a timely manner to facilitate a greater budget for the upcoming year.

He recommended the creation of a comprehensive and effective Integrated Pest Management (IPM) program to tackle the challenges posed by the TMB insect, which has been identified as a significant issue nationwide. He proposed the engagement of pathologists with expertise in horticultural crops to conduct research pertinent to cashew pathology. Furthermore, he noted a prevailing trend in which minor pests are evolving into significant threats, thereby necessitates the need for careful surveillance of any newly introduced pests that may impact cashew cultivation.

Moreover, he indicated that the difficulties faced by farmers in the post-harvest phase could be effectively tackled by establishing roadmaps in conjunction with developmental organizations. For the licensing of different cashew varieties, he advocated for the possibility of offering subsidies through the institute or the council could be explored.

Subsequently, Dr. J.D. Adiga, DCR, requested that ICAR may expedite the distribution of the 7th pay arrears for scientists of AICRP- Cashew. He noted that proposals regarding label claims for insecticides used in cashew could be submitted to the ICAR committee. Regarding the situation in Bhubaneswar, he highlighted that there is only one scientist currently working at that location and proposed that a request be made to ICAR for the transfer of one or two additional scientists to enhance the research capacity at that center.

Dr. TN Raviprasad, Scientist-in-charge, PC cell, ICAR-DCR, Puttur, presented the vote of thanks, expressing gratitude to all those who have directly or indirectly contributed to the success of the AGM – 2024, marking the conclusion of this meeting.

GLIMPSES OF THE ANNUAL GROUP MEETING
of AICRP on Cashew 2024