काजू समाचार
CASHEW NEWS

भा.कृ.अनु.प. - काजू अनुसंधान निदेशालय, पुत्तूर के अर्धवार्षिक वार्तापत्र

HALF YEARLY NEWSLETTER OF ICAR-DIRECTORATE OF CASHEW RESEARCH, PUTTUR

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FROM THE DIRECTOR'S DESK

Cashew Pest Database: A useful compendium on insect pests of cashew

Cashew is no more a crop limited to coastal areas of our country. It is rapidly spreading across the plains areas of different states having suitable climatic and edaphic conditions. In fact, substantial areas in plains of states like Karnataka, Chhattisgarh, Andhra Pradesh, Maharashtra, Kerala, Jharkhand, Orissa, Tamil Nadu have been planted with cashew. As cashew cultivation gains popularity in newer areas, occurrence of pests and diseases is also likely. However, experience so far has indicated that insect pests are relatively a major problem in reducing cashew yield, compared to diseases. The major pests *viz*., tea mosquito bug (TMB) and cashew stem and root borer (CSRB) are prevalent in almost all cashew growing regions of the country. Though diseases of cashew such as leaf blight, gummosis, flower drying etc., are reported in India, their etiology, seasonality and levels of damage have not been studied in detail. Under the current scenario, it is necessary to have a comprehensive information database on both pests and diseases of cashew.

Further, scientists at this Directorate and Centres on AICRP-Cashew often receive representative photos of symptoms of damage from farmers seeking advice and solutions to those problems. Many farmers may not be able to assess the reason for the same, whether it is due to insects/pathogens or due to nutritional deficiency. Though suitable advice is given to farmers, it is difficult to attend to the huge number of queries due to inadequate manpower at the research institutes. Hence, it is prudent to utilize the advances in information technology to reach out to the queries of stakeholders. Keeping these in view, scientists at the ICAR-Directorate of Cashew Research have developed a comprehensive database on cashew pests and it is available through this link https://cashew.icar.gov.in/pestsite/. It contains detailed information on the major and minor pests of cashew along with a pest calendar. Details on species, occurrence, symptoms of damage, life cycle, management measures etc., are available for a pest along with representative images. Information on new insect pests is regularly updated in the database.

It is fervently hoped that this cashew pest database will be quite useful to progressive farmers, researchers and departmental officials associated with cashew crop.

Azadi Ka Amrit Mahotsav

(RAVIPRASAD, T.N.)
Director (Acting)

FOCUS ON RESEARCH

1. Nethra Jumbo-1 - A new cashew hybrid for higher income

J. Dinakara Adiga, G.S. Mohana, B.M. Muralidhara, Eradasappa, E., Siddanna, S. and Veena, G.L.
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Cashew (*Anacardium occidentale* L.), is one of the important hardy commercial plantation crops which is native to North Eastern Brazil and it was introduced to India by the Portuguese in 16th century to check soil erosion. Its commercial cultivation began in the early 1960s and later the crop improvement work was initiated to develop improved new varieties of cashew to increase the productivity. Among the released varieties, more than 80% are of medium nut (7.0g) to small nut (~5.0 to 6.0g) type with a few exceptions of bold nut types weighing around 8.0 to 9.0 g. The process of harvesting through picking of fallen nuts accounts for a major share of production expenditure to the tune of nearly 40 per cent in cashew cultivation. Developing jumbo nut varieties would significantly reduce the man power requirement for harvesting of nuts apart from fetching premium price from processors as it would lead to production of premium sized kernels with higher market price. The bigger nuts also improve processing efficiency in the factory as it would also save labor in processing apart from getting higher outturn. Hence, the research on this line was initiated at ICAR-Directorate of Cashew Research, Puttur during 1999-2000 as a result of which a new jumbo-nut cashew hybrid Nethra Jumbo-1 (H-126) was identified and released in 2021.

Nethra Jumbo-1 was developed through hybridization by crossing NRCC Sel-2 as the female parent and Bhedasi as the male parent. It was found promising with a special character of jumbo nut (12 g), precocious bearing, cluster bearing habit, higher yield, with more than 29 per cent shelling and the average kernel weight of 3.4 g which fits in to kernel grade of W130. It also saves the labor on harvesting, ensures about 10% higher price for the farmers due to bigger nut size. The added advantage of this hybrid is uniformity in nut size, wherein, more than 90 % of nuts are uniform in size. As this hybrid is an early flowering type, the advantage of higher market price in the beginning of cashew season can be exploited. This hybrid can also escape severe pre-monsoon moisture stress as compared to late varieties.

The special traits of Nethra Jumbo-1 are listed below.

1.	**Plant and leaf characters**	
	Plant height (at 9 years)	5.30 m
	Branching pattern	Extensive
	Canopy	Open, 5.40 m spread
	Leaf size and shape	Large, Obovate
	Young leaf colour	Yellow red
2.	**Flowering and fruiting characters**	
	Number of flowering laterals/m^2 canopy	14
	Panicle shape	Broadly Pyramidal
	Sex ratio (hermaphrodite to male)	High (0.21)
	Season of flowering	December-March
	Duration of peak flowering	64 days
	Season of harvest	January-April
3.	**Nut characters**	
	Nut weight (g)	12.0 g
	Number of nuts Kg-1	80-83 nuts /kg
	CNSL content	18.50%
4.	**Kernel characters**	
	Shelling percentage	29.10
	Whole kernel count lb-1	130 Whole kernels lb $^{-1}$
	Kernel sugars (%)	15.6
	Kernel protein (%)	21
	Total fat (%)	47

5.	**Cashew apple characters**	
	Apple colour	Yellow red
	Apple shape	Conical to Obovate
	Apple weight (g)	104 grams
	Juice content (%)	72
	TSS of juice (°Brix)	13.0

Striking/special features of Nethra Jumbo-1: Jumbo sized nuts with uniform nut size, cluster bearing, W-130 kernels grade, higher market price, 50 % reduction in man power for harvest and easy peeling of testa

2. Incidence of cashew leaf blight disease

H. Rajashekara[1], R.T.P., Pandian[2], S. Siddanna[1] and T.N. Raviprasad[1]
[1]ICAR-Directorate of Cashew Research, Puttur-574202, Karnataka
[2]ICAR-Central Plantation Crop Research Institute, Regional Station, Vittal-574243, Karnataka

Cashew (*Anacardium occidentale*) is an important commercial crop and is prone to many biotic and abiotic stresses. The samples of cashew leaf blight disease were collected from the nurseries of ICAR-Directorate of Cashew Research, Puttur, Karnataka during April 2021. Typical symptoms were observed in the form of minute to irregular necrotic spots at the margins of leaf, leaf midrib and leaf petiole. These spots enlarged, turned silvery-grey in color by covering the major portion of the leaf lamina. Severely affected leaves showed blight appearance and premature defoliation (Fig 1A & B). The mycelial growth on potato dextrose agar media appeared whitish in color. The growth pattern also had crenate margins and smooth margins, while others had smooth margins. Topography of the colonies was predominantly raised and fluffy, and zonation were also observed (Fig 1C). The conidia were fusiform, five-celled, versi colored with three olivaceous brown median cells, two apical and basal hyaline cells. The apical cells had two to three flexuous, unbranched appendages, and basal appendage was solitary, tubular and unbranched (Fig 1D). Morphological and cultural characteristics confirmed the pathogen as *Neopestalotiopsis* sp.

Further, molecular characterization of multi genes *viz*., internal transcribed spacer (ITS), translation elongation factor (TEF), β tubulin and large subunit (LSU) was done to confirm the species identity. The ITS gene sequence was analyzed using nucleotide BLAST in NCBI database and confirmed the species as *Neopestalotiopsis clavispora*. ITS gene sequence was submitted to NCBI with the GenBank accession No. OM679447. A phylogenetic tree was generated from the ITS sequences obtained from NCBI database. Based on cultural, microscopic and molecular characterization the pathogen was confirmed as *N. clavispora* (Fig 2). Apparently, this is the first confirmed report of cashew leaf blight disease (CLB) caused by *N. clavispora* from India.

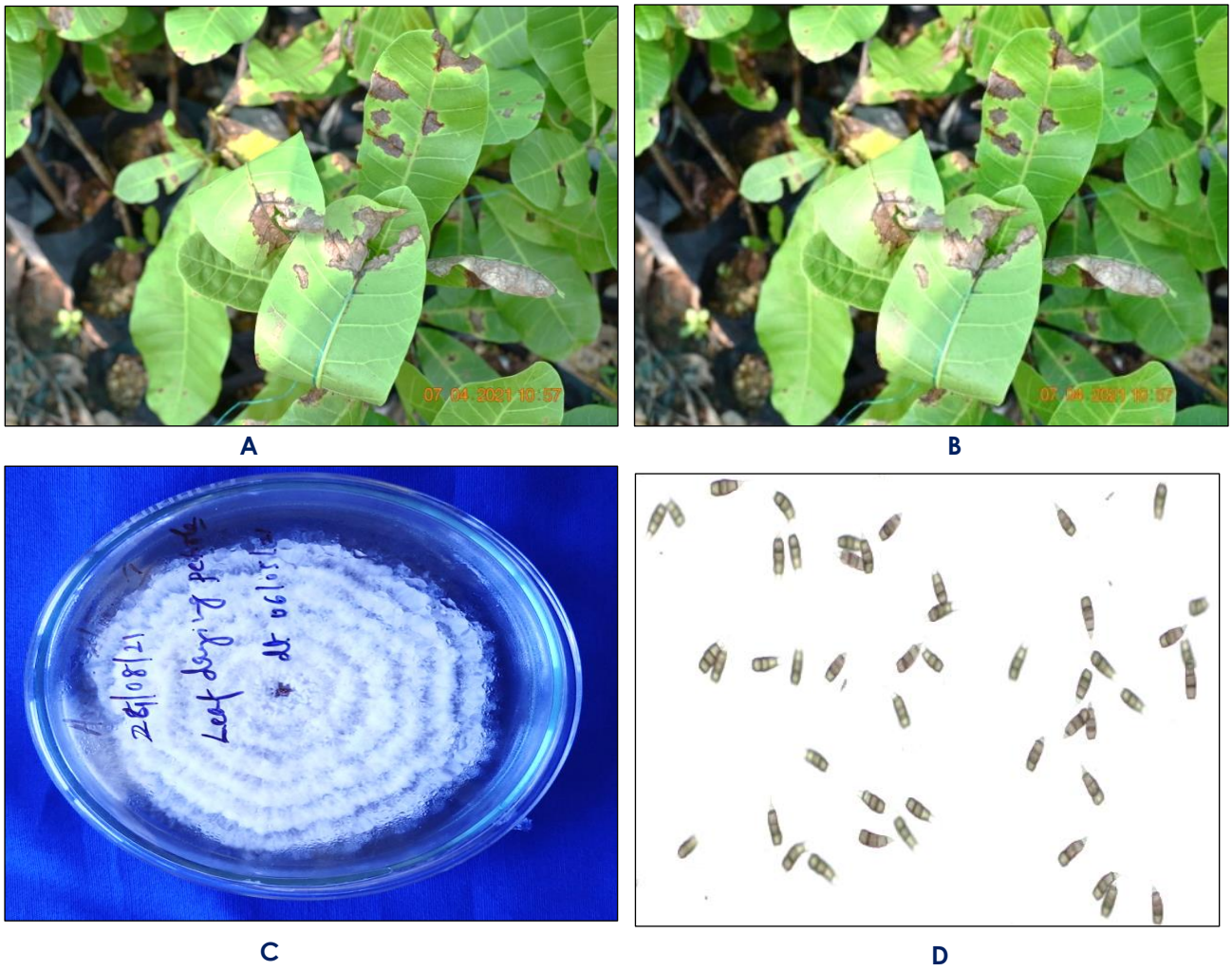


Fig 1. (A) & (B)-Typical symptoms of cashew leaf blight disease, (C) - Pathogen growth on PDA media, (D) - Conidia of pathogen at 20x magnification

Phylogenetic tree was developed using partial ribosomal DNA (*rDNA*)gene sequences showing the phylogenetic relationship of *N. clavispora* isolated from cashew with other *N. clavispora isolates and Alternaria alternata* as out-group retrieved from Gene Bank, using the Maximum-likelihood (ML) method. Relevant bootstrap values (expressed as a percentage of 1000 replicates) are shown at branch points

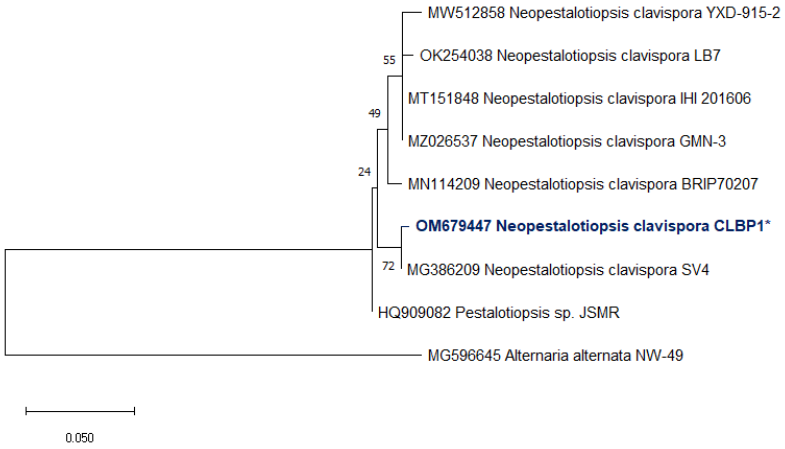


Fig.2 Phylogenetic tree produced using partial ribosomal DNA (*rDNA*)gene sequences showing the phylogenetic relationship of *N. clavispora* isolated from cashew (Bold with asterisk mark)

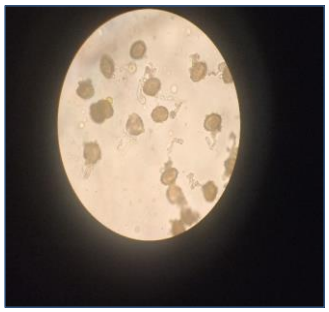
3. Cryopreservation in Cashew

*Veena, G.L., J.D. Adiga, Babli Mog, Eradasappa, E. and Siddanna Savadi
ICAR-Directorate of Cashew Research, Puttur-574202, Karnataka

Plant pollen is an excellent genetic conservation material, which is not easily affected by environmental factors. Therefore, the pollen grains of 30 varieties were collected, dehisced anthers were cryopreserved in liquid nitrogen. This technique ensures safe and long-time efficient conservation of plant parts. At ultra-low temperature (-196^0 C) all the metabolic processes are suspended, thus the plant material can be stored indefinitely without any alteration. As a part of germplasm conservation an *in vitro* conservation technique of cryopreservation was tried.

Anthers kept for dehiscence

Cryopreserved in Liquid Nitrogen cryocan



In vitro germination of cryopreserved pollen

Fruit set using Cryopreserved pollen

MEETINGS CONDUCTED

ITMC Meeting

The 18th Institute Technology Management Committee (ITMC) meeting was held on 6.10.2021 at 2.00 PM at ICAR-DCR, Puttur under the Chairmanship of Dr. Anitha Karun, Director (Acting), ICAR-DCR, Puttur and progress of ITMU activities and licensing of Bhaskara variety were discussed.

Research Advisory Committee (RAC)

The first meeting of 9th RAC was held on 7th and 8th July 2021, in virtual mode. The Chairman, Dr. N.K. Krishna Kumar in his introductory remarks highlighted recent global trends in horticultural research with emphasis on cashew. Dr. P.C. Lenka, member, RAC, expressed the need to improve productivity in cashew on a priority mode. The other members, Dr. N. Basavaraja, Dr. George V. Thomas, Dr. V. Duraisamy and Dr. R. M. Prasad, too opined about the research priorities for cashew in their respective fields of expertise. The farmers' representatives of IMC expressed the difficulties and concerns of cashew farmers in recent years. Action Taken Report on general and project wise recommendations of the previous RAC was presented by Dr. T. N. Raviprasad, Member Secretary. The research programmes being handled by scientists on crop improvement, crop management, crop protection, post-harvest technology and food technology were presented, detailed discussion on each topic was held and recommendations were suggested for implementation.

Institute Research Council (IRC)

The meeting of the 34th Institute Research Committee was held online during 6th to 8th, September 2021 under the Chairpersonship of Dr. Anitha Karun, Director (Acting), ICAR-DCR, Puttur. Scientists of DCR presented their research findings and the results were discussed in detail and technical programme for the ensuing year was finalized.

Dr. Manish Mishra, Principal Scientist (Horticulture), ICAR-CISH, Lucknow and Dr. T.E. Sheeja, Principal Scientist (Biotechnology), ICAR-IISR, Kozhikode served as resource persons for the Crop Improvement division. For the crop management division, Dr. Subramanian P, Principal Scientist (Agronomy), ICAR-CPCRI, Kasaragod & Dr. T. Vidhan Singh, Principal Scientist (Agricultural Engineering), ICAR-IIRR, Hyderabad served as the resource persons. Dr. Chandrika Mohan, Principal Scientist (Agricultural Entomology), ICAR-CPCRI, Regional Station, Kayamkulam & Dr. Vinayaka Hegde, Head, Division of Crop Protection, ICAR-CPCRI, Kasaragod served as resource persons from the crop protection division. Dr. M.R. Manikandan, Principal Scientist (Post Harvest Technology), ICAR-CPCRI, Kasaragod served as resource person for the postharvest technology projects and Dr. C. Thamban, Principal Scientist (Agricultural Extension), ICAR-CPCRI, Kasaragod served as resource person for transfer of technology projects.

Vigilance Awareness Week

ICAR-Directorate of Cashew Research, Puttur celebrated the Vigilance Awareness Week -2021. A week-long programme was conducted by the Directorate from 26th October 2021 to 1st November 2021. During the period, various events were organized at ICAR-DCR, Puttur starting with integrity pledge taken by staff members and general public. Posters on the theme "Public interest disclosure and protection of informer resolution, 2004" were displayed to sensitize the people about the need for adoption of vigilance

हिन्दी गतिविधियां

राजभाषा कार्यान्वयन

इस छः माही में पुत्तूर नगर राजभाषा कार्यान्वयन समिति की अर्ध वार्षिक बैठक और दो तिमाहि बैठकों को आयोजन किया गया। करोना महामारी के कारण अर्ध वार्षिक बैठक और एक तिमाही बैठक कों आन्लाइन् आयोजन किया गया। इन बैठकों में निदेशालय की गतिविधियों के बारे में विस्तृत रूप से चर्चा किया गया। राजभाषा में कार्यालय के कामकाज करने के बारे में जरूरी कदम उठाने के बारे में और कर्मचारियों को हिन्दी ज्ञान दिलाने के लिए आवश्यक कदम उठाने के बारे में योजना बनाई गई। सितंबर महिने में दिनांक 14-28 तक हिन्दी पखवाडा मनाया गया। पखवाडा के अवसर पर विध्यार्थियों और कर्मचारियों के लिए भाषण, निबंद लेखन और सामान्य ज्ञान प्रतियोगिता आयोजन किया गया। हिन्दी में कार्यालयीन काम करने वाले कर्मचारियों को नकद पुरस्कार से सम्मान लिया गया। राजभाषा को बढ़ावा देने के लिए पूरी कोशिश किया गया।

PROGRAMMES ORGANIZED

Poshan Vatika Mahabhiyan

As a part of the campaign on Nutri-Garden and Tree Plantation drive (*Poshan Vatika Mahabhiyan)* organized by Indian Council of Agricultural Research (ICAR), Ministry of Agriculture and Farmers' Welfare, ICAR-DCR organized an awareness campaign on importance of millets on 17th September, 2021. The programme commenced with the introductory remarks by Dr. T N Raviprasad, Principal Scientist (Agricultural Entomology). He gave a brief lecture to the students of Sandeepani school, farmers of Ammunja village and the staff of Directorate on the topic "Millets – Benefits waiting to be exploited". In his speech, he emphasized on the need to include millets in our diet and how its benefits can be exploited for health and nutrition. He concluded his lecture throwing some insights on the traditional millets and the millet-based recipes, attracting the interest of the audience; young and old alike. Following this, Smt. Jayamala N V, Headmistress, Sandeepani School gave her remarks on the importance of millets in addressing lifestyle diseases and how a healthy lifestyle should be followed. The tree plantation drive was flagged off by presenting a cashew graft to the farmer by Smt. Jayamala N V, Chief Guest for the programme.

The programme concluded with tree planting drive conducted in Ammunja village, wherein farmers were given cashew grafts and coconut seedlings and planted in their fields.

Farmer-Scientists interface on Climate resilient varieties, technologies and practices

A farmer-scientists interface was held on 28th September, 2021 to create awareness on climate resilient varieties, technologies and practices. Climate change is adversely affecting agricultural production and productivity. Adoption of climate resilient varieties, technologies and practices is an important means to combat this issue. In this regard, ICAR-Directorate of Cashew Research, Puttur conducted a farmer scientist interface on 28th September, 2021 at 10.30 am as part of the "mass awareness campaign for large scale dissemination of climate resilient technologies and methods" organized by Indian Council of Agricultural Research under *Azadi ka Amrut Mahotsav* initiative.

A live telecast of honorable PM Shri Narendra Modi addressing the farmers through virtual mode was arranged. During the online programme, the honorable PM dedicated 35 crop varieties to the nation, which have been developed by National Agricultural Research System for sustainable agricultural production. He also interacted with 5 progressive farmers across the country to know the problems faced by them in agricultural activities. The new campus of "National Institute of Biotic Stress Management" at Raipur was also virtually inaugurated during this online event and "Clean Green Campus Award" winners among the institutes and universities were also announced. Following this, a brief farmer-scientist interface was arranged with the farmers invited from Puttur. Shri Udayakumar, an enterprising farmer and nominated member of Institute Management Committee of this Directorate, during his interaction emphasized that cashew is also affected by uneven rainfalls as blackening of nuts is becoming a problem in the fields. He stressed that climate resilient varieties need to be developed and such farmer-scientist interface can help in realizing the Prime Minister's dream of an *Atmanirbhar Bharat*.

Farmer-Scientists interface on Natural farming

The Hon'ble Prime Minister, Shri Narendra Modi addressed the nation on the importance of Natural farming during the "Pre-Vibrant Gujarat Summit" held on 16th December 2021. In this regard, a farmer-scientists interface was organized at the Directorate. Around 30 farmers including members of Shri Kshetra Dharmasthala Rural Development Project (SKDRDP) participated in the interface meeting.

Smt. Anitha M, a progressive tribal farmer practicing integrated farming system under the traditional farming system was invited to share her experience. She explained to the audience about the preparation of Jeevamrutha and Beejamrutha. This was followed by a brief interaction between the farmers and scientists discussing the advantages and benefits of adopting Natural farming in field conditions.

After a brief interaction with the farmers by the scientists, the "Pre-Vibrant Gujarat summit" held at Anand, Gujarat was livestreamed at the Directorate. Hon'ble Prime Minister Shri Narendra Modi addressed the farmers on the role of Natural farming in making agriculture more sustainable. In his address, Hon'ble Prime Minister reiterated the role of ICAR and KVKs in lab to land transfer of sustainable, organic friendly technologies and urged the farming community to stop the indiscriminate use of chemical fertilizers. Hon'ble Union Minister of Agriculture and Farmers' Welfare and President, ICAR, Shri Narendra Singh Tomar, Hon'ble Union Home Minister, Shri Amit Shah and Shri Acharya Devvrat, Governor of Gujarat also shared their views on promoting natural farming to protect our nature.

Agriculture Education Day

On the occasion of Agriculture Education Day, on 3rd December, 2021 middle school students of Government School in Mottethadka and students of Narendra Pre University College were invited for an orientation lecture on "Opportunities in Agriculture". Dr. Eradasappa E, Senior Scientist, Genetics and Plant Breeding gave a very informative and detailed talk on the scope of agriculture education, pursuing higher studies and the job opportunities available.

Webinars organized as a part of *Azadi ka Amrut Mahotsav* campaign

As a part of *Azadi ka Amrut Mahotsav* campaign, a flagship programme of Govt. Of India which is celebrated to commemorate 75 years of India's independence, a series of weekly webinars have been initiated by the Directorate since 6th August, 2021. During this period, a total of 19 webinars were organized, the details of which are mentioned below

Sl. No.	Title of webinar/activity	Resource person with contact details	Date	No. of participants
1.	Overview of Global Cashew Scenario and India's Future Forward	Shri Appanna Choneera Poonacha (Ex General Manager-Technical (Plantation and Horticulture), NABARD	06.08.2021	50
2.	Conservation and Utilization of Horticultural Genetic Resources in India	Dr. Rajasekharan P E, Principal Scientist, Division of Flower & Medicinal Crops, IIHR, Bangalore	13.08.2021	51
3.	Agriculture and Nutrition: The Way of Tribal Agriculture	Dr. M Jadegowda, Associate Professor, College of Forestry, Ponnampet, Kodagu	21.08.2021	25
4.	Avocado: A fruit for nutrition security and higher income	Shri Muralidhara B.M, Scientist (Horticulture), ICAR-DCR, Puttur	26.08.2021	51
5.	Prospects of cashew cultivation and its value addition in Kerala	Dr. Jalaja Menon, Asstt. Professor & Head, Cashew Research Station, (KAU) Madakkathara	03.09.2021	48
6.	Cocoponics-A new method of growing vegetables in soilless culture	Dr. D. Kalaivanan, Scientist (Soil Science) of ICAR-IIHR Bangalore	09.09.2021	71
7.	Cashew cultivation prospects in Tamil Nadu	Dr. M. Mohanalakshmi, Assistant Professor (Hort) Vridhachalam AICRP centre	17.09.2021	25
8.	Recent advances in temperate fruit and nut crops for higher productivity and nutritional security	Dr M. K. Verma, Principal Scientist (Hort.- Fruit Science) Division of Fruits & Horticultural Technology ICAR-Indian Agricultural Research Institute, New Delhi, India	24.09.2021	96
9.	Prospects of Cashew Cultivation in West Bengal	Dr. Mini Poduval, OIC, Cashew AICRP Centre, BCKV, Jhargram	01.10.2021	51
10.	Empowering daughters of India in Agriculture	Ms. Suvarna Bhatt, CEO, Bhoomiputri NGO, initiative of Kadamba	14.10.2021	24
11.	Jackfruit and Banana: Potential crops for food and livelihood security	Shri Shreepadre, Editor, Adike Patrike	16.10.2021	92
12.	New trends in coffee processing and innovative coffee products for health and wellness	Dr. Pushpa S Murthy, Principal Scientist, Spice and Flavour Science Department, CSIR-CFTRI, Mysore	22.10.2021	59
13.	Prospects of Cashew Cultivation and processing in Southern Maidan tracts of Karnataka	Dr. Ramachandra R K Head, AICRP on Cashew and HREC, Hogalagare	29.10.2021	21
14.	Interaction with students on "Agriculture and environment for Future Citizens"	Dr. Nagesh Hegde Environmentalist and Visiting Professor to IIJNM, Bangalore	05.11.2021	54
15.	Prospects of Cashew Cultivation in Andhra Pradesh	Dr. K Umamaheswara Rao Senior Scientist (Hort.) Cashew Research Station Dr. Y S R Horticultural University Bapatla, AP	12.11.2021	20
16.	Integration of medicinal and aromatic plants in different	Dr. V Thondaiman	20.11.2021	14

	cropping systems	Scientist (SPM & AP)		
17.	Cashew Cultivation in South East Asian countries: Case study from Vietnam and Cambodia	Varanashi Krishnamoorty, Managing Trustee Varanashi Development and Research Foundation, Adyanadka, Dakshina Kannada	26.11.2021	30
18.	Value addition potential in Cashew	Dr. Rajkumar A Dagadkhair Scientist (Food Science) ICAR-Directorate of Cashew Research, Puttur	10.12.2021	48
19.	Cashew Manufacturing in India: Role of Science and Technology	Sri. Giridhar Prabhu Executive Director Achal Cashew Pvt. Ltd.	18.12.2021	49

TRAININGS CONDUCTED

- Two 5-days "Entrepreneurship-cum-Skill Development Training Programme on Value added products from fruits & Vegetables" was conducted during 20-26 October 2021 and during 25-30 November 2021 funded by RKVY-RAFTAAR. Around 46 rural youths attended the training programme.

- Two days training programme for final year B.Sc., (Horticulture) students

On-farm training programme on Canopy Management in Cashew

A team of scientists from ICAR-DCR, Puttur, comprising Dr. J Dinakara Adiga, Principal Scientist (Horticulture), Shri. Muralidhara B.M, Scientist (Horticulture), Dr. Manjesh G.N, Scientist (SPM and AP) and Dr. Aswathy Chandrakumar, Scientist (Agricultural Extension) visited cashew orchard of Navneeth farm to advice about canopy management practices in cashew as well as other fruit crops. Before the commencement of programme Mr. Venugopal Kedilaya, introduced the concerned scientific staff of DCR to the field workers and urged them to learn the canopy management practices from the experts of DCR.

Dr. J. D. Adiga highlighted about the basic training practices as well as pruning practices to bring young cashew plants to proper shape for better penetration of sunlight and air. Later Shri. Muralidhara B.M. explained about the how to prune the plants right from beginning of the plantation as well as, the time of pruning for various cashew varieties. This was followed by on-farm demonstration of canopy management in young cashew orchards located in the farm

Training Programmes on 'Cashewnut Processing'

- Under ABI, a 3-days Entrepreneurship Development Training Program on 'Cashewnut Processing' was conducted separately for fifteen registered incubates during the period.
- 5-days training program on Cashewnut Processing' conducted for Tribal Women operating cashewnut processing unit, Bastar, Jagadalpur, Chhattisgarh from 4-8th October, 2021

Exposure visits by students to ICAR-DCR, Puttur:

50 students from different universities visited ICAR-DCR as a part of their course work.

Sl. No.	Particulars	Date of visit
1.	18 PG and PhD students from College of Horticulture UHS, Bagalkot visited ICAR-DCR, Puttur as a part of their study tour	03.09.2021
2.	13 Final year B.Sc students from College of Horticulture, Mudigere visited ICAR-DCR, Puttur as a part of their HBI placement training	21.09.2021
3.	9 students from Kittur Rani Channamma College of Horticulture, Arabhavi, under University of Horticultural Sciences, Bagalkot visited ICAR-DCR as a part of tour programme	29.09.2021

Programmes under TSP Scheme

Various household items such as sewing machines and field hand-carts were procured and distributed to beneficiaries from Bettampady, Irde and Nidpally villages. A training programme was also organized for 30 tribal farmers on "Cashew Production Technologies" to give an orientation to the participants regarding production, management and protection of Cashew.

Programmes under SCSP Scheme

To provide self-employment opportunities for Scheduled Tribe beneficiaries, ICAR-DCR supported establishment of 12 model Arecanut plantations, 46 model poultry units, five apiary units and a model earthworm rearing unit

TRANSFER OF TECHNOLOGY

Advisory Visits / Consultancies/ talks delivered

Mohana G. S.	Resource person for Horticulture Based Industrial Training programme for the final year B.Sc. (Hort) students from college of Horticulture, Mudigere. and Delivered a talk on Cashew- A promising crop for the future	16th to 17th April, 2021
	Attended the National Steering Committee Meeting on Cashew at Krishi Bhavan, New Delhi	28th October 2021
	Presented a paper on Cashew Protect an AI based app for identification of pests, diseases and nutrient deficiencies in cashew at 9th Indian Horticulture Science Congress held at Kanpur	18th-21st, November 2021

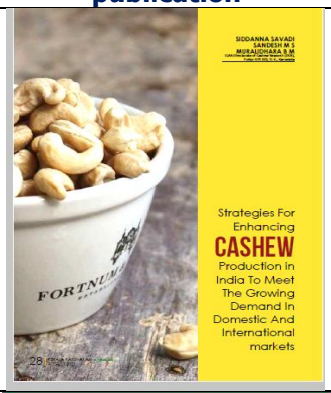
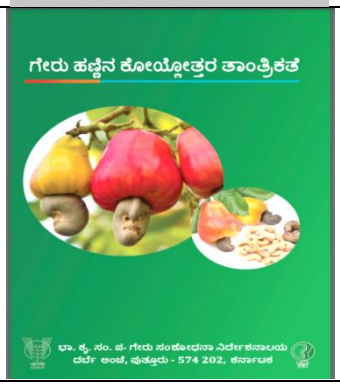
Aswathy Chandrakumar **Manjunath, K** **Thondaiman, V.**	ICAR-DCR, Puttur participated in Krishi Mela, 2021 organized by University of Agricultural Sciences, Bengaluru to impart awareness and knowledge on different aspects of Cashew.	11-14th November 2021
D. Balasubramanian	Provided technical consultancy to M/s Tea Mech Pvt. Ltd., Kolkata to assess continuous convection type drying system for cashew kernels from 27th to 30th October, 2021 (Rs 12000/-). Provided technical consultancy 'Bakawand Cashewnut Processing Unit' located in Jagadalpur, under Chhattisgarh Forest Minor Produce Federation Cooperative Unit (CFMPFCU) from 4th to 8th October, 2021 (Rs 15000/-). Provided technical consultancy to budding Entrepreneur Mr Bidwan Mohapatra, Bhubaneshwar to start cashewnut processing as per directives of DDG (Hort.), ICAR, New Delhi. Utilization of cashew apple and value addition. Presented during webinar organized by Agriculture information, Bangalore on 05.07.2021. Equipment specifications for cashew processing system. Training of Master Trainers, organized by ICAR-CPCRI, Kerala and NEFTEM (Erstwhile IIFPT), Tamil Nadu on 24.07.2021(Online). Over view of Cashew processing and Entrepreneurship Opportunities in Cashew. Entrepreneurship Development Training on Agriculture Food Processing, Packing and Marketing organized by College of Agricultural Engineering and Odisha University of Agricultura and Technology (OUAT), Bhubaneshwar.	27-30th October 2021 4-8th October 2021 5th July 2021 24th July 2021 23rd December, 2021
Aswathy Chandrakumar	Invited as guest speaker to deliver a talk on the topic "sketching the path to JRF/ARS" during the online orientation module for final year B.Sc. RAWE students of College of Agriculture, Vellayani on 24.09.2021.	24th September, 2021
K. Vanitha	Delivered a lecture on 'Advances in cashew pest Management and role of pollinators in cashew' in the 'Azadi ka Amrit Mahotsav' lecture series, through online mode which was organized by S.G College of Agriculture and Research Station, IGKVV, Bastar and AICRP on C, Jagdalpur.	30th September, 2021

E-extension in cashew

E-extension has been strengthened in cashew through social media. The cashew India app has 1,000 plus installs with 3,058 users at present. A total of 130 farmers have booked the cashew grafts through Cashew India App and 92 feedbacks have been received. The ICAR-DCR Facebook page has been regularly updated and uploaded with relevant content. Hitherto, a total of over 300 posts have been posted on Facebook page and 58 tweets have been received in Twitter account.

Till date, 1,09,094 visitors have visited ICAR-DCR website. The top 10 countries visiting the website are India, USA, Russian Federation, Germany, Nigeria, UK, Singapore, Slovakia, Vietnam, Philippines.

Technical bulletins/Extension Folders

Sl. No	Title	Glimpse of the publication
1	Savadi, S; Sandesh M. S; Muralidhara, BM. (2021). Strategies for enhancing cashew production in India to meet the growing demand in domestic and international markets. Kerala Karshakan (e-Magazine 9: 28-31	
2.	Muralidhara, B.M., Sandesh, M.S., Siddanna Savadi, Preethi, P., Veena, G.L., Manjunath, K., Rajkumar, A.D., Mangalassery, S. 2021. Geru Hannina Koylottara Tantrikathe – Sankalana Varadi. Technical Bulletin No. 35, ICAR-Directorate of Cashew Research, Puttur, Karnataka, India, P. 32.	

Exhibition-National Horticulture Fair (NHF) - 2021

ICAR-DCR, Puttur had participated in 'National Horticulture Fair-2021' conducted at ICAR-IIHR, Bengaluru during 08- 12th February, 2021 to showcase the technologies, achievements and activities of ICAR-DCR, Puttur. Dr. Manjunath, K, Dr. Thondaiman V., Dr. Muralidhara B.M., Dr. Manjesh V. and Mr. Vijay Aachari attended the NHF and interacted with the farmers, researchers, entrepreneurs and public and given inputs on cashew cultivation and processing technologies for their requirements and relevant pamphlets and leaflets were distributed to them. More than 1,500 people visited the stall.

Radio/TV talks/Interview

Mohana G. S.	Gave an interview on 'Cashew Production Technology' to Shramajeevi TV	24 May 2021

PATENT/ COMMERCIALIZATION OF ICAR-DCR TECHNOLOGIES

An Indian patent has been awarded by Regional Patent Office, Chennai for the technology 'Rotating drum roasting machine for raw cashewnut (IP: 359214) developed by Dr. D. Balasubramanian, ICAR-DCR, Puttur and Dr. S. D. Deshpande (ICAR-CIAE), Bhopal.

SUPPLY OF PLANTING MATERIAL

The grafts of recommended high yielding cashew varieties are regularly produced at ICAR-DCR, Puttur under institute revenue generation programme. A total of 56,877 grafts were supplied to the farmers and developmental agencies from this Directorate during January-June, 2021.

STAFF NEWS

Recognitions/Awards

Dr. Shamsudheen, M.

- First position for the Poster presentation on "Soil and water conservation practices for improving sustainability in cashew plantations" presented during the online International Conference on Soil and Water Resources Management (ICSWRM2021) during 26-27 February 2021 organised by College of Technology & Engineering, MPUAT, Udaipur, Rajasthan

Dr. K. Vanitha

- Bagged 'Best Oral Presentation Award' for the research paper "Nesting behaviour of three species of *Ceratina* pollinating cashew" during the National Web-symposium on Recent Advances in Beneficial Insects and Natural Resins & Gums held at ICAR-IINRG, Ranchi during February 25-26, 2021

Dr. Siddanna Savadi

- Recognized as the Research guide for supervising the research work leading to Ph.D. degree in the field of Biosciences by the Department of Biosciences, Mangalore University from 21.09.2022

Dr. Babli Mog

- Best Oral Presentation award in the International Web-seminar on Future of Food Agriculture: Trends and Challenges, VAKSANA organised by Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore, Madhya Pradesh during 20-21 September, 2021
- Young Achiever Award-2021 by SADHNA (SADHNA (Society for Advancement of Human and Nature)
- Dr YS Parmar University of Horticulture and Forestry Nauni, Solan 173 230 Himachal Pradesh, India).

Transferred

Sri Muralidhara B.M. Scientist (Fruit Science) was relieved from this Directorate consequent on his Inter Institutional transfer to at ICAR-CHES, Chettalli on 07-10-2021

Superannuation

Dr. M. Gangadhara Nayak, Principal Scientist (Hort.) superannuated on 31.07.2021

Promotion

- Sri. Umashankar UDC was promoted to Assistant w.e.f. 13.08.2021.
- Smt. M. Rathna Ranjini, AAO was promoted as AO w.e.f. 05.11.2021
- Sri R. Muthuraju Sr. Technical Officer was promoted as Asst. Chief Technical Officer w.e.f. 14.11.2019

INFORMATION ON AICRP - CASHEW

Meetings conducted

Organized first meeting of crop specific technical sub-committee for standardization of term sheets, weather triggers and risk period for cashew crop and was held on 25th June, 2021 under the Chairmanship of Dr. B. R. Salvi, Head and Associate Dean, COH, Dapoli in the office hall of Director of Research, DBSKKV, Dapoli through online (Virtual mode).

Progress of TSP / SCSP/ NEH / MGMG

AICRP on Cashew centre	Area expansion achieved (ha)	Trainings conducted (Nos)	Supply of inputs
Jhargram	2 ha	1	--
Paria	-	-	Distribution of Tomato (Arka Samrat) and Chilli (Arka Kayati) seeds
Bapatla	-	1	Neem cake, Neem oil, vegetable seeds (Bhendi, French bean, Dolichous bean, Water melon and Amaranthus), Sprayers, secateurs
Bhubaneswar	4 ha	-	

Tribal sub plan programme- Training (Vridhachalam Centre)

SCSP Programme (Vengurla centre)

Trainings/ Seminars/ Fairs organized or participated (January-June 2021)

AICRP (C) centre	No of trainings / Seminars/ Fairs conducted or organized on cashew related aspects	No of participants	Location
Jhargram	• Cashew Cultivation Aspects • Propagation, cultivation and protection of cashew on 27.01.2022 • scope of entrepreneur development with horticultural crops	60 50 20	Oro village of Jamboni block Manikpara, Jhargram. (Online)
Madakkathra	• Experience sharing session- to promote cashew cultivation and to motivate new entrants • Scope for value added products from cashew apple in collaboration with farm information bureau	230 32	CRS, Madakkathara & KSACC (Online)

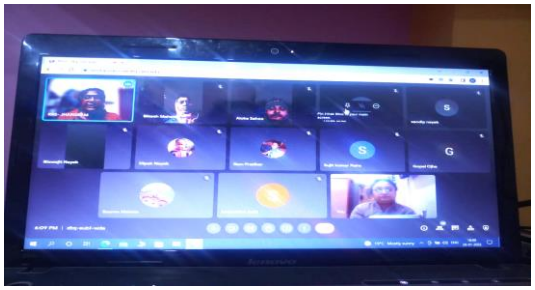
	• Pre flowering management of cashew – farmers of Malappuram		
Paria	• Scientific Cultivation of Cashew • Scientific Cultivation of Cashew • Scientific Cultivation of Cashew • Scientific Cultivation of Cashew	20 15 12 32	Mohangam, Ta:Umergam, Dist:Valsad Amboli, Dist:Surat AES, Paria, Ta:Pardi, Dist:Valsad
Bapatla	• Organized the District level seminar on "Advances in cashew production technology"	150	Kamayyakunta, West Godavari.

Farmers training programme on 'Cashew Plant Protection' held on 24th December, 2021 at Pal, Vengurla)

Farmers training programme on 'Cashew Plant Protection' held on 28th December, 2021 at Rewandi, Tal. Malvan

SCSP Farmers training on Scientific Cultivation of Cashew on 25th October,2021at Mohangam, Gujarat at Pal, Vengurla)

SCSP Farmers training on Scientific Cultivation of Cashew on 25th October,2021at Amboli, Dist:Surat at Rewandi, Tal. Malvan



Online training for 20 farmers was given on scope of entrepreneur development with horticultural crops.

Transfer of technology (FLD, E-Extension etc.)

Jhargram: 20 farmers were trained on Cashew nursery management on 02.02.2022 at RRS, BCKV, Jhargram

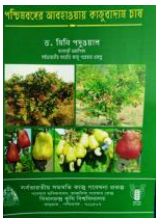
Bapatla: Dr. K. Umamaheswara Rao, Senior Scientist (Hort.) attended as a resource person on cashew rejuvenation, brought the Crossandra seedlings of Arka Chenna variety from the distributed the Crossandra seedlings of Arka Chenna, brought from ICAR- IIHR, Bengaluru to the identified farmers at Bethapudi and Kavurivaripalem of Bapatla Mandal on 13.08.2021

Advisory visits /Consultancy

Advisory visits were made or consultancies were provided by the scientists of AICRP Centres on cashew cultivation (Vengurla), orchard establishment (Jhargram), aftercare of Tauktae cyclone (Paria), orchard establishment (Bapatla), for hard rock Cashew plantation (Vengurla) and forest plantations of cashew (Vridhachalam).

Scientists of AICRP-Cashew, RFRS, Vengurla centre visited to farmer field of Dr. Vivek Raikar, Poip, Tal. Malvan due to cashew tree infested with yellowing of leaf and twig drying disease and also the low yield and suggested proper remedies to the farmer for recovery of the cashew grafts on 22.10.2021.

Research and extension literature



Jhargram

- Cashew cultivation under West Bengal Climate" (in Bengali)

Bhubaneswar:

- Pattnaik, Rakesh Kumar, Panda,Pramod Kumar and Nayak,Sushrita.2021. Influence of organic manure and biofertilizers on quatitative and qualitative traits of cashew cv.BPP-8 in Odisha condition. *Chemical Enginering*, 2(4):37-41.
- Panda, P.K., Patnaik, R. K. and Sethi, K. 2021. Effect of different organic sources of nutrients on yield and quality of cashew (*Anacardium occidentale* L.) cv.BPP-8. In: *9th Indian Horticulture Congress-2021 November18-21, 2021* at CS Azad University of Agriculture anTechnology, Kanpur, Uttar Pradesh Pp.244
- Panda P.K. and Sethi K..2021. Adhika Amala Pain Manjijata Kajubadam Bagichara Parichalana. Chasirara Sansara, 56(2-3):31-33.

Madakkathara

- Dr.Jalaja S. Menon., 2021 -K*asumavu alasakrishiyil ninnum aadayathilek* - Krishi jagaran (Malayalam) Vol-05 (August 2021)
- Dr. Smitha M.S.,2021-*Kasumavile pradhana keedangalum niyanthrana margangalum*- Krishi jagaran (Malayalam) Vol-05 (August 2021)
- Dr. Asna A C-2021- *Kasumavile inaperuma*- Krishi jagaran (Malayalam) Vol-05 (August 2021) Asna A.C,
- Jalaja S. Menon, Smitha M S,2021 Phenotypic diversity and clustering of germplasm accessions of cashew for utilization and conservation12(4):1218-1226-Electronic journal of plant breeding.

Vengurla

- Garande, S T., Gajbhiye, R.C. Khandekar R.G. and Mane, A.V. 2001. Effect of application of organic nutrients on survival and sprouting of black pepper cutting (*Piper nigrum* L.). *The Pharma Innovation Journal,* 2277-7695.
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- R.C. Gajbhiye, L. S. Khapare, M. B. Kadam, S. V. Deshmukh, S. N. Pawar, B .N. Sawant, S. P. Salvi and P. M. Talha. 2001. Standardizing the preparation of carbonated beverage from cashew apple (Anacardium occidentale) syrup. *Crop Research.* 2454-1761
- Gajbhiye, R.C., Pawar, S.N. and Sawant, B.N. 2001. Enhancement of cashew yield through foliar feeding of nutrients. *Journal of Eco-friendly Agriculture* 2582-2683.

Paria

- Folder published on 'Scientific cultivation of Cashew' in Gujrathi with University publication number (61/2021-22)
- Folder published on 'Scientific cultivation of Tomato' in Gujrathi with University publication number (62/2021-22)
- Folder published on 'Scientific cultivation of Chilli' in Gujrathi with university publication number (63/2021-22)
- Calendar published on 'Month wise work in Cashew' in Gujrathi with university publication number (64/2021-22)

TV / Radio talks

Scientist	AICRP Centre	TV/Radio talks	Date
Dr. K. Umamaheswara Rao	Bapatla	'Jeedimamidilo samagra yajamanyam" on 01.12.2021 at Akasavani Kendra, Vijayawada.	01/12/2021
Dr. B. Nagendra Reddy	Bapatla	"Jeedimaamidi Sagulo Cheedapeedala Yajamyam" at Integrated Call Centre, Gannavaram for dissemination of new technologies to the farmers through RBK channel	20.12.2021
Dr. P Dr. P.K. Panda.K. Panda	Bhubaneswar	"*Kaju Badam Chasa*" in Kisanvani programme of **All India Radio, Puri** on 19.07.2021	19/07/2021

Supply of cashew grafts

Cashew grafts of regional importance are regularly multiplied by different AICRP Centres on cashew. The total number of cashew grafts supplied are detailed below,

AICRP C	No. of grafts	AICRP C	No. of grafts
Bhubaneswar	10164	Madakkathara	94020
Bapatla	25,000	Vengurla	196178

Awards and Recognition

- **Dr P. K. Panda,** Horticulturist has been nominated as Director to the Board of Directors of Odisha State Cashew Development Corporation Ltd., Bhubaneswar

- **Dr. Jalaja S Menon**, Principal investigator has been granted CAS Promotion from Assistant Professor (stage2) to Assistant Professor (stage 3) in the pay scale under UGC scheme with effect from 09/10/2018.

Transfer/Superannuation/ Joining

- **Dr.Smitha M.S**, Assistant Professor, Cashew Research Station, Madakkathara has relieved from her duties at this station with effect from 17/08/2021 AN.
- **Smt. Nasiya Beegum A.N** is admitted to duty as Assistant Professor in the discipline of Agrl. Entomology with effect from the F.N. of 01/09/2021.
- **Shri. J.D. Wagh** joined as Agriculture Assistant in AICRP- Cashew, RFRS, Vengurla centre on 01.07.2021.

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