



# 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

### The Need for Farmer Association and FPOs in Cashew



Cashew as a plantation crop has come off age. Driven by continuous increase in market price in recent years, farmers have found a new interest in cashew cultivation. Several advantages of cashew viz., its ability to grow in marginal lands, nutritional richness, presence of cashew nut shell liquid, very less irrigation requirement, least wild animal menace, comparatively short span of harvest period, less labour intensiveness, leverage for farmers to keep the produce at least for six months after harvest, climate smartness and longer economic period have made the cashew, the choice crop among farmers of the country.

ICAR - Directorate of Cashew Research and its centres of All India Coordinated Research Project on Cashew in the country have developed region specific modern varieties/hybrids and technologies for increased production and productivity in

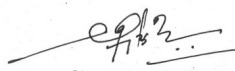
cashew. The Directorate of Cashew and Cocoa Development, Kochi and Cashew Export Promotion Council of India, Kollam in Kerala are involved in rigorous development and export promotional activities respectively. Probably, no other crop in the country has the support of three exclusive institutes i.e. research, development and export promotion as cashew positions itself in India. There is a great opportunity opening up for cashew in India in recent times and these institutes will act as backbone for progress of cashew sector in the country. Along with these, the extension machinery for cashew production assumes a greater significance. While state agencies and line departments are doing considerable efforts throughout the country, further strengthening of the system is needed in taking the technologies to farmers.

In order to offset price fluctuations and to reduce the effect of middlemen in marketing, the farmers growing plantation crops such as areca nut, coffee, tea, rubber etc. have long back formed national level or regional level farmer associations. A successful model 'CAMPCO', a cooperative of Karnataka and Kerala farmers has already demonstrated its efficiency in processing and marketing of areca nut and cocoa. However, so far, such a grower organisation for cashew is not formed and hence,



the Directorate is promoting the formation of a national level cashew farmer association. This is expected to bring about much needed cohesion among cashew farmers of the country to protect their interests at various levels such as research, development, extension, processing and marketing. Further, in the recent years, to gain more for their pains, farmers in different regions of the country have formed more than 800 Farmer Producer Organisations (FPOs) with the help of different state and central government organisations.

In Karnataka alone, more than 115 FPOs are operating for various crops. Many FPOs are formed based on horticultural crops in the country and cashew can definitely find place in the list of crops included because of minimal processing requirements. If such FPOs can be linked with value chain of cashew taking technical support from this Directorate, development support from Directorate of Cashew and Cooca Development, Kochi, and processing and marketing support from NHB and APEDA can bring the expected benefit to farmers. In this direction, ICAR- Directorate of Cashew Research, Puttur is extending all technical help to form farmer groups in cashew. It is hoped that cashew sector in India will get a major boost with these farmer oriented initiatives.

  
**(M.G. NAYAK)**  
**Director (Acting)**

## FOCUS ON RESEARCH

### Identification and codification of phenological growth stages of the cashew tree (*Anacardium occidentale* L.) according to the extended BBCH scale

**J. Dinakara Adiga, Muralidhara. B. M., Preethi. P. and Siddanna Savadi**

Phenology is the study of seasonal timing of recurring events in the annual growth cycle. A generic scale such as the Biologische Bundesantalt, Bundessortenamt and Chemische Industrie (BBCH) scale provides the description of developmentally similar growth stages of different crops and within it, more specific scales for individual species may be developed. Identifying and describing the distinct phenological stages of a crop species is necessary for scheduling of cultural practices, germplasm characterization, crop improvement programmes, and for studying effect of climate change on crop production. Further, it would be useful for sampling the defined developmental stages in biological experiments

to draw appropriate conclusions. Recently, at ICAR-DCR, Puttur, different phenological growth stages were identified in cashew and the detailed descriptions and codes are proposed for the identified growth stages using a modified three-digit scale of BBCH. Phenological growth stages were recorded from 10-year-old trees of two cashew cultivars viz. Ullal-3 and Bhaskara during 2017-18. Data on various phenological stages were recorded from 200 tagged shoots covering four quarters of the canopy in five trees from each variety. The observations were recorded twice or once in a week based on growth rate during each phenological stage. In cashew, eight principal growth stages viz. bud, leaf and shoot

development, inflorescence emergence, flowering, nut and apple development, nut and apple maturity and senescence and forty-one secondary growth

stages were identified and described within the eight principal growth stages. The phenological growth stages identified in cashew are as follows (Table 1, Fig. 1).

**Table 1 Different phenological growth stages identified in cashew and their codification according to the modified BBCH scale**

Principal stage code	Principal stage	Secondary stage code	Secondary stages
0	Vegetative bud development stage	010 011 013 017 019	Dormant stage Beginning of bud swelling End of bud swelling Beginning of bud break End of bud break
1	Leaf development stage	110 111 115 117 119	Separation of leaf scales First pair of leaves separated More leaves separated More leaves unfolded All leaves unfolded
3	Shoot development stage	311 313 315 317 319	Beginning of shoot growth Shoots at 30% maturity Shoots at 50% maturity Shoots at 70% maturity Shoots at 90% maturity
5	Inflorescence development stage	511 514 515 516 517 519	Beginning of reproductive bud swelling Elongation of panicle More laterals separated Separation of sub laterals More sub laterals separated End of panicle development
6	Flowering stage	610 611 613 615 617 619	First flower opened Beginning of flowering Early flowering 50% flowering 70% flowering End of flowering
7	Nut and apple development stages	711 713 715 717 719	Nut at 10% of final size Nut at 30% of final size Nut at 50% of final size Nut at 70% of final size Nut at 90% of final size
8	Nut and apple maturity stages	811 813 815 817 819	Physiological nut maturity Beginning of nut maturity Advanced nut maturity Post advanced nut maturity Horticultural maturity

9	Senescence stage	911 912 913	Detachment of first apple from panicle Detachment of all apples in the panicle Complete drying of harvested panicle
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010                      011                      013                      017                      019

0: Vegetative bud development stages



110                      111                      115                      117                      119

1: Leaf development stages



311                      313                      315                      317                      319

3: Shoot development stages



511                      514                      515                      516                      517                      519

5: Inflorescence development stages



610                      611                      613                      615                      617                      619

6: Flowering stages



711                      713                      715                      717                      719                      811                      813                      815                      817                      819

7: Nut and apple development stages

8: Nut and apple maturity stages

**Fig. 1. Different phenological growth stages identified in Cashew**

Being an economically and nutritionally important nut crop, cashew is gaining popularity across the world. Understanding the phenological stages and assigning specific codes will help in adopting timely crop management practices suitable to various production systems such as high density planting, rainfed agriculture etc. in different parts

of the world. Also, it allows exchange of scientific information obtained from experiments in different environmental conditions by cashew researchers. Therefore, the proposed scale and descriptions of phenological stages will have broader implications for cashew improvement and management.

## PROGRAMMES ORGANIZED

### Swachhata Hi Seva and Celebration of 150<sup>th</sup> Birth Anniversary of Mahatma Gandhiji

Swachhata Hi Seva (Cleanliness is Service), a campaign started as part of Swachh Bharat campaign of Government of India was carried out at ICAR-DCR, Puttur between 14<sup>th</sup> September and 2<sup>nd</sup> October 2018. As part of Swachhata Hi Seva, various activities like cleanliness shramadan, planting of trees and awareness programmes like folk song competitions were conducted at ICAR-DCR, Puttur. A grand function for celebration of 150<sup>th</sup> birth anniversary of Mahatma Gandhiji and valedictory function of Swachhata Hi Seva -2018 was organized at ICAR-DCR, Puttur. The function started with prayer and ICAR song followed by



welcome speech, presidential speech and lecture on “Gandhian values and cleanliness” by chief guest, Prof. Dattatreya Rao, Head of the Department of Sociology, St. Phelomena College, Puttur. Prof.

Dattatreya Rao spoke at length about values, thoughts, dreams and way of living of Mahatma Gandhi. He stressed on values of Mahatma Gandhi such as simplicity, practice and preach and his powerful tools of truth and non violence. He talked how Gandhian thoughts and weapons of fight against injustice and colonialism influenced other reformers and freedom fighters across the world. The lecture was followed by felicitation of housekeeping workers of ICAR-DCR, Puttur by chief guest and Acting Director. A powerpoint presentation on Swachhata Pakwada Shramadan & other activities was screened. Another presentation on Gandhian thoughts was presented by Dr. Mohana G.S. (Senior Scientist) ICAR-DCR, Puttur. It was followed by distribution of



prizes to the winners of different competitions held as a part of Swachhata Hi Sewa - 2018. A speciality of this programme was that after each important activity a patriotic / folk / classical song were sung by staff and students. Towards end of the function an elderly guest from Haveri district spoke about the greatness of Mahatma Gandhi and he appreciated grand function organized to pay tributes to Mahatma Gandhi on his 150<sup>th</sup> birth anniversary. In the end cultural programmes were held in which staff, students and guest took part enthusiastically and the programme was attended by 40 people.

### Vigilance Awareness Week

Vigilance Awareness Week was observed at ICAR - Directorate of Cashew Research, Puttur between 29<sup>th</sup> October and 3<sup>rd</sup> November 2018. The Vigilance Awareness Week was started with a pledge administered as per the directives of CVC and ICAR (HQ), New Delhi and was ended after a week. The valedictory function was organised at the Directorate in association with Taluk and District Legal Service Committee, Dakshina Kannada district and the Bar Association, Puttur. Shri Manjunath, Principal Senior Civil judge

and Additional Chief Judicial Magistrate, Puttur, Dakshina Kannada was the Chief Guest of the function. The function was formally inaugurated by the chief guest and other dignitaries on the dias with lighting of the lamp. In his inaugural address, the chief guest narrated the corruption status during pre and post independence India. He stressed the need for everyone to join hands to eradicate corruption. The Honorary Guest of the programme Mr. A. Uday Shankara Shetty, Advocate and member, District Legal Services Authority, Mangalore spoke about civic duty in the eradication of corruption. Shri. K Bhaskar Kodimbala, President, Bar Association, Puttur expressed his concern over the corruption in the country and its removal. Mr. P. Prashanth Rai, was the resource person to speak on “Eradication of Corruption in India - Build India”. In his elaborated speech, he highlighted the historical aspects of corruption in India and also in various countries. He delineated the steps for eradication of corruption. Further, he highlighted the points for building new India without corruption. He said common people should be aware of corruption and have to put concerted efforts to remove corruption from the society. The Acting Director of ICAR - DCR, Puttur Dr. M. G. Nayak, presided over the function and expressed his opinion about corruption free India. The staff of the Directorate, local school students and teachers, members of parent and teachers’ association and local representatives participated in the meeting. The legal advisory committee along with the honourable judge answered the queries of the participants on corruption free India.



## World Soil Day

World Soil Day was celebrated on 5<sup>th</sup> December 2018 at Bharatiya Kisan Sangha Hall, Kundapura, Udupi, Karnataka. The programme was attended by 76 participants including farmers from various villages in the Udupi district of Karnataka. Welcoming the gathering Mrs. Vidyasree, ICAR-DCR, Puttur briefed about World Soil Day programme and soil health card scheme. Dr. Shamsudheen Mangalassery (Senior Scientist –



Soil Science) briefed about the soil health card programme of Govt. of India and he emphasized on the judicious application of nutrients including micronutrients based on soil test report. He also briefed about the project on Farmer participatory soil and plant health management being undertaken by ICAR - Directorate of Cashew Research, Puttur with funding support from Rashtriya Krishi Vikas Yojana, Govt of Karnataka. One of the components of the project is to demonstrate the good agricultural practices in farmers' field in three districts namely, Uttara Kannada, Udupi and Dakshina Kannada. Chief Guest, Mr. Satyanarayana Udupa, District Secretary, Bharatiya Kisan Sangha, emphasized on the importance of cashew as a climate resilient crop for dry areas. Mr. Venkateswara, President,

Coconut Producers Federation indicated the need for farmers organization for effective marketing and processing of products. Mr. Sitaram, Taluk Secretary, Bharatiya Kisan Sangha told that the farmers should take advantage of soil health card scheme and other schemes of state and central governments and should be proactive. Mr. Ramachandra Aley, Vice President, Bharatiya Kisan Sangha also felicitated during the occasion. The progressive cashew farmer, Mr. Chandra Shekhar Udupa explained about his farming practices and how cashew can be made a profitable enterprise by adopting modern technologies. Later soil health cards were distributed to farmers. The use of soil health cards were also explained to the farmers. A formal vote of thanks was given by Mr. Nirupadi, Young Professional, ICAR-DCR, Puttur.

## Annual Group Meeting (AGM) of AICRP on Cashew - 2018

The Annual Group Meeting (AGM) of Scientists of AICRP on Cashew was organized at the Orissa University of Agriculture and Technology (OUAT), Bhubaneswar during 6<sup>th</sup> December to 8<sup>th</sup> December 2018. Professor S. Pashupalak, Hon'ble Vice- Chancellor, OUAT, Bhubaneswar and Dr. W.S. Dhillon, ADG (Hort.), ICAR inaugurated the AGM. More than 75 delegates from Coordinating Centres of Cashew, Invitees, OUAT Staff, and press and media persons had participated in the meeting. The welcome address was delivered by Dr. L.M. Garnayak, Dean of Research, OUAT. The Project Coordinator's report was presented by Dr. M.G. Nayak, Director (Acting) wherein he highlighted the activities

taken up by 14 AICRP Cashew Centers. He said that the centers are maintaining 1726 accessions and 43 high yielding varieties have been released for commercial cultivation. Around 3.95 lakh cashew grafts were produced and supplied to farmers during 2017-18. He emphasized the importance of high density planting, canopy management for harvesting solar energy, promotion of intercrops in new plantations and management of CSRB. He informed that AICRP centers are also playing major role in transfer of technologies for cashew cultivation and more than 43 trainings were conducted on different aspects of cashew cultivation. The centres have also taken up 13 training and 8 awareness camps in addition to frontline demonstrations in 46 ha area under Tribal Sub Plan Project.



The Presidential address was delivered by Prof. S. Pashupalak wherein he mentioned that cashew is a prominent cash crop and focused on public-private partnership for market intervention. He mentioned that the cashew nut quality in Odisha is on par with national level. However, farmers are not getting good price. He also stated that low yield in Odisha is due to lack of nutrition, old and senile orchard and lack of pruning practices. He also focused

on development of varieties with tolerance to pests, suitable for high density planting and with good processing qualities. The Chief Guest address was delivered by Dr. W.S. Dhillon, ADG (Horticulture), ICAR wherein he mentioned that out of the total export of horticultural crops, one third is contributed by cashew. He also suggested five pronged approach for increasing productivity under cashew. On this occasion, three folders in Gujarati language were released by Agricultural Experimental Station (AES), Paria, one folder in Malayalam language by Cashew Research Station (CRS), Madakkathara and three publications by CRS, Bhubaneswar and Status on cashew by DCR, Puttur. A website of AICRP-Cashew (<https://cashew.icar.gov.in/aicrpc>) was also launched during this occasion and this is designed by Mr. K. Muthuraju and Dr. G.S. Mohana at ICAR-DCR, Puttur. Later, the technical session on ‘Crop Improvement’ was held in the afternoon. The discussions on ‘Crop Management and Crop Protection’ were held on 7<sup>th</sup> December 2018. An ‘Interface of farmers, scientists, processors and officials from development departments’ was also held on 8<sup>th</sup> December 2018 in which more than 100 farmers, officers from the Horticulture Department of Odisha State and officials of Cashew Development Corporation, Odisha State Agency for Cashew Cultivation besides the Scientists of AICRP-Cashew participated. The session was chaired by Dr. Venkatesh N. Hubballi, Director, DCCD, Kochi. The problems and suggestions of farmers regarding cashew was also discussed at length and the AGM was concluded with the plenary session.



## MEETINGS

### राजभाषा हिन्दी कार्यान्वयन

इस छ: माही में काजू अनुसंधान निदेशालय में हिन्दी कार्यान्वयन समिति की दो बैठकों को आयोजन किया गया। बैठकों में कार्यालय में हो रही हिन्दी गतिविधियों के बारे में विचार-विमर्श कर आवश्यक सूचना समिति की सदस्यों को दी गई। वार्षिक



कार्यक्रम के अनुसार आवश्यक लक्ष्य प्राप्ति के लिए जरूरी कदम उठाने के बारे में चर्चा की गयी। जुलाई महीने में पुत्तूर नगर राजभाषा कार्यान्वयन समिति की 34वीं अर्ध वार्षिक बैठक का आयोजन किया गया, जिस में पुत्तूर में स्थित विभिन्न सदस्य कार्यालयों के प्रधान उपस्थित थे। उसी दिन सुबह से दोपहर तक सदस्यों के लिए हिन्दी कार्यशाला का आयोजन किया गया था। कार्यशाला में निदेशालय के कर्मचारियों सहित विभिन्न सदस्य कार्यालयों से 45 कर्मचारियों ने भाग लिया।

निदेशालय में सितंबर 19-26 तक हिन्दी सप्ताह का आयोजन किया गया। इस अवसर पर कर्मचारियों और विद्यार्थियों के लिए विभिन्न प्रतियोगिता का आयोजन किया गया। प्रो. विष्णु भट्ट, सेवा निवृत्त हिन्दी प्राध्यापक, हिन्दी सप्ताह का उद्घाटन किए। सप्ताह के अवसर पर विद्यार्थियों और कर्मचारियों को नकद पुरस्कार से सम्मानित किया गया।

## TRANSFER OF TECHNOLOGY

### Field exposure visit

A field exposure visit was conducted on 5<sup>th</sup> December 2018 at Udupi district, Karnataka. During this programme, farmers were taken to the cashew demonstration plots being undertaken by ICAR-DCR, Puttur in Udupi district under the RKVY-RAFTAAR project. The farmer's



queries on various aspects of cashew production technology were addressed by Dr. Shamsudheen Mangalassery. Farmers interacted with their queries and also shared their experiences during the field visit. A total of 60 farmers participated in the field exposure visit.

### Exhibition

**Krishi Mela and Agri Expo – 2018:** ICAR-DCR, Puttur participated in Krishi Mela and Agri Expo – 2018 conducted at ICAR-Central Plantation Crops Research Institute - Regional Centre, Kidu on 10<sup>th</sup> and 11<sup>th</sup> November 2018. The Directorate put up an exhibition stall showing the technologies developed by this directorate on cashew. The stall was visited by more than 3000 diverse group of beneficiaries such as farmers of Karnataka, Kerala



and Tamil Nadu, students, researchers, processors and general public.

### Advisory Visits / Consultancies/Trainings/ Meetings

- Dr. M.G. Nayak (Acting Director) attended cadre Review meeting and Brain storming session on NAAS rating of ICAR research institutes held at ICAR, New Delhi on 17<sup>th</sup> and 20<sup>th</sup> Jul, 2018.
- Dr. Mohana, G.S., Senior Scientist (Genetic and Cytogenetics), was invited as outside expert of the selection committee for selection of JRF under the project on ‘Development of DUS test guidelines in Cocoa’ held on 28<sup>th</sup> Aug 2018 at ICAR-CPCRI, Vittal campus.
- Dr. M.G. Nayak (Acting Director) attended Krishi Mela at UAHS, Shivamogga as a guest of Honour on 14<sup>th</sup> Sep., 2018.
- Dr. M.G. Nayak (Acting Director) attended standing committee meeting of PLACROSYM held at Coffee Board, Bengaluru on 9<sup>th</sup> Oct 2018.
- Dr. M.G. Nayak (Acting Director), offered training on cashew nursery and cultivation

to farmers and KCDC staff at Mudubudire, D.K., Karnataka and inspected the newly planted KCDC plantations under RKVY on 4<sup>th</sup> Sep 2018.

- Dr. T.N. Raviprasad, Principal Scientist, (Entomology), provided consultancy on control of cashew pest, Ambrosia beetles in Salkani village of Sirsri taluka, U.K., Karnataka on 17<sup>th</sup> Nov 2018.
- Dr. Shamsudheen Mangalassery conducted monitoring of field trials/demonstration under RKVY project in Udupi and Uttara Kannda districts on 28<sup>th</sup> and 29<sup>th</sup> Dec. 2018 respectively.

### Talks delivered

- Dr. Mohana, G.S., Senior Scientist (Genetics and Cytogenetics), delivered a lecture on the topic ‘Science writing: Objectives and ideas’ at Inter-collegiate Science writing and Communication workshop held at St. Philomina College, Puttur on 6<sup>th</sup> Sep., 2018, organised by Department of Physics in association with All India Radio, Mangalore.
- Dr. Eradasappa, E, Scientist (Plant Breeding) delivered a lecture on 26<sup>th</sup> Oct 2018 on ‘Scope of Agriculture Education’ and explained research activities of ICAR-DCR to the 2<sup>nd</sup> PUC science students of Govt. Pre-University College, Puttur, D.K.
- Dr. M.G. Nayak (Acting Director), delivered a lecture on ‘Improved cashew cultivation’ at cashew seminar organized by Krishik Sanmaj of Udupi on 1<sup>st</sup> Dec 2018.

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## Technical Publications

- Shamsudheen, M. 2018. Ad-hoc recommendations on nutrient deficiency management in cashew (In English), E-publication no. 1/2018, ICAR - Directorate of Cashew Research, Puttur, pp. 1-8.
- Preethi, P., Vanitha, K. and Shamsudheen, M. 2018. Ad-hoc recommendations on nutrient deficiency management in cashew (In Tamil), E-publication no. 2/2018, ICAR - Directorate of Cashew Research, Puttur, pp. 1-8.
- Nayak, M.G., B.M. Muralidhara and Preethi, P. 2018. Quality graft production technology in Cashew. 2018. Cashew Technology Handbook 2018: A product of Cashewinfo.com. November (special issue), pp. 55-59.
- Nayak, M.G., B.M. Muralidhara and Preethi, P. 2018. Recent technologies for cashew production towards zero hunger. Indian Farming, 68 (10): 52-55.
- Nayak, M.G. and Savadi, S. 2018. Global status of cashew production and trade: challenges and strategies for India to regain world leadership. Agriculture Year Book 2018 (Agriculture Today). Pp.78-81.

## Visit of Dignitaries

Name	Address	Date of visit
Shri Chinmayananda Swamiji	Chinmaya Mission, Mandya	6 <sup>th</sup> October 2018
Shri Manjunath	Honourable Senior Civil Judge and Additional Chief Magistrate, Puttur	3 <sup>rd</sup> November 2018
Shri Bhaskar	President, Bar Association, Puttur	3 <sup>rd</sup> November 2018
Shri A Udaya Shankar Shetty	District Legal Cell Member	3 <sup>rd</sup> November 2018
Shri Prashant Rai	Lawyer, Puttur	3 <sup>rd</sup> November 2018

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## STAFF NEWS

### Transfers

- **Shri. Vijay Singh**, Senior Technical Assistant – Relieved of his duties on 10<sup>th</sup> August 2018 (A.N.) on transfer to ICAR - Indian Institute of Wheat and Barley Research, Karnal.

### Promotion

- **Dr. Shamsudheen Mangalassery**, Scientist (Soil Science) has been promoted to Senior Scientist (Soil Science) w.e.f 8<sup>th</sup> January 2017.

## Honours/Recognitions/Awards

- **Dr. Shamsudheen Mangalassery**, Sr. Scientist (Soil Science) - Recognised as the PG teacher at University of Agricultural and Horticultural Sciences (UAHS), Shivamogga w.e.f. 08-08-2018 and University of Horticultural Sciences (UHS), Bagalkot w.e.f. 14-08-2018.
- He also received the outstanding best research paper award by Nature Science Foundation, Coimbatore on 30 September 2018.
- He received the Distinguished Scientist Award 2018 of the Agro Environmental Development Society, Rampur, UP, India and secured the First position in oral presentation in the International conference on emerging issues in agricultural, environmental and applied sciences for sustainable development (EIAEASSD-2018) at Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Allahabad, UP, during 27-29 November 2018.
- **Prof. (Dr.) J. D. Adiga**, Principal Scientist (Fruit Science), has been recognized with the Distinguished Researcher Award-2018 in the International conference of SCiCon Series on research interventions and advancements in life sciences-2018 held at Pune, Maharashtra, India during 1<sup>st</sup> to 3<sup>rd</sup> August 2018.



Dr. Shamsudheen M



Dr. J. D. Adiga

## ICAR-SPORTS meet

- **Mr. Bojappa Gowda M.**, Technical Officer bagged the 3<sup>rd</sup> prize in the Discus throw event of the ICAR South zone sports meet held between 5<sup>th</sup> and 9<sup>th</sup> September 2018 at ICAR-Central Tobacco Research Institute, Rajahmundry, Andhra Pradesh.



Mr. Bojappa Gowda M



हर कदम, हर डगर  
किसानों का हमसफर  
भारतीय कृषि अनुसंधान परिषद

*Agrisearch with a human touch*

Published by: **Dr. M.G. Nayak**, Director (Acting)

ICAR- Directorate of Cashew Research, Puttur – 574 202, D.K.,Karnataka.

Tel. No. 08251 – 230 902; Fax: 08251 – 234350; E-mail: director.dcr@icar.gov.in

Website: <https://cashew.icar.gov.in>

Compiled and edited by: **Dr. Siddanna Savadi, Dr. Shamsudheen M, and Dr. Mohana G.S.,**

ICAR - Directorate of Cashew Research, Puttur – 574 202, D.K., Karnataka.