



काजू समाचार CASHEW NEWS



काजू अनुसंधान निदेशालय, पुत्तूर : अर्धवार्षिक वार्ता पत्र

HALF YEARLY NEWSLETTER OF DIRECTORATE OF CASHEW RESEARCH, PUTTUR

Vol. 19 No. 1

January - June 2014

FROM THE DIRECTOR'S DESK

Pollination in Cashew

The goal of every living organism, including plant, is to create offspring for the next generation. One of the ways that plant can produce offspring is by making seeds which contain the genetic information to produce a new plant. Of the 1400 crop plants grown around the world for food and industrial products, almost 80 per cent require pollination by animals. Virtually, pollination is an essential function in the process of seed formation in all angiospermae. In fact, pollination is the transfer of pollen from the male parts (anthers) of a flower to the female part (stigma) and thereafter fusion of sperm nucleus with the egg nucleus (fertilization) takes place to form seed and fruit. Among various horticultural crops, cashew (*Anacardium occidentale* L.) is one of the important plantation crops grown for its delicious kernel. In India, cashew cultivation started as early as in 16th century and at present covers an area of 9.82 lakh ha with annual production of 7.28 lakh tonnes. The national average productivity is low (772 kg/ha). Apart from other factors, pollination plays a vital role in fruit set of cashew. So far least attention has been given to this aspect.

The cashew is insect pollinated crop. In fact, the sticky pollens do not liberate in the air emphasizing the importance of pollination by the insects. It was shown through the use of bagging of panicles (to exclude insects and wind as pollinating agent) and caging / bagging with nylon mosquito nets (allow access to wind but exclude insects) that wind plays little role in cashew pollination. The main pollinating insects are honey bee (*Apis mellifera*), native fly (*Lingyra* sp.), ants, moths etc.



The cashew plant produces polygamous panicles that carry unisexual male and hermaphroditic flowers on the same inflorescence. The male flowers provide pollen grains for the hermaphroditic flowers for pollination and fruit set. Although, the total number of flowers in a panicle varies from 200-1600 over a period of 70-90 days of flowering period, only less than 10 per cent of those are hermaphroditic flowers. The stamens of hermaphrodite flowers are short filamented and only half in length of the style which makes it difficult for self pollination and favours cross pollination. In general, anthesis occurs in between 9 am to 2 pm and hermaphrodite flowers open mostly between 9 am to 11 am though some flowers open beyond this time. Staminate flowers were found to open very early in the morning and continue up to 2 pm. The peak period of dehiscence of anthers is from 9.30 am to 11.30 am and the rate of dehiscence is slightly higher on the sunny side of the tree as compared to that on the shady side. The viability of

pollen is usually high (94%) in types studied and the stigma becomes receptive one day prior to anthesis and its receptivity stays for two days.

In cashew on an average 27 per cent of the pollinated flowers develop into fruits. However, under low pollination only 10.5 per cent fruit yield has been reported. Under natural conditions, it has been shown that 25-72 per cent of the stigmas were not pollinated due to lack of pollinators. Studies conducted at Directorate of Cashew Research (DCR), Puttur indicated that final fruit set was obtained to an extent of 24.6 per cent in Bhaskara variety by hand pollination, whereas among naturally pollinated flowers, the final fruit set was only 10.1 per cent. The research efforts have indicated that by enhancing the level of pollination, the productivity of cashew can be increased, for which adequate active insect pollinators will help rapid transfer of pollens immediately after anthesis. Therefore, pollination is important and the insect pollinators need protection from insecticide



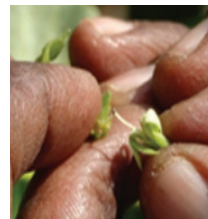
Male flower



Hermaphrodite flower



Bee pollination



Hand pollination

applications. Sometimes, factors other than pollination also limit fruit set. About 85 per cent of the hermaphrodite flowers are fertilized under normal conditions, only 4-6 per cent of them reach maturity to give fruits, the remaining shed away at different stages of development. Fruit drop in cashew during the early stages of development is attributed to physiological reasons and insect attack.

A simple technique of hand pollination in cashew has been developed at DCR. This technique can be employed for developing hybrids in cashew breeding programmes. In studies conducted at DCR to check any chance of self fertilization and fruit set in cashew, five panicles each from two varieties viz., Bhaskara and Ullal-3 were bagged in which only 2-3 nuts were obtained indicating the possibility of self-fertilization to a limited extent. However, with assisted hand

pollination, fruit-set up to 37 per cent was achieved in the cross combination of Vengurla-4 x NRC-492. The pollen fertility status of 20 varieties of cultivated species *Anacardium occidentale* L. and three wild species viz., *Anacardium microcarpum* Ducke, *Anacardium orthonianum* Rizz. and *Anacardium pumilum* St.Hil (*A. humile*) was assessed using acetocarmine staining method at DCR. Results indicated high heritability and high genetic advance for pollen fertility from hermaphrodite flower of wild species. It indicates that most likely the heritability is due to additive gene effects and selection may be effective at pollen level. Low heritability was accompanied with low genetic advance for the pollen fertility from male flower of wild species which indicates that the pollen fertility is highly influenced by environmental effects and selection would be ineffective. The study revealed the possibility of using both male and hermaphrodite flowers as pollen source for inter-varietal hybridization. However, for varieties with partial pollen fertility, large quantity of pollen grains need to be collected during

hybridization. The study also revealed that all three wild species can be used as pollen donors in the inter-specific hybridization programme in which the male flowers of *A. pumilum* should be used as pollen source. Cashew farmers in Benin who integrated bee keeping experienced a 200 per cent increase in yield compared to farmers without bees. Nevertheless, open/natural pollination mainly through insects plays an important role in cashew production as hand pollination in nature for this purpose is an uphill task. However, pollination can be supplemented by the inclusion of bee hives in the cashew orchard to increase the productivity.


(P. L. Saroj)
Director

FOCUS ON RESEARCH

Impact of Technology on Area, Production and Productivity of Cashew

M.V. Sajeew

Directorate of Cashew Research, Puttur - 574 202, Karnataka

In order to improve the cashew cultivation scenario of major cashew growing regions, assessment of the impact of recommended cashew production technologies are very important. Hence, to explore the applicability of technology impact premise in the context of cashew cultivation, the present study was undertaken at DCR with the objectives i) To measure the impact of different varieties on area, production and productivity of cashew and ii) To measure the impact of recommended production technologies on production and productivity of cashew in Dakshina Kannada district of Karnataka. Purposive sampling technique was used to select Dakshina Kannada district since it is a major cashew producing area of Karnataka with presence of two research stations besides other development departments working on cashew and hence having better chances of technology utilization at farm level. Farmers from all the five taluks of the district namely Mangalore, Buntwal, Puttur, Belthangady and Sullia represented the sample. An 'ex-post-facto cause to effect' design was applied. Detailed questionnaire measuring the adoption status of the farmers along with their profiles was developed, pre-tested and utilized for the study. The questionnaire contained 123 questions and took about 45 minutes to elicit information from one household. The data were

collected during 2012-13 through questionnaire and personal interviews. Appropriate statistical measures such as Phi, Spearman's rank correlation and regression analysis were employed. Data was analyzed using IBM SPSS Statistics Ver. 20.

Adoption and Impact of different varieties on cashew area

The highest area under cashew is covered by the variety Ullal-3 (41%) followed by Bhaskara (26.62%). Adoption pattern by farmers also showed similar trend with variety Ullal-3 (59%) followed by Bhaskara (55%). Majority of the farmers have adopted a minimum of two cashew varieties in their fields in which Ullal-3 and Bhaskara are the most popular combination. Varieties Ullal-1 and Vengurla-4 were accounted for around 8 per cent each of rest of the area, indicating only 13 and 4 per cent adoption respectively. Other varieties like NRCC Sel-2 (5.21%), Madakkathara-2 (4.62%), VRI-3 (2.66%), Ullal-4 (2.93%) and Vengurla-7 (0.75%) have low impact on total cashew area. In total, improved varieties were found to be adopted by 92 per cent of the farmers while 8 per cent were still continuing with seedling origin plantations. However, seedling origin plantations have only negligible coverage in farmer fields (0.04%) (Table 1).

Table 1. Variety wise adoption and impact on cashew area

Variety	Adoption pattern by farmers (%)*	Rank	Area covered (%)	Rank
Bhaskara	55	2	26.62	2
NRCC Sel-2	19	3	5.21	5
Madakkathara-2	4	8	4.62	6
Ullal-3	59	1	41.00	1
Ullal-1	13	4	7.66	4
Ullal-4	11	5	2.93	7
VRI-3	7	6	2.66	8
Vengurla-4	5	7	8.43	3
Vengurla-7	4	8	0.75	9
Other varieties	3	-	0.09	-
Total	92**	-	99.96	-
Seedling origin	8	-	0.04	-

* Percentages won't add upto 100 due to adoption of multiple varieties by a farmer

** Represents total percentage of farmers who have adopted released varieties

Impact of varieties on production and productivity of cashew

Analysis of variety wise impact on production of cashew showed that farmers realized highest yield from variety Bhaskara (4.73 kg/tree) followed by Madakkathara-2 (4.45 kg/tree), Ullal-1 (3.90 kg/tree), Ullal-3 (3.87 kg/tree), Ullal-4 (3.67 kg/tree) and NRCC Sel-2 (3.47 kg/tree). The highest productivity of cashew under normal density planting (8m x 8m) as well as high density planting (5m x 5m) was obtained with

Bhaskara (737.9 and 1882.5 kg/ha, respectively) and Madakkathara-2 (694.2 & 1771.1 kg/ha, respectively) varieties. This was followed by Ullal-1 (608.4 kg/ha), Ullal-3 (603.7 kg/ha) and Ullal-4 (572.5 kg/ha) under normal density planting, whereas under high density planting system, Ullal-1 (1556.1 kg/ha), Ullal-3 (1540.3 kg/ha) and NRCC Sel-2 (1374.12 kg/ha) stood at 3rd, 4th and 5th positions, respectively. High density planting system was not observed in case of Ullal-4, VRI-3, Vengurla-4, Vengurla-7 and other varieties during data collection for this study (Table 2).

Table 2. Varietal impact on production and productivity of cashew

Variety	Production (kg/tree)**	Rank	Productivity (kg/ha) (8m x 8m spacing)	Rank	Productivity (kg/ha) (5m x 5m spacing)	Rank
Bhaskara	4.73	1	737.9	1	1882.5	1
NRCC Sel-2	3.47	6	541.3	6	1374.1	5
Madakkathara-2	4.45	2	694.2	2	1771.1	2
Ullal-3	3.87	4	603.7	4	1540.3	4
Ullal-1	3.90	3	608.4	3	1556.1	3
Ullal-4	3.67	5	572.5	5	-	-
VRI-3	3.06	7	477.4	7	-	-
Vengurla-4	1.51	9	235.6	9	-	-
Vengurla-7	3.00	8	468.0	8	-	-
Other varieties	2.23	-	347.9	-	-	-
Seedling origin	1.23	-	147.6	-	-	-

** Trees above 5 years of age

The production and productivity profile of cashew farmers showed that farmers achieved a mean production of 425 kg/household and productivity of 2.92 kg/tree. In case of production, majority fell into medium (40%) and low (43%) producer categories while they were almost equally divided into high (33%), medium (36%) and low (31%) categories with respect to productivity achieved.

Adoption and relationship of technologies on production and productivity of cashew

The overall adoption of cashew production technologies had received an index score of 43.83. Majority (51%) of the farmers belonged to medium adopter category while rest were almost equally divided between high (25%) and low (24%) categories. Of the different cashew production technologies, except recommended varieties (72) and, planting and initial care (73) scored moderate to poor adoption

index. Soil and water conservation (48), pruning and training (43) and, harvesting and post harvest technologies (43) showed medium adoption index while manures and fertilizers (30), plant protection (20) and intercropping (22) scored low adoption index. Low to medium adoption with respect to most of the cashew production technologies could be attributed to the fact that farmers are yet to realize the importance of recommended technologies on the yield and potential economic benefits that accrues from their adoption. Four technologies viz., soil and water conservation ($r=0.338^{**}$), pruning and training ($r=0.344^{**}$), plant protection ($r=0.345^{**}$) and, harvesting and post harvest ($r=0.321^{**}$) had highly significant and positive relationship with the production of cashew while pruning and training ($r=0.271^{*}$) had a significant and positive relationship with the productivity of cashew.

Contribution of technology towards production and productivity of cashew

Regression analysis revealed the extent of contribution of each production technology towards variability found in levels of cashew production and productivity in the district. Plant protection component which scored the lowest adoption index emerged as the most significant contributor towards production of cashew ($b=0.339^{**}$) in the district. The findings calls for development of plant protection measures which are user friendly (less complex), having relative advantage over existing technology and also compatible with farmer situations. Soil and water conservation technology was also found to have a significant contribution towards explaining the variability in cashew production ($b=0.326^{**}$) followed by intercropping ($b=0.243^{**}$). Recommended varieties, manures and fertilizers and, harvesting and post harvest technologies were found to have a non-significant but negative contribution towards cashew production. Though the varieties Bhaskara, Madakkathara-2, Ullal-1 and Ullal-3 resulted in the highest production but area covered accounted for only 26.62, 5.21,

7.66 and 41.00 per cent, respectively of total area. It clearly indicates that the production of cashew in the district can substantially be enhanced by increasing area coverage under cashew cultivation with the high yielding varieties. All the recommended production technologies together could explain only up to 40 per cent of variability in cashew production ($R^2 = 0.406$).

The study reveals that adoption of soil and water conservation techniques and development and popularization of user friendly plant protection measures can largely contribute to increased production of cashew while pruning and training technology can significantly increase the productivity of cashew. The results clearly indicate that socio-economic and bio-physical factors along with policy environment play a major role on the production and productivity of cashew and technology component alone cannot be expected to bring a positive impact. Understanding the above dynamics in technology impact can help researchers and extension agencies working in cashew sector to design better innovations and effective outreach strategies.

PROGRAMMES ORGANIZED

Annual Group Meeting of AICRP on Cashew: 2013

The Annual Group Meeting of All India Coordinated Research Project (AICRP) on Cashew: 2013 was held during 5-7 January 2014 at Bidhan Chandra Krishi Viswavidyalaya (BCKV), Kalyani, West Bengal. At the outset Dr. Biswapati Mandal, Pro-Vice Chancellor welcomed the participants and mentioned that the BCKV had initiated research on cashew way back in 1970's. He said that there is considerable potential for crop in Medinipur, Contai, Digha as well as 24 Paraganas districts. He indicated that though efforts have been taken by several NGOs, the cashewnut yield in the State is not up to their full potential due to unavailability of suitable varieties. The Annual Group Meeting was inaugurated by Dr. S.K. Malhotra, ADG (Hort.), ICAR, New Delhi. In his inaugural address, he mentioned that the efforts of AICRP on Cashew should be intensified so as to make the country self sufficient in terms of rawnut production. He anticipated that even with the existing production technology, cashew yield can be enhanced to the tune of 2.0 to 2.5 t/ha. Dr. T.N. Raviprasad, Scientist In-charge, Project Coordinator Cell presented the Action Taken Report of the previous year which was discussed in detail.



Prof. P.L. Saroj, Project Coordinator (Cashew), presented the salient achievements of different centres of AICRP on Cashew which supported production of elite planting material and also the transfer of technology efforts that has led to a wider awareness and helped popularize the scientific cashew technology among farmers. He expressed that concerted efforts should be made for popularization of new varieties and site specific nutrient and water management by the coordinated approach of line departments for improving rawnut productivity. Prof. C. Kole, Hon'ble Vice Chancellor, BCKV, in his presidential remarks

extolled the nutrient properties of cashew kernels as well as the opportunities for expanding cashew area in West Bengal. He informed that cashew varieties released from Bhubaneswar could perform well in the traditional cashew growing districts of West Bengal. He mentioned that, continuous research efforts of BCKV has led to release of cashew variety which is a high yielder with good shelling percentage.

The research progress and results obtained in various experiments at different AICRP-Cashew Centers viz., Bapatla, Bhubaneswar, Chintamani, Darisai, Jagdalpur, Jhargram, Madakkathara, Paria, Pilicode, Vengurle and Vridhachalam as well as, the co-operating centres viz., Arabhavi and Tura were presented by the scientists of the respective disciplines from each Centre. The presentations were made in three main theme areas viz., Crop Improvement chaired by Dr. P.C. Lenka, Former Professor, OUAT, Bhubaneswar, Crop Management chaired by Dr. P.K. Chattopadhyay, Former Dean, BCKV, Mohanpur and Crop Protection chaired by Dr. Abraham Verghese, Director, NBAll and Co-chaired by Dr. H.S. Singh, CHES, IIHR, Bhubaneswar. A separate technical session was organized regarding Interaction of development departments and research centres which was chaired by Shri. Venkatesh N. Hubballi, Director, DCCD, Kochi. Discussions regarding modalities for implementation of developmental activities being done under the Tribal Sub Plan were explained by Dr. H.S. Singh and Shri. Venkatesh N. Hubballi. In the Plenary Session, chaired by Dr. N.K. Krishna Kumar, DDG (Hort.), ICAR, New Delhi, the recommendations of different technical sessions were presented. The chairman expressed his concern about hastening the progress of research in cashew. He suggested that finger printing of all released varieties should be done. A map should be developed about TMB occurrence to formulate management strategies. Also a base paper may be developed about diseases of cashew. The AICRP-Cashew centre at Jhargram proposed the release of a new variety Jhargram-2 which had higher nut weight and shelling percentage which was approved by the House for cultivation in red and lateritic soils of West Bengal. Subsequently, the representatives of Nari Vikas Sangh, Shri. Sapan Choudhary and Shri. Shaku Bikas Maiti made presentations on the progress of cashew expansion in tribal areas of Bankura and Purulia. Later, Shri. Hemant Ghosh, of Krishi Vikas Trust explained the benefits obtained by the local tribal farmers by cultivation of cashew and integrated farming.

Agricultural Education Day: 2014

Agricultural Education Day: 2014 was organized at DCR, Puttur on 28 February 2014. More than 250 students along with their teachers from various schools and colleges around Puttur participated in the programme. Students were taken to various experimental plots, cashew museum and laboratories where the research achievements and technologies developed by the Directorate were explained. The theme lecture was delivered on the topic 'Scope of



Agricultural Education' by Dr. G.S. Mohana, Senior Scientist, DCR. The students were introduced to the importance of agriculture and various opportunities by the Chief Guest Shri. Sathish Kumar Rai, Head Master, Vivekananda English Medium High School, Puttur. The programme was presided over by Dr. P.S. Bhat, Principal Scientist and Director In-charge, DCR who appraised the students about the role of agriculture in the development of the country and the importance of the services rendered by agricultural scientists in achieving food and nutritional security. A quiz programme on 'General Agriculture' was conducted on this occasion for the students in which 12 teams from various schools participated.

Brainstorming Session on Substitution of NPK requirement using Organic Sources and Orientation Training for Scientists of AICRP on Cashew

As part of the orientation training for newly joined scientists of AICRP on Cashew, a brainstorming session on substitution of NPK requirement using organic sources was organized on 19 May 2014 at DCR, Puttur. Dr. M. Gangadhara Nayak, Principal Scientist and Director In-charge while welcoming experts and delegates mentioned the importance of organic cashew production, which gets a premium price in the global and domestic markets. Dr. T.N. Raviprasad, Principal Scientist (Agrl. Ento.) and Scientist In-charge, PC Cell

briefed about the purpose of this session. The session was chaired by Dr. N.P. Singh, Director, ICAR Research Complex for Goa. He elaborated the techniques of *in situ* composting and benefits of organic cultivation in terms of soil biota, environmental safety and human health. Dr. A.N. Ganeshamurthy, Principal Scientist (Soil Science), IIHR, Bengaluru; Dr. R.A. Ram, Principal Scientist (Hort.), CISH, Lucknow; Dr. P. Subramanian, Principal Scientist (Agronomy), CPCRI, Kasaragod and Dr. T.R. Rupa, Principal Scientist (Soil Science), DCR were the experts for this session. Dr. T.N. Raviprasad, Scientist In-charge, PC Cell moderated the session. During the discussions, the following decisions



emerged: 1) The N requirement needs to be met with the locally available cheapest organic source viz., neem cake, pongamia cake, castor cake, sal cake, FYM, vermicompost, sheep / goat manure etc.; 2) Use of various green leaf manuring crops to provide the N requirement based on the local situations and recycling of residues; 3) Evaluating the microbial consortium having *Pseudomonas* spp., *Bacillus* spp. etc. and dolomite addition and 4) Evaluating biodynamic compost, need based herbal pesticides derived from *Calotropis* and neem may be done. The orientation training for newly joined scientists of AICRP-Cashew was held subsequently from 19-22 May 2014. The scientists of DCR dealing the respective disciplines were the resource persons in which all aspects related to different experiments on cashew were explained. This was followed by field visits to experimental plots in Kemminje and Shantigodu farms of this Directorate.

Plant Protection Laboratory Inaugurated

Dr. S. Ayyappan, Secretary, DARE & DG, ICAR inaugurated the newly built Plant Protection Laboratory at DCR, Puttur on 9 March 2014. Dr. Ayyappan congratulated the Directorate for establishing such a well planned facility in a short period. He suggested



to utilize the facility efficiently to develop alternate strategies for effective management of the pests of cashew. He further advised strengthening research in collaborative mode employing inter institutional approach both at national and international level. Dr. N.K. Krishna Kumar, DDG (Hort.) emphasized upon the need for development of eco-friendly management approaches for the pests of cashew by utilizing the new facility developed at the Directorate. Priority should be given for the development of pheromone/kairomone technology which can be integrated with other measures for tackling the pest menace. He also stressed that the experience of the farmers should also be taken into account while formulating the research programme.

Dr. M.G. Nayak, Principal Scientist and Director In-charge welcomed the gathering and gave introductory remarks. Dr. M.G. Bhat, Former Director, DCR, Puttur; Dr. George V. Thomas, Director, CPCRI, Kasaragod; Shri. N. Kumar, Member, ICAR Governing Body and Dr. A. Gopalakrishnan, Director, CMFRI, Kochi also graced the occasion. Two publications viz., 'DCR at a Glance' and 'Development of Dual Mode Dryer for Raw Cashewnuts' were released by Dr. S. Ayyappan, Secretary, DARE & DG, ICAR and Dr. N.K. Krishna Kumar, DDG (Hort.), respectively. Progressive cashew farmers were felicitated on this occasion. Dr. P.S. Bhat, Principal Scientist proposed the vote of thanks.

28th Foundation Day of DCR: Cashew Farmers Meet

The Directorate of Cashew Research, Puttur celebrated its foundation day on 18 June 2014. Cashew Farmers Meet: 2014 was organized to mark the occasion in which more than 150 cashew farmers participated besides nursery men, representatives of KVK, development departments, NGOs and scientists. Dr. M.G. Nayak, Principal Scientist, DCR, in his welcome address explained about the technology transfer activities carried out at this Directorate. Chief



Guest of the function Shri. A.B. Ibrahim, IAS, Deputy Commissioner, D.K. District, Karnataka, appreciated the efforts being made by the Directorate in demonstrating the technologies at farmers' fields in order to enhance the productivity of cashew. He emphasized that the

cashew apple need to be utilized more efficiently. He also addressed some of the issues like marketing and subsidy for cashew cultivation which were raised by cashew farmers. Dr. George V. Thomas, Director, CPCRI, Kasaragod was the Guest of Honour. Prof. R.K. Pathak, Former Director, CISH, Lucknow in his Foundation Day Lecture on 'Jaivik Cashew for Export Promotion and Domestic Consumption' explained about the various basic and applied aspects of input and crop health management under organic farming. Prof. P.L. Saroj, Director, DCR, highlighted the technologies developed by DCR and urged the farmers to adopt technologies for better profit. Innovative cashew farmers from Karnataka were felicitated on this occasion. Technical bulletins on 'Rejuvenation Techniques in Cashew' and 'Geru Maragala Punaschethana Tantrikathe' (Kannada) were released. This was followed by a farmer - scientist interaction session.

MEETINGS

राजभाषा हिन्दी क्रियान्वयन

इस छः माही में निदेशालय में राजभाषा कार्यान्वयन समिति की दो तिमाही बैठकें हुईं। इसके अतिरिक्त पुत्तूर नगर राजभाषा कार्यान्वयन समिति की दो अर्ध वार्षिक बैठक भी आयोजित हुईं।



तिमाही बैठकों में कार्यालय में हो रही हिन्दी गतिविधियों के बारे में चर्चा किया गया। गृह मंत्रालय, भारत सरकार द्वारा दिये गये वार्षिक कार्यक्रम के अनुसार लक्ष्य प्राप्ति हेतु जरूरी कदम उठाने के बारे में भी चर्चा किया गया। कार्यालयीन कार्यों को हिन्दी में करने के लिए और हिन्दी कार्यान्वयन को बढ़ावा देने के लिए निश्चित कदम उठाने के बारे में निर्णय लिया गया।

जनवरी महीने में पुत्तूर नरकास की 25 वीं अर्धवार्षिक बैठक का आयोजन हुआ। बैठक में पुत्तूर नगर के विभिन्न सरकारी केन्द्रीय कार्यालयों के प्रतिनिधि भाग लिए। बैठक में इन कार्यालयों में हो रही हिन्दी के काम-काज के बारे में चर्चा हुई

और जरूरी दिशा-निर्देश भी दिए गए।

इस निदेशालय और नरकास के सदस्य कार्यालयों के कर्मचारियों के लिए हिन्दी कार्यशालाओं का भी आयोजन किया गया। कार्यशाला में दैनिक काम-काज में उपयोग होनेवाले पत्र लेखन, मसौदा लेखन, नोट लिखना आदि के बारे में प्रशिक्षण दिया गया। कार्यशाला में 45 कर्मचारी भाग लिए।

Institute Management Committee (IMC) Meeting

The 40th meeting of the IMC was held on 22 March 2014 under the Chairmanship of Prof. P.L. Saroj, Director, DCR. The Chairman informed the members about research and achievements of the Directorate. Various administrative and financial matters were discussed and finalized. Dr. Sudha Mysore, Principal Scientist, IIHR, Bengaluru; Shri. Padmanabhan, Special Officer (Cashew), Kerala State; Dr. Ramanathan, Principal Scientist, CTCRI, Thiruvananthapuram; Ms. Rekha, Assistant Director (Hort.), Department of Horticulture, Govt. of Karnataka, Bengaluru; Shri. T.D.S. Prakash, Finance & Accounts Officer, CPCRI, Kasaragod; Dr. P.S. Bhat, Principal Scientist, DCR; Shri. R. Arulmony, AF&AO In-charge and Shri. K.M. Lingaraja, Administrative Officer In-charge, DCR attended the meeting.

Research Advisory Committee (RAC) Meeting

The third meeting of the VIth RAC (18 meeting) of the Directorate was held during 7-8 May 2014 under

the Chairmanship of Dr. P. Rethinam, Former Executive Director, APCC and Former ADG (Plantation Crops), ICAR. Prof. P.L. Saroj, Director, DCR welcomed the RAC and made introductory remarks about research activities of DCR. Dr. K.U.K. Nampoothiri, Former Director, CPCRI and Director, M.S. Swaminathan Research Foundation, Jeypore, Odisha and Dr. M. Udayakumar, Emeritus Scientist, University of Agricultural Sciences, Bengaluru participated in the meeting. The Committee made field visits to various experimental plots in Kemminje as well as Shantigodu campuses of the Directorate. The Chairman and members appreciated the approaches in conserving wide ranging types of cashew germplasm, evaluation of cashew varieties suitable for apple characteristics, developing hybrids for dwarfness, multiplication of uniform root stocks. Later, the progress made under various research projects were discussed. After detailed discussion, recommendations were finalized for submission to the Council. The Committee laid stress on identifying germplasm from non-traditional areas, developing



methods for multiplication of uniform rootstocks, standardizing fertigation to enhance yields, usage of micronutrients, developing semio-chemical based pest management practices with additional efforts on evaluation and conservation of bio-control agents. The Committee also opined that the technologies developed by the Directorate need to be demonstrated in the farmers' plots in the vicinity of the Directorate. The meeting came to an end with vote of thanks by Dr. T.N. Raviprasad, Member Secretary, RAC.

TRIBAL SUB PLAN

Skill Development Programmes

Training on Pest Management in Cashew

A training on pest management in cashew was organized in association with Shri Kshetra Dharmasthala Rural Development Programme (SKDRDP), Puttur for tribal farmers at Perlampady village, Kolthige, Puttur on 23 February 2014. Shri. Achutha Mudithaya, Progressive cashew farmer inaugurated the training programme and shared his experiences in cashew farming. More than 100 farmers participated in the programme. Dr. M.G. Nayak, Principal Scientist, DCR highlighted the importance of scientific management



practices along with high yielding cashew varieties for realizing higher productivity of cashew. Further, he informed the participants about the financial support available for tribal farmers for cashew cultivation under Tribal Sub Plan. Dr. P.S. Bhat, Principal Scientist, DCR stressed on the various aspects for the management of tea mosquito bug and cashew stem and root borer which are the two major pests of cashew. Field visit to demonstration plot of DCR was arranged in which various aspects of ultra high density planting including incidence of tea mosquito bug was shown to the farmers.

Training on Cashew Production Technology

A training on cashew production technology was organized for tribal farmers at Bettampady village, Irde, Puttur on 25 February 2014 in association with SKDRDP, Puttur. Dr. P.K.S. Bhat, Progressive cashew farmer and Ex-President of All India Arecanut Growers' Association inaugurated the training programme and shared his experiences in cashew farming. More than 100 farmers participated in the programme. Dr. M.G. Nayak, Principal Scientist (Hort.), DCR emphasized on the scientific management practices and extension programmes of the Directorate. Dr. T.N. Raviprasad, Principal Scientist (Agrl. Ento.), DCR spoke in detail



on various aspects of pest management in cashew. Farmers were taken to experimental field and explained about the ultra high density planting system in cashew.

Training on Cashew Apple Utilization

Training on cashew apple utilization was organized in association with SKDRDP, Puttur for tribal women at DCR, Puttur on 28 March 2014. More than 100 tribal women participated in the programme. Dr. M.G. Bhat, Former Director, DCR inaugurated the training programme and stressed on the health benefits of cashew apple products. He highlighted the importance of public-private partnership for popularizing cashew apple preparation. Prof. P.L. Saroj, Director, DCR in his presidential remarks informed the gathering about the nutritional benefits and scope for utilization of cashew apple in the country. He opined that food security has no meaning without nutritional security and stressed upon the increased utilization of all locally available fruits in the coastal region.

Shri. M.N. Venkata Krishna, Progressive cashew farmer and entrepreneur shared his experiences on cashew processing and marketing. Smt. Meenakshi, Group Leader, SKDRDP spoke on this occasion and requested the tribal women to make use of the recipes discussed in the training for the nutritional benefit of their families. Dr. M.G. Nayak, Principal Scientist, DCR



informed the participants about the financial support available for tribal farmers. Dr. D. Balasubramanian, Principal Scientist, DCR conducted practical demonstrations on preparation of juice, squash, jam and pickle. Later the trainees were given hands on training on the preparation of these products.

Exposure Visit to DCR

Several individual visitors and visitors in batches including farmers, students and officials to the Directorate were taken to various experimental plots, cashew nurseries, cashew museum and laboratories and were appraised of the achievements and technologies developed by DCR.



Visitors Category	Organization	No. of Participants	Date of Visit
Students	College of Horticulture, Udayanagiri, Karnataka	50	2 January 2014
Students	College of Horticulture, Kolar, Karnataka	50	3 January 2014
Students	College of Horticulture, Yelavala, Karnataka	50	4 January 2014

Students / Teachers	Various educational institutions of Puttur, Karnataka	260	28 February 2014
Farmers / Officials	Moodbidri, Karnataka	22	10 March 2014
Officials	SKDRDP, Dharmasthala, Karnataka	5	11 March 2014
Tribal women / Women farmers	SKDRDP, Puttur, Karnataka	102	28 March 2014
Farmers / Officials	Malappuram, Kerala	27	21 May 2014
Students	College of Horticulture Mudigere, Karnataka	13	11 June 2014
Farmers / Officials	D.K. District, Karnataka	150	18 June 2014

Visit of Dignitaries

Name	Organization	Date of Visit
Dr. S. Ayyappan	Secretary, DARE and Director General Indian Council of Agricultural Research, New Delhi	9 March 2014
Dr. N.K. Krishna Kumar	DDG (Hort.) Indian Council of Agricultural Research, New Delhi	9 March 2014
Dr. George V. Thomas	Director Central Plantation Crops Research Institute, Kasaragod	9 March 2014
Dr. A. Gopalakrishnan	Director Central Marine Fisheries Research Institute, Kochi	9 March 2014
Dr. C. Vasudevappa	Vice Chancellor University of Agricultural and Horticultural Sciences, Shimoga, Karnataka	28 March 2014
Dr. K.E. Lawande	Vice Chancellor Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Maharashtra	11 April 2014
Shri. Nagaraja	Managing Director Karnataka Cashew Development Corporation, Mangalore, Karnataka	29 May 2014
Dr. R.K. Pathak	Former Director Central Institute for Subtropical Horticulture, Lucknow U.P.	18 June 2014

TRANSFER OF TECHNOLOGY

Establishment of Demonstration Plots

The demonstration plots established on farmers' fields at Puttur, Sullia and Bantwal taluks of Dakshina Kannada district of Karnataka with the financial support of National Horticulture Mission (NHM) programme of

DCCD, Kochi were monitored regularly by the Scientists of this Directorate and technical advice was given as and when required. Some new demonstration plots were also established on high density planting of cashew.

Advisory Visits / Consultancy

The scientists of this Directorate were requested for technical advice/lectures on various aspects of cashew production by different organizations. The team of scientists provided consultancy/lectures as and when requested and also participated as resource persons in various cashew related programmes.

Supply of Planting Material

Around 1,50,000 cashew grafts of high yielding and recommended varieties were produced under Institute Revenue Generation programme. Cashew grafts have been supplied to the farmers and developmental agencies.

Technical Publications

Technical bulletins / Brochures published by DCR during January to June, 2014 were:

- Rejuvenation techniques in cashew.
- Geru maragala punaschethana tantrikathe (Kannada).
- Alternate energy utilization of cashew shell cake for thermal application.
- Development of dual mode dryer for raw cashewnuts.
- Post harvest technologies for commercialization.

STAFF NEWS

Appointment

- Shri. Rajkumar Arjun Dagadkhair - Joined as Scientist (Food Technology) on 7 April 2014.
- Dr. Babli Mog - Joined as Scientist (Plant Physiology) on 8 April 2014.
- Shri. M. Bhojappa Gowda - Joined as Technical Officer on 9 June 2014 on transfer from Indian Institute of Horticultural Research, Bengaluru.

Transfer

- Shri. R. Lakshmisha, Senior Technical Officer - Relieved of his duties on 10 June 2014 on his transfer to Indian Institute of Horticultural Research, Bengaluru.

Superannuation

- Shri. P. Krishnappa Poojary, Skilled Support Staff - Superannuated on 31 January 2014.
- Shri. Venkappa Gowda, Skilled Support Staff - Superannuated on 28 February 2014.
- Shri. K. Krishnappa Naik, Skilled Support Staff -

Superannuated on 31 March 2014.

- Shri. Bejmi Veigas, Technical Asst. (Tractor Driver) - Superannuated on 30 April 2014.
- Smt. K. Janaki, Skilled Support Staff - Superannuated on 30 April 2014.

Award / Honour / Recognition

- Prof. P.L. Saroj, Director - Nominated as Patron of Society for Horticultural Research and Development, Ghaziabad (UP).
- Dr. M.G. Nayak, Principal Scientist (Hort.) - Nominated as Member of Editorial Board of Progressive Horticulture by Indian Society of Horticulture for Research and Development, Uttarakhand.

Visit Abroad

- Prof. P.L. Saroj, Director - Participated in Advanced Training on 'Leadership Management Development Programme' at College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853, USA from 28 February 2014 to 8 March 2014.

Published by: **Prof. P.L. Saroj**, Director, Directorate of Cashew Research, Puttur - 574 202, D.K., Karnataka

Tel No: 08251-230902; Fax: 08251-234350, E-mail: dircajures@gmail.com | dircajures@yahoo.com | dircajures@rediffmail.com | Website: <http://www.cashew.res.in>

Compiled and Edited by: **Dr. T.R. Rupa** and **Dr. M.V. Sajeev**