



काजू समाचार

CASHEW NEWS



भाकृअनुप-काजू अनुसंधान निदेशालय, पुत्तूर के अर्धवार्षिक वार्ता पत्र
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FROM THE DIRECTOR'S DESK

Emerging Diseases of Cashew

Cashew is an important commercial horticultural crop in India. The cashew nuts, apple and other by-products are having considerable commercial value. However, low productivity in cashew is attributed to many biotic and abiotic factors. Among the biotic factors, diseases especially caused by fungal pathogens, played a significant role in yield loss. Infact much attention was not given to identify the causal agent of the diseases of cashew and to develop management practices. Probably due to the fact that cashew was considered as forest crop to protect erosion. Now the crop is under intensive cultivation and its cultivated area is increasing. The problem due to diseases is also aggravating. Hence it is essential to address the problems through efforts to identify the factor(s) responsible and to combat the same by integrated approaches. In general, application of chemicals for the management is discouraged due to concern over environmental safety, practical difficulties in application on tall canopy and other socio economic reasons. Hence research focus should be given for developing resistant dwarf clones and biocontrol management so as to avoid the said problems and also easy for cultural operations.

Diseases such as anthracnose (*Colletotrichum gloeosporioides*), gummosis or inflorescence blight/floral shoot and twig die back (*Lasiodiplodia theobromae*), powdery mildew (*Oidium anacardii*), black mold (*Pilgeriella anacardii*), angular leaf spot (*Septoria anacardii*), pink disease (*Corticium salmonicolor*=*Pellicularia salmonicolor*), shoot rot



or leaf fall (*Phytophthora nicotianae*), foot and root rot (*Pythium splendens*) and damping off (*Fusarium* sp.) have been documented in different parts of the world. Among the fungal diseases, anthracnose and gummosis (=inflorescence blight/floral shoot and twig die back) are considered to be important.

Anthracnose disease was first recorded in India from Trichy area of Tamil Nadu and the disease was locally called as 'Soorai'. Both young and mature plants are susceptible to the disease. All parts (leaves, twigs, inflorescences, young apples and fruits) of the plants are prone to attack by the pathogen. Symptoms include initial water soaked lesions on leaves and later they turn orange-brown to light reddish. Affected tender leaves show crumpling, and necrotic spots on tip and edges. Nuts may have necrotic spots and apple become black and mummified. Under severe conditions, both leaves and fruits may completely blight and drop. The pathogen reaches the fruit by entering

via floral stigma. Normally the pathogen survives on dead plant parts after the tissues are killed and it becomes active to produce abundant conidia during rainy season when humidity starts raising and new flushes are put forth. The disease spreads in plantations through the conidia which are easily carried away by air current and rain splashes. High rain and temperature around 22 to 28°C favor fast spread of the disease. This disease is managed mainly through application of copper fungicides or copper based preparations (Bordeaux mixture). In many cases, the disease is predisposed by tea mosquito bug (TMB), *Helopeltis antonii* hence combined application of insecticide and fungicide was found effective. In Brazil, some dwarf clones resistant to this disease have been identified.

Inflorescence or blossom blight /floral, shoot and twig die back/gummosis caused by *Lasiodiplodia theobromae* (*Botryodiplodia theobromae*) is another economically important disease of cashew. It is reported to produce different type of symptoms. In gummosis, swollen cankers with cracking and oozing of gummy exudates/transparent resins like fluid are seen in the trunk/woody part of the tree. It may affect nutrient and water transport, and photosynthesis. In severe cases, it causes plant death. In inflorescence blight and die-back, it causes withering of floral parts and progressive die back of inflorescence, shoot and twigs. Other symptoms include yellowing and dropping of leaves. Infected stems show dark colour with cracking. Wounds created by insects act as predisposing factor for the disease infection. Particularly, *Marshallus bondari*, the root beetle, has been reported as vector or facilitator of the infection. Apart from that, the disease is also favoured or predisposed by water stress. The pathogen can survive endophytically in the tissue and transmit the disease through vegetatively propagated materials (scion/rootstocks).

In India, the disease is reported in the form of inflorescence blight and inflorescence die back. The former one is reported to be caused by fungi, *Gloeosporium mangiferae* and *Phomopsis anacardii* in association with TMB. Characteristic symptoms defined for inflorescence blight are initially water soaked lesions on rachis and secondary rachis and later they become pink to brown colour, gummy



Die back of shoots/twigs



Gummosis on stem

exudations from lesion and drying of floral branches. It is also presumed that the disease is initiated by TMB and secondary saprophytic infection by fungi. While in case of inflorescence die back, the causal agent reported is *L. theobromae* and TMB is recognized as predisposing factor. In many cases, TMB has been proposed as main cause of inflorescence or blossom blight/die back, however, in Brazil, the TMB attacks



Seedling root rot disease



Seedling wilt disease



Black leaf spot (*Pilgeriella* sp.)



Black mold (*Capnodium* sp.)



Red rust (*Cephaleuros* sp.)

were not noticed but still the blight incidences were recorded in severe form, indicating the possibility of involvement of fungal pathogen as primary causal agent of the disease.

Apart from the above diseases, several diseases such as seedling wilt and root rot, black leaf spot, black mold, red rust and inflorescence drying diseases have been observed in cashew plantations of ICAR-DCR. All the diseases except inflorescence drying were noticed mainly during rainy season (June- August).

ICAR-DCR is focusing on the following aspects to manage the diseases in the integrated manner.

- Monitoring emerging/important diseases of cashew
- Identification of causal agents responsible for the diseases
- Studying influence of weather factors on diseases
- Screening for resistant germplasms/cultivars against the major diseases
- Development of eco-friendly approaches for the management of major diseases.


(P. L. Saroj)
Director

FOCUS ON RESEARCH

Spatial Variability of Available Micronutrients in Cashew Orchards of Konkan Region, Maharashtra

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Micronutrient deficiencies in soil and plants are a worldwide nutritional problem and are prevalent in many countries with different magnitude of severity. Micronutrients have not usually been applied regularly to soil in conjunction with common fertilizers, and fertilizing soils with macronutrients solitary is likely to promote nutrient imbalances. Besides, increased yields, losses of micronutrients through leaching, limited or no use of organic manures are among the factors contributing toward accelerated exhaustion of the supply of available micronutrients in cashew growing soils. There is increasing evidence that many orchards are managed under hidden hunger, which limits nut production. A management strategy for micronutrient deficiencies in soil-plant system is crucial because they limit agricultural production and affect human nutrition directly or indirectly. The micronutrient content in soil and plant should be optimum for growth and development since the micronutrient need is site specific. The deficiency and toxicity limits of micronutrients in plant are rather narrow. This calls for location specific management of micronutrients in cashew so that these do not become toxic to plant. Soil surveying and nutrient assessment for a particular area provides information regarding nutrient scenario in soils which forms the basis for the fertilizer recommendations for maximizing yields. In Konkan region of Maharashtra, the major area under cashew cultivation is along the steep hillocks and

prone to runoff and leaching of nutrients due to high precipitation and probably accentuate to the deficiency of some micronutrients in the soil. Knowledge of the scale and distribution of the micronutrient deficiencies / constraints is essential to develop strategies for more sustainable cashew system.

In order to assess the spatial variability of available micronutrients viz., Fe, Mn, Zn and Cu in different cashew orchards of Ratnagiri District, Maharashtra, 70 cashew orchards of 5 to 20 years old in different villages were selected at random, covering the entire range of management and yield level. Surface soil (0-30 cm) samples collected from each orchard were utilized for the present study. The collected soil samples were processed and analysed for DTPA extractable Fe, Mn, Zn and Cu as per standard methods described by Lindsay and Norvell (1978). The range and mean values of DTPA extractable micronutrient contents in soils showed wide variation among orchards (Table 1).

Table 1. Available micronutrient content in different cashew orchards (70) of Ratnagiri district

Available micronutrient	Range (mg kg ⁻¹)	Mean (mg kg ⁻¹)	% samples deficient
DTPA-Fe	5.48-42.63	15.44	0
DTPA-Mn	12.86-34.93	30.10	0
DTPA-Zn	0.10-3.64	0.97	25.71
DTPA-Cu	0.06-19.92	1.67	8.57

The content of DTPA-Fe in soils varied from 5.48 to 42.63 mg kg⁻¹ with an average value of 15.44 mg kg⁻¹. Considering the critical limits of 4.5 mg Fe kg⁻¹ soil as suggested by Lindsay and Norvell (1978), Fe contents of cashew orchard soils of Ratnagiri District are on the high side. The Mn situation in Cashew orchards is very similar to that of Fe. The DTPA-Mn content varied from 12.86 to 34.93 mg kg⁻¹ with mean value of 30.10 mg kg⁻¹. As per critical limits of 2.0 mg Mn kg⁻¹ soil as suggested by Lindsay and Norvell (1978), Cashew orchard soils of Ratnagiri District are exceptionally rich in Mn. Owing to the acidic nature of soils, high Fe and Mn values are typical in Ratnagiri District.

The DTPA-Zn contents of soils vary largely from one site to another. It varied from 0.10 to 3.64 mg kg⁻¹ with mean value of 0.97 mg kg⁻¹. Considering the critical limits of 0.6 mg Zn kg⁻¹ as suggested by Lindsay and Norvell (1978), 26 per cent of soil samples were deficient in available Zn. Similarly, the DTPA-Cu contents of soil vary largely, extremely very low and very high DTPA-Cu values were recorded. The DTPA-Cu contents of soils varied from 0.06 to 19.92 mg kg⁻¹ with an average value of 1.67 mg kg⁻¹. Considering the critical limits of 0.2 mg Cu kg⁻¹ soil as suggested by Lindsay and Norvell (1978), 9 per cent of soil samples were deficient in available Cu. The available micronutrient contents of these soils were in the order of Mn > Fe > Cu > Zn. High spatial variability in available micronutrient content of cashew orchards of Ratnagiri District might be due to differences in nutrient management approaches among cashew farmers.

Based on the analysis of micronutrient contents of cashew growing orchards of Ratnagiri District, they were classified in to three ratings as shown in Table 2. The frequency distribution of available micronutrients showed that, in most parts of the study area, the DTPA-Fe content is greater than 10 mg kg⁻¹, while, in a few places, the content varied between 5 and 10 mg kg⁻¹. In whole study

Table 2. Ratings for DTPA extractable micronutrient (mg kg⁻¹) soil test levels

Rating	DTPA extractable			
	Fe	Mn	Zn	Cu
Low	<5	<5	<0.5	<0.2
Medium	5-10	5-10	0.5-1.0	0.2-0.4
High	>10	>10	>1.0	>0.4

Source: www.gsfcilimited.com

area, DTPA-Mn content was higher than 10 mg kg⁻¹, revealing that available Fe and Mn content of all cashew orchards under study were sufficient to meet the crop demand for longer period. Ranges of variation in DTPA-Fe are wide as compared to DTPA-Mn, though all of the Fe and Mn values are on higher side. Though the contents of DTPA-Zn vary widely between high and low, only in a small part of the study area, DTPA-Zn content was < 0.5 mg kg⁻¹, while in other parts it varied from 0.5 to >1.0 mg kg⁻¹. On the basis of critical limits of available Zn, 18.6 per cent soil samples were deficient, 44.3 per cent samples were marginal and 37.1 per cent samples were sufficient in available Zn. Although the DTPA-Zn content of most cashew orchard soils (44.3% of soil samples) of Ratnagiri District were medium (>0.5-1.0 mg Zn kg⁻¹ soil), which may potentially be at risk to Zn deficiency in future, if no external sources are applied. As is the case for DTPA-Zn, the variation of soil DTPA-Cu is very wide. Of the 70 soil samples, 8.6 per cent of cashew orchard soils fall in deficient, 11.4 per cent occur in the marginal and 80.0 per cent of cashew orchard soils of Ratnagiri District fall in sufficient categories. Only in very few locations, Cu deficiencies have been noted. However, a great number of samples show alarmingly high contents of Cu (>1.0 mg kg⁻¹). The data clearly indicates the deficiency of a single micronutrient prevails in different cashew orchards of Ratnagiri District compared to the multiple micronutrient deficiencies. DTPA-Fe and DTPA-Mn have lower spatial variability compared to DTPA-Zn and DTPA-Cu, most likely due to no / limited application rates (Fig. 1).

Micronutrient status of cashew orchard soils was measured in terms of nutrient index (NI) values.

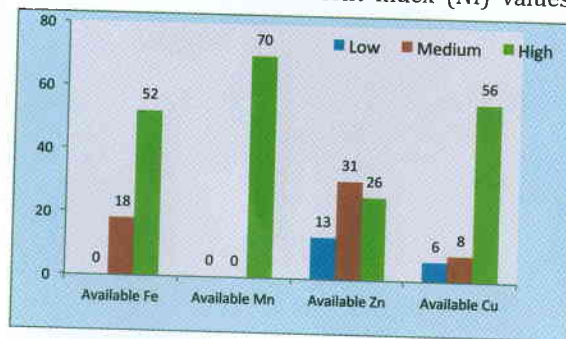


Fig. 1. Frequency distribution of micronutrient availability of cashew orchards of Ratnagiri District

Based on the soil test values for DTPA extractable micronutrients, soil samples were classified into three categories, low, medium and high. Using these categories, nutrient index was calculated as per the following equation.

$$\text{Nutrient index} = (\text{NL} \times 1 + \text{NM} \times 2 + \text{NH} \times 3) / \text{NT}$$

Where, NL, NM and NH are number of samples falling in low, medium and high classes of micronutrient status, respectively and NT is total number of samples analyzed for a given area.

The NI values for DTPA-Fe and DTPA-Mn were 3.00 and for DTPA-Zn and DTPA-Cu, the values were 2.18 and 2.71, respectively. Nutrient index value of <1.5 is taken as low, values between 1.5-2.5 indicates medium and >2.5 as higher fertility status of the given area (Motsara, 2002). Based on the nutrient index value, cashew orchard soils of Ratnagiri District were high in DTPA-Fe and DTPA-Mn contents while majority of soils were medium in DTPA-Zn and high in DTPA-Cu status.

The research findings obtained in the present study would help to improve our understanding of spatially variable availability of soil micronutrients and provide a quantitative basis for decision to develop site specific micronutrient management for high yield and quality of cashew in Konkan region of Maharashtra. Among the four micronutrients studied, cashew orchard soils are exceptionally rich in Fe and Mn and their deficiencies seem very unlikely. DTPA-Zn contents vary greatly, medium and high values being most common but response to Zn may be obtained. However, a great number of samples (80%) showed high contents of Cu. In few areas shortage of Cu is apparent. On an average, 25.7 per cent of soil samples were deficient in available Zn and 8.6 per cent in Cu. Except one or two combinations having Zn and Cu, multiple micronutrient deficiencies are not noticeable. Among the micronutrients, the deficiency of Zn and Cu are of major concern and soils require application of Zn fertilizers / foliar spray to maximize the nut yield and improve the quality of cashew.

PROGRAMMES ORGANIZED

Interactive Meeting of Entomologists

A meeting of entomologists of All India Coordinated Research Project (AICRP) on Cashew and entomologists from ICAR-DCR was organised on 20 August 2015 at ICAR-DCR, Puttur under the Chairmanship of Prof. P.L. Saroj, Director, ICAR-DCR to finalize the treatments for management of tea mosquito bug (TMB) and cashew stem and root borer (CSRB) along with inclusion of new generation insecticides. Dr. G.S. Mohana, Scientist In-charge, Project Coordinator Cell welcomed the participants and briefed about the objective of the meeting. The Chairman solicited response from each participant regarding constraints faced while managing TMB or CSRB along with information on new pests if any, in their respective Centres. He also suggested that under Tribal Sub Plan (TSP), the demonstration on plant protection measures should also be taken up by the centres.

The deliberations addressed current and emerging insect pests and pest management approaches at each centre of AICRP-Cashew. The treatments viz., 1) Thiamethoxam (0.1 and 0.2 ml/L), 2) Carbosulfan (2 ml/L), 3) Buprofezin (2 ml/L), 4) *Beauveria bassiana* WP (1 g/L),



Interactive meeting of Entomologists in progress

5) *Beauveria bassiana* WP (5 g/L), 6) L-cyhalothrin (0.6 ml/L) and 7) Untreated check for the management of TMB, and 1) Fipronil swabbing - 2 ml/L, 2) Neem oil swabbing 5% suspension, 3) Imidachloprid - Swabbing and drenching - 2 ml/L, 4) Chlorpyrifos (10 ml/L), 5) Treated check (only removal of grubs) and 6) Untreated check for the management of CSRB were finalized after thorough discussion. These treatments need to be followed by each AICRP center in addition to the standard check insecticides recommended for the region. The meeting came to end with vote of thanks by Dr. K. Vanitha, Scientist (Agril. Entomology), ICAR-DCR, Puttur.

Annual Group Meeting of AICRP on Cashew: 2015

The Annual Group Meeting of Scientists of All India Coordinated Research Project (AICRP) on Cashew: 2015 was held during 2-4 November 2015 at Regional Fruit Research Station, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (Dr. BSKKV), Vengurle, Maharashtra. At the outset, Dr. U.V. Mahadkar, Director of Research, welcomed the delegates and mentioned the initiation of research work on cashew at Vengurla in Maharashtra since 1957. He said that cashew fetches a substantial foreign exchange among the horticultural crop exports and stressed the need to improve the techniques of cashew cultivation for higher productivity in order to fulfill the demand of the cashew industry.

The Annual Group Meeting was inaugurated by Shri Deepakji Kesarkar, Hon'ble Minister for Rural Development and Finance, Maharashtra. On this occasion, Dr. K.E. Lawande, Former Vice Chancellor, Dr. BSKKV, Dapoli, Maharashtra and Mr. Nagaraja, Managing Director, Karnataka Cashew Development Corporation (KCDC), Karnataka were also present as Guests of Honour. Dr. K.E. Lawande, in his address mentioned that there is an ample scope to increase the productivity to compete with the countries like Vietnam and Nigeria for which future line of research should be focused on development of compact and dwarf high yielding varieties, standardization of package of practices to gear up the yield potential by intercropping, INM, IPM and IDM techniques etc. Prof. P.L. Saroj, Director, ICAR-DCR and Project Coordinator (Cashew), presented the salient results obtained in field trials of different centres of AICRP-Cashew. Dr. G.S. Mohana, Scientist In-charge, Project Coordinator Cell presented the Action Taken Report on decisions of the previous year.

The research progress and results obtained in various experiments at different AICRP-Cashew centres viz., Bapatla, Bhubaneswar, Chintamani, Darisai, Jagdalpur, Jhargram, Madakkathara, Paria, Pilicode, Vengurle, Vridhachalam, Arabhavi and Tura were presented by the scientists of the respective disciplines from each centre. The presentations were made in three main sessions viz., Crop Improvement chaired by Mr. Nagaraja, Managing Director, KCDC; Crop Management chaired by Dr. K. E. Lawande, Former Vice Chancellor, Dr. BSKKV, Dapoli and Crop Protection chaired by Dr. A. Krishnamoorthy, Former Principal Scientist, ICAR-IIHR, Bengaluru.

The Plenary session was chaired by Dr. T. Janakiram, ADG (Hort.I), ICAR, New Delhi. He stressed upon the need for development of varieties with short harvesting duration and screening of apples for tannins and other pigments. He further mentioned the need for large scale demonstrations of proven technologies developed at each centre. Dr. U.V. Mahadkar, stressed that the post harvest processing should be given importance for better utilization of cashew apple.

A session on Interaction of development departments and research centres was also organised which was chaired by Dr. S.A. Chavan, Associate Dean, College of Agriculture, Dr. BSKKV. Farmers inquired about various issues such as CSRB attack in established cashew orchards and cultivation practices for cashew in changing climate scenario. Shri Venkatesh N. Hubballi, Director, DCCD, Kochi; Officers from State Agricultural departments; scientists of Dr. BSKKV and Dr. B.R. Salvi, ADR, RFRS, Vengurle were present and discussed the issues related to government schemes for promotion of cashew, subsidies and excise policy for cashew wine and fermented products.

World Soil Day

ICAR-Directorate of Cashew Research, Puttur organized World Soil Day on 5 December 2015. A total of 213 farmers from Dakshina Kannada District, Karnataka attended the function. Smt. T. Shakunthala Shetty, Hon'ble Member of Legislative Assembly, Puttur, Karnataka inaugurated the function. In her address, she appreciated the efforts made by ICAR-DCR for improvement of cashew production. She congratulated the Directorate for developing new technologies in cashew production and urged the authorities to deliver the new technologies to farmers through the



Dignitaries on the dias

extension agencies of State Government and Krishi Vigyan Kendras. Prof. P.L. Saroj, Director, ICAR-DCR, in his introductory remarks, informed the gathering about the importance of soil health and nutrient management for sustainable crop production. He urged the farmers to test the soil and use fertilizers as per the recommendation in order to ensure optimum nutrient application. He also briefed about the research activities of the institute and technologies developed.

Shri Anna Vinayachandra, Former M.L.C., Karnataka Legislative Council, Sullia, was the Guest of Honour. In his speech, he highlighted the importance of soil by quoting examples appeared in national news papers. Dr. T.R. Rupa, Principal Scientist (Soil Science) gave a talk on Soil sampling, testing and fertilizer recommendation for better soil health and high yields. She made the participants aware about the importance of soil sampling, methodology, interpretation of soil testing data, soil health indicators, soil nutrition, soil degradation, management strategies etc. She also highlighted the importance of world soil day and soil health cards to enable sustainable agricultural production.

Earlier, Dr. M.G. Nayak, Principal Scientist, Puttur welcomed the dignitaries and participants. On this occasion, soil health cards developed at Soil Science laboratory, ICAR-DCR were distributed to 20 cashew farmers. There was a farmer-scientist interaction,



Distribution of Soil Health Cards to farmers by Shri Anna Vinayachandra, Former M.L.C., Karnataka Legislative Council, Sullia

in which scientists clarified the doubts raised by the farmers on soil health and plant nutrition. The function ended with vote of thanks by Dr. G.S. Mohana, Senior Scientist.

राजभाषा हिन्दी कार्यान्वयन

इस छः माही में काजू अनुसंधान निदेशालय में हिन्दी कार्यान्वयन समिति की दो छमाही बैठकों का आयोजन किया गया। बैठकों में कार्यालय में हो रही हिन्दी गतिविधियों के बारे में विचार-विमर्श कर आवश्यक सूचना समिति के 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 पुन्नूर नगर राजभाषा कार्यान्वयन समिति की 28 वीं अर्ध वार्षिक बैठक का आयोजन किया गया, जिसमें विभिन्न सदस्य कार्यालयों के प्रधान उपस्थित थे। उसी दिन सुबह से दोपहर तक सदस्यों के लिए हिन्दी कार्यशाला का आयोजन किया गया। कार्यशाला में निदेशालय के सभी कर्मचारियों सहित विभिन्न सदस्य कार्यालयों से 40 कर्मचारियों ने भाग लिया।



निदेशक द्वारा दीप प्रज्वलन कर कार्यशाला का उद्घाटन

MEETINGS

Institute Management Committee (IMC) Meeting

The 43rd meeting of the IMC was held on 13 October 2015 under the Chairmanship of Prof. P.L. Saroj, Director, ICAR-DCR. The Chairman informed the members about research and achievements

of the Directorate. Various administrative and financial matters were discussed and finalized. Dr. Ramanathan, Principal Scientist, ICAR-CTCRI, Thiruvananthapuram; Ms. Rekha, Senior Assistant Director (Hort.), Directorate of Horticulture,



IMC meeting in progress

Govt. of Karnataka, Bengaluru; Dr. Sudha Mysore, Principal Scientist, ICAR-IIHR, Bengaluru; Dr. Yogisha, Deputy Director of Horticulture; Shri A. Padmanabhan, Special Officer (Cashew), Kollam, Kerala; Smt. Sharda R. Rai (Non-Official Member), Mogarodi, Belthangadi Tq., Karnataka; Dr. T.N. Raviprasad, Principal Scientist, ICAR-DCR; Dr. M.G. Nayak, Principal Scientist, ICAR-DCR; Shri R. Arulmony AF&AO In-charge and Shri K.M. Lingaraja, Administrative Officer In-charge, ICAR-DCR attended the meeting.

Institute Research Committee (IRC) Meeting

The 28th IRC meeting of ICAR-DCR was held on 20 October 2015 under the Chairmanship of Prof. P. L. Saroj, Director, ICAR-DCR. Dr. G.S. Mohana, Senior Scientist and Member Secretary welcomed the chairman and scientists. Prof. P.L. Saroj, in his introductory remarks signified the importance of IRC meeting and the need for in detail discussions to be made in research projects. He also expressed his concern about better management of all field experiments, timely submission of RPPs and development of research database in consultation with PME cell. Dr. Mohana, G.S., presented the Recommendations and Action Taken Report of the 27th IRC meeting. The progress of various research projects along with new projects under Crop



IRC meeting in progress

Improvement, Crop Management, Crop Protection, Post Harvest Technology and Transfer of Technology were presented by the scientists of ICAR-DCR. The results were discussed in detail and technical programme of all the projects was finalized.

Vigilance Awareness Week

ICAR-Directorate of Cashew Research, Puttur observed the Vigilance Awareness Week - 2015 from 26 October to 31 October 2015 with the theme for this year specified by Central Vigilance Commission 'Preventive Vigilance as a tool of Good Governance'. The awareness programme commenced with the pledge administered to the staff of the Directorate by Prof. P.L. Saroj, Director, ICAR-DCR in Hindi and Dr. T.N. Raviprasad, Principal Scientist in Kannada at 11.00 AM on 26.10.2015. Prior to that the programme was started with ICAR song and Dr. Babli Mog, Scientist, ICAR-DCR welcomed the gathering. The Vigilance Officer of the Directorate, Dr. T.R. Rupa, Principal Scientist, briefed about the need and importance of observance of vigilance awareness week and various tools of preventive vigilance for good and effective governance. The messages of Hon'ble President of India, Shri Pranab Mukherjee; Hon'ble Vice-President of India, Shri M. Hamid Ansari and Hon'ble Prime Minister of India, Shri Narendra Modi were also read out by the Vigilance Officer for the benefit of the staff. During the entire week, various posters and banners on anti-corruption aspects were displayed at all prime locations in the office premises in order to create awareness among the staff and public.

The valedictory function of the week long programme was held on 31 October 2015 wherein,



The valedictory function of the vigilance awareness week in progress

Shri Betta P. Ishwara Bhat, Advocate, Puttur, was the Chief Guest. Prof. P.L. Saroj, Director, ICAR-DCR presided over the function. The function was started with ICAR song followed by welcome address by Dr. T.R. Rupa, Principal Scientist and Vigilance Officer, ICAR-DCR. In the opening remarks, Prof. P.L. Saroj, Director, ICAR-DCR, briefed about the importance of observance of vigilance awareness week in bringing about transparency in government organizations. He stressed that preventive vigilance measures should be taken to curb corruption so that the government organizations can run smoothly and for that, it is imperative for the people to have ample awareness. The Chief Guest of the function, Shri Ishwara Bhat delivered a talk on 'Preventive Vigilance as a tool of Good Governance'. He highlighted the importance of preventive vigilance measures and characteristics of good governance. He stressed that corruption is a disease and a social evil and has an

adverse effect on the development of a nation. He explained that corruption cannot be removed from the society but involving latest technological initiatives like e-tendering, e-procurement, e-payment etc at various levels of functioning will ensure efficiency and transparency and facilitate in minimizing corruption. He spoke in detail about the prevention of corruption act, 1988 which is an act of the Parliament of India enacted to combat corruption in government agencies and public sector businesses in India. The programme was concluded with vote of thanks by Dr. T.N. Raviprasad, Principal Scientist, ICAR-DCR.

Institute Joint Staff Council (IJSC) Meeting

The IJSC met twice on 30 September 2015 and 30 December 2015 at quarterly intervals during the period under report to discuss about staff welfare activities. All issues related to staff welfare were addressed.

TRIBAL SUB-PLAN

Area Expansion under Tribal Sub-Plan (TSP)

A survey has been made in various tribal regions viz., Heggada Devana Kote, Mysore District; Yelandoor, Vodeyar Palya, M.M. Hills and B.R. Hills region, Chamarajanagar District; and various taluks of Dakshina Kannada District in Karnataka and Kasaragod District of Kerala by the TSP team of ICAR-DCR for identification of farmers, suitable plots and establishment of new model orchards of cashew. Under TSP programme, 26 new Frontline Demonstration plots were established in tribal farmer fields of Dakshina Kannada District of Karnataka and Kasaragod District of Kerala with high yielding recommended cashew varieties viz.,

Bhaskara, Ullal-3, NRCC Sel-2 and VRI-3. The plots were monitored regularly by the team of Scientists of this Directorate and technical advice was given as and when required.

Awareness Campaign on TSP

An awareness campaign on TSP was organized at Maniampara Village in Kasaragod District of Kerala on 15 November 2015 jointly by KVK, Kasaragod and ICAR-DCR, Puttur in which Dr. M.G. Nayak, Principal Scientist (Hort.), ICAR-DCR delivered a talk on cashew cultivation and briefed about the objectives of the TSP and technical and financial support available to tribal cashew farmers under the scheme.

MERA GAON MERA GAURAV

Mera Gaon Mera Gaurav programme an initiative of ICAR as per the directives from the Govt. of India has been implemented in pre-identified villages. Baseline information from 10 villages viz., Jalsoor, Aletti, Nallur Kembraje, Amara Mudnoor,

Kanakamajalu, Balnadu, Irde Bettampadi, Arlapadavu, Nidpalli and Aaryapu of Dakshina Kannada District of Karnataka were collected. The Mera Gaon Mera Gaurav team provided information to the farmers on technical and other related aspects.

TRAININGS ORGANIZED

Training on Integrated Pest Management in Cashew

A two days training programme on Integrated Pest Management in Cashew was organized at ICAR-

DCR during 8-9 December 2015. A total of 30 participants from Maharashtra who are practicing organic farming of cashew participated in this

training programme. Achal Industries, Mangaluru, Karnataka sponsored this training. Inaugurating the programme, Dr. P. Chowdappa, Director, ICAR-CPCRI, Kasaragod highlighted the horticulture scenario in India. He stressed on the motto 'lose the less' so that loss from pest and disease attack can be minimized to the most possible extent. He also spoke on eco-friendly pest management strategies in organic farming of cashew. Prof. P.L. Saroj, Director, ICAR-DCR, in his address, briefed about the research accomplishments and future focus on various research and development programmes in cashew sector. He stressed upon the need for proper cultivation practices and various approaches to crop protection in organic agriculture in general and cashew in particular. Earlier, on this occasion, two



A view of the inaugural programme

publications viz., training manual on Integrated Pest Management in Cashew and e-manual on Integrated Pest Management in Cashew were released.

TRANSFER OF TECHNOLOGY

Exhibitions / Demonstrations

- 3-6 October 2015 - Krishi Mela organized at University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka. This Directorate put up stall to display various cashew production and processing technologies to the farmers.
- 16-17 December 2015 - Krishi Mela organized at Sri Kukke Subrahmanya temple, Kukke Subrahmanya, Karnataka. This Directorate put up stall to display various cashew production and processing technologies to the farmers.

Monitoring of Demonstration Plots

The demonstration plots already established in farmers' fields at Puttur, Sullia and Bantwal taluks of Dakshina Kannada District of Karnataka were monitored regularly by the Scientists of this

Directorate during the period and technical advice was given as and when required.

Advisory Visits / Consultancy

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

Exposure Visit to ICAR-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 ICAR-DCR.

VISITORS

Visitors Category	Organization	No. of Participants	Date of Visit
Farm Women	Department of Horticulture, Mandya, Karnataka.	50	25 July 2015
Students	University of Horticultural Sciences, Bagalkot, Karnataka.	16	3 August 2015
Students	College of Horticulture, Mysore, Karnataka.	60	16 November 2015
Students	College of Horticulture, Bidar, Karnataka.	60	16 November 2015
Officials	Goa State Dept. of Water Management, Goa.	15	16 November 2015
Students	College of Horticulture, Kolar, Karnataka.	55	17 November 2015
Farmers	Achal Industries, Maharashtra.	30	8 December 2015

Visit of Dignitaries

Name	Address	Date of Visit
Dr. O.P.S. Khola	Principal Scientist and Head, ICAR-Indian Institute of Soil and Water Conservation Regional Centre, Udthagamandalam, Tamil Nadu.	7 August 2015
A.M. Annaiah, IFS	Additional Principal Chief Conservator of Forests (Rtd), Bengaluru, Karnataka.	29 September 2015
Dr. P. Chowdappa	Director, ICAR-Central Plantation Crops Research Institute, Kasaragod, Kerala.	8 December 2015
Smt. T. Shakunthala Shetty	Hon'ble Member of Legislative Assembly, Puttur, Karnataka.	8 December 2015
Dr. S.K. Pandey	Former Director, ICAR-Central Potato Research Institute, Shimla, Himachal Pradesh.	29 December 2015

Radio Talks / TV Programmes

Dr. M.G. Nayak	High Density Planting of Cashew by DD Chandana (Kannada) TV channel and Krishi Darshan Programme.	9 October 2015
Dr. T.N. Raviprasad	Management of Tea Mosquito Bug using conventional and biological methods by DD Chandana (Kannada) TV channel.	9 October 2015
Dr. T.N. Raviprasad	Non insecticidal approaches for pest management by All India Radio, Mangaluru, Karnataka.	29 December 2015

Supply of Planting Material

Around 1,00,000 cashew grafts of high yielding and recommended varieties were produced and supplied to the farmers and developmental agencies.

Technical Publications

- Sudharitha geru besaya - (Kannada) (2015) by M.G. Nayak, P.S. Bhat and Sajeev, M.V., ICAR-DCR, Puttur, Karnataka.

- Cashew cultivation practices (2015) by P.L. Saroj, M.G. Nayak, T.N. Raviprasad, T.R. Rupa and Sajeev, M.V., ICAR-DCR, Puttur, Karnataka.
- Insect pests of cashew and their management - Technical Bulletin No. 27 (2015) by K. Vanitha and P.L. Saroj, ICAR-DCR, Puttur, Karnataka.
- Minor pests of cashew in the Konkan region (2015) by V.K. Zote, R.C. Gajbhiye, B.R. Salvi and S.P. Salvi, RFRS, Vengurle, Maharashtra.

STAFF NEWS

Appointment / Transfer

- Ms. Prabha Susan Philip - Joined as Scientist (Soil Science) on 8 October 2015.
- Dr. J.D. Adiga, Senior Scientist (Horticulture-Fruit Science) - Relieved of his duties on 27 October 2015 to join as Professor of Fruit Science at University of Horticulture Sciences, Bagalkot, Karnataka with retention of his lien for a period

of two years from ICAR-DCR w.e.f. 27 October 2015.

- Shri V. Raghuraman - Joined as Administrative Officer on 5 November 2015.
- Dr. Ramkesh Meena, Scientist (Horticulture-Fruit Science) - Relieved of his duties on 3 December 2015 on his transfer to ICAR-Central Institute of Arid Horticulture, Bikaner, Rajasthan.

Project Work

- This Directorate imparts short term training to M.Sc. students as a part of project work for fulfilling their M.Sc. degree. During the period under report, two students have undertaken the project work in Soil Science Section as detailed below:

Name of Student	Organization	Project Title	Project Duration	Project Guide
Ms. Adhithi, N.	Vivekananda College of Arts, Science and Commerce, Puttur, D.K., Karnataka (Mangalore University).	Available Nitrogen and Potassium Status in Cashew Growing Soils of Odisha.	16 June - 15 July 2015.	Dr. T. R. Rupa, Principal Scientist (Soil Science), ICAR-DCR.
Ms. Shashirekha, P.K.				

Cashew Statistics in India : 2014-15

State	Area ('000 ha)	Production ('000 tonnes)	Productivity (kg/ha)
Kerala	84.53	80.00	946
Karnataka	124.71	80.50	645
Goa	58.17	32.00	550
Maharashtra	186.20	235.20	1262
Tamil Nadu	140.42	67.00	478
Andhra Pradesh	185.45	100.00	539
Odisha	180.41	85.50	474
West Bengal	11.36	13.00	1096
Jharkhand	14.83	4.50	303
Chhattisgarh	13.70	8.50	620
Gujarat	7.22	8.50	1177
Puducherry	5.00	3.00	600
Assam	1.05	0.57	543
Tripura	4.25	2.50	588
Meghalaya	8.50	4.50	529
Manipur	0.90	0.15	167
Nagaland	0.50	0.20	400
Total	1027.20	725.42	706

Source: DCCD, Kochi

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