



संवादपत्र NEWSLETTER

भाकृअनुप - केंद्रीय तटीय कृषि अनुसंधान संस्थान
(भारतीय कृषि अनुसंधान परिषद)

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(Indian Council of Agricultural Research)



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किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

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Flood Impact Assessment

- Flood-impact studies on agriculture, horticulture and animal husbandry in Kerala state.

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Director's Desk

Climate change has a direct link with increased number of incidents of floods, storms, droughts and heat waves globally. Sectors like agriculture and tourism which are closely related to climate are facing a great burden by natural hazards, as reported by Intergovernmental Panel on Climate Change, 2012. Recently, Kerala state faced severe flood due to heavy rainfall and landslides during August 2018, leading to a major disaster. The torrential rains since 10th May 2018 in sporadic places and continuous rains during 09th-18th August accumulated huge rain water in several dams. Finally, thirty-five out of the fifty-four dams within the state were opened for the first time in history. The river basin areas especially Periyar, Pamba and Chalakkudy were submerged with released water from the dams and also heavy downpour. This caused heavy loss to Kerala's agriculture which could impact the state's food production and livelihood of millions of farmers.

Towards contributing to the flood relief efforts and analysing the impact of the disaster, a multidisciplinary team of experts from ICAR-CCARI, Goa in collaboration with ICAR-KVK (Ernakulam) of ICAR-CMFRI, Kochi visited flood-affected areas of the Ernakulam during 1st to 5th September 2018. One team comprised of experts from horticulture and natural resource management disciplines while the second team included experts from veterinary science.

According to the preliminary assessment, standing crops of rice, tapioca, vegetables, nutmeg, black pepper and banana were affected severely, whereas, coconut, bamboo and areca plants were least affected by the flood. Devastating floods had brought a wide range of animal health and management problems, from feed and fodder shortage to infection, drop in milk yield and loss of hygienic condition. Huge silt deposition had also led to poor drainage in the fields.

After both the teams visited many flood hit villages, interacted with farmers, they also conducted animal health camps in 15 places, benefiting around 650 farmers and 200 animals. Important medicines worth rupees one lakh were also distributed to the farmers who could not bring their animals to health camp and indirectly around 5,000 animals were benefited from the medicines supplied through health camps. Plans for rejuvenation of pasture and fodder production, required to feed the livestock and the strategies to harness the silt deposits for benefit of ensuing crops were also recommended.

Chakurkar
DIRECTOR

RESEARCH HIGHLIGHTS

Soil quality assessment under long-term nutrient management in rice in the coastal region of India

(G.R. Mahajan, B.L. Manjunath, Bappa Das, Paramesha V.)

A study was conducted to evaluate the influence of nutrient management practices like farmyard manure (FYM @ 10 t ha⁻¹), vermicompost (VC @ 5 t ha⁻¹), fresh biomass of *Glyricidia* (*Glyricidia maculata*) and Eupatorium (*Chromolaena adenophorum*) (GE each @ 5 t ha⁻¹), paddy straw (dry biomass) and water hyacinth (PW each @ 5 t ha⁻¹), fresh biomass of Dhaincha (*Sesbania rostrata*) (SR @ 10 t ha⁻¹) recommended dose of fertilizers (RDF of N:P2O5:K2O @ 100:50:50 kg ha⁻¹), and control (no application of nutrients) in rice on soil quality (SQ) using soil quality indices (SQIs). The nutrient management practices

affected the soil properties, grain yield and sustainable yield index (SYI) significantly. Phosphatase activity, soil organic carbon, microbial biomass carbon, soil available phosphorus and nitrogen were selected for minimum dataset using the principal component and correlation analysis. The effectiveness of the nutrient management practices to improve the SQ was observed as FYM (0.99) > PW (0.85) > RDF-NPK (0.77) > GE (0.74) = VC (0.75) > SR (0.72) > control (0.68). The FYM improved the SQ by 28.5% and 45.5% over RDF-NPK and control, respectively.

Microbial and enzyme activities of the salt affected soils of the coastal region of India

(G.R. Mahajan, Bappa Das, Ashwini Desai, Dayesh Murgaokar, Rahul M. Kulkarni)

The study was aimed to investigate the effects of salinity with low soil pH (acidic soil reaction) on soil microbial and enzyme activities of the salt affected soils (SAS) of the coastal region of India. Exchangeable Na was the dominant cation. Soil salinity did not have any impact on the soil organic carbon (SOC) content. Soil microbial

activity like microbial biomass carbon (MBC), microbial biomass nitrogen (MBN), basal soil respiration (BSR) and other enzymatic activities decreased significantly with increasing salinity, depicted by the increase in the metabolic quotient (qCO²).

Economics for excavation and lining of farm pond in laterite soils

(Sujeet Desai and G.R. Mahajan)

The economics for excavation and lining of large farm pond (1400 m³ with 2.5 m depth) in laterite soils was worked out. The excavation cost for 1400 m³ volume as per the standard rates was Rs. 2.52 lakhs @ Rs.180/m³. Cost of garden soil required for smoothening of sides and bottom of the pond was Rs. 27000 @ Rs. 900/m³. The cost of silpaulin film required to line the pond was Rs. 1.57 lakhs. The cost of labour mainly involved in smoothening the side slopes and bottom, laying of the paddy straw, excavation of trench around the pond, lining of the pond with silpaulin film and minor cement works and back filling



Rain water harvesting pond

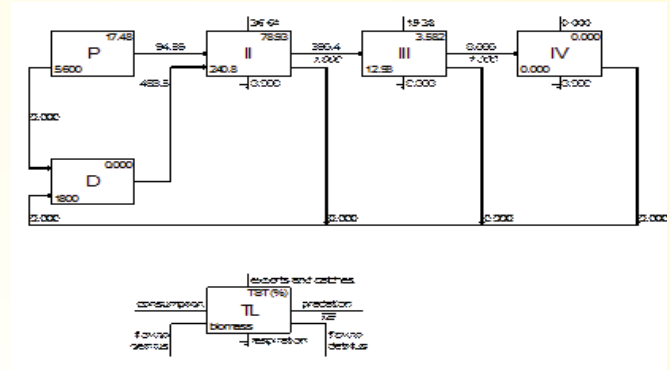
worked out to be Rs. 35,000 @ Rs. 350/day for 98 man days. Thus the total cost involved in construction of farm pond including all the works

was Rs. 4.7 lakhs, which could harvest and store 14 lakh litres of rain water, for irrigation in ensuing summer.

Trophic modeling of IFS system using mass-balance models

V. Paramesh and G. B. Sreekanth

A mass-balance trophic model has been constructed for a lowland integrated farming system to understand the trophic flows, to measure the ecosystem indices and flow characteristics, and to understand the stage of the ecosystem development, maturity, and stability. Thirteen functional groups were identified in the ecosystem model starting from detritus (trophic level=1) to large ruminants (trophic level=3). The trophic network has moderate total system throughput ($1134.9 \text{ Kg N ha}^{-1} \text{ year}^{-1}$), higher dimensions for recycling capacity (Finn's cycling index: 12.7%), system omnivory index (0.36), and relative ascendancy (44.6%). This trophic model is the first agro-ecosystem model for integrated



Trophic flow diagram

farming systems along Indian coast. The model would also be useful for simulating the variations in trophic flows and biomass for functional groups of the system.

Germplasm collection and conservation in rice

K. K. Manohara

Exploration for rice germplasm collection till date has resulted in the collection of 185 accessions comprising of mostly landraces and few wild relatives. Both North and South Goa districts in Goa state and Uttara Kannada and Shimoga districts in Karnataka state were covered during the survey with special emphasis on collecting salinity and submergence tolerant materials. During Kharif 2018, all the 185 accessions were phenotyped for 25 agro-morphological and 12 yield and its attributing traits to assess the extent of variability present in



Field view of rice germplasm

the germplasm collection.

Development of bacterial wilt resistant brinjal varieties

R. Ramesh and M. Thangam

Four bacterial wilt resistant brinjal varieties viz. Goa Brinjal-1, Goa Brinjal-2, Goa Brinjal-3 and Goa Brinjal-4 were developed and evaluated in multiple locations of Goa. The variety release proposal was submitted to Goa Government for the release of the above varieties in the state of

Goa. State seed sub-committee for agriculture and horticultural crops, Govt. of Goa approved these varieties for the state of Goa vide letter No. 3/CIN/Crops/62/SSSC for Agri. & Hort. Crops/2018-19/D.Agr dt. July 12, 2018.

Parameters	Goa Brinjal-1	Goa Brinjal-2	Goa Brinjal-3	Goa Brinjal-4
Wilt (%)	0.0	0.0	3.33	3.33
Av. yield (t/ha)	27.5	20.5	15.0	25.0
Fruit colour	Purple	Light purple	Purple	Purple
Fruit shape	Oval	Oblong	Oval	Long
Av. fruit size (l x b in cm)	8 x 5	7.7 x 5.4	6.4 x 5.2	10.7 x 4.2
Av. fruit weight (kg)	0.150	0.136	0.079	0.100
No. of fruits/plant	9-10	10-11	7-8	12-13
Consumer preference	High	High	High	High

Photographs



Discrimination of tall and dwarf stature Areca seedlings

V. Arunachalam

Areca/betel nut palm (*Areca catechu* L.) is an important plantation crop of coastal humid tropics. Dwarf mutant of areca "Hirehalli Dwarf" is beneficial in overcoming the problems of climbing difficulties in tall statured palms. As part of ICAR- AICRP (Palms) Goa centre, a nucleus seed garden was developed to generate and augment elite mother palms of dwarf stature. Open pollinated progenies of Hirehalli Dwarf at Goa are found segregating for tall, dwarf and intermediate stature. An experiment was taken

up to discriminate the areca seedlings using eight morphometric traits and foliar glucose content. Six indices were worked out based on eight traits as the ratio between two or more of them. Petiole length along with six indices based on eight morphometric traits and quantity of glucose in leaves were found to discriminate the tall seedlings from dwarf seedlings at 91% accuracy. This finding is useful to identify the dwarf seedlings at early stage of six months after sowing.

Microbial load of organic manures and organic manure mixture

(Maneesha S.R. and R. Ramesh)

A fortified organic manure mixture was prepared with definite composition of organic nutrient sources like cow manure, goat manure, poultry manure, ash and inorganic nutrient sources like rock phosphate, zinc sulphate, boron and dolomite. The physical, chemical properties and nutrient content of the individual components and the mixtures were analyzed. Total microbial population of the individual components and the mixture were assessed by plate culture in

Organic manures	After 48 hours
Cow manure	3.69×10^9
Goat manure	3.07×10^9
Poultry manure	1.20×10^9
Ash	6.00×10^8
Coir pith	6.6×10^8
Vermicompost	4.85×10^8
Organic mixture	5.95×10^8
Fortified organic mixture	7.55×10^8

nutrient agar media. The fortified organic manure mixture containing manures, microbes and inorganic chemicals, had also maintained

the highest population count (7.55×10^8) showing the compatibility of microbes with the inorganic source of nutrients.

Evaluation of roosting plants with food baited traps for the management of cucurbit fruit fly *Zeugodacus cucurbitae*

Maruthadurai R.

Adult melon flies have a special behaviour of sheltering and roosting in non-host plants bordering host crops. The aim of this study was to evaluate the roosting plants with food baited traps for the management of cucurbit fruit fly *Zeugodacus cucurbitae* in cucumber. The roosting plants viz., maize, sorghum, castor, red gram, amaranth, tulsi, and tapioca were raised in plastic pots and kept on all the borders of cucumber.

Banana and jaggary based food baited traps were prepared and kept at the centre of the each roosting plant. Attracted fruit flies were collected at weekly interval. Food bait was changed weekly once. Among the treatments, castor + food bait attracted maximum number of fruit flies (18.66 adult flies/trap/week). In all the treatments, more females were attracted when compared to the males.



Roosting plants with food bait traps

Herbal extract blended pineapple RTS

Maneesha S.R.

Five different types of herbal fruit beverages were prepared by blending aqueous extracts of herbs (cumin, mint, basil, ginger and lemon grass) at various concentrations to the pineapple Ready To Serve (RTS). RTS blended with 5% cumin extract had the highest TSS (13.2° Brix) and acidity (0.20%). Sensory evaluation results showed that blending pineapple RTS with lemon grass extract (5 and 10%) had the highest overall acceptance. Blending of pineapple RTS with lemon grass or cumin extracts can form a preferable novel pineapple beverage with good physicochemical parameters and consumer acceptance.



Blended pineapple RTS

FRONT LINE DEMONSTRATION

Front Line Demonstration on upland rice variety Sahbhagi dhan

K. K. Manohara

Front Line Demonstration on high yielding drought tolerant rice variety, Sahbhagi dhan suitable for rainfed upland areas was undertaken at Yedda wada in Cotigaon village of South Goa district. Thirteen quintal of seeds were distributed to the farmers of the village and were briefed about the advantages of growing Sahbhagi dhan over the traditionally grown varieties like Jaya, Karjat-3 and Jyothi in terms of yield, taste and its suitability for milling. More than 26 ha of area distributed among 86 farmers was covered under Front Line Demonstration. Most of the farmers are small and marginal farmers with average land holding of 0.1 to 0.2 acre of land. The performance of the varieties was



Field view of FLD at Cotigaon

recorded. On an average Sahbhagi dhan recorded grain yield 5.0 t/ha whereas Karjat-3, Jyothi and Jaya recorded 4.2 t/ha, 3.2 t/ha and 4.0 t/ha respectively.

TECHNOLOGIES PROPOSED FOR COMMERCIALIZATION

Goa Bio-1: Bio-formulation for plant growth promotion of paddy under salt affected soils of coastal regions

R. Ramesh and G.R. Mahajan

Bio-formulation of salt tolerant, plant growth promoting bacterium (*Bacillus methylotrophicus* STC-4) is recommended for growth promotion of paddy cultivated in the saline areas of coastal regions. The population of bacterium in the formulation is $>10^8$ CFUg⁻¹ with the shelf life of at

least 18 months. Benefits of using Goa Bio-1 include, better nutrient mineralization, alleviation of salinity stress, better crop establishment, improved plant growth parameters, yield and soil biological activity.

Goa Bio-2: Bio-formulation for plant health management of field, vegetable crops and black pepper in coastal regions

R. Ramesh

Bio-formulation of plant growth promoting bacterium (*Bacillus methylotrophicus* RCh6-2b) is recommended for plant health management in coastal regions of the country. The population of bacterium in the formulation is $>10^8$ CFUg⁻¹ with the shelf life of at least 18 months. The formulation is recommended for vegetable crops (brinjal, tomato, chilli and cucumber), black

pepper and fruit and plantation crop nurseries. Benefits of using Goa Bio-2 include, improved plant growth parameters, plant health and yield, reduced soil borne disease incidences in brinjal, chilli and black pepper. This ecofriendly input can form an important component in IPM strategy especially in organic farming.

NEW INITIATIVES

Establishment of six Automatic Weather Station (AWS) in Goa for weather monitoring and forecast

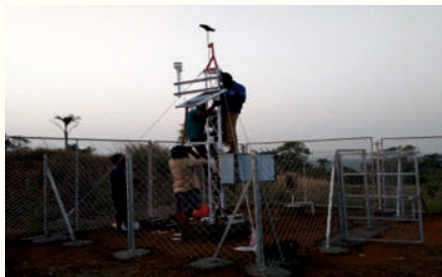
M. Thangam

Automatic Weather Stations (AWS) were established under the RKVY funded project on 'Development of comprehensive agriculture e-portal for Goa' to monitor important weather variables continuously. Parameters viz., temperature, relative humidity, rainfall, wind speed and direction, sun duration, solar radiation, soil temperature and moisture at 5, 20 and 50cm depths are being recorded at three minutes interval from six remote locations of Goa. AWS have been established at Zonal Agricultural Farm, Pernem (AWS-1), ICAR-

CCARI, Old Goa (AWS-2), Govt. Agriculture Farm, Codar (AWS-3), Govt. Agriculture Farm, Kalay (AWS-4), DBCA, Sulcorna (AWS-5) and Govt. Agriculture Farm, Margao (AWS-6). The weather data are remotely sent to central server maintained at ICAR-CCARI, Old Goa through GPS/GPRS modem and are sorted for uploading in the e-portal for general use. Dr. M. Thangam, the nodal officer for all the AWS will be monitoring the data for current use as well as for using in forecasting purposes in future.



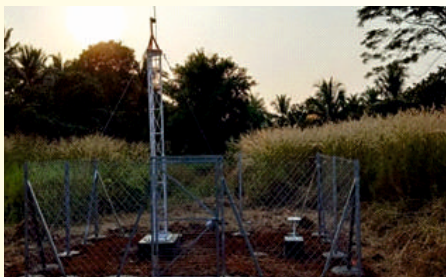
AWS 1 - PERNEM



AWS 2 - OLD GOA



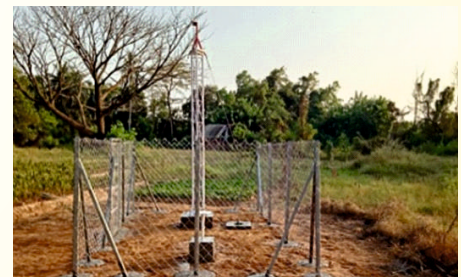
AWS 3 - CODAR



AWS 4 - KALAY



AWS 5 - SULCORNIA



AWS 6 - MARGAO

StationID	SensorName	LastUpdate
AWS 1 PERNEM	AT	2/22/2019 10:03:00 ...
AWS 1 PERNEM	ATAVG	2/22/2019 10:03:00 ...
AWS 1 PERNEM	ATMAX	2/22/2019 10:03:00 ...
AWS 1 PERNEM	ATMIN	2/22/2019 10:03:00 ...
AWS 1 PERNEM	BATT	2/22/2019 10:03:00 ...

Date/Time	AT	ATAVG	ATMAX	ATMIN	BATT	BEC20	BEC50	BEC50	RAIN	RH	SM20	SMS	SM50	SRAD	ST20	ST5	ST50	SUNDUR	AW
2/21/2019 3:00:00 PM	32.9	32.4	33.0	31.9	13.5	0.0	0.0	0.0	0.0	58	8.7	9.0	6.1	390	28.0	28.6	27.8		
2/21/2019 4:00:00 PM	30.6	31.6	32.8	30.4	13.5	0.0	0.0	0.0	0.0	67	8.7	9.0	6.1	390	28.3	29.2	27.8		
2/21/2019 5:00:00 PM	28.8	29.8	30.6	28.8	13.7	0.0	0.0	0.0	0.0	73	8.7	8.8	6.1	89	28.3	29.8	27.8		
2/21/2019 6:00:00 PM	27.7	28.1	28.8	27.7	13.4	0.0	0.0	0.0	0.0	73	8.7	8.8	6.1	34	28.3	30.1	27.8		
2/21/2019 7:00:00 PM	26.1	26.9	27.6	26.1	13.2	0.0	0.0	0.0	0.0	83	8.7	8.8	6.1	0	28.6	30.4	27.8		
2/21/2019 8:00:00 PM	24.6	25.2	26.0	24.6	13.2	0.0	0.0	0.0	0.0	91	8.9	8.6	6.1	0	28.9	30.4	27.8		
2/21/2019 9:00:00 PM	24.1	24.2	24.6	24.0	13.1	0.0	0.0	0.0	0.0	92	8.7	9.0	6.4	0	28.9	30.4	27.8		
2/21/2019 10:00:00 PM	23.7	24.0	24.2	23.6	13.1	0.0	0.0	0.0	0.0	91	8.9	9.0	6.1	0	28.9	30.1	27.8		
2/21/2019 11:00:00 PM	23.9	23.7	23.9	23.5	13.1	0.0	0.0	0.0	0.0	89	8.9	9.0	6.1	0	28.9	30.1	27.8		
2/22/2019	23.6	23.8	24.4	23.5	13.1	0.0	0.0	0.0	0.0	90	8.9	9.0	6.1	0	29.2	29.8	27.8		8
2/22/2019 1:00:00 AM	23.8	24.3	24.4	23.8	13.1	0.0	0.0	0.0	0.0	89	8.9	8.8	6.1	0	29.2	29.5	27.8		
2/22/2019 2:00:00 AM	22.4	23.0	23.8	22.4	13.1	0.0	0.0	0.0	0.0	95	8.9	8.8	6.4	0	29.2	29.2	27.8		
2/22/2019 3:00:00 AM	22.1	22.0	22.3	21.6	13.1	0.0	0.0	0.0	0.0	97	8.9	8.8	6.1	-0	29.2	29.2	27.8		
2/22/2019 4:00:00 AM	21.2	21.5	22.0	21.2	13.0	0.0	0.0	0.0	0.0	99	8.9	8.8	6.1	0	28.9	28.9	27.8		
2/22/2019 5:00:00 AM	21.6	21.4	21.6	21.2	13.0	0.0	0.0	0.0	0.0	98	8.9	9.2	6.1	0	28.9	28.6	27.8		
2/22/2019 6:00:00 AM	20.9	21.2	21.6	20.9	13.0	0.0	0.0	0.0	0.0	99	8.7	9.2	6.1	-0	28.9	28.3	27.8		
2/22/2019 7:00:00 AM	20.7	20.7	20.9	20.5	13.0	0.0	0.0	0.0	0.0	100	8.5	9.2	6.1	4	28.9	28.3	27.8		
2/22/2019 8:00:00 AM	20.9	20.5	20.9	20.3	13.1	0.0	0.0	0.0	0.0	100	8.5	8.8	6.1	60	28.9	28.0	27.8		
2/22/2019 9:00:00 AM	24.1	22.3	24.1	21.0	13.4	0.0	0.0	0.0	0.0	90	8.5	9.2	6.4	318	28.9	27.8	27.8		

Dataview Software

Runoff and soil loss studies under ground nut and maize crops

Sujeet Desai

A new study was initiated to estimate the runoff, soil loss and nutrient loss in groundnut and maize crops on sloping land in runoff experiment plots. The experiment consisted of six runoff plots in which three plots were used for cultivating groundnut (TAG-24) and three for maize (NAH-2049). The soil samples from all six runoff plots

were collected before sowing to estimate the soil properties. Multi-slot divisors were used to measure the runoff from individual plots. The mean runoff recorded from the groundnut and maize plots was 600 mm and 720 mm respectively.



Runoff plots with groundnut and maize

Establishment of Azolla unit as livestock feed in integrated farming system

V. Paramesh, H.B. Chetan Kumar and P.P. Gokuldas

As a part of AICRP (IFS) in low land model, a cement bed of size 6 m length x 2 m width was prepared. About 15 kg of fine sieved soil was spread over the bed, to provide nutrient to the azolla plant. About 5 kg of pre-decomposed (2 days) cow dung was mixed with the water, to provide carbon source for the azolla. About 40 g of nutrient mix (made by mixing rock phosphate and muriate of potash) was added to the azolla bed. Sufficient water was added to make the water level of the bed to 10 cm. About 1-1.5 kg of mother culture of azolla seed material was

spread uniformly over the bed after stirring the water. Initially, azolla spread over the entire bed, took the shape of thick mat within seven days. Around 10 kg of azolla was harvested after seven days, following which, 1.5 kg of azolla was harvested daily. Azolla should be harvested in plastic trays with sieve, washed in fresh water before using with commercial feed in 1:1 ratio. This azolla feed acted as protein supplement to livestock and reduced the dependence on concentrates completely thereby reducing the cost of feed.

Conservation tillage practices in rice-cowpea cropping systems

V. Paramesh

Research on conservation agriculture in rice-cowpea cropping system has been initiated. The conservation tillage practices like zero tillage and minimum tillage improved the soil microbial biomass carbon by 55.9% and 64%. Bulk density was found higher in conventional tillage (1.46 Mg/m³) over conservation tillage. The available

water increased by 33.2% and 34.6% in zero and minimum tillage practices, respectively over the conventional tillage. There was no significant difference in the nutrient availability. The major constraint observed after the rice crop and during cultivation of cowpea was heavy weed menace.

Horticultural planting material for Kulagars

V. Arunachalam

A new project on horticultural planting material for Kulagars has been sanctioned by Directorate of Agriculture with financial support of Rs. 7.3 lakhs from RKVY-RAFTAAR (Rashtirya Krihi Vikas Yojana-Remunerative Approaches for Agriculture and Allied sector Rejuvenation) and Government of Goa. The target crops are

arecanut, coconut, black pepper, mango, banana, wax apple, soursop, noni, drumstick and amaranth. The project aims to strengthen the shade net structures, mother plants, nurseries and augment the nursery plant generation for demonstration, sale and distribution.

Speciality fruit plants in Agro-ecotourism Unit

S. Priya Devi

The Institute agro-ecotourism block was already sporting several speciality fruit species like, soursop, wax apple, Malayan apple, Indian Hog plum, custard apple, bullock's heart carambola, bilimbi, canistel, litchi, and jamun (2-5 each). In addition to these, few more fruit plants viz.,

peanut butter fruit, yellow mangosteen, avacado graft, avacado seedling, loquat seedling, mangosteen, velvette apple and kokum grafts (four each) were added to the unit during June-July 2018. In bearing season, these trees would certainly be an attraction to the visitors of the unit.

Collection and conservation of Tulsi species in Dhanvantari garden

Maneesha S.R.

A germplasm collection of *Ocimum* was established in the medicinal and aromatic plant garden of the Institute (Dhanvantari vatika). In addition to the two types of *Ocimum sanctum* (Krishna tulsi and Ram tulsi) five more types

were added in May-June, 2018. Sweet basil/sabja, purple ruffle basil/ purple sabja, wild basil/ van tulsi, American basil, etc. are being maintained in the garden. All the types are also being seed propagated and used for sales.



Tulsi collections at Dhanvantari vatika of ICAR- CCARI

NABARD funded project on Popularizing good post harvest management practices

Mathala J. Gupta

A new project funded by NABARD "Popularizing Good Post Harvest Management Practices for Field Crops of Goa through Research, Trainings & Demonstrations" was initiated in October 2018

by Dr. Mathala Juliet Gupta as Project Leader and Dr. R. Marutha Durai as Co-Project Investigator. The project was proposed to disseminate the research findings of an Institute funded project

“Estimating Post-harvest Losses of Goa” to the stakeholders viz. the farmers and Directorate of Agriculture. As part of the project, series of training programs are planned for sensitization of farmers at various stages viz. pre-harvest to

harvest, threshing, winnowing, drying, parboiling, milling and storage regarding the extent and causes for postharvest losses and to introduce modern technologies and good management practices to reduce the same.

Studies on kokum butter

S. Priya Devi

Kokum is an important and potential crop of Konkan coast. The seed is a potential source of butter or seed oil that has applications in pharmaceutical, cosmetic and confectionary industries. A new experiment was initiated in May-June, 2018 to evaluate different methods of

butter extraction from kokum seeds, with the extraction processes predominantly including or excluding roasting and fermentation. The study on quantity and quality of butter extracted by the different methods is under progress.

Chipper shredder and pulverizer

Maneesha S.R. and Vinod Ubarhande

A new chipper shredder with 10HP 3 phase motor and a pulverizer was purchased and put under operation in the Institute. With a capacity to shred 700-1000 kg/h depending on the size and conditions of the input material, a large amount of the biomass available in the Institute farm is being shredded and used for mulching and vermicomposting by the farm section.



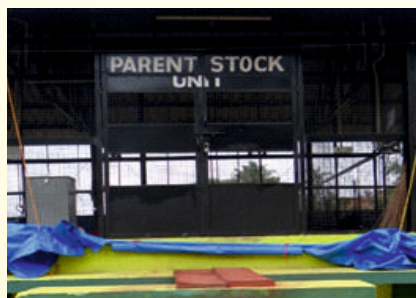
Demonstration of chipper shredder and pulverizer machines on 5th July, 2018

Construction of Poultry units

R. S. Rajkumar and Nibedita Nayak

One brooder cum grower unit and one parent stock unit each of 1600 sq. ft. (Deep litter houses) were constructed under ICAR-Poultry Seed Project, sanctioned by Directorate of Poultry Research. The units were inaugurated by Dr. Trilochan Mohapatra, Honorable Director General, ICAR and Secretary, DARE on 28th July in

presence of Dr. R.N. Chatterjee, Director, DPR and Dr. S. K. Choudhury, ADG, SW&M. The parent stock has the capacity to house 750 adult birds, whereas, the brooder cum grower unit can house nearly 3000 chicks and a range of 1300-1500 birds of different ages.



Introduction and evaluation of CARIBRO-Dhanraja and Pureline Kadaknath

Nibedita Nayak

New poultry breeds like, CARIBRO-Dhanraja and Pureline Kadaknath, were introduced to the Institute in July, 2018, from CARI, Izatnagar. CARIBRO-Dhanraja is a multicolored broiler

preferred by farmers. The breed Kadaknath (*Kalamasi*) is known for its black meat, reported to be rich in protein (23%) with less fat (2%) and cholesterol (0.6%).

Standardization of cryopreservation protocols for long term preservation of boar semen

E.B. Chakurkar and Gokuldas P.P.

A research project aimed at developing and standardizing suitable cryopreservation protocols for long-term preservation of boar semen was initiated during the period. Screening of suitable boars for the semen collection and freezing trials have been undertaken. Designing and standardization of different protocols for freezing of the ejaculates from selected boars using customized freezing cycles in programmable controlled-rate freezer and subsequent post-thaw semen quality assessment were initiated. Controlled-rate freezing technique allows to customize and control each temperature holding or lowering phase in accordance with semen sample requirements. Average progressive sperm motility, viability and other quality parameters of the semen samples preserved using different cryopreservation protocols and in-vivo fertility status are being recorded and evaluated.



Controlled rate freezer

Microplate reader

Chethan Kumar H.B.

An absorbance based monochromator type microplate spectrophotometer (Epoch™2 model of BioTek®, USA) was newly purchased and installed at Animal Health Laboratory. The equipment is capable of performing nucleic acid and protein quantification, End point and Kinetic ELISA, Cytotoxicity, Cell proliferation assay etc. The software can perform several function viz., multilevel transformations, cut-off, validation formulae with flexible reading modes for variety of applications.



Microplate Spectrophotometer

Flood-impact studies on agriculture, horticulture and animal husbandry in Kerala State

Institute Team

Chair	: E.B. Chakurkar
Team Lead	: V.Arunachalam
Members	: Gokuldas P.P., V. Paramesha, Bappa Das, H.B. Chethan Kumar, Sanjay K. Udharwar
Collaborators	: ICAR-KVK, ICAR-CMFRI, Ernakulum Department of Animal husbandry, Ernakulam District, Government of Kerala

Rains and floods created havoc in Kerala

The state of Kerala faced severe floods due to heavy rainfall and landslides during August, 2018, leading to a major disaster. In 2018, during the period of 1st June to 30th August, the daily average rainfall exceeded the normal average rainfall. Maximum departure occurred during 15th to 18th August which led to the havoc. Periyar, the state's second largest river swelled and entered the densely populated low-lying areas of Kochi along the banks of the river. Percentage rainfall departure from long term

average for different districts of Kerala revealed that except Kasaragod, Kannur, Wayanad, Alappuzha and Thrissur, all the districts recorded excess rainfall till 12.09.2018.

The period of waterlogging in different villages varied between 3-15 days and the height of flowing water ranged from 1 m to 10 m. The flood, which caused heavy loss to Kerala's agriculture and allied sectors had a huge impact on the state's food production and livelihood of millions of farmers.

Flood impact on field and horticultural crops

The crop and horticulture team visited one of the flood affected district i.e Ernakulam during 03-05 September 2018 and covered Karumallor, Erumathala, Thottumugham, Chengamauadu, Angumaly, Parapavam villages in Ernakulam district. According to the preliminary assessment, standing crops of rice, tapioca, vegetables, nutmeg, black pepper and banana were affected severely. Among these crops, the worst affected was paddy because the flood occurred during the panicle initiation stage of the crop and so the crop recovery was not possible at that stage. Tapioca was also affected badly due to submergence of the root system, resulting in root rot disease. With loss of both rice and tapioca, the major staple foods of Kerala, the state's food sufficiency was heavily impacted. The team also noted that, coconut, bamboo, areca plants and some of the banana cv. Njalipoovan survived the flood in some locations.

The devastating flood not only created havoc and destroyed many crop and animal species but also brought a huge amount of silt and sand to the crop fields. This silt deposition resulted in choking the

water infiltration, reducing root aeration, leading to drying of the plants like nutmeg, black pepper, pineapple, vegetable plants, teak etc. The severity of damage to the cultivated field and horticultural crops depended on the speed, height and duration of flood water. The crops those



Loss of tapioca crop

Death of nutmeg tree

submerged for 9 days up to 8 meter height had maximum damage, the lesser the height of the crop the maximum the damage. During the interview, it was found that in the village of Karumalloor, out of the total cultivated land of 2340 hectares, most of the area was submerged including 25 hectares of vegetables, most plantations of black pepper, banana, cassava and nutmeg. In most multispecies cropping systems, nutmeg plant was seen as the indicator of severity of flooding. Nutmeg plants those had

suffered three days of flooding up to 1.5 m height survived with minimal injuries, whereas five days of flooding led to partial wilting and medium damage. But the nutmeg trees in more than 8 m submergences had succumbed to the flood and died. Banana plants especially cv. Nendran were damaged to the maximum extent in all the spots visited. While the annual crop loss may be compensated and managed by taking up next crop, loss of perennial tree like nutmeg is severe to a tune of Rs. 3000/tree, if crop was not insured.



Team with flood relief material



Animal health camp

Flood impact on Livestock and animal husbandry

In the post-flood scenario, health care for surviving livestock is of utmost importance. Devastating floods had brought a wide range of animal health and management problems, from feed and fodder shortage to infection, drop in milk yield and loss of hygienic condition. The wet season along with stagnant water caused increase in insect populations of biting midges and fly menace in most parts of the district. With possibility of many infectious agents thriving and multiplying in moist and contaminated environment, Pneumonia, bloat, haemorrhagic enteritis and diarrhoea were also observed in flood-affected animals of the region. Mastitis was also observed in many milking animals as they were stressed and not milked during the initial days of disaster. The team visited major flood-affected areas like North Paravur, Aluva, Kaladi, South Vellarappilly, Chowara, Kodanad and Cheranalloor during the period. Total of 15 animal health camps benefitting around 650 farmers and 20 house visits were taken up to treat severely affected animals. Around 220 animals were also treated during the health

camps organized in active collaboration with Ernakulam District animal husbandry department. Important medicines worth rupees one lakh were also distributed to the farmers who could not bring their animals to health camp. A radio talk on important aspects of post-flood livestock management was also delivered by the team through All India Radio Akashvani (FM 102.3 MHz) Kisanwani programme which was broadcasted on 05.09.18. Dr. E.B. Chakurkar, Director (A), ICAR-CCARI made site visit on 5th September, 2018 to assess the progress of the camps and subsequently held a meeting with the officials of ICAR-KVK, Ernakulam and Ernakulam district animal husbandry department officials at ICAR-CMFRI, Kochi. Dr. Shinoj Subramannian, Head of KVK, Ernakulam and Dr. Mary James, District Animal husbandry officer I/C also participated in the meeting. Based on the observations, interview and impact assessment, a set of recommendations were made to be incorporated as part of post-flood management strategies.

MAJOR EVENTS

Demonstration cum training on Value addition in Kokum

As a part of research project and mandatory exploration, the scientists of NBPGR, Thrissur, Kerala had collected lot of kokum fruits from Konkan region in the past. Subsequently, a germplasm collection of seedling progenies has been established in the Institute, besides which, kokum seedlings were also sold to few progressive farmers. As the trees have started bearing, and kokum being a new crop to that region, a training programme was organised at NBPGR, Thrissur. Demonstration cum hands on training was given by Dr. S. Priya Devi on preparation of squash, syrup, RTS, *agal*, drying of rind/ preparation of *sola*, types of *sol khadi*, to the

staff and farmers on 1st May, 2018. A brief hand-out containing methods of preparation was also distributed to all the participants.



Distribution of bypass fat and jackfruit processing machineries to tribal farmers under TSP

A programme on distribution of bypass fat and jackfruit processing machineries to tribal farmers under Tribal Sub Plan Programme was organised at ICAR-Central Coastal Agricultural Research Institute, Goa on 5th May, 2018. Dr. E. B. Chakurkar, Director, ICAR-CCARI briefed about the research and extension activities of the Institute and also delivered the technical details and use of bypass fat. Dr. S. Priya Devi, Principal Scientist, Fruit Science, presented the use of jackfruit machineries and preparation of various products out of jackfruit.

The Chief Guest Shri Narendra Keshav Sawaikar, Member of Parliament, South Goa, appreciated the efforts of ICAR-CCARI for improving the livelihood of tribal and agricultural farmers through their research and extension services. Shri. Govind Gaude, Guest of honour, Minister for tribal welfare has appealed the tribal farmers to avail the maximum benefits offered by ICAR-CCARI. A group of twenty five tribal farmers from Cuncolliem, Priol, and Veling of North Goa received 1000 kg bypass fat material (each

farmer received 25kg). Shree Kamakshi Self-help group from Cuncolliem, Mardol comprising of 10 women tribal farmers received a set of jackfruit processing machineries. Smt. Sunetra Talaulikar, SMS, Home Science, KVK, North Goa, briefed about the various products made out of jackfruit. Shri Rahul M. Kulkarni, Senior Technical Officer, briefed about the importance of soil testing. Dr. Maruthdurai R., Scientist (Agricultural Entomology) and TSP Co-ordinator, ICAR-CCARI has delivered the vote of thanks



Distribution of processing machinery and training under Tribal Sub Plan Programme

A distribution programme on 14th May, 2019 conducted at the Institute, which was graced by Dr. Pramod Sawant, Hon. Speaker, Goa Legislative Assembly. The processing machinery like mixer, utensils and cutlery, plastic sheets for drying, refractometer and plastic drum (100 l) and electronic balances were distributed by him on the occasion to the two self-help groups. He emphasized upon effective utilization of technical support rendered by the organization. Dr. E. B. Chakurkar, Director (A), stressed upon the importance of value addition as an enterprise and also delivered the welcome address. The Chief Guest to active participation during the training programme in the presence of Dr. A.R. Desai, PS(Hort.). Dr. Mathala Juliet Gupta and Mrs. Sunetra Talaulikar also presented the details



of support the Institute has provided to the tribal farmers of Goa in the past, with respect to value addition and processing. At the end, Dr. Mathala Juliet Gupta, TSP Co-ordinator proposed vote of thanks.

Biodiversity exhibition at Margao

The Institute participated in an exhibition as part of International Day for Biological Diversity (IDB) on 22nd May, 2018, at Parisram Damodar Raikar Hall, Margao. The programme was organized by Goa State Biodiversity Board (GSBB). With the theme of "Celebrating 25 years of Action For Biodiversity". The bioresources like, different local rice collections, cashew, mango, kokum collections, fish, cattle and pig diversity in Goa were showcased. As a part of the programme, Dr. E. B. Chakurkar, Director, ICAR-CCARI, Old Goa, gave a lecture on artificial insemination in pigs and also distributed certificates to all participants.



New FLD on Cashew launched at Ziltawadi village

A new Frontline Demonstration of cashew varieties developed by the Institute was initiated at Ziltawadi Village of Cancona Zone. About six hundred cashew grafts of four cashew varieties (Goa Cashew-1, 2, 3 and 4) and hybrids developed

in the Institute were provided to Ziltawadi Farmers' Group under TSP programme for establishing FLD plot at Ziltawadi village in about four hectares of area. The honorable Member of parliament (South Goa), Shri Narendra Sawaikar

launched the FLD with a ceremonial planting programme on 16.06.2018 by planting cashew grafts in the presence of Dr E.B. Chakurkar, Director, ICAR-CCARI and the Sarpanch of Ziltawadi. This FLD on a single stretch of more than four hectares of area will serve as an excellent model to create awareness about new cashew varieties among the cashew farmers of South Goa district in particular and all the cashew farmers of adjoining areas of the coastal region in general.



'Sahbhagi dhan seed day' organized at Cotigao village

'Seed day' was organized on 16th June 2018 at Cotigao village of South Goa district for distributing the seeds of Sahbhagi dhan, an upland rice variety for the tribal farmers through 'ICAR Seed Project' and 'Tribal Sub Plan' programme. Dr. Manohara, K. K., Scientist in Plant Breeding welcomed the farmers and highlighted the advantages of Sahbhagi dhan over the traditionally grown varieties like Jaya, Karjat-3 and Jyothi in terms of yield, taste and its suitability for milling. He urged the farmers to involve themselves in community based seed production for getting additional income. Thirteen quintal seeds of Sahbhagi dhan was distributed to 80 tribal farmers along with other inputs like fertilizers and plant protection chemicals so as to cover 25-30 ha under Front Line Demonstration of this variety. Shri Narendra Sawaikar, honourable Member of Parliament, South Goa, graced the programme as chief guest. Speaking on the occasion, he emphasized on the



important schemes available from the central government for the benefit of the farmers. He stressed that ICAR-CCARI, Goa is playing a key role in uplifting the livelihood of tribal farmers by way of introducing promising technologies, distributing quality seeds and planting materials and by imparting training. Dr. E.B. Chakurkar, Director, ICAR-CCARI emphasised on the different schemes available under TSP programme for the tribal farmers.

Distribution of jackfruit & kokum processing machinery, fertilizers and Goa Bio 1 under Tribal Sub Plan Programme

Distribution of agricultural inputs to tribal farmers of Goa by Shri. Govind Gawade, Minister for Tribal Welfare was conducted on 19th June, 2018, The members of Shree Suvarna Self Help Group (SHG), Piscal, Priol and Shree Satyanarayana SHG, Arle, Keri, were given process machinery for Jackfruit and Kokum to a worth of Rs. 1,30,644/- per group. The two group members had been given a hands-on training programme on 6th June, 2018, in which, they were trained to operate jackfruit cutting machine, jackfruit chips cutter, electric cabinet dryer, etc. Value added products like jackfruit chips, jackfruit pickle, jackfruit papad were also method demonstrated. Some of these machineries like kokum cutting machine, hand operated jackfruit cutter, jackfruit cutter machine for chips, electric dryer, drying trays 5 no. and sealing machine were also distributed to them on the same day, so that they could start making use of them during the current season itself. The other machinery like wet grinder, utensils and cutlery, plastic sheets for drying, refractometer, plastic drum (100 l) and electronic balances were distributed by Sh. Govind Gawade to the two groups during the programme.

Also inputs *viz.* fertilizers and Goa Bio 1, for site specific nutrient management under project entitled "Site Specific Nutrient Management in



Different Crops for Improved Crop Productivity and Income of Tribal Farmers of Goa" was distributed to tribal farmers of Dhulape, Priol, Piscal, Veling, Canacona etc. on the occasion.

Dr. E.B. Chakurkar, Director (A), during his welcome speech, stressed upon the importance of value addition as an enterprise and use of site specific nutrient management for good soil health. Dr. Gopal R. Mahajan, Scientist (Soil Science) highlighted the salient points of his project and explained the importance of site specific nutrient management and the benefits of use of Goa Bio 1 in soil health management. Sh. Govind Gawade, Minister for Tribal Welfare during his address appreciated the technical expertise given by ICAR for betterment of tribal farmers' income generation and he encouraged the farmers to use this for their development. Dr. Mathala Juliet Gupta, TSP Co-ordinator proposed the vote of thanks.

International Day of Yoga

This Institute celebrated the fourth International Day of Yoga on 21-06-2018. Shri Shailendra Gupta (certified yoga instructor) the chief guest of the function, started with yoga invocations. He addressed the gathering on yoga and its health benefits. He explained the importance of yoga, benefits of different asanas, how the different asanas have to be performed and science behind each asana. He along with some staff members also demonstrated many asanas.



A refresher course on administration & finance management for Section Officers

A Refresher Course on Administration & Finance Management for Section Officers, AAOs, AFAOs and Assistants of ICAR Headquarters & Institutes was conducted by ICAR-National Academy of Agricultural Research Management, (ICAR-NAARM) Hyderabad, Telangana at ICAR-CCARI, Goa from 05-07-2018 to 10-07-2018. A total of 41 participants from 19 ICAR Institutes covering 14 States and ICAR HQ, New Delhi attended the training programme. The training was inaugurated by Dr. Ch. Srinavasa Rao, Director, ICAR-NAARM, Hyderabad on 5th July, 2018. There were 12 Sessions conducted by 11 faculties from ICAR nominated by ICAR-NAARM on positive thinking, MIS/FMS/PFMS, reservation in service, handling of court cases, GeM e-Procurement, conduct rules & preventive vigilance, technical service rules, official language policy & its implementation, office communications, noting & drafting, behavioural skills & motivation,



procurement & works procedures and time management. All the sessions were informative and gave a good learning experience to all the participants. An educational trip to the Big Foot Museum in Loutolim, Goa was arranged to give a glimpse of the Ancestral Goa. The training concluded on 10th July, 2018 with the valedictory ceremony chaired by Dr. E.B. Chakurkar, Director (A), ICAR-CCARI, Goa.

Demonstration and distribution of cue lure pheromone traps for the management of cucurbit fruit flies

A demonstration-cum-distribution programme on use of cue lure pheromone traps for management of cucurbit fruit flies (*Zeugodacus cucurbitae* (Coquillett) (Diptera: Tephritidae)) was organised at Cuncolim on 19th July, 2018. Cue lure trap preparation, placement, servicing and lure replacement were explained to the farmers. The damage symptoms, insect life stages and other integrated pest management practices were briefed to the farmers by Dr. Maruthadurai, R Scientist (Agril. Entomology). Dr. R. Ramesh, Principal Scientist (Plant Pathology) briefed about the benefits of pheromone technology and interacted with the farmers. More than 30

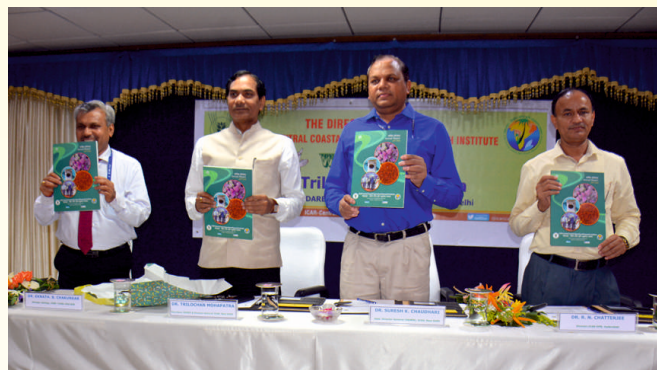
farmers actively participated in the programme and got benefitted with 200 cue lure traps and lures.



Visit of Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR, New Delhi to ICAR-CCARI, Old Goa

Dr. Trilochan Mohapatra, Secretary, DARE, Government of India and Director General, ICAR, New Delhi visited ICAR-Central Coastal Agricultural Research Institute, Old Goa on 28th July, 2018. Dr. S K Chaudhari, ADG (SWM), ICAR, New Delhi and Dr. R N Chatterjee, Director, ICAR-DPR, Hyderabad were also present on the occasion. Honorable Director General inaugurated the Agro-ecotourism unit developed by the Institute. He visited all the components of the Institute's Agro-ecotourism unit. He also inaugurated the 'Poultry parent and brooder shed' facility developed under the 'ICAR- Poultry Seed Project' funded by ICAR-Directorate of Poultry Research, Hyderabad. A foundation stone of the 'Central Instrumentation Facility' approved under the SFC 2017-20 was also laid by honorable Director General. He also visited the exhibition of the Institute technologies before having an interaction with the staff in the conference hall.

Dr. E.B. Chakurkar, Director (A), ICAR-CCARI, Old Goa presented the achievements of the Institute during the past two years. Seven publications were released by the dignitaries during the



programme. Dr. R. N. Chatterjee elaborated the importance of the ICAR-Poultry Seed Project and the newly created facility. Dr. S.K. Chaudhari appreciated the efforts and achievements of the Institute. During the interaction and chief guest address, Dr. Trilochan Mohapatra emphasized on the need to develop a database on the coastal agriculture in accordance with the upgradation of the Institute. He stressed upon developing collaboration with the Institute in the coastal region so as to develop the database and prepare the road map for future. He appreciated the efforts and achievements of the Institute during the past two years.

First meeting of 5th Quinquennial Review Team (QRT)

Quinquennial Review Team (QRT) was constituted by ICAR, New Delhi to review ICAR-Central Coastal Agricultural Research Institute under the chairmanship of Dr. Tapas Bhattacharya, Vice Chancellor, Dr. BSKKV, Dapoli with following members *viz.*, Dr. S.R. Das, Honorary Professor, Dept of Plant Breeding and Genetics, OUAT, Bhubaneshwar, Dr. M. Anandraj, Ex-Director, IISR Calicut, Dr. Syed Mohd. Khurshee Naqvi, Ex-Director, Central Sheep and Wool Research Institute, Avikanagar, Dr. Sreenath Dixit, Ex-Director, ATARI, Bengaluru and Dr. Z. Abraham, Ex-OIC, NBPGR Centre, Thrissur with Dr. M. Thangam, Principal Scientist, ICAR-CCARI, Goa as Member Secretary.

The first meeting of 5th QRT was held on 29th and 30th July, 2018 at ICAR-CCARI. The Chairman could not attend the meeting due to official



emergency at Dr. BSKKV, Dapoli. Dr. M. Anandaraj chaired the meeting with other members. All the experimental plots, infrastructures and different dairy units were visited on 29th July, 2018. On the next day, an interaction meeting was organized with all the staff members of Institute followed by presentation on the salient research achievements by Dr. E.B. Chakurkar, Director

(Acting), followed by a presentation of Action Taken Report of last QRT by Dr. M. Thangam, Member Secretary. After discussions and deliberations, sectional in charges presented the work done report for the past five years. In the

concluding session, QRT members gave their feedback about the work done and way forward as per the revised mandate of the Institute. The vote of thanks was proposed by Member Secretary.

Independence day celebrations

ICAR-Central Coastal Agricultural Research Institute celebrated the 72nd Independence Day on 15th August 2018 at 9.00 a.m. Dr. E. B. Chakurkar, Director (Acting) of the Institute hoisted the flag in presence of all the staff members and their families. On the occasion, he extended warm greetings to all the employees and others who attended the programme. During the address, he stressed upon the working culture in the organization, and urged all the employees to strive hard to take the Institute to new heights in the field of research and extension. He also briefed about the achievements of the Institute and congratulated everyone for it. The meritorious students were



felicitated for their academic excellence for the year 2017-18. There was also prize distribution for the winners of the 2nd Annual Games of ICAR-CCARI, Goa.

The Opening of Agro-Ecotourism unit at ICAR-CCARI, Goa

The Agro-ecotourism unit of the Institute was opened to the public by Mr. Deepak Narvekar, Senior Manager (Public Relations and Marketing), GTDC Ltd, Panaji, Goa on 16th August, 2018. The other dignitaries present at this function were Mr. Suyash Asthana, DGM, SBI-Panaji and officials from Canara Bank and Konkan Railways.

Dr. E. B. Chakurkar, Director ICAR-CCARI, Old Goa welcomed the dignitaries and gave a presentation on Agro-ecotourism unit. Further, he added that the moto of starting this unit is not only to create awareness among the visitors about the technologies developed by this Institute in the field of agriculture and its allied subjects but also for the visitors to learn the various activities carried out like climbing the coconut palm, vermicomposting, nursery activities etc.

Mr. Deepak Narvekar, Senior Manager (Public Relations and Marketing), GTDC Ltd, appreciated



the step taken by the Institute in establishing an Agro-ecotourism unit. He also added that the Goa Tourism Development Corporation will highlight this Agro-Ecotourism unit in the official web site of GTDC to attract more and more domestic as well as foreign tourists. He also said that Agro-ecotourism can be a beneficial source to improve the farmer's income without disturbing the ecological balance. Dr. Arunachalam, Principal Scientist (Horticulture) proposed the vote of thanks.

'Sadbhavana Diwas' celebrated

In order to promote National Integration and Communal Harmony among the people of all religions, languages and regions 'Sadbhavana Diwas' was observed nation-wide on 20th August. The idea behind observance of 'Sadbhavana Diwas' is to eschew violence and to promote goodwill among the people. The Sadbhavana Pledge taking ceremony was observed at 4.00 p.m. in the conference hall of the Institute in which, all the officers and staff members participated.



Awareness programme on ESIC Schemes and Facilities

An awareness programme on the schemes and facilities of Employees' State Insurance Corporation was organised at ICAR-CCARI on 21st August 2018. At the outset, Dr. E. B. Chakurkar, Director (A) of the Institute briefed the participants that the aim of this programme was to create awareness on importance of the various health insurance benefits for the ESIC active subscriber / member workers. He urged all workers to take advantage of the ESIC hospitals and avoid unnecessary expenses at private hospitals for themselves and their dependents.

Shri P. C. Lodwal, Asstt. Director (Benefits), ESIC Panjim gave a detailed presentation on the ESIC organization, various eligibility criteria for availing the health insurance benefits and the procedure to claim due benefits. Shri Hanif Shaikh, Social Security Officer, ESIC Panjim gave various case examples how ESIC is important for taking care of the social security of the various

workers' families in case of any untoward accidents. He explained the unique ESIC maternity benefits for the female workers, besides emphasizing that they should visit ESI hospitals on any illness or injury. Shri Vinod Ubarhande, Farm Superintendent coordinated the programme. All contractual staff along with the administrative and technical staff attended the programme and actively participated in the interaction.



Interface meeting

Training and Education Center, of ICAR-IVRI, Pune in collaboration with ICAR-CCARI, Goa organised Interface meeting for scientists with veterinary officers of Department of Animal Husbandry and Veterinary Services, Govt. of Goa, veterinary officers of Goa state co-operative milk producers Union, Ponda and progressive farmers at ICAR-CCARI on 30-31st August 2018. Dr. Santosh Desai, Director, Department of Animal Husbandry and Veterinary Services, Goa



described the challenges and scope of animal husbandry sector in Goa. Dr. E.B. Chakurkar, Director (A), ICAR-CCARI stressed on continuing education of veterinarians to keep them updated on recent developments in the field of veterinary field to serve the farmers in a better way. Dr. K.N. Bhilegaonkar, Station Incharge, Training and Education Center, of ICAR-IVRI, Pune elaborated on technologies and health services provided by ICAR-IVRI in the field of animal health and production. Dr. Mahesh Chander, Joint Director (Extension Education), ICAR-IVRI, Bareilly described the importance of organic farming and standards related to organic animal husbandry.

Dr. A.K. Verma Head, Division of Animal Nutrition, I.V.R.I. Bareilly enlightened the participants on animal nutrition technologies developed by ICAR-IVRI. Dr. H.P. Aithal, Principal Scientist, Training and Education Center of ICAR-IVRI, Pune presented recent advances in veterinary surgery. The programme was also attended by volunteers from different Goshalas of Sekeri, Valopi and Dhyana foundation. Dr. Chethan Kumar proposed the vote of thanks. Later in the day the live demonstration of epoxy based external skeleton fixation of hind limb fracture in a calf in Sekeri, Goshala was carried out for the benefit of the veterinarians.

World Coconut day celebrations

World Coconut day is celebrated around the world to recognize the contributions of coconut farmers on 2nd September of every year. It was celebrated by ICAR-CCARI Old Goa with support from ICAR-AICRP on Palms-Goa centre, ICAR-KVK, North Goa, coconut farmers and entrepreneurs from 30th August to 2nd September 2018. An exhibition of coconut varieties, climbing machine and the value-added products was displayed at KVK, North Goa during the training program on virgin coconut oil from 30th-31st Aug 2018. Mrs. Sunetra Talaulikar SMS (Home Science) ICAR-KVK, North Goa, explained the production of virgin coconut oil during the two days. The valedictory function of the program was chaired by Dr E. B. Chakurkar, Director (A). Dr Jenifer Kamat Chairperson (Women's wing) of Goa chamber of Commerce and Industries graced the occasion as chief guest. Mr HRC Prabhu, the Program coordinator (I/c) graced the occasion. On 1st September 2018, an off campus training was organized at Mardol village Panchayat near Ponda to 15 coconut farmers. The program was chaired by Dr E. B. Chakurkar Director (A) ICAR-CCARI Old Goa and graced by village panchayat officials and the progressive farmer, Mr. Sanjiv Cunculikar. On 2nd Sep 2018, another off campus training was organized at Cotigao village, Canacona taluk, South Goa for 65 coconut farmers and other villagers. The program was graced by presence of



the surpanch and members of village panchayat and Mr. Dhilan Velip, progressive farmer. An exhibition of coconut varieties, coconut climbing machine and value added products was arranged. Later on, demonstrations of coconut climbing machine and root feeding technique were made to the farmers. The farmers actively interacted with the experts and clarified their doubts on various aspects of coconut cultivation and utilization during the event. During 1st-2nd September, nearly 20 participants attempted to climb coconut palms using climbing devices at Canacona and Ponda. Dr. V. Arunachalam, Principal Scientist (Horticulture) coordinated the activities on all the four days, explained about the varieties, hybrids of coconut and briefed about the mother palms selection, nursery management aspects and various aspects of coconut cultivation to the farmers and entrepreneurs.

Training programme on ornamental fish breeding and culture

A short-term training and skill development programme on “Ornamental fish breeding and culture” was conducted at ICAR-CCARI, Old Goa organised by Fisheries Section, ICAR-CCARI on 10th August, 2nd and 8th September, 2018. The training programme was attended by 25 participants from Govt. College, Sanquelim-Goa. Details on various aspects like ornamental fisheries, breeding and culture, aquarium fabrication and disease management in ornamental fish culture were covered. There were practical sessions on the handling of fish broodstock, breeding, fish seeds, aquarium fabrication, and disease treatment methods in the ornamental fish culture at the hatchery



facility of ICAR-CCARI. The training programme was co-ordinated by Dr. Sreekanth GB, Scientist (FRM), Fisheries Section, ICAR-CCARI.

Participation in State Level Kisan Mela and Farmers Innovation Meet organized at ICAR-CAZRI, Jodhpur

The Central Arid Zone Research Institute (ICAR-CAZRI), Jodhpur organized a State Level Kisan Mela and Farmer's Innovation Meet at Jodhpur during 13th-15th September, 2018. Shri Gajendra Singh Shekhawat, Minister of State for Agriculture and Farmers Welfare, Government of India inaugurated the programme. More than 10,000 farmers and farm women visited the mela. More than 80 exhibition stalls were set up by ICAR Institutes, various other organisations of Rajasthan, Maharashtra and Goa and also several KVKs of different Institutes. ICAR-CCARI also had a stall with technologies and products on display.



Training-cum-Workshop for Nodal Officers of State Horticulture Statistics Authority (SHOSA)

ICAR-CCARI, Old Goa hosted a “Training-cum-Workshop” organized by DASD, Calicut, Kerala, for Nodal Officers of State Horticulture Statistics Authority (SHOSA) of Horticulture Statistics Division, DAC & FW, Govt. of India, on 25th September 2018. The objective of the program was to review the horticulture statistics generated previously and refine the methodologies and techniques for enhancing the precision of the horticulture statistics data. Ms.



Sudha P. Rao, Principal Advisor, Dr. Vidya Dhar, Addl. DG & Ms. Mamta Saxena, Advisor Horticulture Statistics, DAC & FW and Dr. E.B. Chakurkar, Director, ICAR-CCARI, Old Goa addressed the delegates on the occasion highlighting the importance and precision of the Horticulture Statistics data. Dr. Homey Cheriyan, Director, DASD reviewed the anomalies encountered in the horticulture statistics data. ICAR-IASRI, New Delhi and Mahalanobis National Crop Forecast Centre (MNCFC)

presented spice methodology and Coordinated Horticulture Assessment using Management using geoinformatics (CHAMAN) project, respectively. Demonstration and hands on training on Horticulture Area Production Information System (HAPIS) was imparted to the delegates by Horticulture Statistics Division, DAC & F.W. Dr. Femina, Deputy Director, DASD proposed vote of thanks. Dr. A.R. Desai, Principal Scientist (Hort.) coordinated the programme.

Participation in India International Science Festival (IISF-2018) at CSIR-NIO, Dona Paula

Information and prototypes of potential commercializable technologies developed by this Institute were showcased and demonstrated at International Science Festival-2018 (IISF), Goa. CSIR- National Institute of Oceanography (NIO), Dona Paula in association with Vidnyan Parishad Goa with the support of Department of Education and Department of Science and Technology, Govt. of Goa has organized India International Science Festival 2018 IISF Goa, a state level one-day outreach program involving students, and public at NIO campus, Dona Paula, Goa on 25th September, 2018. Shri. Shripad Naik, Hon'ble Union Minister of State for AYUSH inaugurated the event. The programme was organized in an



effort to provide a boost to young minds through awareness creation and showcasing scientific and technological achievements in various fields. Around 1200 students from about 100 secondary as well as higher secondary schools and technical Institutions visited the festival.

Second meeting of 5th Quinquennial Review Team (QRT)

Quinquennial Review Team (QRT) was constituted by ICAR, New Delhi to review ICAR-Central Coastal Agricultural Research Institute under the chairmanship of Dr. Tapas Bhattacharya, Vice Chancellor, Dr. BSKKV, Dapoli with following members viz., Dr. S. R. Das, Honorary Professor, Dept of Plant Breeding and Genetics, OUAT, Bhubaneshwar, Dr. M. Anandraj, Ex-Director, IISR Calicut, Dr. SMK. Naqvi, Ex-Director, Central Sheep and Wool Research Institute, Avikanagar, Dr. Sreenath Dixit, Ex-Director, ATARI, Bengaluru and Dr. Z. Abraham, Ex-OIC, NBPGR Centre, Thrissur with Dr. M. Thangam, Principal Scientist, ICAR-CCARI, Goa as Member Secretary.



The first meeting of 5th QRT was held on 29th and 30th July, 2018. The second meeting was held on 4th October, 2018. Dr. M. Anandaraj and Dr. Sreenath Dixit could not attend the meeting due to their official engagements at their respective

places. As per the suggestions of Chairman, special invitees *viz.*, Dr. P. M.Haldankar, Director of Research, Dr. BSKKV, Dapoli and Dr. P. C. Haldavanekar, Associate Dean, College of Horticulture, Mulde, Maharashtra also attended the meeting for linkage and collaboration. The meeting started formally at exhibition hall with all the scientists and PCI/c, KVK, North Goa. After the brief presentation by Director, ICAR-CCARI on the significant achievements during the reporting period, Member Secretary, QRT presented the proceedings of the first meeting of

QRT held during July, 2018 and later chairman and members interacted with scientists. After discussions and deliberations, five functional groups were constituted as per thematic areas of Institute to finalize the recommendations with time line to be headed by respective QRT expert along with a scientist from Institute as facilitator for discussion and compilation. In the concluding session, QRT members have given their feedback about the work done and way forward as per the revised mandate of Institute. The vote of thanks was proposed by Member Secretary.

Demonstration of new salt tolerant rice varieties in the coastal district of Karnataka

ICAR-Central Coastal Agricultural Research Institute, Goa, in an effort to test salt tolerant rice varieties, conducted demonstrations in the farmers' field at Karwar, Karnataka. Representatives of social organization 'Community Organization of Rural Educe, Karwar', Shri. Yeshwanth Rane and Shri. Ramesh Kadam and progressive farmer Shri. Narayana Gaonkar approached ICAR-CCARI, Goa, for suggesting them with the suitable technologies to bring back cultivation of paddy in the coastal low lying areas which are often affected with salinity and water stagnation. Accordingly, seeds of the new salt tolerant rice varieties developed at the Institute was provided to farmers and demonstration plots were laid out at three villages *viz.*, Ulga, Hankon and Gopshitta.

Field day was organized at Ulga village, in Karwar district of Karnataka on 7th October 2018, where in farmers were apprised about the newly introduced salt tolerant rice varieties *viz.*, Goa dhan-1, Goa dhan-2 and GRS-1 and the package of practices. Later, during a formal interaction meeting held with the farmers, Director of ICAR-CCARI Dr. E. B. Chakurkar, emphasised on the integration of agriculture, animal husbandry and fisheries to increase the income of the farmers.



He informed the farmers that the new varieties of paddy are boon to farmers in the low lying coastal saline area. Dr. Jagadeesh Rane, Principal scientist and Head at ICAR-National Institute of Abiotic Stress Management, Baramati, emphasised on retaining youths in agriculture and highlighted that community farming along with other subsidiary agriculture would help in retaining them in the villages. He also emphasized on use of machinery to bring back a vast area of fallow land into agriculture. Dr. Manohara, K.K., Scientist in Plant Breeding, ICAR CCARI, apprised the farmers about the new varieties of paddy, their tolerance to salinity and water stagnation, capacity to give higher yield compared to the local varieties and their suitability for parboiling and poha making.

ICAR-CCARI's new salt tolerant paddy varieties help farmers bring back barren salt affected land into cultivation at St. Estevum village, North Goa.

The new salt tolerant rice varieties developed at ICAR-CCARI, Goa, has brought good harvest of paddy in the salt affected Khazan land in the St. Estevum village, a small island located in the North Goa district surrounded by the river Mandovi and its creeks. Vast area of cultivable paddy field was left uncultivated for almost 30 years, and the rejuvenation was a huge task to the villagers. Few of the villagers including Mr. Nestor Rangel and Mr. Shailendra Afonso showed interest to restore rice cultivation in the area. The ATMA officials from the Department of Agriculture, Govt of Goa led by the Mr. Sanjeev Mayekar and ICAR scientist Dr. Manohara K. K. organized series of meeting with the villagers to pursue them to go for community farming. Periodical visits were made by the ATMA officials and ICAR scientists to guide farmer about the cultivation practices. Initially 50 ha (125 acre) out of available 250 ha land was brought under



cultivation. Seeds of the rice varieties like Goa dhan-1 and GRS-1 was supplied to the farmers through agriculture department. The new varieties has given good yield under the salinity condition compared to the local varieties. Dr. E. B. Chakurkar, director ICAR-CCARI attended the first harvest prayer and assured farmers of rendering full co-operation during the coming years to cover more area in the village.

Scheduled Tribe Component (STC) sponsored training programme on Livelihood improvement through ornamental fish culture

Two days training programme sponsored by STC on "Livelihood improvement through ornamental fish culture" was conducted at ICAR-CCARI, Old Goa during 10th -11th October, 2018. The training programme was attended by 20 participants from Dharbandora village, South Goa. Lectures were delivered on ornamental fisheries, breeding and culture, aquarium fabrication and disease management in ornamental fish culture. There were practical sessions on the handling of fish broodstock, breeding, fish seeds, aquarium fabrication, feed preparation and feeding and disease treatment methods in the ornamental fish culture at the



hatchery facility of ICAR-CCARI. The training programme was co-ordinated by Dr. Sreekanth G. B., Scientist (FRM), and Dr. Mathala Juliet Gupta, Scientist (Agril. Structures and Process Eng.).

Visit of Shri Chhabilendra Roul, Special Secretary, DARE, and Secretary, ICAR, Ministry of Agriculture & Farmers' Welfare, Government of India

Shri Chhabilendra Roul, Special Secretary, DARE, and Secretary, ICAR, New Delhi visited ICAR-Central Coastal Agricultural Research Institute, Old Goa on 17th October 2018. He visited the Agro-ecotourism Unit developed by the Institute at the 'Block A'. During the interaction programme, Dr. E.B. Chakurkar, Director (A) apprised him on the research achievements and new developments made by the Institute. Shri Chhabilendra Roul addressed the staff of the Institute and briefed about the various initiatives taken by the council to expedite the administrative processes and to make them more



transparent, which was followed by a brief interaction.

Aayudh Pooja performed at Institute

Aayudh pooja was performed at the Institute on 18th October, 2018 to reverence the machinery useful to mankind in his personal and professional life. Dr. E.B. Chakurkar, Director (A) of the institute graced the occasion. Shri. Vinod Ubarhande, Farm Superintendent performed the customary rituals in the Farm section and Animal Section units.



Glorious participation in ICAR Sports meet (West Zone)

The ICAR Zonal Sports Meet (West Zone)-2018 was held at IGFRI, Jhashi from 5th to 8th October-2018. A contingent of 14 sports personnel representing ICAR-CCARI with Shri. Edward Crasta, Technical Officer as Chief-de-Mission and Shri Agostinho Fernandes, AAO as Manager, participated in Football, Volleyball, Carom, Chess, 100 m, 200 m, 800 m and 1500 m race and High Jump. The winners in various events are as follows:

- Football – Winner against CAZRI-Jodhpur beat by 3-1
 - Shri. Anil Khandeparkar 2nd place in 1500 m race
 - Shri Agostinho Fernandes 2nd place in Carom
- The team was qualified for the ICAR Inter Zonal



Sports meet to be held in February, 2019. Nineteen ICAR Institutes participated in this sports meet from West zone with 650 participants. ICAR-CCARI also received the Best Fair play trophy.

On 23rd October 2018, Ex Indian Football

captain and Arjun award winner Mr. Bramhanand Sankhwalkar felicitated the winning sports team of the Institute. He also briefed up on the importance of sports in day to day life of an individual, shared his long football carrier experience with the audience and congratulated the team. Director Dr. E.B. Chakurkar in his address established the

connection between a good sportsman and his best work output in office along with discipline. Shri Agostinho Fernandes, AAO briefed about the ICAR Zonal Sports Meet (West Zone)-2018. Shri Somnath, Administrative Officer compered the function and Mr. Rahul M. Kulkarni, Sr. Technical Officer proposed vote of thanks.

Training-cum-sensitization programmes to minimize postharvest losses in paddy

As a part of NABARD funded project "Popularizing Good Post Harvest Management Practices for Field Crops of Goa through Research, Trainings & Demonstrations", the first sensitization training program was held on 26th October 2018 inaugurated by Dr. E.B. Chakurkar at KVK Training Hall. In the programme, lectures were delivered on topics like, good agronomic practices for field crops of west coast ecosystem to reduce post-harvest losses, choosing varieties suitable for west coast ecosystem to reduce post-harvest losses in field crops, pest management for reducing post-harvest losses in field crops of the west-coastal ecosystem, good management practices to reduce fungi/pathogen related losses in field crops of west coastal ecosystem, nutrient management in field crops in west coastal ecosystem for reducing postharvest losses and machineries and technologies for reducing post harvest losses in field crops of west



coastal ecosystem by, Dr. V. Paramesha, Dr. K. K. Manohara, Dr. R. Maruthadurai, Dr. R. Ramesh, Dr. Gopal Mahajan and Dr. Mathala Juliet Gupta respectively. Besides these programmes, a series of training programmes were conducted on harvest, post-harvest operations like threshing, winnowing and drying practices during harvest season (Oct-Dec, 2018) in 10 different villages of Goa.

Vigilance awareness week 2017

ICAR-Central Coastal Agricultural Research Institute observed the vigilance awareness week from 29th October to 3rd November 2018 on the theme "Eradicate corruption: Build a new India". A committee comprising Dr. E.B. Chakurkar, Director (Acting), Dr. V. Arunachalam, Vigilance Officer, Dr. V. Paramesha, Scientist, Mr. Vinod Ubarhande, Farm Superintendent, Ms. Pranjali Wadekar, Technical Officer, Ms. Sohini Sawant, Assistant, Ms. Shreya Bharve, Stenographer, organised the various events of the programme. Pledge was taken by all staff members at the Institute conference hall both in Hindi and English to eradicate corruption on 29th Oct 2018. An essay writing competition on the theme



corruption free India was held on 31.10.2018. A video dealing with good practices, ways of dealing corruption, dos and don'ts and the details of the functioning of the CVC was prepared by the AKMU of the institute and broadcasted vide

electronically using the TV display near the main entrance during the week. Banners were displayed at main locations of the campus to mark the vigilance awareness week. Hand-out fliers were prepared in Hindi and English with slogans anti-corruption and distributed to the staff and public.

An off-campus campaign was organized on 30th October, 2018 from 10:00 AM onwards as a silent rally to create vigilance awareness by distributing handouts in Hindi and English with

slogans to tourists at Heritage site of Old Goa Church. Many of the staff members of the Institute including contractual workers participated in the rally. A closing ceremony was held on 3rd November, 2018 at the conference hall of the Institute at 4 PM along with Director and staff members where the certificates and prizes were issued to the participants and winners of the essay competition, respectively. Director and Vigilance officer discussed the staff members on vigilance related issues.

ICAR-sponsored Short Course on “Modern techniques in pig semen processing and AI”

ICAR-Central Coastal Agricultural Research Institute, Old Goa organized a ten days ICAR sponsored short course on “Modern techniques in pig semen processing and AI” from 22nd to 31st October, 2018. A total 14 participants from 11 states participated in the programme. The programme was inaugurated by Dr. M. B. Chetti, Hon'ble Vice-Chancellor, University of Agricultural Science, Dharwad. Dr. E.B. Chakurkar, Director (A), ICAR-CCARI was the Course Director and scientists Dr. Gokuldas P. P. and Dr. Susitha Rajkumar, acted as Course Coordinators of the programme. During the course, the participants were exposed to theoretical and practical hands-on sessions on modern techniques in semen evaluation,



processing and artificial insemination in pigs. Besides this, topics like standard hygienic practices for boar semen processing and screening of semen for fertility markers were also included in the course.

Mid-term Institute Research Council (IRC) meeting

Mid-term Institute Research Council (IRC) meeting of the Institute was held during 1st-2nd November 2018. The meeting was chaired by Dr. E.B. Chakurkar, Director, who welcomed all the members of IRC and conducted the deliberations during the meet.

All the scientists from different sections presented the research achievements for the period April to October, 2018, of Institute as well as externally funded projects. The action(s) taken on recommendations/ decisions taken during last IRC meeting were presented and discussed thoroughly. The Chairman, IRC, appreciated the research accomplishments of the scientists. During plenary session, Dr. Manohara, K. K.,



Member Secretary, presented the rapporteurs minutes and the decisions pertaining to each of the research project were finalized. He also concluded the meeting with his formal vote of thanks.

Second meeting of VIII Research Advisory Committee (RAC)

Second meeting of VIII RAC was held on 16th-17th November, 2018. Dr. E.B. Chakurkar, Director (Acting), ICAR-CCARI, Goa briefed the house about the Institute, status of Coastal agriculture, ongoing research projects and the research achievements. He also highlighted the scientific man power requirement of Institute to achieve the mandate and objectives of coastal agriculture research. Action taken report for the RAC recommendations of the previous meet was presented by Dr. R. Ramesh, Principal Scientist and Member Secretary, RAC, that was reviewed by the committee. Presentations were made by the sectional in-charges on the research accomplishments pertaining to the research projects of the section. The chairman and



members of RAC appreciated the achievements made with the limited scientific and technical manpower. After deliberations and discussions, the RAC finalised the recommendations.

Agriculture Education Day

Agriculture Education Day was celebrated at the Institute in commemoration of the birth anniversary (3rd December) of Dr. Rajendra Prasad, the first Indian Union Agriculture Minister (1946) and the first President of Independent India, on 4th December, 2018 at 10.30 am. By this initiative, ICAR aims to develop interest in agriculture and allied sciences among the school and college students and to choose 'agriculture' as their professional and research career or engage themselves in farming as agri-entrepreneurs. The scientific and technical staff of ICAR-CCARI and KVK, North Goa and teachers and students of Old Goa Educational Institute, Old Goa and Madkaikar Navchaitanya High School, Corlim, Goa participated in the event. An essay competition was organized on the topic of 'Importance of agriculture in India' among the schools of Old Goa.

Dr. E. B. Chakurkar, Director, ICAR - CCARI briefed about the programme and initiatives taken by ICAR-CCARI to inculcate the importance agricultural education among the students. Shri. Narendra Sawaikar, Hon. Member of Parliament (South Goa), the chief guest of the function, urged the gathering to contribute for the development



of agriculture and see agricultural education as opportunity shape up career and future. He also awarded the winners of the competition of both the schools with a cash prize and certificate. The programme also had a session on 'Agricultural Education: Introduction and opportunities', wherein a detailed deliberation was given on how to pursue the agricultural education and career opportunities thereafter in various sectors conducted by Dr. G. R. Mahajan, Scientist (Soil Science), and Co-ordinator HRD, Cell, ICAR-CCARI, Old Goa. Subsequently, a field visit on the different research activities of the Institute was coordinated by Public Relation Officers, Mr. Sidharth Marathe and Mr. Edward Crasta.

Distribution of ornamental fish culture inputs and artificial fish habitats to tribal fishers under STC

A programme on “Distribution of ornamental fish culture inputs and artificial fish habitats to tribal fishers under STC” was organised on 4th December, 2018. The ornamental fish culture inputs were distributed to a farmers group of 15 members from Dharbandora, South Goa and artificial fish habitats were given to Shree Shantadurga Fishermen Association from Zuari estuary, North Goa. Dr. E. B. Chakurkar, Director, ICAR-CCARI welcomed the gathering and mentioned about the Schedule Tribe Component programme of Govt. of India and how the fishermen and farmers can be benefitted through the project. Shri. Narendra K. Sawaikar, Hon. Member of Parliament (South Goa), the chief guest of the function, appreciated the efforts of ICAR-CCARI for improving the livelihood of fishermen and agricultural farmers through their



research and extension services. Dr. Sreekanth G. B., Scientist (FRM), Fisheries Section, ICAR-CCARI co-ordinated the distribution programme. The fishermen groups have also assured that a feedback study will be followed to analyse the effectiveness of the STC programme for the welfare of coastal tribal fisher-folk in Goa.

World Soil Day celebrated by ICAR-CCARI and KVK, North Goa

The ICAR – Central Coastal Agricultural Research Institute, Old Goa and Krishi Vigyan Kendra, North Goa celebrated "World Soil Day" on 5th December 2018. Shri. Meghyam, Sarpanch, Sal village, Shri Bhave, ZAO of Bicholim taluka, Mrs Anuja, Branch Manager, SBI, Sal village graced the function. Dr. E.B. Chakurkar, Director, ICAR-CCARI in his welcome address, briefed on the importance of soil health, soil health cards and fertilizer application to the crops. Shri. Meghyam, Sarpanch, Sal village expressed his gratitude for the campaign carried out by the Institute and KVK in their village. About 300 soil health cards were distributed to the farmers from villages Sal. During the technical session, Dr. Gopal Mahajan, Scientist, ICAR-CCARI and Mr. Shashi Vishwakarma, Technical Officer, KVK, delivered detailed talk on soil health card, its importance

and use. Deliberations were also made on the nutrient deficiency symptoms in different crops, their identification and management at farm level. Mr. H.R.C. Prabhu, Program Coordinator, KVK, Shri. Vishwajeet Prajapati, Shri. Shashi Vishwakarma and Shri Rahul Kulkarni coordinated the programme.



Goa Krishi Kranti and Training Hall Inauguration

The Institute participated in the Goa Krishi Kranti exhibition organized by ATMA-North Goa at Dhuler Farm, Mapusa on 18th December, 2018. The exhibition was inaugurated by Chief Guest Shri Shripad Y. Naik Hon. Union Minister for AYUSH, in the presence of other dignitaries like Shri Vijay Sardesai, Hon. Agricultural Minister, Shri Micheal Lobo, Hon. Deputy Speaker, Shri Vinod Paliencar, Hon. WRD Minister, Shri Dayanand Narvekar, Ex-Agriculture Minister and Dr. E. B. Chakuarkar, Director (A). Activities and technologies of ICAR-CCARI, Goa, were showcased and explained by Shri Edward Crasta, Technical Officer (PME) and Shri Shashi Vishwakarma, Technical Officer (Soil Science) for three days, from 18th to 20th December, 2018.



Shri H. R. C. Prabhu, Programme Coordinator Incharge, ICAR-KVK, North Goa and Dr. Maruthadurai, Scientist (Entomology) gave talks on disease management in vegetable crops and pests of vegetable crops, respectively.

Distribution of agricultural inputs to STC beneficiaries

A Scheduled Tribe Component program was held on 29th December, 2018 with 100 farmers, at Shantadurga Mandap, Cuncolem Village, Ponda Taluka, Goa, for distribution of coconut climbing devices, by-pass fat and agrochemicals and fertilizers to STC beneficiaries. An off campus training was imparted with a demonstration of coconut climbing device by Dr. V. Arunachalam, Principal Scientist (Horticulture). Shri. Govind Gaude Minister for Arts, culture, Tribal welfare, civil supplies & Price control, Government of Goa, graced the occasion as chief guest. Dr. E.B. Chakurkar, Director (A), Mr. Durgadas Gaude, Chairman, ST Commission Government of Goa, Dr. V. Arunachalam, Principal Scientist (Hort.), ICAR-CCARI Old Goa and Scientist-in-charge (AICRP on Palms, Goa centre), Dr. M.J. Gupta Scientist (ASPE) and Coordinator (STC) ICAR-CCARI Old Goa, and Mr. Sanjiv Cuncolekar, President, Cuncolem Farmers Cub, Cuncolem addressed the farmers. The dignitaries distributed 15 coconut climbing devices and a fertilizer and agrochemical kit (with muriate of potash, rock phosphate, borax, micronutrient mixture, neem azadirachtin, neem cake and



agricultural lime) during the function to the beneficiaries growing coconut. Besides, seven dairy farmers were given 40 kg each of by-pass fat.

Dr. E.B. Chakurkar addressed the farmers and emphasized the use of by-pass fat in dairy farming. The farmers were briefed by Dr. V. Arunachalam, about the use of fertilizers and agrochemicals and coconut climbing device with the help of charts, power point slides and videos in improving the productivity of coconut. Dr. M. J. Gupta briefed about the outline of STC programme and its implementation at Goastate.

WORKSHOP/SEMINAR/SYMPOSIUM/TRAINING ATTENDED

Date	Name of the scientist	Programme	Venue
8 th -9 th May, 2018	E.B. Chakurkar, S. Priya Devi, Maneesha S.R.	International Mango Symposium	Regional Fruit Research Station, Dr. BSKKV, Vengurle
09 th -11 th May, 2018	Manohara, K. K.	13 th Annual Review Meeting of ICAR seed project - Seed production in agricultural crops'	PAJANCOA, Karaikal
22 nd May, 2018	Gokuldas P.P.	International Biodiversity Day and biodiversity exhibition organized by Goa State Biodiversity Board	Madgaon, Goa
07 th -08 th June, 2018	Manohara, K. K.	Annual review meeting of ICAR- Network Project in Transgenic Crops	ICAR-NRCPB, New Delhi
4 th July 2018	Manohara, K. K.	Half yearly review meeting of the foreign aided projects under Natural Resource Management division	KAB, New Delhi
4 th -24 th September, 2018	G.R. Mahajan	ICAR- Winter School on Advances in Salinity and Sodcity Management under different Agro-climatic regions for enhancing farmers' income'	ICAR-CSSRI, Karnal, Haryana
27 th -29 th September 2018	Maruthadurai. R.	First International Conference on Biological Control approaches and applications	Hotel Le Meridien, Bengaluru
28 th September to 1 st October 2018	E.B. Chakurkar V. Arunachalam Manohara, K.K. Susitha Rajkumar G.R. Mahajan Bappa Das Paramesha V.	12 th national symposium on 'Coastal Agriculture: Boosting production potential under stressed environment'	Dr. BSKKV, Dapoli
3 rd - 6 th October, 2018	Sujeet Desai	Global water security conference for Agricultural and natural resources	Hotel Taj Krishna, Hyderabad
7 th October, 2018	Chethan Kumar H.B.	FSSAI - ICMSF-CHIFSS International symposium on Microbiological Food Safety Sampling and Testing in Food Safety Management	FDA Bhavan, New Delhi
8 th -10 th October, 2018	Chethan Kumar H.B.	FSSAI - ICMSF-CHIFSS International symposium on Microbiological Food Safety Sampling and Testing in Food Safety Management	Radison Blue Plazxa, New Delhi

10 th to 12 th October, 2018	V. Arunachalam	ICGEB Workshop on plant response to light and stress: Emerging issues in climate change	International Centre for Genetic Engineering and Biotechnology, New Delhi
30 th October to 1 st Nov 2018	S. Priya Devi	International Conference on Rural Livelihood Improvement by Enhancing Farmers' Income through Sustainable Innovative Agri and Allied Enterprises	Birla Institute of Technology, Patna
15 th to 17 th October, 2018	Nibedita Nayak	Indian Poultry Science Conference (IPSACON-2018)	ICAR-CIARI, Port Blair
16 th -18 th November 2018	Susitha Rajkumar	26 th Annual Review meeting of AICRP-ADMAS	ICAR-NIVEDI, Bengaluru
14 th December, 2018	Gokuldas P.P.	Interactive meet and Transfer of Technology event supported by DST, Govt. of India and organized by Forum for Innovation Incubation Research & Entrepreneurship	Don Bosco Engineering College, Fatorda, Goa

LECTURES DELIVERED

Date	Name	Title	Venue
03.05.18	S. Priya Devi	Value addition in jackfruit and kokum as an enterprise for farm women of Goa	Shree Shasthi Shanta Durga Community Hall, Dongri
15.06.18	S. Priya Devi	Promoting Value Addition in Jackfruit as an enterprise	Goa Chamber of Commerce and Industries, Panjim
06.06.18	S. Priya Devi	Value addition in jackfruit –a potential enterprise	College of Agriculture, Sulcorna
28.06.18	Nibedita Nayak	Nutrition and feeding management on goats	Krishi Vigyan Kendra, North Goa
29.06.18	Susitha Rajkumar	Importance of vaccination and deworming in goat husbandry and control measures of ecto and endo parasites in goats.	KVK-North Goa
10.07.18	S. Priya Devi	Status and Prospects Of Jackfruit In Goa	KrishiVigyan Kendra, Old Goa
14.08.18	S. Priya Devi	Biodiversity in important crops of Goa	PES College, Ponda
24.9.18	Nibedita Nayak	Managing wet waste by BSF Larvae and using larvae as alternate feed for backyard poultry birds	Navelim, Salcete
26.10.18	Paramesha V.	Good Agronomic Practices for Field Crops of West Coast Ecosystem to reduce Post-harvest losses	KVK, North Goa

Date	Name	Title	Venue
26.10.18	K. K. Manohara	Choosing Varieties Suitable for West Coast Ecosystem to reduce post-harvest losses in Field Crops	KVK, North Goa
26.10.18	R. Maruthadurai	Pest Management for reducing Post-harvest losses in Field Crops of the West-coastal Ecosystem	KVK, North Goa
26.10.18	R. Ramesh	Good Management Practices to reduce Fungi/Pathogen related losses in Field Crops of West Coastal Ecosystem	KVK, North Goa
26.10.18	Gopal Mahajan	Nutrient Management in Field Crops in West Coastal Ecosystem for reducing Post-harvest losses	KVK, North Goa
26.10.18	Mathala Juliet Gupta	Machineries and Technologies for reducing Post harvest losses in Field crops of West Coastal Ecosystem	KVK, North Goa

हिंदी पुरस्कार

AWARDS AND RECOGNITIONS

- 1) भा.कृ.अनु.प. केंद्रीय तटीय कृषि अनुसंधान संस्थान, गोवा, क्षेत्रीय कार्यान्वयन कार्यालय (पश्चिम) गृह मंत्रालय, राजभाषा विभाग, भारत सरकार द्वारा क्षेत्रीय राजभाषा पुरस्कार के प्रथम पुरस्कार से सम्मानित किया गया।
- 2) भा.कृ.अनु.प. केंद्रीय तटीय कृषि अनुसंधान संस्थान, गोवा, भा.कृ.अनु.प. मुख्यालय द्वारा वर्ष 2016-17 के राजर्षि टंडन राजभाषा पुरस्कार के द्वितीय पुरस्कार से सम्मानित किया गया।



Dr. Bappa Das

Received ICAR Jawaharlal Nehru Award for P.G. Outstanding Doctoral thesis research in Agricultural and Allied Sciences 2017 at Indian Council of Agricultural Research, New Delhi on 16th July 2018.



Dr. R. Maruthadurai

Elected as Fellow of Entomological Society of India (FESI) to honour the significant contributions in the field of Agricultural Entomology in the year 2018.

Best poster presentation award bestowed in "First International Conference on Biological Control approaches and applications" by ICAR-NBAIR at Bengaluru, during 27-29th September 2018.



Dr. S. Priya Devi

Secured first place in oral presentation in International Conference on Rural Livelihood Improvement by Enhancing Farmers' Income through Sustainable Innovative Agri and Allied Enterprises, held at Patna, during 30th October to 1st Nov 2018.



Dr. Nibedita Nayak

Received Best oral presentation award for "Detection of partial promoter of ACACB gene" in IPSACON-2018 held at ICAR-CIARI, Port Blair, during 15th-17th November, 2018.