



संवादपत्र NEWSLETTER

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(Indian Council of Agricultural Research)



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भारतीय कृषि अनुसंधान परिषद

AgriSearch with a human touch

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Personalia

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From Director's Desk...

Coastal states of our country hold dense human population throughout the year in comparison with other regions and there is a high demand in this region for meat and meat products. Augmentation of livestock production will assist the coastal population to ensure sustainability in the supply of animal protein. Pig is a potential livestock which could enhance the meat production in coastal region. The pig farming and the production of value added products from pork meat is generally a traditional household activity in most of the coastal areas of the country. However, the dumb growth in the pig industry during the last decade is mainly due to inadequate qualitative improvement of the animal. In this background, ICAR-CCARI has carried out rigorous research actions in the state of Goa to improve the quality of the swine population through selection of local breed, crossbreeding of locally selected animal, controlled breeding using synchronization, artificial insemination, standard balanced feeding and other methodological improvements. As a result, there is a significant increase in the swine production of the state with reference to the Livestock Census-2012. Our salient achievements are registration of local pig (Agonda Goan), production of crossbred pig, estrous synchronization in pigs and standardization of artificial insemination in pigs



The identification and conservation of locally adaptable pigs with superior phenotypic traits (ability to sustain with minimum quantity of feeds and locally available feed stuffs and to resist diseases) is very important for economic pig production. In this context, local pigs were collected from Goa and selectively bred. After continuous breeding experiments, Agonda Goan pig has identified as a breed for the coastal areas. Recently, ICAR breed recognition committee has accepted and recommended it as a breed with id: INDIA_PIG_3500_AGONDA GOAN_09003. A crossbred pig was developed at the institute crossing Agonda Goan with Large White Yorkshire (LWY). Two strains i.e. 50 percentage and 75 percentage LWY were developed. Owing to better growth and other qualitative characteristics, the crossbred pig with 50 percent LWY has become popular in the coastal region of Goa.

Artificial Insemination (AI) is essential for continuous production of animals and the pig farming sector of our country lacks this technology. In this regard, with a funding support from Department of Biotechnology (DBT), Govt. of India, an AI facility for pigs was standardized and established at the institute. For this, the estrous synchronization was standardized in sows with prostaglandins. Thus, the standardization of this method helped to popularize AI in pigs under field conditions and the technology performed well in farmers' field. Moreover, the establishment of National level boar semen collection centre and advanced facility for evaluation, processing and packaging of boar semen at the institute has facilitated training of professionals. Frequent trainings and demonstrations have been provided to professionals from Goa state, ICAR and Universities.

Thus, the research efforts by the institute for improvement of swine population of Goa are commendable and we look forward for further technological and methodological advancements in this sector to trigger holistic improvement along the entire coastal region of our country.

N.P. Singh

(Narendra Pratap Singh)



RESEARCH HIGHLIGHTS

Development of rice-fish based integrated farming system (IFS) for lowland situation of Goa

(Dr. Narendra Pratap Singh, Dr. GR Mahajan and Mr. GB Sreekanth)

A rice (Vytilla)-fish (Rohu, *Labeo rohita*) based integrated farming system (IFS) involving different components; poultry (Gramapriya), cowpea (Goa Cowpea-3), fodder (IGFRI-3) and cucurbitaceous vegetables were tested under the low land situation of Goa. The total area of the system was 0.07 ha (Rice - 0.06 ha, fish - a trench - 40 m² and 1 m deep and rest of the area for fodder and vegetables). A poultry unit (Gramapriya - 4 birds) was kept above the trench so that the poultry litter will fertilise and increase the plankton production in the trench. The total annual cost including annual fixed cost and operating cost was Rs.10875. The net profit (excluding lease and labour) of Rs. 5480 was obtained from 0.07 ha area with a benefit cost ratio of 2.37. The order of contribution of the enterprises to net profit was - fish



(32%) > poultry (23%) > rice (20%) > Fodder (16%) > cowpea (5%) > cucurbits (4%). Thus, practicing this system over one hectare area has a potential to generate a net profit of Rs. 0.78 lakh.

Development and identification of promising high yielding salt tolerant rice lines for coastal salinity conditions

(Dr. KK Manohara)



Pure-line selection in the traditional salt tolerant rice landrace Korgut resulted in the development of two promising selections *viz.*, KS-17 (tall, red kernel) and KS-12 (semi-tall, white kernel). Two year data recorded a grain yield of 1924 kg ha⁻¹ and 1773 kg ha⁻¹ for KS-17 and KS-12, respectively against the unselected Korgut (1007 kg ha⁻¹).

About 41 *saltol* qtl introgressed rice lines received

from International Rice Research Institute, Philippines, were evaluated under coastal salinity conditions in farmers' field at Chorao Island during wet season of 2013 and 2014. Two high yielding stable lines were identified *viz.*, IR87848-301-2-1-1-B (3831 kg ha⁻¹) and IR87848-301-2-1-3-B (3330 kg ha⁻¹) in comparison with national coastal salinity check CST 7-1 (1823 kg ha⁻¹) and local check Korgut (1233 kg ha⁻¹).

Infestation and seasonal occurrence of Cashew aphid and its predators

(Dr. R Maruthadurai)

Infestation and seasonal occurrence of aphid *Toxoptera odinae* was observed in cashew plantations from January to March, 2015. Initially, the aphids were noticed on young growing shoots and underside of young leaves

and later observed to migrate on floral parts and nuts. The minimum (84.44 /leaf) and maximum (203.06/ nut) aphid population were recorded during third week of January and second week of February respectively.



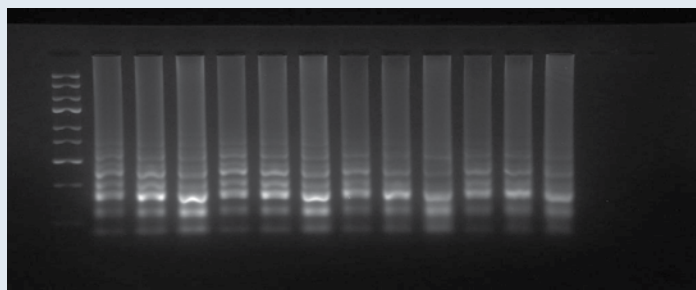


Thereafter, the aphid population was found to decrease due to the significant predator (three species of coccinellids and three species of syrphids) activity. The aphidophagous predators were quite effective in managing aphid in cashew plantations.



Loop-Mediated Isothermal Amplification (LAMP) PCR for detection of *R. solanacearum* (Dr. R Ramesh)

Primers were designed for LAMP PCR and several parameters of reaction mix and PCR cycle were optimized to obtain discrete ladder type banding pattern. Primer specificity was determined using DNA from commonly found soil and plant associated bacteria. LAMP PCR was standardized to detect the bacterium directly from soil and the minimum threshold of detection from soil was 70 CFU. Using water bath, similar pattern of amplification and intensity of bands were obtained. Suitability of several dyes for visual observation of positive LAMP reaction for detection of *R. solanacearum* under field conditions without using agarose gel electrophoresis was standardized. Results of visual observation using dyes were comparable to those obtained by agarose gel electrophoresis.



Allele mining of banana genome sequences for genetic improvement (Dr. V Arunachalam)



Wind stress and salinity are two major problems in coastal region causing low productivity in banana. Short statured plants are able to withstand moderate wind stress. Salt tolerant genotypes are identified using physiological tests elsewhere. Banana is often grown as inter/mixed crop in coconut and arecanut gardens in coastal zone. The objective of the project is to mine the genome sequence information to develop reliable markers associated with salinity tolerance and short stature. Published SCAR markers derived from OPJ04 RAPD associated with dwarf stature and OPA02 associated with salinity tolerance was validated in ten individual banana plants each. The markers can be used for developing the wind and salinity tolerant banana plants.





Probes for molecular marker aided breeding of fruits and vegetable crops (Dr. V Arunachalam)

Sequence characterized amplified region (SCAR) markers are improvement over random markers to improve the reproducibility and precision. They target specific genomic regions and act as diagnostic markers to discriminate specific trait differences in a species. In silico identification of priming sites of a random primer and designing of SCAR primers can save time and resources. A total of 32 published reports on RAPD / ISSR marker were studied using

online database www.bioinfoindia.org/fv-iscardb. Major markers for diversity, dwarfness, salinity tolerance, disease resistance and other desirable traits were predicted using these resources. About 24 primer pairs (Pr032359357 to Pr032359372 and Pr032359658 to Pr032359665) were submitted to NCBI Probe database (www.ncbi.nlm.nih.gov/probe). Markers from the study are useful to horticultural researchers.

Promising black pepper lines for early and high yield (Dr. V Arunachalam)

Black pepper is a major remunerative spice crop suitable for mixed cropping in coconut and arecanut gardens. Panniyur-5 is an important shade tolerant cultivar developed by Kerala Agricultural University. An experiment was initiated to evaluate the performance of Panniyur-5 with gliricidia live support in coconut garden from 2011. Some of these

pepper plants were performing well and many of them could not stand. Three of them had a compact canopy and performed well with early and high yields during first four years of planting. The P-5-1, P-5-2 and P-5-3 yielded 0.13, 0.456 and 0.277 kg/vine after four years. They were screened using OPA01 derived SCAR marker for foot rot resistance.

Promising selections of papaya on desirable qualities (Dr. S Priya Devi)



Promising plants were selected based on yield, quality and tolerance to biotic stress. Either selfing or sibmating was affected depending on the sex of the

selected plant. Seeds have been extracted from three crosses like, 27/16 x 24/18, 21/7 x 21/9, 8/4 x 12/4 and selfed fruit of hermaphrodite plant no.15/10.

Value addition in ribbed cherry (Dr. S. Priya Devi)

Squash was prepared out of juice extracted from ribbed cherry fruits, without boiling and addition of preservatives. Under refrigerated condition, the shelf life was 3 months and mean acceptability score was 7.75/9. Due to the short shelf life, studies have been taken up to find an ideal recipe for squash and jelly cubes.



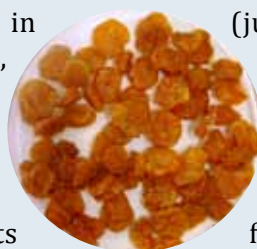
Value added products of nutmeg pericarp for additional income (Dr. AR Desai)

Nutmeg is commercially cultivated for two types of high value spice products viz., nutmeg seed and the mace. In general, A high yielding nutmeg tree yields 75-100 kg of pericarp (yellow colour spherical or oblong fruit rind - 80 to 85% of fruit) per tree in 15 to 20 years. In order to utilise the nutritive value of pericarp, value added products (Jam, candies, rind powder, RTS beverage, syrup, fermented beverage, sweet pickle, chutney/pickle) were prepared. Shelf life, quality attributes and economics of these products are under evaluation.



Value added products from Cashew Apple (Dr. AR Desai)

Cashew apples, the pseudo fruits are rich in ascorbic acid (40 – 390 mg/100 g), sugars, minerals and other anti-oxidants. However, these are mainly used in Goa for preparation a popular alcoholic beverage called “Feni”, a GI registered product. These apples can be used also for preparing value added products



(juice, syrup, beverage, jam, etc). In this context, studies were initiated to process cashew apples for preparing candy. The protocol for preparation of candy was standardized and available for pilot scale trial. Nutritive characterization of candy is under process for commercializing this technology.

Evaluation of gladiolus varieties under open field condition (Dr. M Thangam)

Nine varieties of Gladiolus viz., Souvenir Yellow, Summer Shine, Copper Orange, Summer Pearl, Doll Queen, Souvenir Saffron, Green Bay, Chipper White and Red Majestic were evaluated for different floricultural traits. The spike length ranged from 47.67 cm (Red Majestic) to 66.33 cm (Souvenir Saffron). The number of florets was highest in Copper orange (12.67) followed by Souvenir Saffron (11.67).



Effect of media on rooting of cuttings of ornamental coleus varieties (Dr. SA Safeena)

A study was undertaken to determine efficient medium for propagation and nursery production of different ornamental coleus varieties. About 17 coleus varieties were tested on 5 growing media [M₁:sand (S), M₂: saw dust (SD), M₃: sand + vermicompost (1:1) (SV), M₄: saw dust + vermicompost (1:1:1) (SDV), M₅: sand + saw dust + vermicompost (1:1:1) (SSDV)]. The highest rooting percentage (75.8%) was observed for cuttings in SSDV while the lowest

(57.7%) was for SD. Highest (10.6) and lowest (6.55) number of fully developed leaves were recorded in SSDV and SD respectively. Similarly, highest number of cuttings rooted, shoot length, leaf length and width, petiole length and shoot girth were obtained in SSDV. Hence, in order to promote mass production of coleus varieties, mixture in equal proportion of sand, saw dust and vermicompost is useful under agro-climatic conditions of Goa.



Value addition of tuberose spikes by tinting with edible dyes (Dr. SA Safeena)



In order to improve marketability of white coloured tuberose, studies were carried out to evaluate the ability of cut spikes to develop colour shades. The influence of different concentrations of colouring agents (Tartrazine, Sunset yellow + Carmosine, Tartrazine + Brilliant blue, Tartrazine + Carmosine + Sunset yellow and Royal blue) on vase life of cut spikes of three tuberose cultivars viz., Mexican Single, Pearl Double and Suvasini was tested. Flower spikes were immersed in dyes for three different immersion time (4, 15 and 24 hours). The colour shade of flower spikes was highest with 24 hours of immersion and 1.5% concentration for all colouring agents. The effect of dye concentration, immersion time and combination of both factors on vase life and quality of tuberose cut spikes was non significant.

Identification of suitable cultivar of tuberose for commercial cultivation under agro climatic conditions of Goa (Dr. SA Safeena)

A total of 6 cultivars (Mexican Single, Pearl Double, Suvasini, Bangalore local Double, Calcutta Double and Pune local) were evaluated for commercial cultivation. The varieties differed significantly in growth and flowering behaviour. Shortest time taken for appearance of initial spike and opening of basal floret (84.88 days) were observed in Suvasini. Maximum number of florets/spike (47) was observed in Pune local whereas length of spike (75.59 cm)

was maximum in Mexican Single. Spike girth (0.68 cm), spike fresh weight (69.06 cm), floret stalk length (3.6cm), diameter of floret (5.24cm), weight of individual floret (3.49 g) and vase life (7.93 days) were significantly higher in Suvasini followed by Pearl Double. On the basis of these observations Suvasini, Pearl Double and Mexican Single can be recommended for commercial cultivation under agro-climatic conditions of Goa.

Registration of Agonda Goan Pig (Dr. EB Chakurkar)

Augmentation of livestock production will assist the coastal population to ensure sustainability in the supply of animal protein. Pig is a potential livestock which could enhance the meat production in coastal region. The identification and conservation of locally adaptable pigs with superior phenotypic traits (ability to sustain with minimum quantity of feeds and locally available feed stuffs and to resist diseases) is very important for economic pig production. Local pigs were collected from Goa and selectively bred. As a result, Agonda Goan pig has identified as a breed for the coastal areas. Recently, ICAR breed recognition committee has accepted and recommended it as breed with id: INDIA_PIG_3500_AGONDA GOAN_09003.





Enhancement of milk yield and amelioration of heat stress in dairy animals (Dr. SK Das)

Strategic nutritional and management interventions to reduce heat stress on milk production in dairy cattle were analysed. There was no adverse effect on average daily milk yield and average monthly milk yield due to feeding of bypass fat in addition to cooling arrangement. However, in Sahiwal cow average daily milk yield was reduced significantly by 102 ml

($p < 0.01$) and 312 ml ($p < 0.01$) per unit increase of relative humidity and temperature humidity index. In buffalo, manual cooling by splashing of water twice a day and supplementation of bypass fat to the feed @ 20 g/litre of milk helped to overcome heat stress (by 24.71%) and improved the milk yield (by 9.36%).

Growth and mortality pattern in Gramapriya Parent stock (Dr. RS Rajkumar)

As a part of the poultry seed project, the Parent stock of *Gramapriya* day old chicks were cage brooded and reared under intensive system with strict biosecurity and best managemental practices. Currently the birds are of 23 weeks of age. The male

and female parent lines of *Gramapriya* attained the growth of 2.16 kg and 1.37 kg, respectively at an age of 22 weeks. The peak mortality of the *Gramapriya* Parent stock was found during the grower stage at 8 weeks of age.

NEW INITIATIVES

Salinity Screening Facility (Microplots) (Dr KK Manohara)

A salinity screening facility has been recently developed at the Institute and inaugurated by Dr. AK Sikka, Deputy Director General (NRM), ICAR, New Delhi on 4th April, 2015 in the presence of Dr. Narendra Pratap Singh, Director, ICAR-CCARI. It has 4 tanks (8 m length, 1.8 m width and 1m depth) for salinity screening of rice. Each of these tanks is filled with natural soils transported from salt affected area. This facility will help in screening rice germplasm for salinity stress tolerance both at seedling and reproductive stages. Moreover, the artificial screening facility will help in elimination of soil heterogeneity under natural stress.



AICRP on Palms (Dr. V Arunachalam)

ICAR-All India Coordinated Research Project on Palms at National level focuses on development of need of farmer friendly technologies in palm research especially in integrated nutrient management, pest and disease management, and development of varieties with preferred traits.

Under the All India Coordinated Research Project on Palms the Institute has been sanctioned a project for

experiments covering improvement, seed production and cropping system research of coconut and arecanut. The financial outlay of this project is Rs. 30.7 Lakhs for duration of two years from 2015 to 2017. The project aims at evaluating technologies developed by ICAR-Central Plantation Crops Research Institute, Kasaragod, Kerala for agro-ecological situations of Goa.



MAJOR EVENTS

District level seminar on Spices Production in Goa



A District Level Seminar on Spices production in Goa was organized at ICAR-CCARI, Ela, Old Goa in collaboration with Spices Board, Kochi, Kerala, from 28th to 29th January, 2015. Shri. DP Dwivedi, Secretary (Agriculture), Govt. of Goa, Dr. Narendra

Pratap Singh, Director, ICAR-CCARI, Shri. Orlando Rodrigues, Director (Agriculture), Govt. of Goa, Shri. Siddaramappa, Director (Dev.), Spices Board, Kochi and Dr. AR Desai, Senior Scientist (Horticulture section, ICAR-CCARI) were present during the function. During the technical Session, scientists from IISR, Calicut; Agricultural Research Station (MPKV, Rahuri, Maharashtra); Spices Board and ICAR-CCARI gave detailed account of promising varieties, improved production technologies, plant protection practices and value addition of spice crops. Officers from Spice Board briefed the gathering about various Schemes of Spice Board to support the spice production and marketing. The deliberations of the seminar and open discussion during the interactive session led to the formulation of resolutions to boost the spice industry in Goa.

Participation of ICAR- CCARI in Aqua Goa Mega Fish Festival-2015

ICAR-CCARI has participated with a scientific exhibition stall in the Second Aqua Goa Fish Festival-2015 organised by Directorate of Fisheries, Govt. of Goa with National Fisheries Development Board, Hyderabad from 29th January to 1st February (Navelim) and 6th to 9th February (Mapusa). Shri. Laxmikant Parsekar, Chief Minister of Goa inaugurated the event. The Section, Fisheries Science, ICAR-CCARI, displayed posters representing their research and extension activities in the stall. Moreover, the sale and display of fresh water ornamental fishes were also done.



Participation in Exhibition organized by Vigyan Bharati at Kala Academy

The Institute participated in the exhibition organized by Vigyan Bharati at Kala Academy from 5th to 8th February, 2015. The exhibition was inaugurated by Hon'ble Governor of Goa, Mrs. Mridula Sinha. About 1.5 lakh visitors, including school children and farmers visited our exhibition stall. Different technologies developed by the Institute were showcased in the form of posters, models, samples, etc. during the occasion. Team of scientists/officials headed by the Director, Dr. Narendra Pratap Singh guided the visitors and explained the activities of the Institute and the Krishi Vigyan Kendra attached to the Institute.



Training Programme on “Adoption of improved technologies in cultivation of bulbous flower crops for livelihood enhancement”



A training programme on “Adoption of improved technologies in cultivation of bulbous flower crops for livelihood enhancement” under Tribal Sub Plan project

was organised on 27th February, 2015 at Cotigao Panchayat, Canacona Taluka, Goa by Scientists from ICAR-CCARI. A total of 62 tribal farmers from various parts of Canacona Taluka attended the same. Mrs. Maya Gaonkar, Sarpanch, Cotigao and Mr. Datta Velip, Deputy Sarpanch, Cotigao were present during the function. Technical sessions on improved methods of cultivation of tuberose and gladiolus were delivered by scientists from ICAR-CCARI. This was followed by distribution of planting materials – gladiolus corms, tuberose bulbs and a technical bulletin on “Ready Reckoner on Cultivation of Gladiolus”. Training ended with a field demonstration on cultivation of bulbous flower crops.

Visit of Prof. R. B. Singh, Chancellor CAU and Past President NAAS

Prof. RB Singh, Chancellor, CAU and Immediate Past President NAAS, New Delhi visited the Institute on 10th March, 2015. Dr. Narendra Pratap Singh, Director and Scientists of the Institute explained the research activities being carried out in the Institute. He visited all the experimental units including livestock units and laboratories. He appreciated the efforts of the scientists and complemented the Director and staff for the work being carried out at the Institute. He also addressed all the staff members of the Institute.



NICRA Focus Group Workshop on “Climate Change and Coastal Aquaculture – Impacts, Adaptations and Mitigations for Resilience”



National Initiative on Climate Resilient Agriculture Focus Group Workshop on “Climate Change and Coastal Aquaculture – Impacts, Adaptations and Mitigations for Resilience” was organised by ICAR-Central Institute of Brackishwater Aquaculture

(ICAR-CIBA) in collaboration with ICAR-CCARI on 11th March, 2015. There were about forty participants representing the fishermen, and fish farmers of Goa. Scientists from ICAR-CIBA gave an introduction about the NICRA project, importance of awareness on climate change and various coastal and brackishwater fish culture techniques. Dr. Narendra Pratap Singh, Director, ICAR-CCARI emphasized on climate change and its impacts on the agriculture and fisheries sector of Goa. Dr. Shamila Monteiro, Director, Dept. of Fisheries, Govt. of Goa urged for new initiatives in the fisheries sector to combat the climate change. The participants gave their feedback on their perceptions and auto-adaptations of climate change in Goa.



Hands on training programme on protected cultivation of high value crops in Goa

A RKVY sponsored training programme on protected cultivation of high value crops in Goa was organised from 17th to 18th March, 2015. The deliberations by scientists of ICAR-CCARI included protected cultivation of high value crops in Goa, cultivation of flower crops in polyhouse, cultivation of gladiolus and tuberose under open field in Goa, suitable protected structures for high value crops in Goa and plant protection in protected structures. Dr. Narendra Pratap Singh, Director emphasized the scope of protected cultivation and need to develop marketing strategies for large scale cultivation in Goa.



Secondary livelihood opportunities through fishery resources



A training programme on “Secondary livelihood opportunities through fishery resources” sponsored by National Fisheries Development Board was organised by ICAR-CCARI from 19th to 21st March, 2015.

It covered technical sessions from scientific experts of ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI) and ICAR-CCARI. A total of twenty eight farmers and entrepreneurs from different parts of North and South Goa have participated in the programme. Dr. Narendra Pratap Singh, Director, ICAR-CCARI pin pointed the importance of mariculture and ornamental fish culture in Goa. The training emphasized on mussel culture, ornamental fish culture, fish health management, aquarium construction and management, live feed culture, feed formulation techniques and indigenous freshwater ornamental fishes of Goa and practical sessions on aquarium fabrication and hatchery management.

Training on “Use of online web portal Soil Test Based Fertilizer recommendations in Goa”

The Institute conducted one day training on “Use of online web portal Soil Test Based Fertilizer Recommendations - Goa to make soil test based fertilizer recommendations to Goan crops” on 20th March, 2015. The Institute has launched an online web portal to make the fertilizer recommendations to important crops of the State of Goa. Dr. Narendra Pratap Singh, Director, ICAR-CCARI, enlightened the trainees about importance of making the soil test based fertilizer application and urged them to make use of the utility developed by the Institute. The group of trainees consisted of the officials of soil testing laboratories in Goa, Department of Agriculture, Government of Goa, farmers and participants from the Institute. The importance of the web portal was also conveyed through technical



presentation on development of the web portal and soil test based fertilizer recommendations from farmer, fertilizer manufacturer and distributor point of view.



Visit of Dr. Alok Kumar Sikka, DDG (NRM)

Dr. AK Sikka, DDG (NRM), visited the Institute on 2nd to 4th April, 2015. He visited various research units of Sections - Crop Sciences, Horticulture, Animal Science and KVK and inaugurated the renovated Mandovi Guest House and Salinity Screening Facility at the Institute. A meeting with the scientific, technical, administrative and skilled support staff of ICAR-CCARI was organized. Dr. Narendra Pratap Singh, Director of the Institute briefed about the Institute research activities. Three publications including two technical bulletins and Newsletter (Vol 16 (3)) were released by Dr. AK Sikka. He appreciated the work done by the Institute and assured his continuous support.



Farm inputs Distribution to tribal farmers at Cola village in South Goa



Under the TSP project, a programme on Farm inputs Distribution to tribal farmers was organised on

4th April, 2015 at Cola village, South Goa. The farm inputs viz. power tillers with all accessories, power sprayers, brush cutters, fertilizers and agrochemicals were distributed to six self-help groups of tribal farmers. Dr. AK Sikka, Hon'ble DDG (NRM), ICAR, Dr. Narendra Pratap Singh, Director, ICAR-CCARI and Shri. Narendra Sawaikar, Hon'ble Member of Parliament, South Goa were present during the occasion. Scientists, In-Charge, KVK and other staff of ICAR-CCARI participated in the event.

Distribution of fishing gear and safety devices to tribal fishermen

A programme on "Distribution of eco-friendly fishing gears and safety devices" under TSP project was organised by ICAR-CCARI at Cacara on 13th April, 2015. Fishing gear (gillnet) materials and life jacket floats were distributed among the tribal fisher-folk of Nauxim, Cacara and Odxal. The fisherfolk identified are members of Shree Shantadurga Fishermen Association, Tiswadi. Dr. Narendra Pratap Singh, Director, ICAR-CCARI briefed about the research and extension activities of the Institute and explained how TSP, Govt of India can benefit fishermen and farmers. Hon'ble Minister for Environment and Forest, Govt. of Goa, Smt. Alina Saldanha appreciated the efforts of ICAR-CCARI for improving the livelihood of fishermen and farmers through their research and extension services. Dr. Shamila Monteiro, Director of Fisheries, Govt. of Goa welcomed the great initiative from ICAR and ensured the complete co-operation from the fisheries department for research and extension activities. The occasion had a presence of Dr. Shamila



Monteiro, Director, Dept. of Fisheries, Govt. of Goa and Sarpanchs and members of Taligao, Curca, Bambolim and St. Cruz. Mr. Sanjay Perera, Head of the Shree Shantadurga Fishermen Association requested full support from Department of Fisheries, Ministries and research institutions like ICAR-CCARI for conservation and augmentation of fishery in Zuari estuary and for the better livelihood of tribal fisher-folk.



Workshop / Seminar / Symposia / Training attended

Date	Name of Scientist	Programme	Venue
22 nd to 23 rd January, 2015	Dr. R Ramesh	Workshop of annual review meeting of AMAAS project	NASC complex, New Delhi
28 th January, 2015	Dr. SK Das	National Seminar and XXII Annual Convention of ISAPM on "Livestock production practices for small farms of marginalized groups and communities in India"	C. V. Sc. & A .H. C.A.U., Aizawl, Mizoram
29 th to 30 th January, 2015	Dr. NP Singh Dr. V Arunachalam Dr. R Ramesh	National Seminar on "New frontiers in plant science and biotechnology"	Goa University, Taligao, Goa
29 th January to 1 st February, 2015 and 6 th to 9 th February, 2015	Mrs. N Manju Lekshmi, Mr. GB Sreekanth	Aqua Goa Mega Fish Festival	Navelim, South Goa (29 th January to 1 st February) and Mapusa, North Goa (6 th to 9 th February)
3 rd to 5 th February, 2015	Dr. NP Singh	12 th Agricultural Science Congress (ASC) on "Sustainable livelihood security for smallholder farmers"	ICAR-NDRI, Karnal, Haryana
6 th to 8 th February, 2015	Dr. NP Singh, Dr. EB Chakurkar, Dr. RS Rajkumar, Dr. M Thangam	IV Bhartiya Vigyan Sammelan and Expo 2015	Kala Academy, Panjim, Goa
9 th February, 2015	Dr. NP Singh	The 38 th State Level Technical Committee (SLTC) meeting	Sahakar Sankul, EDC Complex, Panjim, Goa
16 th February, 2015	Dr. NP Singh	Goa State Medicinal Plant Board Meeting	Conference hall Secretariat, Porvorim, Goa
16 th February to 8 th March, 2015	Mr. GB Sreekanth	Summer School on "Recent advances in marine biodiversity conservation and management"	ICAR-CMFRI, Kochi, Kerala

26 th February, 2015	Dr. SK Das	One day workshop on "Training need assessment" of HRD Nodal officers	NAARM, Hyderabad, Telengana
9 th March, 2015	Dr. V Arunachalam	National Seminar on "Recent developments in biotechnology"	St Xavier College, Mapusa, Goa
13 th to 14 th March, 2015	Dr. NP Singh	National Seminar on "Cashew-a perspective crop for future"	Menezes Braganza hall, Panjim, Goa.
16 th to 17 th March, 2015	Dr. R Ramesh	National Symposium on "Understanding host-pathogen interaction through science of omics"	ICAR-IISR, Kozhikode, Kerala
18 th March, 2015	Dr. R Ramesh	Annual review meeting of PhytoFuRa project	ICAR-IISR, Kozhikode. Kerala
22 nd March, 2015	Dr. NP Singh Dr. RS Rajkumar Dr. R Ramesh Dr EB Chakurkar	"Make in Goa" One day Conference organized by Goa Institute of Management – EMBA	EMBA at Ribandar campus, Ribander, Goa
22 nd March, 2015	Dr. V Arunachalam	Symposium on "Mathematical and computational biology"	IIT, Gandhinagar, Gujarat
23 rd to 25 th March, 2015	Dr. M Thangam	International Symposium on "New perspectives in modern biotechnology"	The Accord Hotel, Puducherry
7 th April, 2015	Dr. NP Singh	Meeting of the Advisory group for the Don Bosco College of Agriculture, Sulcorna	Don Bosco College, Panjim, Goa
13 th April, 2015	Dr. NP Singh	XXV meeting of the State Level Executive Committee (SLEC) for National Horticulture Mission and On Farm Water Management	Conference hall, Secretariat, Porvorim, Goa
11 th to 15 th April, 2015	Dr. KK Manohara	50 th Annual Rice Group Meeting	ICAR-DOR, Hyderabad, Telengana
17 th to 19 th April, 2015	Dr. NP Singh	National Seminar on "Harmonizing biodiversity and climate change: challenges and opportunities"	ICAR-CIARI, Port Blair, Andaman and Nicobar
25 th April, 2015	Dr. SK Das	One day seminar on "Vector born zoonotic disease, kidney dialysis and cardiac emergencies"	Miramar, Panjim, Goa



PERSONALIA

Awards/Recognition

Dr. Narendra Pratap Singh

- Lead lecture on 'Plantation crops and fruits and coastal region of India: An overview of prospects and constraints' and chaired the technical session on 'Crop care and plant protection' in the National Seminar on 'Sustainable Horticulture vis-a-vis Changing Environment' at Nagaland University, Medziphama, Dimapur, Nagaland from 26th to 28th February, 2015.
- Lead speaker in technical session 'Constraints and opportunities in Agriculture Industry in Goa' at Goa Institute of Management, Raibandar organised one day Conference on 'Make in Goa - Tourism, Info-Tech and Agro Pharma Industry' held on 22nd March, 2015.
- Presented a lead paper in Technical Session entitled 'Coastal Zone Management and Climate Change' in the National Seminar on 'Harmonizing Biodiversity and Climate Change: Challenges and Opportunity' (NSBC-2015) at ICAR-CIARI, Port Blair, Andaman and Nicobar during 17th to 19th April, 2015.

Dr. SK Das

- Conferred National Fellow of Animal Production and Management (FNAPM) by the President, ISAPM to honour the significant contributions in research, extension and developmental activities in the field of livestock production and management on 28th January, 2015.

Dr. R Ramesh

- Elected as Fellow of National Academy of Biological Sciences 2014
- Invited speaker in the training programme on “Genetic and pathogenic characterization towards managing nationally important plant pathogens causing wilt and blight” conducted during 13th January, 2015 to 2nd February, 2015 by Centre of Advanced Faculty Training (CAFT) at division of Plant Pathology, IARI, New Delhi.
- Lead speaker in the National Symposium on “Understanding Host-Pathogen Interaction through Science of Omics” during 16th to 17th March, 2015 at the ICAR-Indian Institute of Spices Research, Kozhikode, Kerala.

Rahul M. Kulkarni

- Awarded M.Sc. (Soil Science and Agricultural Chemistry) by Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra on 10th November, 2014.

Promotion

Financial upgradation granted to the following Skilled Support Staff under MACP Scheme

1. **Shri. Subhash Mellekar**, Skilled Support Staff
2. **Shri. Gokuldas Kasker**, Skilled Support Staff

Transfer from ICAR-CCARI

Shri Deep Kumar, Farm Manager, transferred to IISR, Lucknow w.e.f 31st March, 2015

Transfer to ICAR-CCARI

1. **Dr. Shivasharanappa N**, Scientist (Veterinary pathology), Transferred from ICAR-Central Institute for Research on Goats, Makdood joined ICAR-CCARI on 22nd April, 2015
2. **Shri Viswanatha Reddy K**, Scientist (Agricultural Economics), Transferred from ICAR-National Institute of Agricultural Economics & Policy Research, New Delhi, joined ICAR-CCARI on 22nd April, 2015

New recruitment

1. **Ms. Maneesha SR**, Scientist (Fruit Science) joined on 1st April, 2015
2. **Dr. Chethan Kumar HB**, Scientist (Vet. Public Health) joined on 10th April, 2015

