SALINITY News

Vol-19, No. 2 July - December 2013

From Directors' Desk

Central Soil Salinity Research Institute (CSSRI) is the premier research organization dedicated to pursue interdisciplinary research on salinity management and use of poor quality irrigation waters in different agro-ecological zones of the country. Since its inception in 1969, the success of the institute is evident from the rapid spread of reclamation technologies especially wide spread adoption of alkali soil reclamation package by the farming community. It is estimated that about 2.0 million ha of salt affected area has been reclaimed by the adoption of technologies developed by CSSRI. This area alone is contributing approximately 16.5 million tonnes of paddy and wheat annually besides generating on-farm and off-farm employment for more than 230 million person-days during the last three decades. Over the years, the Institute has grown into an internationally recognized center of excellence in salinity research. We are conscious that the problems of soil salinity and poor quality water are likely to increase in the next decade due to planned expansion in irrigated area and intensive use of natural resources to meet food, fodder, fibre and timber requirement of the burgeoning human and livestock populations. We are geared to this challenging task and are ready to provide preventive and reclamative cost-effective solutions to these problems.

A number of scientific professional and partnership programmes were organized during July-December 2013. Amongst many important achievements, formulation "CSR-BIO" a potential bio-growth enhancer in normal and sodic soils was commercialized for its large scale production and marketing. New research initiatives include carbon sequestation, solid waste utilization, use of highly saline water through bio-saline agriculture, efficacy of pressurized irrigation for rice-wheat system and studies on salt tolerance of rootstocks of guava and mango.

To disseminate institute technologies to the farming community as well as to provide farmers an opportunity to purchase seeds of promising crop varieties and Kharif Kisan Mela was organized at Nain farm (Panipat district). A training programme for sugarcane officers and farmers on management of salt affected soils, five days' training programme for CADA Officers on use of modern tools in water management for evaluating water use efficiency and crop yield and a three days Regional Expert Consultation meeting on best practices and procedures of saline soil reclamation system in SAARC Region were organized

A National Symposium was organized by the Indian Society of Coastal Agricultural Research, Canning Town (West Bengal) in collaboration with CSSRI, Karnal at the RRS, Bharuch. The XXIII biennial workshop of AICRP on Management of Salt Affected Soils and Use of Saline Water in Agriculture was held at University of Agricultural Sciences, Raichur.

We had an opportunity to receive a number of dignitaries and experts and to discuss with them our research experiments and plans. The notable visitors were Dr. S Ayyappan, Secretary DARE and DG, ICAR; Dr. A.K. Sikka, DDG (NRM) and Dr. B. Mohan Kumar, ADG (A&AF), ICAR New Delhi; Dr. R.B. Singh, President, NAAS, New Delhi; Dr. A.R. Pathak, Vice-Chancellor, NAU, Navsari; Dr. N.K. Tyagi, former Member, ASRB, New Delhi; Dr. B. Mishra, former Vice Chancellor of SKUAST, Jammu; and Dr. K.D. Kokate, DDG (Ag Extn).

During this period, Dr. D.K.Sharma and his team received prestigious Hari Om Ashram Trust Award 2010-11, and other scientists were honoured with award and fellowship. I congratulate them and wish them all the best in their future career. The institute scientists published 37 peer reviewed research papers in international and national Journals while 3 books and manuals were also brought out. Eight bulletins and folders were published by the institute. Under capacity building programmes, institute scientists had visited international organizations in 9 visits. I am confident that the information contained in this newsletter would not only update the readers but would be quite useful to them since many recent scientific and technical developments have been included. I would welcome feedback and suggestions/ comments of our readers to further improve the contents of the newsletter.

(D.K. Sharma)
Director

In This Issue...

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Impact of CSR-BIO-an eco-friendly bio-growth enhancer for increasing profitability in horticultural crops

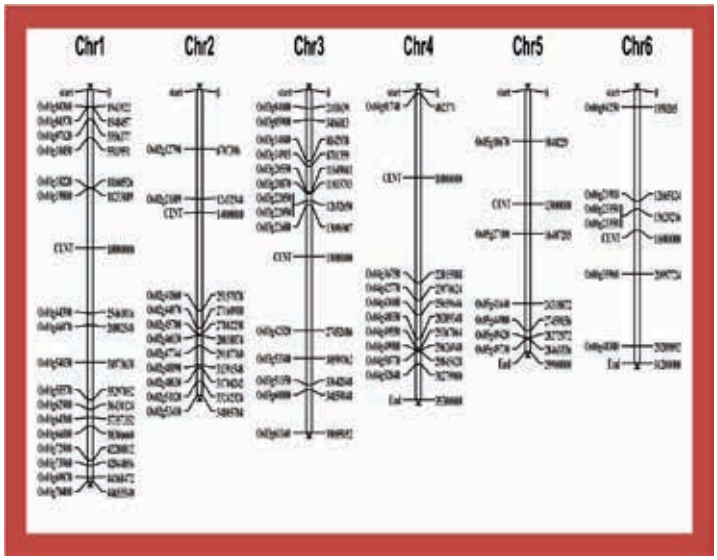
A cost effective bio-growth enhancer CSR BIO was introduced in horticultural crops grown by small and marginal land holders in Barabanki district of Uttar Pradesh. The profitability of the formulation in commercial crops like tomato and banana with its impact on reducing use of chemical fungicides toxic to environment was assessed with adopters and non adopters of CSR-BIO in two major banana and tomato growing areas of during 2011-13. The data were collected from 100 adopters and 100 non-adopters of CSR BIO technology in tomato var. Himsona and banana var. G-9. Results showed an overall increase in yield up to 22.4 and 15.6 per cent in the adopters of tomato and banana. It increased the gross profitability by 20.1 and 17.4 per cent in banana and tomato, respectively. The use of plant protection chemicals was 47.3 and 33.4 per cent lower than the non-adopters in tomato and banana, respectively. The mean banana bunch yield of 31.53 kg of the adopters was 15 per cent more than the non-adopters. The mean expenditure incurred by the adopters was Rs. 1.60 lakhs ha^{-1} which is 8.5 per cent less than non-adopters.

Commercial cultivation of bio primed banana and tomato

T. Damodaran, D.K. Sharma, V.K. Mishra and S.K. Jha

Identification of QTLs for Sodicity Tolerance in CSR11/MI48 RILs by Bulk Segregant Analysis Approach

Sodicity tolerance in rice is a quantitative trait controlled by polygene. Genetic mapping of the quantitative trait loci (QTLs) for the trait is a common method. One method to rapidly identify markers or genomic regions linked to a trait is by bulk segregant analysis (BSA). BSA partitions a population into two pools based on phenotypic performance, so that each bulk contains only a small proportion of the population with extreme phenotypes. The method is based on marker analysis of pooled genomic DNA samples from each bulk to identify association between marker and trait phenotype and thereby designate a probable location for the QTL. In the present study parental polymorphism was surveyed between a salt tolerant rice genotype CSR 11 and a salt sensitive variety MI 48, the two parents of a Recombinant Inbred Lines population of 216 lines. Out of 750 SSR markers surveyed, 80 were polymorphic. Phenotyping for salt tolerance was done in micro plots under normal (pH 7.5), moderate (pH 9.5) and high sodicity (pH 9.9) conditions at CSSRI, Karnal over three



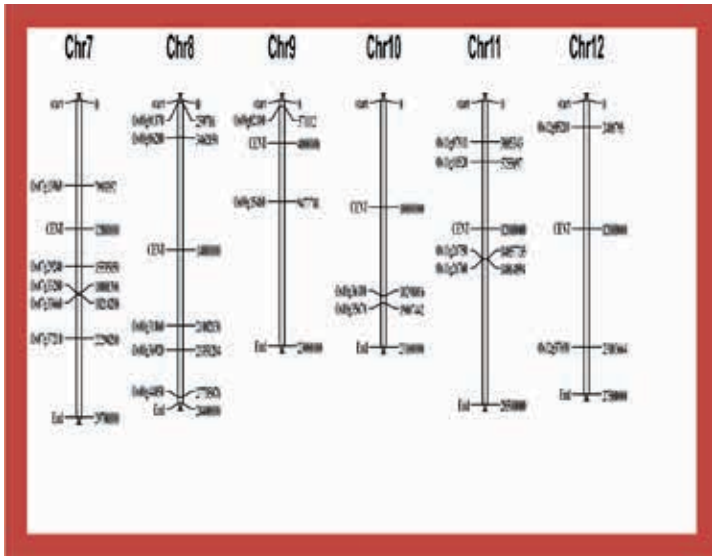


Fig 1 : Mapping of genomic regions for SSI grain yield in CSR11/MI 48 RILs population

years (2010, 2011 and 2012). Ten top tolerant recombinant inbred lines (RILs) namely, RIL 11, RIL 63, RIL 70, RIL 78, RIL 106, RIL 114, RIL 125, RIL 147, RIL 168 and RIL 180; Ten bottom sensitive RIL 32, RIL 85, RIL 102, RIL 112, RIL 115, RIL 129, RIL 144, RIL 145, RIL 153 and RIL 160 were identified on the basis of stress susceptibility index (SSI) for grain yield from three years phenotyping. DNA was extracted from each of the extreme RILs and combined in equal quantities to prepare extreme tolerant and extreme sensitive bulks and analyzed along with the two parents using all the polymorphic markers. A total of five regions on chromosomes 1, 2, 8, 9 and 10 showing tight linkage with the trait were identified (Fig 1). Two of these locations match with QTLs previously mapped on chromosomes 1 and 8. Genetic map of the three novel QTLs on chromosomes 2, 9 and 10 has been prepared to identify their precise location and effect.

S.L. Krishnamurthy, S.K. Sharma, V. Kumar, V. Batra and P.S. Tomar

Improved Nutrient and Crop Establishment Methods for Summer Season Rice in Coastal Salt Affected Soils

Improved method of summer rice cultivation practices were evaluated in an on-farm trial in a farmer's field in village Pakhiralay, block Gosaba, district South 24 Parganas (West Bengal). The soil at the experimental site was clay loam and a salinity of the soil saturation extract of 8.7 dS m^{-1}. The experiment was conducted during January to May, 2013 in a randomized complete block design with four replications, and had five treatments: (i) farmers' variety (IET 4786, locally known as *Sadaminikit*, duration from sowing to harvest 110 to 115 days, plant height 0.80 m, grain type long slender) with normal farmers' practice (transplanting of 30 days old seedling and only N application in the form of Urea); (ii) farmers' variety (IET 4786) transplanted at 30 days with improved integrated nutrient management (INM) involving recommended dose of fertilizers (RDF) i.e. 120-20-0 kg NPK ha^{-1}; *Azolla* @ 2 t ha^{-1} and FYM @ 5 t ha^{-1}; (iii) salt tolerant variety WGL 20471 (locally known as *Lalminikit*, duration from sowing to harvest 115 to 120 days, plant height 77 cm, grain type long slender, reddish grain colour, suitable for *boro* season) with normal farmers' practice (transplanting of 30 days old seedlings and only N application in the form of Urea); (iv) salt tolerant variety WGL 20471 transplanted at 30 days with INM as in treatment (ii); and (v) salt tolerant variety WGL 20471 with direct seeding (drum-seeding of pre-germinated seeds with INM as in treatment (ii). Highest grain yield (4.99 t ha^{-1}) was obtained by replacing farmers'variety (IET 4786) with WGL 20471, introduction of drum-seeding of pre-germinated seeds and INM, statistically same grain yield (4.88 t ha^{-1}) was obtained with the same treatment with transplanting 30 days old seedlings. Both these treatments were significantly better than all other treatments studied in the farmers' field. Under high salinity of 8.7 dS m^{-1}, the susceptible variety (IET 4786) did not perform better than tolerant variety WGL 20471, However, even with farmers'variety, introduction of INM increased the grain yield of *boro* rice by 11%. The use of FYM significantly increased soil organic matter, N, P status and available water holding capacity but decreased the soil bulk density, creating a good environment for growth and development of rice crop. Similarly, keeping the nutrient management constant, introduction of the tolerant variety WGL 20471 alone increased grain yield by 13 and 14% in the improved management and farmers' practice, respectively.

Drum seeding in summer rice in coastal areas

B. Maji, S. K. Sarangi, S. Mandal, D. Burman and D. K. Sharma

Reclamation and Management of Alkali Land – A Success Story

An innovative farmer Shri Mahabir Singh Ror resident of village Dadrath, District Jind (Haryana), while going through his lush green fields, shares his bitter past experiences. He categorically emphasized that frequent application of saline/sodic water year after year changed his ancestral productive land into almost barren and uncultivated land. Agriculture being only the source of his family income, depriving crop production and productivity made significant adverse impact on the farmer's well being and put a question mark on his family's food and livelihood security. To cope up with the aggravated problem and search for relevant corrective measures, in consultation with the officials from State Agriculture Department he approached the scientists at Central Soil Salinity Research Institute, Karnal in the year 1990. Regular field visits and frequent interactions with the scientists made him fully confident to adopt the alkali land reclamation and management programme recommended by CSSRI scientists. Adoption of recommended and innovative technological interventions like proper land shaping, use of laser land leveling for improved water use efficiency, soil test based application of soil amendments like gypsum and sugarcane press mud, incorporation of green manure resulted into significant improvement in crops productivity.

To make poor quality underground water fit for irrigating crops, Shri Singh started applying 35 kg gypsum/acre/irrigation for each milliequivalent/litre of tested residual sodium carbonate (RSC) level. While successfully adopting the time tested water

Sh. Mahabir Singh Ror showing the performance of salt tolerant wheat variety to CSSRI scientist at his farm

recharge technique, particularly with the use of excessive canal and rain water, Shri Singh not only combated the problems of depleting groundwater table but also raised the productivity of the crops to certain possible extent with the application of good quality water particularly during the periods of critical crop growth stages. Adoption of recommended varieties of wheat (KRL 1-4, KRL 19, KRL 210, KRL 213), rice (CSR 10, CSR 23, CSR 27, CSR 36), basmati rice CSR 30 and mustard (CS 52, CS 54, CS 56) on the salt affected soils has made a significant improvement in productivity potential compared to the traditional local cultivars.

Now, Shri Mahabir Singh Ror is a well reputed innovative farmer personality among the farming fraternity and become a creditable example of "Subsistence farming to profit oriented Sustainable farming" in the area. He has made impressive enhancement in his total farm income. He is also taking keen interest in allied agricultural enterprises while conserving the natural resources through adoption of new conservation technologies like laser land leveling, zero tillage, bed planting, happy seeder etc. The real time farm impact of sodic land reclamation and management programme can be witnessed from the fact that a large scale area has been reclaimed and put forth under productive cultivation which has resulted in better resource generation, brought up laurels to the concerned farmers and played a key role in socio-economic upliftment of the farming community in the salt affected degraded lands.

Shri Mahabir Singh Ror has been credited with a number of awards from Indian Council of Agricultural Research, State Agricultural Universities and Krishi Vigyan Kendras at the local, regional and national level. He has always been addressing the field problems at the key platforms while providing critical inputs and feedback for further refinement of the tested technologies. He has always been a front runner in helping and guiding the affected farmers to adopt the sustainable and worthwhile technologies. He has been a source of inspiration for the others. He is playing a pivotal role in uplifting the livelihood security of individual farmers as well as rural society on a community basis.

R.S. Tripathi, D.K. Sharma and Parvender Sheoran

Visit of Dr. S. Ayyappan, Secretary, DARE & DG, ICAR and Dr. Alok Kumar Sikka, DDG (NRM) at CSSRI, RRS Canning Town, West Bengal

Sundarban land of West Bengal is one of the most underdeveloped areas in India where millions of people are living under abject poverty. Agriculture including fisheries is the main occupation of the people but prevalent coastal salinity is the biggest problem for getting higher productivity. As a result, large-scale migration is common for people of this region in search of alternative livelihoods across the country. In view of these problems, CSSRI RRS, Canning Town is actively engaged in research to develop suitable technologies for increasing farm income. The land shaping models as designed by this station reached to many farmers field in this region and the farm income has gone up by manifolds under demonstration plots. The land shaping technique is a unique technology along with salt tolerant rice varieties for addressing the key challenges like land degradation (salinity), drainage congestion and scarcity of fresh water for irrigation and in turn have the potential to enhancing production, productivity, income and employment. These techniques particularly farm pond and paddy-cum-fish are financially viable and attractive proposition for the coastal region.

Many collaborative farmers have explained their experiences and benefits due to adoption of land shaping models to

Dr. S. Ayyappan, Secretary, DARE & DG, ICAR, intracting with the farmers of Mokanberia village

Dr. A.K. Sikka, DDG (NRM) visiting the experimental area of RRS Canning Town

Dr S. Ayyappan, Secretary, DARE & DG, ICAR, during his visit at Mokanberia village of Basanti Block on 26th July 2013. The land shaping models have created an opportunities to grow crops (paddy, vegetables, sunflower etc) along with fishes throughout the year which otherwise was characteriesd by mono-cropped with *kharif*-rice. Farmers are earning around Rs. 1.50 lakh per hectare after land shaping as compared to meagre Rs. 22000 per ha. After successful implementation of these technologies and realizing the benefits, some of the farmers and their relatives have come back to their villages to take up the agriculture as primary occupation.

Similar experiences were shared by the farmers to Dr Alok K. Sikka, DDG (NRM) also, when he visited the area on 1st October 2013 followed by interaction with the collaborative farmers of Sundarban region, they also visited CSSRI, RRS Canning Town and apprised about the various activities during his visit.

Training on Use of Modern Tools in Water Management for Evaluating Water Use Efficiency and Crop Yield

A five days' training programme for CADA Officers on Use of Modern Tools in Water Management was held during August 19-23, 2013. Nineteen Officers/ Engineers from Karnal, Kurukshetra, Kaithal, Panipat, Rohtak, Jind, Jhajjar, and Rewari Divisions participated in the training programme which was inaugurated by Dr. Rameshwar Singh, Project Director, DKMA, New Delhi. Er. Atul Narang Executive Engineer, CAD Division, Panipat and Er. P.K. Luthra, Executive Engineer, CAD Division, Karnal were the Guest of Honour and Special Guest, respectively. Dr. D.S. Bundela, Principal Scientist presented the overview of the training programme. He emphasised that CADA and Irrigation departments of Haryana have not made significant progress in the use of modern tools and ICT in irrigation water management whereas Gujarat, Andhra Pradesh and Maharashtra have become leaders in use of modern tools/ ICT in irrigation. This training course was designed to give a boost to the applications of ICT in irrigation sector of Haryana.

Dr. Rameshwar Singh highlighted the importance of efficient use of water resources for irrigation in enhancing crop production in view of reduction of canal water to agriculture and looming dangers of climate change. ICT have played a pivotal role in monitoring of water delivery to farms in order to improve reliability and equitable distribution with enhanced water use efficiency. Dr. Singh cited the example of Israel which has demonstrated the use of technologies for efficient water conveyance, distribution, delivery and on-farm applications for improving water productivity with minimum

Dr. Rameshwar Singh Project Director, (DKMA), New Delhi, inaugurating the training programme

use and maximum recycle of water resources. Er. Atul Narang emphasised the use of canal water efficiently and equitably for irrigation as less canal water is available for agriculture due to stiff competition from other sectors.

Dr. D.K. Sharma, Director, CSSRI highlighted the leading technologies developed by the institute for reclamation of waterlogged saline and sodic soils, and use of poor quality water in agriculture. He stressed on the use of modern tools in CADWM programme in planning, implementing and monitoring of water course lining and field drain linking. Dr. S.K. Kamra, Head, Division of Irrigation and Drainage Engineering highlighted the projects undertaken on development of modern tools for irrigation by the Division and underlined the importance of modern tools for efficient irrigation water management.

Smt. Sonia Gandhi Distributed Seeds of Salt Tolerant Wheat Verieties

Out of 1.37 M ha sodic lands in Uttar Pradesh, more than 50,000 hectares are severely affected by soil sodicity problem in Raebareli district. Currently 25,000 ha of land have been reclaimed in the district by different government agencies using gypsum based technology developed by CSSRI. This has increased the productivity of these lands to about 5 tones/ha/year. However, there is a scope of further increase in productivity by using salt tolerant varieties of rice and wheat without any additional inputs in the partially reclaimed sodic soil. In view of the importance of salt tolerant varieties, a programme was organised in KVK, Raebareli with the help of International Rice Research Institute for popularisation of these varieties among the farmers. Hon'ble Smt. Sonia Gandhi, M.P. Raebareli distributed the seeds of salt tolerant varieties of wheat viz KRL-19 and KRL-213 developed by CSSRI among the farmers on 8th October, 2013. During this programme,

Hon'ble Smt. Sonia Gandhi, M.P. Raebareli distributing the seeds of salt tolerant varieties of wheat to the farmers

Mrs. Sonia Gandhi appreciated the works of CSSRI and IRRI. Dr. V.K. Mishra, Head CSSRI-Regional Research Station, Lucknow and Dr. Sudhanshu Singh, Agronomist South Asia (IRRI) interacted with Mrs. Sonia Gandhi and farmers, highlighted about the ongoing collaborative STRASA and NFSM programme in the district.

Kisan Gosthi on Sugarcane Production in Salt Affected Soils with Proper Water Management

The institute organised a one day training programme for sugarcane officers and farmers on management of salt affected soils was organized on July 27, 2013. A total of 70 participants participated in this training. The major aspects covered during the training were how to reclaim the sodic/ saline soils and use of poor quality water. The farmers and officers were also exposed to the resource conservation and plant protection measures in the sugarcane based cropping systems.

Kisan Gosthi is in progress

Kharif Kisan Mela

Kharif kisan mela was organized at the door steps of the farmers at Nain Village (Panipat district) on 15th October 2012. The *mela* was inaugurated by Dr. A.K. Sikka, Deputy Director General (NRM), ICAR New Delhi. A number of dignitaries including experts from Karnal based ICAR Institutes, KVKs and Development Departments actively participated in the *Kisan Mela*. The private agencies displayed their exhibitions on seeds, pesticides and agricultural implements. On this occasion, a *Kisan goshthi* and field visit was organized in which scientists and Subject Matter Specialists (SMS) interacted with the farmers and suggested remedial measures for their current and emerging agricultural problems. About 1000 farmers benefited from this important function. Seeds of wheat varieties KRL-210, KRL 213, KRL 19, HD 2967, DPW 621-50 and mustard varieties CS 52, CS 54 and CS 56 were sold during the *mela*. The soil and water samples brought by the farmers were tested free of cost.

Dr. A.K. Sikka highlighted the contribution of CSSRI in solving the problems of salinity and sodicty as well as sustainable use and management of natural resources. He also advocated the sustainable adaptations in the salty environments, especially against the variable climate. He gave remarks on various activities and projects being pursued by ICAR and Government of India for managing problematic natural resources. Dr. D.K. Sharma expressed the purpose for organization of the *kisan mela* and said that *kisan mela* was the best media for transfer of technology to the farmers. Fifteen progressive farmers were awarded for their contributions made in conservation agriculture and natural resources management.

Dr. A.K. Sikka, Deputy Director General (NRM), ICAR, New Delhi addressing the farmers

Regional Expert Consultation Meeting on Best Practices and Procedures of Saline Soil Reclamation System in SAARC Region

The Institute has organized a three days Regional Expert Consultation Meeting on Best Practices and Procedures of Saline Soil Reclamation System in SAARC Region during November 27-29, 2013. The meeting was organized jointly by SAARC Agriculture Centre, Dhaka and CSSRI, Karnal and inaugurated by Dr. I.P. Abrol, Director, Centre for Advancement of Sustainable Agriculture, New Delhi. In this meeting, Dr. Jalal Uddin Md. Shoaib from Bangladesh, Dr. Arshad Ali from Pakistan, Dr. Nihal Sirisena Dinaratne from Sri Lanka and Dr. S.K. Chaudhari from India participated and sharing their experiences on reclamation and management of salt affected soils in respective countries. Dr. Tayan Raj Gurung, SAARC Agriculture Centre was the coordinator of this meeting. The meeting was organized to finalize a concept paper for SAARC

Region by documenting and compiling the data on salt affected areas and existing reclamation systems in SAARC region. The most common and appropriate reclamation techniques were compared and identified to solve the regional problems. Some of the policy, researchable and extension issues were emerged from this meeting.

The policy issues : Adopting a uniform methodology and assessment of salt affected soils and waters may be carried out in the region and clear cut land use policy be developed, sharing of technological innovations, research information and materials including germplasm be encouraged under the framework of IPR, preservation and conservation and sharing of biodiversity in SAARC region under the framework of IPR, adequate government support and funding for the land reclamation programmes in SAARC countries and capacity building for efficient utilization of salt affected areas in the light of climate change must be assigned a priority in SAARC region

The researchable issues : Spatio-temporal data base of salt affected soils, breeding for salt & abiotic stress tolerance, alternate amendments to reclaim sodic soils, management of saline waterlogged soils, management of poor quality waters and climate change & salt affected soils.

The extension issues : Poor diffusion of recommended technologies at farm level, need based availability of technology, human resource development and information technology and financial support. Efforts will be made to document technologies which are highly relevant to solve the problems of salt affected areas and have the potential for dissemination in large areas.

Regional Expert consultation meeting for efficient utilization of salt affected areas in the light of climate change in SAARC region

National Symposium on Managing Natural Resources for Enhancing Agricultural and Allied Productivity in Coastal Region under Changing Climate

India has a long coastal line of 8100 km which has fragile ecosystem. Salinity problems in coastal areas occurred during the process of their formation under marine influences and subsequent periodical inundation with tidal water, and in case of low lands having proximity to the sea, due to high water table with high concentration of salts.

A National Symposium was organized by the Indian Society of Coastal Agricultural Research, Canning Town (West Bengal) in collaboration with CSSRI, Karnal at RRS, Bharuch during December 11-14, 2013 to deliberated the issues pertaining to soil, water, crop and livestock and strategies to overcome them for maximizing production in the region, particularly under the changing climate. Delegates from different parts of the country comprising NARS, Government agencies, NABARD, Sardar Sarovar Narmada Nigam Limited, Non-Government agencies, Farmers and Students participated in the Symposium.

Dr. G. Gururaja Rao, Head, CSSRI, RRS, Bharuch highlighted the issues of coastal agriculture and the technological interventions brought out to mitigate the sea water ingress in the coastal belt, groundwater recharging, enhancement of crop production etc. The symposium was inaugurated by Dr. N.K. Tyagi, Former Member, ASRB, New Delhi while Dr. A.R. Pathak, Vice-Chancellor, Navsari Agricultural University presided over and Dr. B. Mishra, former Vice Chancellor of SKUAST, Jammu as the Guest of Honour of the function. Dr. Tyagi in his address emphasized the climate smart agriculture with special reference to water, nutrients, land use, weather, risk and knowledge aspects that need to be given priority in the region, which protecting the environment resulted in enhancement in crop production in the region. Dr. A.R. Pathak made a special mention on the salt tolerant herbaceum cotton lines identified by the Cotton Research

Dr. N.K. Tyagi, former Member, ASRB, New Delhi inaugurated the symposium

Station, Surat in association with CSSRI RRS, Bharuch. Dr. B. Mishra highlighted the need of biotechnological and genetic engineering studies in identifying salt tolerant lines for further improvement in agricultural scenario in the coastal region. Dr. S.B. Kadrekar, Patron of the Society gave special emphasis on the measures like reclamation bunds in the coast which arresting sea water ingress provides a scope for fresh water conservation and thus the agricultural scenario in the coastal areas.

The delegates were formally welcomed by Dr. A.K Bandyopadhyay, the President of the Society. A special lecture entitled salinity and other water quality challenges of Kalpsar Project was delivered by Dr. N.K Tyagi. The lead papers presented by specialists in the fields of soils, aquaculture, plantation and horticultural crops, poor quality water use in agriculture, commercial crops. The symposium has 39 oral presentations and about 30 posters. The resolutions that emerged from the Symposium have significant impacts in improving the living standards of coastal population.

Visits Abroad

Dr. S.K. Chaudhari, Head, Division of Soil and Crop Management visited Vienna, Australia for attending Ist Research Coordination Meeting on "Landscap Salinity and Water Management for improving Agriculture Productivity" of FAP/IAEA during July 15-19, 2014

Dr. Subhasis Mondal, Sr. Scientist visited Penang, Malaysia for attending wrorkshop on Homestead Production System under Project G2 during September 17-20, 2013.

Dr. P.C. Sharma, Principal Scientist visited Kathmandu, Nepal for attending the meeting of Strategic Experimental Platforms for the Cereal System during September 27-28, 2013

Dr. D.S. Bundela, Principal Scientist visited Amman, Jordan for attending 3 weeks International Training ICARDA during October 27 to November 14, 2013.

Dr. D. Burman, Dr. S. Mondal, Dr. S Sarangi visited Bangladesh for attending Review and Planning Workshop of CPWF G-2 project during November 8-13, 2013.

Dr. S.L. Krishnamurty, Scientist visited Philippines for attending 7th Rice Genetic Symposium during Nov. 5-8, 2013

Dr. S. Modal, Sr. Scientist visited Philippines for working on Food Value Chain Analysis Tools Application during Dec. 4-8, 2013.

Dr. R.K. Yadav, Principal Scientist visited Cario, Egypt for study visit on Controlling Diversification during Dec. 22-29, 2013

Awards and Recognitions

Drs. D.K. Sharma, V.K. Mishra, A.K. Nayak and Y.P. Singh have been bestowed with the prestigious Hari Om Ashram Trust Award 2010-11 by the Indian Council of Agricultural Research, New Delhi on 16th July, 2013 on 85th Foundation Day Function of the Council for addressing the specific issues of harnessing the production potential of sodic soils in Uttar Pradesh for livelihood security of the farmers.

Drs. Anil R. Chinchmalatpure, A.K. Nayak and G. Gururaja Rao have been bestowed with the prestigious ISSS-Dr JSP Yadav Memorial Award-2013 for Excellence in Soil Science by Indian Society of Soil Science, New Delhi during its 78th Annual Convention held at CAZRI, Jodhpur on 22-26th October, 2013 for their contribution in "Characterization of soil and water resources and development of reclamation and management options for providing sustainable livelihood to the resource poor farmers inhabiting the salt-affected soils".

Dr. S.K. Chaudhari, Head, Soil and Crop Management Division has been awarded as Fellow of Indian Society of Soil Science- 2013 during the 78th Annual Convention of the Indian Society of Soil Science held at CAZRI, Jodhpur on 22-26th October, 2013.

Dr. D.K. Sharma, Director and Dr. B. Maji, Head, CSSRI, RRS, Canning Town have been awarded as Fellow of The Indian Society of Coastal Agricultural Research (ISCAR) during 10th National Symposium of ISCAR held at CSSRI, RRS, Bharuch (Gujarat) during December 11-14, 2013.

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