



SALINITY News



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CSSRI GETS ISO 9001: 2008 CERTIFICATION

CSSRI has been certified ISO 9001:2008 Institute to Generate New Knowledge and Understanding of the Processes of Reclamation and Developing Technologies for Improving and Sustaining Productivity of Salty Land and Waters.

XXIII ICAR Regional Committee V Meeting

A two days XXIII meeting of the Indian Council of Agricultural Research (ICAR) Regional Committee V, comprising the States of Punjab, Haryana and Delhi held at Punjab Agricultural University, Ludhiana during November, 14-15, 2014 under the Chairmanship of Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR, New Delhi. Dr. K.M.L. Pathak, Deputy Director General (Animal Science), ICAR was the Nodal Officer while Dr. D.K. Sharma, Director, CSSRI, Karnal was the member Secretary of the meeting. This committee acts as an effective interface between research and development organizations of the region. About 125 Senior Officers including Agricultural Secretaries of the states, Vice Chancellors of agricultural/veterinary Universities, Deputy and Assistant Director Generals, Directors of different ICAR institutes, Heads of the Regional Stations of ICAR and progressive farmers participated. Dr. B.S. Dhillon, Vice Chancellor, PAU delivered the welcome address in the inaugural function. Dr. D.K. Sharma presented the action taken report of the recommendations of the last meeting held at IARI, New Delhi in December, 2012.

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Dr. S. Ayyappan emphasized on moving from green revolution to evergreen revolution. The food basket states of Punjab and Haryana with only 2.9 per cent of nation's geographical area, contribute more than one fifth of country's food grain production including 20% rice and 30% wheat. He said that focus should be on crop diversification, climate change, quality seed production of different crops and development of resource conservation technologies and innovative nutrient and water management practices. He expressed his concern on sub-surface drainage, biodrainage, food quality and safety, development of salt tolerant varieties and improvement in livestock and fishery sector, paddy straw burning, ground water issues, pesticide residue. He suggested that farmers should be provided with soil health cards. He called upon the farm experts to give a new paradigm shift to all the Krishi Vigyan Kendras through cyber extension and lay special thrust on more farm productivity and profitability.

Dr. Pathak pointed out for meeting the food requirements of 2025 in view of the challenges of climate change and decreasing profits is going to be a tough task. Dr. Sharma said that recommendations emerging out of this meet will go a long way in improving the livelihood of the farmers of this region. The progressive farmers of these states were also facilitated during the meeting.



XXIII ICAR Regional Committee V meeting is in progress

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Integrated Farming System for Management of Waterlogged Salt-affected Soil

Sharda Sahayak Canal is one of the major canal commands which provide irrigation to 17.80 lakh ha in 16 districts of U.P. and 0.12 to 0.18 M ha sodic land suffers from shallow water table conditions. To address these problems, pond based farming system module based on harvesting and management of canal seepage water for multipurpose use, possible cropping system, suitable plantation crop for harnessing the proactive potential of unproductive water logged sodic soil have been initiated under farmers participatory mode at Patawakhera (Sameshi), Lucknow. The total area of model was 0.80 ha, out of which rice-wheat (993 m²), rice-mustard (14395 m²), tomato (337m²) fodder Napier CO-4 (343 m²) and Fish (3137 m²) were taken. The grain yield of 5.83 and 5.57 t ha⁻¹ was obtained from CSR 36 and CSR 43, respectively. After harvesting of CSR 36 and CSR 43, wheat and mustard was sown. The napier hybrid fodder (CO4) was planted using stem cuttings in month of July on raised



Visit of Dr Panjab Singh at Village Patwakhera bed. Total 28.4 t ha⁻¹ green fodder was harvested during five months.

V.K. Mishra, C.L. Verma, Y.P. Singh, T. Damodarn, S.K. Jha, Sajay Arora, A.K. Singh, P.K. Varsney, D.K. Sharma

ML-6 and ML-2 – Potential Polyembryonic Mango Rootstocks for Salt Affected Soils

Salt toxicity is a major productivity constraint which limits cultivation of several fruit crops and mango is one of the important fruit crop of Indo-Gangetic plains is more sensitive to salinity. Development of rootstock tolerant to salinity and sodicity was the only alternative approach to establish the crop in salt affected soils. Mango, being cross pollinated nature exhibits higher heterozygosis in seedling progenies developed from fertilized ovule (monoembryony). Therefore, there is a need to develop true type polyembryonic rootstocks. The mango rootstock '13-1' is a promising salt tolerant polyembryonic type developed from Israel in 1984. Indian workers have reported the salt tolerance phenomenon in Karukkan and Olour rootstocks but the field level sustenance under high pH and EC was still a challenge expecting for 13-1.

With the above constraint, an exploratory survey was conducted in 2005 immediately after tsunami in the affected mango growing regions of South Andaman to collect diversity of the polyembryony mangoes from island and screen out their potential against sodic and

saline environment. Subsequent survey was conducted during 2012 based on the results of the earlier collections and diverse conditions as in island. About 15 different polyembryony types were collected and evaluated for survival and growth in sodic soils of pHe 9.51 and sodium (Na⁺) 21.20 meq/L. Six accessions GPL-1, GPI-3, ML-3, ML-6, ML-2 and GPL-4 exhibited tolerance to high sodium content and pH in pot experiment. Further screening of the tolerant accession in field conditions with soil pH 9.42 along with 13-1 as a standard check was carried out in sodic plot of CSSRI-RRS, Lucknow for a period of two years (2012-2014). It was observed that the accessions ML-6, ML-2 and 13-1 survived in typical sodic soils while others exhibited scorching symptoms in leaves and showed mortality at the end of six months. Furthermore, with regard to growth parameters the accession ML-6 and ML-2 exhibited higher plant height of 111.42 cm and 76 cm, respectively. than 13-1 (61 cm). Na /K ratio leaves which is considered as one of the tolerance indices of plants to sodium toxicity was also significantly higher in ML-6 (0.14) and ML-2 (0.19) compared with 13-1 (0.24), signifying its importance as a potential rootstock for salt tolerance. Analyzing the anti-oxidant enzymes activity like peroxidase (PO) and Superoxy dismutase (SOD) revealed that the accession ML-2 produced higher amount of these enzymes which resulted in reduced effect of sodium toxicity in the plant than 13-1. Hence, the accession ML-6 and ML-2 can be recommended as one of the potential salt tolerant and vigorous rootstock for mango.



T. Damodaran, Shailendra. Rajan, V.K. Misra, S. Ramkumar, S.K. Jha and D.K. Sharma

Success of CSR-BIO Technology in India through Public-Private Partnership

The technology of CSR-BIO production using microbial consortium of *Bacillus pumilus*, *Bacillus thuringiensis* and *Trichoderma harzianum* in a dynamic media was patented and commercialized by NAIP on 7.11.2012 and subsequently by ICAR on 20th July 2013. Three firms had obtained the license for producing the material. Apart from the firms licensed the bio-formulation was also being produced at CSSRI, RRS, Lucknow. The technology had reached to 10800 ha in the country covering 7 states with an average yield increase of 19.75 % over the crops. Extensively, the technology is being adopted by 18400 farmers of banana, flower growers of Southern Tamil Nadu, Karnataka and Andhra Pradesh. In Uttar Pradesh, Uttarakhand, Bihar, and Madhya Pradesh region, it has been widely used by the growers of potato, chillies, tomato and gladiolus (Table 1). The bio-formulation had resulted in reducing the use of chemical pesticides and fungicides to a level of 3000 L thereby saving the environment and people from exposure to different types of toxins through their food chain. In potato, the farmers over 450 ha in U.P. are treating the seed tubers with 3 % CSR-BIO instead of chemical fungicide followed by drenching during the months of December and January. They had harnessed a yield increase of 12 % with 65 % reduction in blight incidence when compared with the non-adopters. Based on the on-field evaluation,

the technology is also being promoted by many research institutes like National Bureau of Agricultural Important Micro-organisms, Mau, Directorate of Seed Research, Mau and YSR Agricultural University, Andhra Pradesh. The bio-formulation has been found to control major diseases like wilt in Ixora, banana, tomato, chillies, coriander and false smut of paddy. The Farmer Producer Company of Trichirapalli district in Tamil Nadu has successfully reported the control of paddy false smut to about 90 % in their monsoon crop.



Impact of CSR-Bio in Potato

Table 1 : Impact of CSR-Bio on the production of commercial horticultural crops

Firms producing	Quantity produced (2012-14)	Area benefitted	% yield increase	Crops	Disease controlled
CSSRI, RRS, ICAR Lucknow	22 tonnes (solid)	1200 ha	15	Paddy, wheat, potato, banana, tomato, capsicum, okra, gladiolus, mango and guava (both salt affected and normal soils)	Wilt of tomato, banana, Fe ⁺ availability, Blight of potato and Paddy smut
	3000 L (liquid)				
M/S Krishicare Bioinputs, Tamil Nadu	140 tonnes (solid)	2200 ha	24	Ixora, banana, jasmine and green house tomato	Wilt of Ixora, Fe ⁺ availability and Blight of potato
	1200 L (liquid)				
M/S Alwin Industries, Madhya Pradesh	164 tonnes (solid) 6000 L (liquid)	7000 ha	22	Chilies and garlic etc.,	Wilt and blight
M/S Jai Visions Agri-Tech, Ghaziabad, U.P.	3 tonnes (solid)	400 ha	18	Gladiolus and Potato	Blight of potato

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

Improved Crop Management Options for New Rice Variety "Amal-Mana" in Coastal Rainfed Lowlands

Sundarbans, the lower Gangetic delta, is located in the eastern coastal part of India, where rice is the only crop grown in about 98% cultivated area under rainfed condition during wet season (*kharif*). Growing other crops is difficult during this period due to waterlogging of low-lying agricultural fields. The productivity of rice is constrained with several biotic and abiotic stresses as well as poor agronomic practices followed by the farmers. Low yields are mainly due to lack of suitable cultivars for coastal rainfed lowland ecosystem. Rice variety "Amal-Mana" (developed



Rice variety "Amal-Mana" with improved agronomic management practices

by ICAR-CSSRI, RRS, Canning Town), a promising variety for *kharif* season with average grain yield of about 4-5 t ha⁻¹, 165-170 days duration, a height of 160-170 cm, long slender grain, and salt tolerant (4.0-6.0 dS m⁻¹). The varieties grown by the farmers are either traditional landraces or old varieties which no longer fit to the appropriate rice growing ecologies. The balanced fertilizer dose of (50:20:10 kg NPK+

5 t FYM ha⁻¹), 2 seedlings per hill, spacing of 15 cm x 15 cm and rice variety "Amal-Mana" were found to be the best with optimum management practices to improve the productivity and economics of transplanted *kharif* rice in coastal rainfed lowlands. These cost-effective approaches on management options have great potential of enhancing rice yield in stress-prone rainfed coastal areas.

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

Integrated Impact of Sub-surface Drainage and Salt Tolerant Crop Varieties: A Success Story

Village Dhanhana and Jagsi are located in Sonapat district of Haryana where problem of water-logging and soil salinity with secondary salinity has been the major constraints in cultivating rice and wheat crop till 2005. To overcome these problems, Department of Haryana Operational Pilot Project (HOPP) and CSSRI took initiative to layout, design and implement the SSD during 2006 and 2009 at village Dhahana and Jagsi, respectively. Village Panchayat took interest and has mobilized village community for their participation.

CSSRI developed salt tolerant varieties for biological interventions to combat the problem of salinity along with SSD technology. Farmers' committee was formed at village level to assign them responsibilities of managing SSD especially in pumping out of drained water. Beside, the salt tolerant rice as well as wheat varieties of CSSRI was identified as biological interventions to combat the problem of soil and water salinity. A group of 10 farmers were selected based on their interest to conduct demonstrations on salt tolerant rice (CSR 36 and CSR 30), and wheat (KRL 19) varieties.

The average annual income derived from agriculture was Rs. 30,000 to 35,000 per farm family. The initial cost involved in installation of SSD system was about Rs. 50,000 per hectare. To have the effective management of SSD, the farmers' society has been formed with a condition of initial contribution of Rs. 1000 per farm family to promote 'ownership sense' among them. Before the implementation of SSD and salt tolerant varietal intervention, farmers were hardly harvesting 1.0-1.2 tonne per hectare of wheat and 1.5-2.0 tonne per hectare of paddy. The post drainage evaluation indicated that the



Impact of integrated technologies of SSD with CSR 36 rice variety

integrated impact of SSD has contributed to a significant decline in soil salinity and improvement in water quality and proved the excellence of salt tolerant varieties in the region. The average productivity of rice varieties CSR-30 (basmati) and CSR-36 were 1.2-1.5 tone and 2.4-2.5 tonnes ha⁻¹ respectively, in the region, whereas in case of wheat, the average yield of KRL-19 was recorded 2.0-2.5 tonnes per ha. One farmer, Shri Dharmveer Singh came forward very eagerly and acted as knowledge leader of village since his land was also severely affected from salinity. He became part of integrated intervention of SSD and salt tolerant crop varieties. He adopted SSD technology along with salt tolerant paddy varieties CSR 30 and CSR 36. Mr. Dharmveer Singh harvested about 4.5 tonnes from CSR 36, and about 1.2 tonnes from CSR 30 ha⁻¹ in saline soils where earlier there was not possibility even to harvest a kg of grain.

Ranjay K. Singh, R. Raju, Thimmappa K, Parvendar Sheoran and D.K. Sharma

Kharif Kisan Mela

The *Kharif Kisan Mela* was organized at the door steps of the farmers at Village Siwanamal (Jind) on 22nd October, 2014. The *kisan mela* was inaugurated by Dr. Rameshwar Singh, Project Director, Directorate of Knowledge Management in Agriculture, New Delhi while Dr. D.K. Sharma, Director CSSRI, Karnal presided over the *Kisan Mela*. A number of dignitaries including consultants, experts from Karnal based ICAR Institutes, KVK and State Deptt of Agriculture actively participated in the *Kisan Mela*. Exhibition of seeds, fertilizers, pesticides and agriculture implements were also put up by



Dr. Rameshwar Singh addressing the farmers

various governments, cooperative and private agencies on the occasion.

On this occasion, a *kisan goshti* and field visit was organized in which scientists and Subject Matter Specialists (SMS) interacted with the farmers and suggested remedial measures for their emerging agricultural problems. About 800 farmers were benefited from this important function. Seeds of salt tolerant varieties of wheat KRL 19, KRL 210, KRL 213 and HD 2967 and mustard CS 52, CS 54 and CS 56 were sold during

the *mela*. Three hundred soil and water samples brought by the farmers were tested free of cost.

Dr. Singh highlighted the contribution of CSSRI in solving the problems of salinity and sodicity as well as sustainable use and management of 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. The Sarpanches of two villages were awarded for their contributions made in adoption of CSSRI technologies.

Short Course on Advanced Technologies in Land and Water Remediation and Management

Ten days short course on Advanced Technologies in Land and Water Remediation and Management was organized during September 15-24, 2014. Twenty three delegates from Haryana, Uttar Pradesh, Rajasthan, Gujarat, Karnataka, Maharashtra and Telengana participated. The programme was inaugurated by Dr. S.K. Chaudhari, Asstt. Director General (SWM), ICAR, New Delhi while Dr. D.K. Sharma, Director, CSSRI, Karnal presided over the function. Dr. S.K. Chaudhari emphasized on basic and applied research. With the reclamation of salt affected soils, the institute has contributed a lot toward the food security of the country.

Dr. D.K. Sharma, Director informed that the institute has reclaimed 2.00 m ha salt affected land with the active participation of the farmers by applying gypsum, using sub surface drainage and developing salt tolerant varieties of



rice, wheat and mustard. He said that with the proper use of waste land and poor quality waters can make a remarkable contribution to the production of food grains to sustain the livelihood.

National Seminar on Innovative Saline Agriculture in Changing Environment

A three days national seminar on 'Innovative Saline Agriculture in Changing Environment' was organized in collaboration with Indian Society of Soil Salinity and Water Quality (ISSWQ) and Rajmata Vijayaraje Scindia Krishi Vishwavidalaya, Gwalior (MP) from 12-14th December 2014. The seminar was aimed at providing a platform to research scientist to discuss the emerging issues on salinity and poor quality waters.

Dr. A.K.Singh, Vice-Chancellor, Rajmata Vijayaraje Scindia Krishi Vishwavidalaya, Gwalior (MP) in his inaugural address informed the house that year 2015 has declared as world soil year. He said that in Madhya Pradesh 2.4 lakh ha area falls under salt affected soils. The area under irrigation is

increasing in Madhya Pradesh but judicious use of water is a great challenge and water use efficiency should be increased. He suggested some innovative saline agriculture option like development of salt tolerant varieties; adopt agro forestry and use of organic manure because gypsum is costly for reclamation of sodic soil.

Dr. S.S. Khanna, Former Advisor (Agri.), Planning Commission, GOI, New Delhi stressed that environmental aspect should be given priority and said that Coastal area salinity ingress is highly detrimental aspect because of sizeable area is affected in the coastal areas. Dr. D.K. Sharma, Director, CSSRI, Karnal explained the achievements and



Dr. A.K. Singh, Vice Chancellor, RVSKV, Gwalior inaugurating the seminar

future challenges of the Institute. He informed the house that the institute has reclaimed 2.0 M ha salt affected land in Haryana, Punjab, Uttar Pradesh, Maharashtra and Gujarat. The institute has developed 15 salt tolerant varieties of rice, wheat, mustard and gram. He also mentioned about nanotechnology that urban and industrial waste can be used for reclamation of sodic soil and multiple stress tolerance varieties should be developed. Under canal command areas, the secondary salinisation is another problem even in the reclaimed soils. Dr. P.C. Sharma,

General Secretary of Indian Society of Soil Salinity and Water Quality emphasized about the productive use of poor quality water with proper management. He cautioned that reclamation of degraded land and climate change are the second generation problem and researchers, policy makers and administrators should give proper thinking on these aspects.

About 150 delegates from different Institutes and Organizations in the country discussed the innovations on saline agriculture in changing climate for future research in India.

Training Programme on Conservation Agriculture: Developing Resilient Systems

A training programme on conservation agriculture (CA) for capacity development of researchers of Indian NARES (ICAR, SAUs) and CGIAR institutes was organized during 27 September to 4 October, 2014 under the Flagship of CSISA project funded by USAID and Bill & Melinda Gates Foundation (BMGF). The training programme was sponsored by CSISA, CIMMYT and organized jointly by CSSRI and CIMMYT. CA refers to an innovative crop rotation system where crops are planted in minimum, no-till or drastically reduced tillage systems with some crop residue retention on the soil surface to reduce unproductive losses of water and control weeds.

Drs. H.S. Jat and P.C. Sharma coordinated this training programme with the aim of sharing experiences and in depth knowledge on various aspects of CA in the Indo-Gangetic plains of India. Field experiences and modern technologies for efficient and sustainable management of natural resource for sustaining food security and profitability and productivity were also covered. Dr. J.S. Chauhan, ADG (Seeds), ICAR, New Delhi inaugurated the function and underlined the importance of CA training for improving the productivity of crops and cropping system in the different agro-ecological regions of India to sustain the livelihood of small holders.



Drs. D.K. Sharma and A. McDonald had opinion that continuous cultivation of rice-wheat cropping system for almost five decades in Indo-Gangetic alluvial plains has set in the processes of degradation in the natural resources of water, soil, climate and biodiversity. Apart from these, the labour charges continues to increase, high prices of inputs with low factor productivity making profits from rice-wheat crops to decrease and thus causing unsustainability and migration of farmers to urban areas and also selling of agriculture lands. Therefore, there is an urgent need to reorient the present ways of doing agriculture to those that can improve resource (water, labour and energy) efficiency by advanced crop management technologies.

Winter School on Diagnosis, Assessment and Management of Salt Affected Soils and Poor Quality Waters to Improve Productivity and Livelihood Security

Twenty one days winter school on diagnosis, assessment and management of salt affected soils and poor quality waters to improve productivity and livelihood security was organized during 11th Nov. to 1st December, 2014. Twenty four delegates from 10 states participated in this winter school. The programme was inaugurated by Dr. B. Mishra, Former Vice Chancellor, Sher-e-Kashmir University of Agricultural Science and Technology, Jammu while Dr. S.K. Ambast, Director (A), CSSRI, Karnal presided over the function.

In his inaugural address, Dr. B. Mishra told that about 260 million tones of food grain is produced from 40 per cent irrigated areas. About 300 per cent more fertilizers are being used in Haryana. Variety CSR 30 of rice replaced the taraori basmati rice in this area because it gives about 20 percent more yield than taraori basmati. Dr. S.K. Ambast informed that the main purpose of this winter school was to share the

knowledge with the participants. This institute has reclaimed the salt affected soil with gypsum and sub-surface drainage technology as well as developed salt tolerant varieties of rice, wheat, mustard and gram.



Short Course on Management of Frost and Prolonged Foggy Weather

Seven days short course on Management of Frost and Prolonged Foggy Weather was organized during 17-23 December, 2014. This training was organized under the aegis of National Disastrous Management Division, New Delhi and 23 Scientists/Officers from Haryana, Punjab, Uttar Pradesh and Bihar participated. Dr. Indu Sharma, Director, ICAR-Indian Institute of Wheat and Barley Research, Karnal was the Chief Guest and Dr. D.K. Sharma, Director, ICAR-CSSRI, Karnal was the Chairman of the Inaugural Session of the training programme.

Dr. Indu Sharma stressed upon the management of disaster because the productivity of the crops reducing due to occurrence of floods, changing pattern of rainfall. She informed that when the temperature goes down to less than 5°C sometime the panicles of wheat becomes white and no grain formation takes place specially in early sown crop and it is necessary to irrigate the crop.

Dr. D.K. Sharma informed about the various disastrous events occurred during 1900 to 2009. He suggested that conservation agriculture is a very effective technology to maintain the temperature of the soils. Sprinkler irrigation is also an effective option to reduce the loss in crop productivity of wheat crop during the month of March when temperature becomes high.



Awards and recognition

- Dr Ajay Kumar Bhardwaj, Sr. Scientist has been awarded CONICET-UNESCO Associateship for 2015-2017.
- Dr. T. Damodaran, Sr. Scientist has been awarded the Biotech Product & Process Development and Commercialization Awards for the year 2014.
- Dr. Ranjay Kumar Singh, Senior Scientist and his team begged Central Lal Bhadur Shastri Outstanding Young Scientist Award-2013
- Dr. P.C. Sharma, Head, Crop Improvement Division has been awarded as fellow of Society for Rapeseed-Mustard Research, Bharatpur and fellow of Indian Society of Soil Salinity and Water Quality.
- Dr. Krishnamurthy, S.L. Awarded Srinivasa Ramanujam Memorial Award of Indian Society of Genetics and Plant Breeding
- Dr. Krishnamurthy, Scientist has been awarded as Fellow of Eurasian Academy of Environmental Sciences
- Dr. Jogendra Singh, Scientist has been awarded as Fellow, Association for the Advancement of Biodiversity Science

Visits Abroad

Dr. Neeraj Kulshreshtha, Principal Scientist, visited Kathmandu, Nepal for attending the review and work plan meeting on BML & CSISA wheat breeding during 10-14 September 2014

Dr. B. Maji, Head, RRS, Canning Town, Dr. Subhasis Mandal, Sr. Scientist, Dr. D. Barman, Principal Scientist visited Dhakha, Bangladesh to participate in the conference revitalizing the Ganga coastal zone in Bangladesh during October 17-24, 2014.

Dr. Krishna Murthy, Scientist visited Bangkok, Thailand to attend 4th international rice congress during 27th Oct. – 1st Nov. 2014.

Dr. D.K. Sharma, Director visited Bangkok, Thailand to attend 12th Asian Maize Conference, expert consultant on maize for food, feed, nutrition and environment security during 30th Oct. – 1st Nov. 2014.

Dr. Krishna Murthy, Scientist visited Laguna, Philippines to attend workshop on rice breeder expert elicitation during 20-21 November, 2014.

Dr. D.K. Sharma, Director visited Tokyo, Japan to attend 2014 JIRCAS International symposium and 2014 Japan International Award for young Agricultural Researcher during 27-28 Nov. 2014.

Dr. B. Maji, Head, RRS, Canning Town, Dr. D. Barman, Principal Scientist, Subhasis Mandal, Sr. Scientist and S.K. Sarangi, Sr. Scientist visited Vietnam for study tour organized under CGIAR Challenge programme on water and food (CPWF) funded project G-2 by IRRI during 20-27 December, 2014.

Visitors from Abroad

During the period July-December, 2014, four delegations-one each from Tanzania, Japan, Malaysia, Thailand, Sri Lanka visited the Institute. Others who visited the Institute include Dr. R.S. Paroda, Chairman, Haryana Kisan Ayog, Dr. J.S. Chauhan, ADG (Seeds) and Dr. S.K. Chaudhari, ADG (SWM), ICAR New Delhi; Dr. Rameshwar Singh, Project Director, DKMA, New Delhi, Dr. B. Mishra, Former Vice Chancellor, SKUAST, Jammu, Dr. K.K. Katoch, Vice Chancellor, HPKV, Palampur, Dr. A. McDonald, Dr. A.K. Singh, Vice Chancellor, RVSKV, Gwalior, Dr. Rajmohan Natarajan from International Water Management Institute, New Delhi.



International visitors visiting the recharge structure at farmers' fields

From the Director's Desk

A number of major/medium irrigation projects have been commissioned in India to insure farming from the vagaries of nature, bring more land under irrigation to increase production and productivity and stabilize yields to ensure everlasting food security. Extension of irrigation to the arid and semi-arid regions, however, had led to an increase in the area under water logging (shallow water tables) and expansion of salinity/sodicity. Besides additional salts brought in with the irrigation water, irrigation acts



as a catalyst to bring the salts located down in the profile in the root zone as well as release immobilized salts in the soil through mineral dissolution and weathering. Over time the evapotranspiration process helps to concentrate these salts in the root zone. Atmospheric salt depositions may also be an important source along the coasts although its degree may vary from place to place. The relative significance of each source in contributing soluble salts depends on the natural drainage conditions, soil properties, water quality, soil water, and agronomic management practices followed for crop production. The excessive soil moisture (water logging) and natural/secondary salinization/alkalization of the root zone impacts the plant growth that is reflected initially in reduced yields so much so that after some time the land might have to be taken out of plough because of uneconomical yields. On the contrary, appropriate reclamation and management practices, if adopted can turn these soils into an opportunity with bumper yields as high as that of normal lands. Although several technologies are known and have spread widely, our endeavour is to modify, develop new technologies and address new challenges that are emerging over the years. This issue of salinity newsletter covers some significant activities and achievements of research, development and capacity building during July-December 2014. Some of the significant achievements made are: integrated farming system for management of waterlogged salt-affected soils, identifying the potential polyembryonic mango rootstocks for salt affected soils, labile carbon fractions build-up and dynamics under agroforestry systems, remunerative rice based cropping systems for coastal saline soil, improved crop management options for new rice variety amalmana in coastal rainfed lowlands and cluster demonstration of salt tolerant varieties of wheat.

Human resource and capacity building activities undertaken during this period included Short Course on Advanced Technologies in Land and Water Remediation and Management, Training Programme on Conservation Agriculture (CA): Developing Resilient Systems, Hindi Week, Kharif Kisan Mela, ICAR Regional Committee V Meeting, Winter school on diagnosis, assessment and management of salt affected soils and poor quality waters to improve productivity and livelihood security, National Seminar on 'Innovative Saline Agriculture in Changing Environment at Gwalior and Short Course on Management of Frost and Prolonged Foggy Weather.

We had an opportunity to receive a number of dignitaries and experts at the institute that provided us opportunities to discuss with them our research experiments and plans. The notable visitors were Dr. R.S. Paroda, Chairman, Haryana Kisan Ayog, Dr. J.S. Chauhan, ADG (Seeds) and Dr. S.K. Chaudhari, ADG (SWM), ICAR New Delhi; Dr. Rameshwar Singh, Project Director, DKMA, Dr. B.Mishra, Former Vice Chancellor, SKUAST, Jammu, Dr. K.K. Katoch, Vice Chancellor, HPKV, Palampur, Dr. A. McDonald, delegation of Tanzania namely Dr. Jackson Madulu Nkuba, Mr. Johan Linus Banzi, Ms. Ruth Kokuganyilwa Kamala, Dr. Geophrey Jasper Kajitu, Mr. El Matungwa Balongo, Ms. Justa Mtasingwa Katunzi, Dr. Mohamed Msigara Bahari and Mr. Mganga Joshua Kitilu; Mr. Michinari Kawano, Mr. Mitsuki Goto and Mr. Isamu Yamanaka of Japan, Mr. Watchara Suiadee, Mr. Sirode Prakunhungsit, Mr. Theeraphol Tungsomboun of Thailand, Mr. Mohd Yazid Bin Abdullah of Malaysia and Mr. Upali Wickramarane & Raj Mohan Natrajan of Sri Lanka and Dr. A.K.Singh, Vice Chancellor, RVSKV, Gwalior.

A number of colleagues retired from services after rendering meritorious services to the institute during this period. We wish them a very healthy and happy retired life. We always look forward for comments/suggestions from the readers for further improvement in the contents of the Newsletter.

(D.K. Sharma)
Director

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