



SALINITY NEWS



From Directors' Desk

Since its establishment in 1969, the ICAR-CSSRI has made remarkable progress in developing technologies to reclaim salt-affected soils in India. Notable achievements include the implementation of gypsum-based soil amendments, the introduction of salt-tolerant crop varieties, and the development of sub-surface drainage (SSD) systems. These advancements have significantly improved soil health and enhanced agricultural productivity nationwide. However, several challenges continue to impede the reclamation of salt-affected lands (SALs). These challenges include outdated databases on salt-affected soils and water resources, limited availability of soil amendments, the presence of multiple abiotic stresses, re-sodification of waterlogged alkali soils, and inadequate options for managing dryland salinity. To address these persistent issues, current research is focused on identifying effective soil ameliorants and optimizing cultural practices. The goal is to simultaneously achieve productivity, profitability, and sustainability in the management of SALs. These efforts aim to support the development of evidence-based policies and national-level action plans, ultimately contributing to the realization of sustainable development goals (SDGs).

This volume of Salinity News (July-December, 2023) includes following listed major research achievements: Management of salt affected soils through Cut-Soiler technology, Rapid acidulated manure (RAM) a low-cost technique for improving yield and restoring the health of alkaline soil, Enhanced wheat crop yield with gypsum technology in sodic soils, CSR 96 (CSR 179-11-215): A Saltol QTL introgressed line governing tolerance to salinity stress, Quinoa: a new promising crop for saline areas, Efficient use of highly saline groundwater for sustainable wheat production in vertisol of Gujarat, Boosting homestead pond productivity and profitability in coastal West Bengal with small indigenous fishes and Salt tolerant onion Genetic stock POS 35. This newsletter also contains brief details of different programs organized during this period: Hindi Pakhwada 2023, Kisan goshti and paddy seed distribution programme, Training of farmers to promote and diversify agriculture in salt affected areas, Parthenium awareness week, National dialogue on stubble management for circular economy, and Swachhta Pakhwada celebration at the Institute.

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Management of salt affected soils through Cut-Soiler technology

Cut-soiler is a machine that cuts and opens V-shape furrow at desired depth and fills it back with scattered straw and residue lying on the soil surface and further covered with soil. Such cut-soiler lines serve as drainage channels and thus have potential to manage surface waterlogging and soil salinity. This technology could serve as remunerative alternative for management of salt affected soils in India and also helpful in surface residue management in NW Indo-Gangetic plains. Looking to the feasibility and applicability of Cut-soiler technology, ICAR-CSSRI and JIRCAS initiated a collaborative project to provide sustainable resource management system for waterlogged saline soils in India. To see the effect of cut-soiler on salt and water dynamics under fluctuating water table along with an irrigation experiment are undertaken at ICAR-CSSRI, Karnal. For these artificial conditions were created in lysimeters with variable inputs. Results revealed the desalinization effect of Cut-soiler in saline (6.73 to 5.5 dS m⁻¹) and heavy textured soils (0.86 to 0.34 dS m⁻¹). The Cut-soiler technology reduced the soil salinity by 18% and thereby an improved yield of ~23% was recorded under pearl millet and mustard crop as compared to control. In farmer's participatory

trials at Village Budhmor and Patiala in Punjab, soil ESP was decreased by ~ 18.3% at 40 cm depth up to a lateral distance of ~0.7 m from cut-soiler line. Significant improvement in grain and biological yield of wheat was also recorded with decreasing Cut-soiler spacing after 12 months of trial.



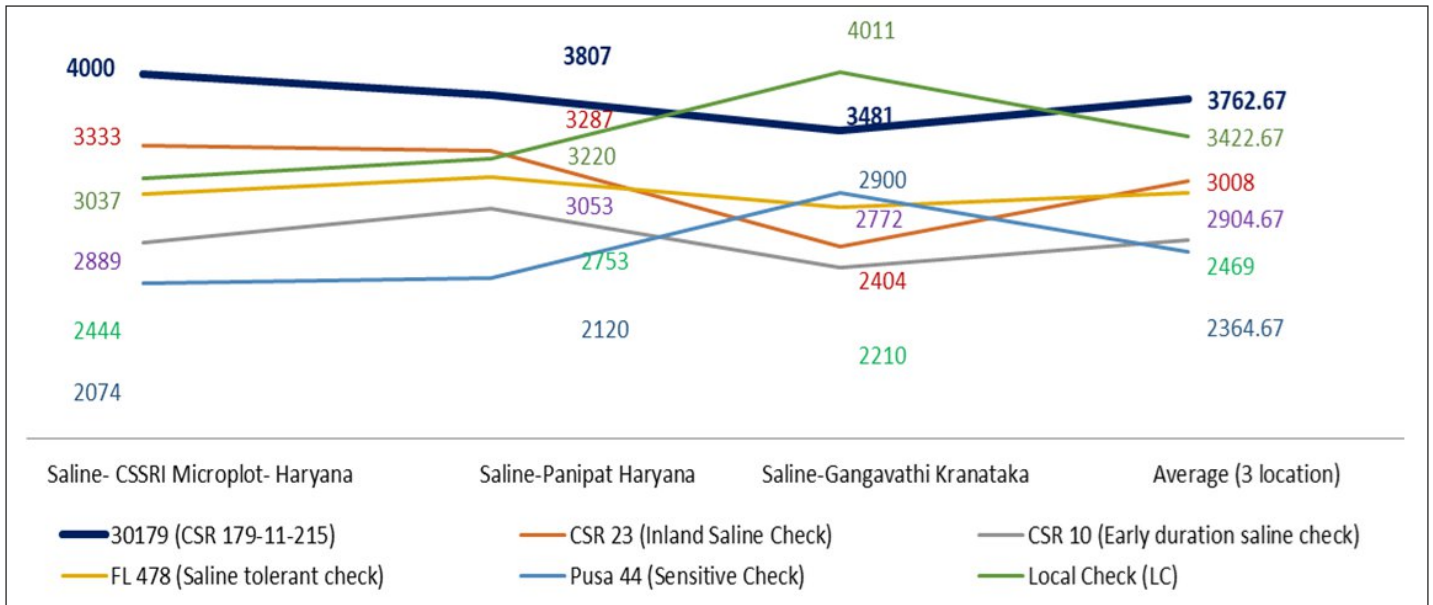
Wheat crop without gypsum (left) and with gypsum (right)

Gajender Yadav and RK Yadav

CSR 96 (CSR 179-11-215): A Saltol QTL introgressed line governing tolerance to salinity stress

In India, rice is an essential staple crop. The two main biotic and abiotic factors that have the most effects on rice productivity are salt and drought. More over 800 million hectares of land globally (6%) are affected by salt, including 6.73 million hectares in India. Salt stress can affect rice at both the seedling and reproductive

stages. Tolerance at the seedling stage is essential for crop establishment and survival in salt-stressed circumstances. An important QTL saltol is present in the seedling stage salt-tolerant variety FL478 (RIL of IR29 × Pokkali). The sensitive variety Pusa 44 served as the recurrent parent in the development of CSR 96 (CSR



Performance of CSR 96 (CSR 179-11-215; IET 30179) for grain yield across the salt affected locations

179-11-215) and FL478 served as the saltolQTL donor (Pusa 44 / FL478 // Pusa 44 *3). From 2019 to 2021, the NIL CSR 96 (CSR 179-11-215) and ten sibling lines positive for saltolQTL linked markers RM3412 and AP3206 were evaluated in glass houses and micro plot saline ($EC_e = 10 \text{ dSm}^{-1}$) environments. CSR 96 (CSR 179-11-215) performed well throughout the season, with the lowest salt injury score (3.00), which was similar to FL478. Along with tolerance for the seedling stage, it has other desirable agronomic traits including a medium duration (130–135 days), dwarf culture, green foliage, medium slender grains, and full panicle exertion. Line CSR 96 (CSR 179-11-215) was subsequently submitted for evaluation in

the AICRP AL&ISTVT trials of rice and evaluated under saline ($EC_e = 10 \text{ dSm}^{-1}$) and alkaline (pH-9.5) conditions. In terms of yield, this line CSR 96 (CSR 179-11-215) outperformed the CSR 23 (Inland Saline Check), CSR 10 (Early Duration Saline Check), FL 478 (Saline Tolerant Check), Pusa 44 (Sensitive Check), and Local Check by 25.09%, 52.40%, 29.54%, 59.12%, and 9.93%, respectively. CSR 96 (CSR 179-11-215) was promising in the states of Haryana and Karnataka under inland salinity (Figure). This line CSR 96 (CSR 179-11-215) possesses a saltol QTL, seedling stage salinity tolerance, and considerable yield potential; hence, it may be used to develop salt-tolerant cultivars and can be registered as genetic stocks.

SL Krishnamurthy, BM Lokeshkumar, Suman Rathor, AS Warraich and PC Sharma

Rapid acidulated manure (RAM) a low-cost technique for improving yield and restoring the health of alkaline soil

Acidification of farmyard manure and city waste compost by the addition of elemental S (S^0) and S^0 -oxidisers is an easy and simple way to increase the reclamation potential because chemical and microbiological conversion of S^0 produces mineral acids that cause rapid acidulation. Application of 20 kg S^0 for each tone of farmyard manure and city waste compost generates an appreciable quantity of titratable acidity (TA) of 5983.6 and 726.2 me kg^{-1} , respectively after 28th days of incubation. Acidulated manure and city waste compost termed as Rapid Acidulated Manure "RAM" dissolve inherent soil CaCO_3 and reduce pH because it has the potentiality for production of equivalent neutralization potential (ENP) 6366.0 and 911.5 me L^{-1} . Application of rapid acidulated city waste compost decreased pH_s (8.43) of alkali soil (8.6) irrigated with different RSC water irrigation. Besides, the neutralization of soil pH_s , the recurring application of compost in kharif season in rice-wheat cropping system increased Walkley-Black organic C (3.6 g kg^{-1}) than unamended control (2.8 g kg^{-1}). Acidulated composts effectively neutralized the alkalinity of partially reclaimed soil in lysimeter and multi-location

participatory trials in Karnal and Kaithal district in alkaline soils, improved yield and yield attributing parameters of sorghum and mustard and rice and wheat grain yield, and reduced the erucic acid percent of mustard. Application of acidulated manure and city waste compost decreased soil pH and lower down sodium adsorption ratio and increased microbial biomass C, N, P, and S and enhanced the activities of soil enzymes, dehydrogenase, and alkaline phosphatase except for arylsulphatase.



Application at Lysimeters

N Basak, AK Rai, S Bedwal, RK Yadav, P Sundha, S Kumar, RK Singh, P Chandra and PC Sharma

Efficient use of highly saline groundwater for sustainable wheat production in vertisol of Gujarat

An approach of highly efficient and salinity alleviating pressurized irrigation methods coupled with salt tolerant variety was adopted for enhancing grain yield of wheat crop irrigated with highly saline groundwater (7.1 to 8 d S m^{-1}). A salt tolerant KRL-210 variety of wheat was cultivated and the performance of drip irrigation and mini-sprinkler irrigation methods was

compared with conventional border irrigation method in Vertisol of Bara tract region of Gujarat. A 16 mm lateral pipe having inline dripper of 4 litre per hour discharge and 40 cm dripper spacing was placed at 80 cm spacing for drip irrigation method (first photo) while mini-sprinklers of 350 litre per hour discharge and $10 \times 10 \text{ m}$ spacing (second photo) was installed in mini-sprinkler



Drip irrigation System installed in wheat crop

irrigation system. The two years pooled data pertaining to grain yield, test weight, soil salinity (EC_e) development and water productivity were collected. Grain yield (3.3 t ha⁻¹) of drip irrigation method was significantly higher than both mini-sprinkler and border irrigation method whereas water productivity in drip irrigation method was 21 % and 26% higher than mini-sprinkler and border irrigation methods, respectively. Mini-sprinkler irrigation showed significantly lower test weight (35.62 g) and significantly higher salt accumulation in shoot of



Operation of Mini-sprinkler Irrigation System in wheat crop of Vertisols

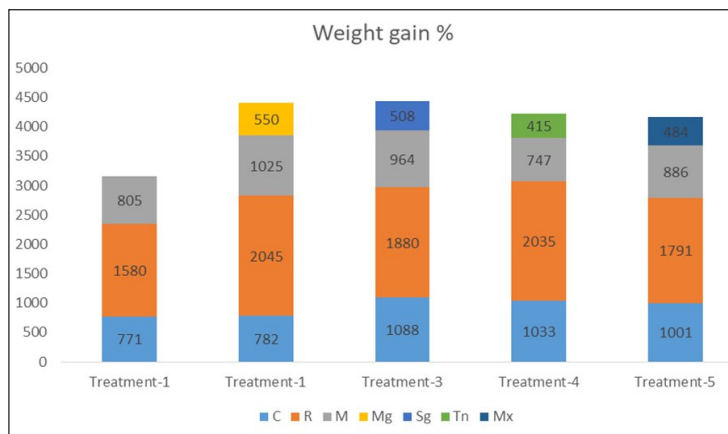
wheat crop compared to drip irrigation and border irrigation methods. Due to less application of irrigation water, 11% and 25% lesser salt deposition in drip irrigation method was observed as compared to mini-sprinkler and border irrigation methods, respectively. Overall, drip irrigation method coupled with KRL-210 variety should be adopted for irrigating wheat crop with highly saline groundwater in Vertisol of Bara tract region as it has resulted in superior grain yield, higher water productivity and lower salt accumulation in soil profile.

Sagar D. Vibhute, Vineeth T. V., Monika Shukla, Anil R. Chinchmalatpure and David Camus D.

Boosting homestead pond productivity and profitability in coastal West Bengal with small indigenous fishes

Small indigenous fish species (SIF) are fishes that attains a maximum size up to 20-30 cm. They are a valuable and easily accessible source of protein, fatty acids, vitamins, and essential micronutrients. In addition to their high nutritional value, many SIFs possess medicinal properties, offering therapeutic benefits. The culture practice of these species in homestead is mostly through self-recruitment. However there is a scope for strategic and scientific introduction of SIFs in IMC (Indian major carp) based homestead ponds for increasing the productivity of pond and also the profitability of fish farming owing to the higher price fetched by the SIFs in comparison to carps. Hence the experiment was planned to integrate SIFs (*Mystus vittatus*, *Clarias batrachus*, *Heteropneustus fossilis* and Mixture of three) in IMC (*Labeo rohita*, *Gibelion catla* and *Cirrhinus mrigala*) based homestead ponds to evaluate its potential in enhancing ponds profitability and productivity. The results showed that weight gain percentage (WG%) of *Labeo rohita* and *Gibelion catla* was higher when cultured with different varieties of SIFs in comparison to culture of only IMC, except for *Cirrhinus mrigala*, where the WG% was lowest when IMC is cultured with *Mystus vittatus*. Among the SIFs, the highest WG% was in *Clarias batrachus* (550%) followed by *Heteropneustus fossilis*, Mixed of three, and *Mystus vittatus* (Fig.). The specific growth rate (SGR) of IMC was also higher when cultured with SIFs and among the SIFs, *Clarias batrachus* had the

highest SGR of 1.55 and the lowest was observed for *Heteropneustus fossilis* at 0.82. Production performance and economic analysis revealed that total production was higher in IMC cultured with *Heteropneustus fossilis* (86.03 kg/bigha) in comparison to only IMC (76.48). The net return was also more in IMC culture with *Heteropneustus fossilis* (Rs.10178.87) then only IMC (Rs.4542.79). From this study it can concluded that culture of IMC with SIFs, particularly *Heteropneustus fossilis* (Singi) and *Clarias batrachus* (Magur) is more productive and profitable due to species diversification and high market price of SIFs.



Species wise weight gain percentage

RN Bhutia, D Burman, UK Mandal and S Mallick

Salt tolerant onion Genetic stock POS 35

A onion germplasm POS 35 (INGR23099) registered in NBPGR, New Delhi in 2023 for salinity tolerance (EC_{iw} 7 dS/m). The length of this germplasm is about 60-62 cm and mature in about 105-108 days after transplanting. Average bulb weight is about 68-70 g and white in colour. Average yield is about 44.0 tons/ha. It has higher TSS content (12.27 °B) and dry matter (12.84 %). Under saline environment (EC_{iw} 7 dS/m), this genotype hardly 8-10 % yield reduction than normal soil condition while in susceptible lines (Bhima Dark Red) the yield reduction was 63%. This line had strong antioxidant defence systems and lower Na⁺/K⁺ ratios in the shoot/leaves and maintained a higher tissue water status and osmoprotectants. Higher activity of antioxidant enzymes (APX, SOD, POX, and CAT), higher physiological parameters (RWC, MSI, gS, and Pn), and lower production of H₂O₂ and lipid peroxidation was observed in this line. This genetic stock could be directly recommended for enhancing agricultural resilience in saline agro-



ecosystems and can be utilized as potential genetic resources (salt-tolerant donor parents) in onion improvement programme.

SK Sanwal and Anil Khar

Quinoa: a new promising crop for saline areas

Over exploitation of saline ground water for irrigation year after year increases the salt load in soil and after certain time, the salinity crosses the threshold limits of crop germination and such lands are converting unproductive. Bio-saline agriculture with exploitation of naturally salt loving or salt tolerant economic crop/tree species seems to be feasible options to harness sustainable biomass output from such soils with poor irrigation water quality. There are certain crop plants which naturally tolerant to wider range of abiotic stresses like salinity. Use of such plants which have economic value too, can be a feasible option to bring these soils under cultivation with short time span. Quinoa (*Chenopodium quinoa* Willd) is one of the such promising facultative halophyte which has been recognized recently for endurance in multiple abiotic stresses (drought, salinity, frost etc.) and for exceptional nutritional quality grain, has a high potential for growing saline and drought prone areas. Grains are also gluten free which can be a good alternative of wheat for those having gluten allergy. Its grains are a rich source of a wide range of minerals (Ca, P, Mg, Fe and Zn), vitamins (B1, B9, C and E), oil containing large amounts of linoleate, natural antioxidants and high quality protein (14-20%). The results of experiments at ICAR-CSSRI, Karnal showed that tolerant

accession produced grain yield of about 3.2 t ha⁻¹ in the saline soil of 6-8 dSm⁻¹ EC₂ irrigated with high SAR saline water. Based on the evaluation of different sowing time, 15th to 30th October has been found suitable for growing quinoa in Haryana. The optimum temperature requirements for growth stages was observed as 21.7 to 25.0 °C for germination; 12.6 to 16.8 °C for flowering and 11.0 to 14.0 °C for grain development.



Quinoa crop at ICAR-CSSRI exp. farm

Kailash Prajapat and SK Sanwal

Hindi Pakhwada 2023

Hindi Pakhwada was organized at the Institute from 14 to 28 September 2023 by the constituted committee of Dr. Kailash Prajapat, Scientist, Dr. Ram Kishore Fagodia, Scientist, Dr. Naresh Arora, Chief Technical Officer and Shri Brahm Prakash,

Administrative Officer. Hindi Pakhwada was inaugurated on 14 September 2023 by the chief guest Dr. Shравan Kumar Dubey, Emeritus Scientist, Central Soil Salinity Research Institute, Karnal. Dr. Shравan Kumar Dubey, chief guest of the Hindi Fortnight

inauguration ceremony, said that since independence, the influence of Hindi has increased in cinema, print media and social media. We should express our feelings using Hindi as the medium. During the Hindi Pakhwada total 12 competitions were organized for all the staff members and students of the Institute. The officers and employees of the institute participated enthusiastically in all these competitions. The closing ceremony of Hindi Fortnight was organized on 27th September 2023 in which Dr. Surendra Kumar Nagiya, Vice-Principal Government College, graced as chief guest. In his address, he stated that it is very important to work in the mother tongue for the progress and unity of the country. The official language Hindi is the supreme medium to unite all the countrymen. Director of the institute, Dr. Rajendra Kumar Yadav

emphasized upon the importance of Hindi language and encouraged all the employees of the institute to work in Hindi language as much as possible.



Dr. SK Nagiya addressing the audience

Kisan goshti and paddy seed distribution programme

To boost agricultural productivity and promote sustainable farming practices, the CSSRI-led Farmer FIRST Project organized a Kisan Goshthi cum Seed Distribution Programme at village Kathura, Sonipat (Haryana). The Kisan Goshthi served as a platform for farmers to share experiences, discuss best practices, and gain insights into modern farming techniques. Approximately 130 farmers participated in the programme and seed of improved paddy varieties (PB 1847, PB 1885, PB 1886, PB 1121, PB 1718, PB 1509, PB 1692, CSR 30 and CSR 56) were distributed to farmers along with information on proper cultivation techniques, water management and pest control. The distribution of high-quality paddy seeds is expected to improve crop yields, enhance resilience to pests and diseases, and ultimately increase farmers' incomes.

Dr. Rajkumar emphasized sustainable and eco-friendly farming practices, encouraging farmers to adopt environmentally conscious techniques.



Dr. Rajkumar and team in village Kathura

Enhanced wheat crop yield with gypsum technology in sodic soils

ICAR-CSSRI, Karnal is technically supporting NABARD in executing a Pilot Project on reclamation of alkaline soils in Punjab & Haryana with two districts each of the state. Under this pilot project, about 512 beneficiary farmers are being covered. In year 2022, gypsum was applied in the fields of Shri Jarnail Singh, S/o- Fakir Singh of village Moonak (district Sangrur, Punjab), according to the gypsum requirement of the sodic soil, before rice transplanting as per package of gypsum technology application of ICAR-CSSRI, Karnal. The initial soil pH before application of gypsum was 9.55 (soil: water 1:2). To demonstrate the advantage, the gypsum was applied in one part of field and the other part was left without gypsum for comparison. The effect of gypsum application was evaluated on wheat (variety HD 3086) yield of April, 2023. The farmer obtained about 5.5 t/ha wheat grain yield and 7.56 t/ha straw yield with the application of gypsum, whereas the grain and straw yield from without gypsum application field were ~ 2 t/ha grain and 4.5 t/ha straw, respectively. The farmer is very happy with the performance of the wheat crop in his farm land where gypsum

was applied. As per his opinion, such crop yield is an exceptional instance in sodic soils as visible in the field (photo). He demonstrated such result to other farmers of the village for motivation and suggested to follow reclamation with gypsum as per application guidelines of ICAR-CSSRI for degraded sodic soil.



Wheat crop without gypsum (left) and with gypsum (right)

Gajender Yadav, Ashim Datta, AK Mandal and RK Yadav

Training of farmers to promote and diversify agriculture in salt affected areas

A six-day (26–31 December 2023) training session under the Farmer First Project was inaugurated at ICAR-CSSRI Karnal. Thirty-five farmer brothers from different districts of Haryana participated in this program. Senior scientist, Dr. Rajkumar Jaglan, coordinator of this program, while addressing the farmers, highlighted the technologies that promote progress in agriculture and create business opportunities in farming. The program underlined the Institute's commitment to the nationwide campaign launched by the Government of India and emphasized the importance of modern agricultural technologies to ensure long-term agricultural prosperity. Several topics including soil health management, water conservation, crop diversification and use of advanced technologies in agriculture were also highlighted. Exchanged ideas with farmers on vermicomposting, reducing the use of harmful chemicals in agricultural practices. Dr. S.K. Sanwal, Officiating Informed by the Director informed about the various institute technologies like use of gypsum for reclamation of alkaline soil, gypsum bed technology for poor quality water management, sub surface drainage technology, auger hole, bio drainage, water recharge structure, multi-enterprise farming model, CSR-Bio, Salinity Tolerant Varieties of Wheat, Paddy, Mustard and Gram, Halo-Azo, Halo-PSB, GypCal Mobile App: Soil Alkalinity Assessment and Gypsum Requirement, Salinity Expert Mobile App etc. The main objective of this training is to provide training for Agribusiness Startups like vermicompost, mushroom

production, beekeeping, method of making silage for animals, housing management for animals during summer and winter, problems related to reproduction in animals and their treatment, breed improvement of animals through AI, cultivation of off-season vegetables, increasing use of nano fertilizers in agriculture, improved sugarcane varieties and their management, budget farming/organic farming, complete knowledge of making FPO and conversation with well-established FPO officials, Haryana about various government schemes. Farmers were also taken on tour to Bajwa Mushroom Farm, Harbeer Nursery, Karan Sikri Earthworm Farm, Sub-nutrition Tropical Fruit Center Ladwa, Integrated Beekeeping Development Center Ramnagar, Potato Technology Center Shyamgarh, Onion and Garlic Center Salaru etc. so that the farmers can develop their knowledge about agricultural business.



Dr. SK Sanwal in group photo with participants

National dialogue on stubble management for circular economy

The National Dialogue on Stubble Management for Circular Economy was held at the ICAR-CSSRI on October 25, 2023, and 32 farmers from the village of Kathura (Sonipat) attended. The event took place in the Dr. D R Bhumbra Auditorium at the Central Soil Science Research Institute (CSSRI), Karnal and was hosted by the ICAR and the Department of Agriculture and Farmers Welfare of the Government of India. Farmers were invited to participate in a face-to-face discussion to raise awareness. Farmers heard from researchers, strategists, and users of CRM machines, remote sensing for monitoring, and the involvement of Krishi Vigyan Kendras of various regions, as well as non-governmental organizations (NGOs), in an effort to reduce the prevalence of stubble burning. Research efforts to maintain healthy soil in a rice-wheat cropping system were presented to farmers by Dr. A. K. Rai, Head, Central Soil Science Research Institute (CSSRI), Karnal. The tactics for maximizing the use of CRM (crop residue management) devices to accomplish the zero burning mission were also explained by DR. R S Narang, Head, FPME, PAU. Dr. V K Sehgal, Principal Scientist, CREAM, IARI, New Delhi, spoke about the use of remote sensing in the monitoring, mapping, and management of

stubble burning. During his talk, Dr. P. Sheoran, Director, ATARI, Jodhpur, discussed KVKs' contributions to addressing residue management problems in Northern India. Farmer income can be increased by Ex-situ management of paddy straw, according to Sh. K. Sanadhaya, Senior AGM at IOCL in Chandigarh. Then, farmers from Village Kathura (Sonipat) were attended by Dr. Rajkumar at Horticulture field of CSSRI, Karnal. Dr Rajkumar told farmers about nursery management and package practices of guava. Plants of guava and night jasmine were also distributed among farmers. The meeting ended with vote of thank by the Dr Rajkumar, PI (FFP).



Dr. SK Chaudhari, DDG (NRM) addressing the farmers in auditorium

Parthenium awareness week

The Institute organized a parthenium awareness week from August 16 to 22, 2023. During this week, all the staff members of ICAR-CSSRI, Karnal were made aware of the identification, problems caused by parthenium weed, and its management practices in the general landscape. A parthenium uprooting and elimination drive involving all permanent and contractual staff of the Institute was also organized on 16th August 2023. Parthenium growing along field bunds, campus buildings, and ponds was uprooted and transported to a composting pit for decomposition and compost making. The parthenium awareness programme was also organized at Govt. high School, Kalamtura, Karnal on 21st August 2023. All the students and teachers were made aware of parthenium weed and its harmful effects on land, crops, humans, and animals through a presentation. Subsequently, parthenium was eliminated from the school campus through uprooting and spraying with glyphosate herbicide.



Awareness programme for school students

Swachhta Pakhwada celebration at ICAR-CSSRI, Karnal

ICAR-Central Soil Salinity Research Institute, Karnal organized Swachhata Pakhwada programme during 16-31 December, 2023. Various activities and programmes were conducted during these 16 days as part of Swachhata Abhiyan programme at the Institute and in its vicinity including that in the 50 villages adopted by the Institute. The programmes conducted by the Institute consisted of awareness programs for farmers including children and women about the multiple aspects of cleanliness using various technologies. Farmers from Kathura village participated in the Swachhata Pakhwada on 23.12.2023 at ICAR-CSSRI Karnal. Addressing the gathering, Dr. Rajkumar, Senior Scientist, ICAR-CSSRI Karnal, highlighted the dual objective of Swachhata Pakhwada – promoting cleanliness and promoting progress in agriculture. The program underlined the Institute's commitment towards Swachh Bharat Abhiyan, the nationwide campaign for cleanliness launched by the Government of India. He stressed the importance of integrating modern agricultural technologies with a clean and sustainable environment to ensure long-term agricultural prosperity. Several topics including soil health management, water conservation, crop diversification and use of advanced technologies in agriculture were also highlighted.

Swachhata Pakhwada led to dynamic discussions on waste management practices that can be implemented at the grassroots level. Farmers exchanged ideas on composting, recycling and reducing the use of harmful chemicals in farming practices. The institute's researchers and agricultural experts provided valuable insights into sustainable farming practices that are consistent with the principles of sanitation and environmental responsibility.



Employees taking Swachhata Pledge

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