SEED SPICES
E - Newsletter
ICAR-National Research Centre on Seed Spices

An ISO 9001:2008 Certified Institute

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Important Events

XIV-IRC II Meeting-2014

The XIV(II) Institute Research Council Meeting of the centre was held on August 29-30, 2014 to review the progress of ongoing research projects under the chairmanship of Dr. Balraj Singh, Director, NRCSS, Ajmer. The progress report of ongoing projects were presented by the individual scientist and discussed thoroughly. Five external invited members Dr. Sain Dass (former Director, DMR, Pusa, New Delhi), Dr. M.D. Arha (former Dean, College of Agriculture, SDAU, Dantiwada), Dr. R.S. Rathore (former Prof. & Head, Department of Plant Pathology, RCA, MPAUT, Udaipur) Dr. B.R. Choudhary (Director Research, Jodhpur Agricultural University, Jodhpur) and Dr. B.S. Tomer (Pr. Scientist, IARI, Pusa, New Delhi) participated in the meeting and critical suggestions were given to improve the research programme. The new proposals were also discussed critically and the projects were improved as per suggestions from the house before executing in the field and laboratory trials.



Dr. Balraj Singh with external members and scientists in XIV IRC

Important Events

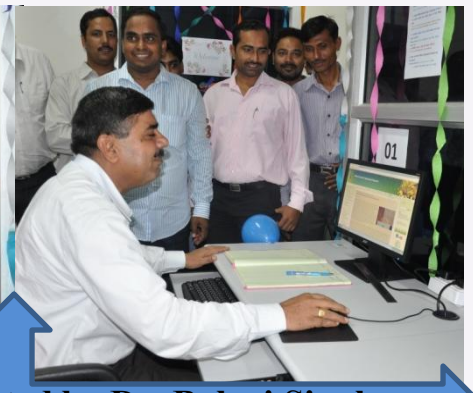
Inauguration of Biotechnolgy Lab Under AMAAS

Dr. Balraj Singh, Director inaugurated the full fledged Microbial Biotechnology Laboratory at the centre which will work on metagenomics.



Inauguration of Agricultural Knowledge Management (AKMU) Lab





AKMU Lab Inaugurated by Dr. Balraj Singh

Agricultural Knowledge Management Unit (AKMU) Lab was inaugurated by Dr. Balraj Singh, Director of the centre in the presence of all staff members (scientists, technical's and administrative staff). In this Lab state of art facility are provided for the purpose of training and other computer facilities.

Distribution of seed for ajwain and fennel demonstration in TSP area

Dr. Gopal Lal, Principal Scientist and PI of TSP project has distributed seed of ajwain and fennel among farmers of TSP area of Pratapgarh and Dungarpur districts of Rajasthan with the help of respective KVKs during 23-24 August, 2014. The seed was given for 0.25 ha area under each demonstration. In all 32 demonstrations (16 in each district) were given for both the crops. The growers were told about the scientific cultivation practices of ajwain and fennel by Dr. Lal, Dr. Prakash Panwar, Programme Coordinator, KVK, Pratapgarh and Dr. S.N. Ojha, Programme Coordinator of KVK, Dungarpur and other scientists of respective KVK.





RESEARCH HIGHLIGHTS

Bioprospecting for phosphate solubilizing bacteria (PSB) in fennel (*Foeniculum vulgare* L.)

B.K. Mishra

Bioprospecting can be defined as the systematic search for and development of new sources of chemical compounds, genes, micro-organisms, macro-organisms and other valuable products from nature. It entails the search for economically valuable genetic and biochemical resources from nature. So, in brief, bioprospecting means looking for ways to commercialize biodiversity. Lately, exploration and research on indigenous knowledge related to the utilization and management of biological resources has also been included into the concept of bioprospecting. Thus, bioprospecting touches upon the conservation and sustainable use of biological resources and the rights of local and indigenous communities. Phosphorus (P) an essential element for plant nutrition can only be assimilated as soluble phosphate. It is found in soil as insoluble calcium iron or aluminum phosphates organic forms are derived from the decaying plants, animals and microorganisms. A Number of soil microorganisms, which include bacteria, fungi and actinomycetes, are known to solubilize unavailable, from of calcium bound P through metabolic activity, by excreting organic acids, causing acidity in the medium. Phosphatases are known to play a key role in transforming organic forms of phosphorus into plant available inorganic forms. Soil application of such Phosphate Solubilizing Bacteria (PSB) would result into the solubilization of naturally abundant phosphatic compounds in a more environmentally-friendly and sustainable manner. PSB is very common under *in-vitro* conditions the performance of PSB *in-situ* has been contradictory; the variability in the performance has thus greatly hampered the large scale application of PSB in sustainable agriculture. Numerous reasons have been suggested for this but none of them have been conclusively investigated, despite the variation in their performance. PSB are widely applied in agronomic practices in order to increase the productivity of crop while maintaining the health of soil. Fennel plant and soil samples have been collected from Ajmer, Pali Jhalawar, and Kota districts of Rajasthan for isolation of rhizospheric bacteria on selective nutrient agar medium. Sixteen Phosphate solubilizing microorganism have been isolated on Pikovskaya medium containing Tricalcium Phosphate and these were further screened on National Botanical Research Institutes phosphate (NBRIP) medium with decolouring of bromophenol blue as indicator of acid production. Quantitative assay of Phosphate solubilization was done in NBRIP broth. The Maximum phosphate solubilization in broth assay was observed in three bacterial isolates *viz.* Fen-1, Fen-5 and Fen-14.

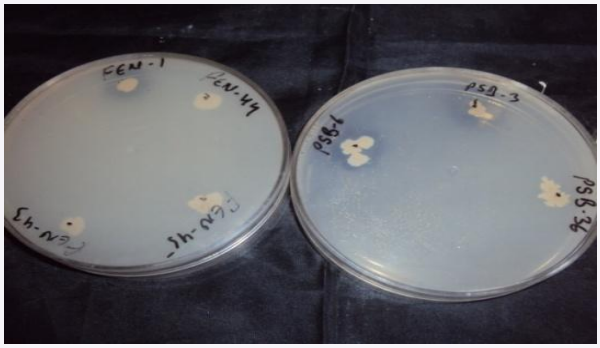


Plate1: PSB isolates on Pikovskaya medium showing halo zone round colonies

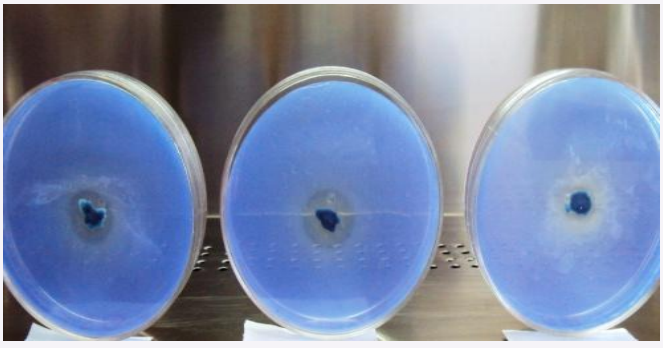


Plate1: PSB isolates on NBRIP medium showing halo zone around colonies

RESEARCH HIGHLIGHTS

Seed wasp (*Systole albipennis* Walker) (Eurytomidae: Hymenoptera): An Important borer pest of seed spice crops

Krishna Kant and Siya Ram Meena

Chalcid wasp, *Systole albipennis* Walker, is specific pest of seed spice crops. It is causing serious damage to crops of coriander, fennel, ajwain and anise and recorded from cumin and dill crop. Infestation occurs at field level and continues during storage of seed. The female chalcid wasp laid egg on developing seed whose larvae feed and destroys the embryo and/or endosperm consequently. It is found that seed damage by the pest ranged 40% in fennel (*Foeniculum vulgare* Mill.), 30% in coriander (*Coriandrum sativum* L.), and 20% in ajwain (*Trachyspermum ammi* Sprague). The pest significantly reduces the market value of seed and it is one of the major constraints for quality seed production. Presence of immature stages of chalcid wasp, affects export of seed spices as it is important quarantine pest registered in India and abroad.



Fig:1 Seed borer adult, larval, pupal stages and damaged seed of fennel, coriander, ajwain and anise crops

RESEARCH HIGHLIGHTS

Control of cumin wilt through soil solarization is boon for the farmers

R D Meena

The technology has been finalized and also presented in ZREC, Mandor, Jodhpur. The technology is so effective and may be boon for the cumin growers and control the cumin wilt in sustainable manner without harming the environment. Since three years, during rabi season cumin crop was raised at experimental site (soil solarized sick plots). Eleven different treatments including control with various combinations (soil solarization, neem cake and *Trichoderma viride*) have been tested against wilt disease of cumin. The experimental pooled results showed that in all the ten treatments, the wilt incidence was reduced as compared to control. The maximum reduction in wilt disease (PDI-5.31) was found in the treatment T8 (20 days of soil solarization + neem cake + *Trichoderma viride*) followed by (PDI-5.69) in the treatment T9 (30 days of soil solarization + neem cake + *Trichoderma viride*). Whereas the maximum disease severity was recorded in control /T10 (PDI-58.81). After soil solarization the pathogen population count per cent reduction was maximum (82.8) in treatment T9 followed by treatment T8 (78.0) and the minimum reduction % pathogen population count (15.9) was found in T10 (control).

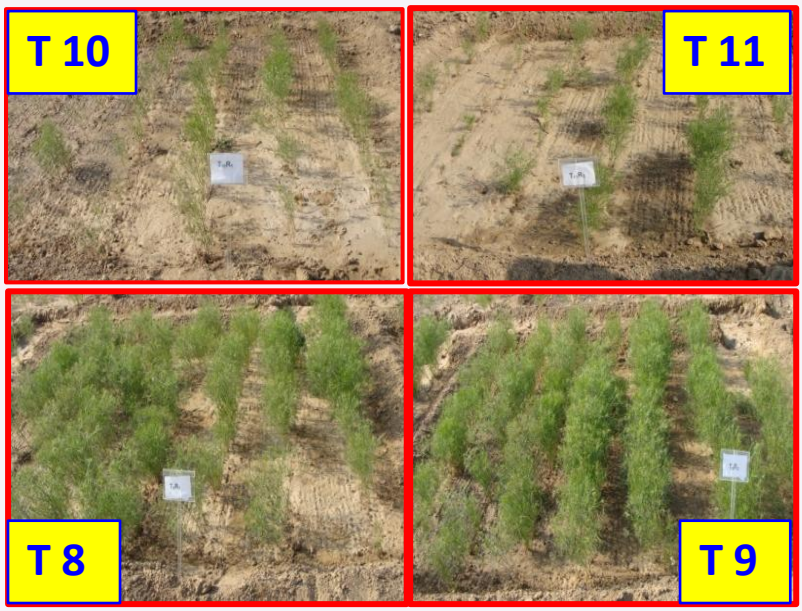


Fig. 1: In vitro comparison among various treatments (T10):control , (T11): fungicide, (T8): 20 DSS + T + NK and (T9): 30 DSS + T + NK.





Transfer of Technology

Training

One day farmers training programme at the centre

One day training programme on "Soil and Plant Health Management for Quality Production of Crops" organized at the centre on August 13th, 2014 with the collaboration of National Fertilizer Limited, Jaipur. About 50 farmer's (ladies & gents) have participated. NRCSS scientists and nodal officer's of National Fertilizer Limited, talked about soil and plant health management of crops to the participants.





A field day organized

A field day on Tinda (Round guard) was organised by NRCSS with collaboration of NFL Jaipur on the field of Mr. Pukhraj Paroda, Village Dumara (Ajmer) on August 14, 2014. Mr. S.P. Singh, State Manager, NFL, Jaipur, Mr. S.L. Beniwal, Manager (Mkt.), NFL, Jaipur , Mr. S.L. Choudhary, Area Manager (Mkt.), NFL, Chittorghar, and a team of Dr. G. Lal, Dr. O.P. Aishwath, Dr. B.K. Mishra and Dr. R.S. Meena from NRCSS were active participants of the field day. The demonstration on Tinda crop was raised with interventions of bio-fertilizers and compared the crop grown without bio-fertilizers. The officers and scientists visited the field and appreciated the response of bio-fertilizers. Later they have interacted with farmers (male & female) and talked about scientific cultivation practices of vegetables especially round guard and the importance and effect of bio-fertilizers on the crops. Some packets of azotobactor in powder as well as in liquid form were distributed among the vegetable growers.





Human Resource Development

Professional Attachment Training of Newly Joined Scientists

The four newly recruited scientists of discipline Spices, Plantation, Medicinal and Aromatic Plants have joined NRCSS, Ajmer after successful completion of 99th Foundation Course for Agricultural Research Service (FOCARS) from NAARM, Hyderabad. As a part of FOCARS, after completing initial one month institute orientation programme at NRCSS these scientists were underwent three months professional attachment training (from 12.05.2014 to 11.08.2014) at various institutes in different fields as per the mandates of this institute.



Dr. Arvind Kumar Verma, Scientist, has undergone professional attachment training at Bhabha Atomic Research Centre, Mumbai. The training was on the aspect of "**Mutation Breeding Approaches for Crop Improvement**". The main objective was to get knowledge on the use of mutation breeding techniques for genetic improvement of seed spices with special reference to cumin and fennel.



Mr. Harisha, C. B., Scientist, has undergone professional attachment training at Department of Agricultural Chemistry and Soil Science, Anand Agricultural University, Anand, Gujarat. He got training on "**GPS-GIS Based Soil Fertility Mapping**". The objective of this training was to get acquainted with the use of GPS and GIS tools for evaluating soil fertility.



Mr. Diwakar, Y., Scientist, has undergone professional attachment training at Pesticide Residue Laboratory, Anand Agricultural University, Anand, Gujarat. During his training, he worked on "**Status of Pesticide Residues in Market Cumin Samples**" with an objective to get expertise in analytical and instrumental techniques involved in analyzing pesticide residues.



Mr. Honnappa Asangi, Scientist, underwent professional attachment training at CRIDA, Hyderabad on "**Precision Type Weighing Lysimeters and Open Top Chamber Technologies and Morpho-physiological Parameters of Black Gram Genotypes Under Water Deficit".**

Human Resource Development

Conference/symposia/seminars attended

•Balraj Singh, Director has attended EFC meeting in SMD and at ICAR from July 6-7, 2014 at New Delhi.

•Dr. Balraj Singh, Director attended ICAR Foundation Day and Vice Chancellor's Conference on July 29-30, 2014 at NASC Complex Pusa, New Delhi.

•Dr. Balraj Singh attended a workshop on July 26, 2014 as a invited speaker on "Protected Cultivation" organized by Gujarat Green House Grower's Association at Rajkot, Gujarat.

•Dr. G. Lal participated in State level awareness programme on NHB's Schemes in Rajasthan, organized by NHB (Ministry of Agriculture, Govt. of India) on 11.07.2014 at Jaipur.

•Dr. R.S. Mehta Principal Scientist, attended Management Development Programme on Leadership Development Pre-RMP Programme, held July 15-26, 2014 at NAARM, Hyderabad.

•Dr. R.S. Mehta Principal Scientist participated in group meeting & Network Project "Organic Horticulture" held on August 13th, 2014 at IISR, Calicut.

•Dr. Krishna Kant, Senior Scientist attended annual meeting on programme for women in Department of Biotechnology during July 10-11, 2014 at New Delhi and presented second year progress report of project funded under this programme.

Publication

Mehta R.S., Patel B.S. Patel, Meena S.S., Lal G. and Singh, R. 2014. Water dynamics and yield of fenugreek (*Trigonella-foenium-graecum* L.) as influenced by irrigation scheduling and weed management practices. *International J. Seed Spices 4(2):42-46*

Human Resource Development

Attended Management Development Programme on Leadership Development (Pre-RMP Programme)

Dr. R. S. Mehta ,Principal Scientist (Agronomy) attended Management Development Programme on Leadership Development (a Pre-RMP Programme) held on 15-26, July, 2014 at NAARM, Hyderabad. In the training programme, lecture on leadership issues, excellence, personality profiling, motivation skills for leadership, research programme prioritization, vigilance management, public procurement, power of trust, conflict management, time management and team building was delivered by faculty of NAARM and other experts.



Dr. R. S. Mehta, Principal Scientist (Agronomy) receiving MDP training completion certificate

Visitors

Dr. Preeti Choudhary, Dy. S.P. (Rural Ajmer) visited NRCSS on August 4, 2014. Dr. Balraj Singh, Director, NRCSS briefed her about various activities of the centre and woman cell of NRCSS which is working for betterment of woman employees at the centre.



From the Director's Desk



This newsletter highlights some of the salient research and training achievements and other significant activities performed during this period.

The *Kharif* season of the year 2013-14 has reached at the edge of harvesting and threshing, the entire NRCSS campus is covered with the greenery of Dhaincha crop (Sesbania sp.) which was grown for green manuring and to boost or increase fertility status of the soil of the centre.

During this period XIV IRC meeting was held for the reviewing of ongoing institute projects, externally funded projects as well as new projects proposals presented, critically discussed and finalized.

Infra-structural facilities of NRCSS campus strengthened by establishing an AKMU Lab in the main building of the centre for computing and a full fledged microbial biotechnology lab to carryout research on microbial and metagenomics.

I hereby welcome four newly joined scientists at our centre who were under went for three months rigorous training programme at different prestigious institutes. Their gained expertise will be beneficial for different research programmes and activities at the centre.

In research highlights three important topics were introduced by our scientists on bioprospecting of PSB, seed wasp and control of cumin wilt through soil solarization. Hope this will be beneficial and informative for our stakeholders especially farmers. Farmer training, field day and seed distribution programme were also organinized, this will help to increase seed replacement rate under TSP programme.

I wish that the contents of this document would be informative and useful to all concerned persons of the farming community and researchers. Any suggestion for improving the content of the E-newsletter would be highly appreciated..

Balraj Singh







Green manuring with Dhaincha crop (*Sesbania sp.*) at the field of the centre