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

An ISO 9001:2008 Certified Institute

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Important Events

XV Institute Research Committee Meeting 3-4 July, 2015

The IRC (II) meeting of the center was held on 3rd and 4th Aug, 2015. In the meeting expert were called from various national and state agencies viz., Dr. Pritam Kalia, Principal Scientist & Head, Vegetable Science Division, IARI, Pusa, New Delhi; Dr. R. N. Pandey, (Professor & Head, Dept. of Plant Pathology, BACA, Anand Agricultural University, Anand, Gujarat and Dr. A.U. Amin, In-charge, CRSS, SDAU, Jagudan, Mehsana, Gujarat. The meeting was chaired by the Director, Dr. Balraj Singh, he welcomed invited external members and all the scientific staff. Later he presented in brief salient achievements of the center. The In-charge PME cell presented in brief about the ongoing research programmes. During the two days programme section wise presentations were made, each scientist presented the results of the experiments conducted during *rabi* 2014-15. New research programmes were also presented and discussed. All the suggestions made by the house were recorded for improvement in the ongoing research programme. The experts panel appreciated the efforts placed by the center for seed spice research and development.



Dr. Balraj Singh, Director with external members in XV IRC meeting

Important Event

मसाला बोर्ड के नवनियुक्त अधिकारियों का भ्रमण

मसाला बोर्ड, जो कि वाणिज्य एवं उद्योग मंत्रालय भारत सरकार के अधीन कोच्ची में कायरत संस्थान के 30 नवनियुक्त अधिकारियों जैसे प्रक्षेत्र अधिकारी, निदर्शक, गुणवत्ता प्रयोगशाला विश्लेषक आदि पदों पर कायरत अधिकारियों के दल ने राष्ट्रीय बीजीय मसाला अनुसंधान केन्द्र, तबीजी अजमेर का एक दिवसीय भ्रमण किया। इन्होंने राष्ट्रीय बीजीय मसाला अनुसंधान केन्द्र पर चल रहे विभिन्न अनुसंधान एवं विकास कार्यों पर जानकारी प्राप्त की। दल के साथ मसाला बोर्ड के सहायक निदेशक, डॉ एन.एम. उस्मान, क्षेत्रिय कायलय जोधपुर थे। इन अधिकारियों को केन्द्र के निदेशक, डॉ बलराज सिंह द्वारा 4 घण्टे के पावर पाइन्ट प्रस्तुतिकरण द्वारा एक चर्चा के माध्यम से बीजीय मसाला अनुसंधान से संबंधित सम्पूर्ण जानकारी दी। निदेशक महोदय ने प्रस्तुतिकरण के दौरान बीजीय मसाला फसलों की वर्तमान स्थिति, निर्यात एवं भविष्य में आने वाली चुनौतियों पर विस्तार से चर्चा की। ज्ञात रहे कि उक्त नवनियुक्त अधिकारियों की नियुक्ति मुख्यालय कोच्ची तथा अन्य क्षेत्रीय कायलयों जैसे जोधपुर, मुम्बई, गुवाहाटी, चेन्नई, बंगलूरू, दिल्ली आदि स्थानों पर की गई है। साथ ही साथ कुछ विश्लेषकों की नियुक्ति मसाला बोर्ड के अंतर्गत स्थापित गुणवत्ता प्रयोगशालाओं जैसे नरेला (दिल्ली), कोच्ची तथा मुम्बई में कायरत है। मसाला बोर्ड का मुख्य उद्देश्य भारतीय मसालों को अतंर्राष्ट्रीय स्तर पर विपण्न एवं गुणवत्ता प्रबंधन के साथ मसाला उत्पादक किसानों एवं मसाला व्यापारियों के हितों की रक्षा करना है। वर्तमान समय में स्वास्थ्य के प्रति जागरूकता एवं वैज्ञानिक दृष्टिकोण के कारण खाद्य सामग्रियों के गुणवत्ता पर विशेष ध्यान देने की आवश्यकता है।





Research Highlights

A promising Zn solubilizing fungus isolated from coriander rhizosphere

O.P. Aishwath, B.K. Mishra, Dharmesh Jain and A.N. Ganeshamurthy

Micronutrients play a pivotal role in the day to day life of plants as well as animals. There are many micronutrients which are present in the soil in insoluble forms and can't be taken up by the plants directly, such as Zinc (Zn). Zn is essential in plants for transformation of carbohydrates, it also regulates the consumption of sugars, it act as a part of enzyme system which regulates plant growth. Micronutrients are also required by organisms throughout life in a small quantity to orchestrate a range of physiological functions. Some of the microbes have capability to solubilize zinc by secreting organic acids under stressed soil environment to utilize for completing their life cycle. After decaying the microbial cell nutrients left over in soil, which is an available form to the crop plants. Keeping in view, we conducted series of laboratory experiments to isolate Zn solubilizing organisms from the coriander rhizosphere. Among those experiments, a hit triggered to get a Zn solubilizing fungus, which has potential to solubilize the insoluble Zn present in the soil. The fungal species was cultured on Liquid Tris-minimal Salt media containing insoluble zinc (ZnO), on which it was showing the zone of clearance. Further we tested it at different concentrations of insoluble Zn and calculated the solubilizing index (Fig. 1). More studies are required for its use as a Zn solubilizing biofertilizer. The culture of this fungi could be used as Zn solubilizing microorganism in many other crops that show symptoms of Zn deficiency. The present study was carried out under the Network Project on "Micronutrient management in Horticultural (Seed Spices) crops for enhancing yield and quality".

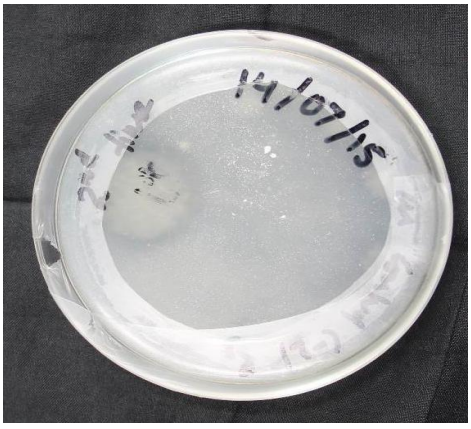
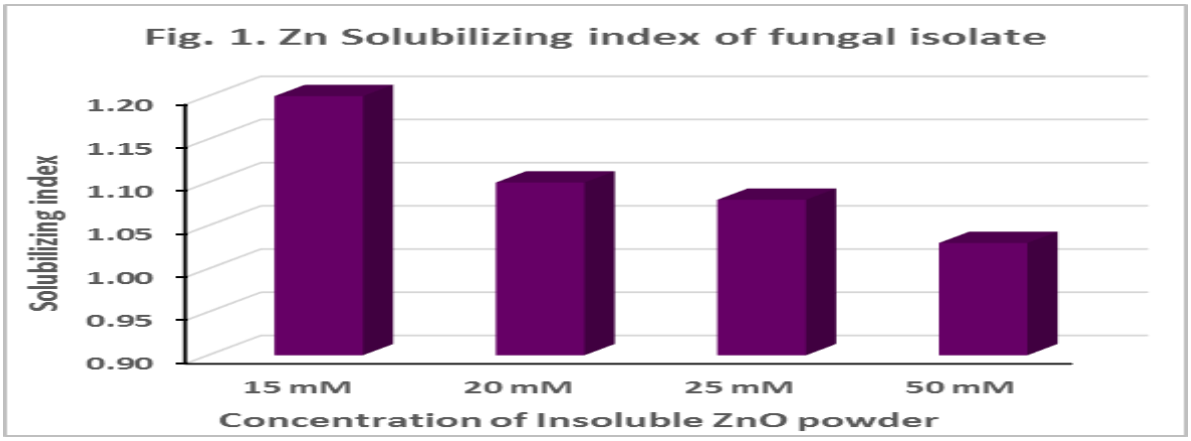




Fig. 1. Zn Solubilizing index of fungal isolate



Research Highlights

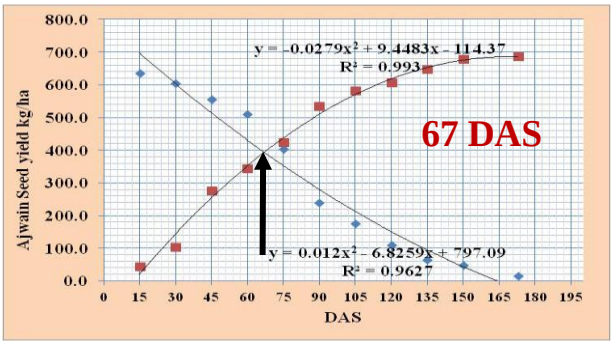
Identification of critical stage for weed management in ajwain and fennel

Ravindra Singh, Gopal Lal, R. S. Mehta, Sharda Choudhary, O. P. Aishwath and Balraj Singh

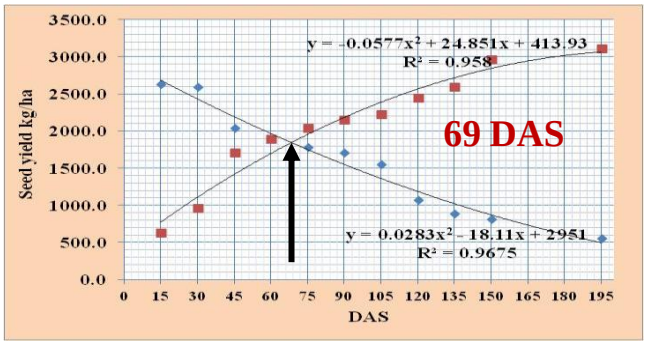
Two field experiments having 22 treatments for ajwain and fennel were conducted during 2014-2015 in RBD with 3 replications. The treatments comprising of initial weed free periods of 15, 30, 45, 60, 75, 90, 105, 120, 135, 150 days after sowing (DAS) and weedy upto 15, 30, 45, 60, 75, 90, 105, 120, 135, 150 DAS along with weed free till harvest (weed free check) and weedy till harvest (un-weeded check) in ajwain. Weed density and dry weight was recorded by putting a quadrate (0.25 m^2) at one random spots in each plot. Weed flora of the experimental field consisted of *Chenopodium murale* L., *Chenopodium album* L., *Cynodon dactylon* L. and *Cyperus rotundus*. The maximum seed yield of ajwain and fennel (686.0 and 3111.0 kg/ha) were recorded with the weed free throughout growth period treatment, where as lowest were recorded (15.3 and 555.7 kg/ha) at weedy check plots, respectively. On the basis of one season data, the critical stage for weed competition in ajwain and fennel were 67 and 71 days respectively. The loss in yield due to weeds (weedy throughout growth) in ajwain and fennel were 670.7 and 2555.3 kg/ha as compared with weed free plots. The net returns and B:C ratio were maximum at weed free throughout growth period which were decreased with the increase of weedy period and leads to net loss rather than gain.

Table : Grain yield of ajwain and fennel under different of weedy and weed free treatments

Treatment	Seed yield (kg/ha)	
	Ajwain	Fennel
Weedy up to 15 DAS	636.0	2,629.7
Weedy up to 30 DAS	603.3	2,592.7
Weedy up to 45 DAS	554.7	2,037.0
Weedy up to 60 DAS	509.3	1,889.0
Weedy up to 75 DAS	424.0	1,777.7
Weedy up to 90 DAS	238.7	1,703.7
Weedy up to 105 DAS	175.3	1,555.3
Weedy up to 120 DAS	108.7	1,074.0
Weedy up to 135 DAS	63.3	889.0
Weedy up to 150 DAS	48.7	815.0
Weedy throughout	15.3	555.7
Weed free up to 15 DAS	43.3	630.0
Weed free up to 30 DAS	104.0	963.0
Weed free up to 45 DAS	274.7	1,703.7
Weed free up to 60 DAS	342.3	1,888.7
Weed free up to 75 DAS	403.7	2,037.0
Weed free up to 90 DAS	534.7	2,148.0
Weed free up to 105 DAS	581.3	2,222.0
Weed free up to 120 DAS	606.7	2,444.7
Weed free up to 135 DAS	646.7	2,592.7
Weed free up to 150 DAS	678.0	2,963.0
Weed free throughout	686.0	3,111.0
CD at 5%	**21.2**	**397.0**



Critical stage for weed competition in ajwain



Critical stage for weed competition in Fennel

Research Highlights

Nutrient media developed for Isolation and Identification of Rhizobium from Fenugreek growing field to enhance plant growth.

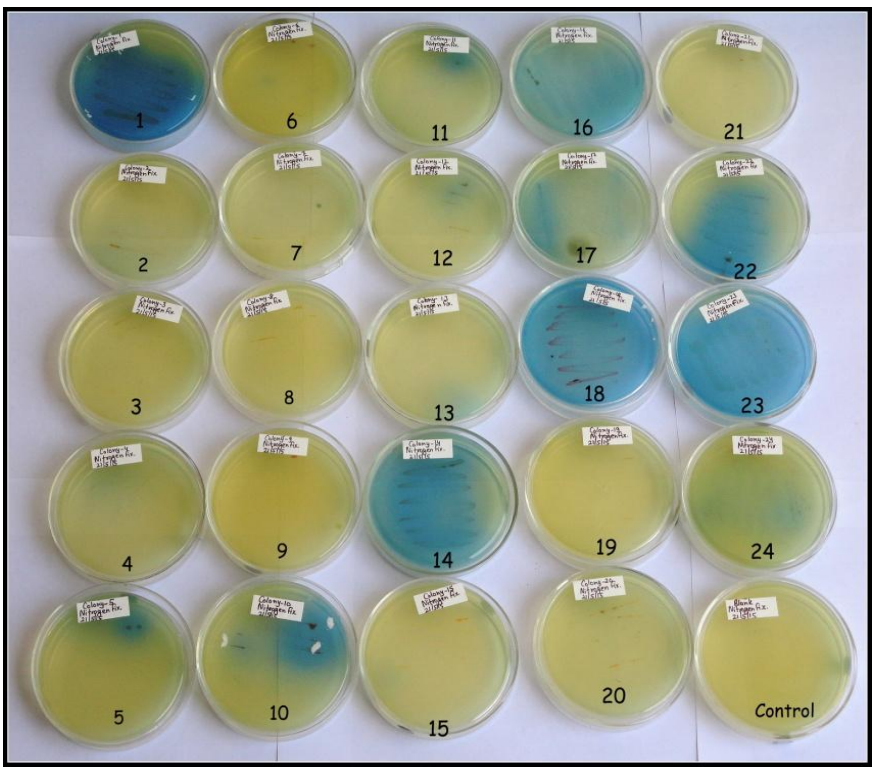
Sharda Choudhary, A. Tripathi, J. Mishra, R.S. Sharma, G. Jethra and BK Mishra

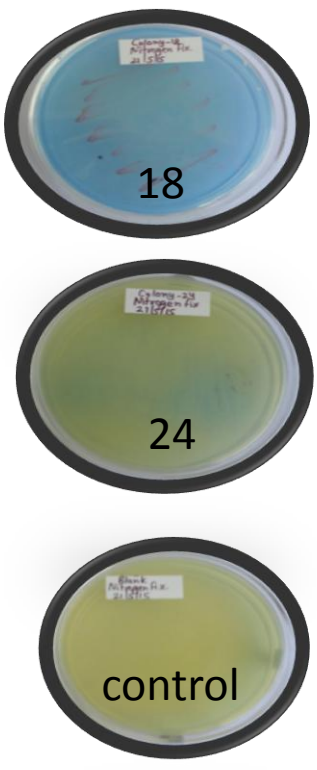
Nitrogen is the most significant yield limitating element factor in many agricultural production systems. It is known that in legumes, Biological Nitrogen Fixation (BNF) by symbiotic bacteria provides a sustainable amount of nitrogen required by the plant. In the present investigation, nutrient media was developed by modifications in method of Oken *et al*., 1971, total 13 plant growth promoting rhizobacteria (PGPR) strains were isolated by using modified method for nitrogen free medium from fenugreek field soil sample at Microbial biotechnology laboratory of ICAR-NRC on seed spices, Tabiji, Ajmer.

A laboratory protocol has been standardized for isolation of Nitrogen fixing ability microorganism.

In this experiment modified Nitrogen free malate medium was used for isolation of PGPR. This medium was modified further by adjusting the phosphate buffer to a lower pH (6.6). Nitrogen Free malate medium was modified by using 0.6 g of K_2HPO_4 , 0.002 g of Na_2MoO_4 and 5 g of malic acid per liter. Solid media were prepared with 20 g of agar per liter.

The isolates were streaked on modified nitrogen free malate medium to evaluate the ability to fix the atmospheric nitrogen. Incubation time given for cultures was 24 hours at 28º C temperature. Out of total twenty four isolated bacterial cultures, 13 cultures were showing nitrogen fixing ability on modified N2 – free malate medium rest 11 were negative. Isolated strain no. 18 and isolated strain no. 23 were showing maximum and isolated strain no. 24 was showing minimum capacity to fix atmospheric nitrogen respectively.





Transfer of Technology

Participated in Agriculture Exhibition at SSB, Motihari-Bihar

Dr. A.K. Verma, Scientist and Mr. M.A. Khan, Assistant Chief Technical Officer of NRC Seed Spices, Ajmer activelt took part Agriculture Exhibition at SSB Ground (Seema Suraksha Bal) Pipra Kothi, Motihari, Bihar by exhibiting the technologies developed by ICAR-NRCSS. The stall exhibited on seed spices benefitted the farmers by familiarizing them with recent advancements in seed spices production & processing, supporting literatures in this regard in the form of pamphlets/folders were also distributed to the interested farmers/visitors/students visited to the stall on this occasion.

Exhibition was inaugurated by Hon'ble Minister Shri Radha Mohan Singh, Ministry of Agriculture (Govt. of India) and Chairman ICAR on 21st August, 2015. During the occasion Hon'ble Dr. S. Ayyappan, Director General ICAR & Secretary DARE, New Delhi visited the stall and appreciated the technologies developed by the scientists & the way it was exhibited during the event.





Hon'ble Director General, ICAR Dr. S. Ayyappan and school children interacting at NRCSS stall

Transfer of Technology

Cleanliness Programme held within & outside NRCSS campus

Four well scheduled cleanliness programmes on July1, 4, 16 & 24th, 2015 were conducted under National Campaign "Clean India Mission" within & outside the NRCSS campus. A mision mode approach was performed by all the staff members of the centre under the leadership of Dr. Balraj Singh, Director, NRCSS-Ajmer.





Inside NRCSS Campus









Outside NRCSS campus

Human Resource Development

Hello Kisan programme on DD Kisan Channel

❖Dr. Balraj Singh, Director, NRC on Seed Spices, Ajmer had participated as an expert in "Phone in programme on" Akashwani, Jaipur on July 7, 2015.

❖ Dr. Balraj Singh, Director, NRC on Seed Spices, Ajmer had participated as an expert in Hello Kisan Programme on "*Sanrakshit Kheti*" in DD-Kisan, New Delhi on July 13, 2015.

❖Dr. Balraj Singh, Director, NRC on Seed Spices, Ajmer had participated as an expert in Hello Kisan Programme on "*Green House, Net House Faslon Ki Sanrakshit Kheti*" in DD-Kisan, New Delhi on July 31, 2015..

Training attended

❖Mr. Harisha, C. B., Scientist (Spices, Plantation, Medicinal and Aromatic Plants) attended 10 days short Course on "Smart Agro-input Delivery Approaches Based on Hydrogels and Other Polymeric Carriers for Improved Crop Health and Productivity" at Division of Agricultural chemicals, ICAR-IARI, New Delhi from 21st July 2015 to 30th July 2015.

Symposia/seminars/conferences/meetings attended

❖Dr. B. K. Mishra participated in International Conference on Agriculture; Veterinary & Environmental Sciences -2015 held on July 24 - 25, 2015 at Vijayawada, Andhra Pradesh, India and presented his oral paper on "Effect of native plant growth promoting rhizobacteria on coriander (Coriandrum sativum L.) crop growth and yield" in the International Conference.

❖Dr. B. K. Mishra attended and participated in National Symposium on Sustaining Agricultural Productivity in Arid Ecosystem: Challenges and Opportunities (Sapco-2015) held on August, 19-22, 2015 at Regional Research Station, Central Arid Zone Research Institute, Leh, India and presented his oral paper on "Bioprospecting of phosphate solubilizing bacteria from fennel (Foeniculum vulgare Mill.) rhizospheric soils of semi-arid region of India" in the National Symposium.

From the Director's Desk



Seed spices being the potential source of nation's export earnings are the herbaceous high valued low volume crops of immense therapeutic properties widely renowned by western countries. The crops being annual in nature and unexploited scientifically, provides ample of opportunities for scientific interventions and breakthroughs for overall development of the sector. ICAR-NRCSS servicing on similar line since its inception is dedicatedly working towards exploring the fullest potential of these crops through well monitored research programmes, being evaluated at each stage of advancement by expert review team formed at national level.

One such headway of various ongoing research projects and new project proposals (*i.e.*, II meeting of XV IRC) were assessed before the expert committee on 3rd and 4th Aug, 2015 for their scientific approach and clarity of achieving well defined objectives. On the way of scientific explorations towards the upliftment of seed spices and its stake holders as a whole, the scientific community of the centre was able to isolate a promising zinc solubilizing fungus from the rhizosphere of the coriander, have identified critical stage for weed management in Ajwain & Fennel and has also developed nutrient media for isolation and identification of rhizobium from the fenugreek growing fields. Apart from working on research aspects, the institute has also got its mandatory functions on training and extension activities with a motto to equip and update the stake holders with recent advancements and consequences in seed spices cultivation. In this direction ICAR-NRCSS actively took part in Agriculture exhibition at Seema Suraksha Bal (SSB) Ground, Pipra Kothi, Motihari, Bihar by exhibiting and delivering all its recent advancements on seed spices production, improvement, protection and processing for the welfare of the seed spices farming communities. Despite of participation in exhibitions and krishi melas, scientists are actively involved in various science led platforms like hello kisan programmes, trainings, national and international conferences and have brought in a greater visibility of the centre in the field of horticulture science nationally and globally. Upholding the dream of our Father of Nation and campaign called by Honorable Prime Minister, our institute has mandated the programme "Swacch Bharat Abhiyan" and cleanliness drive under this programme is being performed in a well scheduled manner with the active participation of all the staff members of the centre.

Balraj Singh





सवच्छता अभियान