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

An ISO 9001:2008 Certified Institute

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Important Events

World Soil Health Day-2015

ICAR-NRC on Seed Spices along with KVK, Ajmer & Deputy Director (Ag. Extn.) Bhinay Panchayat Samiti, Ajmer commemorated the International Year of Soil by jointly organising World Soil Health Day on 5th December 2015 at NRCSS, Ajmer. Hon'ble Prof. Sanwar Lal Jat, Union Minister for State for Water Resources, River Development and Ganga Rejuvenation, presided the occasion. Among other dignitaries Shri Suresh Rawat, local MLA (Pushkar), Dr. Balraj Singh, Director, NRCSS, Dr. V. K. Sharma, Deputy Director (Agri.), Ajmer, Dr. N.K. Sharma, Director (Extension), SKN Agriculture University, Jobner and Dr. G. N. Mathur, Programme Coordinator, KVK-Ajmer had graced the occasion. Prof. Jat in his inaugural address urged to celebrate this day in true spirit by understanding critical importance of soils in our life as well as for civilizations. Highlighting upon the creation of increased irrigation facilities in the country after independence and various scheme launched on irrigation, assured the commitment of the current government to serve farmers. About 250 soils health cards each of ICAR-NRCSS, KVK and State Agriculture Department were distributed by Prof. Jat and other dignitaries to the farmers. On this occasion, an interactive session between farmers and experts was also organized on importance of soil, maintaining soil fertility and judicious usage of chemical fertilizers.



Distribution of soil health card to female farmer by Honorable Prof. Sanwar Lal Jat, Union Minister for State for Water Resources, River Development and Ganga Rejuvenation

Important Event

Winter school organized at the Centre

A 21-days ICAR sponsored Winter School on "Utilization of degraded land and soil through horticultural crops for improving agricultural productivity and environmental quality" was organized at NRC on Seed Spices, Ajmer, during 3-23 December, 2015. A total number of 26 participants from various universities and institutions located across the length and breadth of the country representing 11 states had attended the Winter School. Dr. Arushi Ajey Malik Collector & District Magistrate, Ajmer and Dr. T. Janakiram, Asstt. Dir. General (Hort. Sciences) were the Chief Guest and Guest of Honour of the inaugural function held on 3rd December, 2015. All the aspects of Utilization of degraded land and soil through horticultural crops for improving agricultural productivity and environmental quality have been covered during the training period. The Winter school was divided into eight modules *viz* **Module-1** Land and soil degradation extent and evaluation. **Module-2** Plasticizing crops under various degraded situations, **Module-3** Stabilization and improvement in soil and land by the horticultural crops, **Module-4** Scope for sequestering additional soil carbon in degraded land and soils, **Module-5** Climate stabilization and improvement in environment & soil quality, **Module-6** Hi-tech horticulture for degraded lands, **Module-7** Disease and pest problems in horticultural crops in concern with degraded lands, **Module-8** Transfer of technologies and associated activities for control, regeneration and rejuvenation of degraded lands through horticultural crops. Dr G. N. Mathur, PC, KVK, Ajmer and Dr. Balraj Singh Director, ICAR-NRCSS, Ajmer were the Chief Guest and Guest of Honour of the valedictory function and they distributed the certificates to the trainees. Dr O. P. Aishwath (Course Director) extended the vote of thanks to all the chairmen and members of organizing and other committees along with all the personnel, who had directly and indirectly supported the programme. He expressed his deep sense of gratitude to the resource persons and also to the worthy participants. He also expressed his honour to the ICAR, DDGs and ADGs (HRD and HS) for providing such a great opportunity to the institute.







Important Event

Celebration of *Jai Kisan Jai Vigyan Week* 2015 (23-29, December,2015)

Jai Kisan Jai Vigyan Week 2015 was celebrated during 23-29, December, 2015 at ICAR-NRCSS, Ajmer (Rajasthan) on the birth anniversary of former Prime Minister, Bharat Ratna Shri Atal Bihari Vajpayee and Late Shri Chaudhary Charan Singh. The celebration was organized by keeping in view of their immense contribution for promoting use of science for the welfare of farmers. On the inaugural day of *Jai Kisan Jai Vigyan* Week 2015, Dr. Balraj Singh, Director, NRCSS, Ajmer highlighted the role and contribution of former Prime Ministers Shri Atal Bihari Vajpayee and Late Shri Chaudhary Charan Singh. He appraised about contribution of Late Shri Chaudhary Charan Singh in consolidation of holdings to solve the problem of fragmentation of land holding for ensuring economical size. The contribution of Shri Atal Bihari Vajpayee in implementing the policy of construction of road corridor which enabled farmers to transport their produce to far places. During the week several other programmes and activities were organised at NRCSS. Two days seminar on *"Phulon Ki Vavsaik Kheti Avam Prabandhan"* was organised during 28-29, December, 2016 sponsored by Assistant Director (Horticulture), Ajmer under National Horticulture Mission, in which 100 farmers from Ajmer district had participated. On concluding day of the week, a five days farmers training programme on "*Bijya Masala Phasalon Ki Unnat Kheti"* from 29, December, 2015 to 2 January, 2016 was inaugurated. During the week several groups of farmers from Gujarat, Rajasthan and MP had visited and gained practical know how of seed spices cultivation at ICAR-NRCSS, Ajmer.



Research Highlights

Genotype-specific molecular markers for Fennel

Sharda Choudhary, R.S. Sharma and R.S. Meena
ICAR-National Research Centre on Seed Spices, Tabiji, Ajmer (Raj.)

Molecular Markers identified for Fennel genotypes using RAPD primers

Two RAPD primers (OPB-07 and OPB-11) generated unique bands in fennel genotype as shown in (Table 1). These primers produced specific DNA bands which distinguished the genotypes from the rest of the genotypes. Primer OPB-07 generated a unique allele for Pant-madurika (Figure 1) which is 1850bp in size and Primer OPB-11 generated a unique band for the variety CO-1 (Figure 2) of 210bp, these primers will work as specific molecular markers for the identification of both Pant-madurika and CO-1 varieties, respectively.

Table 1. Unique/genotype specific bands detected by 2 RAPD primers in Fennel

RAPD Primers	Genotype	No. of Unique band	Size of Band (bp)	Primer Sequence
OPB-07	Pant-madurika	1	1850	GGTGACGCAG
OPB-11	CO-1	1	210	GTAGACCCGT

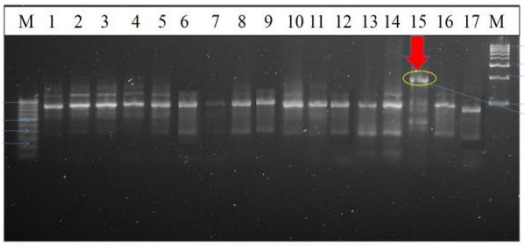


Figure 1. RAPD banding pattern generated through OPB series of primers.
•Arrows indicate putative genotype specific bands.
*1:GF-1, 2:GF-2, 3:GF-11, 4:GF-12, 5:RF-101, 6:RF-125, 7:RF-143, 8:RF-178, 9:RF-281, 10:RF-145, 11:RF-205, 12:Rajendra-Surabhi, 13:Azad-Saunf-1, 14:CO-1, 15:Pant-Madhurika, 16:AF-1, 17:Hisar-Swarup

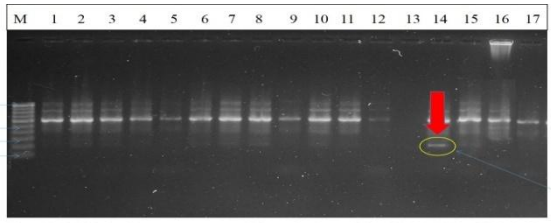


Figure 2. RAPD banding pattern generated through primer OPB-17 (M1=100 bp DNA ladder; G1-G17 are code of different genotypes as listed in Table 1). Arrows indicate putative genotype specific bands.
*1:GF-1, 2:GF-2, 3:GF-11, 4:GF-12, 5:RF-101, 6:RF-125, 7:RF-143, 8:RF-178, 9:RF-281, 10:RF-145, 11:RF-205, 12:Rajendra-Surabhi, 13:Azad-Saunf-1, 14:CO-1, 15:Pant-Madhurika, 16:AF-1, 17:Hisar-Swarup

Molecular Marker identified for Fennel genotypes using ISSR primers

Primer UBC-810 generated a unique allele (1550bp) for fennel variety Hisar-swarup (Figure 3) this primer will work as a specific molecular marker for the identification of Hisar-swarup variety.

Table 2. Unique/genotype specific bands detected by ISSR primers in Fennel

ISSR primer	Genotype	No. of Unique band	Size (bp)	Primer Sequence
UBC-810	Hisar-swarup	1	1550	$(GA)_8T$

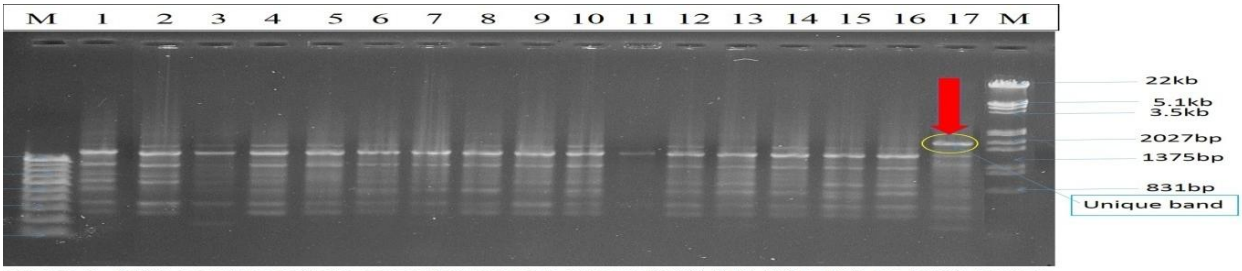


Figure 3. ISSR banding pattern generated through primer UBC-810 (M1=100 bp DNA ladder; M2= Lambda DNA/EcoRI/HindIII double digest, G1-G17 are code of different genotypes as listed in Table 1. Arrows indicate putative genotype specific bands.
*1:GF-1, 2:GF-2, 3:GF-11, 4:GF-12, 5:RF-101, 6:RF-125, 7:RF-143, 8:RF-178, 9:RF-281, 10:RF-145, 11:RF-205, 12:Rajendra-Surabhi, 13:Azad-Saunf-1, 14:CO-1, 15:Pant-Madhurika, 16:AF-1, 17:Hisar-Swarup

Research Highlights

First report on diversity of thrips species in seed spice crops

Krishna Kant, Siya Ram and Vikas Kumar*

Thrips is an important pest of all seed spice crops grown across the country. It develops, colonise and damage the crop from early vegetative stages to full vegetative stages and seed formation stages. It is one of the very important pests of cumin that causes serious damage to the crop especially at early stage of growth. It also colonize and damage on other major and minor seed spice crops. Nymph and adults of thrips congregates in between the leaves and leaf sheath, stem of crops and suck the sap of the plants, which causes drying of the leaves and inflorescence/flowers. A study on thrips species diversity on various seed spice crops was conducted based on the thrips population collected from important seed spices growing areas of Rajasthan and Gujarat. Thrips samples collected at various crop growth stages showed large variability in species composition on different crops (Table 1). The thrips species were identified at ZSI, Kolkata (W. Bengal). There were seven species of thrips found associated with the various crops, in which two predatory thrips (***Aeolothrips* spp. *and Haplothrips* spp.***)** species were also identified.

S.No.	Crop	Phytophagous Thrips Species	Predatory Thrips sp.
1	**Cumin** (*Cuminum cyminum* L.)	***Frankliniella schultzei***	***Aeolothrips spp.***
		Scirtothrips *dorsalis*	***Haplothrips spp.***
		Anaphothrips sudanensis	
2	**Coriander** (*Coriandrum sativum* L.)	***Thrips*** *tabaci*	***Aeolothrips spp.***
		Frankliniella schultzei	
		Scirtothrips *dorsalis*	
3	**Fennel** (*Foeniculum vulgare* Mill)	***Scirtothrips*** *dorsalis*	
		Thrips *tabaci*	
		Frankliniella schultzei	
4	**Fenugreek** (*Trigonella foenum-graecum*)	***Thrips tabaci***	***Aeolothrips spp.***
		Frankliniella schultzei	
5	**Dill** (*Anethum graveolens* L.)	***Frankliniella schultzei***	
		Thrips *tabaci*	
		Caliothrips indicus	
6	**Celery** (*Apium graveolens* L.)	***Frankliniella schultzei***	
		Thrips *tabaci*	
		Caliothrips indicus	
7	**Nigella** (*Nigella sativa* L.)	***Scirtothrips*** *dorsalis*	***Aeolothrips spp.***
			Haplothrips spp.
8	**Anise** (*Pimpinella anisum* L.)	***Frankliniella schultzei***	***Aeolothrips spp.***
		Thrips *tabaci*	***Haplothrips spp.***
		Scirtothrips *dorsalis*	
9	**Ajwain** (*Trachyspermum ammi Sprague)*	***Thrips*** *tabaci*	***Aeolothrips spp.***

*Senior Scientist, Zoological Survey of India (ZSI), Kolkata

Transfer of Technology

Training/ seminar organized

Sr. No	Name of the sponsoring agency	Duration	Title of the training	No. of farmers
1	Five days farmers training sponsored by Project Director ATMA, Bhilwara (Rajasthan)	15-12.2015 to 19.12.2015	*Bijya Masala Phasalon Ki Vaigyanic Kheti*	30
2	Two days seminar sponsored by Assistant Director (Horticulture), Ajmer under National Horticulture Mission	21-22, December, 2015	*Sanraksit Kheti avam Prabandhan*	100
3	Two days seminar sponsored by Assistant Director (Horticulture), Ajmer under National Horticulture Mission	28-29, December, 2015	*Phulon Ki Vavsaik Kheti avam Prabandhan*	100
4.	Five days farmers training sponsored by Project Director ATMA, Jodhpur (Rajasthan)	29-12.2015 to 02.01.2016	*Bijya Masala Phasalon Ki Unnat Kheti*	30





Human Resource Development

TV and AIR Talk

Sr. No	Name of expert	Title of talk	Date	Media
1.	Dr. Balraj Singh Director	Improved technology of seed spice cultivation	3.11.2015 7.00-7.30 PM	Phone in programme, All India Radio, Jaipur
2.	Dr. R. S. Mehta Principal Scientist	Care and maintenance of spice crop	02.12.2015 7.00-7.30 PM	DD Kisan Channel in Hello Kisan programme
3.	Siya Ram Meena (Sr. Tech. Officer)	Beejiye Masalo ke Nasak Keeto ka Samekit Prabandhan	10.12.2015 7.15 PM	All India Radio (Akashwani) Jaipur
4.	Dr. Balraj Singh Director	Cultivation of spice crops	25. 12.3015 7.00-7.30 PM	DD Kisan Channel in Hello Kisan programme

Winter School/Symposia/seminars/conferences/workshop attended

➢Dr. A. K. Verma has undergone 21 days winter school on "Novel Genomic Tools and Modern Genetics and Breeding Approaches for Vegetable Crop Improvement" from November 07-27, 2015 at ICAR-Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh.

➢ Dr. Gopal Lal, Principal Scientist (Hort.) attended symposium on spices, medicinal and aromatic crops (SYMSAC-VIII) towards 2050- Strategies for sustainable spice production held during 16-18, December, 2016 at Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu and delivered a lead lecture on Organic Production of Seed Spices.

➢Dr. R. S. Mehta, Principal Scientist (Agronomy) attended symposium on spices, medicinal and aromatic crops (SYMSAC-VIII) towards 2050- Strategies for sustainable spice production held on 16-18, December, 2016 at Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu. He presented Special lecture III on "Protected cultivation techniques for seed spices crops" authored by Dr. Balraj Singh and Dr. Ravindra Singh. He also presented research paper on "Intercropping of fennel (*Foeniculum vulgare* L.*)* with vegetables for enhancing system productivity*"*.

➢Mr. Diwakar, Y. Scientist (Spices, Plantation, Medicinal & Aromatic Plants) presented oral presentation on "Characterization & Evaluation of *N. Sativa* L. genotypes in National Symposium on Spices, Medicinal and Aromatic Crops (SYMSAC-VIII), 16-18 December 2016, TNAU, Coimbatore, Tamil Nadu.

➢Mr. Harisha, C. B. Scientist (Spices, Plantation, Medicinal & Aromatic Plants) presented a poster on Impact of micronutrient application on growth, yield and micro nutrient uptake in Fennel in SYMSAC-VIII, 16-18 December 2016, TNAU, Coimbatore, Tamil Nadu.

Sports

ICAR West Zone Sports Meet – 2015-16

ICAR West Zone sports meet was organized at ICAR-CSWRI, Avikanagar, Jaipur from 2nd Nov to 6th Nov, 2015. A total of 619 participants from 17 different ICAR institutes had represented in this meet. In the present event a team of 32 members from NRCSS, Ajmer had participated in almost all the 21 events (Football, Volleyball Smashing and Shooting, Basketball, Kabbadi, Cycling, Table Tennis, Chess, Carom, and athletic events like 100 m sprint, 400 m, 4x100 m relay, long jump, high jump, shot put throw, discus throw, javelin throw, 1500 m, 800 m race etc.). A major boost in the current years' performance in all the events participated by ICAR-NRCSS was witnessed and the same was reflected in the form of 3 gold, 3 silver, 1 bronze and got best athlete award (Men) along with the added credit of making through to semi finals in almost all the team events participated by ICAR-NRCSS.

Medals and Awards

Mr. Diwakar, Y., Scientist (Spices, Plantation Medicinal and Aromatic Plants) won:
Three Gold Medals : 100 m sprint, Long Jump and 4 x 100 m relay race.
Two Silver Medals : Javelin Throw and High Jump
One Bronze Medal: Shot Put Throw
Best Male Athlete Award of the West Zone Sports Meet, 2015

Mr. Mukesh Kumar Vishal, Scientist (Statistics) got **Silver Medal** in Discus Throw

Dr. R. K. Solanki, Scientist (Plant Breeding), **Mr. Diwakar, Y.** , Scientist (Spices, Plantation Medicinal and Aromatic Plants) , **Mr. Honnappa Asangi** Scientist (Spices, Plantation Medicinal and Aromatic Plants) and **Mr. Mukesh Khandari**, LDC, won **Gold Medal** in 4 x 100 m relay race.



From the Director's Desk



Seed spices, the predominant annual rabi crops of arid and semi-arid parts of India are the crops with greater economic value and global demand. Although, seed spices are grown under conditions deprived with natural resources, rather severe climatic limitations, their ability to withstand and perform optimally under these natural conditions have been one of the prime reasons for formidable growth of horticultural sector in these areas. Seed spices possessing inherent aroma and flavour imparting characteristics other than industrially potent pharmaceutical constituents, are the chief components driving their value and demand. National Research Centre on Seed Spices, established with the motto of strengthening seed spices sector and their dependent stake holders, over the years with many cutting edge technologies and farmer educative activities have brought in a greater visibility both nationally as well as globally.

Among many farmer oriented activities, an event to mark the celebration of world soil health day was organized by distributing 250 soil health cards describing the inherent nutritional status and management practices of soils collected from different farmers' fields. Similarly to farewell the year 2015 "International Year of Soils" as declared by 68th UN General Assembly to generate awareness and understanding on the importance of the soil for food security and ecosystem function, a winter school of 21 days duration to researchers representing different parts of the country was organized at the centre to upgrade the knowledge on aspects encompassing "Utilization of Degraded Land and Soil through Horticultural Crops for Improving Agricultural Productivity and Environment Quality". Being a farmer oriented institute to mark the birth anniversary of former prime ministers, Bharat Ratna Sh. Atal Bihari Vajpayee and Sh. Chaudhary Charan Singh, whose visions relied on promoting use of science for the welfare of farmers, a weeklong celebration "Jai Kisan Jai Vigyan" was celebrated by organizing two days seminar and five days training programme to the farmers with the advanced production technologies for enabling profitable cultivation of seed spices and flower crops.

In the era of technological revolution, innovations in the field of science and its counterparts have reached several depths of understanding. Similarly in Agriculture and its allied sciences valuable genetic resources of respective kinds are the greatest assets for future growth and development. Over the years through molecular technologies and approaches their characterization and marker assisted selections have offered greater scope in detecting trait specific variation as it reveals ultimate level of variation present at gene level. In this regard, by using RAPD and ISSR primers, genotype-specific molecular markers for identifying few fennel varieties at molecular level have been developed at the centre. Through survey, collections and identification, a report for the first time on diversity of *Thrips* spp. in seed spice crops has been reported from the centre. Similarly to upgrade the knowledge on advanced technologies and to share & discuss about the research findings before the scientific gathering, few scientists of the centre during the period have participated in winter school and National Symposium organized at different locations of the country. At last I am happy to add that in the year 2015, ICAR-NRCSS have been honoured with three gold, three silver and one bronze medal in ICAR-West zone Sports Meet.

With this, I would like to take the opportunity to congratulate each and every one who has given valuable contribution and support for the current year's achievement and progress of ICAR-NRCSS.

Balraj Singh