BI-MONTHLY SEED SPICES E-Newsletter

ICAR-National Research Centre on Seed Spices

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G.K. Tripathi

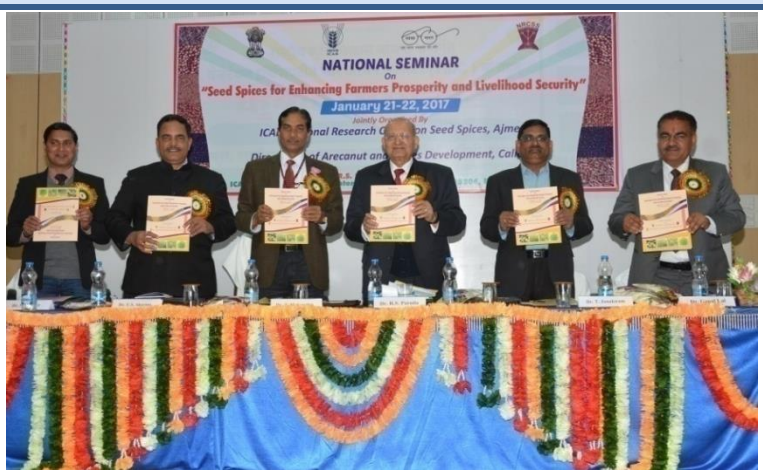
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Important Events

National seminar organized on "Seed Spices for Enhancing Farmers Prosperity and Livelihood Security" at ICAR-NRCSS, Ajmer

Padma Bhushan Dr. R.S. Paroda, Chairman TAAS and Former D.G., ICAR & Ex-Secretary, DARE, GOI, New Delhi, Dr. Trilochan Mohapatra, Hon'ble D.G., ICAR & Secretary, DARE, GOI, New Delhi inaugurated the national seminar on "**Seed Spices Enhancing Farmers Prosperity a Livelihood Security**" held during January 21-22, 2017 at R.S. Paroda Auditorium, ICAR- National Research Centre on Seed Spices, Ajmer, Rajasthan (India). The seminar was jointly organized by ICAR-National Research Centre on Seed Spices, Ajmer & Directorate of Arecanut and Spices Development, Calicut. The chief guest of the inaugural function Dr. R. S. Paroda, emphasized the development of holistic approaches towards the sustainability and livelihood security of the farmers. Hon'ble D.G., ICAR encouraged the scientists to work for doubling the income of farmers through diversification and value chain development in seed spices while delivering his presidential address cum foundation day lecture of ICAR-NRCSS. The clean and green campus of ICAR-NRCSS, Ajmer witnessed an eco-friendly energy solution by inauguration of fully functional Roof top based solar system with installed capacity of 105KW on this occasion. Dr. Paroda and Dr. Mohapatra along with other invited dignitaries visited the experimental farms and

continue.....



Important Events

laboratories and appreciated the ongoing R & D work of the centre. Dr. G. Lal, Director and Organizing Chairman welcomed all the delegates and presented the achievements made by the NRCSS since inception, on the occasion of foundation day celebration and seminar. The National Seminar focused on the elaborated discussion and paper presentation on research achievements and challenges in seed spices production. A special session was organized for panel discussion with invited experts of Spices Board, DASD, World Spice Organization and farmers under the leadership of Dr. T. Mohapatra & Dr. R. S. Paroda to prepare a roadmap for safe and profitable spice production, future export demand as well as to cater the domestic consumption. During the seminar more than 200 participants presented their research papers on various aspects such as Crop Improvement for enhancing productivity of seed spices, Crop Production with sustainable natural resource management, Plant health management, Hi-Tech interventions for seed spices cultivation under adverse climate conditions, Post-harvest handling, processing and value addition for high profitability, Marketing & Export of Seed Spices and Transfer of Technology.

Dr. U.S Sharma,VC, MPUAT, Udaipur, Dr. Nirmal Babu, Director, ICAR- IISR, Calicut, Dr. T. Janakiram, ADG (HS-II) ICAR, Dr. O.P. Yadav, Director, ICAR-CAZRI, Jodhpur, Dr. S.M.K. Naqvi, Director, ICAR- CSWRI, Avikanagar were present among the diaspora of the guests and chaired the various technical sessions in the seminar.







The plenary cum valedictory function was chaired by Dr. R. R. Hanchinal, Chairman, PPVFRA, New Delhi who also distributed the awards to the winners participants of the seminar. Dr. B.B. Vashishtha, former Director and Chairman, RAC ICAR-NRCSS, Ajmer was also present in the plannery session as Guest of Honour. The function ended with a formal vote of Thanks by organizing Secretary Dr. S. S. Meena, Principal Scientist, NRCSS, Ajmer.

Important Events

NATIONAL SCIENCE DAY (2017) CELEBRATED

National Science Day (NSD) was observed on 28 February, 2017 at ICAR-National Research Centre on Seed Spices, Ajmer. The theme of the National Science Day, 2017 was "Science and Technology for Especially Abled Persons" the NSD function was inaugurated by Dr. Gopal Lal, Director, ICAR-NRCSS, Ajmer in the presence of the entire staff members and RA/SRF/students. Dr. R.D. Meena (Scientist, Plant Pathology) coordinated the program and all the activities during National Science Day. The following activities/competitions were performed during NSD, 2017 celebration:

1. Debate competition on "Has Science made world smaller or bigger." Total 9 persons participated out of which 5 favored and 4 opposed.
2. Essay writing competition on "Role of Science for especially abled persons". In essay writing total 9 persons participated.

The winners were given certificates and prizes. The winners name has been listed below rank wise.

Debate Competition (favour)

1. G. K. Tripathi
2. S. R. Meena
3. Hemant Ameta

Debate Competition (opposition)

1. Sharda Choudhary
2. M. A. Khan
3. Jyoti Mishra

Essay competition

1. Rajkumar Kanwria
2. R. K. Solanki,
3. Jyoti Mishra & Yesh Sharma





















Research Highlights

A dwarf fennel mutant line "RF/250/73/1"-identified

A.K. Verma, R.K. Kakani, R.K. Solanki, R.D. Meena and Sharda Choudhary

Fennel (*Foeniculum vulgare* Mill) is an annual, aromatic herb having yellow flowers and native of Southern Europe and Asia. The potential yield of fennel is still low and there is an urgent need to increase the productivity. It is long duration crop and requires 6-7 months for maturity. Due to long duration crop farmers need to give more inputs to produce the crop. The normal plants height also high, hence, it creates the chances of lodging and ultimately it reduces the yield and quality of produce. The improvement of fennel crop was made mostly through conventional breeding method. Low genetic variability, tiny flower size obstruct the artificial pollination and incompatibility due to protandrous, which promotes the cross pollination are the main drawback of conventional breeding methods in fennel. Induced mutation has been widely used in a number of crops and species to generate broad spectrum of genetic variability. Mutation breeding is generally employed when low genetic variability present in a gene pool for particular trait.

The dried seeds of fennel cv. RF-125 were used for irradiation. Seeds were exposed to different doses of gamma ray and then sown in the field. The M_1 seed were harvested from irradiated plants. The M_2 population were raised and mutants were selected on the basis of morphological characters. Among the selected mutants one of the mutants was dwarf "RF/250/73/1" and early maturing identified (M_2 generation). The plant required 140 days to complete flowering.



The height of plants was just 36 cm. The plant was bagged and progeny will be advanced to know the stability of the different characters. If the mutant characters will be stable, it can be used as a source for developing early and dwarf fennel cultivars

Research Highlights

Technology on development of botanical adjuvant for efficacy enhancement of synthetic/botanical insecticides.

Krishna Kant, P N Dubey, B K Mishra and Siya Ram Meena

Studies of plant based adjuvants to enhance the efficacy of chemical and botanical insecticides was conducted in the externally funded "Out Reach Programme on Management of Sucking Pests of Seed Spice Crops" at ICAR-NRCSS, Ajmer. The adjuvant developed from the leaves of *Dalbergia sissoo*, seeds of *Sapindus mucorasai* and *Cyamopsis tetragonalobus* provided higher efficacy in terms of insecticidal value, when mixed with chemical insecticides/botanicals than sole application in field trial during 2015-16. The products were tested on crop of coriander (*Coriandrum sativum* L.) and cumin (*Cuminum cyminum* L.) against aphids (*Apis gossypii & Myzus persicae* of cumin and *Hydaphis coriandri* of coriander) The prepared adjuvants were mixed with synthetic insecticides (Acetamiprid - 0.025%) and botanical neem oil (2.0%) @ 2.0 % V/V basis (adjuvants) .

Field evaluations of adjuvants mixed with insecticide/botanical when applied on coriander crop, adjuvants prepared from *Sapindus mucorasai & Dalbergia sissoo* significantly enhanced efficacy in comparison to sole application of insecticide (Acetamiprid) at first spray. In second spray all three adjuvants including *Cyamopsis tetragonalobus* recorded for superior control of aphids population than sole application of insecticides. Similarly efficacy of adjuvant with botanicals also showed higher aphids control. Mixing of adjuvants with neem oil (2%) were found to show significantly higher efficacy than application of only neem oil @ 2% at both the application. Further, significantly higher build up of predators, parasitoids and pollinators were also recorded on application of insecticides/botanicals mixed with adjuvant.

Research Highlights

Technology on Seed wasp *Systole albipennis* (Walker) management

Krishna Kant, P N Dubey, B K Mishra, N K Meena and Siya Ram Meena

Chalcid wasp *Systole albipennis* (Walker) is a specific pest of coriander, fennel and other seed spice crops. Infestation occurs at field level and continues up to storage stage of seed. The eggs laid by female wasp hatches and developing larva feeds upon and destroys the embryo and/or endosperm consequently. The pest significantly reduces the market value of seed spices, is one of the major constraint for quality seed production. Presence of immature stages of chalcid wasp in seed affect export as it is an important quarantine pest.

Studies on management of borer in coriander crop showed that seed sown at 20th September recorded minimum infestation (1.0 %). Intercropping with dill crop showed maximum protection from borer infestation and recorded only 2.3 % infestation in comparison to coriander. Soil application of Chlothianidin @ 0.5 a.i. Kg/ha at the time of sowing resulted into maximum protection against borer followed by foliar application with Imidacloprid 0.005% and Abamectin 1.9EC @ 2ml/lit. Among different botanicals applied neem oil, insecticide soap was most effective in all crops. Post harvest management of borers using Modified Atmospheric Packaging with different gases were able to inhibit/ kill the immature stages of borer population present inside the seed.

The coriander crop was sown at five different date to study the impact of different sowing date with variable flowering and seed set time in relation to damage of borers. The crops were sown at 10 days intervals from 20th September to 30th October. Seed sown at 20th September showed minimum infestation of borers and was only 1.0% in comparison to 4.4% infestation coriander crop sown at 30th October.

Transfer of technology

"International Program (Exposure visit/training) for Undergraduates of the University of Arkansas, USA."



Farm visit (field crops and vegetables) and interaction with scientists & farmers at NRCSS, Ajmer, Pushkar, Govindgarh and Baseri with the help of NRCSS scientists. The programme was organized from 6-7 January, 2017 by Dr. Sharda Choudhary, Dr. Ravindra Singh & Dr. A.K. Verma. Dr. G. Lal, Director, NRCSS & Organizing Chairman briefed about the research activities of ICAR-NRCSS and socio-economic status of spices grown in the country especially the Rajasthan and Gujarat states. Eight students and two professors of the University of Arkansas, USA, participated in the training cum exposure visit.

DD Kisan have conducted "Krishak Prashna Manch" programme

DD Kisan have conducted "Krishak Prashna Manch" programme with 70 farmers at ICAR-NRCSS, Ajmer centre on 16.1.2017. Dr. Gopal Lal, Director (Act.) and 07 Scientists of NRCSS have also participated as experts in the programme. The farmers also placed their problems to the scientist and got solution.

Participation in Kisan Mela

National Sheep and Wool Fair-2017 attended by Dr. G. Lal, Director(Act.), Mr. M.A. Khan, ACTO and Mr. G.K. Tripathi, STA at CSWRI, Avikanagar on 4th Jan., 2017. Dr. Gurbachan Singh, Chairman ASRB, New Delhi was the Chief Guest of this important function. Technologies of seed spices cultivation were exhibited in the events. Value added products of seed spices like fenugreek biscuits, dill/fennel/coriander squash and various cryo ground products were displayed and technology pamphlets were distributed to the farmers. Various farmers queries were attended & given solution by NRCSS Scientists and Technical Officers.



Trainings/ workshop organized

Sr. No	Name of the sponsoring agency	Duration	Title of the training	No. of farmers
1.	Four days farmer's training programme , Deputy Director, ATMA, Chittorgarh	From 18-01-2017 to 21-01-2017	"Improved Package Practices of Seed Spices"	30
2.	Four days farmer's training programme , Deputy Director, ATMA, Chittorgarh	From 22-01-2017 to 25-01-2017	"Improved Package Practices of Seed Spices"	30
3.	One day training programme , CAD Kota	20 February, 2017	"Pre and post harvest technology of coriander	200
4.	One day training programme,	26 February, 2017	"Sustainable Production Technology of Seed Spices"	100

Human Resource Development





Winter School/Symposia/seminar/conference/workshop attended

1.	Dr. Saxena panelist in technical session during Rajasthan Food Protect organized by Indian Chamber of Commerce on 19th January 2017 at Marriot the Hotel, Durgapura, Jaipur and delivered invited lecture on "Commercial potential of cryogenic grinding technology for spices" during Rajasthan Food Protect organized by Indian Chamber of Commerce on 19th January 2017 at Marriot the Hotel, Durgapura, Jaipur.
2.	Dr. G. Lal, Director, NRCSS delivered a key note addressed on (Value addition, Processing and Mechanization) delivered by to enhancing farmer's income with value addition in seed spices in National Seminar on Jan 21, 2017.
3	Dr. S.N. Saxena, Pr. Scientist Co-Chaired technical session based on spice processing and value addition during National Conference on Spices: Challenges and opportunities held during 2-3 February, 2017 at CSIR-Central Food technology Research Institute, Mysore, Karnataka
4.	Dr. S.N. Saxena, Pr. Scientists delivered invited lecture on Cryogenic grinding technology: An effective approach for retention of flavour and enhancing medicinal properties of spices during National Conference on Spices: Challenges and opportunities held during 2-3 February, 2017 at CSIR-Central Food technology Research Institute, Mysore, Karnataka
5.	Dr. S.S. Meena, Pr. Scientist (Hort.) as a Organizing Secretary of organzinged National Seminar on "Seed Spices for Enhancing Farmers Prosperity and Livelihood Security" held during January 21-22 Feb, 2017 at ICAR- National Research Centre on Seed Spices, Ajmer, Rajasthan (India).
6.	Dr. S.S. Meena, Pr. Scientist (Hort.), presented research paper on Screening of Nigella (Nigella Sativa L) Germplasm for Development of a New High Yielding Variety: Ajmer Nigella-20 for Rajasthan State during "XIII Agriculture Science Congress: 2017 Climate Smart Agriculture " held during 21-24 February, 2017 at UAS, Bengaluru, India.
7.	Mukesh Kumar Vishal, Scientist (Statistics) attended Second Workshop of Officer In charge Data Management of ICAR Research Data Repository for Knowledge Management initiative organized at NASC Complex, New Delhi during January 24-25, 2017.

Human Resource Development

Research Papers /Lead /Oral Paper Presented in the National Seminar at NRCSS, Ajmer during 21-22, jan., 2017

S. No	Paper	Topic	Speaker
1.	Lead paper (Crop improvement)	Status of genetic resources and their conservation in seed spices	Dr. R.K Kakani
2.	Lead paper (Crop Improvement)	Usefulness of seed priming technology for enhancing yield and quality in seed spices	Dr. S.N. Saxena
3	Oral paper (Crop improvement)	Distinctness, uniformity and stability characterization on phonological traits in coriander and fenugreek	Dr. R. S. Meena
4	Oral paper (Crop improvement)	Induction of genetic variability through acute exposure of gamma ray in fennel (Foeniculum vulgare)	Dr. A. K. Verma
5.	Lead Paper (Crop production)	Organic production technology for enhancing yield and quality of seed spices	Dr. R. S. Mehta
6.	Lead paper -2 (Crop production)	Enhancing productivity of seed spices through hi-tech interventions:	Dr. R. Singh
7.	Oral Paper (Crop production)	Liming influence on growth, yield and quality of nigella in acid soils of eastern plateau hill region, Ranchi, Jharkhand	Dr. O.P. Aishwath
8.	Oral Paper (Crop production)	Study of rhizosphere effect in seed spices crops grown in Rajasthan	Dr. B.K. Mishra
9.	Lead paper (Plant health Management)	Advances in diseases management of seed spices	Dr. Y.K. Sharma
10.	Lead paper (Plant health management)	Integrated insect-pests management in seed spices	Dr. K. Kant
11.	Oral Paper (Plant health Management)	Efficacy and dissipation studies of propiconazole and deltamethrin in cumin cultivation	Dr. P. N. Dubey
12.	Oral Paper (Plant health Management)	Pollination management in seed spices	Dr. N .K. Meena
13.	Oral Paper (Plant health Management)	Weed infestation effect on Ramularia blight disease in fennel (*Foeniculum vulgare*)	Dr. R. D. Meena
14.	Oral Paper (Value addition, Processing and Mechanization)	Major bioactive compound in seed spices	Dr. S. N. Saxena
15.	Oral Paper (Value addition, Processing and Mechanization)	Status innovation and intervention of mechanization in seed spices	Er. S. P. Maheria
16.	Oral Paper (Quality, marketing & TOT)	Delineating the important seed spices growing areas and their AESR for Rajasthan and a discussion on past climate scenarios	Mr. M. K. Vishal

Human Resource Development

Honour and award

Honour and awards received by the staff of NRCSS in the national seminar on "Seed Spices for Enhancing Farmers Prosperity and Livelihood Security" held during January 21-22, 2017 at ICAR-National Research Center on Seed Spices, Ajmer .

S.No	Paper	Topic	Author
1.	Best oral paper presentation award (crop improvement)	Induction of genetic variability through acute exposure of gamma ray in fennel (Foeniculum vulgare Mill.) , pp141.	A.K. Verma, R. K. Kakani, R. K. Solanki, S. Choudhary, R.D. Meena, K. S. Reddy, P. Dhansekar and G. Lal
2.	Best oral paper presentation award (crop production)	Study of rhizosphere effect in seed spices crops grown in Rajasthan pp169.	B.K. Mishra
3.	Best oral paper presentation award (Plant health management)	Pollination management in seed spices.	N.K. Meena
4.	Best oral paper presentation award (Plant health management)	Efficacy and dissipation studies of propiconazole and deltamethrin in cumin cultivation. pp209.	P. N. Dubey, Ajoy Saha, S N Saxena, Y K Sharma and K. Kant
5.	Best oral paper presentation award (Value addition, Processing and Mechanization)	Chemo-profiling of volatile oil in cumin (*Cuminum cyminum* L) varieties. pp233.	G. K. Mittal, D. Singh, A. C. Shivran, D. K. Gothwal and S. N. Saxena
6.	Best oral paper presentation award (Value addition, Processing and Mechanization)	Status innovation and intervention of mechanization in seed spices pp235.	S. P. Maheria, G. Lal, R.S. Mehta, S.S. Meena and R. Singh
7.	Best oral paper presentation award (Quality, Marketing and TOT)	Delineating the important seed spices growing areas and their AESR for Rajasthan and a discussion on past climate scenarios pp256.	M. K. Vishal, G.P. Obi Reddy, Nirmal Kumar, R. S. Mehta, O.P. Aishwath and R. Singh
8.	Best poster presentation award (Crop production)	Enhancing farmer's income with dill based (Anathum sowa) inter-cropping system. pp189	R.S. Mehta, G. Lal, S.S. Meena, R. Singh, O.P. Aishwat, N.K. Meena, S.P. Maheria & H.K. Ameta
9.	Best poster presentation award (Crop production)	Performance of different varieties of coriander under organic production system, pp176.	G. Lal, N.K. Meena, R.D. Meena, C.B. Harisha, M.K. Choudhary and Neha Shekhawat

Human Resource Development

Honour and award

S. No	Paper	Topic	Author
10.	Best poster presentation award (Plant health management)	Anti-inflammatory potency of crude seed extracts of cumin genotypes. pp242.	Dolly Agarwal, L.K. Sharma and S. N. Saxena
11.	Best poster presentation award (Plant health management)	Cryogenic grinding enhances anti fungal potency of cumin seed extract. pp242.	L.K. Sharma, Dolly Agarwal and S. N. Saxena
13.	Best oral paper presentation award (Quality, Marketing and TOT)	Impact of Training Programme and Frontline Demonstration on farmers' knowledge and adoption of the improved technology of cumin cultivation in Ajmer and jodhpur Districts of Rajasthan. pp270.	G. Lal, P.C. Choudhary, M.A. Khan and G.K. Tripathi
14.	Best oral paper presentation award (Quality, Marketing and TOT)	Impact assessment of Front line demonstration on yield enhancement of fennel under TSP Area in Dungarpur of Rajasthan. pp266.	M.L. Choudhary, G. Lal, R S Mehta and N K Meena

Honour and awards received by the staff of NRCSS out of the centre

1.	(Lead lecture presented)	Integrated insect Pest Strategies in seed Spices. In: "National Seminar on Research and Development advances in Spices, Medicinal & Aromatic Crops cultivation, processing and trade for prosperity of Indian Farmers" during 1-2,Feburary,2017 jointly organised by (SIDA) and Agriculture University , Jodhpur	K. Kant, and S.R. Meena, 2017
2.	presented oral paper	"A perspective look on promotion of seed spices based agri-tourism in Rajasthan state" in a National Seminar at "Tourism, Linguistic and Culture" held at (DAV), Ajmer.	Mukesh K Vishal, 14 January, 2017

Human Resource Development

Technical Popular Article

1.	हरीश सी. बी. एवॅ पी. के. अग्रवाल. जैविक उत्पादन का सिद्धान्त एवॅ कृषि में महत्व। गोपाल लाल, आर. एस. मेहता, एस. एस. मीणा, बी. के. मिश्र, पी. एन. दूबे, एन. के. मीणा, ए.के. वर्मा, एम. ए. खान एवॅ एस. र. मीणा, 2017ण बीजीय मसाला फसलों के उत्पादन की उन्नत प्रौद्योगिकियाँ. संपादित भ.क्रु.अनु.पा. राष्ट्रीया बीजिया मसाला अनुसंधान केंद्र, अजमेर।

Research Papers Published

1.	S.N. Saxena, S.S. Rathore, Y. Diwakar, R.K. Kakani, K. Kant, P.N. Dubey, R.K. Solanki, L.K. Sharma, D. Agarwal, S. John (2017). Genetic diversity in fatty acid composition and antioxidant capacity of *Nigella sativa* L. Genotypes. LWT - Food Science and Technology 78:198-207.
2.	C. B. Harisha, Y. Diwakar, O. P. Aishwath, R. Singh, H. Asangi, 2017. Soil Fertility and Micronutrient Uptake by Fennel (Foeniculum vulgare Mill.) as Influenced by Micronutrients Fertilization. Environment & Ecology, 35 (1B): 514—518.
3.	Anand, P., Singh, K.P., Prasad, K.V., Kaur, C. and Verma, A.K. (2017). Anthocyanins production from bougainvillea. Indian Journal of Agricultural Sciences, 87(2): 191–196.

Events attended by Director

S No.	Event attended by the Director, ICAR-NRCSS	Date
1	Kisan Mela at CSWRI, Avikanagar	4th January, 2017
2	National Round Table on Horticulture , at India Habitat Centre Lodi Estate New Delhi organized by Indian Council of Food and Agriculture New Delhi	10th January, 2017
3	Stake holder meeting at KVK Neemach organized by ATARI to made a presentation on seed spices held on	13th January, 2017
4	The meeting of JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON SPICES AND CULINARY HERBS at Chennai, India	6 -10 February 2017
5	Director's Conference at NASC, New Delhi on	15-16 February, 2017
6	To conduct training of farmer's at Sultanpur, Kota (MIDH Project)	20th Feb., 2017
7	Farmer's training at Mundwa	26th Feb, 2017

From the Director's Desk



January and February months are very important regarding yield of seed spices because this is the fruiting time of the crops. Weather is expected to be favourable with mild winter and little or no rainfall. The year 2017 started with a very positive note on R&D activities of NRCSS. A national seminar was organized successfully on the very pertinent topic "Seed spices for enhancing farmers prosperity and livelihood security" at NRCSS, Ajmer.

The event was very fruitful with the presence of dignitaries of ICAR namely Dr. Trilochan Mohapatra, Secretary, DARE and DG, ICAR, New Delhi along with Padma Bhushan Dr. R.S. Paroda, Ex-Secretary DARE & DG, ICAR, New Delhi with a galaxy of renowned scientists like Dr. U.S. Sharma, Hon'ble, V.C., MPUAT, Udaipur, Dr. M.L. Jat, Coordinator, South East Asia, CIMMYT, New Delhi, Dr. R.R. Hanchinal, PPVFRA, New Delhi. Dr. B.B. Vashishtha, Ex Director, NRCSS and many Director's of ICAR institutes. The special mention is required for the panel discussion on how to double the farmers income through seed spices cultivation. The inauguration of fully functional roof top based solar power generation system with installed capacity of 105 KW at NRCSS Administrative-Cum-Laboratory Building by Padma Bhushan Dr. R.S. Paroda and Dr. T. Mohapatra, a golden feather in the cap of NRCSS, Ajmer. The thought provoking Foundation Day Lecture cum Presidential Address by Dr. Mohapatra motivated the scientist as well as farmers to work for sustainability and profitability of seed spices. I wish best of luck to all the participants of the National Seminar and hope R & D collaboration of all stakeholders with NRCSS, Ajmer for future endeavours.

(Gopal Lal)

