From Director’s Desk

Dear Readers,

With the outset of Rabi seasons, we have once again begun with sowing of seed spices trials, experiments and various research activities in our farm. In the month of January and February the bloomed crops with the pollinators around it presents a amazing scenario. These colours of flowers attracts the lot of pollinators and visitors also. Besides the umbelliferi/apiaceae with yellow, red and golden flowers, the nigella adds further multicolor to the crop land. This is an important period for the researchers for taking observations on crops and farmers have opportunities to see variability and crop performance. Seed spice Kisan Mela and Sangoshthi were organized at the institute to fulfill the mandates and about 1500 farmers participated in organized programme.

Research highlights on insect-pest infestation in kasuri methi alongwith control measures and development and validation of micro-satellite molecular markers for coriander are the achievements made by researchers on this issue. During the period, productivity week was also celebrated by focussing on organic farming and recycling of resources. It is the optimum time to visit the farmers field also, hence a field day was organized at village Kalesara. As usual Swachcha Bharat Abhiyan is going on and its activities list accordingly. Institute personnals also participated in seminar, symposia and conferences in their concerned field are also listed at the end of this issue as an activities of the period.

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(Gopal Lal)
RESEARCH HIGHLIGHTS
Crown aphids infestation in Kasuri methi
Krishna Kant and Siya Ram Meena

*Kasuri methi* (*Trigonella corniculata*) is popular scented fenugreek also known as *Nagauri methi* used as spices and as garnishing, grown mostly in Nagour district of Rajasthan. The crop generally affected by cutworm, leaf aphids, and noctuid larvae of *Helicoverpa armigera*. During 2018-19, field of Kasuri methi was recorded crown aphids infestation, on the lower portion of the plant stems near to soil surface. The presence of this species did not report so far on kasuri methi plant elsewhere.

**Description:** Development of aphids on *Kasuri methi* starts at full vegetative growth of the crop through last week of January. Initially winged aphids settle on lower part of the stem near to base at soil level. It starts laying nymph and gradually colonize at lower side of the stems during peak of the population level, it remains 3-4 inch above the soil surface. The maximum colonization has been observed just above the soil surface and on stem below the 2 cm on root occasionally. Non winged form of aphids appear in purple in colour, whereas winged forms appear in purple to grey colour and body covered with ash colour wax.

**Damage:** Crown aphids congregate on lower stem (crown) region of the plants. It feed on the stem and roots very near to soil surface make the plant week and ultimately reduces yield. Development of large population at crown region led to
formation of black mould due to honey dew secretion by aphids.

**Development and validation of microsatellite molecular markers for coriander (Coriandrum sativum)**

Sharda Choudhary and M.K. Vishal

Coriander is very popular seed spices, but very limited molecular and genomic studies on it, hinders the molecular research on it. In addition, lack of coriander molecular markers limits the process of molecular breeding. Till date very limited literature is available for molecular studies in coriander. Molecular selection. However, only a few molecular markers have been reported in coriander like RAPD and ISSR (Choudhary et al. 2019) and transferability of SSRs (Choudhary et al. 2017). A very popular and informative marker SSR was lacking for coriander crop. To overcome the problem of specific SSRs for coriander we have used the RNA seq technique. ESTs were developed for the coriander crop using transcriptome sequences of the NRCSS, Ajmer variety (Acr-1). Microsatellites were developed using the MISA v1.0 software from transcriptomes. In silico validation confirmed the SSRs availability at difference sizes and distance. Microsatellites developed from ESTs of Acr-1.

**Simulated PCR (SPCR3.0)** was used to carry out PCR technique computationally (Cao et al., 2005) In Silico gel simulation (Simgel) was done computationally. Sequences of coding SSRs for coriander were grouped in a single text to carry out the annotation analysis. SSR sequences were compared against SwissProt database and sequences with significant matches

**Wet Lab validation of primers**

300 hundred primers were subjected to wet lab validations which were showing amplification in coriander samples.
CASE STUDY/EVENTS/MEETINGS/ FIELD DAYS/ KISAN MELA

Seed Spices Kisan Mela & Sangosthi at ICAR-NRCS, Tabiji, Ajmer

Two days “Seed Spices Kisan Mela & Sangosthi” was organised at ICAR-NRCS, Tabiji, Ajmer in the presence of distinguished dignitaries on 8th & 9th February, 2019. The program was inaugurated by Shri Suresh Rawat, Member Legislative Assembly, Pushkar, Ajmer, the chief guest of this function and Dr. P.L. Saroj, Director, CIAH, Bikaner, Dr. S.K. Singh, Director, ATARI, Jodhpur, Shri Ajai Vikram Singh, Former Defence Secretary, GOI, Dr. C.B. Gena, former Vice-chancellor, MGS University Bikaner, Dr. A.K. Tomar, Director, CSWRI, Avikanagar, Shri V.K. Sharma, Deputy Director Agriculture, Ajmer & Dr. D.S. Bhati, Incharge KVK were present as guest of honour. Dr. Gopal Lal, Director, ICAR-NRCS, Ajmer welcomed all the dignitaries on the dais, scientists, officials from various line departments and more than 1500 farmers that gathered for the events from the various parts of the state of Rajasthan, Gujarat and MP and UP. At Mela ground 40 stalls were exhibited their products, technologies with live samples including CAZRI, Jodhpur, CIAH Bikaner, CSWRI, Avikanagar, NRCC, Bikaner and SAUs like MPUAT, SKNUA, NGOs and private vendors from Rajasthan.
There was two hrs farmer-scientist interaction in which farmers were encouraged to ask their agricultural problems to experts. Director, NRCSS in his speech appraised the august gathering about the various activities of the centre involving development & release of varieties, technologies, post harvest management of seed spices and other related activities. He also mentioned that Rajasthan and Gujarat are together producing 80% of seed spices of the country (18.5 lakh tons) with the cropping area of about 18 lakh hectares and also that the increase in production has gone up by 2.5 times within the last two years. He also mentioned about the climatic vagaries and ways to mitigate them. The various technologies developed w.r.t. INM, IPM were also mentioned by him. The seed spices processing, use of nano technology, patents and commercialization activities were also presented before the audience. As a mile stone achievements the spread of seed spices to the farthest north-eastern area were also mentioned here.

Dr. Bhati disclosed the various achievements of the KVK, Ajmer w.r.t. animal husbandry, vermi-composting, mushroom and azola production as well as poultry etc. Dr. Tomer highlighted the importance of agriculture with integration of animal husbandry, poultry and sheep rearing. Dr. S.K. Singh provided means and measures to mitigate the climate change effect. Dr. Saroj in his speech put forth the importance and economic benefits of growing date plam, aonla, ber, kinnow etc. in the arid and semi arid regions. Shri Suresh Rawat applauded the work being done by the centre for the economic upliftment of the farmers and doubling their income. During the programmes various publications produced by the centre viz. Annual Report 2017-18, Masala Surbhi hindi magazine, folders and other publication were released for the benefit of the users. The programme was coordinated by Dr. S.N. Saxena, Principal Scientist and his team which ended with vote of thanks to all.

Report on celebration of National Productivity Week (12-18 February 2019) at ICAR-NRCSS, Ajmer (Raj.)

National productivity week was organized at ICAR-NRCSS, Ajmer during 12-18 February 2019. The theme of year 2019 was circular economy for productivity and sustainability. The week was inaugurated on 12th February by Dr. Gopal Lal, Director, NRCSS. Dr. S. N. Saxena PS, NRCSS highlighted the significance of productivity week celebration in reference to the theme of year 2019. The current model of production and management of resources, goods and services that seeks to promote short-term consumption is leading the planet to an unsustainable situtation. The nowadays economic system is the opposite of the life cycle of nature and collides with
sustainable development. In agricultural perspective the theme is very well imply in reference to organic agriculture. Director NRCS, Dr. Gopal Lal in his speech emphasized to propogate the potential of organic agriculture for sustainable production and better waste management with efficient recycling of resorces. On this occasion Director, NRCS also constitute Productivity Improvement Committee of NRCS comprised of Dr. S. N. Saxena (Chairman), Dr. Y. K. Sharma, Dr. O. P. Aishwath, Dr. Ravindra Singh and Dr. Krishna kant as members. It was decided to make visit of nearby villages adoped in MGMG programme during different days of the week.

Four team of scientist visited different villages and had meeting with progressive farmers and convience them to adopt organic agriculture and recycling the available resouces.

A team visited the villages Makreda and Dumada and also interacted to the Tabiji farmers for the production of organic seed spices on 15.02.2019. We have also hold the meeting cum trainings for organic cultivation and processing of their produces. Traing were also imparted on how to increase productivity by using existing resources, cleaning for weed free farm. How to use farm waste recycling through various composting methods for bring the sustainability.

Some of the photographs showing circular economy by waste utilization at farm and organic cultivation.
Another team comprised Dr. S.N. Saxena, Dr. S.S. Meena, Dr. N.K. Meena and Mr. Ravi, Y. visited the Dang Village of Saradhana Panchayat on dated 13.02.2019. On this visit team interacted with farmers Sh. Harkaran Paroda, Sh. Ram Sodan, Sh. Jayram and their family members and discussed the various agricultural activities going on in Rabi season crop including plant protection measures. Interaction was also made with farmers along with their family on integrated farming system. All farmers having good land with minimum irrigation water facilities and having 4-6 buffalo, 1-2 cows and 3-4 goats, hence it was suggested to create compost pit as well as vermicompost pit at their farm yard or nearby by farm yard. They were also suggested to install orchard of ber and aonla for better integration of resources.

One more team made a visit on 16th February, 2019 at Atal Sewa Kendra, of village Kalesara, Ajmer and discussed with them how the agricultural productivity can be enhanced through new and advanced technologies and recycling of nutrients. The team also visited the agriculture farm of a progressive farmer Mr Brijesh Soni and discussed with him to rectify the lacuna in technologies adopted by him or to install the effective advanced technologies available for high productivity. The people of village were encouraged to use bio-pesticides. Farmers were suggested to use as per need based application pesticides at correct time with optimum dose. They were advised to recycle water and nutrients by using water saving irrigation systems.

A team of scientists visited Mangaliyawas village and interacted with Mr. Sukhpal regarding cropping system and other farm related activities taken up by him from last 3 years. Mr. Sukhpal is growing cumin (GC-4), medicago, wheat, barley in this season. In addition, he grows cotton and vegetables. He used to burn straw after harvesting. Scientists advised him not to burn straw as it can be used to prepare compost with farm yard manure, so that nutrient cycling can be maintained at farm. Composting procedure can be fastening with the addition of urea. In addition to that scientist explained him that how to increase productivity of crops by judicious application of fertilizers, drip irrigation, adoption of high yielding varieties.

On concluding day of productivity week the institute organized one day training programme on Organic production technology of seed spices for a group of 50 farmers. Dr. Gopal Lal, Director NRCSS delivered one hr talk to farmers about
organic production technology of seed spices.

Dr. S.N. Saxena, Chairman, Productivity improvement committee of NRCSS conveyed thanks to all scientists and staff of NRCSS and farmers for their active participation and showing their willingness to follow circular economy rather than linear economy.

Field day and interaction/ discussion with farmers under MGMG Activity

MGMG activities of 4th team were held on February 16, 2019 at Village Kalesara, Peesangan, Ajmer. The team comprised of Dr Ravindra Singh, Dr. R.S. Meena, Dr. Shiv Lal, Dr. R. D. Meena and Sh. S.R. Meena. A meeting was held at Kalesara by the Sarpanch Smt. Vimla Choudhary for discussion of technological interventions for improving productivity of rabi crops in the area. Some of the common problems noticed were crops diseases & pest such as \(\text{Alternaria}\) blight, black aphid, animal immunization, child health, sanitation, lack of awareness, village sanitation, creating employment, arranging light facilities & drinking water, Irrigation, hard water, lack of awareness among villagers for better life. We conducted different activities (3) with villagers including women, village leaders (Patels), gram panchayat officials and others. Total 40 farmers including farm women's were benefited in the programme.

Activities

1. Promoted farmers for organic farming
2. People were urged to use bio-pesticides such as \textit{Trichoderma}, \textit{Paecilomyces}, Neem product and PSB for organic farming.
3. Farmers were suggested to use as per need based application pesticides at correct time, optimum dose.
4. Farmers were motivated for water saving through micro irrigation systems.

Extension/TOT and HRD/Exhibited Stall

Students Training Programme

A one week student training programme on “Present status and future prospects of seed spices research and development in India” for students from Banaras Hindu University, Varanasi, Uttar Pradesh was organized for B.Sc. (Agri.) final year’s students. This training was like skill development course where students were imparted with hands on training on various aspects related to seed spice cultivation and lab techniques were also learnt by the
students. Course coordinators prepared a training bulletin containing information useful to agri. graduates and provided to the students.

**Farmers Training Programme**

A five days farmer’s training was organized for the seed spice growers of Rajasamand (Rajasthan) where participants were trained on different scientific technologies of seed spice cultivation for better harvest as farmer’s field.

**A Model Training Course (MTC)**

A Model Training Course (MTC) for government officers from Madhya Pradesh was conducted at NRCSS for ten days. Horticulture officers of Government of Madhya Pradesh were imparted training on “Madhya Pradesh Rajya me masalon ki pronatutpadan takniki tatha sasyotrekiyaye”. A training bulletin containing all the latest information on seed spices technologies was supplied to the officers for their reference.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Training Date</th>
<th>Coordinators name</th>
<th>Sponsored by</th>
<th>No. of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27 Dec. to 2 Jan., 2019</td>
<td>Dr. Gopal Lal, Dr. M.D. Meena, Dr. A.K. Verma</td>
<td>BHU, Varanasi (UP)</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>7-11 Jan. 2019</td>
<td>Dr. B. K. Mishra, Dr. Shiv Lal</td>
<td>ATMA, Rajsamand</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>21-30 Jan., 2019</td>
<td>Dr. S. S. Meena, Dr. P. N. Dubey, Dr. M.D. Meena</td>
<td>Dept. of Hort., Govt. of Madhya Pradesh</td>
<td>20</td>
</tr>
</tbody>
</table>

**Table: Details of trainings conducted during Jan-Feb., 2019**

ICAR- NRCSS participation in 14th Agricultural Science Congress at NASC New Delhi

To exhibit the technologies developed by this centre, a stall in 14th Agriculture Science Congress held at National Agricultural Science Complex, Pusa New Delhi during 20-23 Feb.,
2019. Dr. M.D. Meena, Dr. S.S. Meena and Dr. Shiv Lal represented NRCSS at this congress. Many dignitaries including DG-ICAR along with Prof. Panjab Singh, President, NAAS visited the stall. Many other participants of the congress show the interest in the technologies developed by this centre.

**Swachhta Abhiyan**

Under the ambit of “Swachh Bharat Abhiyan” cleanliness program is continuously being organised on Friday of every week. Cleaning work in and around the office premises is being carried out. The following works were carried out which involves eradication of weeds, plastic and other unwanted material.

**MEETINGS/TRAININGS/ SEMINARS /SYMPOSIA/ LECTURES/ CONFERENCES/ TV/ Radio Talk**

- **Dr. Gopal Lal, Director, ICAR-NRCSS, Ajmer**
  2. Attended floriculture conference during 11-12 Jan., 2019 at MPAUT Udaipur (Rajasthan).
7. Attended XXV meeting of ICAR Regional Committee No. VI comprising the State of Rajasthan, Gujarat, UT of Dadra & Nagar Haveli & Daman & Die during 4-5 February, 2019 at Anand Agricultural University, Anand, Gujarat.


➤ Dr. O.P. Aishwath

1. Participated and presented paper in 28th National Conference of SCSI on “Farmer’s friendly soil and water conservation technology for mitigating climate change impact” held on 31.01.2019 to 02.02.2019 at Udhagamandalam, Tamil Nadu.

2. Honoured by the society through the Chief Guest of the function Honourable Governor of Tamil Nadu by awarding ‘Gold Medal’ to mark the achievement in the field of soil and water conservation.

3. Delivered a oral presentation on ‘Performance of nigella (Nigella sativa) with sodic irrigation water in Toppic Haplutepis’ also fetched ‘Best Paper Presentation Award’ certificate was presented him in the concluding session.

4. Triannual election was held during the conference and Dr. Aishwath elected as a Vice President of soil conservation society of India.

➤ Retirement

Sh. S.P. Maheria, CTO, retired on 31st Jan., 2019 after serving in ICAR-NRCSS, Ajmer for 18 years.

➤ Transfer

Sh. Suresh Kumar, Assistant transferred to ICAR-Hqrs., New Delhi w.e.f. 8th Feb., 2019

➤ Promotions

1. Dr. P.N. Dubey, Pr. Scientist w.e.f. 19th May, 2017
2. Sh. G.K. Tripathi, Technical Officer (TO) w.e.f. 12th Dec., 2017

3. Sh. Ram Balai, Technical Assistant (T-3) w.e.f. 22nd Feb., 2018

4. Sh. Pramod Kumar Agarwal, Assistant (T-3) w.e.f. 4th Nov., 2016

➢ **TV/Radio Talk**
Dr. Ravindra Singh, Pr. Scientist attended DD Kisan Live programme "बीजीय मसालों की देखभाल " which was telecasted under "HELLO KISAN", Doordarashan Kisan, on 27th February, 2019 at 06:00 P.M. to 07:00 P.M.

➢ **Sports**
ICAR-Interzonal Tournaments held at IVRI-Bareilly during 25 Feb. to 28 Feb., 2019. Sh. Pradeep Kumar won the following medals in different events.

1. Won Gold Medal in Men’s 200 m race
2. Won Silver Medal in Men’s 100 m race

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