SEED SPICES
E-Newsletter
National Research Centre on Seed Spices

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Record of a new alternate host of *Thrips* spp.

Thrips is a major pest of many seed spices crops in Rajasthan and Gujarat. The major thrips species associated with seed spices are *Thrips tabaci, Frankliniella schultzei, Aeolothrips collaris, Haplothrips spp., Caliothrips indicus, Scirtothrips dorsalis, Diarthothrips nimbus and ,Scirtothrips oligochaetus.* In cumin crop it causes severe damage at early vegetative stages. Leaves damaged by thrips feeding turns to yellow/brown and finally die. At severe infestation of thrips over long period, plant turn to week and yield fewer seeds. It is also pests of fenugreek, fennel, dill and coriander.

Thrips having rasping type of mouth parts and both immature and adults suck the sap of plant. Feeding injury appears as coarse stippling on the leaf surface. Large populations of thrips cause serious plant injury, which results in a silvery or scratchy appearance on leaf surfaces. Scratched area induced bleeding of cell sap which used by insect as ready available food. On later stage scratched area turn radish brown and look like uneven dry patch on leave surface. Dry patch surface prevent photosynthesis of plant to produce food and retard normal plant growth. ***Cenchrus ciliaris*** commonly known as anjan grass or buffelgrass found abundantly in Rajasthan on bund of agricultural field. It is also used to check soil erosion in semi arid areas. On survey to seed spice growing areas, *C. cilaris* found an alternative host of thrips spp. during off season of seed spice crops. Thrips survive on this grass in absence of seed spice crops and shift on seed spice crops like cumin and fennel on early vegetative stages and when crop mature it leave again to weedy bund of buffle grass and survive on it till next preferable crop come in existence.

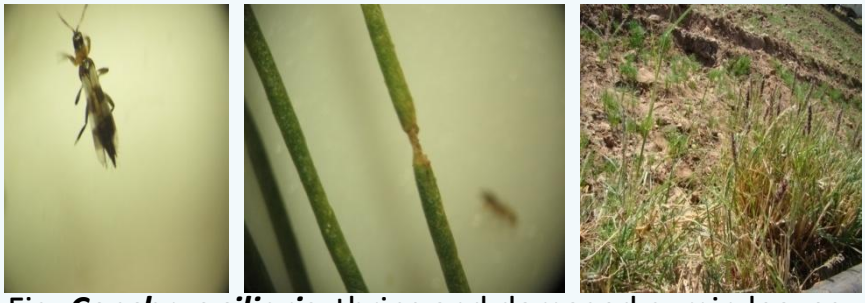


Fig: ***Cenchrus ciliaris,*** thrips and damaged cumin leaves

Krishna Kant and Siya Ram Meena

RESEARCH HIGHLIGHTS

Record of root knot nematode infestation in cumin crop

Root knot nematode (*Meloidogyne* spp.) is a serious pest of many agricultural crops. These nematodes are reported on more than 2000 crop plant as important host and are responsible for approximately 50% of the overall nematode damage. After infestation of root knot nematodes root of plant induce major morphological and physiological changes and formation of gall which hamper normal root activities vital for plant growth and reproduction. Seed spice crop are reported to attack by different nematode during crop growth of plant in the soil.

On survey of insect pest of seed spices, root knot nematode population on cumin root was observed in cumin crop in village of Pabuthan of Ajmer district. Cumin crop was observed suffering from root knot nematodes, and secondary root plant showed gall formation. The affected plants all around the field showed wilted symptom and leaves turned dry and straw colour.



Fig: Cumin root showed gall formation by root knot nematode

Krishna Kant, Siya Ram Meena & Y K Sharma

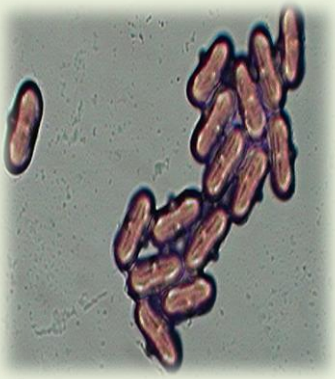
NRCSS, Tabiji, Ajmer- 305206 (Rajasthan)

RESEARCH HIGHLIGHTS

Concept of inducing male sterility through chemical hybridizing agents

In coriander, a technology of induction of male sterility in coriander has been standardize using two chemicals i.e., 2,4-D (50ppm) and MH(150 OR 200ppm). These chemicals induced sterility up to or more than 64%. Coriander is a cross pollinated crop and most of the varieties are bred either by mass selection or recurrent selection. Very few artificial crossing attempts have been made because of small and delicate flower. Hence to strengthen the crop improvement strategies by taking advantage of recombination breeding there is a need of an alternative to cumbersome emasculation. The present study of inducing male sterility was done on variety ACr-1 to find out the effect of different chemical hybridizing agents (CHAs) on induction of pollen sterility. Twenty different treatment combinations applied as spray at flower primodia initiation stage @ 25 ml per plant. Pollen sterility and ovular sterility, phytotoxic effect of different CHAs and effect on pollinators were recorded along with other agro-morphological traits. Significant difference was observed w.r.t. other ancillary data. No adverse effect on number of pollinator visit was recorded after application of this treatment. In the present study a locally available machine (plate 1) has been modified in to a instrument for pollen collection from field (battery operated) with power source from 9V dry battery. All the pollen collected from this instrument was fertile when tested with aceto-carmine solution.

J K Ranjan, S S Rathore, R K Kakani, MK Vishal, K. Kant



Fertile pollen



Sterile pollen



Battery operated Pollen collector

RESEARCH HIGHLIGHTS

Assessing N requirement through leaf angle: A technology for precise N management in coriander: (Leaf angle a bio-indicator in Ajmer Cor-1(dual type cultivar)

Experiment conducted at NRCSS revealed that leaf angle of coriander to ground was negatively correlated (r = -1.0) with yield and graded levels of N supplied (0.0, 20, 40, 60, 80 and 100 kg N ha^{-1} and angle varied from 0 to ≈ 35º). Therefore, 'leaf angle' in Ajmer-coriander-1 is a prominent character and indicator for deficiency and sufficiency of N supply, among the entire parameters of root and shoot morphology. While keeping other factor constant (spacing etc), if leaf angle of Ajmer coriander-1 (ACr-1) is ≈ 35º from land surface it does means that N requirement is 70-80 kg ha^{-1} (when soil available N is < 50 kg ha^{-1} and SOC ≈ 0.2%) and if leaves lie down on soil surface/zero angle or <10º means there is no need to apply N and so on. Most appropriate time to use this indicator is at the age of 45-65 days. This is a farmer's friendly technique which does not need any tool or chemicals.

O.P. Aishwath, Ravindra Singh and R.S. Mehta





Human Resource Development

National conference on "Effect of Biotechnological Advancement on Environment" held at Ajmer

A UGC sponsored conference was organized by the PG Department of Zoology and Biotechnology, Dayanand Collage, Ajmer on 22-23 November, 2013. Dr O.P. Aishwath was invited as a 'Chief Guest' in this national conference. He also Chaired the session and was Lead Speaker during session-III on 'Pesticide in Agriculture and Integrated Pest Management & Biotechnology'. Dr O.P. Aishwath delivered his speech on 'Stewardship in Use of Pesticides for Mitigating Adverse Impact on Agricultural Ecosystem and Environment' during the session. The best papers/posters were selected for awards and was presented by the chief guest. Dr Aishwath delivered the valedictory speech and addressed the gathering of eminent scientists, academicians, students, policy makers and delegates participated across the country including press and media. During his valedictory speech, he highlighted the role of biotechnology for improvement in environment. Still there is a lot of scope in India to harvest the benefits of horizontal biotechnology than to go for vertical, in concern to agro biodiversity. He also emphasized that researcher should have great concern on the dire consequences of any technology developed, rather to highlight and harvest merely the benefits, so as to maintain the quality of environment.



Human Resource Development

10th National Symposium of Indian Society of Coastal Agricultural Research held at Bharuch, Gujarat

National Symposium on 'Managing Natural Resources for enhancing Agricultural & allied Productivity in Coastal Region under Changing Climate' was held on 11-14 December, 2013 at CSSRI Regional Station, Bharuch, Gujarat. Dr. O.P. Aishwath, participated and presented the paper in the symposium. The convention was slated with registration and then inaugural on 11.12.2013. There were various sessions since first day i.e. Advances in soil, water and crop management in coastal region, Salinity and water quality challenges, Technologies for climate resilient agriculture and aquaculture, Horticulture and plantation crops in coastal region, Emerging ecological threats and mitigation measures and coastal forestry management. There was a poster session on 12.12.2013 afternoon and Dr Aishwath, had presented his paper on 'Seed germination study of fennel cultivars with extended exposure to hyper saline conditions'. The NGOs and private organization interacted on seed spices presentation in context to their adaptability with salinity and they discussed the plan to include some of the seed spices in their programme with our collaboration. Dr Aishwath also attended the annual general body meeting of ISCAR held during the symposium.



Human Resource Development

Dr. B.K. Mishra successfully completed the three months foreign training on Biosecurity

Dr. B.K. Mishra, Sr. Scientist (Microbiology), visited Cornell University, Ithaca, NY, USA to attended a World Bank funded training program under NAIP component-I of ICAR. He got opportunity to work under supervision of Prof. K.V. Raman, Associate Director, Special Programs, College of Agriculture & Life Sciences, Cornell University, Ithaca USA. He got trained on various aspects of Bio-security (Horticulture).Bio-security is a strategic and integrated approach that encompasses the policy and regulatory frameworks (including instruments and activities) for analysing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment. It covers food safety, zoonoses, the introduction of animal and plant diseases and pests, the introduction and release of living modified organisms (LMOs) and their products (e.g. GMOs), and the introduction and management of invasive alien species. In doing so, biosecurity is an essential element of sustainable agricultural development. Interaction meeting with Dr. Hossien El-Nashaar, Consultant at the USDA – Animal Plant Health Inspection Service -Plant Protection and Quarantine, Centre for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory, Raleigh, North Carolina. He got hands on training on "MANAGEMENT OF *SALMONELLA* AND *ESCHERICHIA COLI* STRAINS ON ALFALFA SEEDS", Environmental risk analysis (ERA) and how to minimize Pathogen Contamination during Production and Harvest of Fresh Produce. He also visited Department of Food Science & Technology Farm at Geneva campus of Cornell University, New York State Agricultural research experiment station Geneva, New York. He also attended relevant classes and seminar lectures related to his area of specialization a







Human Resource Development

Conference/symposia/seminars attended

Dr. Balraj Singh, Director, attended an International training on leadership at Harvard Business School, Harvard University, Boston, USA from 16-23 November, 2013.

Dr. Sharda Choudhary, Scientist attended Indraprastha International Conference on Biotechnology-2013 (IICB-2013), held at Guru Gobind Singh Indraprastha University, New Delhi, India from 22 to 25 October, 2013.

Dr. Sharda Choudhary, Scientist went on 3 months training (15 December to 15 March, 2014) on "Marker Assisted Selection" (MAS). at University of Arkansas, USA.

Dr. G. Lal (Pr. Sci.), Dr. S.S. Meena (Sr. Sci.) and Mr. S. P. Maheria (T-9) attended a National Seminar on Plant Physiology held from 13-16 December, 2013 at Directorate of Groundnut, Junagadh, Gujarat

Dr. Balraj Singh, Director, participated and delivered a lecture on "Protected cultivation" in National Seminar on Hindi held on 15.12.2013 at CIFE Mumbai.

Dr Balraj Singh, Director, attended a one day training on protected cultivation and seed spices cultivation was conducted at CAZRI KVK at Bhuj, Gujarat on 16.12.2013.

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Trainings

1. Two days farmers training under NHM at KVK, Jhunjhun

Two days farmer's training on "Enhancing production, productivity and quality of seed spices in Sekhawati region" was organized on 7-8, November, 2013 at KVK, Jhunjhunu (Rajasthan).Dr. Hanuman Prasad, member, Farmers Commission. Govt of Rajasthan was the chief guest and Dr. Gajanand Yadav, Deputy Director (Agriculture), Jhunjhunu was the special guest and Dr S.R.S. Dange, Ex- Director Research SDAU, Sardarkrushinagar, Gujarat was the guest of honour of the inaugural function of the training programme Dr. R. S. Mehta, Sr. Scientist (Agronomy) Dr. R. S. Meena, Scientist (SS) Plant breeding and Dr. N. K. Meena, Scientist (SS) Entomology were subject matter specialist from NRCSS. Dr. R.S. Meena and Dr. N. K. Meena were co-cordinator of the training. In the training farmers were advised to adopt improved production technology of seed spices and organic seed spice production is the best way to get quality seed spice. Wide spaced seed spices viz. fennel and ajwain are the suitable seed spices which are well suited accommodating cabbage, carrot and khnolkhol as inter crops.



Trainings

2. Two days farmers training programme under NEH at College of Horticulture and Forestry, Pasighat (Arunachal Pradesh)

Two days farmers training on " Promotion of seed Spices production Arunachal Pradesh was organized under NEH on 18-19 November, 2013 at College of Horticulture and Forestry, Pasighat (Arunachal Pradesh) with an object to promote seed spice cultivation in non traditional seed spice growing area of North Eastern Hill region. Dr. A. K. Pandey, Dean, College of Horticulture and Forestry was the chief guest and Dr. G. Lal, Principal Scientist and Coordinator of the training programme presided over the session. He welcomed all the guests on dais, faculty and farmers participant. Dr. G. Lal appraised that it is necessary to diversify existing cropping system with the introduction of seed spices due immense possibility of higher productivity of seed spices in this region compared to traditional seed spice growing area. Dr. Mahesh Pathak, Programme Coordinator of KVK highlighted constraints and strength of seed spice production in NEH region. Dr A. K Pandey, Dean CHF and chief guest in his inaugural speech, he pointed out that the NEH region is having good potential.

Continue...



Trainings

Programme Coordinator of KVK highlighted constraints and strength of seed spice production in NEH region. Dr A. K Pandey, Dean CHF and chief guest in his inaugural speech, he pointed out that the NEH region is having good potential. Looking to very low cost of production, low volume and high value and drought resistant nature of seed spices, there is immense possibility of seed spice production for enhancing income of the farmer with ecological compatibility. At the end of inaugural function. Dr. R.S. Mehta, Sr. Scientist appraised farmers in technical lecture that there are immense possibilities of high quality of organic seed spice production in Arunachal and long duration seed spices viz. fennel, ajwain and dill are well suited for introduction of short duration vegetable crops in between rows of these crops. Dr. R.S. Meena, Scientist, Plant Breeding appraised about improved varieties of seed spices. Dr. N. K. Meena, Entomologist pointed out the pest problems in seed spices should be managed by integrated approaches to escape from pest damage. In valedictory function, Dr. S. D. Warade was the chief guest and Dr. Mahesh Pathak, was the guest of honour and Dr. G. Lal was the president of the function. Certificates of training participation, book on High Tech Seed Spice Production and demonstrations on coriander; fenugreek, ajwain and nigella were given to the farmers. Dr. M. M. Kumawat, Assist. Professor (Entomology) and Dr. Toge Riba, SMS (Plant Protection) from College of Horticulture and Forestry,Pasighat were Local Coordinator of the training programme.



Trainings

3. Two days farmers training programme under NEH at Regional Station CPCRI, Kahikuch, Guwahati (Assam)

National Research Centre on Seed Spices, Ajmer (Rajasthan) organized two days farmer's training on "Promotion of seed spice production in Assam at Central Plantation Crop Research Institute, Kahikuchi (Assam) on 21-22 November, 2013. In the inaugural function, Dr. N. K. Mohan, Ex. Chief Scientist, Horticultural Research Station, Assam Agricultural University was the chief guest and Dr. G. Lal, Principal Scientist over inaugural session of the training. Dr. G. C. Acharya, Head, Regional station, CPCRI , Kahikuchi, Assam was the guest of honour of the programme. Dr R. S. Mehta , Sr. Scientist and coordinator of the training programme welcomed all the guests on dais, faculty and farmers participant. Dr. G. Lal highlighted that looking to very low cost of production, low volume and high value and drought resistant nature of seed spices, there is immense possibility of seed spice production for enhancing income of the farmer with ecological compatibility. Dr. N. K. Mohan, chief guest in his inaugural speech, pointed out that seed spices are having very good medicinal value and some seed spices like coriander may be grown on conserved moisture under rain fed farming. Dr. R. S. Mehta, Sr. Scientist appraised farmers in technical lecture that there are immense possibilities of high quality of organic seed spice production in Assam. Dr. R.S. Meena, Scientist, Plant Breeding appraised about improved varieties of seed spices. Dr. N. K. Meena, Entomologist pointed out the pest problems in seed spices should be managed by integrated approaches to escape from pest damage. In valedictory function, Dr. D. N.Kolita Programme Coordinator KVK, Kamrup, Assam Agricultural University was the chief guest and Dr. G. C. Acharya, was the guest of honor and Dr. G. Lal was the president of the function. Certificates of training participation and book on High-Tech Seed Spice Production were given to farmers besides these demonstrations on coriander, fenugreek, ajwain and nigella and plastic crates for safe handling of seed spices were given to farmers. Dr. N. K. Meena, Co-coordinator of the training programming acted as announcer in both inaugural as well as valedictory function.





From the Director's Desk



The flavour and aroma of Indian seed spices are known world over, the demand of seed spices is also increasing day by day. The export of cumin has increased three fold in the present year. The increasing world demand is also pressurizing us to produce more and more seed spices with the best marketable quality. This growing demand is going to increase the income of Indian farmers, but to catch the potential international market its important to cultivate the crops following good agricultural practices to ensure the produce as safe and healthy for human consumption. The present climatic conditions are very much favorable for the crop initial development. The temperature has gone done with the snow fall occurred in the Himalayas. The season seems to be very favorable for seed spices production, looking to the status of rainfall in the monsoon season and pre-rabi showers in the western arid and semi arid zone the farmers having water as limited resource have also sown crops like cumin and coriander. Besides doing research on improvement production practices its necessary to make farmers aware about the adoption of improved technologies. Hence to meet the objective NRCSS is organizing the West Zone Regional level Kisan mela in the month of February-2014 , farmers from states of Rajasthan Gujarat, Madhya Pradesh, Maharashtra, Daman & Diu and Goa are likely to participate. I wish NRCSS will put its best effort to develop more and more of improved technologies for seed spice growth and development and will make it available to seed spice growers.

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