



NRCL

newsletter

(An ISO 9001:2015 Certified Institute)

From the Director's Desk

Increasing Farm output in tune with Doubling Farmers' Income (DFI) by 2022 has been a challenge for agriculturists in the country. The farmers' income can be enhanced and doubled or even increased many fold by reducing the production cost, improving the productivity, minimizing the postharvest losses, and realizing the better price for the produce. Besides, integration of various farm activities and utilization of the available natural resources for the production system in such a manner where minimum inputs are required to be procured from outside can be a better option.



The integrated approach of production system for small and marginal farmers can play a crucial role for doubling their income. The litchi-based farming system by integrating the components of crops and vegetables, short duration fruit crops, fisheries and aquaculture, dairy and small ruminants and poultry along with litchi in a system mode can be viable options for the farmers. Allied activities like production of vermi compost, apiary and fruit and vegetable processing can further aid to income of the farmers. Creation of employment for whole family round the year can also be ensured along with a healthy environment and ecosystem services.

The efforts of natural farming and zero budget farming by utilization of indigenous technical knowledge and inculcating the values of life in line of the national and international calls like 'Swachh Bharat Abhiyan', 'International Yoga Day', 'Conserving Earth and Environment' can be very well integrated to develop a complete system where each and every activities have synergy with each other.

The Centre has made efforts to develop a model which is attracting various players and making them oriented towards the national goal of 'Pramparagat Krishi' and 'Natural Learning Process'. I am happy to present this issue of our Newsletter containing important events and developments at our Centre. Hope you enjoy reading the issue and offer your valuable feedback for further improvement.

Highlights

- NRCL Microbial consortium for enhanced growth, productivity and quality of litchi
- Thermocol packaging—a packaging solution to maintain freshness and quality of litchi fruits
- NRCL foot prints in Non-traditional areas for enhanced Litchi acreage
- National Dialogue on Improving Productivity and Utilization of Litchi
- Entrepreneurship Development Training Programme on Litchi-Based Beverage Unit
- किसान कल्याण सम्मेलन एवं रबी फसल गोष्ठी का आयोजन
- उत्तर प्रदेश में लीची का विस्तार: एक प्रयास

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(Vishal Nath)
Director



NRCL Technologies

NRCL Microbial Consortium for Enhanced Growth, Productivity and Quality of Litchi

Litchi is an important woody mycorrhizal fruit tree. Besides AMF, the key beneficial microbial resources that can be harnessed for nutrition and plant health include - free living nitrogen fixer, *Azotobacter*; the biocontrol and biofertilizer fungi, *Trichoderma* sp. These are essential for healthy soil and litchi crop productivity. Generally, these microbes promote plant growth directly by either facilitating resource acquisition (nitrogen, phosphorus and essential minerals) or modulating plant hormone levels, or indirectly by decreasing the inhibitory effects of various pathogens on plant growth and development in the forms of biocontrol agents.

NRCL Microbial consortium

'NRCL Microbial Consortium' is a carrier-based formulation of three microbes, Arbuscular mycorrhiza (AM), *Azotobacter chroococcum* (AZ) and *Trichoderma viride* isolate NRCLT-01 (TR). AM contains two species viz., *Glomus mosseae* and *G. fasciculatum*, produced as colonized root bit of finger millet (*Eleusine coracana*) and soil mix having 25-30 spores g⁻¹ of inoculant. The minimum colony forming unit (cfu) per gram formulation of AZ and TR is 1×10⁶.



Arbuscular Mycorrhizal spore, colony of *Azotobacter* and conidiophores and conidia of *Trichoderma* (left to right)

Method of application

Adult bearing trees: Apply AM @250 g/tree, *Azotobacter* @100 g/tree and *Trichoderma* @100 g/tree, mixed in 5 kg FYM or vermicompost per tree. Application is done in August (after end of rainy season) and February (at onset of flowering)

Raising quality planting material in nursery: Add one pack of consortium - AM (1 kg) + *Azotobacter* (500 g) + *Trichoderma* (500 g) to 100 kg potting mixture, and dispense about 1 kg of this in each filling bag covering top 6 cm, at the time of planting gooties/air-layers.

Cost of application

One time application of consortium costs Rs. 36-40/ adult tree and about Rs. 1.80 to 2.00/ plant in nursery. A 2-kg pack of consortium costs about Rs. 160-180. Currently, trial pack is available for farmers at ICAR-NRCL Muzaffarpur. For large scale applications, AM and *Azotobacter* can be obtained from ICAR-IIHR, Bangalore or any other research institutions, and *Trichoderma* from ICAR-NRCL, Muzaffarpur.

Benefits of application

Application of this consortium in litchi is very effective in maintaining soil and plant health. It enhances growth, plant resistance against attack of pathogens, increase yield and percentage of quality fruits. Litchi farmers at large and nursery man will be benefitted by adoption of this technology. It will also protect the health of consumers.

Thermocol Packaging – A packaging Solution to Maintain Freshness and Quality of Litchi Fruits

Maintaining freshness or harvest quality of litchi fruits particularly during long distant transportation is one of the biggest challenges in the litchi supply chain. Consumers want produce to be fresh, typified by the quality at harvest. However, fresh handling and marketing of litchi is severely impaired by pericarp browning, a phenomenon whereby detached fruit rapidly turns from red to dark brown. Quick moisture loss from fruit is the most important reason for pericarp browning, and important factors that aggravate pericarp browning include high temperature, low humidity, atmospheric composition, surface air movement etc. In addition, internal fruit physiological conditions such as very high respiratory metabolism and high susceptibility to water/

transpiration loss also predispose the fruit to quick deterioration. World-over litchi fruit is either packed as individual fruits (detached from pedicel) or as whole fruit bunches. Packing detached fruits into bags or boxes, or bamboo baskets are more common and popular in Asian countries, while in India litchi is packed as whole bunches. Such packing generally results in 25-50% post harvest losses. Under such conditions packaging plays an important role in protecting the fresh produce and delaying the process of deterioration. Packaging makes this possible by creating conditions that reduce internal fruit metabolism. Efforts to develop packaging regime for litchi must therefore ensure reduction in quick loss of moisture and respiratory



metabolism. Considering these Thermocol packaging was tried, and it has been found effective in maintaining the fruit quality and freshness up to 5-7 days. Thermocol boxes are utilized for insulation of content from temperature abuse on the outside. Pre-cooled litchi fruits in perforated bags are kept inside the thermocol box and the temperature inside the box is also brought down by introduction of ice-packs and such lower temperature can be maintained over extended

period of time due to the temperature insulation provided by thermocol covering. Although this technique is comparatively costlier than other packaging material, it offers feasibility for transport of litchi fruits to distant markets. Packaging of litchi in foam plastic box with ice inside is commercially used in China on large scale which can maintain freshness of litchi by 7-10 days under ambient conditions.



Thermocol packaging of litchi fruits



Litchi fruit packed in thermocol displaying fresh like appearance after 5 days

Success Stories

NRCL foot prints in Non-traditional areas for enhanced Litchi acreage

The ICAR-NRCL is constantly making efforts to expand the area under litchi cultivation in the potential areas across the length and breadth of the country. The centre has made rigorous efforts to generate awareness among the farmers of Uttar Pradesh, Karnataka, Kerala, Himachal Pradesh and Chhattisgarh. Efforts have also been made to have one-to-one meeting with Vice chancellors of NDUAT, Faizabad and CSUAT, Kanpur and Head of Research Stations, Ambayal (KAU), Kerala to sensitize about the NRCL Technologies.

As a result, the farmers from Kodugu district of Karnataka (Sh. Achal Achaiyya) and Lakhimpur Khiri district U.P. (Sh. Santosh Kumar, Suresh Verma, and Vikram Bhalla from Midhasan, Ramia Behar and Lejan block) and Dr. Rajendran, Assistant Director Research (KAU) visited the Centre and obtained training on various aspects of litchi crop management, including canopy architecture management, plant health management, bearing management, high density planting and organic farming. The visitors have also taken quality planting material in bulk for starting litchi cultivation in their respective areas.



Karnataka farmers being trained on NRCL Technologies



News Feature

Proliferating Litchi in Kerala

Mr. Ahmad Kutty is a progressive farmer of Wayanad (Kerala). He adopted the NRCL Girdling technology last year and performed girdling on 3 year old litchi plants. After obtaining higher fruit-set from girdled plants in previous year; in the current year he girdled more than 100 plants. All the girdled branches gave flowering and fruiting in 4th year also. This technology is also helpful in maintaining plant canopy. By conventional method the sporadic flowering and fruiting starts after 6-7 years.

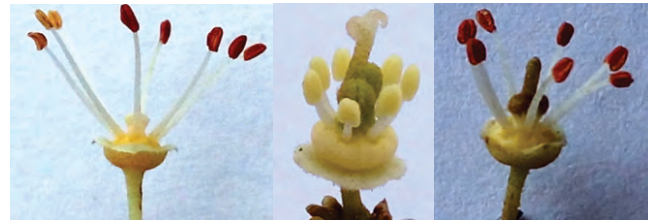


Change in flowering pattern: omission of M1 male flower

Litchi bears determinate panicle either terminally or occasionally axillary, in clusters of 10 to 20 on current season's wood. The number and percentage of different types of flowers in litchi varies with cultivar, environmental conditions, tree and panicle within a tree. The proportion of functional female flowers varies between 10 and 60 per cent depending on tree age. Each panicle produces several small, white, greenish or yellowish flowers in three stages in succession. Generally, litchi follows a highly conserved pattern of flower opening; first male flower followed by hermaphrodite female flower and finally hermaphrodite male flowers.

National Dialogue on Improving Productivity and Utilization of Litchi

A programme on "National Dialogue on Improving Productivity and Utilization of Litchi" was organized at ICAR-National Research Centre on Litchi in collaboration with ICAR-All India Coordinated Research Project (Fruits) from 30th November - 1st December, 2018. The objective of the program is to address the issues and production problems with regard to improving litchi productivity, faced by farmers and litchi growers in major litchi belts of the country.



Three types of flower: a-Male Flower (M1), b- Female Flower (F), c-Male Flower (M2)

During the flowering period of the year 2018, it was observed that flowering pattern in some litchi genotypes including NRCL-20 and NRCL-83 deviated from the normal trend in which the first stage of flowering (Male flower) was omitted and flowering started directly with the opening of hermaphrodite female flower or second stage flower followed by hermaphrodite male flowers.



Opening of female flowers without M1 phase of flower

This might be due to variation in canopy temperature, where lower temperature within the plant canopy compared to open environment, altered the hormonal balance in favour of gibberellic acid which triggered production of hermaphrodite female flower instead of male flowers. This nature of opening of flowers does not ensure fruiting because of lack of pollen at the time of opening of hermaphrodite female flower. The stigma of flowers does not receive any pollen grain to effect fertilization, which after two days, stigma becomes dry, brown and finally black.

The programme was facilitated by Dr. A.K. Singh, DDG (HS), ICAR, in presence of ADG (HS-I) ICAR, Dr. W.S. Dhillon, Dr. Gopalji Trivedi, Ex-Vice Chancellor, DRPCA, Samastipur, Pusa, Dr. Prakash Patil, PC (AICRP - Fruits), Dr. Vishal Nath, Director, ICAR-NRCL, experts on litchi, scientists of AICRP (F) working on litchi at Chettalli (Karnataka), Himachal Pradesh, Mohanpur (West Bengal), Medziphema (Nagaland), Gangian (Punjab), Pantnagar (Uttarakhand), Ranchi (Jharkhand), Sabour (Bihar) and Muzaffarpur (Bihar), and development partners of State Government, progressive litchi growers and stakeholders.



लीची में प्रयोग के लिए 'एनआरसीएल माइक्रोबियल कंसोर्टियम' का विमोचन

वृद्धि, उत्पादकता एवं क्वालिटी फलों के उत्पादन के लिए नई तकनीकी 'एनआरसीएल माइक्रोबियल कंसोर्टियम' का विमोचन दिनांक 30 नवम्बर 2108 को आयोजित "लीची उत्पादकता एवं उपयोग बढ़ोत्तरी हेतु राष्ट्रीय संवाद" कार्यक्रम में किया गया। यह 'माइक्रोबियल कंसोर्टियम' तीन सूक्ष्मजीवों नामतः, अर्बस्कुलर माइक्रोराइजा, एजोटोबैक्टर क्रोकोक्कम और ट्राइकोडर्मा विरिडे (स्ट्रेन एनआरसीएल टी-01) के आनुपातिक मिश्रण से बना कैरियर आधारित फार्मूलाशन है। लीची में इस कंसोर्टियम का अनुप्रयोग मिट्टी और पौधों के स्वास्थ्य को बनाए रखने में बहुत प्रभावी है। यह विकास को बढ़ाता है, रोगजनकों के हमले के खिलाफ पौधे की प्रतिरोधकता एवं उपज में वृद्धि के साथ-साथ गुणवत्तायुक्त फलों का प्रतिशतता बढ़ाता है। इस तकनीक को अपनाने से बड़े फलदार वृक्षों वाले लीची बागवान के साथ-साथ नर्सरी तैयार करने वाले लोग भी लाभान्वित होंगे। यह उपभोक्ताओं के स्वास्थ्य की रक्षा भी करेगा। कंसोर्टियम के एक बार प्रयोग की लागत 36-40 रुपए/वयस्क वृक्ष और नर्सरी में 1.80-2.00 रुपये/पौधा होती है। कंसोर्टियम के 2-किलो के पैक का मूल्य लगभग 180 रुपए है। वर्तमान में, राष्ट्रीय लीची अनुसंधान केंद्र, मुजफ्फरपुर

Entrepreneurship Development Training Programme on Litchi-Based Beverage Unit

Preservation and processing of litchi into different products can help growers and entrepreneurs overcome glut and distress sale situation, because the processed products have long shelf life that allows for planned and organized distribution according to market demand. Processing and value addition can lead to generation of employment and addresses to achieve the Govt of India's aim to double farmers' income by 2022. Litchi can be processed into various value-added products and offers huge potential for entrepreneurship in the food processing sector. With a view to promoting entrepreneurship among litchi growers and stakeholders, an 'Entrepreneurship Development Training Programme on Litchi-Based Beverage Unit' was conducted at the centre from 17-22nd December 2018. The training programme was conducted by Dr. S.K. Purbey as Course Director, and Dr. Vinod Kumar and Dr. Alemwati Pongener as Course Coordinators. The following entrepreneurs attended the training that included all modules related to technical knowhow, licensing, hands-on practicals, and establishment of litchi-based beverage unit and now engaged in business:

में किसानों के लिए ट्रायल पैक के रूप में यह उपलब्ध है। बड़े पैमाने पर तत्काल अनुप्रयोगों के लिए किसान अर्बस्कुलर माइक्रोराइजा और एजोटोबैक्टर भारतीय बागवानी अनुसंधान संस्थान, बैंगलोर या किसी अन्य शोध संस्थानों से, एवं ट्राइकोडर्मा राष्ट्रीय लीची अनुसंधान केंद्र, मुजफ्फरपुर से प्राप्त कर सकते हैं।



मंचासीन माननीय डॉ ए.के. सिंह, उपमहानिदेशक (बागवानी), डॉ गोपालजी त्रिवेदी, पूर्व उपकुलपति, राजेंद्र कृषि विश्वविद्यालय, डॉ वशाखा सिंह दिल्ली, सहायक निदेशक (बागवानी) एवं अन्य 'एनआरसीएल माइक्रोबियल कंसोर्टियम' का विमोचन करते हुये

1. Mr. Ram Sarovar Singh, Ramsarowar Agro Food, Chhitrauli, Kudhani, Mariyani, Muzaffarpur
2. Mr. Pankaj Kumar, Muzaffarpur Agro, Krishanapuri, Kanhauli, Muzaffarpur
3. Mr. Krishna Gopal Singh, Vishvakshenah Agro & Dairy Pvt. Ltd., Ahiyapur, Muzaffarpur
4. Mr. Md. Shoaib, Sadpura, Near Central Public School, Mithanpura, Muzaffarpur.
5. Mr. Hasnain Arij, Satpura, Mithanpura, Muzaffarpur.

"Entrepreneurship Development Training on Litchi-based Beverage Unit" (17-22 December, 2018)



Standing L-R: Rajmani; Md. Shoaib; Dr. Alemwati Pongener; Ram Sarovar Singh; Dr. Vinod Kumar; Dr. Vishal Nath; Hasnain Arij; Dr. S.K. Purbey; Krishna Gopal Singh; Pankaj Kumar



Visit to Farmers' field at Ranchi

The ICAR - NRCL has been playing a key role in developing technologies to enhance litchi productivity which can increase the income of the farmers. On September 15, 2018, the Director along with scientist of the centre, visited the orchard of Mr. Giri, a litchi farmer in Ullihuttu, Thakur Gaon, Bodio, Ranchi. During the field visit, the importance of management aspects of litchi orchard, encompassing young

and adult bearing trees were discussed. The technologies generated by ICAR - NRCL and ICAR - RCER, Ranchi were highlighted and the potential and prospect of canopy architecture management was emphasized. Dr. Kuldeep Srivastava, Principal Scientist, ICAR - NRCL discussed the insect pest infestation at different stages of litchi growth and accordingly suggested strategies for controlling the same.



Farmers Group from Lakhimpur Khiri, UP got updated knowledge of Litchi Production

As expressed by the visiting farmers the centre's technologies have made up impact to convince them for initiating litchi production with up-to-date knowledge. The

centre is quite hopeful that in years to come, these efforts will definitely be a landmark for expansion of litchi in the country. The centre has also ensured to conduct series of trainings and visits of experts to provide hand holding to the upcoming farmers in the non-traditional areas of the country.



Farmers group from Lakhimpur Khiri, UP got updated knowledge of litchi production

Events & Meetings

किसान कल्याण सम्मेलन एवं रबी फसल गोष्ठी का आयोजन

फार्मस फर्स्ट परियोजना के अंतर्गत किसान कल्याण सम्मेलन सह तकनीकी गोष्ठी का आयोजन दिनांक 14.10.2018 को चकिया के गाँधी मैदान में आयोजित किया गया। इस अवसर पर माननीय कृषि एवं किसान कल्याण मंत्री, भारत सरकार, श्री राधा मोहन सिंह, मुख्य अतिथि थे। माननीय पर्यटन मंत्री, बिहार सरकार, श्री प्रमोद कुमार ने कार्यक्रम की अध्यक्षता की तथा श्री श्यामबाबू यादव, माननीय विधायक, पीपरा कोठी, श्री सचीन्द्र प्रसाद सिंह, माननीय विधायक, कल्याणपुर एवं श्री राजेन्द्र गुप्ता, पूर्व विधान परिषद सदस्य, (बिहार) कार्यक्रम में विशिष्ट अतिथि के रूप में भाग लेकर किसानों का सम्बोधित किया। इस अवसर पर परियोजना के अन्तर्गत चयनित ग्राम समूह चिंतामनपुर (लाला टोला), चिंतामनपुर (मलाही टोला) रामगढ़वा खैरयामहुआवा, ओझा टोला (बैयसहा), उझिलपुर, बखरीनाजिर एवं दामोदरपुर के परियोजना से जुड़े 1000 (एक हजार) परिवारों के साथ-साथ भारी संख्या में मक्का उत्पादक, सब्जी उत्पादक, फल उत्पादन, पशुपालन एवं मशरूम उत्पादन

से जुड़ किसानों ने भाग लिया। कार्यक्रम में लीची सहित अनेक फलदार फसलों के उचित रख रखाव एवं प्रबंधन पर डॉ. एस. डी. पाण्डेय एवं अन्य वैज्ञानिकों ने अपने विचार रखे। डॉ. विशाल नाथ, निदेशक, भाकृअनुप-राष्ट्रीय लीची अनुसंधान केन्द्र, मुजफ्फरपुर द्वारा अतिथियों का स्वागत किया गया। अपने उद्बोधन में माननीय कृषि मंत्री ने किसानों को उपलब्ध संसाधनों के अनुरूप समेकित कृषि प्रणाली को अपनाने का आह्वान किया। माननीय मंत्री जी ने उपस्थित किसानसमूह को विज्ञान पर कृषि तकनीकों को अपनाने और उससे अपनी आमदनी को दुगुना करने की सलाह दी। अन्य गणमान्य अतिथियों ने औषि में किये जा रहे वैज्ञानिक संसोधनों को अपनाने के लिए किसानों के प्रशिक्षण एवं ज्ञान कौशल वृद्धि के लिए समय-समय पर किसान गोष्ठियाँ एवं जागरूकता शिवरों के आयोजन पर बल दिया। इस अवसर पर बड़ी संख्या में जन प्रतिनिधि एवं कृषक उत्पादक संगठन (FPO) के सदस्य एवं उपादान विक्रेता भी मौजूद रहे। कार्यक्रम के अंत में मुख्य अतिथि एवं अन्यान्य अतिथियों का धन्यवाद ज्ञापन डॉ. एस.डी. पाण्डेय ने किया।



IIM, Lucknow sees Litchi as Vehicle for Growth of Muzaffarpur

A team of Scientists comprising Shравan Verma and Anupam Gupta from IIM, Lucknow visited the Centre to discuss the various aspects of litchi for economic growth of Muzaffarpur district. Muzaffarpur's economy is mainly derived from agriculture particularly litchi as it is the prime crop of the district. They resonated the centre's view of the vast potential in litchi marketing, trade and value addition which can be a vehicle for future economic growth.

The visitors took keen interest in Centre's activities and exchanged the ideas with the Director and Scientists to improve upon. The team is working with the Department of

Industrial Policy and Promotion, Ministry of Commerce and Industries, Govt. of India.





Method demonstration of Jaivik Kheti under Farmers First Project

A method demonstration on *jaivik kheti* was conducted by Dr. Vinod Kumar, Sr. Scientist (Plant Pathology) under *Farmers First Project* on 27th October 2018 (Saturday) at Chintamanpur village, East Champaran. At the outset, farmers were briefed about *jaivik kheti* and related video films were played for them. During the programme, preparation method and application of *Panchgavya*, *Jeevamrit*, and *Jaivik jeevnashi* (ethnomedicinal plant infusions extracted in *gomutra*) were demonstrated. Ethnomedicinal plants such as neem (*Azadiracta indica*), catnip or catmint (*Nepeta cataria*), karanj (*Pongamia pinnata*), goma or thumba (*Lucas aspera*), aak (*Calotropis procera*), datura (*Datura stramonium*), garlic (*Allium cepa*) etc. were extracted in cow urine was advocated as natural pesticides. Application method of '*NRCL Trichoderma*' and *Azotobacter* in vegetables and fruits (mango, litchi) was also demonstrated during the programme and demo pack of the same was provided to farmers. Dr. Prabhat Kumar, Scientist (Soil Science) also participated in the programme as resource person. During interactive session problems and package of practices for current crops namely, ginger, potato, tomato and other vegetables, mustard, *rabi* pulses and fruit crops, like litchi and mango were discussed with farmers.



Scientists of centre guiding farmers for preparation of *jaivik* products through technical demonstration and video show

Improving Knowledge and Skill of Stakeholders for Increasing Production of Litchi under Tribal Sub Plan

During 2017-18, the centre made commendable inroads into widening its presence in the Tribal areas of Shahdol district in Madhya Pradesh. ICAR-NRCL had provided 8000 plants of litchi cultivars Shahi, China and Kasba to beneficiaries with active collaboration of Krishi Vigyan Kendra, Shahdol, M.P.



NHB-Sponsored Workshop on Sensitization of Schemes for Enhancing Litchi production and Post Harvest Management of Litchi Orchards towards Development of Economic Horticulture

A one day workshop on "Sensitization of NHB schemes for enhancing litchi production and post harvest management of litchi orchards towards development of economic horticulture" sponsored by National Horticultural Board was

organized at NRC on Litchi, Muzaffarpur from 20th July 2018. Several litchi growers, entrepreneurs and stakeholders took part in the training. Information on various schemes which can be taken up by the farmers were discussed in great details to the satisfaction of the audience. Officials from the NHB, Muzaffarpur Zone and Scientist of NRCL answered various range of issues raised by the litchi farmers.



ATMA-Sponsored 3 days Training Programme on Technological Innovations in Litchi Production and PHM for Doubling Farmers Income

A three-day training programme on technological innovations in litchi production and postharvest management sponsored by ATMA was organized at NRC on Litchi on 10-12 September, 2018. A total of 24 farmers from Begusarai district of Bihar were trained on various aspects of good agricultural practices in litchi production, management of pests and diseases, water and fertilizer management and its processing towards export quality production of litchi. Special emphasis was given towards minimizing losses during postharvest stages with the objective of maximizing economic returns. The programme was conducted by Dr. Kuldeep Srivastava, Principal Scientist (Entomology), Dr.

R.K. Patel, Principal Scientist (Hort) and Dr. Alok Kumar Gupta, Scientist (Hort.). During the three day programme scientists and staff interacted with the farmers on diverse range of issues and concerns faced by the litchi growers.



उत्तर प्रदेश में लीची का विस्तार : एक प्रयास

उत्तर प्रदेश के मैदानी एवं तराई क्षेत्रों में लीची उत्पादन की संभावना को तलाशने के लिए वैज्ञानिकों का दल गोंडा जिले के मनकापुर से बाराबंकी (देवा), सीतापुर (महमूदाबाद, ओयल), लखीमपुर खीरी (खंभार खेड़ा, शारदा नगर, निघासन, किसन नगर) पहुंचा। इस सर्वेक्षण में पाया गया की इस क्षेत्र में मूलतः गन्ना की फसल प्रमुखता से पैदा की जा रही है परंतु बाराबंकी के देवा और उससे सटे हुए सीतापुर के महमूदाबाद क्षेत्र में लीची के बगीचे भी मौजूद हैं। किसानों से बातचीत के बाद पता चला की वे गन्ने के विकल्प के रूप में लीची की फसल को देख रहे हैं परंतु उनमें तकनीकी ज्ञान का अभाव है।

लखीमपुर खीरी के निघासन और किसन नगर में लीची के पुराने एवं नए बागों का मिश्रण है लेकिन आधुनिक तकनीकों का ज्ञान नहीं के बराबर है अतः यहाँ 20-21 नवम्बर, 2018 को एक जागरूकता कार्यक्रम आयोजित किया गया

जिसमें 50 से अधिक किसानों ने भाग लिया। किसानों की मुख्य समस्या पौधों का आपस में मिलना, फलों में मिठास पर्याप्त न होना, कीड़ों का प्रकोप आदि रहा जिस पर गोष्ठी में विस्तार से चर्चा की गयी। कुछ किसानों के खेत का भी विशेषज्ञों ने भ्रमण किया और उन्हें क्षेत्रक प्रबंध, काट छांट, कीड़ों के पहचान और नियंत्रण, फलों के परिपक्वता की सही जानकारी दी।

क्षेत्र के किसान लीची को लेकर काफी उत्साहित दिखे और ऐसा निर्णय लिया गया कि कृषि विज्ञान केंद्र, लखीमपुर खीरी के वैज्ञानिकों तथा जिला उद्यान विभाग के अधिकारियों के साथ किसानों का एक दल 2-3 दिनों के प्रशिक्षण के लिए राष्ट्रीय लीची अनुसंधान केंद्र, मुजफ्फरपुर का भ्रमण करेगा।

नए क्षेत्रों में लीची के क्षेत्रफल विस्तार के लिए इस तरह के जागरूकता कार्यक्रमों एवं किसानों से संपर्क का कार्य नियमित रूप से होना चाहिए।





लीची की बागवानी कर क्षेत्र का नाम रोशन करे किसान:- विशाल नाथ

मुम्बई खान

टीका कदम न्यूज नेटवर्क

बैलगावां खेती। विहार के विज्ञानिकों ने लीची की खेती करने तथा उसके रोग रक्षा की जानकारी के लिए इंडो-नेपाल सीमा के किसान नगर में एक दिवसीय प्रशिक्षण सह जागरूकता कार्यक्रम आयोजित कर, यहाँ को विस्तृत जानकारी देकर लीची की बागवानी करने तथा उसके रोग रक्षा के बारे में बताया। इंडो-नेपाल सीमा के किसान नगर स्थित भल्ला घास पर आयोजित यहाँ की एक दिवसीय प्रशिक्षण कार्यक्रम में मुजफ्फरपुर विहार से आठ राष्ट्रीय लीची अनुसंधान केंद्र के निदेशक डॉ.विशाल नाथ ने प्रशिक्षण कार्यक्रम में उपस्थित यहाँ के लीची की रोपाईं करने समय एक पैर में दूसरे पैर की दूरी 8/6 मीटर



तथा खाद एक जैकेट इन्धन तथा कीट व ज्योति नियंत्रण बहुत ही व्यवहारिक एवं व्यापक रूप से ध्यान देने की जरूरत होती है। उन्होंने अपना कार्टेस्ट नं० 9431813684 देते हुए बताया कि एक जनते फोन कर जानकारी ले सकते हैं। यहाँ द्वारा रोपाईं करने समय एक पैर में दूसरे पैर की दूरी 8/6 मीटर का ये तराई इलाका लीची की बागवानी के लिए बहुत ही अनुकूल है। विज्ञान केंद्र ललीमपुर खेती से आये वि विशेषज्ञ डॉ.विशाल कुमार बिरौन ने विज्ञान केंद्र अनुवाद की कार्यशैली पर प्रवक्ता आता चन्नी ने बताया कि यहाँ के विशेषज्ञ किसानों की आय को दुबला करने के लिए दिन रात

प्रसारित करते हैं। एक जनते मोबाइल नं० 9465191684 पर फोन कर अपनी प्रसंगों में जानकारी ले सकते हैं। इस मौके पर डॉ.एन. यु. खान, वीरेंद्र प्रसाद भन्ना, सुरवीर सिंह बन्ना, महावीर कर्मा, विजय बन्ना, सुरेश कुमार शर्मा, विक्रम भन्ना, जयिन्द्र कुमार (जयान विभाग) जलनोष काकरा,सज्जद मुशी मंडीत लयाय मोर उपस्थित रहे कार्यक्रम में आये यहाँ का जयान प्रकट करते हुए विक्रम भन्ना ने यहाँ लोगों के लीची की बागवानी करने के लिए सभी को सलाहकार्यन किया।

केंद्र पर 'हिन्दी सप्ताह' का आयोजन

संसाधन और संस्थान अनुसंधान परिषद (आईआरसी) के बैठक की निर्धारित तिथि के मद्दे-नजर केंद्र पर 14 सितंबर से 'हिन्दी सप्ताह' का आयोजन किया गया। इस दरम्यान कुल पाँच प्रतियोगिताएं नामतः प्रश्नोत्तरी, अनुवाद (अंग्रेजी से हिन्दी), निबंध लेखन, श्रुतिलेखन और आशुभाषण का आयोजन किया गया एवं उत्कृष्ट प्रदर्शन करने वाले प्रतिभागियों को पुरस्कृत किया गया। हिंदी कार्यशाला सह पुरस्कार वितरण समारोह 10 अक्टूबर 2018 को आयोजित की गई। डॉ. विनोद कुमार, वरिष्ठ वैज्ञानिक एवं केंद्र के राजभाषा हिन्दी प्रभारी ने हिन्दी के प्रगामी प्रयोग के मुद्दों पर चर्चा की और कार्यशाला में उपस्थित सभी सदस्यों को अवगत कराया कि केंद्र पर पहली छमाही के दौरान राजभाषा कार्यान्वयन समिति कि 2 बैठकें और 2 कार्यशालाओं का आयोजन किया गया। कार्यालय में हिन्दी में कार्य करने की प्रतिशतता निरंतर बढ़ी है।



हिन्दी सप्ताह के उद्घाटन सत्र में राजभाषा हिन्दी प्रभारी डॉ. विनोद कुमार बैठक में उपस्थित सभी सदस्यों का स्वागत और उद्बोधन करते हुये

केंद्र पर नराकास, मुजफ्फरपुर की पहली छमाही बैठक का आयोजन

नगर राजभाषा कार्यान्वयन समिति (नराकास), मुजफ्फरपुर की पहली छमाही बैठक 21 अगस्त, 2018 को राष्ट्रीय लीची अनुसंधान केंद्र के सभागार में आयोजित की गई। समारोह का आरंभ दीप प्रज्वलन से हुआ। तत्पश्चात, डॉ. विनोद कुमार, वरिष्ठ वैज्ञानिक और इस केंद्र के राजभाषा हिन्दी प्रभारी ने अतिथियों एवं विभिन्न कार्यालयों से आये हुये प्रतिनिधियों का स्वागत किया। डॉ. कुमार ने अपने स्वागत भाषण में केंद्र पर राजभाषा हिन्दी के प्रगामी प्रयोग के मुद्दों पर चर्चा के साथ-साथ लीची अनुसंधान केंद्र के कार्यकलापों एवं हाल में विकसित तकनीकियों की भी संक्षिप्त जानकारी दी। समारोह के मुख्य अतिथि श्री नकुल बेहेरा, उपमहाप्रबंधक, बैंक ऑफ इंडिया एवं अध्यक्ष, नराकास, मुजफ्फरपुर थे। समारोह की अध्यक्षता डॉ. विशाल नाथ, निदेशक, राष्ट्रीय लीची अनुसंधान केंद्र ने की। श्री सुदीप सैनी, सचिव, नराकास, मुजफ्फरपुर ने हिन्दी के प्रचार-प्रसार में कम्प्यूटर के योगदान पर प्रशिक्षण दिया एवं कार्यालयों में उपलब्ध सभी कम्प्यूटर में यूनिकोड हिन्दी इन्स्टाल होने की अनिवार्यता पर जोर दिया। मुख्य अतिथि ने सभी विजेताओं को पुरस्कृत किया। अपने संबोधन में उनहोने कहा कि हिंदी भाषा विविधता में एकता का प्रतीक है। हिन्दी पुरातन भी है और आधुनिक भी। हिन्दी भारतीयता की चेतना है। मंच संचालन डॉ. संजय

कुमार सिंह, मुख्य प्रबन्धक, एसबीआई ने किया और धन्यवाद ज्ञापन पंजाब नेशनल बैंक के प्रबन्धक श्री इंद्रजीत दास ने किया। समारोह में विभिन्न कार्यालयों से 47 प्रतिनिधि कार्यालय-प्रमुख एवं राजभाषा हिन्दी अधिकारियों ने भाग लिया।



नराकास, मुजफ्फरपुर की पहली छमाही बैठक में मुख्य अतिथि एक कार्यालय प्रमुख पुरस्कृत करते हुये

ICAR-NRCL participated in the East Zone ICAR Sports Meet 2018

A 12-member contingent, led by Chief-de-Mission Dr. SD Pandey and Team Manager Dr. Kuldeep Srivastava, represented ICAR-NRCL at the ICAR Sports Tournament for Eastern Zone being held at ICAR-IINRG, Ranchi from 5-8 October, 2018. The team participated in various sports events, where Dr. Alok Gupta secured 3rd position in discus throw and the volleyball team secured the runners' up position in team event.



Participants of ICAR-NRCL in the East Zone ICAR Sports Meet 2018

Visitors



Shri Chhabilendra Roul, Special Secretary, DARE & Secretary, ICAR visited ICAR-NRCL on 12th September, 2018

Human Resource Development

Sl. No.	Title	Venue & Date	Participant(s)
1.	National Farmers Science Congress-2018	BAU, Sabour 5-7 Aug 2018	Dr Vishal Nath
2.	Doubling Farmers Income for Sustainable and Harmonious Agriculture	IINRG, Ranchi 11-12 Aug 2018	Dr K Srivastava
3.	Awareness of Krishi Road Map and Horticulture Scheme in Bihar	BAMETI, Patna 11 Aug 2018	Dr Vishal Nath
4.	Pension and Retirement Benefit	ICAR-CIFRI, Kolkata 3-4 Sept 2018	Sh. Dileep Kumar Sh. Pawan Kumar
5.	10 days training course on Increasing Farmers Income and Livelihood Security: Role of Agriculture Diversification and Value Addition	SKUAST, Srinagar 3-12 Sept 2018	Dr SK Singh
6.	ICAR- Regional Committee Meeting	ICAR-IINRG, Ranchi 14-15 Sept 2018	Dr. Vishal Nath, Dr K Srivastava
7.	Stress Management	ICAR-NAARM, Hyderabad 17-20 Sept 2018	Dr. SD Pandey
8.	Workshop on Doubling Farmer Income	ICAR-IIHR, Bengaluru 17-19 Sept 2018	Dr. E S Marboh
9.	26 th State Level Children's Science Congress-2018	Science for Society, Bihar; SCERT; BCST; NCSTC; DST, GOI 25-27 October 2018	Dr. S K Purbey
10.	District Level Children's Science Congress	Niteshwar College, Muzaffarpur, Science for Society, Bihar; SCERT; BCST 28 October 2018	Dr. S K Purbey
11.	National Conference on "Arid Horticulture for Enhancing Productivity and Economic Empowerment"	ICAR-CIAH, Bikaner 27-29 October 2018	Dr. Vishal Nath Dr. SK Singh
12.	New Paradigms of Plant Health Management: Sustaining Food Security under Climate Change Scenario (Indian Phytopathological Society) Annual Meeting	BAU, Sabour 17-19 Nov 2018	Dr. Vinod Kumar
13.	International Conference on "Role of Soil and Plant Health in Achieving Sustainable Developmental Goals"	Bangkok, Thailand 21-25 Nov 2018	Dr. Vinod Kumar
14.	Management Development Programme on Leadership Development	ICAR-NAARM, Hyderabad 18-29 Dec 2018	Dr. K Srivastava



Publications

Research Articles

- Lal N., Pandey S.K., Nath V., Agrawal V, Gontia A.S. and Sharma H.L. 2018. Total phenol and flavonoids in by-product of Indian litchi: Difference among genotypes. *Journal of Pharmacognosy and Phytochemistry*, 7(3): 2891-2894.
- Lal N., Pandey S.K., Nath V., Gontia A.S. and Sharma H.L. 2018. Evaluation of litchi (*Litchi chinensis* Sonn.) genotypes for fruit quality attributes. *International Journal of Chemical Studies*, 6(3): 2556-2560.
- Nawade B., Mishra G.P., Radhakrishnan T., Dodia S.M., Ahmad S., Kumar A., Kumar A. and Kundu R. 2018. High Oleic Peanut Breeding: Achievements, Perspectives, and Prospects. *Trends in Food Science & Technology* 78: 107-19.
- Srivastava K., Choudhary J.S., Patel R.K., Reddy P.V.R. and Nath V. 2018. Identification and phylogenetic analysis of fruit borer species of litchi using DNA barcode sequences. *Indian Journal of Horticulture* 75(3): 415-422.
- Verma V., Jha A.K., Patel R.K., and Ngachan S.V. 2018. Studies on storage life, and effect of temperature and pre-sowing seed treatments on germination behaviour and maturity indices in King-chilli (*Capsicum* spp). *Indian Journal of Agricultural Sciences* 88(8): 1162-1167.
- Verma V., Jha A.K., Verma B.C., Babu S. and Patel R.K. 2018. Response of tomato (*Solanum lycopersicum*) to foliar application of micronutrients under low cost protected structure in acidic soil of Meghalaya. *Indian Journal of Agricultural Sciences* 88(7): 998-1003.

Papers in Seminar, Symposium and Conference

- Kumar A., Pandey S.D., Purbey S.K., Patel R.K., Pongener A. and Nath V. 2018. Response of growth regulators on flower induction, fruit yield and quality of litchi 'Shahi'. In: Proc. V International Symposium on Lychee, Longan and Other Sapindaceae Fruits. *Acta Horticulturae* 1211: 29-34. DOI: 10.17660/ActaHortic. 2018.1211.5.
- Kumar A., Radhakrishnan T., Singh B.K., Mishra G.P. and Dobarja J.R. 2018. Heterologous expression of BcZAT12 transcription factor

greatly enhances drought stress tolerance in transgenic groundnut (*Arachis hypogaea* L.). In: India International Science Festival 2018 (5-8 Oct, 2018), Indira Gandhi Pratishthan, Lucknow, India, pp. 40.

- Kumar A., Radhakrishnan T., Singh B.K., Mishra G.P. and Dobarja J.R. 2018. Stress-inducible expression of BcZAT12 transcription factor greatly improves drought stress tolerance in transgenic groundnut (*Arachis hypogaea* L.). In: 2nd National Conference on Doubling Farmers Income for Sustainable and Harmonious Agriculture DISHA-2018 (11-12 August, 2018), ICAR-Indian Institute of Natural Resins and Gums, Ranchi pp. 62.

Awards

- Dr. Kuldeep Srivastava received Distinguished Scientist Award for outstanding contribution in the field of Entomology during 2nd National Conference on Doubling Farmers Income for Sustainable and Harmonious Agriculture at ICAR-IINRG, Ranchi from 11-12th August, 2018.
- Dr. Abhay Kumar received Young Scientist Award for outstanding contribution in the field of Plant Biotechnology during International Conference on Global Research Initiatives for Sustainable Agriculture & Allied Sciences (GRISAAS-2018), 28-30 October, 2018 at Rajasthan Agricultural Research Institute, Durgapura, Jaipur, Rajasthan, India.

Peer Recognition

- Dr. Vinod Kumar, Senior Scientist (Plant Pathology) was appointed as member of the Editorial Board in *SCIREA Journal of Agriculture*, an international open access journal of Science Research Association.

Popular article

- कुमार विनोद, अभय कुमार एवं अजीत कुमार दुबेदी अनल. 2018. ट्राईकोडर्मा किसानों का हितैषी सूक्ष्मजीव. स्मारिका: उन्नत तकनीकी-खुशहाल किसान, 15 अक्टूबर 2018, भा.कृ.अनु.प.-भारतीय गेहूँ एवं जौ अनुसंधान संस्थान, करनाल, हरियाणा, पेज 29-32.

Clearance of Probation and Confirmation of Service

- Service of Dr. J.P. Verma confirmed to the post of Technical Assistant T-3 (Field/ Farm) w.e.f. 15th July, 2017.
- Service of Dr. Ramashish Kumar confirmed to the post of Technical Assistant T-3 (Field/ Farm) w.e.f. 30th July, 2017.

Superannuation/Resignation

- Sh. Ranjeet Kumar, Assistant resigned from post of Assistant from ICAR-NRC on Litchi, Muzaffarpur on 05th July, 2018.

Staff News

New Joining

- Ms. Upagya Sah joined the centre as Technical Assistant (T-3) on 29th October, 2018.



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