



Vegetable-Newsletter

ICAR-Indian Institute of Vegetable Research



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- Celebration of curtain raiser programme on "International Year of Millets 2023"
- Technology Promotion Day for okra and pumpkin organized at ICAR-Indian Institute of Vegetable Research, Varanasi
- ICAR-Indian Institute of Vegetable Research, Varanasi Celebrated 31st Foundation Day
- ICAR-IIVR, Varanasi organized four events to observe "Fit India Freedom Run 2.0"
- Honourable Secretary DARE and DG ICAR, Prof. T. Mohapatra visited farmers field at Varanasi and interacted with scientists of ICAR-IIVR
- Dr. A. K. Singh, DDG horticultural Science, ICAR pays a visit to the ICAR-IIVR, Varanasi
- Constitution Day observed at ICAR-IIVR
- International Conference on Vegetable research and innovations for nutrition, entrepreneurship and environment (ICVEG-21) organized at IIVR

From the Director's Desk

Vegetables are important constituents of Indian agriculture due to their short duration, high yield, nutritional richness and ability to generate on-farm and off-farm employment. Global vegetable production has increased dramatically, especially per capita, over the years. This trend is more pronounced in developing countries. Vegetable production in India has increased significantly over the last two decades. The production of vegetables has increased from 93.85 million tonnes in 2000-01 to 196.26 million tonnes in 2020-21 (2nd Advance DAC Estimate, GOI). However, this spectacular growth of vegetable production in the country has accompanied with several challenges like low and uneven productivity across the country; different biotic and abiotic stresses, perishability and high cost of cultivation; inadequacy of multipurpose varieties and eco-friendly agro-techniques for improving total factor productivity (TFP); poor management of dwindling natural resources and poor quality of the produce including food safety issues. These issues need to be addressed under depleting natural resources; emerging abiotic/ biotic stresses; global developments and climate change. To advance further, agricultural operations must be directed in two ways. The first is to reduce cultivation costs, and the second is to add value to the product. In conventional vegetable cultivation there is injudicious use of irrigation water, fertilizer, pesticides, and so on. This not only increases the cost of cultivation but also exacerbates the problems of pest and diseases as well as associated environmental pollution. Adoption of water conservation technologies, region specific ecofriendly pest management options, improved hybrids and varieties are the few steps in this venture. Due to small and fragmented land holding, the concept of "family farming" by utilizing of the available time of the family members can be helpful in this venture. Value addition by post-harvest processing in vegetable sector has immense opportunity. Micro enterprises at the household level, Self-Help Groups (SHGs) at the community level, and Farmer Producer Organizations (FPOs) at the village level must be established, as well as value chain management from production to consumption. Suitable processing technologies in vegetables not only reduce farm waste but also have the potential to generate additional income for villagers. It is imperative to train the villagers, particularly farm women, in low-cost vegetable processing techniques. Quality control of those products, as well as a secure market, is also essential for the long-term viability of such businesses.



T K Behera
T K Behera
Director, ICAR-IIVR

Research Update

Screening of Okra (*Abelmoschus esculentus* L.) genotypes for germination and seedling growth under peg-induced drought stress

Seed germination is one of the most important phase in the life-cycle of a plant and is highly responsive to the existing environment. The study of drought tolerance during germination, early and late growth of plants is important for determining dry limits at each developmental phase. An experiment was conducted for screening of 20 genotypes of okra (*Abelmoschus esculentus*) for drought tolerance. Firstly, filter papers (two layers) were lined on 12 cm petri plates and then seeds were sown on. Thereafter, petri plates with seeds were kept in seed germinator (temp, $25 \pm 2^\circ\text{C}$). To induce drought stress 18 % polyethylene glycol (PEG 6000) was used which creates -0.41 MPa of osmotic stress. After 3 days of sowing, percent germination, radical and plumule

length, and vigor index of okra seedlings were measured. It was found that VRO-110, VRO-106 and Pusa Makhmali genotypes donot show significant reduction in germination percentage under PEG treatment as compared to control condition. Moreover, it was also observed that VRO-110, VRO-106 and Pusa Makhmali genotypes have better seedling vigor index under PEG treatment. The identified okra genotypes could be used not only in breeding programs to improve tolerance to drought stress with the aim to increase the probability of successful okra establishments in arid or semi-arid environments but also to be cultivated in environments where water scarcity is a frequent constraint.

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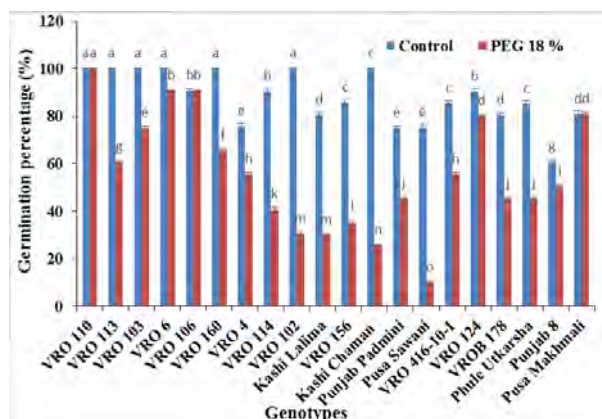


Fig1: Germination percentage of okra genotypes

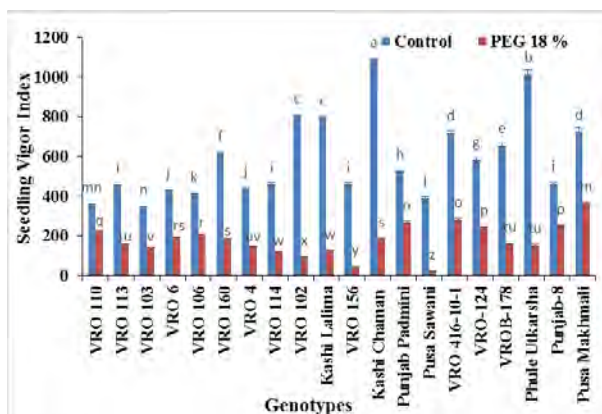


Fig 2: Seedling Vigor Index of okra genotypes

Common Indian Purslane (*Portulacaoleracea* L.): A Nutraceutical crop of Bundelkhand, Uttar Pradesh

The *kulfa* or *pigweed* or *rigla* or common Indian purslane (*Portulacaoleracea*) is a member of family Potulaceae. It is commonly found in tropical and sub-tropical regions of India as weed in cultivated lands during warm and wet months (March to October). It is also prevalent in warmer parts of the world viz., Japan, Australia, Africa and America. Tender twigs with leaves are cut and cooked as vegetable. The plant is known for its nutritive values like Omega-3- Fatty Acids {especially α -linolenic acid (18:3w3) ~300-400 mg/100g fresh weight}, vitamin A (1320 IU/100 g~1.9 mg β -carotene), vitamins C (26.6 mg/100 g), α -tocopherol (12.4 mg/100g), minerals like magnesium (68 mg/100 g), phosphorus (44 mg/100 g), calcium (65 mg/100 g) and iron (1.99 mg/100 g) and anti-oxidants (β -cyanins and β -xanthins) (Simopouloset al., 1992). Owing to high oxalate content in leaves and twigs (910-1679 mg/100 g), raw consumption should be avoided. However, the oxalic acid concentration in leaves vary with stage of harvesting and nitrogen status of growing media. The leaves harvested at 8-true leaf stage contain ~36-45% higher oxalic acid content compared to those harvested at 16-true leaf stage and also the crop grown in soil with high N-content, show 40-50% lower

oxalic acid content. There is wide range of morphological variability in India ranging from green stem and bigger leaves to reddish stem and small leaves. This crop is very famous in Bundelkhand area and is one of the important leafy vegetables. The seeds of unidentified landraces are collected by the farmers of Bundelkhand region and grown for local markets. Evaluation of local genotypes for green yield and high nutraceutical values may lead to evolve improved varieties with systematic seed channel. In spite of high nutritional importance, the *kulfa* (Purslane) is a minor crop which not still under scientific cultivation. By virtue of extremely small seeds (~4000-5000 seeds in a gram), the seed rate is also low (2 kg/ha). Seeds are sown directly in well prepared field by mixing in 20 times higher weight of compost or sand in lines spaced at 30 cm. Organically rich sandy loams with good water holding capacity are ideal. Although, it can be grown any time during warmer part of the year, even though, February- March is the most suitable for its cultivation. The crop becomes ready for harvesting in 35-40 days after sowing. The tender shoots are harvested and consumed as cooked vegetable. The tender shoots can be harvested 2-3 times with green yield of 240-250 q/ha. However, the green yield gradually decreases in consecutive cuttings. Department of Vegetable Science of BUAT, Banda is maintaining various morpho-types of purslane by collecting the seeds from local areas. The BUAT Kulfa 18-1 has green and tender leaves and shoots. The flower colour is yellow as usual. The crop becomes ready for harvesting within 35 days from sowing. Green yield varies from 240-250 q/ha.



Fig: Common Indian Purslane (BUAT Kulfa18-1)

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Effects of synergistic treatment of polyamines and chitosan coating on quality, shelf-life and senescence dynamics of bell pepper (*Capsicum annuum* L.) fruit

Capsicum fruit is very popular among the masses with high market demand due to its unique sweetness and slightly pungent flavor and use, particularly in fast foods. However, the postharvest shelf-life of the fruit is limited particularly at lower temperatures due to quick development of chilling injury symptoms, visible shrinkage and loss of crispiness among others. The effects of polyamines (spermidine and spermine) and chitosan coating was evaluated on bell pepper fruit cv. "Rehana" on fruit quality, bio-active compounds, antioxidant enzyme activities, shelf-life and senescence related compounds. The results revealed that synergistic treatment of spermine 1.5 mM and chitosan 1% was most effective for reducing weight loss, electrolyte leakage, maintaining fruit quality and enhancing antioxidant activity over other treatments during storage. The spermine and chitosan treated bell pepper fruit exhibited lower weight loss by 47.6%, electrolyte leakage by 62.6%, malondialdehyde accumulation by 28.3% while maintaining higher total phenols by 68.8%, total carotenoid by 21.9%, ascorbic acid by 15%, total chlorophyll by 30.4% and catalase by 34.3% in comparison to control on the last day of storage. The results suggest potential beneficial influence of synergistic treatment of polyamines, particularly spermine 1.5 mM with chitosan 1% in extending shelf life of bell pepper by about 28 days with notable preservation of bioactive compounds, antioxidant enzymes and slowing senescence indicators over untreated fruit.



Fig: Capsicum fruit at final day of storage
(A)Control; (B)SPM + Chitosan

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Outbreak of invasive chilli thrips [*Thrips parvispinus* (Karny)] in Telangana

Chilli is the major commercial spice crop grown in Telangana state in an area of 0.99 Lakh ha with a production of 5.81 lakh tonnes covering Warangal, Mahabubabad, Khammam, Suryapet, Gadwal, Nagarkurnool, Mahabubnagar, Siddipet, Vikarabad, Rangareddy, Narayanapet and Adilabad districts. During 2021-22, there was 25-30 % increase in chilli area, as cotton was severely attacked by pink boll worm and farmers preferred chilli cultivation in Telangana. Incidence of regular pests like chilli thrips (*Scirtothrips dorsalis*), yellow mites (*Polyphagotarsonemus latus*), pod borers (*Helicoverpa armigera*, *Spodoptera litura*) and viral diseases (Gemini viruses) are observed. Apart from these regular pests, incidence of chilli flower thrips (*Thrips parvispinus*) was first noticed on leaves during 2021-22 in Narasampeta Mandal of Warangal district. Subsequently chilli flower thrips (*Thrips parvispinus*) spread to other chilli growing areas of Telangana. The samples were collected and sent to NBAIR, Bengaluru and it was confirmed that 90-95 % of thrips species infesting chilli were *Thrips Parvispinus* which was first reported from India by Tyagiet al. 2015 and Rachanaet al. 2018.

Females of *Thrips parvispinus* were observed mostly

on petals and below the stamens near the ovary. Whereas, males were congregating underside of leaves in large numbers and sucking the sap from the leaves as well as pods. Females are 1mm in size, black in colour and bigger in size than the males. Males are 0.7mm in size and yellow in colour and smaller than females. *Scirtothrips dorsalis* causes damage by sucking sap on the leaves and typical upward leaf curl is observed. In case of *T. parvispinus*, they suck the sap from flowers, leaves and fruits. The infested flowers wither and there is no fruit set. Thrips suck sap from the lower surface and leaf is deformed. The fruits attain abnormal shape. *Scirtothrips dorsalis* population is not observed this year. During the survey, it was observed that Warangal Chapata, a local land race belongs to paprika group, is more susceptible. Warangal chapata flowers and fruits were severely affected as the flowers are big in size and fruits are succulent. It was observed that, varieties with big flower size had severe infestation compared to smaller flowers. In addition to chilli, *Thrips parvispinus* was recorded on capsicum and mango also. Apart from chilli flower thrips, leaf curl incidence was also severe which created havoc among the farming community. Scientists of Sri KondaLaxman Telangana State Horticultural University (SKLTSU) has conducted surveys, arranged awareness meetings for integrated management of thrips and mass



Field visit at Mahbubabad



Meeting at Khammam district



Adults of *Thrips parvispinus*



Thrips parvispinus on chilli flower



T. parvispinus on leaves and fruits (Warangal chapata)



campaigning along with Department of Horticulture, and Indian Institute of Horticultural Research team of scientists. Integrated pest management practices for chilli thrips include installation of blue and yellow sticky traps @ 30 per acre on community basis, application of neem oil @ 3 ml/l, rotation of recommended insecticides Fipronil 50 WG @ 40 g/acre or Cyantrilipole 10 % @ 240 ml/acre or Acetamaprid 20 SP @ 40 g/acre or Spinosad 45%SC @ 64 ml/acre and avoidance of excess use of insecticides.

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Spinetoram, a selective novel insecticide able to check key lepidopteran pests in cabbage ecosystem

Diamondback moth (DBM) and cabbage butterfly (CB) were serious cabbage yield limiting factors in India. Considering insecticide resistance development in these pests, a study was conducted to find out the effective chemical molecule(s) for managing these pests. Several novel insecticides were evaluated against DBM and CB. Efficacy of insecticides was determined by comparing larval densities of each insect species, immature and adult of natural enemies, crop damage ratings and marketable yield in insecticide treated versus untreated control plots. Spinetoram 45 and 60 g a.i. per ha recorded significantly higher larval population reduction (>80%) with least crop damage ratings (< 2) for both the insect pest population. Spinosad, Emamectin benzoate, Indoxacarb and Chlorantraniliprole were also the found effective



Figure : Effect of insecticidal treatment over the untreated control for managing the lepidopteran insect pests in cabbage
A: Control (sprayed with only water); B: Spinetoram (60 g a.i. per ha) treatment

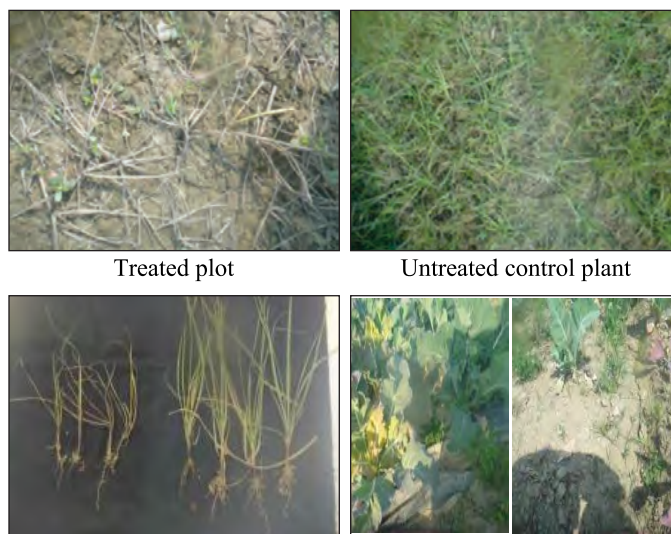
treatments in controlling DBM and CB. No phytotoxic symptoms were observed in any treatment after spray application. Chlorpyrifos, deltamethrin, lambda-cyhalothrin and flubendiamide were found adverse to natural enemies. Thus, spinetoram, spinosad, emamectin benzoate, indoxacarb and chlorantraniliprole are recommended to manage DBM and CB on rotational basis in the cabbage ecosystem.

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Chemical control of motha (nutgrass/nutsedges) in vegetable crops

Motha (Cyperus rotundus) is one of the most notorious weed of vegetable crops. Halosulfuron methyl 75%WG (sempra) is a selective, systemic, postemergence and acetolactate synthase herbicide evaluated for controlling of motha on vegetable crops namely brinjal (cv KashiTaru/KashiSandesh), tomato (cv KashiAman), chilli (cv KashiAnmol), cauliflower (cv PusaSnoball), rajma/French bean (cv KashiRajhansh), bottle gourd (cv Kashi Ganga) and radish. Foliar spray of halosulfuron methyl 75%WG @ 0.02% after 40 days of transplanting/sowing was found most effective for controlling of motha in above selected solanaceous, cucurbitaceous and leguminous vegetables. Treated



Treated plot

Untreated control plant

Rhizome seed bank in
treated/untreated

Phytotoxicity in
treated cauliflower plants

plots were showed reduction of root length (5 cm), shoot length (6 cm), rhizome numbers (22) with higher degree of rhizome necrosis in motha than untreated control 6cm, 3 cm and 51, respectively after 30 days of application. Similarly, rhizome bank reduction rate was recorded 41.17% in treatment over control, however it was found highly phytotoxic for cole vegetable crops.

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Bacterial wilt: An emergent disease of brinjal in Eastern Uttar Pradesh

Bacterial wilt caused by Race1 of *Ralstonia pseudosolanacearum* on solanaceous vegetable crops. Recently its occurrence is being noted on brinjal (*Solanum melongena*, solanaceae) hybrid cv NavKiran (35%) at Magaraha and Kashi Sandesh (100%) in farmers' fields at Bangalipur in Varanasi district of Eastern U.P., coinciding with warmer and higher humid month of August to November 2021. Pure cultures of bacterial wilt pathogen, *R. solanacearum* were established from infected samples of brinjal on Kelman's triphenyltetrazolium chloride (TZC) medium. Based on the cultural, morphological characteristics, sugar oxidation test and cross pathogenicity test we confirmed that race 1/ biovar III of *R. pseudosolanacearum* caused



Incidence of bacterial wilt on brinjal (Navkiran) at Magaraha



Incidence of bacterial wilt on brinjal (Kashi Sandesh) at Bengalipur



TZC culture plate of *R. pseudosolanacearum*



Pathogenicity test

the wilt on solanaceous vegetables. Cross pathogenicity of *R. solanacearum* isolates were tested on twenty five days old seedlings of brinjal (*Solanum melongena*, *S. incanum*, *S. torvum*, IC-35457, IC111056, Ram Nagar Giant, EC-790570, Surya, IVBHR-16, 17, 20, 22, IVBHL-20,21,22, Mau Local-1, BUAT-1 and KashiTaru).

A.N. Tripathi, S.K. Tiwari, Anant Bahadur and T.K. Behera

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Success stories

Front Line Demonstration of okra variety Kashi Chaman developed at ICAR- Indian Institute of Vegetable Research fetched bumper yield at farmer's field

Front Line Demonstration (FLD) on okra variety Kashi Chaman had been conducted in the field of Shri. Upendra



Shri Upendra Singh Patel says-

"The texture, shape and attractive green colour of the variety fetch good market price upto Rs. 30 to 45 per kg. Besides selling in the market we are also consuming it at home. I am very satisfied with the performance of this okra variety".

Araziline block, Varanasi. This variety has been developed from ICAR- Indian Institute of Vegetable Research, Varanasi in the year 2019 and can be cultivated in both summer and rainy season. This variety is tolerant to Yellow Vain Mosaic Virus (YVMV) and Okra Enation Leaf Curl Virus (OELCV) diseases which are the most dangerous diseases for okra crop and a major problem in okra cultivation. The yield potential of this variety is 21.66% more in its sector. This variety is becoming popular in Uttar Pradesh, Bihar, Odisha for its better performance in farmers' field. Shri Patel had sown seeds of okra variety Kashi Chaman on 10th July 2021 in 10 biswa (0.3 acre) land under the guidance of the scientists of ICAR-IIVR, Varanasi. He followed scientific package of practices for okra production and used recommended fertilizers and chemicals as suggested by the scientists. First flush of okra fruit was harvested 46 days after sowing i.e. on 25th August 2021. After that he had taken regular harvest of 35 to 40 kg okra in 3 to 4 days interval and had taken 19 harvests up to last week of October with total yield 668 kg in 90 days duration form 0.3 acre of land only with net profit of Rs. 21,376/- after deducting cost of cultivation and transportation cost to the market.

This FLD was supported by very prestigious ICAR-National Agricultural Science Fund (NASF) sponsored project "Development and Validation of need based technology delivery model through FPOs in eastern region of India".

Shubhadeep Roy, S. Maurya, A. N. Tripathi, Hare Krishna, Neeraj Singh and T. K. Behera

ICAR-Indian Institute of Vegetable Research, Varanasi, UP

EVENTS

Plantation program organized at ICAR- Indian Institute of Vegetable Research, Varanasi

Plantation program was organized at ICAR-IIVR on 16th July 2021. The saplings of Chandani, Hibiscus, Ficusnuda were planted by Dr. TusarKantiBehera, Director of the Institute. About 50 saplings were also planted by other employees of the institute. All the scientists and employees of the institute marked their presence in this program.



ICAR-Indian Institute of Vegetable Research, Varanasi commercialized high yielding genotypes of radish, carrot and Palak

ICAR- Indian Institute of Vegetable Research, Varanasi added three more crops to its basket of technologies commercialized to private sector organizations. The high yielding varieties of carrot (Kashi Arun), Radish (Kashi Mooli-40) and Beet leaf/Palak (VRPLK-2) were commercialized to M/s Ellora Natural Seeds Pvt. Ltd. Aurangabad, Maharashtra. The Memorandum of Understanding (MoU) was executed and exchanged between the organizations. The Director, Dr. TusarKantiBehera executed the license and handed it over to the representative from the Ellora Natural Seeds Pvt. Ltd. Aurangabad.



Captain Vikas Gupta, President of Uttar Pradesh Agricultural Research Council visits the Indian Institute of Vegetable Research

Captain Vikas Gupta, President, Uttar Pradesh Agricultural Research Council, Lucknow visited the institute on August 09, 2021. Capt. Vikas Gupta, in his address, expressed his gratitude towards all the scientists and praised the achievements of the institute so far. He said that the goal of doubling the income of farmers can be achieved by cultivating vegetables, for which the Uttar Pradesh government is making continuous efforts and is ready for all possible help in this direction.



MoU Sign between IIVR and State Bank of India for better availability of vegetable seeds across the country

A Memorandum of Understanding (MoU) has been signed with State Bank of India for Digital Payment of Online Seed Portal of ICAR-IIVR between General Manager (Retail & Digital Banking) State Bank of India Challaji Nivassulu Shetty and Dr. Tushar Kanti Behera, Director, Indian institute of vegetable research, Varanasi. Online Seed Portal is going to start very soon through which any farmer and other people can order vegetable seeds from any corner of the country.



Fertilizers and agricultural machines distributed among the farmers of the scheduled Caste category

Under Scheduled Caste Sub-Plan, 22 bags of urea, 12 bags of DAP, 20 kg Zinc, 25 kg Sulfur was distributed among 60 scheduled caste category farmers of Sursi, Maharach and Mujahidpur villages. Apart from this 65 sickle and grafted brinjal plants were also distributed to the beneficiaries.



Independence Day celebrated at ICAR-IIVR, Varanasi

75th Independence Day of India celebrated with joy and glee at ICAR-IIVR, Varanasi on 15th August 2021. Prof. Tusar Kanti Behera, Director of the institute told that we should not forget the agonizing pain freedom fighters endured to make our country independent. Now it is our responsibility to value and cherish their sacrifice by doing our duties honestly and make our country proud. Agri scientists have big role to make country food and nutritional secure. He urged to all staff of the institute to hold hand together and reach a new height to the institute.



“Parthenium awareness week” celebrated at ICAR IIVR, Varanasi

“Parthenium awareness week” observed from 16-22 August 2021 to make farmers and General public aware about the menace of Parthenium which is responsible for causing health problem in human beings, animal and deteriorating the environment. During this period different activities were organised by the institute to sensitize one and all for eradication of parthenium. The activity of Parthenium uprooting from the residential campus was organised on 21.08.2021 to make the campus Parthenium free. The Director Dr. T. K. Behera and all staff members of the institute actively participated in this Programme.



Training on “Nutritional Security and Women Empowerment through Mushroom Production” organized

Two days training programme on “Nutritional Security and Women Empowerment through Mushroom Cultivation” organised at ICAR-IIVR, Varanasi on 26-27 August 2021 under the ICAR-NASF project “Development and validation of need based technology delivery model through FPOs in eastern Region of India”. On the eve of “Azadi ka Amrit Mahotsav” this training programme was organised to make the trainees aware about the mushroom facilities and technologies available at institute. Prof. T. K. Behera, Director of the institute interacted with the trainees about the nutritional value of mushroom and business opportunity of mushroom spawn production, different kinds of mushroom (button, oyster, milky) production and value addition. He told that mushroom bags may be prepared at the average cost of



Rs. 20-25, whereas the selling price of mushroom is Rs. 100 to 250 per kg. Income of the farmers can be doubled in short span of time by the mushroom cultivation.

Keeping in mind the COVID-19 protocol 17 women trainees were trained with practical and theoretical aspects of mushroom production. Mushroom production kits were also distributed. A brain storming session was organised to develop business model of mushroom enterprise through PPP mode in which National Rural Livelihood Mission (NRLM) and ReNew Power (CSR) will cooperate. A training manual “Mushroom Utpadan: Digdarshika” (in Hindi) released on this occasion. Mr. Dilip Sonkar, Deputy Commissioner, National Rural Livelihood Mission (NRLM), Varanasi Division was the chief guest of the function.

Hindi workshop organized at Indian Institute of Vegetable Research, Varanasi

Hindi workshop was organized on 4th September, 2021 at Indian Institute of Vegetable Research,



Varanasi. Dr. Rajkumar, Senior Professor, Hindi Department, Banaras Hindu University acted as the chief guest. The Chief Guest in his address expressed happiness on the work of Official Language at the institute and guided the participants to take this work further. Further he stressed upon simplification and meaningful application of technical terminology of Hindi in the field of science.

ICAR-IIVR, Varanasi organized the “Fit India Freedom Run 2.0” programme

Ministry of Youth Affairs & Sports, Department of Sports, Govt. of India has planned “Fit India Freedom Run 2.0” to commemorate the 75th Independence Day- “Azadika AmritMahotsav”. All the staff of ICAR- Indian Institute of Vegetable Research, Varanasi celebrated the first event of “Fit India Freedom Run 2.0” programme on 4th Sept 2021. The purpose of this programme is to encourage fitness awareness among people which will help to get freedom from obesity, laziness, stress, anxiety, diseases etc. The concept behind this run is that “It can be run anywhere, anytime”. All Indian citizens are given a call to make physical activity a regular habit and exercise for at least 30 minutes daily i.e. “FITNESS KI DOSE, ADHA GHANTA ROZ”.



Field day on cowpea (Kashi Nidhi) organised under Farmer FIRST project

A Field Day on successful demonstration of cowpea (Kashi Nidhi) was organised at the field of Anil Kumar Patel, a progressive farmer of village Rajapur, Varanasi on 06.09.2021. Anil Kumar Patel told that he planted cowpea



(Kashi Nidhi) in 1 acre. From Kashi Nidhi he got income of Rs 66,000.00 from one acre area and 19.15% increase in production and 29.96% increase in income was recorded. More than 30 progressive farmers of Rajapur village participated in this program and got information about the new techniques introduced by the scientists.

Shubhadeep Roy and Neeraj Singh

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39th Annual Meeting of All India Coordinated Research Project (Vegetable Crops) conducted

The Group meeting of 39th All India Coordinated Research Project (Vegetable Crops) held at ICAR-Indian Institute of Vegetable Research, Varanasi from 7th to 9th September, 2021. In this group meeting 20 varieties/hybrids of different vegetable crops were marked for release and notification. Apart from this 12 techniques of vegetable production, 5 of protected cultivation, 5 of vegetable seed production, 6 of integrated vegetable pest management and 2 techniques of integrated vegetable disease management were recommended for different agro-climatic regions of the country.

Celebration of curtain raiser programme on “International Year of Millets 2023”

ICAR-Indian Institute of Vegetable Research, Varanasi organized a curtain raiser programme on “International year of millets 2023” on 17th September 2021. More than 100 farmers and 71 girl students and farm-women were



invited to participate in this programme. The online inauguration programme organized by Ministry of Agriculture and Farmers Welfare was attended at the committee hall of the institute. Director of the institute Prof. T. K. Behera distributed vegetable kitchen garden packets to the farm-women and girl students to enhance nutritional security among villagers particularly girls. Director also discussed the role of nutri-cereals and vegetables on human health. 100 saplings of guava, citrus and papaya were planted at Institute premises by the institute's staffs and girl students. The participants were provided millet based food items and motivated them to incorporate millets in regular diet.

Technology Promotion Day for Okra and Pumpkin organized at ICAR-Indian Institute of Vegetable Research, Varanasi

Technology promotion day for okra and pumpkin was organized at ICAR-Indian Institute of Vegetable Research, Varanasi on 20.09.2021. On this occasion, the representatives of seed companies were made aware of



the improved varieties of okra and pumpkin developed by the institute. Dr. Tushar Kanti Behera, Director of the institute asked the participants to popularize improved varieties of Okra, Bitter gourd, Sponge gourd, Bottle gourd, Water Melon and Pumpkin etc through licensing and public private partnership. On this occasion 70 representatives of seed companies participated.

ICAR-Indian Institute of Vegetable Research, Varanasi Celebrated 31st Foundation Day

On the occasion of 31st foundation day, the ICAR-Indian Institute of Vegetable Research, Varanasi organized a virtual meet as well as panel discussion on "Enriching Diet with Nutri-dense Vegetables for better Health and Wellness" on 28.09.2021 (Tuesday). The event flagged off with a welcome address by the Director, Dr. Tushar Kanti Behera which laid out a fact sheet of the institute's current programmes and prospects. He also discussed the various initiatives taken by the institute for enhancing income of farmers as well as environmental sustainable farming practices. Former directors Dr. G. Kallu, Dr. Mathura Rai, Dr. T.A. More and Dr. P.S. Naik shared their memories. On this occasion Panel discussion on Enriching Diet with Nutri-dense Vegetables for Better Health and Wellness was organized. Dr. A.K. Singh, DDG, Horticulture ICAR, New Delhi Chaired the virtual panel discussion as the Chief Guest. The 'Foundation Day Lecture' was delivered by Dr. Mangala Rai, Former Secretary, DARE and Former Director General, ICAR, New Delhi. Institute also organized drawing and arts events for the school students. The programme was attended by a large number of farmers, scientists, technical staff, officers,



retired members, and representatives from the media via online platform and in physical presence at ICAR-IIVR auditorium.

ICAR-IIVR, Varanasi organized four events to observe “Fit India Freedom Run 2.0”

Ministry of Youth Affairs & Sports, Department of Sports, Govt. of India has planned “Fit India Freedom Run 2.0” to commemorate the 75th Independence Day- “Azadi Ka Amrut Mahotsav”. All the staff members of ICAR-Indian Institute of Vegetable Research, Varanasi actively celebrated the events of “Fit India Freedom Run 2.0” programme on 04th, 18th, 25th September and 2nd October, 2021. The purpose of the programme is to encourage fitness awareness among people which will help get freedom from obesity, laziness, stress, anxiety, diseases, etc. The concept behind the program is that “It can be run anywhere, anytime!” All Indian citizens are given a call to make physical activity, a regular habit and exercise for at least 30 minutes daily i.e. “FITNESS KI DOSE, ADHA GHANTA ROZ”. Dr. T. K. Behera, Director, ICAR-IIVR emphasized the importance of physical activities and its role in developing a healthy lifestyle on this occasion. Three events were organized at ICAR-IIVR farm and forth event (2nd October 2021) was organized at ICAR-IIVR, Guest House, Sunderpur to BHU, Main gate, Lanka, Varanasi. All the staff members were encouraged to involve in physical activities along with friends, families and other acquaintances to ensure a healthy lifestyle.



Honourable Secretary DARE and DG ICAR, Prof. T. Mohapatra visited farmers field at Varanasi and interacted with scientists of ICAR-IIVR

Honourable Secretary DARE and DG ICAR, Dr. T. Mohapatra visited the farmer's field demonstrations at Bangalipur village, Varanasi conducted by ICAR-IIVR and supported by ICAR-National Agricultural Science Fund project “Development and Validation of Need Based Technology Delivery Model through Farmers' Producer Organization in Eastern Region of India”. During his interaction with the farmers he appraised the performance of the demonstrations of capsicum in protected conditions and brinjal hyb. Kashi Sandesh and suggested to develop remunerative marketing channels through the FPOs. Emphasizing the role of FPOs he suggested developing vibrant business models of agri inputs out of which farmers could get instant profit. Through processing, value addition and market intelligence farmer's share in consumer's money can be increased. He suggested developing role model of successful entrepreneur and making proper documentation. Seeing good crops he also suggested developing “seed village” in that area. Dr. T. Mohapatra also visited ICAR-IIVR research farm on 14th November 2021 and appraised the work conducted by the scientists. The occasion also held an interaction with the staff of ICAR-IIVR where different issues were discussed for further improvement.



Dr. A. K. Singh, DDG horticultural Science, ICAR pays a visit to the ICAR-IIVR, Varanasi

Dr. A.K. Singh, DDG horticultural science, Indian Council of Agricultural Research, New Delhi visited ICAR-Indian Institute of Vegetable Research, Varanasi on 17 November 2021. He praised the horticultural sector's expansion in terms of production and productivity. Furthermore, he also told that the third estimate predicts that vegetable production will surpass all the previous records this year. He also emphasized that as production level raises, the challenges of storability and processing will rise. During his interactions with the scientists of the institute he said that when developing the variety, we should think like farmers and consumers. He praised the basic, strategic and farmer-oriented research activities of the institute and emphasized the importance of identifying the districts involved in vegetable production for one district, one product (ODOP) along with the Government of India. Dr. Singh also highlighted that the cultivation of indigenous vegetables in the identified ODOP, with the goal of bringing these into the main stream. He also highlighted the use of artificial intelligence in the horticulture sector to strengthen farming and improve the forecasting.



Constitution Day observed at ICAR-IIVR

An oath taking ceremony was organized on Constitution Day 26th November 2021 at the institute. Director of the institute, Dr. TusarKanti Behera, head of the divisions along with other staff of the institute participated in the oath taking ceremony.



International Conference on Vegetable research and innovations for nutrition, entrepreneurship and environment (ICVEG-21) organized at IIVR

International Conference on Vegetable research and innovations for nutrition, entrepreneurship and environment (ICVEG-21) organized at IIVR during 14-16th December 2021. The objective of the conference was to provide a platform for researchers and development partners to exchange innovations for sustainable vegetable production, availability, affordability and consumption and foster individual and institutional linkages for outlining environmentally sustainable vegetable production and value chain. Scientific discussions were carried out and research papers were presented from all over world on the technical themes of untapped vegetable diversity and improvement, production system and climate smart agriculture, plant health management, healthy food and diet diversification with vegetables, post harvest management, value chain and export of vegetables, entrepreneurship, IPR and education.



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Joining/Transfer/ Retirement

Joining Dr. Govind Pal Dr. Rajesh Singh Dr. (Mrs) Bhubaneshwari	Date of joining 08.10.2021 15.11.2021 10.12.2021
Transfer Dr. T. N. Rai Dr. Anjali Sahoo	Date of transfer 20.10.2021 22.10.2021
Promotion Mr. Prashant Gupta Mr. Roshan Lal Mr. Arun Mishra (UDC to Assistant)	Date of promotion 17.08.2021 17.08.2021 23.12.2021



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