



# Vegetable Newsletter



ICAR-Indian Institute of Vegetable Research



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- Prevalence of *F. oxysporum* f. sp. *lycopersici* race 1 infecting tomato in India
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### New initiative

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- Winged bean: an underutilised legume vegetable crop of future

### Sustainable agro-practices

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### Events

- ICAR- IIVR hosts Tomato Day
- Farmers' Fair cum Vegetable Show-Casing organized
- PARAVET training programme organized
- Visit of Shri Chhabilendra Roul, Addl. Secretary, DARE & Secretary, ICAR
- रबी किसान सम्मेलन एवं कृषि प्रदर्शनी का आयोजन
- National Science Day organized
- मधुमक्खीपालन पर प्रशिक्षण कार्यक्रम का आयोजन
- Visit of Dr PK Mishra, Addl. Principal Secretary to the GOI
- Special Swachhta Pakhwada organized
- Meeting of NICRA organized
- International Day of Yoga celebrated
- AICRP-VC Group meeting held at Bengaluru
- Distribution of vegetable kitchen garden packets in Hon'ble PM's newly adopted village

## From the Director's Desk

Vegetable crops are important component of Indian agriculture because of high yield potential, nutritional and therapeutical properties, suitability to fit in cropping system, economic viability and ability to generate more employment. Vegetables form an integral part of diet, especially vegetarians where they are main sources of daily requirement of proteins, dietary fiber, vitamins, minerals and phyto-nutrients. Our country is blessed with diverse agro-climates from typical tropical to typical temperate along with distinct seasons, making it possible to grow a wide range of vegetables across its territory. Although India ranks second in vegetable production (175.19 mt) in the global paradigm, vegetable productivity in our country is low just about 17.0 t/ha which is because of fragmented land distribution, occurrence of extreme weathers in changing climate scenario, deterioration in natural resources (soil and water), uneven growth across the country, and most importantly inadequate availability of quality seeds. The insect pollinators, mainly honeybees, solitary bees and bumblebees are very important in determining in productivity and quality of seeds, especially cross- and often-cross-pollinated crops, including vegetables. Beekeeping is an important component of agriculture that helps in better pollination, promotes rural diversification, and is an alternative source of income. Beekeeping also provides nutritional, economic and ecological security to rural communities at the household level. Being non-land-based activity of mixed farming, beekeeping does not compete with other resource demanding. Considering the importance of beekeeping as an agro-based industry and its role in increasing seed and crop yield by proper pollination, a Centre of Excellence on Beekeeping initiated by Govt. of India at ICAR-IIVR, Varanasi to improve the productivity and quality of agriculture in general and horticultural crop productivity in particular. This Center will also impart training to the farmers and other stakeholders. The institute along with AICRP-Vegetable Crops and three Krishi Vigyan Kendras under administrative control of IIVR are pursuing various research and extension activities aimed to address these challenges by increasing vegetable productivity per unit area and time; improving quality of the produce; and better resource management. The varieties of the institute have got a widespread adoption across the country and seed production of the developed varieties is one of the key functions of the institute. Round the year input distribution, capacity building and advisory services provided by the institute to the different stakeholders. Besides research activities, ICAR-IIVR is doing intense extension activities and has adopted 40 villages under "Mera Gaon Mera Gaurav" scheme and 6 villages under "Sansad Adarsh Gaon" scheme in 6 districts of Uttar Pradesh and Bihar. Similarly 1000 tribal households in 14 villages have been adopted in Sonbhadra district under Tribal Sub Plan scheme. In recent addition, the institute has adopted 5 more villages in the periphery of the institute under Farmers' FIRST project where cluster of technologies are being demonstrated in integrated vegetable based farming system approach for sustainable nutritional and livelihood security.

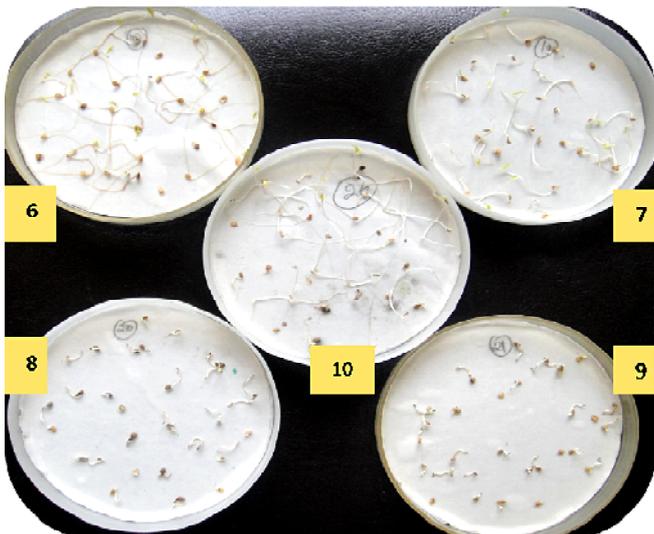
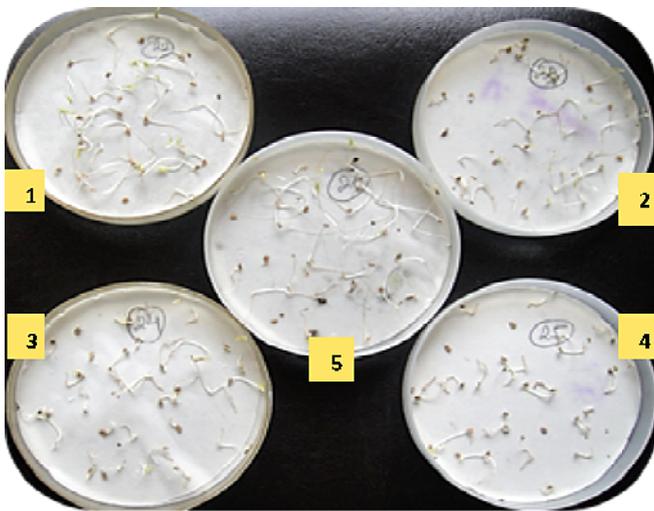


(Bijendra Singh)

## PROMISING TECHNOLOGY

### Nano-particles to enhance seed quality

Nano-technology has already shown its significant potential in many fields, including agriculture. The potential of nano-particles on seed quality enhancement has not been sufficiently exploited. Preliminary studies at ICAR-IIVR, Varanasi showed that application of 20 ppm nano-Zn enhances vigour index by 10% and 8.5 % in tomato and amaranth, respectively, along with increased germination



Effect of nano-Zn and bulk-Zinc seed treatment in tomato; 1- 20 ppm nano-Zn, 2- 200 ppm nano-Zn, 3- 1000 ppm nano-Zn, 4- 2000 ppm nano-Zn, 5- & 10- Control (Untreated) 6-20 ppm bulk-Zn, 7- 200 ppm bulk-Zn, 8- 1000 ppm bulk-Zn and 9- 2000 ppm bulk-Zn.

percentage by 4.2% and 11% over the control. While extremely higher (2000 ppm) of nano-zinc reduced vigour index by 72% and 49% in tomato and amaranth, respectively, mainly affecting the root growth. Similarly, the respective germination percentage was also reduced by 8.6% and 8.2% in tomato and amaranth. Interestingly, Shoot growth is found more positively affected at optimum dose (20 ppm nano-Zn) than root growth, while higher dose (2000 ppm nano-Zn) affects root growth more than the shoot growth in both vegetable crops. The seed treatment with nano materials at optimum dose gives enhanced germination and vigour as compared to seed treatment with bulk Zinc and control (untreated).

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## PROMISING GENOTYPE

### UHF VR12-1 & UHF VR12-2: Improved genotypes of mustard green

The mustard green (*Brassica juncea* L.) or vegetable mustard is an important crop of temperate hills of Uttarakhand, locally called Vegetable Rai or Sabji Rai. An old landrace 'Chinese Sarson' with flat, green and leathery leaves with thick and white midrib was grown since last three decades. However, some other races with green (Hathikan)



UHF VR12-1 (IC-0598459)



UHF VR12-2 (IC-0612094)



VRCAR-126 (Black carrot)

or purple leaves (Badshahi) also became popular from last few decades. Two improved genotypes viz., UHF VR12-1 (IC-0598459) and UHF VR12-2 (IC-0612094) have been developed at Department of Vegetable Science, Uttarakhand University of Horticulture and Forestry through half-sib recurrent selection from landraces Badshahi and Hathikan, respectively. Both of the lines can be grown by direct sowing or transplanting and perform very well even in frost conditions. UHF VR12-1 produces purple, broad, flattened, succulent, crispy, non-bitter and non-pungent leaves; withstand frost; and have leaf yield potential of 587-653 q/ha at the spacing of 20×10 cm spacing. Moreover, UHF VR12-2 produces green, broad, flattened, succulent, crispy, non-bitter and non-pungent leaves; withstand frost; and have leaf yield potential of 519-629 q/ha at the spacing of 20×10 cm spacing.

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### **VRCAR-126: a black carrot genotype for high anthocyanins and antioxidant activity**

It is a genotype of black carrot (*Daucus carota* ssp. *sativus* var. *atorubens*) having danvers (tapering) root shape, self-coloured and smaller core, fewer secondary roots, lesser root scars, tolerant to bolting, green colour leaves, purple colour petiole, tropical in nature and annual in life span. The roots are suitable for the purpose of salad, juice and halwa,

and a good candidate for making nutraceutical food supplement. VRCAR-126 has been developed through selection at ICAR-IIVR, Varanasi. It is ready to harvest after 95-105 days after sowing. The roots are long measuring 22-24 cm in length, 3.2-3.6 cm in diameter, 105-112 g in weight and has good root yield potential 20-22 t/ha in silt-loam soil. It is good source of phyto-nutrients such as anthocyanins (275-295 mg/ 100 g FW), phenolics (275-315 mg GAE/100 g FW) and flavonoids (125-145 mg CE/100 g FW). The antioxidant potentiality in terms of scavenging ability (ABTS) of VRCAR-126 is very high (65-75  $\mu\text{mol TE/g}$ ) which is >20-times higher than the most popular orange and red carrots. Because of the richness for phyto-nutrients and antioxidant properties, the black carrots provide many health benefits such as anti-carcinogenic effects against colon cancer cells, anti-inflammatory properties, eye health protecting qualities, improved vascular health and inhibits LDL (the bad) cholesterol.

**BK Singh**

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### **VRBTG-5: A promising genotype of bitter gourd**

VRBTG-5 is an advanced breeding line of bitter gourd developed through pedigree selection (VRBTG-47×VRBTG-89). Plants are vigorous and produce more branches. It flowers in 45-50 days and ready to first harvest in 55-60



days after sowing. As summer and kharif season crop, a plant produces 15-18 and 18-22 fruits, respectively, and each fruit weighs around 100-120 g and contains 10-20 seeds. The fruits are attractive, glossy green colour, medium long (18-20 cm) with discontinuous and medium tubercles which make them suitable for packing and distant marketing. The fruits have acute base at peduncle end and obtuse apex at blossom end. Fruits remain at harvestable maturity for longer duration. Total crop duration is 100-110 days with an average yield potential of 18-20 t/ha. It is tolerant to anthracnose and downy mildew under field condition.

***KK Gautam and DR Bhardwaj***

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### **VRPG-141: a high yielding clone of pointed gourd**

The fruits of this clone are spindle shaped, pointed towards stem-end and blossom-end, smooth surface without



any longitudinal strip, light green in colour, measuring 8-10 cm in length, 2.7-3.0 cm in diameter, average fruit weight 30-40 g, and fruit yield per vine varies from 10.5-12.0 kg. This type of pointed gourd is very common and popular in Varanasi and adjoining localities and fetches high prices because of the consumer's preference. The yield potential of VRPG-141 is 275 to 300 q/ha with 2500 plant population. This clone performs well both in summer and rainy season under Varanasi conditions.

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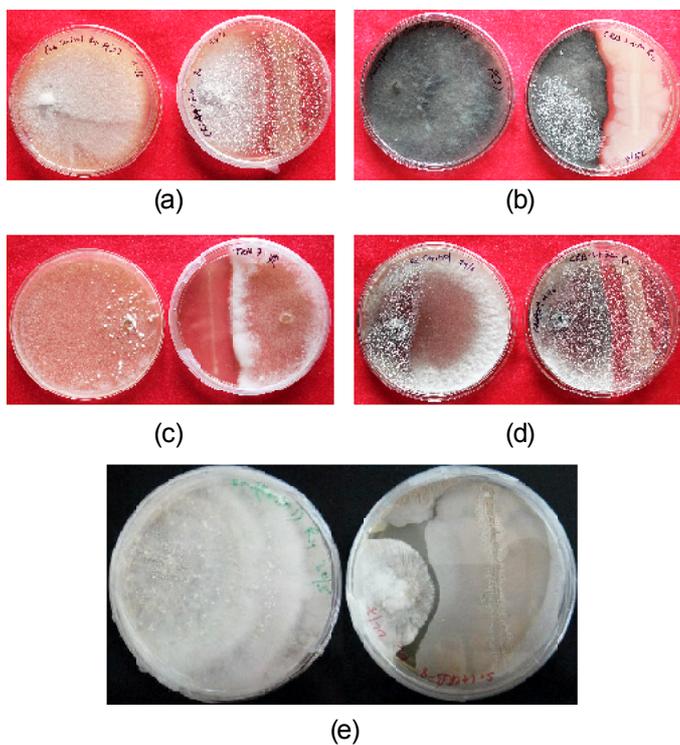
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## **PEST MANAGEMENT**

### **CRB-4, CRB-7 and CRB-8: Potential PGPR isolates against soil borne pathogens**

Plant Growth Promoting Rhizobacteria (PGPR) has been also used as potential bioagent for the management of plant diseases. A total of 52 isolates of rhizobacteria have been isolated from the tomato and chilli rhizosphere and rhizoplane using the serial dilution technique. These PGPR isolates were screened against important soil borne fungal pathogens such as root rot (*Rhizoctonia solani*), collar rot (*Sclerotium rofsii*), wilt (*Fusarium oxysporum* f.sp. *lycopersici*), charcoal rot (*Macrophonia phaseolina*) and white rot (*Sclerotinia sclerotiorum*) following the dual culture technique. The dual culture study revealed that CRB-7 is effective against *Fusarium oxysporum* f.sp. *lycopersici* and *Macrophonia phaseolina*, TRB-7 against *Rhizoctonia solani*, CRB-4 against *Sclerotinia sclerotiorum* and CRB-8 against *Sclerotium rofsii*.

The suppression of radial growth was 53.84% for *Fusarium oxysporum* f.sp. *lycopersici* (a), 44.67% for *Macrophonia phaseolina* (b), 50.76% for *Rhizoctonia solani* (c), 46.15% for *Sclerotinia sclerotiorum* (d) and 61.53% for *Sclerotium rofsii* (e) representing their biocontrol potential. The potential PGPR isolates have been identified by following the 16s r-DNA amplification and sequencing. The PGPR isolates CRB-7 and CRB-8 were identified as *Bacillus subtilis*, TRB-7 as *Alcaligenes faecalis* and CRB-4 as *Bacillus*



Dual culture of soil borne fungal pathogens and PGPR isolates

*pumilus*. These potential isolates can be used as one of the component in eco-friendly management of plant health.

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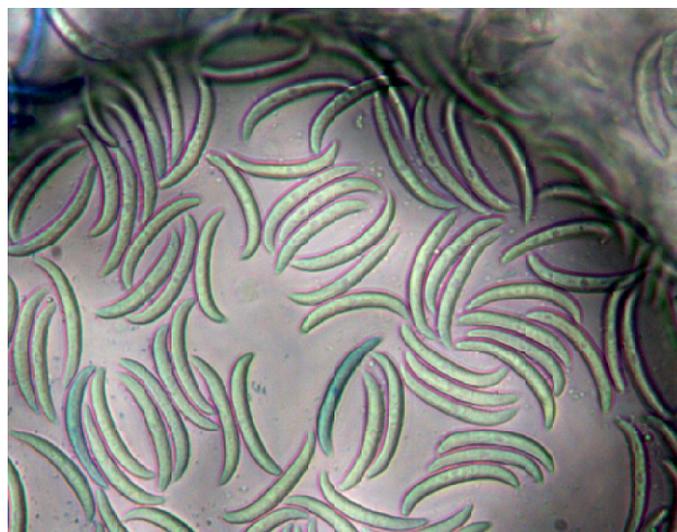
### Identification and characterization of ripe chilli fruit rot pathogen

Chilli (*Capsicum annum* L.) fruits showing typical anthracnose symptoms of sunken necrotic lesions with black dot like acervuli in concentric rings collected from Research Farm, ICAR- IIVR, Varanasi.

Infected fruits were examined under a microscope and small pieces of infected tissue were inoculated on potato dextrose agar (PDA). The inoculated Petri plates were incubated at  $28^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for 7 days. Pure culture of the pathogen isolate was established on PDA by hyphal tip method. Under light microscope, one-celled, smooth walled hyaline falcate, tapered ended conidia ( $16-26 \times 3-4 \mu\text{m}$ ) and acervuli were recorded. On the basis of macroscopic and microscopic features of the pathogen colony and on the basis



Typical fruit rot symptoms caused by *Colletotrichum capsici* on fruits of chilli



Microphotograph of micro-conidia of *C. capsici* (40x)

of their habitat and size of acervuli and conidia of chilli fruit rot causing pathogen was identified as *Colletotrichum capsici*. *Colletotrichum* sp. is an anamorphic fungal genera ranking 8<sup>th</sup> among top ten most important fungal plant pathogens in the world. In this respect this documentation will play an important role for better understanding of the pathogen and formulation of disease management strategies for prevention of pre and post-harvest crop losses under changing climatic scenario.

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## CRB-2, CRB-7 and CRB-9: Promising biocontrol agents to management of root-knot nematode

*Meloidogyne incognita* (Kofoid & White) Chitwood, the southern root-knot nematode, is one of the most important plant-parasitic nematode causing substantial damage to tomato crop. This pest is reported to cause 27.20% of yield loss at national level. In addition, act as predisposing agent for the entry of soil borne fungal and bacterial pathogens and aggravates the problem still further. Owing to their parasitic activity, second stage infective juveniles locate the plant root tips, penetrate and cause root infection. Typically they induce 'root-knot' or 'root-galls' by feeding on modified living plant cells inside plant roots and completes life cycle within 3-6 weeks. Damaged root systems become less efficient in nutrient uptake, as a result plant exhibits symptoms of chlorosis, yellowing, wilting, premature shedding of the foliage, and finally stunted growth.

Nematode management largely done by using the synthetic pesticides however, the many folds of adverse effect



Effect of consortia on *Meloidogyne incognita*



*Meloidogyne incognita* infected roots of tomato

on human health and environment cannot be overlooked. Research on alternative to chemicals drew more attention towards biological control agents. In this endeavor, ICAR-IIVR identified promising plant growth promoting rhizobacteria, *Bacillus subtilis* (CRB-7 and CRB-9) and *Bacillus marisflavi* (CRB-2) IIVR strain from chilli rhizosphere against this nematode. These bio-agents @ 5 kg/ha were enriched with FYM @ 5 t/ha could be applied individually or as consortium. Among all treatments, consortium of these bio-agents showed highest nematicidal efficacy by significantly reducing the number of root galls (Root-knot index: 1), final nematode soil population (61.49% over control) and increased yield (35% over control) in tomato under field condition. Hence, these bio-agents can exploit for cost effective, eco-friendly and sustainable management of root knot nematode.

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## Prevalence of *Fusarium oxysporum* f. sp. *lycopersici* race 1 infecting tomato in India

Tomato is affected by several fungal diseases under field conditions. Among them, wilt disease caused by

*Fusarium oxysporum* f. sp. *lycopersici* (FOL) is a devastating disease leading to 30-40% yield loss. There are three races (race 1, 2 and 3) reported on FOL pathogen. Selection of cultivar resistance to the particular pathogenic race prevailing in the local environment is the foremost important step in the disease management. A detail understating on the prevalence and distribution of FOL race is essential to select the suitable resistance varieties. Survey was conducted in major tomato growing area of Uttar Pradesh, Assam, Sikkim, Tamil Nadu, Punjab, Haryana, Jammu & Kashmir, Madhya Pradesh, Chhattisgarh, Bihar and Jharkhand. FOL isolates associated with the wilt disease were isolated and inoculated on the susceptible cultivar DVRT-1 to prove their pathogenecity. To discriminate the races of the FOL isolates infecting tomato in India, specific primers were used in the PCR analysis. Among the 20 isolates of FOL collected, 15 isolates were belonging to race 1. Around 75% of the isolates infecting are identified as race 1. In conclusion, predominant race of FOL infecting tomato in India is race 1.

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### Screening of vegetable soybean germplasm for resistance to *Spodoptera* spp.

Vegetable soybean [*Glycine max* (L.) Merrill] is quickly gaining popularity among health conscious Indian consumers due to its rich nutraceutical profile. It is valued for its tender 'green pods' which could be served as snacks, salad-mixes, stir-fried or for 'immature green seeds' which are consumed just like the green peas. ICAR-IIVR, Varanasi has made a humble beginning on vegetable-soybean research. *Spodoptera* spp. was recorded as major insect pest during the cropping season (*Kharif* 2016). The incidence was recorded during the vegetative and pod formation stage of the crop. A total of 75 different soybean accessions were screened on the basis of leaf damage rating scale, which varies from 0-9 (0- No visible leaf damage, 9- Leaves destroyed on 70% of leaves). Our results showed that leaf damage rating varied from 1.0 in EC-771-197 to 8.33 in EC-771-159. Among the 75 accessions screened for *Spodoptera* spp., 20 genotypes were found resistant, 51 genotypes were

moderately susceptible and 4 genotypes were found highly susceptible.

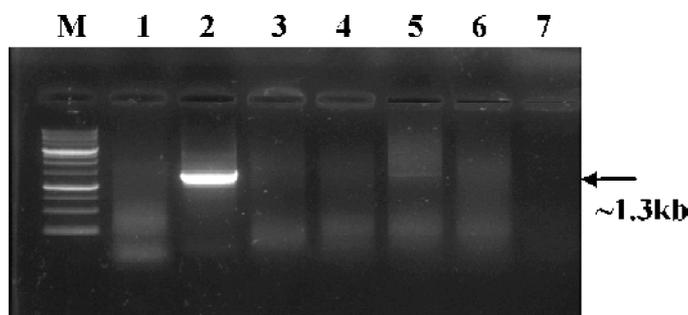
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### Molecular detection of phytoplasma infecting brinjal

Brinjal being a hardy crop grow well even under drought conditions and is prone to attack from a number of biotic and abiotic stresses. Among the major biotic constraints, brinjal little leaf (BLL), a phytoplasma disease poses a serious threat by affecting its cultivation and yield. Almost all the brinjal varieties under cultivation are susceptible to this phytoplasmal disease and causing significant yield loss up



Typical symptom of brinjal little leaf



Nested PCR amplification of 16S rDNA region of phytoplasma infecting brinjal using primers P1/ P7 followed by 3F/3R at different DNA dilutions

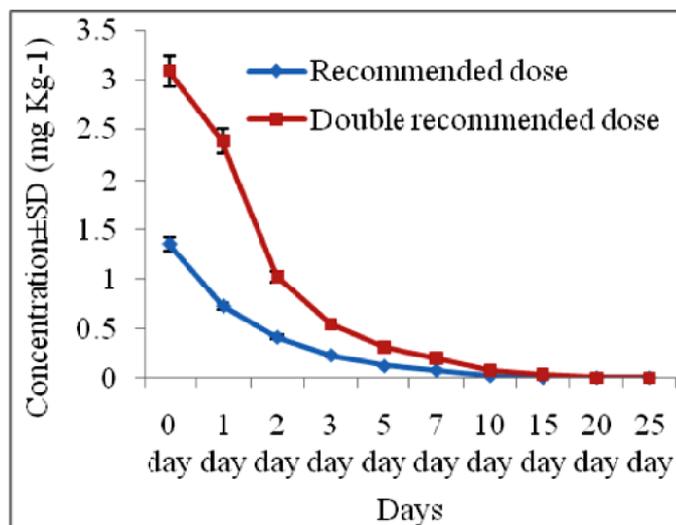
to 40 per cent. However in severe condition, losses can approach up to 100 per cent. BLL is transmitted by insect-vectors leaf hoppers (*Hishimonas phycitis* and *Empoasca devastans*) and grafting. The infected brinjal plants showed typical symptoms of reduction in leaf size, shortening of internodes, severe stunting and excessive branching giving witches'-broom appearance. Nested PCR assay using universal phytoplasma specific primer pairs (P1/P7 followed by 3F/3R) showed the amplification of ~1.3 kb corresponding to 16SrDNA gene in symptomatic brinjal samples. Phylogenetic analyses of 16SrDNA sequences revealed the association of 16SrVI-D (Clover proliferation group) subgroup with little leaf disease of phytoplasma in Varanasi region. This was further confirmed with the *in silico* virtual RFLP analysis.

Polymerase chain reaction (PCR) assay of 16SrDNA followed by RFLP analysis by using universal phytoplasma specific primers showed the amplification of 1.3 kb corresponding to 16SrDNA gene of phytoplasma infecting brinjal crops. Phylogenetic analyses of 16SrDNA sequences of phytoplasma strain revealed that brinjal associated with little leaf phytoplasma in Varanasi belongs to 16SrVI-D (Clover proliferation group) sub-group.

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### Dissipation pattern and risk assessment of Cyazapyr in okra fruit

Cyazapyr was sprayed in okra field at recommended dose of 1.8m/L and double of the recommended dose (DD). Sample was collected at 0 (2 hours after spraying), 1, 2, 3, 5, 7, 10, 15, 20 and 25 days after second spraying, and also from unsprayed crop as control. After extraction and cleanup of samples, analysis for Cyazapyr residue was done with LC-MS/MS system equipped with an Agilent 1200 series HPLC. Analyst was used for data acquisition and processing. The kinetic equation, correlation coefficient and half-life of Cyazapyr were calculated. Initial deposits of cyazapyr at 24.5 g and 49 g a.i. ha<sup>-1</sup> in okra fruits were 0.01355 and 0.03085 mg g<sup>-1</sup>, respectively. Cyazapyr residue dissipation fit best into, first and first+first order kinetics with half-life of 1.5 days for both the doses. The Pre-harvest interval (PHI)



Dissipation of Cyazapyr in okra

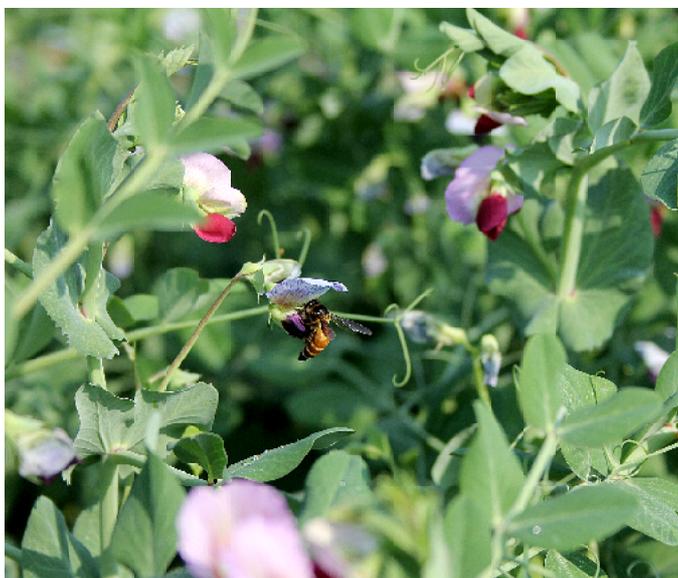
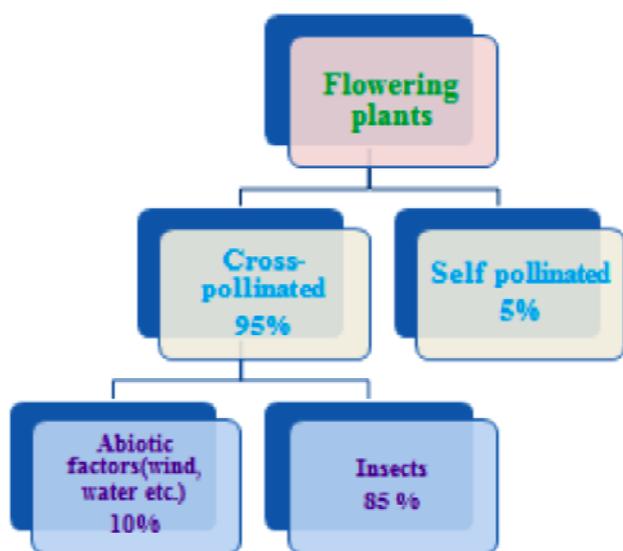
for cyazapyr was 1.0 and 2.0 days for single and double dose in whole fruits. The residues dissipated to below the Maximum residue limit (MRL) of 1.5 mg kg<sup>-1</sup> on the same day. The acceptable daily intake (ADI) for Cyazapyr is 0.01 mg kg<sup>-1</sup> body weight day<sup>-1</sup>. Multiplying the ADI by the body weight of an average child (16 kg), the MPI was estimated at 0.16 mg person<sup>-1</sup> day<sup>-1</sup>. The dietary exposure on each sampling day based on average daily consumption of 0.0106 kg okra per day were less than the MPI both at the RD and DD of applications. The residue dissipation studies and PHI of the test insecticide with dietary exposure less than MPI indicated their use as quiet safe for human consumption. It will be useful for promoting effective residue management and to ensure safe use of this insecticide for controlling sucking insect pests in okra crop.

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## NEW INITIATIVE

### Centre of Excellence (CoE) on Beekeeping at ICAR-IIVR, Varanasi

Honeybees are by far the most useful creatures of our green planet. The greatest species diversity of genus *Apis* is seen in India and adjacent regions. Among the different species of the bees spread all over the globe, the most



important four species viz., Rock bee (*Apis dorsata*), Indian hive bee (*Apis cerana indica*), little bee (*Apis florea*) and the stingless bee (*Tetragona* species) are widely distributed in India. Introduction and successful establishment of the high yielding exotic honey bee (*Apis mellifera*) in the country has added a new dimension to bee-keeping. This species has been spread to all parts of the country during early eighties, and brought about the amber/ honey/ sweet revolution in our country. The change of subsistence system to commercial cultivation of horticultural crops possesses new challenges for improving crop productivity and quality. Amongst several factors attributing to low productivity, inadequate pollination is the most important due to decline

in population of pollinators. Among different pollinators, bees are considered most important in flowering plants bringing about pollination, maintaining genetic diversity and continuation of the plant species, in addition to honey production.

Among different insects, bees are credited as efficient and effective pollinators in majority of the crops, including vegetables especially cross-pollinated ones such as bottle gourd, cucumber, ash gourd, melons, gourds, pumpkin, onion, cole crops (cabbage, cauliflower, broccoli, knoll-kohl), radish, carrot and leaf mustard. Honeybee especially in cucurbits is the primary and only dependable pollinator which contributes 84–96% of the total pollinators. The vegetables like brinjal, lima bean and okra set fruit without bees, but bee activity has shown to increase yield. Honey bees don't assist in the pollination of the following crops, but will collect pollen and nectar from peas, snap bean, sweet corn and tomato. However, the virtual use of honey bees as a tool in increasing production and quality of produce is apparently in infancy stage in our country. ICAR-IIVR pioneer institute dealing with vegetable research and development in the country. Thus, keeping in view the importance of bee as an agro-based industry and its role in increasing crop yield by proper pollination, a Centre of Excellence on Beekeeping initiated at ICAR-IIVR, Varanasi to improve agriculture productivity in general and horticultural crop productivity in particular. This Center will also impart training to the farmers and other stakeholders.

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## VEGETABLE FOR HEALTH

### Winged bean: an underutilised legume vegetable crop of future

Winged bean (*Psophocarpus tetragonolobus*) is one of the newest Asian vegetables coming to market these days, and its appearance is long overdue. Known for centuries in tropical Asia, this attractive climbing perennial is more or less your total meal: all parts of the plant are edible—the pods, the beans inside, the shoots, the flowers and even the tubers. Tender, immature pods are one of the very low-



calorie vegetables. Winged bean can also be grown as annual vine. It grows with the support of trellis to about 5 m in length. It grows best under hot, humid tropical belt supplanted with short daylight, enough moisture and well-drained sandy loam soil. After about 45 days of planting, it bears white, pink or light blue colour flowers appear in spikes. Wing shaped, elongated pods come into view about 60 days after planting.

The pods feature along its entire length, frilly edges on its four sides and round to oval shape seeds inside. There are enough variability for various traits of horticultural importance viz. days to anthesis, days to first fruit appearance, days to edible-pod maturity, pod length, number of pods/cluster, pod width, fresh pod weight, number of seeds/ pod and tuber weight. Antioxidant analysis was also performed for some of the lines for edible pods and tubers.

Its green pods possess higher antioxidant activity than raw tubers.

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## SUSTAINABLE AGRO-PRACTICES

### Crop geometry and fertigation in summer squash

A study on crop geometry and fertigation was conducted in summer squash during winter season. The crop geometries studied were- single, double, three, and four plants irrigated by single emitter. The fertigation level was varied from 60-120% NPK with an increment of 20% under various crop geometries. Summer squash responded



Bumper crops stand of summer squash

positively to increased level of plant population and fertigation by enhanced yield and water use efficiency under various crop geometries. The yield of summer squash enhanced 42-72% with 2, 3 and 4-plants irrigated by single emitter over single plant geometry. Water use efficiency enhanced from 52-72% in various plant geometry. The maximum fruit yield of 40 t/ha with water use efficiency 2.17 t/ha-cm was achieved when plant geometry was kept 4 plants/emitter and fertigation was done @ 120% NPK. Yield enhanced with increasing level of fertigation by 52-90% with 60-120% fertigation under various crop geometries over control.

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ICAR-Indian Institute of Vegetable Research,  
Varanasi-221 305, UP

## EVENTS

### ICAR- IIVR hosts Tomato Day

The Zonal Technology Management Unit (ZTMU) of ICAR-IIVR, Varanasi organized "Tomato Day" on 7<sup>th</sup> January 2017 to showcase its varieties and hybrids of tomato to the private organizations with aim to percolate these varieties and hybrids on to farmers' field. The institute is already licensing its promising technologies on non-exclusive basis for further multiplication and sale of materials including parental lines of the hybrids to the private sector in accordance with the guidelines provided by ICAR, New Delhi. The program was attended by 21 representatives from 11 private seed companies. The participants expressed their keen interest in some of the promising varieties and hybrids particularly Kashi Aman, Kashi Adarsh and Kashi Abhimaan (hybrid). Dr B Singh, the Director of the Institute, while interacting with the participants expressed his belief that the program has enriched the Institute with the current market requirements in these crops and has provided an opportunity to the private sector to have hands on promising materials. He assured on working for an effective public-private partnership so that ultimately we can benefit the farmers of the country through commercial, cooperative and public routes by transferring the developed technologies.

### National Farmers' Fair cum Vegetable Show-Casing organized at ICAR-IIVR

A National Farmers' Fair Cum Vegetable Show-Casing was organized in collaboration with Association for Promotion of Innovation in Vegetable (APIV) at ICAR-IIVR, Varanasi on 27.01.2017 to educate the farmers regarding sustainable vegetable and agriculture production. It was inaugurated by Padmashri Dr Brahma Singh, Ex-Director, Life Sciences, Defence Research & Development Organization (DRDO), New Delhi. In his inaugural address, he emphasized for climate resilient vegetable production, protected cultivation through poly- and net-houses as well as use of drip and fertigation for sustainable vegetable production in the country. During celebrations, the Director, IIVR, Varanasi highlighted the production and distribution of high quality seeds of improved vegetable varieties of the institute. More than 3000 farmers participated from different states like Uttar Pradesh, Bihar, Maharashtra, Karnataka, Jharkhand, etc.

Altogether 39 stalls related to vegetables, potato, seeds, fertilizer, beneficial microbes, fisheries, onion, garlic, pesticides, drop irrigation, etc. displayed by various ICAR Institutes, KVKs, Agricultural Universities and Private Sectors. The prizes were distributed to farmers for their contribution in vegetable production.

### PARAVET training programme organized at KVK, Bhadohi

Fifteen days vocational PARAVET training programme was organized at KVK, Bhadohi, UP during 06-20 February 2017. In this programme, 15 unemployed educated rural youths were selected from each of 06 blocks of the district. The need based course content was developed jointly by the District Veterinary Department; KVK, Bhadohi; and BHU,



Varanasi. The objective of the training was to make aware the participants about cattle breed improvement, artificial insemination, diagnosis & treatment of major diseases, vaccination and fertility management. This helped to develop skill among trainees and they are able to provide door to door veterinary services. The pharmaceutical companies had provided the treatment kits to the trainees for their use in field. After that the trainees are being deputed to various nearby Veterinary Hospital of the district for a period of three month for practical exposure under the supervision of Veterinary Department of the district and KVK, Bhadohi.

### Visit of Shri Chhabilendra Roul, Addl. Secretary, DARE & Secretary, ICAR, New Delhi

Shri Chhabilendra Roul, Addl. Secretary DARE & Secretary ICAR, New Delhi visited ICAR-Indian Institute of Vegetable Research, Varanasi on 18<sup>th</sup> February 2017. In an interaction with the scientists of the institute, he categorically



mentioned for adoption of new technologies like genome editing to keep pace with advance researches being done elsewhere in the world. He stressed for more focused attention towards developing hybrids in vegetables by public sector and making them available to the farmers at affordable price. He also briefed about new reforms of ICAR. While visiting Technology Park, experimental fields and laboratories of the institute; he appreciated the team ICAR-IIVR for excellent works being done at the institute. He was highly impressed with live demonstration of latest vegetable technologies in Technology Park for the benefit of farmers and other stake holders.

### कृषि विज्ञान केन्द्र, भदोही द्वारा रबी किसान सम्मेलन एवं कृषि प्रदर्शनी का आयोजन

कृषि विज्ञान केन्द्र, बेजवाँ, भदोही द्वारा एक दिवसीय जनपद स्तरीय रबी किसान सम्मेलन एवं कृषि प्रदर्शनी (18.02.2017) का आयोजन किया गया। इस सम्मेलन का विशय “नवोन्मेषी कृषि तकनीकी एवं पशुपालन द्वारा मृदा स्वास्थ्य संरक्षण” था। सम्मेलन के मुख्य अतिथि श्री विरेन्द्र सिंह ‘मस्त’, माननीय सांसद, भदोही एवं विशिष्ट अतिथि डा. बिजेन्द्र सिंह, निदेशक, भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी थे। मेले का अध्यक्ष प्रगतिशील कृषक राम अकबाल तिवारी, चकसुन्दर (ज्ञानपुर) थे। माननीय सांसद महोदय ने कृषि प्रदर्शनी का अवलोकन करने के पश्चात् उपस्थित कृषक समुदाय को सम्बोधित किये एवं सरकार के विभिन्न योजनाओं के बारे में विस्तृत जानकारी दिये। सब्जी एवं फल की खेती पर जोर देते हुए कहा कि भदोही जिले में इसकी अपार सम्भावनाएं हैं। सोलर पम्प से सिंचाई, फसल बीमा योजना, डेयरी योजना के बारे में सिकानों को जानकारी दिये एवं कहा कि इससे किसानों की लागत कम हो



रबी किसान सम्मेलन -2017

जायेगी, जिससे की आय दोगुना हो जायेगा। निदेशक, भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी ने किसानों को सम्बोधन करते हुए कहा कि जैविक खेती हेतु पं. दीनदयाल जैविक खेती योजना का क्रियान्वयन किया जा रहा है।

### National Science Day organized with theme “Science and Technology for Specially Abled Persons”

On the occasion of National Science Day on 28 February 2017, ICAR-IIVR, Varanasi celebrated with the theme of “Science and Technology for Especially Abled Persons”. The programme was inaugurated by Dr. B. Singh, Director, ICAR-IIVR, Varanasi. In his inaugural address, he highlighted the great contribution of specially abled personalities in the areas of science and technologies. On this occasion, a debate and poster competition was



organized with an objective of creating awareness regarding role of specially abled person in the development of Nation through science and technology, where about 150 students from Kiran ViklangVidyalaya, Madhavpur; and Shri Agrasen PG College, Varanasi were participated with zest and enthusiasm. The debate with its time honored topic "Science and Technology in the Development of Nation with special reference to specially abled person" was the platform of exchange of knowledge base and the posters based on "Role of science and technology for specially abled persons" were emphasized the contribution of specially abled personalities in the development of nation in different challenging areas. The scientists from ICAR-IIVR also delivered the speeches on "Assistive technologies and use of new gadget" and "Inspirational stories and contribution of specially abled person in nation development".

### भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान ने दो दिवसीय मधुमक्खीपालन पर प्रशिक्षण कार्यक्रम का आयोजन

उत्तर प्रदेश में मधुमक्खीपालन की अपार सम्भावनाओं को देखते हुए किसानों के सर्वांगीण विकास हेतु प्रधानमंत्री कौशल विकास एवं किसानों की आय दोगुना करने की योजना के अन्तर्गत कृषि एवं किसान कल्याण मंत्रालय के अधीन राष्ट्रीय मधुमक्खी बोर्ड द्वारा पूर्वांचल में स्थित भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में समेकित मधुमक्खीपालन विकास केन्द्र स्थापित किया गया है। यह उत्तर प्रदेश का प्रथम इकलौता मधुमक्खीपालन विकास का उत्कृष्ट केन्द्र भी है। उत्तर प्रदेश के साथ-साथ पश्चिम बिहार के युवकों का भी कौशल विकास में बढ़ोत्तरी को ध्यान में रखते हुये भारतीय सब्जी अनुसंधान संस्थान, वाराणसी द्वारा दो दिवसीय (20 एवं 21 मार्च, 2017) राज्यस्तरीय मधुमक्खी पालन एवं प्रबंधन पर प्रशिक्षण कार्यक्रम राष्ट्रीय मधुमक्खी का आयोजन हाइटेक नेशनल प्रोडक्ट (इण्डिया) लिमिटेड के सहयोग से किया जा रहा है। इस कार्यक्रम का शुभारम्भ डा. जनार्दन सिंह, भूतपूर्व अधिष्ठाता, कृषि विज्ञान संकाय, बनारस हिन्दू विश्वविद्यालय, वाराणसी आज दिनांक 20.03.2017 द्वारा किया गया। इस अवसर पर किसानों को सम्बोधित करते हुए डा. सिंह ने लीची एवं नीम के बगीचों में मधुमक्खीपालन करने एवं मधुग्राम विकसित करने का सुझाव दिया। उन्होने मधुमक्खीपालन के लिये विभिन्न प्रकार के फलदार वृक्षों की जानकारी दी। डॉ. अनिल कुमार सिंह, उपनिदेशक (उद्यान), मिर्जापुर ने अपने संबोधन भाषण में राज्य सरकार द्वारा मधुमक्खीपालन पर चलाये जा रहे कार्यक्रमों की जानकारी दी। श्री देवव्रत शर्मा, मधुमक्खीपालक एवं सदस्य, राष्ट्रीय

मधुमक्खी बोर्ड किसानों को सम्बोधित करते हुये कहा कि नवयुवक शहद, पराग, मोम, मधुविष एवं रायल जेली का उत्पाद करके रोजगार प्राप्त कर सकते हैं।

### Visit of Dr PK Mishra, Addl. Principal Secretary to the Hon'ble PM, Gov. of India

Dr PK Mishra, Additional Principal Secretary to the Hon'ble PM, Government of India visited ICAR-IIVR, Varanasi on 01<sup>st</sup> May 2017. While visiting experimental fields, Technology Park and Waste Management Unit of the institute, he appreciated the team ICAR-IIVR for excellent works being done at the institute. He was highly impressed to see the low energy gene bank and live demonstration of latest vegetable technologies for the benefit of farmers and other stake holders. In an interaction with scientists of the institute, he categorically mentioned for doubling the farmers' income by 2022 and said that vegetables cultivation has much important roles for increasing farmers' income. He also emphasized that farmers should be made aware regarding price risk, market intelligence and post-harvest management. He stressed for more focused attention towards transfer of latest technologies to the farmers'



developed by public sector and making them readily available to the farmers at affordable price. He opined the need of advance research keeping in view the holistic approach to insure the benefits for the farmers and other stakeholders.

### Special Swachhta Pakhwada organized

Special Swachhta Pakhwada (16<sup>th</sup> to 31<sup>st</sup> May 2017) organization commenced at ICAR-IIVR, Varanasi with the sworn-in of the Swachhta Pledge (cleanliness Oath) by all the staff of Institute under the leadership of the Director, Dr. B. Singh. During the pledge, Director highlighted the importance and benefits of cleanliness and hygiene. All staff committed for at least 100 hours of Cleanliness action on their part, in Institute as well as their residential surroundings. During the program institute and its mini campus, ATIC center, institute lawns, laboratories, parking areas and adjoining roads etc nearby institute were cleaned. One day was also devoted to clean the individual office rooms as well as weeding out of obsolete records. Extensive Cleanliness Drive was undertaken by one and all during the pakhwada.



Campaign for Vermicompost under the banner of “How to recycle your kitchen waste: Vermicompost, a key solution” was launched both electronically and physically. As a part of the awareness program, different crop/vegetable residues, rather than conventional burning and there by polluting the environment, are directed to make the compost in the residue management unit of the institute. Accordingly, residues of sponge gourd, bottle gourd and pumkin after their seed extraction were extensively used for the vermicompost which is further used for organic manure for sustainable agriculture without zero pollution to the environment.

### Meeting of National Innovations in Climate Resilient Agriculture (NICRA) organized

A meeting of NICRA project on Horticultural Crops to review the progress and finalize the technical programmes for the years 2017-2020 was held at ICAR-IIVR, Varanasi on 17.06.2017. Dr. A. K. Singh, DDG (Hort. Sci.), ICAR, New Delhi chaired the meeting and remarked that the horticultural crops have the potential to increase the farmers’ income and hence the effect of climate change on these crops across the country be critically studied. He also emphasized on



identification of critical issues related to effect of climate change and execution of realistic technical programme on horticultural crops to have an impact on economy of farmers. Dr. B. Singh, Director, ICAR-IIVR, Varanasi welcomed the delegates and narrated the research achievements of NICRA project in the institute. He highlighted the success of grafted tomato for water-logged condition. He also informed the house that under the flagship programme of the Prime Minister of India, “Mera Gaon Mera Gaurav”, ICAR-IIVR has adopted villages from each district of Chandauli, Ghazipur, Jaunpur, Mau, Mirzapur and Varanasi and scientists of the institute regularly visit these villages for demonstration and dissemination of technologies to increase the income of farmers. The programme was attended by representatives from different institutes of horticulture across the country viz., ICAR-CPRI, Shimla; ICAR-CRIDA, Hyderabad; ICAR-RCER, Ranchi; ICAR-IIHR, Bengaluru; ICAR-CITH, Srinagar; and ICAR-DOGR, Pune in addition to ICAR-IIVR, Varanasi. The scientists from these institutes presented the progress of research work and technical programme for next three years at their respective institutes.

## International Day of Yoga celebrated

International Day of Yoga was celebrated at ICAR-Indian Institute of Vegetable Research, Varanasi in the morning of 21<sup>st</sup> June 2017. All the employees of institute, including scientists, technicals and administrative staff had participated in program with enthusiasm under the leadership of the institute's Director, Dr. Bijendra Singh. On this occasion, he welcomed all the participants and thrown light on the importance of daily practicing yoga. In this program,



various exercises, yoga asans, pranayam, etc were demonstrated and conducted by Yoga expert Sri Chandesh Dube and Girish Upadhyay. They had emphasized that the regular practice of these asans and pranayam would be helpful in relieving of body pains and remedy for several diseases such as diabetes, heart and lung diseases.

## AICRP (VC) group meeting held at Bengaluru

XXXV annual group meeting of AICRP (VC) organized at ICAR-IIHR, Bengaluru, Karnataka during 24-27<sup>th</sup> June 2017. It was inaugurated by Dr. A.K. Singh, DDG (Hort. Sci.). More than 300 participants from 36 regular centres, 18 voluntary centres, more than 40 private seed companies and different state agencies as well as progressive farmers participated in the meeting. During the group meeting, three open pollinated varieties, one each in brinjal (long), dolichous bean (pole type), bottle gourd); three hybrids, one each in tomato

(determinate), brinjal and ridge gourd; and one resistant variety in brinjal against bacterial wilt were identified for cultivation in different agro-climatic zones of the country. Besides, 32 production and 6 protection technologies were also identified for the benefit of farming community.

## Distribution of vegetable kitchen garden packets in PM Shri Narendra Modi's newly adopted village Kakrahiya for nutritional security of the villagers

Vegetable kitchen garden packets distributed to 150 farm families in PM Sri Narendra Modi's newly adopted village Kakrahiya in district Varanasi. The kitchen garden packets contained improved varieties of bottle gourd (Kashi Ganga), sponge gourd (Kashi Divya), pumpkin (Kashi Harit), cowpea (Kashi Kanchan) and okra (Kashi Kranti). Further, one day workshop on "Importance of vegetables and modern cultivation techniques" was organized on 30.06.2017 in the Anganwadi campus of the Kakrahiya village where the scientist of ICAR-IIVR told that consumption of vegetables can fetch nutritional security and make people healthy. Every village household should have vegetable kitchen garden for consumption of fresh vegetables throughout the year. It is estimated that every farmfamily can earn Rs. 1500-2000 in each cropping season from the kitchen garden after fulfilling family consumption requirement.



## AWARDS AND RECOGNITIONS

- Dr B Singh, Director, IIVR selected for the Membership of the National Academy of Sciences, India (NASI) for the year 2017
- Dr B Singh, Director, IIVR elected as Fellow of the National Academy of Agricultural Sciences (NAAS).
- Dr B Singh, Director, IIVR, received Dr Kirti Singh Life Time Achievement Award-2016 in Vegetable Science by ISVS, Varanasi.
- Dr Selvakumar R, Div. of Vegetable Science, IARI, New Delhi awarded with Dr Dwarika Nath Memorial Award-2016 for best PhD thesis "Genetic studies for economic traits and molecular mapping for anthocyanin content in carrot (*Daucus carota*)".
- Dr Anant Bahadur, KK Jangid, AK Singh, Umesh Singh, KK Rai, MK Singh, N Rai, PM Singh, AB Rai and B Singh awarded with Dr Harbhajan Singh Memorial Award-2016 for best paper entitled "Tomato genotypes grafted on eggplant: physiological and biochemical tolerance under waterlogged condition" published in Vegetable Science 43(2): 208-215.
- Dr Arun Kumar Singh conferred with Dr Bishwajit Choudhary Memorial Award-2016 for Outstanding Vegetable Scientist by ISVS, Varanasi.
- Dr TK Behera; Dr Arup Chattopdhyay; Dr BS Tomar; Dr T Pradeepkumar; Dr SK Malhotra; Dr Akhilesh Sharma; Dr KK Pandey; Dr Sudhakar Pandey; and Dr Shri Dhar honoured as ISVS Fellows-2016.

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