



# Vegetable Newsletter



ICAR-Indian Institute of Vegetable Research



VOLUME 3, No. 2

JULY-DECEMBER 2016

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#### Events

- हिन्दी चेतना मास का शुभारम्भ
- Training on hybrid seed production
- Okra Field Day organized
- Secretary (DARE) & DG, ICAR visited Varanasi
- Sw achhta Pakhwada organized
- Short Course on Underutilized Vegetable Crops
- Dr. AK Singh, DDG (AE & HS) visited at KVK, Bhadohi
- केन्द्रीय कृषि एवं किसान कल्याण राज्य मंत्री का, वाराणसी भ्रमण
- Brinjal and Chilli Field Day organized
- समेकित एवं उत्कृष्ट मधुमक्खीपालन विकास केन्द्र की स्थापना

## From the Director's Desk

Vegetable production is always profitable as a cash crop for small and marginal farmers for their subsistence and nutritional security. Globally, India ranks second in vegetable production, contributing 15.8 and 14.0% of global vegetable area and production, respectively. With 9.8 million ha area under vegetables and 171 million tonnes of production, the vegetables also contribute significantly in export market. During 2014-15, India exported 20,19,342 tonnes fresh vegetables, valued approx. Rs. 4,61,164 lakh, and also earned Rs. 53,855 lakh by exporting dried and preserved vegetables. Countries like UK, Saudi Arabia, USA and the Netherlands have good demand of processed vegetables. ICAR-IIVR is adopting a multi-pronged strategy to meet the future challenges in vegetable production. This includes genetic improvement, vegetable production and vegetable protection strategies. Genetic improvement strategies focus on evolving climate-proof vegetables, genetically edited vegetables (GEV), resource efficient, photosynthetically efficient and thermo- and photo-insensitive, nutri-rich and multipurpose vegetable varieties. The rootstock breeding strategies are also being explored to manage abiotic stresses. The institute has developed transgenic varieties in brinjal and tomato. In brinjal, Kashi Taru cultivar has been transformed with two Bt genes, *Cry 1 Ac* and *Cry 1 Aa3* for effective control of fruit and shoot borer. Similarly, transgenic was developed in tomato cultivar Kashi Vishesh with *Cry 1 Ac* for resistance to tomato fruit borer. To sustain in deficit water condition and increased temperature, tomato cultivar Kashi Vishesh has been transformed with *AtDREB1A* gene for drought and salt tolerance and *BcZAT12* gene that provides drought and heat tolerance. The institute has standardized the drip irrigation scheduling protocol for tomato, broccoli, spring-summer okra and cucumber. Through drip irrigation, 65-150% higher water use efficiency and 46-55% water savings have been achieved in vegetables along with 17-62% increase in yield compared to surface irrigation. Besides, ICAR-IIVR is in the process of standardizing the technology for organic production of brinjal, tomato, cowpea, cabbage, pea, etc. The vegetable produced under organic farming are free from chemical contaminants and are good for health. The quality, taste and flavour improves mainly through increased dry matter, vitamin-C, protein content, and decrease in nitrates and oxalates in vegetables. The institute has standardized the shellac based edible coating for extending the shelf life of capsicum, bitter melon and okra. Further, simple low-cost steeping preservation with hurdle concept has been developed for cauliflower, carrot and pointed gourd for extending the shelf-life at ambient storage temperature. Low-cost drying technology with good hydration and aesthetic quality has also been standardized for bitter melon, cauliflower, okra, carrot, tomato and green chilli powder. ICAR-IIVR is thriving to make vegetable cultivation a very lucrative venture by strategic and applied research for developing technologies to enhance productivity of vegetable crops, scientific leadership in coordinating network research for solving location specific problems, acts as a national repository of scientific information relevant to vegetable crops and as a centre of training for upgradation of scientific manpower in vegetable crops.



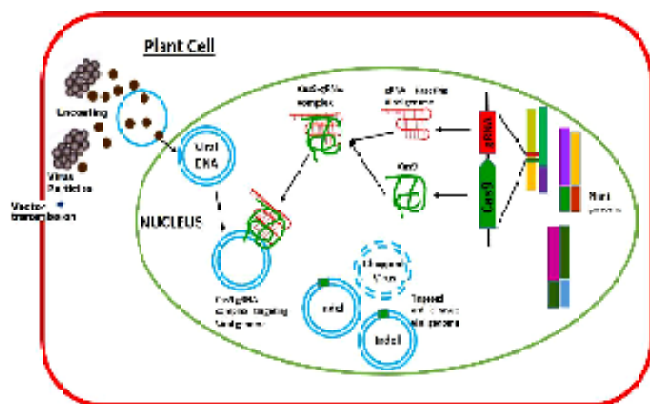
*Bijendra Singh*

(Bijendra Singh)

## NEW CONCEPT

### CRISPR/Cas9 to engineer virus resistance in plants

CRISPR/Cas9-mediated virus resistance in the plant cell. gRNA, and Cas9, components of the CRISPR/Cas9 machinery, are expressed from the plant genome and form gRNA-Cas9 complex. Upon viral infection, the viral DNA replicates through the dsDNA replicative form inside the nucleus of host cell. The gRNA-Cas9 complex targets the viral dsDNA at complementary target sites and cleaves the



viral genome via double strand breaks formation which can be repaired by non-homologous end joining repair. Otherwise, the formation of double strand breaks can lead to the degradation of the virus genome.

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## PROMISING TECHNOLOGY

### Development of instant protein rich vegetable soup mix

Soups are refreshing and good sources of easily digestible nutrients such as protein, vitamins and minerals. Soups are delicacy items which are generally served in parties and functions. The process for making soups is cumbersome process with limited shelf life of 4-5 hrs. Heat treatment and subsequent cold storage can extend the shelf life to not more than 8-10 hrs. Protein calorie malnutrition is very much prevalent especially in children of our country due to very low consumption of vegetables in the diet of children. The consumption of vegetables in the form of soup in the diet of children would reduce the protein calorie malnutrition. Furthermore, instant protein rich vegetable soup mix requires only reconstitution in definite volume of water and boiling for 2-3 min as well as retains the quality of soup mix for more than 6 months at ambient storage. The

development of vegetable soup mix involved freeze drying of blanched vegetables such as green tender pea, carrot shreds, cauliflower shred, onion and garlic pieces. Freeze dried vegetable pieces are mixed with whey protein concentrate, corn flour, modified starch, spices and seasonings with sifting so that there should be uniform mixing of ingredients.



Instant Protein rich vegetable soup mix is packaged in laminated pouches and subsequently sealed and stored at ambient storage temperature. Instant soup mix contained moisture 4.3-5.0%, protein 20-21%, insolubility index of 12-13 ml/cc, loose and packed bulk densities of 0.39-0.40 and 0.51-0.53 g/cc. Instant vegetable soup mix upon reconstitution exhibited good sensory perception for flavour, consistency and overall acceptability score of 7.5 on 9-Point Hedonic scale.

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## PROMISING GENOTYPE

### VRCP-112-4: a promising advance genotype of vegetable cowpea

It is high yielding and cowpea golden mosaic virus resistant advance breeding line of cowpea which developed through pedigree selection by crossing IC-559386 × Arka Garima. It is dwarf & bush type (45-50 cm), photoperiod-insensitive, early line suitable for sowing in both spring-summer and rainy seasons. It flowers in 45-50 days after sowing and pods get ready for harvest in 57-60 days.





It produces 35-40 pods per plant of 30-35 cm long. The pod weight is about 12 g with 13-14 seeds per pod. The pods are dark green, thin, pulpy, cylindrical and parchment free, and produces 150-175 q/ha green pods.

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### **CCH-11: a CMS-based F1 hybrid of chilli**

Cytoplasmic male sterility (CMS) system is being used for commercial hybrid production in several crops including chillies. At ICAR-IIVR, Varanasi, a new chilli hybrid, namely CCH-11 has been developed utilizing the CMS line and a multiple stress tolerant pollinator parent. The fruits of CCH-11 are ideal for table purpose (fresh consumption) with fruit



length of 7-9 cm, width 0.8-1.0 cm and thin pericarp. Fruits are green at fresh stage and red at maturity, slightly wrinkled, pendant, straight and pointed. The yield potential of this CMS-based F1 chilli hybrid is 20-25 t/ha green fruits in 7-8 months duration.

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### **VRO-115: an okra line resistant to YVMV and OELCV**



**VRO-115: a YVMV and OELCV resistant line**

VRO-115, an advanced breeding line of okra, has been identified as a promising genotype having dark-green fruit color, medium fruit-size with yield potential of 170-180 q/ha. This line is found to be resistant to both yellow vein mosaic virus (YVMV) and okra enation leaf curl virus (OELCV) diseases under North Indian conditions when planted with other susceptible lines as check. Further, the days to first flowering of this genotype is 40-42 days after sowing, while first flower comes at 4-5th node and plant bears on an average 25-30 fruits per plant under North Indian conditions. The

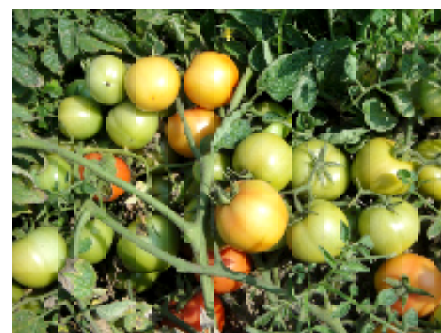
fruit-length and fruit-diameter of this genotype is 11-12 cm and 1.4-1.5 cm, respectively. Since, this line is showing resistance to both YVMV and OELCV diseases subsequently last three years at IIVR, Varanasi farm; therefore, we are using this line in our resistance breeding programme as one of the parent. Further, due to its high yield potential and resistance to most deadly begomoviruses, VRO-115 may be released as a variety after its multilocation testing under AICRP-VC.

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### **Kashi Adarsh (VRT-1201): a semi-determinate variety of tomato**

Kashi Adarsh, a semi-determinate tomato variety, has been recommended for release in zone VII comprising Madhya Pradesh and Maharashtra states. Average yield of up to 60 tonnes/ha could be realised with Kashi Adarsh. The fruits of



**Performance of Kashi Adarsh in field**

this variety are round and firm with a pericarp thickness of 6 mm. Average fruit weight ranges from 80-115 g with 3-4 locules. The fruits are attractive red in colour. This variety carries an allele of Ty-3 conferring resistance to tomato leaf curl virus disease. It has shown resistance to both monopartite and bipartite viruses in artificial screens, and high level of resistance in field tests conducted over years in disease hot spot at IIVR, Varanasi. It was identified and recommended in the 34th group meeting of AICRP-VC held on 10-13th May, 2016 at ICAR-Indian Agricultural Research Institute, New Delhi.

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### **VRPG-103: a cluster bearing high yield potential clone of pointed gourd**

A unique clone (VRPG-103) bearing fruits in cluster have been identified in pointed gourd (*Trichosanthes dioica*) during field evaluation at IIVR, Varanasi. Generally pointed gourd bears single fruit at each or alternate node, while cluster bearing habit is rare and not characterized till date. After identification in the field this line clonally multiplied



Fruiting in VRPG-103

using mature vine cuttings to increase the plant population and rooted vine cuttings were planted in the field to validate the cluster bearing habit of VRPG-103. During the field evaluation it was observed that all the plants of VRPG-103 produced fruits in clusters. The number of fruits per cluster varied from two to four in this unique clone. The double fruited cluster contributed maximum towards the number of fruits per plant. The fruits of this clone were light green in colour with longitudinal white strip. Average fruit weight ranged from 25 to 30 g and containing 20-25 seeds per fruit. The fruit length and fruit diameter of this line were 6.00 to 6.30 cm and 3.15 to 3.50 cm respectively. The average yield per vine in VRPG-103 varied from 12.5 kg/vine to 13.2 kg/vine, was contributed by more number of fruits per plant which ranges from 375 to 440. The yield potential (tender fruits) of VRPG-103 is 300-400 q/ha with 2500 plant population. This clone performs well both in summer and rainy season under Varanasi condition. In pointed gourd number of fruits/plant has positive effect on total yield. Therefore VRPG-103 has great potential in developing high yielding variety in pointed gourd as it produced more number of fruits per plant.

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### **EC769321-1 (VRB-48-1): A unique *Basella* genotype with snow-white flower**

*Basella alba* commonly known as Indian Spinach or Malabar Spinach is a potential leafy vegetable blessed with immense nutritional and medicinal potential. Indian spinach is native to tropical Southern Asia, probably originated from India or Indonesia. There are basically two types in *Basella alba*. The green types are designated as *Basella alba* var. *alba* and red types are *Basella alba* var. *rubra*. Usually the flower colour is purple in *Basella alba* var. *rubra* and pink or pinkish white with pink or purple tip on the bud in *Basella alba* var. *alba*. The purple/red colour stem or leaf in *Basella* is due to the presence of betalain pigment. The major betalain pigment in mature fruit of *Basella* is Gomphrenin I and has great potential for utilization as natural food colourant, dye making and cosmetics.

India, the primary centre of origin for Indian Spinach, is endowed with enormous variability and genetic divergence throughout the country. A total of 70 accessions have been augmented at ICAR-IIVR including 35 accessions from National Gene Bank and 35 collections from different regions of the country. These accessions were characterized and evaluated for agro-morphological traits during 2015 and 2016 at ICAR-IIVR, Varanasi. A range of flower colours comprising purple, pink, white with pink or purple tip were observed. The accession EC769321, collected from AVRDC, Taiwan bears purple flower. However, a unique variant from the germplasm EC769321 bearing pure white flower was selected and named as EC769321-1.

The variant possesses intermediate growth habit with green, caudate, soft and succulent leaves. Immature fruits are green in colour without any pinkish or purple tinge. Usually, the mature fruits are black coloured berry full of dark purple pigment betalain in *Basella* and are known to have medicinal and industrial value. But in this unique genotype even mature fruits are green coloured and the juice is colourless devoid of any red/purple pigment. This is also a rare trait. This unique feature may help in study of flower colour inheritance



EC769321-1: A *Basella* accession with pure white flowers

and can be utilized as a morphological marker linked to other desirable traits in conventional breeding programme. Since this germplasm is devoid of betalain even in the mature fruits, such pigmentation markers could be used for studying the metabolic pathways of betalain biosynthesis in *basella*.

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### **Identification of unique vegetable-pea genotypes with multiple-pods at single node**

During the Rabi season (2015-16), few plants having tetra and penta- pods at single node were identified in an advanced breeding line VRPM-901. The line VRPM-901 was developed for triple podded character at each node. The





Tetra-podded plant



Penta-podded plant

appearance of first flower was found on 17th or 18th node at 55 to 60 days after sowing while average numbers of branches per plant were 2-3.

The total numbers of pods were 20 to 24 with average pod-length and width of 8.5 cm and 1.1 cm, respectively. Since picking of vegetable-pea pods is generally done manually, therefore it is expected that the genotypes with multiple pods at a single node will facilitate the harvesting and reduce the picking cost. In this background, the newly identified line will be evaluated in coming years for inheritance of this character and other horticultural traits.

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## PEST MANAGEMENT

### Cross infectivity of *Sclerotinia sclerotiorum* on different leguminous vegetables

*Sclerotinia sclerotiorum* is one of the most devastating pathogens causing severe crop losses on various economically important leguminous, solanaceous and cole vegetables. Its incidence has been recorded up to 20% on french bean and dolichos bean in research farm, ICAR-IIVR, Varanasi during cool and moist climate in 2016. Initial disease symptoms appeared in the form of water-soaked lesions on stem during the flowering and pod formation stages. Later it expanded rapidly on infected plant parts including leaf, flower and pods, finally caused girdling and rotting of these parts. Lesions of infected plant parts usually developed patches of white, fluffy mycelial mats often with large, irregular, black-coloured sclerotia. Different isolates of *S. sclerotiorum* were



Differential level of infection by *S. sclerotiorum* on cowpea, macuna bean and sword bean



Detached pod assay of *S. sclerotiorum* on dolichos and pea pods.

isolated from French bean (3), dolichos bean (1) and pea (1) on potato dextrose agar and purified by hyphal tip method. These isolates were subjected to cross infectivity test on different leguminous hosts viz. French bean, dolichos bean, cowpea, sword bean and pea adopting leaf detachment method. Under *in vitro* condition, the surface sterilized leaf and pod of these leguminous vegetables aseptically inoculated with 5 mm mycelial bit of five days old pathogen culture and observed for colonization of pathogen after 2 days of incubation at  $18 \pm 1^\circ\text{C}$ . It was observed that inoculated pathogen isolates infected leaves of all the tested hosts with maximum severity on the cowpea leaf. However, infection level was more on pods of dolichos bean than that of pea. It clearly revealed cross infectivity of the pathogen indicating the emergence of this pathogen as broad spectrum covering wide host range.

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## Association of endoparasitoid *Pristomerus euzopherae* (Hymenoptera: Ichneumonid) with stem borer, *Euzophera perticella* (Lepidoptera: Pyralidae), a serious pest of grafted and ratoon brinjal

Brinjal stem borer *Euzophera perticella* Ragonot is an oligophagous insect pest found mostly in the Indian subcontinent. Recently, its infestation was observed on eggplant in severe form during 2015-2016 and 2016-17 in and around the experimental farm of ICAR-Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh. It was observed that the infested plants became light yellow in colour with stunted growth and detected in patches across the plot. Finally the affected plants were completely drooped, withered and wilted with stunted growth, reduced plant vigour and lowered fruit bearing capacity. Larvae bore the stem portion of the eggplant near the collar region and fed the pith portion, thereby reducing the translocation activity of the plants. The prominent larval galleries/tunnels filled with frassy excreta were observed inside the stem and its underneath. Number of larval tunnels were varied from 3-11 per plant with an average of  $7.92 \pm 0.69$  tunnels/plant. Larval feeding tunnel length varied from 8.4 – 21.3 cm with an average of 12.8 cm. Pupation was generally inside the stem with brown coloured fibrous cocoon. Oviposition, incubation, larval and pupal periods of *E. perticella* ranged from 4-11, 3-9, 29-47 and 7-14 days, respectively, whereas adult longevity were 4-8 days for male and 5-13 days for females. Adult exit points were quite often adjacent to the branch or any weak or injured point on the stem. A single exit point was often used by many borer larvae by interconnecting their feeding tunnel. Field incidence of the stem borer was observed from second fortnight of February with 13.5% stem damage and gradually

increased coinciding with increase in atmospheric temperature during summer months. The stem damage during March, April, May and June were 29.75, 51.5, 76.5 and 89.7%, respectively. Almost all the plants were affected by this borer during July. Infestation was more severe in ratoon and grafted brinjal. A promising ichneumonid larval endoparasitoid was recovered from *E. perticella* which was taxonomically identified as *Pristomerus euzopherae* Viereck. Incidence of this parasitoid was recorded during second fortnight of April (1.91% parasitization) with highest parasitization during July (12.48%) followed by June (7.73%).

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## Emergence of tospovirus on solanaceous vegetables in Indo-Gangetic plain

In recent days, tospoviruses are increasingly becoming most serious threats to vegetable cultivation in India. Infection of Tospovirus on vegetable crops is causing 29 to 100% yield loss. In addition, it is also deteriorating the fruit quality. Among the 23 Tospovirus species reported globally, Groundnut bud necrosis virus (GBNV) syn. Peanut bud necrosis virus (PBNV) and Capsicum chlorosis virus (CaCV) were found to infect solanaceous vegetable crops in India. Dispersal and survival of Tospovirus from infected to healthy plants mainly depends on thrips vector under natural conditions. Thrips feed on infected plants and specifically transmit the tospoviruses in persistent and propagative manner. Upon feeding on infected plants, 2<sup>nd</sup> instar nymph stage acquiring virus can alone be able to transmit the virus in adult stage. *Thrips palmi* and *Frankliniella occidentalis* are the species transmitting GBNV and CaCV on solanaceous crops. In North India, incidence of tospovirus is increasing on tomato and brinjal which were recorded upto 23% and 46%, respectively during 2015-16 in Varanasi region. In near future it may leads to havoc for the cultivation of solanaceous vegetables in north India. Reverse Transcription- Polymerase Chain Reaction (RT-PCR) assay using the PBNV specific primer showed the amplification of the coat protein gene of PBNV from infected tomato and brinjal plants (Fig 1).

*Tospovirus* infection causes different types of symptoms according to the strains of viruses associated with crop, its stage of infection, cultivars of crop, load of virus inoculums and availability of viruliferous vector and also varieties of symptoms are associated with single virus on single host species. It is essential to know the field symptoms for the proper diagnosis of the *Tospovirus* infection. Stunting of infected plant is common symptom of *Tospovirus* on

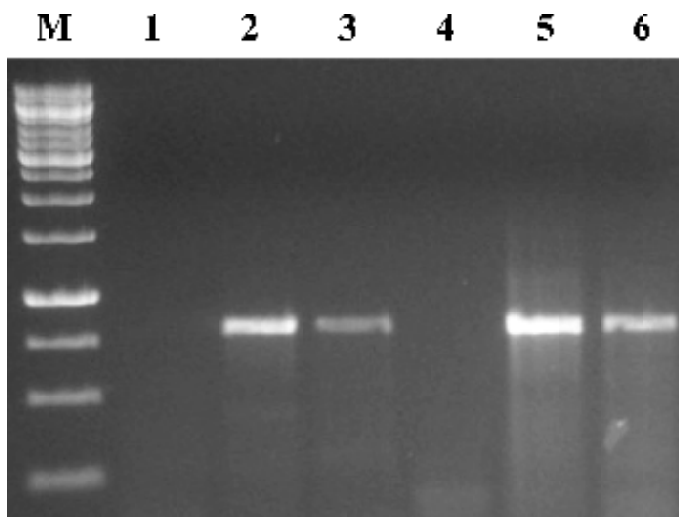


Brinjal stem infested by  
*E. perticella*



Endoparasitoid *Pristomerus euzopherae*





Amplification of coat protein gene of PBNV from infected tomato and brinjal (M- 1kb Marker; 1- Healthy tomato; 2 & 3- Infected tomato; 4- Healthy brinjal; and 5 & 6- Infected brinjal)

vegetable crops. Chlorotic or necrotic rings are seen on the leaves of many infected plants and sometimes on fruits of some hosts. Necrosis may develop on the foliage and stem of some hosts and make the plants to dry from tip downwards and is commonly called as "bud necrosis". Sometimes it is causing chlorosis on leaves of infected plants. Advancement of disease may causes death of infected plant.

In tomato, infection of PBNV causes circular necrotic spots on the leaves with green center. Also necrotic lesions on stem and young shoots were observed and finally lead to drying of entire plant from tip to downwards. Moreover, chlorotic lesions with concentric rings seen on infected leaves were seen on PBNV infected brinjal plants. In some cases, circular necrotic lesions with green centre was also observed.

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## VEGETABLE FOR HEALTH

### Purple radish: antioxidant rich vegetables with colour potential

The demand of coloured vegetables has increased as they are richer sources of nutraceuticals. Recently IVR have been developed a series of coloured genotype of radish among which purple coloured genotype VRRAD-151 was found prominent. To investigate the chemical composition detail chemical profiling was carried out using high resolution mass spectrometry. The putatively identified compounds were flavonols, dihydroflavonols, flavonones, flavones, anthocyanins, isoflavonoids and phenolic acids. The

anthocyanins were mostly present in acylated forms, indicating the potential use of this radish genotype as a source of stable natural colors. Antioxidant activity was studied using four *in-vitro* methods and, the CUPRAC method provided the best estimate of antioxidant activity, with the flavonols being the major contributor.

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### Cluster bean: a promising vegetable crop of future

Cluster bean (*Cyamopsis tetragonoloba*) is considered as a minor crop although it is reservoir of different amino acids including glutamic, arginine, aspartic acid and leucine. It also contains glycol nutrients that help in controlling blood sugar levels in the body. Iron and calcium present in cluster beans fills up the deficiencies of these minerals and also accounts in strengthening the bones and thus, prevents bone loss. Cluster bean is rich in dietary fibre, potassium and folate which protect the heart from various cardiovascular complications. It is also work as a good laxative, stimulating bowel movement, improving digestive system and help in flushing the unwanted toxins from the stomach.

In view of the importance of the crop, genetic improvement programme on cluster bean has been initiated at ICAR-IIVR, Varanasi in order to popularize and augment its production among growers. Initially, two hundred fifteen diverse genotypes of cluster bean are under characterization for various traits focussing mainly for vegetable purpose which showed lot of genetic variability pod length and shape. The



Variability for pod length in cluster bean

variety Pusa Navbahar was observed to be promising for maximum fruit length. Cluster bean being a short duration crop holds immense potential to generate better economic returns to growers from marginal land holdings with high production.

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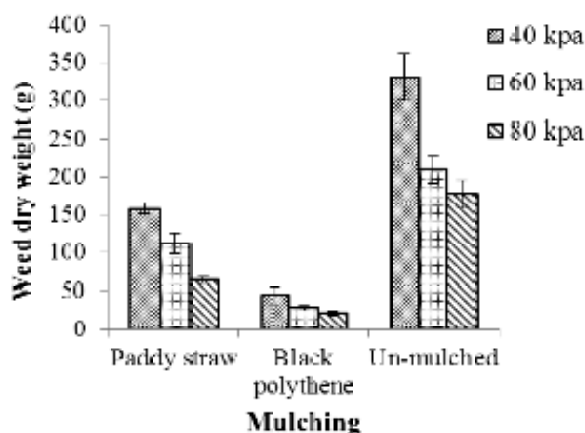
## SUSTAINABLE AGRO-PRACTICES

### Tensiometer based drip irrigation scheduling in tomato

Irrigation management directly affects crop performance and can lead to qualitative and quantitative changes in vegetables. Tensiometer is rapid, cheap and easy device for monitoring the soil water status. It is preferred to other type of soil moisture sensors because of its low cost, simplicity of use, high accuracy of measurement and unaffected by

temperature and soil osmotic potential. Drip irrigation system and polyethylene mulch is known to reduce the evaporation and therefore increase water use efficiency, among many other benefits. A study was conducted to evaluate the effect of different soil moisture tensions (-40, -60 and -80 kPa) and black polyethylene mulching on growth, yield and water use efficiency of tomato. Experimental findings revealed that the maximum tomato production of 89.17 and 85.98 tons/ha was reported with drip irrigation at -40 kPa or -60 kPa coupled with black polythene mulching (BP). The maximum water use efficiency (WUE) of 355.31 kg yield/ ha/mm of water was recorded with drip irrigation at -60 kPa + BP mulch. The highest soil moisture in 0-30 cm soil profile was registered with BP mulch at -40kPa (17.8-20.73%) and -60 kPa (16.3-18.6%) soil moisture tensions. Lowest weed growth was also observed under BP mulch as compared to paddy straw or un-mulched control.

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## SUCCESS STORY

### Frontline demonstrations (FLDs) of improved vegetable varieties pave the path for livelihood and nutritional security among tribals

ICAR-Indian Institute of Vegetable Research, Varanasi adopted 14 villages with 1000 tribal households in Chopan block of Duddhi tehsil in district Sonbhadra under Tribal Sub Plan (TSP) sanctioned by ICAR, New Delhi. Front Line Demonstrations (FLDs) on vegetables were conducted at selected tribals' fields for dissemination and adoption of improved vegetable varieties by the tribal farmers (Table). As a part of integrated support, technology intervention through kitchen gardening had also been made among selected beneficiaries to ensure their livelihood and nutritional security. In a series of demonstrations, regular field visits and need based advisory services were provided to make their farming system sustainable.

The bumper yield harvested in demonstrated vegetable field resulted satisfaction about the introduced vegetable varieties among the farmers. Farmers used the vegetables for household consumption as well as sold excess produce in nearby market. An average yield of 80 q/ha in case of cowpea var. Kashi Kanchan and 45 q/ha okra var. Kashi Pragati was recorded in tribals field condition which are mostly undulated hilly and water scarce area. By and large, the farmers gained monetary benefits in terms of improving the productivity of vegetable crops as well as improved the nutrition standards by daily vegetable based dietary intake.



**Table: Outstanding results of FLDs of improved vegetable varieties in tribal's field.**

Name of the farmer	Village	Crops	Area (ha.)
Fateh Singh	Salaibanwa	Bottle gourd	0.025
		Tomato	0.025
		Brinjal	0.015
Laxman Shankar	Salaibanwa	Bottle gourd	Kitchen garden
		Tomato	0.018
		Brinjal	0.006
Hirawati Devi	Salaibanwa	Sponge gourd	Kitchen garden
Sonmati Surajlal	Sanathdandi	Sponge gourd	Kitchen garden
		Bottle gourd	0.0125
		Pumpkin	0.0125
		Sponge gourd	0.0125
Shobhnath	Sanathdandi	Okra	0.0375
		Bottle gourd	0.0125
		Sponge gourd	0.0125
		Pumpkin	0.0125
Malti	Sanathdandi	Brinjal	0.0125
		Sponge gourd	Kitchen garden
		Bottle gourd	Kitchen garden
		Okra	0.0125
Ramnaresh	Satduari	Tomato	0.0125
		Brinjal	0.0125
		Chilli	0.0062
		Bottle gourd	Kitchen garden
		Sponge gourd	Kitchen garden
Savita Devi	Kekrahvakhad i	Bottle gourd	Kitchen garden
Basmati	Kekrahvakhad i	Sponge gourd	Kitchen garden
		Bottle gourd	Kitchen garden
		Sponge gourd	Kitchen garden
		Cowpea	0.0125
		Okra	0.0125
		Tomato	0.0125
		Brinjal	0.0125
		Chilli	0.0062



Brinjal 'Kashi Uttam' in the field of Surajlal.



Sponge gourd 'Kashi Diya' in the kitchen garden of Hirawati Devi.



Bottle gourd 'Kashi Ganga' in the field of Fateh Singh



Advisory services at farmer's field regarding crop protection measures.

**Rakesh Pandey, AK Chaturvedi, AK Singh, RP Chaudhary, Shubhadeep Roy, Neeraj Singh, SK Singh, Paresh Chaukhande, RN Prasad and B Singh**  
ICAR-Indian Institute of Vegetable Research,  
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## KVK ACTIVITIES

### KVKs celebrated World Soil Health Day

World Soil Health Day celebrates the importance of soil as a critical component of eco-system and as a vital contributor to the human commonwealth through its contribution to food, water and energy security and as a mitigation of biodiversity losses and climate change. Therefore, Krishi Vigyan Kendras of Kushinagar, Deoria and Bhadohi districts of Uttar Pradesh working under the administrative control of ICAR-Indian Institute of Vegetable Research, Varanasi celebrated the World Soil Health Day (WSHD) on 5th December 2016 at their respective district with an aim to connect people with soils and raise awareness on their critical importance in their lives.

Krishi Vigyan Kendra, Kushinagar celebrated World Soil Health Day at Village Deopokhar, Block- Tamkuhiraj in Kushinagar district which was inaugurated by District Agriculture Officer, Dr. Umesh Kumar Gupta in presence of district's Agriculture Extension Officer, former Pradhan Shri Nathuni Singh of Deopokhar village and more than 400 farmers. On this occasion, 125 soil health cards were distributed among the farmers of Deopokhar, Sondia, Gangitkar, Awaraon Sofiganj, Bashdila Durjan villages of Tamkuhiraj block. During the inaugural address, Dr. Gupta emphasized the importance of soil testing and requested the farmers for adoption of balance dose of fertilizer as per

recommendation of KVK so that the cost of cultivation can be reduced and crop yields are increased. He also told the farmers about different programmes implemented by State Department of Agriculture.

Similarly, this World Soil Health Day was celebrated by Krishi Vigyan Kendra, Bejwan, Bhadohi at its center which was inaugurated by Shri Kedar Nath Singh Ji, Member of Legislative Council (Varanasi) in presence of Dr. Bijendra Singh, Director, ICAR-Indian Institute of Vegetable Research, Varanasi. Shri Kedar Nath Singh while discussing the issues on soil health asked the farmers to get aware about their soil properties to exploit it in a better cropping system in a sustainable manner. He also advocated the different programmes being run by the Central Government for the betterment of farming community. The Director, ICAR-IIVR also raised the detrimental soil health issues. He suggested the farmers different corrective measures with special reference to the application of micronutrients, which must be followed during cultivation of the crops. On this occasion soil health cards were also distributed by the chief guest to the farmers of different villages. About 110 practicing farmers and farm women participated from more than 15 villages in this programme.





Krishi Vigyan Kendra, Deoria celebrated World Soil Health Day at village Bangra of Bankata Block where more than 125 farmers/farm women from nearby villages had participated. Sh. Sanjay Kumar, Block Development Officer (BDO) of Bhatpar Rani Block inaugurated this event and distributed soil health cards to participated farmers/farm women. While addressing the farmers Sh. Kumar emphasized on the importance of soil and maintaining its health for more productivity per unit area. He appealed the farmers not to burn crop residue in their field as they not only hampers the soil health but also kills valuable micro-organism present in the soil.



While creating awareness among the farmers regarding the effect of crop residue burning in field, importance of soil testing, availability of nutrient in soil and how to use balance dose of fertilizer in Wheat, Sugarcane, Rabi Maize, Rice crops, pulses, oilseeds and horticulture crops. Heads and SMSs of all the three KVKs also described the benefit of resource conservation techniques like sowing of wheat with zero-tillage machine, turbo seeder etc. Preparation techniques of various organic manure and use of bio fertilizer, water soluble fertilizers etc in different crops were also discussed during this event.

**RN Prasad, AK Dube, Rajendra Prasad and AR Kumari**  
KVK, ICAR-IIVR, Varanasi

## EVENTS

### हिन्दी चेतना मास का शुभारम्भ

हिन्दी चेतना मास का शुभारम्भ निदेशक एवं राजभाषा समिति भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी के अध्यक्ष डा. बिजेन्द्र सिंह के कर-कमलों द्वारा हुआ। हिन्दी चेतना मास के इस अवसर पर प्रो. (श्रीमती) श्रद्धा सिंह, हिन्दी विभाग, काशी हिन्दू विश्वविद्यालय, वाराणसी मुख्य अतिथि थी। अपने उद्बोधन में डा. बिजेन्द्र सिंह, निदेशक ने हिन्दी में संस्थान द्वारा किये जा रहे अनेकों कार्यक्रमों का विस्तृत ब्यौरा प्रस्तुत किया तथा जोर देते हुए कहा कि भारतीय संस्कृति को समृद्धि करने के लिए हिन्दी भाषा लोगों के बीच एक माध्यम है। जहाँ तक कृषि विज्ञान में हुए शोध को किसानों तक पहुँचाने का सवाल है इस दिशा में संस्थान द्वारा हिन्दी में सब्जी किरण पत्रिका एवं विभिन्न सब्जियों पर प्रसार-पुस्तिकाओं को प्रकाशित किया जा रहा है।

इस अवसर पर मुख्य अतिथि प्रो. (श्रीमती) श्रद्धा सिंह ने कहा कि हिन्दी की दशा आज विश्व स्तर पर अच्छे मुकाम पर पहुँची है, इसका अन्दाजा इसी से लगाया जा सकता है कि आज हिन्दी में डिप्लोमा करने वाले विदेशी छात्रों में अन्य देशों की तुलना में चीन के छात्र सबसे आगे है। इसी संदर्भ में डा. सिंह ने बताया कि वर्तमान में चलचित्र, आकाशवाणी एवं दूरसंचार में सबसे ज्यादा कार्यक्रम हिन्दी में ही प्रसारित होते हैं जो कि भारत वर्ष में ही नहीं अन्य देशों में देखे एवं सराहे जाते हैं। आज आवश्यकता इस बात की है कि जो भी शोध कार्य हो रहे हैं उनको अंग्रेजी के साथ-साथ हिन्दी में प्रकाशित करे। इस कार्यक्रम में संस्थान के सभी वैज्ञानिक, तकनीकी सहायक, प्रशासनिक अधिकारी एवं कर्मचारी तथा वरिष्ठ शोध सहायक आदि ने बढ़ चढ़ कर भागीदारी की।

### ICAR sponsored 12 days training on “Principles and production techniques of hybrid seeds in vegetables”

An ICAR sponsored 12 days training course “Principles and production techniques of hybrid seeds in vegetables” organized at ICAR-IIVR, Varanasi from September 27 to October 08, 2016. Hon'ble Secretary DARE and DG ICAR Dr. Trilochan Mohapatra, as Chief Guest, graced the valedictory function of training. He appreciated the efforts of the organizers to conduct a training programme for the technical personnel of ICAR, who are real workforce to strengthen the research programme. He asked to develop training module for robust skill and entrepreneurship

development in agriculture and allied sector as per Agriculture Skill Council of India (ASCI) model. This will help to agriculture educated unemployed youth to start the new entrepreneurship in Agriculture sector. A total of 21 participants of technical cadre working in 14 ICAR institutes in the areas of agriculture/horticulture/vegetables covering 10 states participated in this training programme. The Course Director, Dr. B. Singh, Director, ICAR-IIVR, stated that this programme was intended to train the participants in the area of hybrid development and techniques of hybrid seed production. He also informed that during this training programme, a series of lectures and practical sessions on various aspects of hybrid seed production and its principles were conducted. He also acknowledged the support given by ICAR, New Delhi. The training programme was coordinated by Dr. Neeraj Singh and Dr. Sudhakar Pandey.

**Neeraj Singh**

*ICAR-Indian Institute of Vegetable Research,  
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### Okra Field Day organized at ICAR-IIVR

A field day on Okra was organized at ICAR-IIVR, Varanasi by its Zonal Technology Management Unit on 3<sup>rd</sup> October, 2016 to showcase and commercialize the promising okra varieties and advanced lines developed by the Institute.



Okra field day at ICAR-IIVR, Varanasi, UP

The programme was attended by breeders and marketing strategists from several private vegetable seed-companies like Syngenta, Mahyco, Ajeet Seed, Nuziveedu, VNR Seeds, Metahelix, etc. The seed-company's representatives visited the okra field of the Institute and appreciated the varieties, hybrids and other advanced breeding lines developed by the Institute. The representatives critically observed the promising materials and expressed their desire to get some of the promising advanced breeding lines, combining virus-resistance and high-yield. The delegates thoroughly interacted with the breeders of the institute and provided valuable feedback on the current market needs of okra. The Director, Dr. B. Singh expressed his keen desire for an effective collaboration with the private sector in PPP mode to extend the technologies of the Institute into farmers' field within the ambit of ICAR guidelines. The Director also assured the delegates to develop new technologies in accordance with the current market and consumer preference and inputs provided by the representatives. Dr. S.K. Pandey (Former Director, ICAR-CPRI, Shimla, HP) was also present on this occasion. At the end, Dr. P.M. Singh, Principal Scientist and In-charge ZTMU proposed the vote of thanks.

**Gyan P Mishra, Tania Seth, SK Tiwari and PM Singh**

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

### Secretary (DARE) & DG, ICAR visited ICAR-Indian Institute of Vegetable Research, Varanasi

Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR) visited ICAR-Indian Institute of Vegetable Research, Varanasi during 08<sup>th</sup> to 09<sup>th</sup> October 2016. He also graced the valedictory function of training on "Principles and production techniques of hybrid seeds in vegetables" organized at ICAR-IIVR, Varanasi from September 27 to October 08, 2016. In his address, he advised organizing of such skill development training programme for self-employment of the unemployed youth. Dr. Bijendra Singh, Director, ICAR-IIVR, Varanasi briefed the Director General, ICAR about the ongoing activities and achievements of the institute, and its impact on farmers' field.

During interaction with the staff of the institute, Dr. Mohapatra discussed several important issues including scientific, administrative, and personnel in length. While interacting with the scientists, he emphasized on developing the technologies for nutritional security through vegetables, promoting balcony vegetable farming and exploring the possibilities of exotic vegetable cultivation. He also expressed his concern over climate change and its impact on vegetable production, and suggested that the scientists should initiate work on root-stock breeding to develop multiple stress



tolerant root-stock for grafted vegetables and also stressed for intensive utilization of wild-species in pre-breeding programme of vegetables.

He also visited the Experimental farm and laboratories, and expressed his satisfaction over the achievements and efforts being made to maintain the germplasm and develop varieties utilizing them. He appreciated the efforts being made by the institute for waste management and desired the adoption of this model by other ICAR institutes. Dr. B. Singh, Director, ICAR-IIVR expressed his gratitude and sincere thanks to the DG, ICAR and assured to take appropriate measures to address the suggestions given by him.

**Neeraj Singh**

*ICAR-Indian Institute of Vegetable Research,  
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### Swachhta Pakhwada organized at ICAR-IIVR

Swachhta Pakhwada was organized at ICAR-IIVR, Varanasi (16-31<sup>st</sup> October 2016), with the swearing of the Swachhta Pledge (Cleanliness Oath) by the Scientific, Technical, Administrative and Skilled Support Staff of the Institute under the leadership of Dr. B. Singh, Director, ICAR-IIVR. After the Pledge, Director highlighted the importance and benefits of cleanliness and hygiene. The staff committed themselves for at least 100 hours of Cleanliness action on their part, in Institute as well as their residential surroundings. During the programme, the institute and its mini campus, ATIC center, training hostel, institute lawns, laboratories, main gate, residential areas and adjoining roads and areas nearby institute were cleaned. One day 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 "Say No to Plastic" for encouraging less/no use of plastic bags was launched both electronically and physically. Charts/ display boards were installed in and



Cleaning of the institute by the staff

around Campus premises. Drawbacks and health hazards associated with continuous use of plastics in daily life were also highlighted in this awareness program. As a part of the awareness program, different crop/vegetable residues, rather than conventional burning and thereby polluting the environment, are directed to make the compost in the residue management unit of the institute. Accordingly, residues of okra, bottle gourd and pumpkin after their seed extraction were extensively used for the vermicompost which is further used as an organic manure for sustainable agriculture without zero pollution to the environment.

**Jaydeep Halder and Suhas Kurkute**

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### ICAR-sponsored Short Course on "Advances in Genetic Enhancement of Underutilized Vegetable Crops"

A ten-day short course on "Advances in Genetic Enhancement of Underutilized Vegetable Crops" sponsored by Education Division, ICAR was held at ICAR-Indian Institute of Vegetable Research, Varanasi from 18-27<sup>th</sup> October 2016. A total of 19 participants from 08 states of



Swachhta Shapath by the staff members





Release of training manual "Advances in genetic enhancement of underutilized vegetable crops".

the country attended the training. The training mainly focused on the importance and genetic enhancement through modern tools and techniques in improvement of underutilized vegetables. Training was also given on physiological aspects of different underutilized vegetables under changing climate scenario. Besides, basic and advanced statistical tools for data analysis were also integrated in the training programme. The trainees assured of promotion, collection, evaluation, genetic enhancement and utilization of underutilized vegetables across the country to address nutritional security.

The various lectures were compiled as a training manual "Advances in genetic enhancement of underutilized vegetable crops" which was released by the Director, IIVR, Varanasi during the function. Dr B Singh, Director and Course Director in his concluding remarks, emphasized the importance of underutilized vegetables in addressing nutritional security and combating the challenges of climate change. He reiterated the need to initiate focused research on underutilized vegetable crops to harness their nutritional and medicinal potential. Dr JK Ranjan and Dr BK Singh were Course Coordinators, and Dr Pragya and Dr SK Tiwari were Co-coordinators for this Short Course.

**JK Ranjan and BK Singh**

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### **Dr. AK Singh, DDG (AE & HS) visited ICAR-IIVR KVK, Bhadohi**

Dr. AK Singh, DDG (AE & HS), ICAR, New Delhi visited Krishi Vigyan Kendra, Bhadohi on 02.11.2016. During his interaction with staff of KVK, he suggested that the cluster demonstration of oilseed and pulses, soil testing and soil health card, regular update of activities on KVK portal, development of Technology Park, etc should be priority of

the KVK. He also visited the instructional farm of KVK. Dr. B. Singh, Director, ICAR-IIVR, Varanasi welcomed DDG and briefed about the activities of KVK such as reclamation of usar soil, seed production of paddy variety CSR-36 and CSR-43.

**Neeraj Singh**

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### **केन्द्रीय कृषि एवं किसान कल्याण राज्य मंत्री का भा.कृ. अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी का भ्रमण**

माननीय केन्द्रीय कृषि एवं किसान कल्याण राज्य मंत्री, श्री सुदर्शन भगत ने भारतीय कृषि अनुसंधान परिषद के प्रतिष्ठित संस्थान भारतीय सब्जी अनुसंधान संस्थान, वाराणसी का भ्रमण दिनांक 10 नवम्बर, 2016 को किया और संस्थान में चल रहे सब्जी सम्बंधित शोध एवं किसानों के लिए चल रहे कार्यक्रमों की जानकारी प्राप्त की। प्रक्षेत्र एवं प्रयोगशालाओं का अवलोकन कर सब्जी अनुसंधान की रूप-रेखा पर उन्होंने प्रसन्नता एवं संतोष व्यक्त किया। इस अवसर पर श्री भगत ने संचालित आदिवासी उप-योजना 2014-17 के तहत सोनभद्र जिले के आदिवासियों की आजीविका एवं पोषण सुरक्षा हेतु समन्वित कृषि प्रणाली आधारित प्रशिक्षण एवं प्रदर्शन कार्यक्रम का उद्घाटन किया। संस्थान द्वारा सब्जी आधारित तकनीकों के प्रचार-प्रसार हेतु 14 चयनित गाँवों के 41 आदिवासी परिवारों से विचार विमर्श किया और बल देते हुए स्पष्ट किया कि अनुसंधान एवं विकास की गति को दूर-दराज के संसाधन विहिन कृषकों के बीच अनेकानेक कार्यक्रमों के माध्यम से पहुँचाकर आर्थिक एवं सामाजिक रूप से सम्पन्न बनाना आवश्यक है। आज के बदलते परिवेश में कृषक बन्धु आर्थिक एवं गुणवत्तायुक्त उत्पाद प्राप्त करने के लिए कम लागत वाली तकनीकों जैसे उन्नतिशील प्रजातियों, जैविक खादों सम्बंधित पोषक तत्व प्रबन्धन कीट एवं रोग प्रबन्धन, टपक एवं फाब्यारा सिचाई आदि पर विशेष ध्यान दें। मुख्य अतिथि द्वारा तकनीकी पुस्तक का विमोचन एवं सब्जी बीज तथा स्प्रेयर का जनजातिय उपयोग के अन्तर्गत चयनित आदिवासी कृषकों में वितरण किया गया।

इस अवसर पर संस्थान के निदेशक डा. विजेन्द्र सिंह ने संस्थान में चल रहे विभिन्न शोध एवं प्रसार के क्रिया-कलापों से माननीय मंत्री जी को अवगत कराया एवं इस बात पर विशेष बल दिया कि संस्थान के विकसित तकनीकों को उत्तर प्रदेश एवं बिहार के विभिन्न जनपदों में मेरा गाँव मेरा गौरव एवं सासंद आदर्श गाँव में किसानों तक प्रदर्शन एवं प्रशिक्षण के माध्यम से पहुँचाया जा रहा है। डा. सिंह ने संस्थान के अन्तर्गत कार्यरत कुशीनगर, देवरिया एवं भदोही जनपदों में स्थापित कृषि विज्ञान केन्द्र के प्रसार गतिविधियों की भी चर्चा की। उन्होंने संस्थान के वैज्ञानिकों से भी कहा कि खेती-बारी में दिन प्रतिदिन मिल



रही चुनौतियों का विश्लेषण कर शोध की रणनीति बनायें जिससे देश में खाद्य एवं पोषण सुरक्षा को सुनिश्चित की जा सके। इस कार्यक्रम का संचालन डा. नीरज सिंह, प्रधान वैज्ञानिक एवं धन्यवाद ज्ञापन डा. ए.बी. राय, विभागाध्यक्ष, फसल सुरक्षा ने किया।

**नीरज सिंह**

भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी

## Brinjal and Chilli Field Day organized at ICAR-IIVR

Zonal Technology Management Unit of ICAR-Indian Institute of Vegetable Research (ICAR-IIVR), Varanasi organized "Brinjal-Chilli Day" on 5<sup>th</sup> December, 2016 for showcasing its varieties and hybrids in brinjal and chilli to the private organizations with the 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 19 representatives from 12

private seed companies. The participants expressed their keen interest in some of the promising varieties and hybrids. Dr. B. Singh, the Director of the institute while interacting with the participants expressed his belief that the programme has enlightened and enriched us with the market requirements in these crops and provided an opportunity to the private sector to have hands on promising material. He assured on working for an effective public-private partnership to improve agricultural research so that we can ultimately benefit the Indian farmers through commercial, cooperative and public routes by transferring the developed technologies to them.

**SK Tiwari and PM Singh**

ICAR-Indian Institute of Vegetable Research,  
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## भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान में समेकित एवं उत्कृष्ट मधुमक्खीपालन विकास केन्द्र की स्थापना

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 माननीय कृषि एवं किसान कल्याण मंत्री श्री राधामोहन सिंह जी के पहल से भारत के 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 जा रहा है। यह उत्तर प्रदेश का प्रथम व इकलौता मधुमक्खीपालन विकास का उत्कृष्ट केन्द्र होगा। इससे उत्तर प्रदेश के साथ-साथ पश्चिम बिहार के युवकों के भी कौशल विकास में बढ़ोतरी होगी। समेकित एवं उत्कृष्ट मधुमक्खीपालन विकास केन्द्र की स्थापना हेतु 20-12-2016 को कार्यशाला का शुभारम्भ करते हुए मुख्य अतिथि श्री छोटे लाल खरवार, माननीय सांसद, रावर्टसगंज ने किसानों को सम्बोधित करते हुए कहा कि वनों में मधुमक्खीपालन एक परम्परागत उद्यम के रूप में प्रचलित है जहाँ पर आदिवासी एवं अन्य शहद प्राप्त करने की कला से परिचित है। यद्यपि उनको वैज्ञानिक पद्धति द्वारा मधुमक्खियों के प्रबंधन पर प्रशिक्षित करने की आवश्यकता है। यहाँ पर प्रशिक्षण लेकर कौशल विकास के माध्यम से ग्रामीण नवयुवक संग्रहण, प्रसंस्करण एवं मधुमक्खी उत्पादन के विपणन पर आधारित प्रशिक्षण प्राप्त कर शहद, पराग, मोम, मधुविश एवं रायल जेली का उत्पादन करके रोजगार प्राप्त कर सकते हैं। जिससे प्रधानमंत्री के कौशल विकास योजना को बल मिलेगा। इससे न केवल रोजगार का सृजन होगा बल्कि मधुमक्खी उत्पादों को निर्यात करके विदेशी मुद्रा भी अर्जित की जा सकती है।

वर्तमान परिवेश में जहाँ लोग अपने स्वास्थ्य के प्रति जागरूक हो रहे हैं शहद का उपयोग शरीर को स्वस्थ एवं निरोगी रखने के लिए उपयोग कर लाभान्वित हो सकते हैं एवं मधुमक्खी द्वारा उत्पादित अन्य उत्पादों का खाद्य, भेषज एवं सौन्दर्य प्रसाधन के उद्योग में भली-भाँति प्रयोग किया जा सकता है। ग्रामीण परिवेश में मधुमक्खीपालन आय



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सृजन करने का एक सार्थक माध्यम है। मधुमक्खियाँ न केवल शहद का उत्पादन करती हैं बल्कि विभिन्न फसलों में परागण द्वारा उनके उत्पादन को बढ़ाने में अपनी महत्वपूर्ण भूमिका निभाती हैं। यह केन्द्र उत्तर प्रदेश में मधुमक्खीपालकों व किसानों को वैज्ञानिक ढंग से मधुमक्खीपालन को समन्वित ढंग से अपनाने की दिशा में मदद करेगा। इस केन्द्र में किसान व मधुमक्खीपालक एक स्थान पर मधुमक्खीपालन से सम्बन्धित विभिन्न आयामों पर जानकारी प्राप्त करके लाभान्वित होंगे। उन्होंने बताया कि इसके माध्यम से सभी वर्गों के किसान जैसे लघु एवं मध्यम, मजदूर एवं अन्य के आय में वृद्धि की जा सकती है। इसमें शारीरिक दक्षता की कम आवश्यकता होती है अतः महिलायें भी इसके लिए सर्वथा उपयुक्त हैं।

इस अवसर पर विशिष्ट अतिथि राष्ट्रीय मधुमक्खी बोर्ड के निदेशक डॉ. बी. सारस्वत ने कहा कि मधुमक्खी परागण द्वारा फल एवं सब्जियाँ, तिलहन, दलहन, अन्य विभिन्न फसलों की उपज में 2 से 33150 प्रतिशत तक वृद्धि प्राप्त की गयी है। अमेरिका एवं यूरोप के कृषि वैज्ञानिकों ने यह आंकलन किया है कि कई बार मधुमक्खी द्वारा परागित फसल के उत्पादन का मूल्य, मधुमक्खियों द्वारा उत्पादित शहद एवं मोम के मूल्य से कई गुना अधिक होता है। प्रायः यह देखा गया है कि मधुमक्खियाँ टिकाऊ एवं पर्यावरण के अनुकूल कृषि तथा फसलों की उत्पादकता को बढ़ावा देने के लिए कम खर्चीली निवेश है। भारतीय मधुमक्खियों की कुछ विशिष्ट प्रजातियाँ हैं, जिनका प्रयोग करके कृषि एवं बागबानी फसलों की उपज में आशातीत वृद्धि की जा सकती है। देश में एपिस सेराना एवं एपिस मेलीफेरा के प्रजनक द्रव्य के विकास एवं गुणन हेतु बेहतर प्रबंधन की पद्धतियों को अपनाने की आवश्यकता है जिससे विभिन्न फसलों की एवं शहद उत्पादन तथा उत्पादकता में वृद्धि की जा सके।

संस्थान के निदेशक डॉ. बिजेन्द्र सिंह ने बताया कि

भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में स्थापित केन्द्र में रानी मक्खी के गुणन की इकाई, मधुमक्खी रोग निदान प्रयोगशाला, अवशिष्ट रसायन विश्लेषण प्रयोगशाला एवं अन्य मधुमक्खी उत्पादन के निष्कासन एवं प्रसंस्करण इकाई, एपिस सेराना एवं एपिस मेलीफेरा के गुणवत्ता रानी मक्खी/प्रजनक द्रव्य का विकास, वैज्ञानिक ढंग से मधुमक्खीपालन का सूचना केन्द्र होगा जिसमें तकनीक एवं सम्बन्धित सेवाओं सहित अन्य जानकारी प्राप्त होगी। 2015-2016 के आंकड़ों के अनुसार इस समय देश में लगभग 27 लाख मधुमक्खियों की कालोनी हैं जिससे 88,900 मैट्रिक टन शहद का वार्षिक उत्पादन होता है। फिर भी प्रति व्यक्ति प्रति दिन 50 ग्राम के सापेक्ष मात्र 10 ग्राम शहद ही उपलब्ध है। प्रति व्यक्ति उपलब्धता को ध्यान में रखते हुए कालोनियों की संख्या बढ़ाने के साथ-साथ प्रचलित प्रजातियों एपिस सेराना (10 किग्रा. शहद/छत्ता) एवं एपिस मेलीफेरा (30 किग्रा. शहद/छत्ता) के उत्पादन को दुगना करने की आवश्यकता है जिससे शहद की उपलब्धता के साथ-साथ पर-परागण द्वारा 12 मुख्य फसलों की उत्पादकता बढ़ई जा सकती है। इस सन्दर्भ में यह केन्द्र अग्रणी भूमिका निभाएगा व आने वाले दिनों में उत्तर प्रदेश के साथ-साथ पश्चिम बिहार के किसानों को अपनी आमदनी दोगुनी करने में सहायता मिलेगी। इस अवसर पर क्षेत्र के किसान श्री देवव्रत शर्मा, मधुमक्खीपालक एवं सदस्य, राष्ट्रीय मधुमक्खी बोर्ड ने भी अपने विचार व्यक्त किये तथा आशा व्यक्त की कि इस केन्द्र के बनने से भविष्य में इस क्षेत्र में उत्कृष्ट कार्य होगा। इस अवसर पर धन्यवाद ज्ञापन डॉ. ए.बी. राय, विभागाध्यक्ष एवं प्रधान वैज्ञानिक, फसल सुरक्षा ने किया।

नीरज सिंह

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