# Vegetable Newsletter

ICAR-Indian Institute of Vegetable Research

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### Events

- Pointed Gourd Field Day cum Kisan Gosthi organised at Haripur village, Varanasi
- International Yog Day celebrated at ICAR-IIVR
- Celebration of World Food Safety Day at ICAR-IIVR
- Progressive Farm Delegates from Nepal visited ICAR-IIVR
- संस्थान में सुश्री डॉली चक्रवर्ती, अपर सचिव कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार का भ्रमण
- World Honeybee Day celebrated
- Interaction of KVK scientists and farmers
- Rajbhasa Karyashala
- **अन्तर्राष्ट्रीय महिला दिवस का आयोजन**
- National Academy of Agricultural Sciences - Varanasi Chapter organized a Special Lecture
- Celeberation of field day on Solanaceous vegetables at ICAR-IIVR

### Awards and Recognitions

### Appointment, Transfer & Retirement

## From the Director's Desk

The farmers are pillars of the agriculture growth and rural economy; and Indian agriculture is developing day by day and has almost achieved the goal of food security. Presently, rural community is facing the problem of unemployment, low income and nutritional disorders. All possible efforts are being made by the present central government to provide adequate assistance to the farmers and states for agricultural development and doubling farmers' income by 2022.

The scenario of horticulture crops in India is encouraging. This is the seventh continuous year when the total horticultural production (314.87 mt) has outstripped the cereal production (281.37 mt). The percentage share of horticultural output and area in Agriculture has become about 33.3% and 16.2%, respectively. Although under the purview of Agriculture & allied sectors, the share of plan outlay for horticulture increased from 3.9% during IX Plan to 4.6% during the XII Plan. Over the last decade, the area under horticulture grew by 2.6% per annum and annual production increased by 4.8%. During 2017-18, the production of horticulture crops was 311.71 mt, of these vegetables constitute 59.2%. Urbanization, growing incomes, better accessibility and changes in food consumption are the main driving force for growth of horticulture in India. The horticulture sector has potential to play crucial role in increasing the agriculture growth, employment opportunity, net income and nutritional security. Vegetables, however, have edge on other horticultural crops as they can be grown suitably by small and marginal farmers; higher employment opportunities being labour intensive; suitable to grow under protected conditions; appropriateness to intercropping and high cropping intensity; faster and continuous income; better returns being high value crops; higher export potential; and better nutritional security as vegetables are rich and mankind's most affordable source of fibres, minerals, vitamins and health benefiting phyto-chemicals needed for good health.

## NEW CONCEPT

### Hairy-root transformation: a rapid method to test genome-editing efficiency of CRISPR/Cas9 guide-RNA constructs

*Agrobacterium rhizogenes* has ability to transform plant tissues/cells and induce hairy root formation. These hairy roots can be maintained in culture. Hairy roots have been used for different purposes like for production of recombinant proteins, metabolic engineering to study rhizosphere etc., Hairy root transformation takes 2-4 weeks. This can be used to check the genome editing efficiency of CRISPR/Cas9 guide-RNA constructs in crop plants. To get effective CRISPR/Cas9 cleavage, a complete gRNA sequence match to the 20-nucleotide target sequence in the target sequence is critical. As the sequences used for gRNA design are taken from databases generated in different crops, there is a possibility of SNPs in the target sequence of the genotypes used for genome editing which will affect the genome editing efficiency of CRISPR/Cas9 guide-RNA constructs. Stable transformation is time consuming (3-5 months) which means that we can only find out whether the entire exercise of genome editing is working or not after 3-5 months. As hairy root production takes less time and genomic DNA can be easily isolated from them, hairy root transformation helps in ascertaining the genome-editing efficiency of different gRNAs and the nature of the mutations produced before taking the time to make CRISPR/Cas9 edited plants.

**Suresh Reddy Yerasu, Achuit Kumar Singh, K Nagendran and B Rajasekhar Reddy**
**ICAR-Indian Institute of Vegetable Research, Varanasi-221 305, UP**

## PRODUCTION TECHNOLOGY

### Standardization of foliage stem cutting propagation technique of lotus

Lotus is usually propagated by the seed or division of enlarged rhizomes. Vegetative propagation allows the cloning of superior individuals and enables nurseries to supply uniform planting stock to growers. Since enlarged rhizomes are divided and transplanted for propagation in late March, before the sprouting of terminal buds, the propagation of lotus is limited to a relatively short period of the year when lotus does not grow actively.

**Cutting –preparation**

**Plants developed through stem cutting**

During the growth period in early summer, farmers who cultivate edible lotus generally use rhizome straps with enlarged rhizomes as materials for propagation. They consider that rhizome straps without enlarged rhizomes would not be suitable. However, excavation of enlarged rhizomes from lower depths in soil is laborious, and the buds often break vigorously in response to heavy pruning. Rhizome straps without enlarged rhizomes may have the potential to produce many roots, and it could be possible to develop a propagation method that uses rhizome straps. Thus, rigorous studies were undertaken to determine whether lotus could be propagated through some other plants parts than seeds or rhizomes and also their survival rate evaluation. Large number of plants could be raised by foliage stem cuttings for vegetative propagation. Through this method, we could produce true to characters as of source material within a very short period of time and plant survival rate was also found to be 90%.

**Rakesh Kr Dubey, PM Singh, B Singh and MK Singh**
**ICAR-Indian Institute of Vegetable Research, Varanasi-221 305, UP**

## Propagation of Moringa through air layering

Moringa is a perennial softwood tree found throughout the globe. It is a sun and heat-loving plant which does not tolerate freeze or frost, it grows best where the average maximum daily temperate is within the range of 25 and 35 °C, although it can survive summer temperatures of up to 48 °C for a limited period of time and can tolerate some frosts in winter. Moringa is generally propagated from seeds or cuttings. Direct seeding is possible because the germination rate is high. Propagation by cuttings is often preferred over plants raised from seeds, which are reportedly slower to flower and fruit and produce fruits of inferior quality. Some studies suggest that trees grown from seeds produce longer roots than those from cuttings and may be preferable for planting in semiarid and arid regions where water table depth is a potential growth-limiting factor. Cuttings of 1 meter length and a diameter of at least 4 cm can be used for propagation. At least one third of the cutting must be buried in the soil. Air layering was tried at this institute and succeeded in getting large number of surviving plants after planting.

**Selection of suitable stem:** The proper girth of stem is very important for survival of air layers. In general the stems with the girth of 1.5-2 cm yield good rooting and do not break off during girdling. As the Moringa tree produces 5-8 branches from main stem thus from a single plant 10-12 air layers can be obtained.

**Layering method:** The upright branches of 1.5-2.0 cm diameter from healthy plants are selected, girdled 1.5-2.5 cm in length and rooting hormone is applied on the upper part of the cut. All the sub-branches of those branches of the griddled are removed. All the leaves except one or two apical leaves and buds are also removed. The mud mixture/sphagnum moss is placed over the girdled area to a length of 7-8 cm, followed by wrapping with 200-300 gauge black/white polythene strips and tied with coir/jute thread or string at both the ends. The type of mud mixture used for layering plays important role in rooting and survival of layers. Soil, sand and cow dung manure in 2:1:0.5 proportion has been found as suitable substrate for air layering. In general, rooting takes place between 30-35 days and well rooted layers are detached from mother plants within 40-45 days. The air layers can be planted in nursery or polythene bags/plastic pots containing a mixture of soil, sand and well rotten FYM in 2:1:1 ratio and kept in shade condition for 10 days. These air layers are watered regularly to maintain sufficient level of soil moisture. After the start of new flush these layers are planted in the main field.

**Successful regeneration of Moringa air layers after planting in pots**

**Seasons suitable for layering**

Spring summer (February end to Mid of March) and rainy (August-September) seasons are the suitable seasons to get maximum rooting. Out of both the seasons August-September is more conducive for layering. Multiplication by layering is not possible during summer season due to high heat stress and wrapping of polythene sheet increases the temperature of wrapped portion significantly.

**Vidya Sagar, Nakul Gupta, Ram Chandra, Sunil Kumar Singh, PM Singh and B Singh**
**ICAR-Indian Institute of Vegetable Research, Varanasi-221 305, UP**

## Two-stem training system in tomato for higher yield under protected cultivation

Tomato plants grown in a vertical culture tied to strings were trained onto one-stem and two-stem systems for canopy management under naturally ventilated polyhouse, while and unpruned plants were treated as control. Among different training systems, plants

trained to two-stem performed better. The highest numbers of clusters (12.10), average number of fruits per cluster (7.60), fruit length (4.44 cm), fruit diameter (5.25) and yield per plant (9.76) were noted in two-stem training system in variety NS-4266. However, the maximum soluble solid content (8.13 $^0$Brix) was noted in plants trained onto one-stem. Unpruned control registered lower value for most of the attributes except No. of fruits/ cluster.

Bearing in tomato trained on two-stem system

**Hare Krishna, Anant Bahadur, DK Singh and J Singh**

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## Performance of muskmelon cv. Kashi Madhu under polyhouse condition

Muskmelon cv. Kashi Madhu, which is characterized by round and yellow fruits with prominent green stripes and orange flesh color, was selected for off-season production. The seedlings were raised in polybags and planted on raised beds in last week of June in a naturally ventilated polyhouse. Flowering was noted 35 days after planting and first picking was done in second week of September, which continued till the first week of November. The average yield per plant and fruit weight was recorded to be 3.1 kg and 1.1 kg, respectively. However, the maximum fruit weight was found to be 2.2 kg. The weight was exceptionally higher under polyhouse conditions as Kashi Madhu is reported to produce fruit weighing around 800 g under open field conditions. Likewise, the fruit soluble solid content was also comparatively higher (13.5 $^0$Brix) under polyhouse than reported open condition (13.2 $^0$Brix).

Kashi Madhu under polyhouse

**Anant Bahadur, Hare Krishna, DK Singh and J Singh**

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## Development of package of practices for water spinach cultivation

Water spinach is commonly grown in waterlogged areas. However, such cultivation requires cumbersome practices for plant protection measures and harvesting. This also invites water pollutants harmful for human health. Therefore, an attempt was made for cultivation of water spinach in field conditions and promising results were obtained for the same. This technology can prove to be simple and be cultivated round the year which can serve as boon for the socio-economic upliftment of farmers of this region.

**Advantages of field grown water spinach**:

a. Multiple cuttings
b. Can be grown throughout the year
c. Can be grown in field condition, submerged condition is NOT necessary
d. Produce may be free from water pollutants
e. Technology promises “Safe Biomass” as “Upland Water Spinach”

f. Promotion of cultivars VRWS-1 for socioeconomic prosperity among growers

Water spinach in field condition

**RK Dubey, PM Singh B Singh and MK Singh**
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## PEST MANAGEMENT

### Tomato leaf curl Palampur virus: Cause for leaf curl disease of *Basella alba* L.

Malabar spinach (*Basella alba* L.), a leafy vegetable native to Indian subcontinent and Southeast Asia. It is widely consumed in Northern India and is rich in vitamin A, vitamin C, iron, calcium, soluble fibers and protein. Additionally, it possesses neutraceutical values such as nephroprotective, antioxidant, antibacterial and anti-inflammatory. During the period of August-October 2017, *Basella* plants were observed with virus-like symptoms such as stunted growth, rosetting and severe curling of leaves at Research Farm of ICAR-IIVR, Varanasi with a disease incidence of 5%. Total DNA molecules extracted from symptomatic samples were subjected to rolling circle amplification (RCA) and were tested positive for the presence of begomovirus, using universal primer pair corresponding to DNA-A and DNA-B through PCR analysis. Restriction fragment length polymorphism (RFLP) analysis of RCA product followed by cloning and sequence analysis revealed association of bipartite tomato leaf curl Palampur virus (ToLCPalV) with the leaf curl disease of *Basella*. Moreover, efforts were also made to detect association of alpha and betasatellites through PCR assay. But there was no evidence for the presence of alpha and betasatellites observed. To our knowledge, this is the first confirmed report for the association of ToLCPalV with leaf curl disease of *B*asella from India.

**Shweta Kumari, Nagendran K, Vikas Dubey and KK Pandey**
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### Tomato leaf curl Joydebpur virus (ToLCJoV): Incident of chilli leaf curl disease in Andaman and Nicobar Islands

Chilli (*Capsicum annuum* L.) is a major vegetable crop cultivated in Andaman & Nicobar Islands in an area of around 120 ha with total production of 289 tons. Several biotic stresses are posing serious constraint to chilli cultivation by resource poor farmers. Chilli leaf curl disease (ChiLCD) caused by infection of begomoviruses is one of the most destructive diseases leading to considerable yield loss. Leaf curling, puckering, clearing of veins and veinlets, enation, chlorosis and yellowing, thickening of leaves and stunted growth of the plants are symptoms associated with leaf curl disease on chilli.

In survey conducted during 2017 in chilli cultivated areas of Andaman & Nicobar Islands, recorded disease incidence of ranging between 30-68%. Samples collected from 15 different places were confirmed the association of begomovirus in the PCR analysis using universal primer pair. Complete genome characterization of begomovirus associated with the leaf curl disease through rolling circle amplification

(RCA) followed by restriction-based cloning and sequencing identified as Tomato leaf curl Joydebpur virus (ToLCJoV) consisting of 2,761 nt (GenBank accession no. MK330665). The sequence exhibited 98.23% nucleotide identity with the DNA-A like genome sequence of ToLCJoV isolate from Bangladesh infecting tomato. Further analysis confirmed the associated of tomato leaf curl Joydebpur betasatellite (GenBank accession no. MN066162) with the samples. To the best of our knowledge, this is the first confirmed document for the infection of monopartite ToLCJoV in association with betasatellite causing ChiLCD of chilli plants in Andaman and Nicobar Islands.

Chilli plants showing leaf curl

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## CIARI-Bioconsortia– talc based microbial formulation for the management of solanaceous bacterial wilt disease in the islands

Solanaceous vegetables like brinjal, tomato and a chilli occupy a sizeable area of vegetable cultivation of Andaman and Nicobar islands. But the bacterial wilt disease caused by *Ralstonia solanacearum* is the severe concern for growing solanaceous vegetables. Farmers are facing yield loss of 10-50% in these crops every year solely due to this disease. The climate of Andaman Islands with more than 3000mm rainfall and 80% relative humidity is also highly conducive for this bacterial plant pathogen survival all-round the year and to induce severe disease.

The control of bacterial wilt disease is a serious concern due to the complex nature of pathogen as it could survive in soil for more years in association with infested plant debris and of its wider host range. Till date, various control strategies are recommended for the management of bacterial wilt disease like crop rotation with alternate hosts, usage of chemical fumigants, soil solarization, and usage of resistant cultivars, transgenic plants andgenetically modified microbes. But the usage of chemicals is not advocated in Andaman and Nicobar group of islands since the island agriculture is moving towards organic and other practices like soil solarization and alternate cropping etc., are also not much successful due to complex nature of pathogen and farmers preference. But in recent days, usage of beneficial microbes proved successful in managing bacterial wilt disease worldwide.

In view of this, ICAR - Central Island Agricultural Research Institute has developed the talc based bio formulation with native multi potential *Bacillus* spp isolated from diverse environment of the islands. The microbial product was suggested to be applied with farm yard manure in the form of bio enriched FYM for the management of disease.


Experimental plot showing effect of Bioenriched FYM

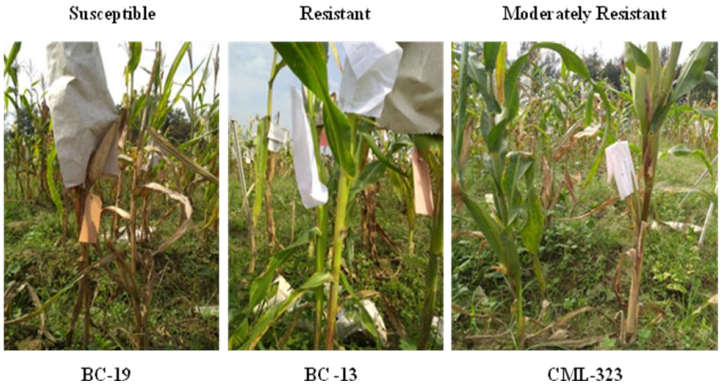
Farm showing effect of Bioenriched FYM

The results of studies in brinjal crop from two years revealed that the bio- enriched FYM treated fields showed least disease incidence of about 9-11% and having high bio control effect of about 72-78% when compared to control and FYM alone treated plots. Also the bio-enriched FYM treated plots showed excellent fruit yield and compared to the control and FYM treated plots. Now the usage of CIARI-Bio consortia microbial formulation and technology of bio-enriched FYM application in management of bacterial wilt in solanaceous crops in the islands have been taught to farmers through different training programs.

**K Sakthivel, RK Gautam and PK Singh**
**ICAR-Central Island Agricultural Research Institute, Port Blair– 744 101**

## Identification of resistant and moderately resistant germplasm against Banded sheath and leaf blight (BSLB) disease for baby corn and sweet corn.

Maize has been widely used as vegetable in the form of baby corn and sweet corn (*Zea mays* L.). *Rhizoctonia solani* causes banded sheath and leaf blight (BSLB) disease in baby corn and sweet corn. Worldwide, the disease causes huge economic losses. Use of resistant cultivars is among the most effective, economic and environmentally safe strategy. To identify resistance source available baby corn and sweet corn inbred lines were screened under field conditions as well under artificially controlled condition. Inbred lines IIVRBC-13 and CML-323 gave resistant and moderately resistant disease responses respectively and rest of the germplasm lines gave susceptible responses. Biochemical analysis revealed higher content of lignin, phenol, protein and carbohydrate in resistant (IIVRBC-13) and moderately resistant (BC-62) germplasm in comparison to highly susceptible (IIVRBC-19) germplasm.




Evaluation of Baby corn germplasm against BSLB under filed conditions

Further, higher level of defence related enzymatic activities of peroxidase and poly phenol oxidase were detected in the resistant inbred lines. Similar trend was observed for level of electrolyte leakage also. The study clearly shows the presence of effective pre-infection barriers and induced biochemical defence mechanisms operating in the resistant inbred lines. Identified resistant lines can be used in BSLB disease resistance breeding programmes

**BR Meena, YS Reddy, Nakul Gupta and KK Pandey**
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## *Solanum torvum*: a promising rootstock for root knot nematode (*Meloidogyne incognita*)

Root- knot nematodes (*Meloidogyne* spp.) are one among the major biotic stresses in vegetable crops. This plant parasitic nematode affects the root growth system by inducing severe galling, stunted growth of plant due to reduced nutrient uptake from soil and predisposition of roots to secondary pathogen invasion. In fact, use of nematicides for the management of this polyphagous nematode pest is discouraging due to their toxic hazards

on environment. Thus search of an alternative safe approaches are warranted. Grafting is a unique horticultural technology presently exploited for mitigating biotic stress including root knot nematodes and other soil borne pathogens.

*Solanum torvum* reaction to Root knot Nematode

Tomato seedling grafted on *Solanum torvum*

In this endevour, *Solanum torvum* (wild brinjal) obtained from ICAR-IIVR germplasms collection was screened for root knot nematode resistance under challenged inoculation of 2000 second stage infective juveniles of root knot nematode per plant. The study confirmed the resistance reaction of *S. torvum* against root knot nematode (*M. incognita*) by exhibiting gall index 1.0 (Gall index scale 0-5, Taylor and Sasser 1978). Further *S. torvum* was used as root stock to evaluate its compatibility with the scion of promising tomato varieties i.e. Kashi Aman and Kashi Vishesh upon grafting and root knot nematode resistance in grafted plants through challenged nematode inoculation. The study revealed that, grafted plants i.e. Kashi Aman and Kashi Vishesh on *S. torvum* root stock exhibited greater compatibility and also reduced 82 and 81% of final nematode population in soil with gall index 1, 1 respectively, over control.

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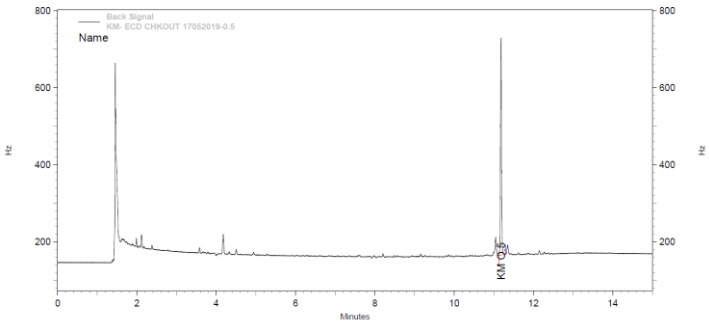
## Gas chromatography with microelectron capture detector (GC-µECD, 63Ni) method for the estimation of Kresoxim-methyl

Kresoxim-methyl (KM), is a fungicide, which is synthetized by BASF from strobilurin-A. It is used to control powdery mildew and scab in grapes, cucumbers and vegetables. This fungicide has broad spectrum activity, unique modes of action, low use rate and excellent yield and quality benefits. However, residues may remain in the crops and soil and may causes the health hazard to consumers. Thus, pesticide residues are regulated in different countries in terms of maximum residue limits (MRLs). For estimation of KM, standard solution was prepared by dissolving 10 mg of KM in 10 mL of solvent. The intermediate standard of 1 µg/mL was prepared by appropriate dilutions. The calibration standards, ranging within 0.1-0.5 µg/mL, were prepared by means of serial dilution with ethyl acetate. An Agilent gas chromatography model 7890B equipped with an autosampler and microelectron capture detector (µECD, $^{63}$Ni) were used for the detection of KM. A standard syringe split/splitless injector was used in the split injection mode at a ratio of 10:1 at 250 ºC with an injection volume of 1 µL. A HP-5 capillary column (30 m length, 320 µm id, 0.25 µm film thickness with nitrogen gas flowing at 2 mL/min) was used for separation. The detector was maintained at 300 ºC with makeup gas ($N_2$) flowing at 60 mL/min. The oven temperature was set to 100 ºC for 1 min, ramped to 280 ºC at 15 ºC /min, and held for 2 min. Under these conditions, KM appeared at retention time (RT) of 11.18 min (Fig.-2). An Agilent openlab EZchrom used for chromatogram acquisition.

Gas chromatography




Retention time (min)
Chromatogram for KM

**Sujan Majumder, Vijaya Rani, BR Meena, Chandan K Verma, KK Pandey and Jagdish Singh**
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## SUCCESS STORIES

### Improved tomato production brings happiness to farmers

Mr. Puspa Ranjan Dhar, 52, lives in Block Kalain of Cachar, Assam state, India, with his wife and two children. He's been a vegetable farmer for the past three decades. Even with all his years of farming experience, he still learned some new approaches for producing tomatoes by participating as a demonstration farmer for the APART project. Since October 2018, the World Vegetable Center (WorldVeg) has been carrying out demonstration trials for the Assam Agribusiness and Rural Transformation Project (APART) funded by Assam Rural Infrastructure and Agricultural Services Society (ARIAS) through World Bank, to demonstrate climate-resilient cropping practices to tomato farmers in Cachar district. Encouraging results produced at Mr. Dhar's demonstration fields during the 2018/19 Rabi season inspired other tomato growers in that area. His demonstration plots were guided by Mr. Souradeep Acharjee, World Vegetable Center Technical Officer, and other demonstrations in Kalain were administered by Mr. Nikubur Jaman, the Agriculture Development Officer (ADO) for the area.

The set of improved cropping practices, based on a jointly elaborated package of practices (PoP) developed WorldVeg and the Assam Agricultural University (AAU), led to better plant growth, improved plant health and higher yield—all of which increased Mr. Dhar's income. The demonstration was conducted on an area of 0.125 ha. The locally popular variety "Victor" (F1 hybrid) from Crystal Seeds was selected based on market preference. The same variety was used in both the WorldVeg demo plot and the farmer's control plot to effectively display the outcomes from adopting improved agricultural practices such as proper fertilizer dose, healthy nursery, proper plant spacing, proper weed management, proper irrigation and plant protection, staking of the plants, etc.

**First key to success: Improved nursery management**

A good vegetable crop always starts with a good nursery. Under the guidance of WorldVeg, a semi-protected tunnel nursery with a raised bed was established with polyethylene sheets and locally sourced materials such as bamboo. These low-cost, simple structures protect seedlings from intense radiation, strong rainfall and other detrimental environmental impacts. Improved pest and disease management methods, such as following a recommended schedule of pesticide spraying, make small tunnels even more effective. The healthier and stronger seedlings produced in the tunnel gave the demo plots a head start, compared with seedlings produced with the usual farmer's practices.

A well-managed nursery grown in tunnels to protect seedlings from heavy rain and intense sunlight

Mr. Dhar in his well-staked tomato plot


Learning new vegetable production methods

**Active participation of women farmers:** Women farmers were encouraged to participate in the operation of all aspects of the WorldVeg demonstration plots. Women worked together with men to establish a seedling nursery. They sowed seed, transplanted, weeded, applied top dressing, harvested, graded, sorted, and packed the tomato fruit. The activities empowered women, strengthened their position in the family as well as in the local community, and inspired other women in the village. With women working side-by-side with male family members, farm families were able to reduce external labor costs.

**Improved field management:** WorldVeg demonstrated enhanced plant fitness through proper staking. Staking improves aeration within the field, reducing fungal disease pressure, while allowing crop plants to better explore the available space and avoid contact of fruits with the soil. In the WorldVeg plots, staking prolonged crop duration and produced disease-free and mud-free tomatoes, thus improving yield and fruit quality. For the farmers, better fruit quality translates to better market acceptance and prices for their produce.

**Table 1** Additional Cost to follow PoP

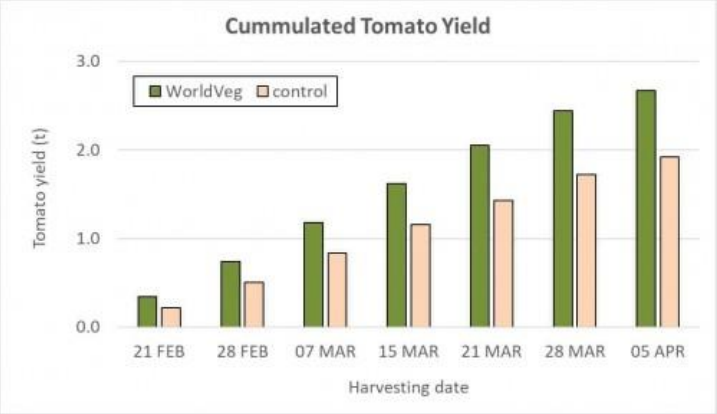
| Type of additional cost | unit | unit cost (INR) | amount | additional cost (INR) |
|---|---|---|---|---|
| bamboo | lump sum | 1,000.00 | 1 | 1,000.00 |
| Staking | man*days | 300.00 | 3 | 900.00 |
| Pesticides according to PoP | lump sum | 1,500.00 | 1 | 1,500.00 |
| weeding | man*days | 300.00 | 8 | 2,400.00 |
| **Total additional cost** | | | | **5,800.00** |

**Table 2** Income Components

| | |
|---|---|
| Total harvest WorldVeg (kg) | 2668 |
| Total harvest control (kg) | 1920 |
| Difference (kg) | 748 |
| Tomato price (₹/kg) | 15.00 |
| Additional revenues from tomato sale (INR) | 11,220.00 |
| **Increase in farmer's income** | **5,420.00** |

**Success in the field pays off!**

Mr. Dhar harvested 23 quintals (2.3 t) of marketable tomatoes from the WorldVeg demo plot, which produced revenues of Rs. 40,000 from sales at a price of Rs. 15 per kg. On the other hand, only 19 quintals (1.9 t) of marketable tomatoes were harvested from the control plot, which sold for Rs. 29,000. The difference in revenues was more than Rs. 11,000, which in terms of a one-hectare area is Rs. 88,000.




Applying the techniques recommended in the PoP incurred some additional costs:

- Seedlings grown in the low tunnel were used in both the demo and control plots. So, costs associated with the low tunnel were not taken into consideration.
- Bamboo for staking was available on the farm. The estimated cost for the amount used was Rs.1,000.
- Staking required additional labor of 3 worker-days at an average cost of Rs.300 per worker-day.
- The farmer purchased pesticides as recommended in the PoP for an additional Rs.1,500.
- No additional fertilizer was used in either the demo or control plot. Low tunnels were fertilized at the time of land preparation with cow dung from own farm.
- The demo plot was hand-weeded three times and the control plot was weeded only once. Each weeding required approximately 4 worker-days.

Taking in account the additional cost, the higher tomato yields generated a plus in income to the farmer of more than Rs. 5,400 on the demo plot as compared to the farmer's practice. This translates into a potential increase in income of Rs. 43,360 per ha.

**Souradeep Acharjee,**
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**काशी गोभी-25 से आय में वृद्धि एवं आजीविका सुरक्षा**

उत्तर प्रदेश के ककरही, राबर्टस्गंज, सोनभद्र निवासी 38 वर्षीय किसान श्री शिवशंकर मौर्य एक ऐसे प्रगतिशील किसान हैं जो सदैव खेती कि उन्नत क़िस्मों एवं नवीन तकनीकों का उपयोग करके न केवल अपनी आय बढ़ाने में सफल हुए हैं बल्कि क्षेत्र के अन्य किसानों के लिए प्रेरणास्रोत का कार्य भी किया है। ये मुख्यतः सब्जियों जैसे फूलगोभी, पत्तागोभी, टमाटर, मिर्च, बैगन, लोबिया, बीन्स फली, पालक, परवल, इत्यादि कि व्यावसायिक खेती करते हैं।शिवशंकर जी ने वर्ष 2018 में भा॰ कृ॰ अनु॰ प॰- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी, उत्तर प्रदेश द्वारा विकसित फूलगोभी कि उन्नत किस्म 'काशी गोभी-25' एवं बाजार में उपलब्ध दो संकर प्रजातियों को लगभग डेढ़-डेढ़ एकड़ क्षेत्रफल में तीन समयान्तराल (10, 20 तथा 30 जुलाई 2018) में नर्सरी में बुवाई के लगभग 30 दिन बाद पौध की रोपाई की। संस्थान के वैज्ञानिकों डा॰ बी॰ के॰ सिंह तथा डा॰ प्रदीप करमाकर द्वारा समय-समय पर उत्पादन की विभिन्न तकनीकी जानकारियाँ प्रदान की गयी तथा 29 सितंबर एवं 30 अक्तूबर 2018 को प्रक्षेत्र का भ्रमण भी किया गया। कुल मिलाकर ककरही में काशी गोभी-25 का प्रदर्शन बहुत ही अच्छा रहा। इस उन्नत किस्म का फूल (कर्ड) लगभग 60 दिनों में तैयार होना शुरू हो गया, जो कि शिवशंकर जी द्वारा बाजार से खरीदी संकर प्रजातियों से 15-18 दिन अगेती थी। इसका फूल आकर्षक, मध्यम आकार का, रंग लगभग सफ़ेद तथा ठोस होता है। सफ़ेद एवं गठीला फूल होने के कारण

बाजार में इसकी मांग सबसे अधिक थी और साथ ही उत्पादक को प्रीमियम कीमत भी मिली। अक्तूबर माह के द्वितीय, तृतीय एवं चतुर्थ सप्ताह तथा नवम्बर माह के प्रथम सप्ताह में फूलगोभी का थोक भाव क्रमशः रु॰ 20-25, 15-20, 8-10 तथा 10-12 प्रति फूल था।

शिवशंकर जी नें 1.5 एकड़ खेत से लगभग 22,500 गोभीफूल उत्पादित किए जिसको उन्होने बाजार में रु॰ 2,70,000/- में बेचा। उन्होने बताया कि डेढ़ एकड़ फूलगोभी की खेती के लिए किस्म काशी गोभी-25 के बीज की खरीददारी में मात्र रु॰ 500/- तथा संकर प्रजाति के लिए रु॰ 7,500/- व्यय करना पड़ा, इस प्रकार उन्होने काशी गोभी-25 को अपनाकर मात्र बीज हेतु व्यय में ही रु॰ 7,000/- की शुद्ध बचत की (अर्थात रु॰ 4,700 प्रति एकड़)। कुल उत्पादन लागत लगभग रु॰ 1,40,000/- थी जिसमें जमीन का किराया, बीज की कीमत, सस्य-क्रियाएँ, खाद, उर्वरक, रसायन, मजदूरी, विपणन काश्त, इत्यादि सम्मालित है। प्रसन्नचित शिवशंकर जी ने बताया कि काशी गोभी-25 की 1.5 एकड़ व्यावसायिक खेती से उन्होने लगभग रु॰ 1,30,000/- का शुद्ध लाभ मिला। इस प्रकार शिवशंकर जी ने फूलगोभी की खेती के लागत में कमी तथा आय में वृद्धि करते हुए अपनी आजीविका को सुरक्षित किया।

**बी॰ के॰ सिंह, प्रदीप करमाकर एवं शुभदीप राय**
**भा.कृ.अनु.प.- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी, उ.प्र.**

## EVENTS

### Pointed gourd Field Day cum Kisan Gosthi organised at Haripur village, Varanasi

ICAR-IIVR, Varanasi organized Pointed Gourd Field Day cum Kisan Gosthi on 21st June 2019 at Haripur (Kaniyar) village in Badagaon block of Varanasi which was inaugurated by Dr AK Singh, DDG (Hort. Science), ICAR, New Delhi. The Chief Guest of this event along with scientists of ICAR-IIVR and about 100 vegetable growers from nearby villages visited the demonstration plots of pointed gourd varieties developed by ICAR-IIVR in the village wherein, the institute had demonstrated 02 promising varieties of pointed gourd viz., Kashi Alankar and Kashi Suphal and advance line VRPG-141 in small fruited without stripes segment in more than 5 ha area along with improved production technologies like plastic mulch, drip irrigation and fruit fly trap. The farmers showed their great satisfaction on the performance of demonstrated pointed gourd cultivars and said it not only gave better quality but also more yield and revenue than existing local varieties. Addressing the farmers during Kisan Gosthi, Dr AK Singh said the farmers to visit ICAR-IIVR regularly for quality seeds and technical guidance so that their farm income can be doubled in the coming years which are also a dream of our Hon'ble Prime Minister. During technical session problems of farmers in vegetable farming were discussed and solutions were provided by the scientists. On this occasion, scientists from ICAR-IIVR Drs Neeraj Singh, Achuit Singh and Shubhadeep Roy also shared their views for enhancing the farm income.

**Shubhadeep Roy and Neeraj Singh**
**ICAR-Indian Institute of Vegetable Research, Varanasi-221 305, UP**

**International Yog Day celebrated at ICAR-IIVR, Varanasi**

International Day of Yog was celebrated at ICAR-Indian Institute of Vegetable Research, Varanasi on June 21, 2019. All the employees of the institute, including Scientists, technical and administrative officials participated in the program with enthusiasm. In this programme, various yogic exercises, asanas, and pranayams were demonstrated by Yoga experts Sri Chandresh Dube and Sri Girish Upadhyay.

**Celebration of World Food Safety Day at ICAR-IIVR, Varanasi**

ICAR-Indian Institute of Vegetable Research, Varanasi celebrated the World Food Safety day on June 7, 2019. Food borne diseases adversely affects the socio-economic development, harming national economics, tourism and trade. The programme started with taking pledge collectively by the staff of the institute regarding the issues related with food safety on June 7, 2019. Dr. Sudhir Singh, Principal Scientist presented briefly the importance of five pillars in food safety such as maintenance of personal hygiene, keep cooking and surrounding areas clean, follow keys to safer foods, check food for adulteration and spoilage before consumption and read the labels to know what you are eating.

**दूसरी तिमाही राजभाषा कार्यशाला का आयोजन**

भा. कृ. अनु. प.- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में दूसरी तिमाही राजभाषा कार्यशाला "प्रशासनिक कार्यों में राजभाषा को बढ़ावा" विषय पर दिनांक 6 जून, 2019 को आयोजित की गयी। इसका मुख्य उद्देश्य संस्थान एवं इसके क्षेत्रीय शोध केन्द्र, सरगटिया के वैज्ञानिकों एवं तकनीकी अधिकारियों को अपने कार्यालयीन एवं दैनिक कार्यों में राजभाषा को अधिक से अधिक प्रयोग करने के लिए प्रोत्साहित करना एवं सुझाव देना था। संस्थान के कार्यकारी निदेशक, डॉ. एस के वर्मा ने अपने उद्बोधन में कहा कि सभी भाषाओँ की अपनी महत्ता है परन्तु जो भाषा जन मानस को अधिक आसानी से जोड़ सके एवं जनसंचारी हो सके, उसमे काम करने का प्रयास करना चाहिए। उन्होंने कहा कि कृषि वैज्ञानिकों एवं तकनीकी अधिकारियों को किसानो के लिए काम करना होता है, अतः उनको अपने लेखन एवं परिचर्चा में हिन्दी का प्रयोग करते हुए संवैधानिक दायित्वों को पूरा करना चाहिए। डॉ हरे कृष्ण ने "राजभाषा नीति एवं राजभाषा के प्रयोग को बढ़ावा" विषय पर व्याख्यान दिया. उन्होंने अपने व्याख्यान में वैज्ञानिक लेखन में हिन्दी के प्रयोग को बढ़ाने के उपायों की चर्चा की। प्रतिभागियों को राजभाषा के प्रयोग में आने वाली समस्याओं का समाधान वाद संवाद के द्वारा किया गया। कार्यशाला में सभी प्रतिभागियों को प्रमाण पत्र वितरित किया गया। कार्यक्रम का संचालन डॉ इन्दीवर प्रसाद ने किया। इस अवसर पर डॉ पी एम सिंह, विभागाध्यक्ष (फसल उन्नयन), डॉ आर एन प्रसाद, विभागाध्यक्ष (फसल उत्पादन), डॉ डी आर भारद्वाज, डॉ ए एन त्रिपाठी, डॉ राजशेखर रेड्डी, श्री एस के सिंह (वरिष्ठ प्रशासनिक अधिकारी) एवं डॉ रामेश्वर सिंह उपस्थित रहे।


**Progressive Farm delegates from Nepal visited ICAR-IIVR**

26 progressive farm delegates from Nepal visited ICAR-IIVR, Varanasi on 29th May 2019. They visited the institute research farm and technology block to get acquainted with the modern and improved vegetable production technologies developed by the institute. They also interacted with the extension scientist of the institute to discuss about efficient technology delivery mechanism of India which can be replicated in Nepal.

**Shubhadeep Roy**
**ICAR-Indian Institute of Vegetable Research, Varanasi**

**संस्थान में सुश्री डॉली चक्रवर्ती, अपर सचिव कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार का भ्रमण**

भा.कृ.अनु.प.–भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में सुश्री डॉली चक्रवर्ती, अपर सचिव, कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार ने 21 मई, 2019 संस्थान के अनुसंधान प्रक्षेत्र एवं समेकित मधुमक्खी पालन केन्द्र का भ्रमण किया। सब्जियों की खेती से संबंधित अनुसंधान एवं प्रसार कार्यक्रमों की समीक्षा किया एवं संतोष व्यक्त करते हुये संस्थान के वैज्ञानिकों की सराहना किया। उन्होने कहा कि देश में कई प्रकार के आयातित सब्जियों की मांग उपभोक्ताओं के बीच में अधिक है। इस मांग की पूर्ति के लिये संस्थान ने सब्जियों की कई किस्मों और वैज्ञानिक तकनीकियों व नवाचारों को विकसित किया है जिससे किसान मौसम व बेमौसम में सब्जियों की कम लागत में खेती कर अपनी आय बढ़ा रहे है। खाद्य प्रसंस्करण के क्षेत्र में संस्थान द्वारा विकसित सेलाक कोटिंग तकनीक को अपनाने से सब्जियों की भण्डारण अवधि बढ़ाने एवं परिवहन के दौरान क्षति को कम करने से होने वाले लाभों को बताया। मधुमक्खी पालन से किसानों को गुणवत्ता युक्त शहद उत्पादन द्वारा अधिक आमदनी प्राप्त करने के साथ साथ फसल उत्पादन में होने वाले अतिरिक्त लाभों की परिचर्चा किया। पोषण सुरक्षा को सुदृढ़ करने एवं किसानों को आय बढ़ाने हेतु वैज्ञानिक तकनीक से सब्जी उत्पादन करने का सुझाव दिया। डॉ. अरविन्द कुमार, निदेशक, अन्तर्राष्ट्रीय चावल अनुसंधान संस्थान, आईसार्क, वाराणसी ने किसानों के लिये चावल एवं सब्जियों पर आधारित फसल प्रणाली की उन्नत तकनीकियों को विकसित करने का सुझाव दिया। किसानों के प्रशिक्षण हेतु किये जा रहे कार्यों एवं अनुसंधान को और प्रभावी बनाने हेतु संस्थान एवं आइसार्क को संयुक्त रूप से कार्य करने की पहल पर जोर दिया। डॉ. ए.एन.सिंह, निदेशक, राष्ट्रीय बीज अनुसंधान एवं प्रशिक्षण केन्द्र, वाराणसी ने संस्थान द्वारा विकसित सब्जियों की किस्मों द्वारा किसानों को होने वाले लाभों को बताया। संस्थान के निदेशक ने सब्जियों में किये जा रहे शोध एवं प्रसार कार्यों एवं उपलब्धियों की जानकारी देते हुये कहा कि किसान सब्जियों की खेती द्वारा कृषि के विविधीकरण के साथ-साथ कम समय में कम लागत में अपनी आमदनी को बढ़ा सकते हैं। इस अवसर पर संस्थान के सभी विभागों के विभागाध्यक्ष एवं अन्य वैज्ञानिकगण भी उपस्थित रहें।

**World Honeybee Day celebrated and Commodity Interest Group (CIG) on Honey and Honeybee raring formed at Paniyara village of Varanasi**

On the occasion of World Honeybee Day on 20th May 2019, a sensitization workshop on importance of honeybee keeping was organised at Paniyara village of Varanasi. Scientists of ICAR-IIVR, Varanasi interacted with potential honeybee growers of that region and told them about the importance of honeybee in agriculture and its prospects in additional income generation. Farmers can rare honeybee with minimal cost involvement. As honeybee helps in pollination, productivity of the crops also increases. Scientists told about different by-products of honey like propolis, wax, royal jelly which are very exotic and high value in market. More than 50 farmers participated in this workshop and a Commodity Interest Group (CIG) on honey and honeybee raring was formed with the farmers who showed keen interest in honeybee keeping. Scientists of ICAR-IIVR also assured that special training and exposure visit for this CIG will be organised at the Integrated Bee Keeping Development Centre/ Centre of Excellence established at ICAR-IIVR, Varanasi for further handholding and assistance.

**Shubhadeep Roy and Neeraj Singh**
**ICAR-Indian Institute of Vegetable Research, Varanasi**

**Interaction meeting of KVK scientists and farmers organised at ICAR-IIVR for Inter Institutional Human Resource Development**

An Interaction Meeting of KVK scientists and farmers organised at ICAR-IIVR, Varanasi on 8th April 2019 for reviewing the works of KVKs and strengthen inter institutional human resource development. Thirteen KVKs situated at eastern Uttar Pradesh viz. Varanasi, Mirzapur, Chandauli, Sonbhadra, Bhadohi, Gazipur, Mau, Jaunpur, Balia, Azamgarh, Prayagraj, Kaushambi and Pratapgarh participated in this workshop. The KVK Heads associated with representative progressive farmers of the respective KVKs took part in the interaction workshop and discussed several issues to improve agriculture scenario and strengthen technology delivery mechanism for inter institutional human resource development. Dr. A. K. Singh, D.D.G. (Agril. Extension), ICAR, New Delhi presided over the meeting and emphasized on efficient technology delivery mechanism though KVKs. Dr. Panjab Singh, Former Secretary DARE and DG, ICAR was the Chief Guest of the function. He told KVK scientists and farmers to work together on export quality vegetable production. He emphasized on formation of SHGs and FPOs for empowering rural youths in National as well as World market. Other dignitaries like Dr. Atar Singh, Director, ICAR-ATARI, Kanpur, Dr. Arvind Kumar, Director, IRRI (Regional Centre), Varanasi, Dr. Ramesh Chand, Director, IAS, BHU, Varanasi and Dr. Jagdish Singh, Director, ICAR-IIVR, Varanasi and scientists of ICAR-IIVR, Varanasi participated in this interaction meeting.


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**ICAR-Indian Institute of Vegetable Research, Varanasi**

## भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में राजभाषा कार्यशाला का आयोजन

भा.कृ.अनु.प.-भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में राजभाषा कार्यशाला का आयोजन दिनांक 11 मार्च, 2019 को कार्यालय के कार्यों में हिन्दी की उपादेयता पर किया गया। संस्थान के निदेशक डा. जगदीश सिंह ने राजभाषा के प्रगामी प्रयोग को बढ़ावा देने के लिए प्रशासनिक कार्यों में शत-प्रतिशत हिन्दी में कार्य करने के लिए सभी को निर्देशित किया। डा. सिंह ने संस्थान में हिन्दी में किये जा रहे प्रशासनिक कार्यों, शोध एवं प्रसार के कार्यों में हिन्दी की महत्ता को बताया। इस कार्यशाला में कार्यालय के कार्यों में, सरकारी काम-काज में हिन्दी के प्रयोग को बढ़ाने हेतु प्रतिभागियों को आवश्यक प्रशिक्षण दिया गया। राजभाषा को कार्यों में सुलभ बनाने के लिए राजभाषा कार्यालयी शब्दावली एवं कार्यालयीन हिन्दी पर डा. सुरेश कुमार वर्मा एवं डा. आत्मा नंद त्रिपाठी ने विस्तार से बताया। कार्यशाला का समापन प्रमाण पत्र वितरण के साथ किया गया। इस कार्यक्रम का संचालन डा. रामेश्वर सिंह ने किया।


## भा.कृ.अनु.प.- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में अन्तर्राष्ट्रीय महिला दिवस का आयोजन

भा.कृ.अनु.प.- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी में अन्तर्राष्ट्रीय महिला दिवस का आयोजन दिनांक 08 मार्च, 2019 को किया गया। कार्यक्रम का शुभारम्भ संस्थान के निदेशक डॉ. जगदीश सिंह ने दीप प्रज्ज्वलन एवं स्वागत भाषण के साथ किया। इस अवसर पर संस्थान के वैज्ञानिक अधिकारी, कर्मचारी और प्रक्षेत्र पर कार्यरत एवं निकटवर्ती गोद लिए गए गांवो की लगभग 200 महिलाएं उपस्थित रहीं। इस अवसर पर प्रधानमंत्री श्री नरेन्द्र मोदी जी का विश्व महिला दिवस पर दिये गये उद्बोधन का सभागार में प्रसारण किया गया। संस्थान के निदेशक ने राष्ट्र निर्माण के योगदान में विभिन्न क्षेत्रों में महिलाओं की भूमिका को याद करते हुए उनके रोचक, प्रेरक और सफल भागीदारी की महत्ता को बताया। महिलाओं के सशक्तीकरण हेतु स्वंय सहायता समूह, निजी संस्थान एवं कृषक उत्पादन संगठन बनाने का सुझाव दिया, जिससे महिलाओं को वैश्वीकृत दुनिया में तकनीकी के प्रयोग द्वारा कृषि को उद्यम का रूप देकर रोजगार एवं आजीविका के साधन सृजित करने के अवसर प्राप्त हो सके। कृषि विविधिकरण के अंतर्गत महिलाओं को सब्जियों का संकर बीज उत्पादन, मशरूम उत्पादन, मधुमक्खी पालन, मत्स्य पालन, डेयरी, कटाई उपरान्त प्रौद्योगिकी एवं मूल्यवर्धन को अपनाने की बात कही जिससे उनको रोजगार व आय बढ़ाने के साथ-साथ खाद्यान एवं पोषण सुरक्षा मिल सके।

संस्थान के निदेशक ने प्रक्षेत्र में उत्कृष्ट कार्य के लिये महिला श्रमिक श्रीमती फूलमनी देवी को पुष्प एवं शाल देकर सम्मानित किया। निदेशक महोदय ने स्पष्ट किया कि प्रत्येक वर्ष अन्तर्राष्ट्रीय महिला दिवस के अवसर पर शोध एवं विकास में महिलाओं के योगदान हेतु संस्थान एक उत्कृष्ट महिला को सम्मानित करेगा। इस अवसर पर संस्थान के प्रधान वैज्ञानिक डॉ. डी. आर. भारद्वाज ने सब्जी उत्पादकता बढ़ाने में महिलाओं के योगदान एवं डॉ. ए. एन. त्रिपाठी ने कृषि व्यवसाय के द्वारा महिला सशक्तीकरण पर व्याख्यान दिया। इस अवसर पर डॉ. एस. के. वर्मा, डॉ. पी. एम. सिंह, डॉ. शुभदीप रॉय एवं संस्थान के अन्य वैज्ञानिकों, कर्मचारी गण उपस्थित रहे। कार्यक्रम का संचालन डॉ. एन. त्रिपाठी व धन्यवाद ज्ञापन डॉ. ज्योती देवी ने किया।

**National Academy of Agricultural Sciences-Varanasi Chapter organized a special lecture**

National Academy of Agricultural Sciences -Varanasi Chapter organized a special lecture on **"**Feeding 1.37 billion with Nutritional Security: Bigger Challenge" delivered by Dr. A.K. Srivastava, Chairman, ASRB, New Delhi & Vice President, NAAS on 29nd January, 2019 at ICAR-Indian Institute of Vegetable Research, Varanasi. During his deliberation, Dr. Srivastava emphasized on nutritional, food and economic security of farmers. He also advised the scientists to develop the climate resilient technologies, which may be helpful to sustain the production to feed the increasing populations. 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 focused attention towards developing hybrids in vegetables by public sector and making them available to the farmers at affordable prices. Dr. Gautam Kalloo, Ex VC, JNKAV, Jabalpur and DDG (HS) gave his remarks. On this occasion Fellows, NAAS-Varanasi chapter, Scientists, Technical, Research Associates, SRFs etc. were present.


**Field day on Solanaceous Vegetables organized at ICAR-IIVR, Varanasi**

"Field day: Solanaceous Vegetables" was organized by Zonal Technology Management Unit of ICAR-IIVR, Varanasi on 19th January, 2019 to showcase and commercialize the promising varieties and advanced lines of tomato, brinjal and chilli developed by the Institute. The programme was attended by more than 30 breeders and marketing strategists from ten private vegetable seed-companies like Gemini seeds Pvt. Ltd., Known-you Seeds, Ankur Seeds Pvt. Ltd., Agriisia Seeds Pvt. Ltd., Metahelix Life Sciences Ltd., Nuziveedu seeds, East-West Seeds, Sakata Seeds and Tanishk Agro Inputs. The representatives of seed-companies visited the research farm 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 hybrids/varieties and advanced breeding lines having a combination of desired quality traits along with yield. The delegates thoroughly interacted with the breeders of the institute and provided valuable feedback on the current market needs in various vegetables. 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 to 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. At the end, Dr. P.M. Singh, Principal Scientist and In-charge ZTMU proposed the vote of thanks.

## AWARDS AND RECOGNITIONS

The Awards/Fellows-2018 of ISVS have been conferred to the following personalities:

- **Dr Kirti Singh Life Time Achievement Award-2018** in Vegetable Science to Dr Sudhakar Pandey, Pr. Scientist, Div. of Veg. Improvement, ICAR-IIVR, Varanasi.
- **Dr Bishwajit Choudhary Memorial Award-2018** for Outstanding Vegetable Scientist to Dr. T.K. Behera, Professor, Div. of Veg. Sci., ICAR-IARI, New Delhi.
- **Dr Dwarika Nath Memorial Award-2018** to Dr Nangsol Dolma Bhutia, Div. of Vegetable Science, ICAR-IARI, New Delhi for best PhD thesis "Assessment of heterosis for yield and quality traits and molecular mapping of cluster bearing habit in *Luffa*" under chairmanship of Dr Amish Kumar Sureja.
- **Dr Harbhajan Singh Memorial Award-2018** to Dr Tania Seth, GP Mishra, B Singh, Sarvesh Kashyap, Sarvesh K Mishra, SK Tiwari and PM Singh for paper "Optimization of quality DNA isolation protocol from various mucilage rich cultivated and wild *Abelmoschus* spp. and its validation through PCR amplification" for best paper published in Vegetable Science 45(1): 1-6.
- **ISVS Fellows-2018** awarded to 15 Scientists/ Academicians:
  1. Dr. A.T. Sadashiva, Head, Div. of Vegetable Crops, ICAR-IIHR, Bengaluru
  2. Dr. Anil Khar, Pr. Scientist, ICAR-IARI, New Delhi
  1. Dr. B.K. Singh, Sr. Scientist, ICAR-IIVR, Varanasi
  2. Dr. Gobin Chandra Bora, Prof., Dept. of Plant Breeding & Genetics, AAU, Jorhat
  3. Dr. Jitendra Singh, Professor, CoA, IGKV, Raipur
  4. Dr. Nirmal Kumar Hedau, Pr. Scientist, ICAR-VPKAS, Almora
  5. Dr. P.K. Gupta, Director, NHRDF, Nasik
  6. Dr. R.K. Yadav, Pr. Scientist, Div. of Vegetable Science, ICAR-IARI, New Delhi
  7. Dr. R.S. Pan, Pr. Scientist, ICAR-RC-ER-RC, Ranchi
  8. Dr. Ramesh Kumar, PS, Dept. of Veg. Sci., YSPUH&F, Solan
  9. Dr. Sudhir Singh, Pr. Scientist, ICAR-IIVR, Varanasi
  10. Dr. Sumati Narayan, Prof.-cum-Chief Scientist, SKUAST, Srinagar
  11. Dr. Tolety Janakiram, ADG (HS-I), ICAR, New Delhi
  12. Dr. V. Kanthaswamy, Dean, PJNCA&RI, Karaikal
  13. Dr. Vijay Mahajan, Pr. Scientist, DOGR, Rajgurunagar, Pune

## APPOINTMENT/ TRANSFER/ RETIREMENT

| **Appointment** | **Date of Joining** |
|---|---|
| Sh. Rajeev Kumar, Scientist | 15.04.2019 |
| Sh. Sujit Kr. Singh, SAO | 21.05.2019 |
| Sh. Manish Omar, Stenographer Gr. III | 05.04.2019 |
| Sh. Manish Kr. Pandey, Stenographer Gr. III | 05.04.2019 |
| Sh. Ankit, Stenographer Gr. III | 22.04.2019 |
| Sh. Ankit Kr. Pandey, Stenographer Gr. III | 22.04.2019 |
| Sh. Vinod Kr. Verma, Tech. Asstt. (T-3) | 08.01.2019 |
| Sh. Sudeep Singh, LDC | 23.01.2019 |
| **Transfer** | **Date of Relieving** |
| Sh. Sumit Kr. Jindal, SAO | 15.04.2019 |
| Rahul Roushan, Assistant | 28.02.2019 |
| Dr. D.K. Singh, PS | 30.04.2019 |
| Sh. Ajyan P., Private Secretary | 15.05.2019 |
| **Deputation** | **Date of Relieving** |
| Sh. Roshan Lal, Assistant | 20.05.2019 |
| **Resignation** | **Date of Resignation** |
| Ms. Poornima Gaikwad, Tech Asstt | 28.02.2019 |
| Sh. Mukesh, Tech Asstt | 31.05.2019 |
| ***Dr. B. Singh, Ex-Director, ICAR-IIVR relieved on 05.03.2019 to join as Director General, UPCAR, Lucknow.** | |

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