

2. The trial on “Influence of pelleting and planting methods in onion”, conducted and concluded at Rahuri. Among the various pelleting materials tried, the highest bulb yield was recorded in onion seeds pelleted with Karanj leaf powder (500 g per kg of seed) in flat bed system during *Kharif* season and in *Rabi* season higher bulb yield was recorded in flat bed system of planting with Bavistin (3g/kg of seed).

Public Private Interface

The Chairman, Dr. S.L. Mehta, Former Vice-Chancellor, MPUA & T, Udaipur, emphasized that the partnership between public and private must be co-operative, completely transparent and honest, at the same time the breeding lines and varieties developed out of the partnership must be of good quality and cost should be affordable by the farmers.

Dr. P. Subbayan, Director of Agricultural Business, TNAU, Coimbatore briefed about TNAU-Private Seed Sector Research and Technology Consortium that was initiated in 2007. He informed that this consortium was developed mainly to co-ordinate Agribusiness and started with the venture capital Rs 6.0 crores and primarily focusses on rice, millets, oil seeds and horticultural crops. He also informed that TNAU has developed a clear cut guideline, which contains the information about the membership fee, royalty, MOU, quality maintenance, brand name and testing fees, etc.

Dr. S.U. Baig, Nath Biogene, emphasized the role of private sector in seed production and desired that there should be no differentiation between public and private sector with regard to the sharing of germplasm lines.

Dr. D.S. Cheema, Head, Department of Vegetable Crops, PAU, Ludhiana stressed that there should be complete transparency in any agreement and research benefit should be shared on MoU basis. The materials should be shared by both parties.

Dr. Mathura Rai, Director, IIVR, Varanasi, emphasized that private sector should continue with vision and mission so that seed should reach to the farmers through private sectors. He suggested that i) system of working together should be developed, ii) private sector must consider the cost of seed material and it must be amicable to farmers to buy, iii) system of profit sharing adopted by IARI or ICRISAT or AVRDC, and iv) on MoU basis both systems should work synergistically.

XXVIII-Workshop

Venue : I.I.H.R., Bangalore
Date : 16th - 19th January, 2010

Collection, Evaluation and Conservation of germplasm

Table 1: List of promising germplasm available with different centres (2008-09)

Crops/Source	Notable/ Promising germplasm
Amaranths	
HARP, Ranchi	Yield/plot- 0.9m ² (kg)- HAAMTH-48-Red (3.15) HAAMTH-13-Green (2.65)
Jorhat	Green Leaf & Red Vein- AAU-2 (Pl.wt.61.8 g and leaf wt.34.0g) Leaf & Vein both Red- AAU-1 (Pl.wt.53.1g and leaf wt.23.6g)
Coimbatore	Yield (g)- CO-1 (110.3), A-77 (107.28) Pl. height (cm)- A-77 (207.3), A-99 (201.3)
IIHR	Total plant weight (g)- IIHR-258 (240.0), IIHR-255 (156.0) Plant Height (cm)- IIHR-258 (47.0), A. Arunima (45.5)

Crops/Source	Notable/ Promising germplasms
Vellanikkara	Leaf and stem both red- VKA-3 (110.6 g/pl.), VKA-6 (950.0g/pl) Leaf and stem both green- VKA-4 (170 g/pl.), VKA-57 (225g/ pl.)
Hyderabad	<i>A. hypochondriacus</i> -IC447682 (880 g/pl.), <i>A. spinosus</i> -IC 547517 (20 g/pl.) <i>A. dubius</i> NIC22577 (680 g/pl.), <i>A. tricolor</i> EC150202 (64 g/pl.) <i>A. caudatus</i> EC289380 (760 g/pl.), <i>A. cruentus</i> EC150201 (1120 g/pl.)
Bitter gourd	
IIVR	Yield- VR-101 (2.53 kg/pl.) and VR-103 (2.41 kg/pl.)
Vellanikkara	Fruits/plant- VKB-176 and VKB-170 (14) Fruit length (cm)- VKB-176 (25.70) and VKB-175 (22.40) Fruit weight (g)- VKB-176 (215.0) Susceptibility to Powdery mildew and leaf mosaic- All
HARP, Ranchi	Dark Green HABG-1-1 (1.79 kg/pl.), SEL-04/29 (0.79kg/pl.) Green- HABG-10 (1.39kg/pl.), HABG-11 (1.28kg/pl.) Light green- HABG-13-1 (1.50 kg/pl.), BT-1-9 (1.49kg/pl.)
Bottle gourd	
IIVR	Long : VR-94 (430.0q/ha.), VR-40 (419q/ha.) Round (winter): W-6-1 (20.458 kg/pl.) and W-6-2 (16.987 kg/pl.)
Faizabad	Long and Early: NDBG-5005, NDBG-5022
Cucumber	
IIVR	Yield and Earliness: VRC-11-2
Rahuri	Earliness: (Days to 50% flowering)- Surabhi (34.80) Yield/plant (kg)- Surabhi (2.67), MLKP-1 (1.46) Fruit weight (g)- Surabhi (173.37) and KOP-2 (168.60) Bitter less- SNG-5, KOP-1, KOP-2, MLKP-1 and Surabhi
Pointed gourd	
IIVR	Yield - VR-1 (2.742 kg/pl.), VR-2 (2.636 kg/pl.), VR-3 (2.546 kg/pl.)
Kalyani	Earliest fruiting lines (Days to 1st flowering: BCPG-9 (81), BCPG-15 (85) BCPG-5(85) Fruit Yield (q/ha): BCPG-8 (666.8 q/ha.), BCPG-10 (597.8 q/ha.) Fruits /plant: BCPG-16 (98.80), BCPG-3 (93.20) Downy mildew (Mini. Intensity%): BCPG-13 (13.1) BCPG-10 (17.0) Vine & fruit Rot (Mini. Intensity%): BCPG-13 (13.2), BCPG-10 (15.2)
Faizabad	Yield (q/ha)- NP-520 (226.0) NP-801 (217.0), NP-260 (208.0)
HARP, Ranchi	Yield (q/ha)- Swarna Rekha (330.0), HAP-102 (287.0), HAP-5 (286.0) Fruit Length (cm)- Swarna Rekha (10.84), HAP-5 (10.77), HAP-88 (10.72) Av. Fruit weight (g)- HAP-75 (55.8), HAP EI-1 (55.0)
Bhubaneswar	Fruit Length (cm)- BPG-4 (7.34), DR/PKP/AN-02 (7.18) Fruit weight (g)- BPG-4 (31.6 g), and BPG-9 (31.2 g) Fruit Girth (cm)- BPG-11 (4.14) and IIVRPG-1 (4.10)
Ivy gourd	
IIVR	Fruit yield: VR-1 (15.742 kg/pl.), VR-2 (14.636 kg/pl.), VR-3 (13.546 kg/pl.)
IGKVV, Raipur	Fruit Yield (kg/pl.): Acc. 05 (24.887), Acc.-52 (24.430) Fruits /plant- Acc.05(2377), Acc.52 (1858)
Vellanikkara	Yield (kg/pl.)- CG-23 or Sulabha (14.50), CG-27 (10.250), CG-9 (8.200) Fruit/pl. CG-27 (1210), CG – 23 (1208) Av. Fruit weight (g)- CG-23 (17.6), CG-82 (15.40)

Crops/Source	Notable/ Promising germplasms
Ludhiana	Market collection 2008-7- 400 g, flesh thickness (2 cm), TSS 7-11 % Market collection 2008-5- 700-2250 g, flesh thickness (4 cm), TSS 8 % Patasa- 930 g, flesh thickness (2.5cm), TSS 12 % Market collection 2007-4 1350 g, flesh thickness (3.8 cm), TSS 11 % Market collection 2007-14 1250-1400 g, flesh thickness (3.3 cm), TSS 8-9 %
Rahuri	Yield (q/ha) -RHRMM-23 (199.99), RHRMM-1 (189.99) High TSS (brin) - RHRMM-1(11.5) and RHRMM-9(11.5)
Pumpkin	
IIVR	Yield IVPK-310, IVPK-222-1-1 Fruit/plant IVPK-222-1-1, IVPK-07-01 Fruit weight IVPK-310, MKB/SP-02
Faizabad	yield, earliness, fruits/plant- NDPK-5040- Resistance to CMV and WMV, Salt tolerance- NDPK-5029 (Dark green round fruit, Fruit weight 8-10 kg) Tolerance to CMV, Salt tolerance- NDPK-5044 (Oblong round striped fruit, orange flesh, big fruit cavity)
Water melon	
Ludhiana	Max. fruits- Watermelon-4406, Black boy, Watermelon- 4405, Watermelon-4019 High TSS- Watermelon-4313 (14-17%), Watermelon-4009 and Karan (14%)
Tomato	
Solan	Yield (q/ha) -LO-1003 (357.0), Lo-2410 (340.0)
Coimbatore	Yield/plant (g) -LE-231 (2867.2), LE-1150 (2484.9) Earliness (Days to 50% flowering) -LE-18 and LE-477 (54.2)
IIVR	Fruits/pl. -EC 625650 and EC620414 Max. Av fruit wt. EC620409 and EC 620493 Fruits/pl. -EC625650(80.60), EC620413 (50.80)
Ludhiana	BT-117-5-3-1-Av. Fruit wt. 45-50 g, late fruit setting and excellent re-sprouting habit Sel. 1-6-1-4-Determinate, pear shaped fruit, deep red, Av. Fruit wt. 50-55g
Brinjal	
Vellanikkara	High yielding lines (kg/plant)- IC249368 (4.7), IC249344 (4.6), IC090906 (4.4) Resistant to Bacterial wilt (All 10%) - IC261785, IC261803, IC336473, IC354573 Resistant to fruit borer (0%) - IC099674, IC215020, IC216264, IC249329, IC249387, IC261772, IC261803, IC261813, IC336473
Bhubaneshwar	High yielding lines (kg/plant)- BBSR-202 (1.627), BBSR 195-1 (1.54), Earliness (Days to 50% flowering) -BB-45C (48.0)
Kalyani	Yield/plant (kg) -BCB-11 (1.57), PB-67 (1.48) Earliness (Days to 50% flowering) -PB-67 (48), SH-BH-101 (48) Fruits/plant -DBI -02 (12), HBL-25 (12)
IGKV, Raipur	Dark Purple- IGB-1, IGB-25I,GB-49, IGB-58, IGB-68 Purple- IGB-2, IGB-10, IGB-17, IGB-23, IGB-30, IGB-36 Green white Varigated- IGB-3, IGB-4, IGB-40 White- IGB-54 Green- IGB-9, IGB-16, IGB-28, IGB-37, IGB-56
IIHR	Yield (kg/pl.) - IC249371 (2.85), IC336473 (2.67) ,IC99614 (2.55) IC20061-A (2.47), IC90780 (2.31) Earliness (Days to 50% flowering) - IC90812 (46.78), IC4386089 and IC074209 (47.78), IC216264 and IC136248-1 (47.21)

Crops/Source	Notable/ Promising germplasms
Chillies	
IIVR	Yield/plant (g) (Red fruit)- EC605713 (130) Fruits/plant- EC607926 (32), EC605720 (21)
NBPGR	EC637341-42, EC656663-66, EC656670, EC656671, 73, 75, 77, 79, 81, 83, 85, EC656672, EC656674, EC656676, EC656678, EC656680, EC656682, EC656684, EC656686-87,
Kalyani	Earliness (Days to 50% flowering) -COB-3 (30.67), COB-10 (30.33) Capsacin (%) - BCC-12 and KDCS-810 (0.37), Ascorbic Acid (mg/100g) - J. Mukta (168.10), KDCS-810 (162.46) Fresh yield/plant (g) -Chaitali pointed (253.96) & BCCH Sl.4 (218.42) Fruits/plant- BC CH Sl. 4 (134), Chaitali pointed (114.4) Disease incidence -Leaf curl- ICPN-1 and ICPN-9(5) Dieback -ICPN-3, ICPN-8 and ICPN- 10 (10%) Yellow mite -ICPN-2, ICPN-3 & ICPN-9 Thrips- ICPN-1, ICPN-2, ICPN-3, ICPN-4 & ICPN-5
Jorhat	Fresh Yield/plant (g) - CH09/14 (450), CH09/05 (220) Fruits/pl. - Ch09/14 (205), Ch09/05 (159)
Lam	Yield (Dry) -IC265050(112.3), IC276571(108.3) Oleoresin (%) -IC278336 (23), IC391365 (21.0) Capsanthin (EOA Color value) -IC383136 (48280) & IC266342 (44970) Fruits/pl. -IC391461 (263.1), IC266805 (196.8)
HARP, Ranchi	Yield (Fresh, Kg/pl.) -IIVR Local Super (1.21), PBC535 (1.02) Earliness (Days to 50% flowering) -Ajeet-3 KA-2 & LCA235 Fruits/pl. -Pant C-1 (579) LCA-235 (535)
Coimbatore	Yield Red Ripe fruit (g) - ALS- 98-8 (294.49) CA-48 (286.18) Fruits/plant- ALS- 98-8 (132), CA-77 (88.30)
SKUAS T (S)	Yield RED Ripe fruit (g/plant) -SH-KC-62 (800), SH-KC-64 (656) Fruits/plant- SH-KC-62 (120), SH-KC-64 (102)
IIHR	Yield plant Fresh (g) -Korean collection-3 (210.3), Korean collection-1 (200.0) Dry fruit yield/plant (g) - Korean collection-1 (65.0), Sel.-16 (22.1) Reaction to Diseases (Field Tolerant) <i>Alternaria</i> spp.-NE Coll.-1, BCTKVK, Korean coll.-4, Sel.-16 <i>Cercospora</i> spp- NE Coll.1, Sikkim Local-1, 2, Korean Coll. 2 and Coll. 4 <i>Collettrichum</i> spp.- NE Coll.1, BCTKVK, Sikkim Local-1, <i>Leveillula</i> spp.-Sringeri Local-3 and Sringeri Local-4 Mite- Sikkim Local- 2, Korean coll.-3
Capsicum	
Srinagar	Yield/plant (g) -SH-SP-39 (800) SH-SP-38 (770) Fruits/plant- SH-SP-39 (16) SH-SP-41 (14.25) Plant height (cm) - SH-SP-41 (52.1), SH-SP-39 (50.50)
NBPGR	EC656688, 90, EC656689, 91, EC656692, 93, 94, 95, 96, 97
Solan	Yield (q/ha) - Tri Selection (230.0), Gajio Sel. (211) Fruits/plant- Dilman Sel. (12.33) and Tri Selection (10.24)
Katrain	Yield/plant (g) - Bangalore-30 (1250.0), Superset (1100.0) Fruits/plant- Bangalore-30 (30), Superset (25)
IIHR	Yield/plant (g) -ISPN-6-2 (800) Mites (Field Tolerant) -ISPN-6-3, ISPN-6-4

Crops/Source	Notable/ Promising germplasms
Paprika	
IIVR	Free From Leaf Curl Virus and Anthracnose (Under Field condition) BS-35, Bhut Jolokia, MC334 Tolerant to Pep. LCV and Heat: VR-339
Srinagar (K)	Red Ripe Fruit wt./plant (g)- SH-P-43 (430) and SH-P-38 (420) Fruits/plant -SH-P-39 (31) and SH-P-40 (28.6)
Katrain	Fruit weight/plant (g)-Indu (800.0), RCH-1 (715.0) Fruits/plant- Indu (123) & Nagajhlokia (74)
IIHR	Fresh Yield/plant (g)- 9852228 (110), 9852136 (100) Dry fruit yield/plant (g)-PBC-535 (25.0), 9852179 (24.0) <i>Alternaria</i> + <i>Cercospora</i> + <i>Virus</i> - (Field Tolerant)-9852136
Pea	
IIVR	Early maturity-196, Mid maturity-107, Late maturity-147 Powdery mildew Resistance-96, Rust Resistance- 6 Powdery and Rust Resistance (Both)- VRP-343, VRP-152 and No.17
Ludhiana	Early line (Days to 50%Flowering)- PSM-3 (40) (37) and AP-3 (40) Pods/plant - PSM-3 (9-10), Seeds/pod- PSM-3 (6-7)
Palampur	Early line (Days to 50%Flowering) - DPPM-65 (82) Seeds/pod- DPPM-65 (8.51), Yield (Q/ha.)- DPPM-64 (99.41) Resistance to Powdery mildew- DPPM-64
Kalyanpur	Green pod yield(g/pl.)-KS 228 (120-125) Biotic stress resistance-KS205, KS210 & KS242
Solan	Green pod yield(q/ha- EC39859 (61.65) Powdery mildew Resistance -Moderate- PMR-53
French bean	
Rahuri	Pods/plant- RHRFB-21 and RHRFB-32 (76) and RHRFB-25 (75) Pod Length (cm)- RHRFB-14 (18.30) and RHRFB-26 (14) Earliness (50% flowering)- RHRFB-5 (38), RHRFB-6(40) and RHRFB-2 (42)
Pantnagar	Green Pod Yield (q /ha)-FB-4 (111.66), FB-12 (110.99) Pods/plant-FB-7 (12.40), FB-13 (11.80) Pod weight/pl.-FB-4 (69.20), FB-12 (68.80)
Lab lab bean	
IIVR	Green pod yield (Q/ha)- VRSEM-501 (310.0), VRSEM-6 (309.0) Days to 1st flowering -VRSEM-752 (45), VRSEM-201 (54) Pod Length (cm)-VRSEM-934 (15. 57), VRSEM-946 (14.69)
Raipur	Days to 1st flowering -IS-21 (41), IS-9 (89) Green pod yield (Q/ha)-IS-2 (161.10) IS-3 (151.4) & IS-1(151.0) Seeds/pod (Max.) IS-17 (6.33)
HARP Ranchi	Green pod yield (Kg/pl.)-IC249534 (1.032), IC249531 (0.826) Days to 1st pod harvest- IC249522, HADB-119, HADB-120 &HADB-121 (68) Pod length (cm)-IC249534 (14.05), IC213324 (13.87) Pods/pl.- EC305120 (133), IC249539 (127)
Okra	
IIVR	YVMV Free (field Condition)- EC329357, EC329407, and IC45802 More number of fruits/plant- SKY/DR/RS-118 SKY/DR/RS-107, IC282272, IC218444 and EC 169378

Crops/Source	Notable/ Promising germplasms
Bhubaneshwar	Earliness (50% flowering)-BSBR-24, BSBR-56 and Bo-2 (42 days) Average fruit weight (g)- BBSR-7 (17.1) BBSR-49 (16.8)
Carrot (Tropical)	
Hisar	Red: Root length (cm)- Max.- HC-251 (24.8), HC-1-3-3 (24.0) Purple: Root length (cm)- Max.- HCP-160-1 (23.3) Yellow: Root length (cm)- Pusa Yamdagni (24.3), HCY-3 (22.6) Black: Root length (cm)- Max.-HCB-1-4 (23.6), HCB (SC) - (23.1) Orange: Root length (cm)- Max.-HCO-4 (19.5)
IIVR	Promising- BS-2, Golden Resy, Super Red, Carrot Red and Yellow Carrot
Ludhiana	Dark Red-PC-10, Black color- PCB-2
Carrot (Temperate)	
Katrain	Yield/plot kg (2.70M2)-Acc.339(7.00), Acc.342-9(6.750) Root Length (cm)-Acc.-343 (19.0), Acc-341 (18.0)
Cauliflower (Early)	
IIVR (Kunwari)	Net Curd Weight (g)-Max.-Kunwari Early Green Seed-(660), Kunwari Baijnath Seed (630)
IIVR (Katki)	Net Curd Weight (g)-Max.-Cauliflower G-1 (550), Katakai Anand (490)
Cauliflower (Mid)	
IIVR (Aghani)	Net Curd Weight (g)-Max.-Aghani Phoolgobhi GSH (1816), Aghani Poornima (1775)
Cauliflower (Late)	
Solan	Yield (q/ha)-EC344287 (234), Autman Giant (216)
Katrain	Yield (t/ha.)- Hermia (26.4), Alpha and Composite (23.32) 1-Res. To Downy Mildew- RSK-1301 2-Mod. Res. To Black Rot + Downy mildew- SR-05 Days to 50% Curd Maturity- Agrotech-21 (81days), Alpha (128 days)
Cabbage	
Solan	Yield (q/ha) C No. 8 (236) Net Head weight (g)-Max.-C.No. 8 (760)
NBPGR	EC664342-61
Katrain	Plant Spread (cm)-AC-236 (Max. 49.0), EC490165 (Mini. 22.0) Net Head Weight (kg)-KK-3 (0.933), Sel.-6 (0.900)
Spine gourd	
Kalyani	Fruit yield (Kg/pl.)-BCSG-1 (2.08), BCSG-2 (1.83) Fruits/plant- BCSG-1 (32), BCSG-2 (27) Earliness (Days to first flowering) -BCSG-1 (59)
Cowpea	
IIVR	Earliness (Days to 50% flowering) - ET-116914, EC528412, EC472283, EC472250 (47.7) Green pod/plant (g) -V-240 (228.41), EC458455 (176.09)
Raipur	Pod Length (cm)-ICP-38 (31.80) Ind. Green pod weight (g)-ICP-10 (13.50), ICP-4 (11.40) GoldenVirus- ICP-1, ICP-24, ICP-38 and ICP-3 ICP-38 Aphid- ICP-3, ICP-24, ICP-38

Table 2 : List of promising germplasm available with different centers (2009 - 10)

Crops/Source	Notable/ Promising germplasms
Amaranths	
Coimbatore	Yield (g)-A.101(127.4), A-155 (116.7) Leaf length (cm)-A-145(24.9), A.-12 (24.7) Leaf width(cm)-A.-69 (16.7)
Jorhat	Green Leaf & Vein-Purple- Am-1 Leaf & Vein purple Am-3 (Pl.wt.53.3g and leaf wt.23.5g)
HARP-Ranchi	Yield (q/ha.)- HAAMTH-8 & HAAMTH-13 (105.45) Pl. Wt. (g)-HAAMTH-7 (21.10)
Bottle gourd	
Rahuri	Yield/plant (kg/pl.)-RHRBG-18 (9.980), Earliness (days)-RHRBG-23 (61)
Cucumber	
Solan	Yield (t/ha.)- LC-10 (61.8), LC-4 (51.7) Fruits/plant -LC-10 (6.286), LC-6 (6.16) Fruit length (cm)-LC-10 (26.14), LC-6 (22.80)
Tomato	
Solan	Yield (q/ha) EC29414 (536.4), EC2791(450)
Coimbatore	Yield/plant (Kg/pl.)- LE-231 (2.853), LE-1150 (2.473) Earliness (Days to 50% flowering)-LE-18 and LE-477 (55)
Chillies	
IIHR	Earliness (flowering)- EC631776 (32), EC631789 & EC631796 (35)
SKUAT-Srinagar	Yield fresh wt. (g/ plant)-SH-KC-1003 (790), SH-KC-1111 (620) Fruits/ plant- SH-KC-1003 (120), SH-KC-1111 (111)
Capsicum	
IIHR	Fruit wt.(g) -EC631775 (80)
Srinagar	Yield/plant (g)-SH-SP-46 (810) SH-SP-47 (790) Fruits/plant- SH-SP-46 (14) SH-SP-44 & 48 (13)
Solan	Yield (q/ha)- LC-1 (210), LC-2. (206) Fruits/plant- LC-1 (17.60) & UHF-14 (16.8)
Katrain	Yield/plant (g)- Sphynx (1.45) Capsacin Bang-14 Fruits/plant- Bang.-12 (25-35)
Paparika	
IIHR	Fresh wt. (g)-EC631782 (20)
SKUAST	Red Ripe Fruit Wt./plant (g)- SH-P-82 (420) and SH-P-203 (415) Fruits/plant-SH-P-82 (22) and SH-P-7-1 and SH-P- 45 (21)
Katrain	Pickling Type- Piquilo and Jammu Table purpose- No.679 Powder making -Siddhi Ornamental- Ornamental Red
Pea	
Palampur	Resistant to Powdery mildew- DPPM-64 Yield (q/ha.)- DPPM-64 (99.41) TSS (Brix.)- DPPM-64 (17.80)
Frenchbean	
Rahuri	Earliness- RHRFB-38 (41), No. of Pods/pl.- RHRFB-44 (74)
Okra	
IIVR	YVMV Free (field Condition)- IC329422, SKY/DR/RS-113,EC305616, More number of fruits/ plant- IC282237, SKY/DR/RS-99, EC169359, IC140906 Longest Fruit- No. 136 (25.06 cm)

Crops/Source	Notable/ Promising germplasms
Bhubaneshwar	Earliness (50% flowering)-BSBR-07-1 (42)
Rahuri	Yield (q/ha)-26-A (189.91) Fruits/pl. -Sel.86423 (19.6)
Carrot	
IIVR	Self core colour- BS-2, Golden Resy, Superv Red
Srinagar	Yield(Q/ha.)-SH-C-149 (285.62), SH-C-154 (275.52)
Momordica dioica	
Bhubaneshwar	Fruit yield/plant (kg)-BSG-3 (1.080) Days(Early) to harvest-BSG-4 (70), BSG-4 (69) and BSG-3 (70) Days to first female flowering- BSG-4 (52), BSG-1 (54)
Kalyani	Fruit yield/plant (g)- BCSG-6 (640), BCSG-2 (458)
Cauliflower (Early)	
IIVR	Kunwari: Kunwari Early Green Seed-(Curd wt. 660 g) Kataki: Cauliflower G-1 (Curd wt. 550 g)
Cauliflower (Mid)	
IIVR	Aghani Phoolgobhi -GSH (1816 g)
Cowpea	
IIVR	Branching- Max.- IC528428 (6.2), ET116932 (5.6) Earliness (Days to 50% flowering)- IC559398 (44.6) Green pod/plant (g)- EC472261 (139.44)
IIHR	Yield (t/ha.)-IC471933 (27.0) Earliness (Days to Harvest)- IC471937 (60) Pod length (cm) Max. -IIHR-249 (57)
Watermelon	
IIVR	VRW-1, VRW-2, VRW-3, VRW-22

Vegetable Production

Integrated Nutrient Management

Cucumber

- At Vellanikkara, the maximum yield (234.7q/ha) along with highest C: B ratio (1:2.23) in cucumber cv. AAUC-2 was obtained with the application of FYM @ 10 t/ha + vermi-compost @ 2 t/ha. Hence, it is recommended for Vellanikkara conditions of Kerala.
- At Sabour, the maximum yield (133.81/ha) along with highest C: B ratio (1:2.27) in cucumber was recorded with the application of half recommended doze of NPK (30:15:15kg/ha) +FYM @ 10 t/ha + *Azotobacter* @ 5 kg/ha. Hence, it is recommended for Sabour conditions of Bihar.

Bottle gourd

- At Kalyanpur, the maximum mean yield (177.19 q/ha) along with highest C: B ratio (1:1.85) in bottle gourd cv. Kalyanpur Long Green was recorded with the application of vermi-compost @ 2.5 T/ha+ recommended dose of NPK. Hence, it is recommended for Kalayanpur conditions of Uttar Pradesh.
- At Hisar, application of neem cake@ 0.5 t/ha. + Half recommended NPK (1:2.14) gave the maximum yield (383.7 q/ha.) alongwith highest C: B ratio (1:2.14) in bottle gourd. Hence, it is recommended for Hisar conditions of Haryana.

Broccoli

- At Kalyanpur, application of Vermo-compost @2.5 t/ha + half recommended dose of NPK gave the maximum yield (204.76 q/ha) along with highest C: B ratio in broccoli cv. Aishverya. Hence, it is

recommended for Kalayanpur conditions of Uttar Pradesh.

- At IIHR, the highest yield (83.5 q/ha) and C: B ratio (1:1.21) in broccoli hybrid Fiesta was obtained by the application of poultry manure @ 2.5 t/ha + ½ recommended NPK (75:50:63kg/ha). Hence, it is recommended for Bangalore conditions of Karnataka.

Cowpea

- At Vellanikkara, the maximum yield (103.12/ha) along with highest C: B ratio (1:2.5) in cowpea cv. IVRCP-4 was obtained with the application of FYM @ 20 t/ha. Hence, it is recommended for Vellnikkara conditions of Kerala.
- At Jorhat, the highest yield (133.7q/ha) alongwith the maximum C:B ratio (1:2.62) in cowpea was recorded with the application of FYM @ 10t/ha+ half recommended dose of NPK. Hence it is recommended for Jorhat conditions of Assam.
- At IIHR, application of FYM @10 t/ha + ½ recommended NPK (13:38:30kg/ha) gave the highest yield (135.6q/ha) and maximum C:B ratio (1.2.3). Hence, it is recommended for Bangalore conditions of Karnataka.

Studies on micronutrient

Cauliflower

- At Jabalpur, the maximum yield (376.65 q/ha) along with highest C: B ratio (1:2.67) in cauliflower var. Girija was recorded by the application of Borax @ 20kg/ha + Ammonium molybdate @ 1 kg/ha over and above the recommended dose of NPK (200:125:150 kg/ha). Hence, it is recommended for Jabalpur conditions of M.P.

Bitter Gourd

- At Sabour, the maximum yield (150.25.65q/ha) along with highest C: B ratio (1:2.37) in bitter gourd var. Pusa Do Mausami was recorded by three foliar spray of Mixture of all (B, Zn, Mo, Cu, Fe, and Mn) over and above the recommended dose of NPK (120:60:60 kg/ha). Hence, it is recommended for Sabour conditions of Bihar.

Organic Trials

- At Hyderabad, under organic farming trial in okra, tomato and cowpea, application of FYM A@ 10 t/ha + poultry manure @ 2.5 t/ha gave the higher yield of okra (48.9 q/ha) and tomato (449 q/h). Hence, it is recommended for Hyderabad conditions of Andhra Pradesh.

Protected Conditions

Cucumber

- At Kalyanpur, under naturally ventilated polyhouse conditions, cucumber hybrid Noori gave the maximum yield (334.77 q/ha). Hence, this hybrid is recommended for protected cultivation in Kalyanpur areas.
- At Pantnagar, under naturally ventilated polyhouse conditions, bitter gourd cv. Pant Karela-1 gave the maximum yield (814.2/ha). Hence, this bitter gourd cultivar is recommended for protected cultivation in Pantnagar conditions of tarai region of Uttarakhand.

Precision Farming

- At Kalyanpur, the maximum yield (362.73 q/ha) along with highest C: B ratio in tomato cv T-6 was recorded by planting in raised bed followed by straw mulch. Hence, this method of planting is recommended for tomato cultivation in Kalyanpur areas of Uttar Pradesh.

Varietal Trials

The data for the year 2006-07, 2007-08, 2008-09 and 2009-10 was thoroughly scrutinized by the committee and the following 7 entries of 6 crops were identified for release and notification.

Table 3: List of the varieties identified

Crops	Entries	Source	Recommended Zones
Brinjal	PB-70 (green long)	GBPUAT, Pantnagar	IV, VI, VII, VIII
	DBL-02 (purple long)	IARI, New Delhi	I, IV, VI
Tomato (determinate)	Pant T-10	GBPUAT, Pantnagar	I, IV
Chilli	PC-56	GBPUAT, Pantnagar	I, IV, V, VII, VIII
<i>Dolichos</i> bean (pole type)	IIVR Sem- 8	IIVR, Varanasi	III, IV, V, VII
Bottle gourd	PBOG-89	GBPUAT, Pantnagar	I, IV, VII
Sponge gourd	VR-1	IIVR, Varanasi	IV



PB-70

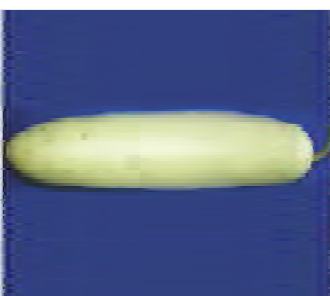
DBL-02

T-10

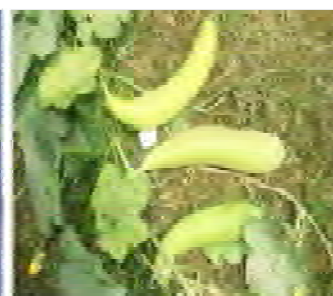
PC-56



IIVR Sem-8
(Kashi Haritima)



PBOG-89



VR-1
(Kashi Divya)

Physiology, Biochemistry and Processing

Physiology

- The trial on 'Effect of genotype and planting time on growth habit and productivity of tomato was taken during October, 2008 and July, 2009 using three cultivars of tomato viz., Pusa Ruby, Arka Ashish and Arka Vikas in October planting and two cultivars in July planting viz., Arka Ashish and RF4-A. Data on plant biomass, leaf area, fruit filling rate and fruit weight were recorded. It was found that cv. Pusa Ruby had the maximum leaf area during May as well as July planting. LAI also

was maximum in cv. Pusa Ruby (3.093 by 60 DAP). SLA was maximum in cv. Pusa Ruby (242.63 cm²/g). cv. Pusa Ruby also had the highest biomass by 60 DAP (200.30 g/plant). 50% flowering was earlier by 5 days in cv. Pusa Ruby and Arka Ashish as compared to Arka Vikas. The fruit weight was highest in cv. Arka Vikas (137g). cv. Arka Vikas also had the highest per plant yield of 1.79 kg as a result the yield/ha also was highest in cv. Arka Vikas (41.6t/ha). In July planting initially cv. Arka Ashish had higher leaf area, whereas by 60 DAT, cv. RF4-A had higher leaf area. Fruit filling rate, number of fruits and per plant yield was higher in RF4-A in the July planted crop.

Biochemistry

- At IIVR, Varanasi, 30 promising genotypes of tomato, 10 genotypes of pumpkin and 6 genotypes of bitter melon were analyzed for quality attributes. Amongst the 30 tomato genotypes tested the pH ranged from 3.9 to 4.5, acidity from 0.37 to 0.53 %, TSS from 3.4 to 5.3, vitamin C from 21.2 to 41.0 mg/100g, total carotenoids from 3.18 to 6.70 mg/100g and lycopene from 1.85 mg/100g to 3.95 mg/100g. In bitter melon the vitamin C content ranged from 39.6 to 45.9 mg/100g, whereas in pumpkin genotypes it ranged from 2.97 to 17.85 mg/100g. Besides this 25 promising genotypes were analyzed for their capsaicin and oleoresin content which ranged from 0.20 to 0.89 % and 10.25 to 19.85 %, respectively.
- At IIHR, Bangalore 11 tomato genotypes were analyzed for total phenols, total flavonoids, vitamin C, total carotenoids and lycopene. Among the tested genotypes the phenol content ranged from 34.77 to 66.02, flavonoids from 3.68 to 12.86, vitamin C from 1.45 to 26.54 and lycopene from 0.43 to 13.52 mg/100 g.
- At PAU, Ludhiana 45 promising genotypes of tomato and 34 genotypes of chilli were tested. In tomato genotypes the acidity ranged from 0.36 to 0.68, TSS from 3.5 to 6.0, vitamin C from 30 to 75, lycopene from 2.6 to 3.6 and total carotenoids from 4.1 to 6.0 mg/100g. In chilli genotypes the capsaicin ranged from 0.34 to 1.10 and oleoresin ranged from 8.1 to 17.4 %.

Under post harvest processing there were two trials on lycopene development and standardization of packaging materials for tomato and sweet pepper to be conducted at IIVR, Varanasi, IIHR, Bangalore and PAU, Ludhiana.

- At IIHR, Bangalore, lycopene development in tomato at three stages of harvest viz., breaker, turning and pink stage have been carried out. Lycopene development, acidity and vitamin C were higher in red stage than pink and turning stages for four tomato hybrids such as H-162, H-169, Arka Ananya and Abhinava. Further, the effect of packaging with PE and individual shrink packaging on PLW, quality score, shelf life, colour, texture, vitamin C content in sweet pepper was studied in and found that packaging with PE and individual shrink packaging reduced the PLW, maintained freshness and extended the storage life at 8°C as well as maintained the green colour, and texture and firmness for longer duration. Standardization of packaging material for shelf life extension in tomato was also studied for three tomato hybrids using CFB boxes, wooden boxes and plastic crates.
- At IIVR, Varanasi, the effect of packaging materials viz., carton box, Perforated polypropylene pouch, Non perforated polypropylene pouch, Plastic crates and Jute bags were studied in Pepper for PLW%, decay %, vitamin C content, moisture content and overall acceptability score after storage at room temperature and refrigerate storage at 7-8°C for up to 30 days.

Hybrid Trials

The data for the year 2006-07, 2007-08, 2008-09 and 2009-10 was thoroughly scrutinized by the committee chaired by Dr. M. L. Chadha and the following 04 entries of 03 crops were identified for release and notification.

Table 4: List of the hybrids identified

Crops	F ₁ hybrids	Source	Recommended Zones
Tomato (Det.)	BCTH-4	BCKV, Kalyani	I, IV
Chilli	NCH-587	Nirmal seeds	IV, VII
	VNR-332	VNR Seeds	IV, VIII
Okra	JOH-05-9	Junagarh	V, VI, VII



BCTH-4



NCH-587



VNR-332



JOH-05-9

Insect Pest Management

The following recommendations emerged out after discussion:

- Based on experiments carried over three years at PAU, Ludhiana, it was concluded that the pheromone trap for brinjal borer is effective for monitoring the activity of the adult male.
- In Kanpur, soil application of organic inputs viz., FYM @ 10 t/ha + neem cake @ 500 kg/ha at time of transplanting reduced pest infestation on brinjal (jassids, aphids and shoot borer) and gave higher yields with C:B ratio of 1: 1.47.
- In Hyderabad, seed treatment with thiamethoxam (70 WS) @ 5 g/kg seed + 4 alternate spray of neem and avermectin at 15 days interval starting from 20 DAT and later, application of neem based insecticides at weekly interval proved effective in reducing the thrips and leaf curl incidence and consequent yield increase.
- Under Bangalore condition, seed treatments with newer molecules (*viz.*, thiamethoxam/ imidacloprid /acetamiprid @ 5g/kg seeds) was found to be effective for the first 35-40 days after sowing against sucking pests in leguminous vegetables.
- In Ludhiana, soil application of carbofuron 3G @500g a.i./ha at the time of sowing gave the effective control of red pumpkin beetle on bottle gourd and recommended. This treatment was effective more than any other treatment.

Resistant Varietal Trials

The varietal identification committee under the chairmanship of Dr. M.L. Chadha reviewed the data of 2005-06, 2006-07, 2007-08 and 2008-09 trials and recommended that the resistance trials (AVT II) on Tomato (TLCV), Tomato (Bacterial wilt), Brinjal (Bacterial wilt), Pea (Mid season powdery mildew) should be repeated with the inclusion of susceptible check.

Seed Production

- Application of Phosphate Solubilizing Bacteria (400 g mixed in 20 litres of water & roots dipping for 30 minutes)+30kg Phosphorus + Recommended dose of N (300 kg) & K (120 kg) was superior and economical with a seed yield of 20.1 q/ha and a cost to Benefit ratio of 1:3.6 under Lam conditions of Andhra Pradesh and it is recommended for higher seed yields in chilli in that area.

- Dipping of tomato roots for 30 minutes before transplanting in Azospirillum (400 g mixed in 20 litres of water) alongwith application of recommended dose of P& K gave the highest seed yield (186.63 kg/ha) under Bhubaneshwar conditions of Orissa and it is recommended for higher yields of tomato seed in that area.
- Foliar application of a mixture of micronutrients (i.e. 100ppm each of zinc sulphate, manganese sulphate, copper sulphate, ferrous sulphate, boric acid & 50 ppm ammonium molybdate) is recommended for higher seed yield (175 kg/ha) of tomato in Orissa based on trials at Bhubaneshwar.
- Harvesting the seeds from first 12 fruits per plant is recommended for higher yield of good quality capsicum seed (558kg/ha) under net house conditions based on trials at Solan.

Breeder Seed

At the end, after thorough deliberations on Breeder seeds price fixation, it was decided to raise the breeder seed prices of all the vegetable crops by 10 percent rounding off to the nearest multiple of rupees ten. Accordingly the breeder seed price of vegetables as listed below were revised:

Table 5: Breeder seed price of important vegetables

S. No.	Vegetable	Existing Rates (Rs./kg)	Revised Rates (Rs./kg)
1.	Palak	90	100
2.	Methi	100	110
3.	Okra	200	220
4.	Tomato	1400	1540
5.	Brinjal	650	720
6.	Chilli	700	770
7.	Capsicum/Paprika	2000	2200
8.	Cowpea	140	150
9.	Cluster bean	100	110
10.	French bean	150	170
11.	Dolichos bean	150	170
12.	Garden pea	100	110
13.	Early/Mid-early/Mid Cauliflower	1000	1100
14.	Late Cauliflower	2500	2750
15.	Cabbage	650	720
16.	Knol Kohl	400	440
17.	Radish	300	330
18.	Carrot	400	440
19.	Turnip	250	280
20.	Onion	600	660
21.	Bottle gourd	350	390
22.	Bitter gourd	450	500
23.	Sponge gourd	350	390
24.	Ridge gourd	350	390
25.	Cucumber	800	880
26.	Tinda (Round melon)	200	220
27.	Pumpkin	450	500
28.	Muskmelon	500	550
29.	Water melon	550	600
30.	Coriander	100	110
31.	Amaranthus	200	220
32.	Long melon	400	420

The revised prices after approval of the Council will be circulated by Director, IIVR, Varanasi to all the centres who are producing breeder seeds under the national seed chain. At the end of the session, the Chairman made following observations:

- Monitoring of conversion of breeder seed to foundation and certified level to be taken up with DAC.
- The region wise list of new varieties to be circulated to all State Departments Director Horticulture/ Director Agriculture/Private Companies.
- At the time of sowing, some seeds should always be retained for use in case the crop is damaged due to natural calamities.

Disease Management

1. Raipur centre has concluded the experiment Veg 8.2 with the recommendation of application of green manure (*Sesbania* sp.) + neem cake + antagonist (*Trichoderma viride*) as soil application for controlling collar rot (*Sclerotium rolfsii*) in brinjal. It also concluded Veg 8.4 with the recommendation of seed treatment of carbendazim @ 1 g/kg + thiram @ 2 g/kg for improving germination in tomato crop.
2. Hesaraghatta centre has reported Veg 8.3 experiment with concluding remarks that there is a significant positive correlation on the incidence of thrips population, maximum temperature and relative humidity in the morning hours, which influenced the incidence and spread of Water melon Bud Necrosis Virus (WBNV). Whereas wind velocity and rainfall has not influenced the WBNV spread or thrips population build up. The rate of spread of WBNV is faster in susceptible cultivar Arka Manik as compared to the tolerant type Madhu Bala. Using weather parameters multiple regression models were developed for susceptible and tolerant varieties of watermelon. The linear regression equation was developed using weather parameters such as temperature, relative humidity, wind velocity and rainfall, virus incidence in relation to vector population. The weather parameters prevailing two weeks before and vector population one week before influences the disease development. The prediction model developed is relatively accurate to monitor the epidemic development of WBNV.
3. Coimbatore centre has concluded the experiment Veg 8.6 with the recommendation of seed treatment with ridomil (0.25 %) + 3 times removal of infected leaves in the morning and spraying of mancozeb 0.25 % for controlling downy mildew disease of cucurbits. Bhubaneswar centre concluded the experiment Veg 8.7 with the recommendation of seed treatment with carbendazim (0.25 %) + seedling dip in carbendazim (0.1 %) + two need based sprays of validamycin 0.1 % to combat *Rhizoctonia* root rot/collar rot of cowpea. Solan centre also concluded the experiment Veg 8.7 with the recommendation of seed treatment with carbendazim (0.25 %) + raising seedlings in solarized beds + soil application of green manure + neem cake + antagonist (*T. viride*).

Public-Private Interface

Dr. M. Rai, said that an exchange of seed materials between public and private sectors is the need of the hour so as to bring about synergy in vegetable research, to enhance the efficacy of the agricultural system and to provide answers to the farming community of the country. Private Public Partnership (PPP) mode of functioning was advocated by him.

Dr. S.K. Tikko highlighted the need to find the genes responsible for the susceptibility and resistance of the crop, and for this purpose the germplasm need to be investigated by both private and public sectors.