

XXXII Group Meeting of AICRP (VC) held at IGKV, Raipur from 24-27th June, 2014

Collection, evaluation, conservation and utilization of germplasm

List of promising germplasm available with different centers (2013-14)

Crops/Source	No. of germplasm	Notable/Promising germplasm
Amaranth	Coimbatore (111)	A2, A11, A61, A 100, A 155, A 156, A 158, A 159 and A172 recorded >200 g of bio mass per 10 plants
	Hyderabad (38)	RNT-29 (348g/plant) ; RNT-21(340g/ plant) ; RNT -20(339g/plant)
Bitter Gourd	Vellanikara (44)	Days to first harvest: VKB-203 was noted earliest for first harvest (77.5 days) but was <i>at par</i> with check (Preeti, 77.0 days) and genotypes VKB 184, VKB204, VKB208, VKB211, VKB 192, VKB 177, VKB207 and VKB214 Yield/plant (kg): VKB 176 (2.1 kg) and VKB 175 (1.95 kg) ; Check: Preeti (1.38 kg) Disease reaction: VKB 135 and VKB 205 was noted resistant to distortion mosaic virus
Cucumber	Solan (5)	LC-40 (a of local cucumber collection having yield of 454.17 q/ha)
Pointed gourd	Bhubaneshwar (9)	Promising: BPG-4 (Fruit Length : 6.74 cm, Fruit diameter : 3.10 cm Fruit wt. : 20.2 g)
Ridge gourd	IIHR (14)	Genotype (IIHR-81-10) of <i>Luffa hermaphrodita</i> : only hermaphrodite flowers in clusters
Ivy gourd	Raipur (32)	Yield (kg/plant): Acc No. 05 (24.80 kg/plant), 52 (24.30) Earliness (first harvest)- Acc No. 36, 23, 15, 10, 34, 06 and 05 took 73 days to first harvest
Tomato	Ludhiana (2)	Resistant to root knot nematodes: Genotype: 0 97 and Genotype:8-2-1-2-5
	IIVR (30)	The genotypes EC-786252, EC-520061, WIR-3928 and H-88-78-1 showed highly resistant reaction against collar rot EC-520078 and WIR-3928 expressed resistant reaction to early blight caused by <i>Alternaria solani</i>
Brinjal	IIVR (72)	White Round IC - 354517 (2.65) Purple Long IC - 112322 (1.42) Purple Round IC - 249349 (1.45), IC- 112747 (1.95) Purple oblong IC- 261818 (2.36) White strip on green Round IC- 112736 (7.15) Purple strip on green Round IC- 249344 (3.80) (Data within parenthesis are yield /plant in kg)
	Raipur (76)	Yield (kg/plant): IGB 25 & 26 (1.250), IGB 19 (1.246) Flowering (days): IGB 9 (44), IGB33 (45)
Chilli	IIVR (250)	Earliness (days to first harvesting, 52 DAT): C00-265, IC-413762, PBC-1512, EC-519636 No. of Fruit ./plant: IC-41370 (214.33), AKC-89/38 (157.33), PBC-904 (128.33), LCA-235 (126.67), JCA-283 (117.33) Yield per plant (g): EC-341044 (645.82), EC-519632 (642.86), DC-4 (630.04), SM-12 (621.25), EC-119457 (612.36) Capsaicin content (%) Anthracnose resistance: NG-2, IC-383072, NG-8, BS-35
	Srinagar (4)	Yield/pl. (g) red ripr fruits : SH-KC-82 (434), SH-KC-83 (410) Fruits/plant: SH-KC-82 (70), SH-KC-83 (45) Fruit length (cm): SH-KC-82 (10.03), SH-KC-83 (9.0)
	Lam (84)	Yield/pl. (g): N GP-62 (500) and NGP-8 and 61 (425) No. of fruits /plant: NGP 20 and 49 (347.5)
	IIHR (19)	Field tolerant to <i>Alternaria sp</i> , <i>Viruses CYMV & CMV</i> and <i>Phytophthora sp</i> (19): EC771534, EC771535, EC771537, EC771538, EC771539, EC771540, EC771541, EC771542, EC771543, EC771549, EC771550, EC771551, EC771552, EC771553, EC771554, EC771555, EC771556, EC771558 and EC771559 Field tolerant to <i>Clletotrichum sp</i> (6): EC771534, EC771535 EC771537, EC771553, EC771554 and EC771555 Highly pungent genotype: EC771559 and EC771541

FOUR DECADES... ACCOMPLISHMENT OF AICRP ON VEGETABLE CROPS

Crops/Source	No. of germplasm	Notable/Promising germplasm
Capsicum	Srinagar (4)	Yield q/ha: SH-SP-62 (311.11), SH-SP-64 (310.19) SH-SP-63 (260.86) and SH-SP-61 (176.87) Fruits/plant: SH-SP-62 (13), SH-SP-64 (10) SH-SP-63 (11) and SH-SP-61 (8)
	Solan (4)	Yield. (q/ha): SP-633(290.06) , EC-579997 (267.18), K.Sel-9 (239.84) and UHF-14 (237.30) Fruits/plant: SP-633(14.63) , EC-579997 (13.25) , K.Sel-9 (12) and UHF-14 (11.85) Average fruit Wt. (g): K.Sel-9 (65.62), EC-579997 (68.25) , SP-633(70.12) , and UHF-14 (73.18)
Paprika	Srinagar (3)	Yield: Red ripe (g/plant): SH-P-60 (400.2) and SH-P-59 (325) and SH-P-58 (300) Fruits/plant: SH-P-60 (23) and SH-P-59 (22) and SH-P-58 (20) Fruit length (cm): SH-P-60 (10.0) ,SH-P-58 (9.4) and SH-P-59 (9.2)
	IIHR (2)	Field tolerant to Viruses CYMV & CMV and Phytophthora and 0% pungency: EC771536 and EC771557
Pea	Ludhiana (2)	Days to first flowering Sugar Snappy (42); Easy Peasy(mid season group (50)
French bean	IIHR (25)	Yield(q/ha): IIHR-PB-4 (230.5), IIHR-PB-2 (212.5) Earliness (50% flowering): IIHR-119 and 130 (38 days) Pod length (cm): IIHR-PB-4 and 124 (17.5)
	Rahuri (52)	Pods yield q/ha: RHRFB-32 (68.47) , RHRFB-34 (68.13) Earliness (50% flowering): RHRFB-20 (40 days), RHRFB-21, RHRFB-11, RHRFB-22 and RHRFB-44 (42 days) Pod length (cm): RHRFB-14 (14.88), RHRFB-28 (14.03)
	IIVR (179)	Potential yielder along with good quality pod : VRFB-1, VRFB-2, VRFB-67, VRFB-95, VRFB-44, VRFB-131 and VRFB-14 A anthocyanin rich French bean genotype VRFB-14
Lablab bean	Raipur (99)	Days to 50% flowering -IS-21 (51.33)-old; IS-97 (79)-new Pod yield (q/ha)-IS-14 (154.15)-old IS-104 (146.05)
	IIVR (25)	Early and high Yield : VRSEM-1(First picking : 124DAS ; Yield: 3.6 kg/ plant), VRSEM-904 (First picking : 128 DAS; Yield: 4.9 kg/ plant) DYMV tolerant lines (Under field condition) VRSEM-797 and VRSEM-887 Green with purple line VRSEM-805, VRSEM-836, VRSEM-704 and RP-08-32 White VRSEM-932, VRSEM-835, VRSEM-863 and VRSEM-768 Green VRSEM-900, VRSEM-800, VRSEM- 881 and VRSEM-730
Okra	IIVR (86)	IC 582757 (<i>A. enbeepgeerens</i>) IC90364, IC90507, IC140995, and IC90519 (<i>A. manihot var. tetraphyllus</i>) were found completely free from YVMV infection.
	IIHR (20)	Yield: EC-769363 350 g/plant (Clemson spineless: 260g/plant)
	Bhubaneswar (48)	Yield/pl. (kg): JOL 2K-19 (201.8); PK (198.2)
Carrot (Temperate)		
	Katrain (5)	1. Namdhari Kuroda (106 q/ha) 2. NS Mushashio (125 q/ha) 3. NSC-R 820 (89 q/ha)
Cauliflower Early	IIVR (179)	VRCF-32, VRCF-48 and VRCF-66 were the potential yielder (Curd yield: 125-130 q/ha) in October maturity having net curd weight of 320-336 g. While, in November maturity group, six lines such as VRCF-2, VRCF-16, VRCF-37, VRCF-50, VRCF-75 and VRCF-86 were found better yielder (Curd yield: 182-205 q/ ha) along with a net curd weight of 465-530 g
	RAU, Pusa (12)	RECF 2 - Curd weight (g) : 395.76 RECF 5 - Curd weight (g) : 376.93 RECF 4 - Curd weight (g) : 369.45 RECF 6 - Curd weight (g) : 338.86

Crops/Source	No. of germplasm	Notable/Promising germplasm
Cauliflower Mid	RAU, Pusa (8)	RMCF -8: Curd weight (g): 510.00 RMCF -2: Curd weight (g): 477.81 RMCF -3: Curd weight (g): 476.55 RMCF -7: Curd weight (g): 455.65 RMCF -5: Curd weight (g): 430.05
	Sabour (14)	Promising SBMCF-2/10 : Curd weight (g): 590 96-5M: Curd weight (g): 582 SBECF-1/11: Curd weight (g): 575 2008-1M: Curd weight (g): 568 99-1M: Curd weight (g): 550 2007-5M: Curd weight (g): 545 2007-1M: Curd weight (g): 540 97-1M: Curd weight (g): 535
Cauliflower Late	Katrain (70)	Eight genotypes received from NBPGR, New Delhi were evaluated. Highest individual curd weight was recorded in EC 716607 (650.8 g) followed by EC 716679 (526.9 g) and EC716671 (513.8g).
	Solan (2)	The genotype Purple of Sicily (181.25 q/ha) was superior in terms of net yield in comparison to Minaret which gave net yield equal to 166.65 q/ha.
Cabbage	Katrain (8)	Eight new germplasm of cabbage received from NBPGR, New Delhi were evaluated. Highest individual net head weight of 1.175 kg was recorded in EC-616657 followed by EC-686712 (0.910 kg).
	Solan (5)	During the year (2013), 5 genotypes were evaluated. Amongst all, AC-27 recorded maximum yield per plot (27.98 kg) and per hectare (298.48 q/ha) over other genotypes at Nauni (Solan)
Cowpea	IIVR (3 new)	Kshyang AC-1 (pod yield: 73.48 g) , Kalingpang AC (pod yield: 51.36 g)
	Raipur (38)	Promising ICP- 38: Green pod yield/ plant (g): 154.43 ICP-2: Green pod yield/ plant (g): 150.71 ICP-14: Green pod yield/ plant (g): 150.00
	IIHR (30)	Promising IC 471933: Pod yield per ha (q): 261.7 IC 471928: Pod yield per ha (q): 213.3 IIHR-247: Pod yield per ha (q): 212.0
Spine gourd (<i>Momordica dioica</i>)	Bhubaneshwar (5)	BSG- 3 recorded maximum yield/ plant (1.180 kg) followed by BSG- 2 (0.880 kg).
	Kalyani (15)	Two new collections have been added during 2013-14.
Drumstick	Vellanikkara (15)	Survey was conducted in Palakkad (Kerala) and Periyakulam (Tamil Nadu) districts and seeds/ cuttings of 15 types were collected and planted in field

Varietal Trial

The data for the year, 2011-12, 2012-13 and 2013-14 was thoroughly scrutinized by the committee and following entries were identified for release and notification.

Crops	Name of entry	Actual Name	Source	Rec. Zone
Kale	2011/KLVAR-4	KTK-64	Katrain	I
Cauliflower (early)	2011/CUEVAR-2	SECF-102	Sabour	VII
Cauliflower (early)	2011/CUEVAR-5	DC-31	IARI	IV
Tomato (Indeterminate)	2011/TOINDVAR-5	DARL-68	DIBER	III, IV
Tomato (Determinate)	2011/TODVAR-1	Punjab Ratta	Ludhiana	IV
Ash Gourd	2011/ASGVAR-3	DAG-12	IARI	VIII
Chilli	2011-CHIVAR-9	LCA-620	Lam	V



KTK-64

SBECF - 102 (Sabour Agrim)

DC 31

DARL-68



Punjab Ratta



DAG-12



LCA-620

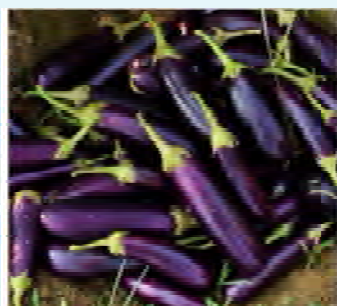
Hybrids Trials

The committee thoroughly scrutinized the data of the hybrid trials for the year 2010-11, 2011-12 and 2012-13 and the following entries were identified for release and notification.

Crop	F ₁ Hybrid	Original name	Source	Rec. Zone
Okra	2011/OKHyb-7	JOH-0819	Junagadh	VI,VII
Brinjal Long	2011/BRL Hyb-6	PBHL-52	Ludhiana	IV
Tomato Det.	2011/TODHyb-2	-	-	I
Tomato Det.	2011/TODHyb-6	Improved Bhagya	Nuziveedu	IV,VII



JOH-0819



PBHL-52



2011/TODHyb-2



Improved Bhagya

Resistant Varietal Trials

The data for the year 2011-12, 2012-13 and 2013-14 was thoroughly scrutinized by the committee and the following entries were identified for release and notification.

Crops	Entry	Original Name	Source	Zone recommended
Okra	2011/OKYVRES-4	VRO-25	IIVR	IV

VEGETABLE PRODUCTION

Integrated Nutrient Management (INM)

1. In Broccoli, the maximum head yields (104.37 q/ha) with higher B:C ratio (2.90) was obtained at **Hyderabad** with application of Poultry manures (5.0 t/ha) along with half recommended NPK.
2. Application of recommended dose of NPK (50:30: 50 kg/ha) gave the maximum fruit yield of 330.2 q/ha with BC ratio of 3.92. This can be recommended for bottle gourd (BBOG 3-1) under Bhubaneshwar conditions.



VRO-25

Micronutrient studies

1. Micronutrient study in tomato conducted at Kalyanpur demonstrated that 3 foliar sprays of Multiplex (Commercial formulation) @ 4 ml/lit. of water produced the maximum fruit yield (264.64 q/ha) with highest B:C (2.96).
2. At Bhubaneswar, in Broccoli (cv. CBH 1), application of boric acid + $MnSO_4$ @ 100 ppm each, three sprays at 10 days interval from 30 days after transplanting gave the maximum yield of 192.72 q/ha with higher B:C ratio (3.5)
3. At Hyderabad, in Broccoli, application of three foliar sprays of boric acid + copper sulphate in Rabi season gave maximum head yield (112.54q/ha) and B:C ratio (3.64).
4. Micronutrient study in cowpea (Kashi Kanchan) at Faizabad revealed that treatment comprising 3 foliar sprays of molybdenum (50 ppm)+ soil application of sulphur (15 kg/ha) exhibited maximum pod yield of 108.68 q/ha with B:C ratio (2.03).

Organic vegetable production

1. At IIVR, the maximum green leaf production (161.17 q/ha) in amaranth was recorded with application of FYM (20 t/ha) + PSB and Azospirillum (each at 5 kg/ha), whereas at Faizabad the maximum yield to the tune of 204.65 q/ha was noticed under recommended NPK practice (100:50:50 kg/ha).

Protected cultivation

1. Experiment conducted at Srinagar on two cherry tomato cultivars with two spacing revealed that cultivar NS 6667 produced maximum mean fruit yield (771.1 q/ha) and B:C (3.52) when spaced at 100 x 45 cm and also pinched and trained.

Drip irrigation

1. Experiments on drip irrigation scheduling in broccoli concluded at IIVR and Durgapura revealed that drip irrigation at alternate day with 100% of Pan Evaporation (PE) registered maximum head yield (122.4 q/h and 149.1 q/ha respectively) and B:C ratios (2.45 and 3.29 respectively) at both centres.

2. In hybrid tomato, at IIVR and Srinagar drip irrigation scheduled at 0.7 bars coupled with black plastic mulching gave maximum fruit yield of 820.9 and 927.83 q/ha respectively with the B:C ratio of 2.85. At Coimbatore, drip irrigation scheduled at 0.5 bars coupled with black plastic mulching noticed maximum fruit yield of 796.5 q/ha with the BC ratio of 2.80 in hybrid tomato CO3.

Inter-cropping

1. Experiments on intercropping of vegetables with seed spices were concluded at Durgapura and IIVR. At both the centres, the maximum vegetable equivalent yield and income was generated under Carrot + Fennel or Carrot + Ajwain cropping system. At Hyderabad, intercropping in carrot with fennel recorded higher yield of 250.7 q/ha with B:C ratio 1.63.

DISEASE MANAGEMENT

RECOMMENDATIONS

- ❖ Foliar spray of Difencnazole (0.05%) for three times at 10 days interval from initiation of disease was effective to control anthracnose (*Colletotrichum capsici*) disease (86.6%) in chilli (Utkal Rashmi) and the treatment recorded with maximum B:C ratio (1:2.32) at Bhubaneswar and the similar treatment was effective at Sabour.
- ❖ Foliar spray of 0.1% Dimethomorph (50% WP)+0.2% Mancozeb (75% WP) for three times at 10 days interval was effective to control early blight (*Alternaria solani*) by 44.72% and late blight (*Phytophthora infestans*) by 65.36% in tomato at Kalyani and the treatment recorded highest B:C ratio of 1:2.93
- ❖ IDM including, use of white nylon net (40-60 mesh) and soil application of neem cake @ 0.5kg/m² in nursery, border crop with two rows of maize and seedling dip of Imidacloprid 0.5ml/l for 60 min followed by four sprays at 10 days interval, first spray with Acephate @ 1.5 g/l + Neem oil 2 ml/l, second spray with Fipronil @ 1.5 g/lit + Neem oil 2 ml/l, third spray with Imidacloprid @ 2 g/ 15 l + Neem oil 2 ml/l and fourth spray with Acephate @ 1.5 g/l + Neem oil 2 ml/l under main field, recorded with significant less *Tospo virus* incidence (14.82%) in comparison to control (46.77%) as well as high B:C ratio 1:2.89 in tomato (cv. Dhanashree) at Rahuri.
- ❖ Application of Streptomycin sulphate (100 ppm) as seed treatment and two foliar sprays starting from initiation of disease was effective to control 59.2% disease severity of black rot of cabbage (cv. Golden acre) and the treatment recorded the maximum B:C ratio 1:2.65 at Kalyani.

Physiology, Biochemistry and Processing

Lycopene development in OP and hybrid tomato varieties:

Trials were conducted for three years by PAU, Ludhiana, IIHR Bangalore and IIVR, Varanasi, the analysis were carried out at breaker, turning and ripe stage of harvest. It has been concluded that harvesting of tomatoes at breaker stage had maximum overall acceptability score while tomatoes harvested at ripe stage had minimum overall acceptability score. Lycopene content was also maximum at ripe stage and was minimum at breaker stage of harvest. It was proposed to conclude the trial.

Packaging materials in tomatoes

The trials on different packaging materials were assigned to PAU, Ludhiana, IIHR Bangalore and IIVR, Varanasi. It was carried out for three years. It was concluded that non-perforated polypropylene

pouches was most acceptable for increasing the shelf life to 25-30 days and minimum shelf life of 10-15 days in OP and hybrid tomato cultivars in plastic crates, jute bags and CFB boxes. It is proposed to conclude the trial.

Packaging materials for chillies

The trial on standardization of packaging materials for chilli was assigned to three centres viz. IIVR, Varanasi, PAU Ludhiana and IIHR Bangalore. The trial was conducted for three years. It was concluded that green chillies packaged in polypropylene pouches were acceptable for 21 days at ambient room temperature (21-27°C) while it was acceptable for 63 days in polypropylene pouches with overall acceptability score of 6.8-7.0 during refrigerated storage at 10°C. It is proposed to conclude the trial.

Insect Pest Management (Entomology)

After the presentations the following recommendations were made under IPM sessions

Brinjal

- In brinjal for the management of leaf hoppers and shoot and fruit borer *Leucinodes orbonalis*, IPM module comprising of seedling root dip with imidacloprid 17.8 SL @ 1 ml/lit for three hours before transplanting, sowing of maize as border crop, installation of sex pheromone traps @ 100 traps/ha, clipping of infested shoots at weekly interval from 20 days after transplanting and spray of azadirachtin (1500 ppm) @ 3 ml/l and triazophos 40 EC @ 2ml/l alternately twice at an interval of 10 days starting from flowering gave 83.61 and 71.91% reduction in leafhopper and fruit damage, respectively and 38.85 % increase in yield over control with maximum 1:21.64 ICBR and 1:1.95 B:C ratio at Rahuri conditions.

Okra

- Foliar application of thiamethoxam 25 WG @ 0.35 g/l and spiromesifen 22.9 SC @ 0.8 ml/ l proved to be most effective against jassids, *Amrasca bigutulla bigutulla* and whitefly, *Bemisia tabaci* with 39 and 33.53 % reduction in the population, respectively as compared to untreated control and recorded lowest incidence of YVMV (22.41 %) with 110 % increase in yield and maximum ICBR of 1:76.31 at Anand conditions,
- Spraying of thiamethoxam 25 WG @ 0.35 g/ l was found superior for the control of jassids, *Amrasca bigutulla bigutulla* (71.05 % reduction) on okra with higher yield (184 q/ha) and cost benefit ratio (1.43 : 1.0) under mid hill conditions of Solan, Himachal Pradesh.
- Diafenthiuron 50 WP @ 1g/l and buprofezin 25 SC @ 1ml/l were most effective against leafhoppers *Amrasca bigutulla bigutulla* with 46.11 % and 46.54 % reduction, respectively. For whitefly *Bemisia tabaci*, thiamethoxam 25 WG @ 0.35g/l and spiromesifen 22.9 SC @ 0.8ml/l were found effective with 47.10 % and 37.05 % reduction. Highest marketable fruit yield with 60.70% increase as compared to untreated control was obtained in diafenthiuron treatment at Varanasi conditions.

Chilli/Capsicum

- Chlorfenapyr 10 SC @ 1.5g/l proved to be most effective followed by emamectin benzoate 5 SG @ 0.35g/l against chilli yellow mites, *Polyphagotarsonemus latus* with 69.95 and 63.06 per cent reduction over untreated control. For thrips, *Scirothrips dorsalis* fipronil 80 WG @ 0.35g/l and emamectin benzoate 5 SG @ 0.35g/l were found highly effective with 75.41 and 67.68 per cent reduction of thrips population with highest yield and net returns at Varanasi conditions.

- Spray of imidacloprid 200 SL @0.5 ml /l was found superior for the control of aphid, *Myzus persicae* on capsicum (cv Bharat) grown under protected cultivation with higher fruit yield (164.0 q/ha) as well as cost benefit ratio (3.07: 1.0) under mid hill conditions of Solan, Himachal Pradesh.

Cabbage

- Pest management module consisting of spray of imidacloprid 200SL @ 0.5ml/l at 20 DAT followed by spray of indoxacarb 14.5 SC @ 0.5ml/l at 30 and 60 DAT and spray of rynaxpyr 18.5 SC @ 0.3ml/l at 15, 45 and 75 DAT found to be most effective against cabbage aphid, *Brevicoryne brassicae* and gave higher yield (252.6 q/ha) and cost benefit ratio (2.72 : 1) under mid hill conditions of Solan, Himachal Pradesh.

Bitter gourd

- Installation of cuelure baited traps @10 traps / acre and application of bait spray (jaggery solution 100 g + malathion @ 2 ml/l at 250 spots /ha) at 15 days interval from flowering reduced the fruit fly, *actrocera cucurbitae* damage to 18-20 % as compared to control with highest yield (21.3 t/ha) during kharif at Solan.

Seed Production

Recommendations: The following recommendations emerged from the discussions

1. Based on three years data from PAU, Ludhiana, it is recommended that sowing the palak cv. All Green in the month of October and with one cutting recorded maximum seed yield (29.31q/ha), 100 seed weight (1.46g), seedling vigour index-I (1166.03) and seedling vigour index-II (1.34).
2. Based on three years data from PAU, Ludhiana, it is recommended that treat the seeds of bottle gourd cv. Punjab Komal with Potassium dihydrogen phosphate $10^{-1}M$ for 24 hours before sowing to get maximum seedling emergence (81%) and seedling dry weight and vigour indices.
3. Based on three years data from PAU, Ludhiana, it is recommended to treat the seeds of bitter gourd cv. Punjab-14 with Potassium dihydrogen phosphate $10^{-3}M$ /GA₃ 100 ppm for 48 hours before sowing to get maximum germination (78.89%) and seedling vigour indices.
4. On the basis of three years data from Solan, it is recommended to treat the seeds of pea cv. before sowing with combination of carbendazim(@2g/kg + Imidacloprid@2m/kg+ Micronutrient mixture @20g/kg to increase germination (81.87%). The growth parameters such as roots, shoot length, dry weight as well as seedling vigour -I and II were also better with this treatment.
5. On the basis of three years data from Solan, it is recommended to treat pea seed cv. Azad Pea-1 either with plant extracts of *Mentha piperata*, *Allium sativum*, *Tagetes erecta*, *Curcum longum* or *Adhatoda vasica*, *A. cepa* @ 30% to control the storage fungi during storage of seed.
6. On the basis of three years data from PAU, Ludhiana, it is recommended to treat pea seed cv. Pb.-89 either with plant extracts of *Allium sativum*, *Melia azadirachta*, *vitex negunda* and *Allium cepa* @ 30% to control the storage fungi of pea
7. Based on pooled data of two years on hybrid seed production of okra (Seed parent Ankur-40 and pollen parent Arka Anamika) under IIHR, Bangalore conditions, it is recommended that simultaneous emasculation at yellow bud stage on the day of anthesis before dehiscence and pollinating with yellow bud stage pollen is the easiest and efficient pollination method for higher seed yield of 57% and saving in the time taken for crossing of 65% over the conventional method of crossing.

Breeder Seed Production and Price Review

At the outset, the Chairman welcomed the dignitaries and participants in the session and emphasized the importance of seeds in general, and breeder seeds in particular, for enhancing the vegetable productivity. After his brief remarks, the Chairman asked the Co-chairmen Dr. Naik and Dr. Prasad to brief the house about the importance of seed. After the brief remarks of co-chairman, Dr. Peter asked Dr. Pandita to present the report of breeder seed production for the year 2013-14. Dr. Pandita presented the report of 21 centres on 111 varieties of 36 vegetable crops and produced in total 23033.45 kg seed against the indented quantity i.e. 5932.84 kg for the year 2013-14. The seed production programmes of some crops are in progress and production is awaited. Some of the centres were unable to produce the indented quantity of some of the vegetables due to non availability of nucleus seeds. Dr. SK Malhotra ADG pointed out why the seed production of some of the centres are less against the indented one. The

Selling rate for breeder seeds of Vegetable Crops

S. No.	Crop	Existing Rates (Rs/kg) as per XXXI Group Meeting, Palampur	Revised Rate as per XXXII Group Meeting, Raipur
1	Palak	250	290
2	Methi (Kasuri)	375	375
3	Okra	500	500
4	Tomato	2250	2770
5	Brinjal	1750	2290
6	Chilli	1500	1810
7	Capsicum/Paprika	7500	9310
8	Cowpea	500	500
9	French bean	380	380
10	Dolichos bean	380	400
11	Garden pea	250	270
12	Cauliflower (Early/Mid-early/Mid)	1900	3150
13	Late Cauliflower	4375	4950
14	Cabbage	1500	2290
15	Knol Kohl	1500	2290
16	Radish	625	700
17a	Carrot (Tropical)	1000	1400
17b	Carrot (Temperate)	--	2750
18	Turnip	750	1330
19	Onion	1250	2000
20	Bottle gourd	750	930
21	Bitter gourd	1000	1175
22	Sponge gourd	750	880
23	Ridge gourd	750	930
24	Cucumber	1900	2000
25	Tinda (Round melon)	750	930
26	Pumpkin	1000	1175
27	Muskmelon	1000	1400
28	Water melon	1900	2650
29	Coriander	375	400
30	Amaranthus	500	500
31	Long melon	875	1140
32	Cumin	750	880
33	Fennel	250	330
34	Garlic	190	240
35	Fenugreek	250	290
36	Cluster bean	500	500
37	Snake gourd	800	1000

ADG asked the PC to ensure the breeder seed production as per the targets allotted to all the centres. Some delegates and officials from private companies made the remarks that breeder seed production of some old varieties is still in demand, which may be due to presence of some special traits in these old varieties. Moreover, the old varieties must be replaced with new high yielding varieties. The co-chairman Dr PS Naik asked the PC to submit the details of allocation of breeder seed to public and private institutes from next year onwards for proper monitoring. He also emphasized that newly released varieties must be popularized amongst the farmers through strong linkage by extension personnel through KVK's by demonstration in the fields and by media also like radio and TV talks.

After the presentation of breeder seed production reports, the prices of breeder seeds revised in last group meeting held at CSK HPKV Palampur (2013) were also presented in the house. The Chairman and Co-chairmen and other dignitaries stressed upon the need for increase in cost of the breeder seed keeping in mind increased cost of production. It was also discussed in the house that a committee may be formed to discuss the existing prices and to revise them, wherever necessary. However, house advised to increase the price of breeder seed of all vegetable crops by taking all production components of quality seed into consideration. Finally a committee of scientists from IIHR (Dr. BL Kashinath), IARI- Karnal (Dr. VK Pandita), PAU (Dr. MS Dhaliwal), Pantnagar (Dr. JP Singh), Nasik- NHRDF (Dr. P.K. Gupta) Dr. MPS Mangat (Century Seeds) and Dr. Krishna Prasad from Advanta Seeds was constituted for necessary suggestions in the price of the breeder seed under the Chairmanship of Dr. PS Naik.

The above committee meeting was held on 26 June, 2014 at IGKV, Raipur. It was decided that rates are fixed based on prevailing market prices. In general, the cost of breeder seed has been fixed 4 times more in low value crops and two times in high volume crops. If the existing breeder price is less than two times the prevailing sale price has been proposed. Accordingly the following breeder seed rate has been proposed for the year 2014-15.

Public Private Partnership

The chairman welcomed the delegates and after his brief opening remarks invited the house to deliberate on effective public-private partnership. The co-chairman Dr. C. S. Pathak emphasized the importance of PPP and to build mutual trust and confidence between the public and private organisation to work together to help the farming community. The chairman requested Dr. S. Ganeshan, Principal Scientist from IIHR to flag the issues related to Public Private partnership as desired by honourable DDG (Hort.).

Dr. S. Ganeshan from IIHR, Bangalore has apprised the house of the issues related to PPP. He emphasized the issue of sharing the planting material / Germplasm between public and private sectors. He also stressed the issues of implementing the rules and regulations of National Biodiversity Authority. He informed the house that under National Biodiversity Authority, a committee has been constituted under the chairmanship of Dr. R. S. Paroda to finalize the issues of sharing the germplasms between public and private as per the NBA Act. In this regard the committee has already conducted its 5th meeting on 16th June, 2014 to finalize the MTA and to formalize the modalities of sharing the germplasm lines. NAARM is going to organize the meeting between the public and private sector in near future. There was lot of discussion with respect to PPP and chairman opined that whatever recommendations made during the previous (31st AICRP Group Meeting held at CSKV, Palampur) will remain the same and to be carried forward this year also and those recommendations are as follows:

- 1) Molecular markers development for key traits in okra
- 2) Breeding for Tospo virus in Tomato (understanding the epidemiology of disease, identify the sources of resistance and molecular markers)

- 3) Breeding for insect resistance in hot and sweet pepper (mites, white flies, aphids and thrips)
- 4) Breeding for Black rot resistance in cauliflower
- 5) Development of CMS lines in Okra and other cucurbits
- 6) Breeding for heat tolerance in Tomato and sweet and hot Pepper.

Dr. Kirti Singh advocated that PPP should not be emphasized simply on the basis of breeding point of view, but as a total package of vegetable production. He said that along with the varieties, the full production technology is to be given by the private sector and due acknowledgement for the same is to be made.

According to Dr. Brahma Singh, the chairman of the session, breeding programme should be taken up vigorously by the private sector, especially for developing varieties for protected cultivation, and public sector needs to be proactive in breeding of European vegetables. He further said that marketing, transportation and packaging are grey areas in vegetable system and more manpower is required to bring the system properly on board.

Dr. Malhotra, ADG (Horticulture) informed the house that a company of ICAR, Agro Inovate India Pvt. Ltd. has set up the Business Plan Development Unit (BPDU) and Technology Parks. He further said that 25% of the total budget of DOAC is devoted to post harvest management and Hi tech nursery development. He said that Farmers Producers Organisation (FPO) is to be linked with Market Aggregate and to be registered with SFAC.

Dr. Chaddha highlighted that trust building is important among private and public sectors to make the model successful.

Finally, the chairman flagged the point that 'consortium' approach needs to be implemented for a successful PPP framework in the country.

The session ended with a vote of thanks.

Plenary Session

The session commenced with the introduction of the meet by the Project Coordinator, AICRP-VC, Dr. B. Singh. The remarks of the Chairman, Dr. S. K. Malhotra, ADG (Horticulture), ICAR, formally inaugurated the program. He welcomed all the guests including dignitaries and AICRP group professionals and said that the platform of AICRP-VC was just apt for accelerated development of technologies pertaining to vegetables. The Co-chairman Dr. P. S. Naik also remarked that the recommendations of AICRP will help the policymakers to frame new guidelines for horticultural development. He further informed that during the workshop, a total of 11 sessions were conducted to review the progress and recommendations were made. Thereafter, the Chairman invited Chairman/Co-chairman/Rapporteur of different technical sessions to present the proceedings and recommendations of the respective sessions.

Dr. K.K. Gangopadhaya, NBPGR, presented the proceedings of Session II on Collection, Evaluation, Conservation and Utilization of Germplasm. He informed that during 2013-14, a total of 75 germplasm trials were allotted to 8 main centers (44), 17 sub-centers (20) and 13 voluntary centers (11) with 80.4 % reporting. Dr. Naik reflected the words of DDG (HS) and said that inventory of germplasm available with different centers has not yet been prepared. This was one of the recommendations of the previous group meeting as well which should be given top priority.

Dr. T. S. Aghora, IIHR, presented the recommendations in Session III on Varietal Trials. Suggestions were made on tomato, brinjal, chillies (green & red), okra, leguminous, cole and cucurbitaceous vegetables' yield, disease reaction and index value. ADG (Hort) commented more entries should be