

XXII-Workshop

Venue : ANGRAU, Hyderabad

Date : 27th - 30th May, 2004

Collection, evaluation and conservation of germplasm

Table 1. List of promising germplasm available with different centres

Crops	Source	Notable / Promising Germplasm
Amaranth	Jorhat	Strain-26, 27 (high yielder)
	Vellanikkara	VKA 26, 81, 32, 1 (resistant to leaf sport), VKA -31, VKA-77 (high yielder)
Bitter gourd	Vellanikkara	VKB 127, VKB139 and VKB 120 (for yield), VKB 139 (for fruit yield)
Bottle gourd	Rahuri	RHRBG-24, RHRBG-30, RHRBG-22 (fruit length)
Cucumber	Solan	Karnataka-1, Set-1, LC-1
	HARP, Ranchi	HAC-125 and HAC-250
	IIVR	VRC-11-2 and CHC-1
Ivy gourd	IIVR	VRK-88-2, VRK 89-5M VRJ-90-3, VRK-93, VRK-96-4, VRK-99 and VRK-101
	Vellanikkara	CG-23, CG-81 (fruit length), CG-23, CG-27, CG-81 (yield)
Pointed gourd	Sabour	Rajendra Parwal-1, Rajendra Parwal-2, Sultangaunj
	HARP, Ranchi	HAP-102, HAP-105 and HAP-103 (high yielder), HAP-92, HAP-97, HAP-98 (fruit length)
	IIVR	VRPG - 203-1, VRPG-206, VRPG-209, VRPG-210-2
Pumpkin	Hyderabad	CM-115, CM-27, CM-35, CM-25, CM-74 (yield), CM-74 (fruit length)
	IIVR	DR/SP-106, BS-165, DR/SP103 (yield), BS-165, DR/SP (fruit weight)
Chow chow	ICAR Res. Complex, Umiam	Sikkim Sel-5, 4, 2 (fruit weight), Sikkim Sel-5, 4 (polar diameter), Sikkim Sel-6, 9, 1 (Equatorial diameter)
Tomato	Solan	Line 553, EC-15990 (high yielder), Line 663 (high pesicarp thickness)
	HARP, Ranchi	HAT-293, HAT-292, HAT 17-3, HAT 92-2 (yield)
	IIVR	EC-501576, IST-4, EC-498864
	IIHR	IC-395463, IC-39458, IC-395460
	IARI	ACC 677-10-8, ACC-586-4, ACC-550-4-2 (fruit weight),
Brinjal	PAU, Ludhiana	CLN-29/3R, DR-4
	HARP, Ranchi	HAB-378, HAB-554-6, HAB-306
	Vellanikkara	VKBr-2 (Average fruit weight, fruit girth)
	IIHR	IC-344318, FC-344321
	Bhubaneshwar	BBSR-156, BBSR-159, BBSR-157
Chilli	SKUAS&T	SH-KC-1, SHKC-11, SH-KC-2, SH-KC-13 and SH-KC-7
	Lam	LEC-29, PBC-6 and PBC-16 (Tolerant to thrips), LIC 64 (fruit yield)
	IIHR	MS2A, MS2B (Male sterile line)
	Kalyani	Suryamukhi, Suryamukhi Cluster, Gosaba local
	Dharwad	ACS-2000-03, LCA-357, LCA-206
	Jorhat	Jati long, Round Chilli
Capsicum	YS PUA&T, Solan	Sel-2-9, Sel-104-1-4, Sel-17-1-2
	SKUAS&T	SHSP-1005, SHSP-1006, SHSP-1007
Paprika	SKUAS&T	SHP-1007, SH-P-1005, SHP-1004
	Dharwad	Byadagi Dabbi, Byadagi Kaddi

Crops	Source	Notable / Promising Germplasm
Pea	CSKHPKU, Palampur	DPP-120
	Ludhiana	Jagatpur-I, Jagatpur-II
French bean	Dharwad	DWD-FEB-57, BWD-FEB-57
Lab lab bean (Sem)	HARP, Ranchi	CHDB-14, CHDB-76, CHDB-75
	IIVR	FD-54, VRD-12
	Dharwad	Konkan Bhushan, DB-1, DB-9
Okra	IIVR	ELCV No-315
Onion	NRC(D&G), Pune	W-307, W 306
	IIHR	Bellary, Rampur Local
Garlic	IIHR	ACC No-316
Carrot Temperate	Katrain	Line-1061
Cauliflower Early	Sabour	81-5, 84-3, 91-1, 91-2
	IIVR	Kuwari 23/42, Katki early 23/95, Awasthi seed, Pusa Prem seed
Cauliflower late	Solan	Everyday
Cabbage	Solan	Autumn victory
	Katrain	EC-490162, EC490170, EC-490174

Vegetable Production

Use of biofertilizers

1. Maximum yield (86.39 q/ha) and C:B ratio (1:2.82) were recorded with the application of *Azospirillum* along with 100% recommended dose of nitrogen in chillies cv. Azad Mirch-1. Hence, it is recommended for Kanpur conditions.
2. The maximum yield of cauliflower cv. Pusa Snowball K-1 (304.5 q/ha) and C:B ratio (1:3.88) were recorded with the application of PSB @ 500 g/ha as seedlings root dip along with recommended dose of NPK through fertilizers. Hence, it is recommended for Pantnagar conditions.

Use of liquid fertilizers

3. At Hyderabad, maximum yield of brinjal (365.6 q/ha) with C:B ratio (1:3.8) were obtained with 5 sprays of water soluble fertilizer having the combination of NPK 15 : 15 : 30. Hence, it is recommended for Hyderabad conditions.
4. At Kalyanpur 5 foliar applications of water soluble fertilizer NPK (17: 10:27) at 10 days interval resulted in maximum yield (241.5 q/ha) and C:B ratio (1: 2.97) in tomato cv. Type -1. Hence, it is recommended for Kanpur conditions.
5. At Jabalpur, the maximum yield of tomato (269.28 q/ha) along with the C:B ratio (1:2.08) were obtained with 5 sprays of Multi K 13:0:45 applied at 10 days interval after 40 days transplanting. Hence, it is recommended for Satpura hills and Kaymore plateau region of M.P.
6. At Coimbatore foliar application of water soluble fertilizer NPK (19 :19: 19) 5 times at 10 days interval starting from 40 days after transplanting resulted in maximum yield (556 q/ha) and C:B ratio (1:5.05) in Brinjal Hybrid -1 (COBH-1). Hence, it is recommended for Coimbatore conditions.

Use of micronutrients

7. At Pantnagar, maximum yield (314 q/ha) and C:B ratio (1:2.15) along with high TSS (5.7%) and shelf life (7.6 days) were recorded in Pusa Hybrid -1 tomato with three foliar sprays of micronutrient

mixture (B, Zn, Cu, Fe, Mn, each @ 100 ppm and Mo @ 50 ppm) at 10 days interval starting from 40 days after transplanting. Hence, it is recommended for Tarai conditions of Pantnagar.

8. At Jabalpur, the maximum yield (360.40 q/ha) and C:B ratio (1: 2.75) of hybrid cabbage Krishna were recorded with 3 foliar sprays of ZnSO₄ at 100 ppm concentration. Hence it is recommended for Satpura hills and Kaymore plateau region of M.P.
9. At Kalyanpur three foliar sprays of mixture of micronutrients (B, Zn, Cu, Fe, Mn each @ 100 ppm and Mo @ 50 ppm) at 10 days interval starting from 40 days after transplanting resulted in maximum yield (83.89 q/ha) and C:B ratio (1:3.43) in capsicum cv. California Wonder. Hence, it is recommended for Kanpur conditions.

Integrated Nutrient Management

10. At Bhubaneswar the integrated application of FYM @ 40 t/ha + half the dose of NPK through fertilizers resulted in maximum yield in tomato cv. Utkal Deepti with C:B ratio of 1: 1.62. Hence, it is recommended for Bhubaneswar conditions.
11. At Jabalpur, maximum yield (310.68 q/ha) and C:B ratio (1:2.58) of cv. Jawahar Tomato-99 was obtained with the application of 20 t/ha FYM and full dose of N:P:K (180:120:80 kg/ha) through fertilizers. Hence, it is recommended for Satpura hills and Kaymore plateau region of M.P.

Irrigation trials

12. At Bhubaneswar, application of irrigation at 50 mm CPE resulted in yield of 251.4 q/ha with the highest C:B ratio of 1:1.81 in tomato. Hence, irrigation scheduling at 50 mm CPE in tomato is recommended under Bhubaneswar conditions.
13. At Sabour, the highest yield (483.40 q/ha) and C:B ratio (1:4.65) were obtained with 75 mm CPE in tomato hybrid Avinash-2. Hence irrigation in tomato at 75 mm CPE is recommended under Sabour conditions.

Protected cultivation

14. At IHR, Bangalore, maximum yield of 1329.0 q/ha was obtained under protected cultivation of hybrid tomato cv. SH-7611 with a spacing of 50 x 20 cm by following double stem training, which is recommended for Bangalore conditions.

Use of bio-fertilizers

1. At Hyderabad, the maximum yield (226 q/ha) along with C:B ratio (1:2.96) were obtained in late Cauliflower with the application of VAM @ 15kg/ha. + recommend dose of NPK. Hence, this is recommended for Hyderabad conditions.
2. At Hisar, the highest yield (347.8q/ha) and C:B ratio (1:5.53) were obtained with the application of PSB +75% P and recommended dose of nitrogen and potassium in late cauliflower. Hence, it is recommended for Hisar conditions.
3. At Faizabad, the maximum yield (257.75 q/ha) and C:B ratio (1:3.19) were obtained in cauliflower cv. Snowball-16 with the application of *Azospirillum* plus recommended dose of NPK. Hence, it is recommended for Faizabad conditions.
4. At Kalyanpur, the application of *Azospirillum* with 75% of N and full dose P and K gave the maximum yield (293.95 q/ha) and C:B ratio (1:1.60) of cauliflower cv. Snowball-16. Hence, it is recommended for Kanpur conditions.

Use of liquid fertilizer

- At Faizabad, in addition to the recommended dose of NPK (150:80:80) five foliar applications of water soluble NPK fertilizer (19:10:27) after 30 days of transplanting at 10 days interval resulted in maximum yield (395 q/ha) and highest C:B ratio (1:3.53) of brinjal hybrid Suchitra. Hence, it is recommended for Faizabad conditions.
- The highest yield of capsicum hybrid Bharat (167.45 q/ha) along with C:B ratio (1:1.52) were recorded with three foliar sprays of water soluble fertilizers (15:15:30 @ 0.5%) at 10 days interval starting from 30 days after transplanting. Hence, it is recommended for Pantnagar conditions.

Use of micro-nutrients

- At Coimbatore, the foliar application of $ZnSO_4$ at 100 ppm concentration thrice starting from 40 days after transplanting resulted in the maximum yield (645.6q/ha) along with C:B ratio (1:4.86) in case of tomato hybrid - 1 (COTH-1). Hence, it is recommended for Coimbatore conditions.
- At Bhubaneswar, the maximum yield (431.6 q/ha) of hybrid cabbage along with C:B ratio (1:1.83) were obtained with 3 sprays of 100 ppm $ZnSO_4$ at 10 days interval starting from 40 days after transplanting. Hence it is recommended for Bhubaneswar conditions. However, at Jorhat, application of boron at same concentration resulted in maximum yield (485 q/ha) and C:B ratio of (1:2.76) which is recommended for Jorhat conditions.

Planting date cum spacing trial

- At Jorhat, planting of broccoli cv.KTS-1 at 45x30 cm spacing on 30th October resulted in maximum yield (158 q/ha) and C:B ratio (1:1.77). Hence, it is recommended for Jorhat conditions.

At Kalyanpur, maximum yield (315.52 q/ha) and C:B ratio (1:2.27) were obtained when broccoli hybrid Fiesta was planted on 15 October at 45x30 cm spacing. Hence, it is recommended for Kanpur conditions. However, at Durgapura, the maximum yield (310.4 q/ha) and C:B ratio (1:8.5) were obtained at 45 x 45 cm spacing on the same date of transplanting, which may be recommended for Durgapura conditions.

Varietal Trial

Yield data of 2001-2002, 2002-03 and 2003-04 provided by IIVR was thoroughly scrutinized by the committee and following varieties were identified for consideration of the central varietal release committee for release and notification.

Table 2: List of varieties identified

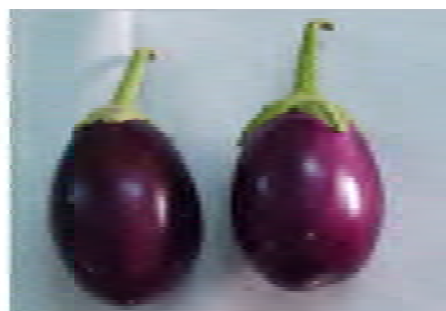
Crops	Name of Entries	Source	Recommended zones
Brinjal (long)	DBL-21	IARI, New Delhi	IV
Brinjal (round)	KS-235	CSAUA&T, Kalyanpur, Kanpur	IV, V & VII
Brinjal (small Round)	ABSR-2	GAU, Anand	VII
Tomato (det.)	NDTS-2001-3	NDUA&T, Faizabad	IV
Tomato (det.)	Mani Lema	ICAR Res. Complex for NEH Region, Barapani	III
Chilli	ASC-2000-02	GAU, Anand	VII
Bottle gourd	NDBG-132	NDUA&T, Faizabad	VI
Dolichos bean	CHDB-1	HARP, Ranchi	IV
Cowpea	IIVRCP-1	IIVR, Varanasi	IV



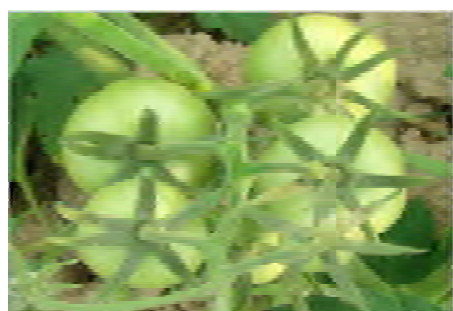
DBL-21 (Pusa Shyamala)



KS-235 (Azad B-4)



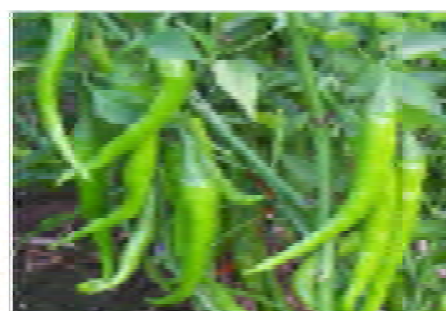
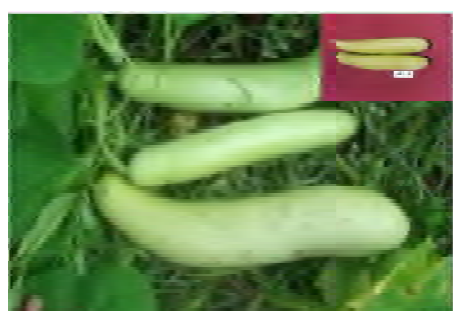
ABSR-2



NDTS-2001-3



Mani Lema (Sel.-2)

ASC-2000-02
(Gujarat Vegetable Chilli-101)

NDBG-132



CHDB-1 (Swarna Utkrisht)



Kashi Shyamal (VRCP-1)

Physiology, Biochemistry and Processing

Physiology

- During 2002-03, studies on screening of 11 chilli cultivars for drought tolerance were conducted at IIHR, Bangalore. Results indicated that cultivars Krishna, and Arka Lohit had the maximum RWC during water stress at all the growth stages. There was good recovery in RWC value after release of water stress in cultivars Krishna, Pusa Jwala and Arka Lohit. The maximum flower and fruit drop was observed in cultivars Krishna, Arka Abhir, Arka Lohit and MSH-96.
- During 2003-04 another trial on Morpho-physiological response of capsicum in relation to different seasons was conducted at IIHR, Bangalore in two seasons (September and January) and was noticed that there was low harvest index during both the seasons.
- In a trial on evaluation of tomato hybrids under saline condition conducted at CCS, HAU, Hissar, during 2002-03 and 2003-04, it was observed that increasing level of salinity reduced the fruit yield of tomato. Among 12 hybrids tested. Hisar Arun gave the maximum yield of 400.0 g/plant at maximum level of salinity i.e. 10 dSm⁻¹.

- In the third trial conducted at CCS, HAU, Hisar on interactive effect of salinity and phosphorus on productivity and physiological behaviour of tomato cv. Hisar Arun, it was observed that application of 80 kg P₂O₅ at salinity level of 4.0 dSm⁻¹ gave the maximum fruit yield of 281.6 g per plant.

BIOCHEMISTRY

There were three trials allotted to PAU, Ludhiana and IIVR, Varanasi. Both the centres have reported the results for 2002-03 as well as 2003-04.

- Out of 45 genotypes of tomato tested at PAU, Ludhiana, Mani Thoiba had the highest dry matter content (7.61%). TSS varied from 3.0% (Th-017) to 6.2% (ALT-97-44) while the pH of Juice ranged between 3.81 to 4.48. The acidity of juice varied from 0.26 (CHDT-1) – 0.70 g anhydrous citric acid/100 ml juice, whereas Vitamin C ranged between 15.68 – 39.20 mg/100 ml juice, being maximum in Nun -5001, TH-1 and Akash genotypes. The ranges for lycopene and carotenoids were 0.42 – 5.59 mg/100g and 2.89-7.20 mg/100g, respectively.
- Three genotypes of muskmelon were analysed for their biochemical composition. Dry matter and TSS ranged between 8.17 – 12.88% and 11.8 – 14.6% respectively, both being maximum in Punjab Hybrid. The Vitamin C content ranged between 20.09 – 49.02 mg/100ml juice. The titratable acidity and pH of juice varied between 0.10 – 0.16 g anhydrous citric acid/100ml juice and 6.06 – 6.39 respectively.
- At IIVR, Varanasi, twenty promising lines of pea were analyzed for their quality characters. The carbohydrate content on fresh weight basis ranged from 15.50 to 20.12%, total sugar from 13.87 to 15.72% and starch from 8.63 to 17.66 %. The crude fiber content on fresh weight basis ranged from 1.78 to 5.90%. On dry weight basis, the protein content ranged from 18.9 to 28.8%.
- Sixteen promising lines of brinjal were evaluated. The ascorbic acid content of the fresh fruits ranged from 5.55 to 11.10 mg/100 g fresh weight. Titratable acidity from 0.096 to 0.244%, phenolics from 1.00 to 80.40 mg/100 g, Anthocyanin content from 17.10 to 29.73 mg/100g and total carbohydrate from 2.00 to 5.84 g/100 g.
- The ascorbic acid and carotenoids of green fruits (10 DAH) of pumpkin were analysed in twenty-five promising lines. The ascorbic acid ranged between 1.82 upto 4.55 mg/100g and carotenoids ranged from 1.17 up to 8.78 mg/100g.
- During 2003-04 at PAU, Ludhiana, quality parameters in ten genotypes of capsicum, twelve genotypes of pea, eight genotypes of cabbage, eleven genotypes of brinjal and four genotypes of cauliflower were analyzed.
- During 2003-04 at IIVR, Varanasi, quality parameters were analyzed in ten varieties/hybrids of tomato, fifteen varieties of cauliflower, fifteen varieties/hybrids of cabbage and twenty-five promising lines of pumpkin.
- The second trial on estimation of nitrate and nitrite content of leafy vegetables was conducted at IIVR, Varanasi in 2002-03 and 2003-04. Lettuce had the maximum nitrate content (1323.25 mg/kg fresh wt).
- Oxalate content in tomato was estimated in 45 different genotypes of tomato at PAU, Ludhiana. The maximum oxalate content was recorded in tomato cv. Annapurna (15.95 mg/100 g).
- The third trial on estimation of capsaicin and oleoresin in chillies was conducted at PAU, Ludhiana as well as IIVR, Varanasi. At PAU, Ludhiana, capsaicin content and coloring matter were estimated in fifteen genotypes of chilli. The capsaicin content was maximum in CH-1 (0.78%), its value ranging from 0.30-0.78% among various genotypes. The coloring matter in red chillies ranged between 110.2 and 205.2 ASTA units and its value was maximum in CH-58 (205.2 ASTA) followed by CH-45

(165.2 ASTA) and CH-47 (163.7 ASTA units). The oleoresin content of chilli powder varied between 12.50 and 17.22%, the highest being in CH-1 followed by CH-58 (17.06%).

- At IIVR, Varanasi, twenty promising lines of chilli were analysed for their quality characters. The ascorbic acid content ranged from 20.0 to 340 mg/100 g. On dry weight basis the capsaicin content ranged from 0.132 to 0.730%. Maximum capsaicin content was recorded in line 9852-173 (0.730%), whereas the minimum capsaicin content was recorded in genotype PBC-535 (0.132%). The absorptions ratio of oleoresin on dry weight basis ranged from 0.766 to 1.017. The extractable colour on dry weight basis ranged from 95.12 to 332.10 ASTA.

Insect Pest Management

- Resistant/tolerant variety of the locality, root dripping in imdacloprid 0.018 % suspension (1ml/lit) for 3 hrs and weekly shoot clipping of infested shoots followed by foliar spray of NSKE 4% / profenophos 0.1% / cypermethrin 0.005 % alternatively was found most suitable for shoot and fruit borer management of brinjal at Sabour and Hyderabad centres.
- Barrier crop of maize sown 10 days before brinjal transplanting + shoot clipping at weekly interval followed by 5 sprays of NSKE 4% was effective against brinjal pests at Varanasi and Hyderabad centres.
- Seedling root dip in Imidacloprid 0.018% suspension (1ml/lit) for 3 hrs + Cypermethrin @ 0.005% foliar spray at flower initiation for thrice at 15 days interval was found relatively effective against shoot and fruit borer of brinjal at Sabour and Hyderabad centres.
- Spraying of vertimec @ 20 g a.i./ha at 30,45,60 and 70 DAP was found effective in reducing chilli thrips incidence at Hessarghatta, Rahuri and Hyderabad centres.
- Trap crop with marigold and spraying of polytrin-c @ 660 a.i./ha or endosulfan 700g a.i./ha at 28 and 35 DAT was found effective in reducing fruit borer (*Helicoverpa armigera*) damage to tomato at Hyderabad.
- Fortnightly sprays of Cypermethrin (@ 30 ml a.i /ha), Dichlorvos (@ 500ml a.i /ha) and alternate sprays of Bt (Dipel ES @ 500 ml /ha) and Endosulfan (700 g a.i /ha) were effective against pests of summer cabbage at Katrain (H.P).

Heterosis Breeding

The committee identified following hybrids for recommendations to the CVRC for their consideration for release, subject to availability of quality attributes and uniqueness of the hybrids.

Table 3: List of hybrids identified

Crops	Hybrids	Developing center	Recommended zones	Remarks
Brinjal	IVBHL-54	IIVR	IV	Long fruited
	ARBH-786	Ankur Seeds	IV	Long fruited
Tomato	JKTH-3055	J.K. Seeds	I, IV	Determinate
	KTH-1	CSAUAT	IV	Determinate
	Nun-7730	NunHems	I, IV	Indeterminate
Cucumber	Hybrid No. - 1	Century Seeds	I, IV, VII	
Bitter gourd	NBGH-167	Nirmal Seeds	IV	
Cauliflower	SYCFH-202	Syngenta	IV, VII	Early group
	Summer King	Sungro	I, IV	Early group



VBHL-54 (Kashi Komal)



ARB-786



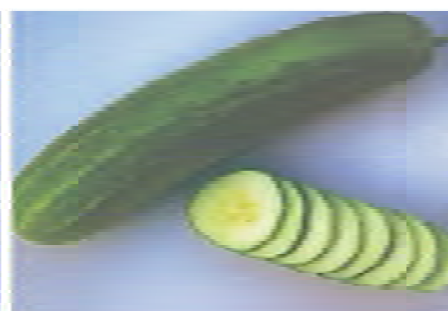
JKTH-3055



KTH-1



Nun- 7730



Hybrid No. - 1



NBGH-167 (Savitri)



SYCFH-202



Summer King

Disease Management

Evaluation of new chemicals for control of *Phomopsis* blight (1998)

On the basis of five years experimentation, it was concluded that four sprayings of carbendazim @ 0.1% starting first spray after a month of planting followed by subsequent sprays at 10 days interval is the best fungicide for management of *Phomopsis* blight of eggplant. It significantly reduced twig blight and fruit rot phase of *Phomopsis* and increased fruit yield. The cost benefit ratio was recorded 1:5.2 at Sabour and 1:12.3 at Junagadh regions.

Integrated management of insect borne viruses in chilli/capsicum (1998)

Nursery management by use of nylon net (40 mesh), soil application of carbofuran @ 1 kg a.i./ha and seedling dip by Imidacloprid @ 0.2% for 3 hours followed three foliar sprays of any systemic insecticide combined with wettable sulphur alternatively along with border crop of maize/bajra/sorghum is the best combination for the integrated management of insect borne viruses of chilli/capsicum. This combination gives maximum yield with highest C:B ratio of 1:6.8 in Coimbatore region and 1:7.6 at Hessaraghatta region.

Management of fungal disease complex of tomato (1998)

Multiple fungal diseases comprise of buckeye rot and leaf blight under Solan region was effectively managed by four sprays of mancozeb @ 0.3% at 15 days interval. It gave maximum cost benefit ratio of

1:6.2. The same fungicide was also very effective for management of tomato leaf blight in Junagadh region with 1:14.4 C:B ratio. Early blight, leaf blight and powdery mildew diseases of tomato were managed by mancozeb FP @ 0.5% giving 1:6 C:B ratio under Rahuri condition.

Integrated management of bacterial diseases of cauliflower with bio-control agents and plant product (1998)

Seed treatment with streptomycin @ 100 ppm for 15 minutes followed by seedling dip @ 100 ppm for 15 minutes before transplanting followed by three sprays @ 200 ppm at 10 days interval starting from 5 days after transplanting was the best for management of black rot of cauliflower in Bhubaneswar and Kalyani region.

Integrated management of Fusarium wilt of cucurbits (1998)

Soil solarisation with white polythene for 30 days during peak period of summer and seed treatment with *T. viride* @ 4 g/kg of seed was the best treatment combination for integrated management of *Fusarium* wilt of bottle gourd in Sabour region. However, seed treatment by Monceron @ 2 g/kg of seed was best at Ambajogai and Junagadh.

Studies on associated seed mycoflora of tomato, chilli, brinjal and its management (1998)

In vitro studies revealed that seed treatment by carbendazim @ 0.2% was the best for increasing the germination percentage of chilli (88.5%) and tomato (86.5%) at Junagadh. The same treatment was also found best at Kalyanpur and Vellanikkara for tomato, brinjal and chilli. However, captan @ 0.2% was better for these crops at Hyderabad. Invariably the dominant associated seed mycoflora were *Alternaria*, *Fusarium*, *Aspergillus* on brinjal, tomato and chilli. *Phomopsis* was specific to brinjal, while *Colletotrichum* to chilli and *A. solani* to tomato seed.

Disease management of vegetable crops at nursery stage with biocontrol agent and plant products (1998)

Seed treatment with captan @ 0.25% and soil drenching with 0.25% solution @ 6 litre/m² was the best on the basis of pooled data for maximum seedling stand of brinjal, chilli, cabbage & onion at Durgapura centre. This treatment was also best for tomato at Coimbatore; for brinjal at Sabour, and Ludhiana. The same treatment was effective for tomato, chilli and brinjal at Hyderabad center.

Seed Production

- At Lam centre, the pooled data of three years revealed that in chilli, 1st July sowing with recommended dose of fertilizer and 2nd picking recorded highest seed yield, 1000 seed weight and seed vigour.
- At Vellanikkara, treating chilli seeds with antioxidants like CaCl₂ @10⁻⁵M helped in enhancement of its storage life.
- At IIVR the pooled data of two years revealed that highest seed yield in early cauliflower (Pusa Deepali) was recorded by sowing on 16th June while the maximum test weight was recorded with 31st July sowing.
- The maximum seed yield of 147 kg/ ha in Bell pepper cv California Wonder was recorded at Srinagar with spray of 20 ppm NAA+ pinching of apical shoot when planted at 60 x 60 cm spacing.
- Highest seed yield of 11q/ ha in cabbage cv. Golden Acre was obtained at Srinagar with five weekly foliar applications of poly feed (19:19:19) @ 5 g/l starting from 30 days of transplanting.
- Maximum germination and minimum hard seed per cent in brinjal (Pb. Sadabahar) was observed at IIVR when after extraction the seeds were pre treated for 30 minutes with 50°C hot water or 0.25% HCl.
- Application of GA 10 ppm at curd maturity produced highest 100 seed weight and germination in cauliflower at IIVR.
- Priming with KNO₃ (150 ppm) produced maximum germinability and vigour in Tomato (Sel-7) seeds at IIVR and capsicum (California Wonder) seeds at Solan.

Breeder Seed Price Fixation

After having the thorough discussion breeder price of vegetable were fixed as below-

Table: Breeder seed price of vegetable crop

S.No.	Name of vegetable	Rate (Rs./kg)	S.No.	Name of vegetable	Rate (Rs./kg)
1.	Palak	90	15.	Radish	260
2.	Methi	100	16.	Carrot	320
3.	Okra	300	17.	Turnip	230
4.	Tomato	1250	18.	Onion	600
5.	Brinjal	700	19.	Bottle gourd	400
6.	Chilli	800	20.	Bitter gourd	650
7.	Capsicum	1400	21.	Sponge gourd	350
8.	Cowpea	140	22.	Ridge gourd	550
9.	French bean	160	23.	Cucumber	1000
10.	Dolichos bean	200	24.	Tinda (Round melon)	390
11.	Garden pea	100	25.	Pumpkin	600
12.	Cauliflower	1150	26.	Muskmelon	750
13.	Cabbage	650	27.	Water melon	1000
14.	Knol Khol	380			

National Seed Project Review

Major recommendations of this session are given as under-

- Indents for outdated varieties are still being received. Breeder seed production can be upgraded by inclusion of latest varieties. He emphasized that some modality needs to be worked out for bringing latest varieties to the front.
- Nucleus seed plots must be maintained and monitored along with breeder seed plots to ensure availability of sufficient nucleus seeds. Proper mechanism for effective monitoring of nucleus and breeder seeds needs to be worked out.
- Maintenance breeding must be adhered for maintaining the purity. A publication on maintenance breeding should be brought out in vegetables.
- The conversion of breeder seed into foundation and certified seed also needs monitoring for effective utilization of precious breeder seeds.
- Preservation of seeds of old and new varieties is must. The seeds must be preserved in NBPGR and cooperation of everybody in this regard is solicited.
- Seed treatment is very important and all the seeds should be treated with seed dressers before it goes to the growers. He desired that a status paper on seed treatment may be prepared.

Summing up his remarks, the DDG said that an overall approach to upgrade the quality of public sector seed is desired and the modalities to do so for various issues need to be worked out.

Breeding for resistance

Table 4: Resistant lines to bacterial wilt

S. No.	Crops	Name of the entries	Source	Recommended zones
1.	Brinjal	BB-64	OUAT, Bhubaneswar	IV, V, VII, VIII
2.	Tomato	LE-415	KAU, Vellanikkara	I, V, VIII



BB-64



LE-415