

XXIV-Workshop

Venue : UAS, Dharwad
Date : 22nd - 24th April, 2006

After going through the summary reports of AVT Trials data the following entries recommended for identification and release

List of varieties

Crops	Name of entries	Source	Recommended Zones
Onion	L-28	NHRDF, Nasik	IV, VII
	HOS-1	HAU, Hisar	VI
Muskmelon	IVMM-3	IIVR, Varanasi	IV
Sponge gourd	KSG-14	CSAUA&T, Kanpur	IV
Ashgourd	IVAG-90	IIVR, Varanasi	IV, VIII
	PAG-72	GBPUA&T, Pantnagar	VIII
Brinjal (long)	HABL-1	HARP, Ranchi	I
Carrot (temperate)	SKAUC-50	SKUA&T, Srinagar	I

Varietal Trials



Linc-28



HOS-1



IVMM-3 (Kashi Madhu)



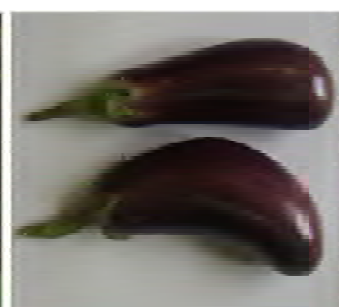
KSG-14 (Azad Torai-2)



IVAG-90 (Kashi Ujwal)



PAG-72



HABL-1 (Swarna Abhilamb)



SKAUC-50 (Shalimar Carrot-1)

Hybrid Trials

No hybrid was released during this group meeting on AICRP (Vegetables)

Resistant Varietal Trials

No resistant varieties was released during this group meeting on AICRP (Vegetables)

Vegetable Production

Integrated nutrient management

INM in brinjal –Okra cropping sequence

1. Application of neem cake @ 5 g/ha and rest of the recommended NPK through chemicals fertilizer gave the highest mean yield of 415.86 q/ha along with the maximum C:B ratio of 2.34 in brinjal. The residual effect of the same treatment was found to be the best of okra crop producing the highest mean yield of 133.71 q/ha with the maximum C:B ratio of 1:1.82. Hence, it is recommended for Kalyanpur conditions.
2. At Bhubaneswar, application of FYM @ 10 t/ha and recommended doses of NPK (125:50:75 kg/ha) gave the highest fruit yield of brinjal (229.36 q/ha) along with the maximum mean yield of 1:4.05. However, the residual effects of treatment did not show significant improvement in succeeding okra yield. Hence, it is recommended for Bhubaneswar conditions.
3. Under brinjal – Okra cropping sequence at Faizabad, the maximum mean yield of brinjal i.e., 269.55 g/ha and C:B ratio 1:1.57 was recorded with the application of neem cake @ 5 q/ha + recommended dose of NPK through chemical fertilizer. The residual effect of same treatment gave the highest C:B ratio 1:2.16 in okra. Hence, this is recommended for Faizabad conditions.

Integrated nutrient management

Garden pea

4. At IHR, Bangalore, the garden pea variety Arka Kartik recorded the highest yield of 105.2 q/ha with the maximum C:B ratio of 1:2.78 with the application of 10 t/ha FYM plus half dose of N:P:K (20:30:25 kg/ha). Hence, this is recommended for Bangalore conditions.
5. At Faizabad, application of neem cake @ 2.5 q/ha plus half of the recommended dose of NPK (15:30:20 kg/ha) recorded the highest mean yield of pod in garden pea cv. Azad Pea-3 (102.10 g/ha) with the maximum C:B ratio of 1:2.98. Hence, it is recommended for Faizabad conditions.

Tomato

6. At IHR, application of recommended doses of NPK (120:60:60)+ FYM @ 10 t/ha + Sulphur at the rate of 25 kg/ha + *Azotobacter* + mixture of all micro nutrients (Zn, B, Mo, Fe, Cu and Mn) resulted in the best mean yield 413.83 g/ha along with highest C:B ratio 1:3.65 of tomato cultivar H-86. Hence, it is recommended for Varanasi conditions.
7. At IHR Bangalore, cucumber hybrid Tripti recorded the highest yield of 269.2 q/ha with the C:B ratio 1:2.17 by application of FYM @ 10 t/ha + half NPK (30:25:40 kg/ha) + Biofertilizers. Hence, it is recommended for Bangalore conditions.

Cucumber

8. At Varanasi, the maximum mean yield of cucumber 218.76 q/ha along with highest C:B ratio 1:2.13 was recorded with the application of half NPK (60:30:30 kg/ha) + FYM @ 10 t/ha + Biofertilizer. Hence, it is recommended for Varanasi region.

Carrot

9. At Hyderabad, the maximum yield (316 q/ha) with C:B ratio of 1:3.70 of carrot cv. Improved Kuroda was obtained with the application of vermicompost @ 2 t/ha + biofertilizer + half

recommended dose of NPK (25:20:25 kg/ha). Hence, it is recommended for Hyderabad conditions.

10. At Durgapura, the maximum yield of carrot i.e., 557.09 q/ha and C:B ratio 1:2.59 was obtained under half recommended dose of NPK (30:20:60 kg/ha) + vermi compost @ 2 t /ha + biofertilizer. Hence, it is recommended for Jaipur conditions of Rajasthan.
11. At Varanasi, the maximum yield (246.80 q/ha)of carrot cv. Early Nantes was obtained with the application of half dose of recommended NPK (60:30:30 kg/ha) + vermin compost @ 2t /ha + biofertilizer. Hence, it is recommended for Varanasi conditions.

Carrot crop

12. At Faizabad, the maximum yield (212.91 q/ha) and C:B ratio 1:2.98 of carrot cv. Nantes was obtained with the application of half NPK (40:30:30 kg/ha) + legume green manure @ 2.5 t/ha + Biofertilizers. Hence, it is recommended for Faizabad conditions.
13. At IIHR, Bangalore, the maximum yield (248.7 q/ha) and C:B ratio 1:2.0 of carrot cv. Early Nantes was recorded with the application of half NPK (40:30:25 kg/ha) + FYM 10 t/ha + biofertilizer. Hence, it is recommended for Bangalore conditions.
14. At Srinagar, the maximum yield (210.95 q/ha) and C.B. ratio 1: 4.11 was obtained with application of FYM @ 10t/ha + vermicompost @ 2t /ha for organically produced carrot var. Chamman. Hence, it is recommended for Kashmir valley.

Use of biofertilizers

15. Under Pantnagar conditions, application of PSB + recommended dose of NPK (150:90:60 kg/ha) gave the highest average yield of tomato i.e., 653.4 q/ha along with the maximum C:B ratio 1:3.19. Hence, it is recommended for Tarai region of Pantnagar conditions.
16. At Kalyanpur, application of *Azospirillum* with 75% N and 100% PK gave the highest average yield 267.44 q/ha of tomato var. Type-1 with the maximum C:B ratio 1:2.20. Hence, it is recommended for Kanpur conditions.

Foliar application of water soluble fertilizers

17. Trials conducted at Jabalpur on brinjal cv. Jawahar Brinjal 64, the maximum mean of yield 243.72 q/ha with highest C:B ratio i.e., 1:3.02 was obtained by five foliar sprays of NPK (19:19:19) @ 5 g/ litre in addition to recommended dose of NPK. Hence, it is recommended for Keymore Plateau and Satpura hills of M.P.
18. At Sabour, the highest yield (494. 11q/ha) and C:B ratio 1: 2.13 of tomato was recorded with the five foliar sprays of NPK (15:15:15) @ 5g / litre in addition to recommended dose of NPK. Hence, it is recommended for Sabour conditions of Bihar.
19. At Bhubaneswar, the maximum curd yield (178.03 q/ha) and C:B ratio 1:2.11 of cauliflower was obtained with three foliar sprays of NPK (19:19:19) in addition to recommended dose of NPK. Hence, it is recommended for Bhubaneswar conditions.

Application of micronutrients

20. Under Durgapura conditions, three foliar applications of Ferrous sulphate @ 100 ppm at 40, 50 and 60 DAT gave the maximum mean yield of 454.11 q/ha along with highest C:B ratio 1:2.44 of tomato cv. Pusa Hybrid-2. Hence, it is recommended for Durgapura conditions of Rajasthan.
21. At Faizabad, the maximum C:B ratio 1:3.15 and better yield of cauliflower cv. Pusa Snowball K-1

was obtained with the foliar application of Boron @ 100 ppm + Molybdenum @ 50 ppm. Hence, it is recommended for Faizabad conditions.

Protected cultivation of vegetables

22. In three years of experimentation at Pantnagar, cucumber cv. Poinsette recorded the maximum mean yield of 14.12 kg/m² with the highest C:B ratio 1:31.01. Hence, this variety is recommended for protected cultivation.
23. At Hisar, the highest yield (530.6 q/ha) and C:B ratio 1:2.19 tomato cv. ARTH-128 was recorded under 50x40 cm spacing with double stem training.
24. At Hisar, the maximum yield (570.5 q/ha) and C:B ratio 1:2.61 of cucumber cv. Phule Prachi was recorded.

Seed pelleting and planting method

25. Trials conducted on seed pelleting and methods of planting on onion at NRC (O&G) showed that higher yield i.e., 25.6 t/ha with the maximum C:B ratio i.e., 1:2.40 was recorded with the pelleting of *Trichoderma viridae* @ 4g/kg seed under flat bed system in Kharif planting. The same treatment is recommended for rabi season also.

Planting date and spacing

26. At Faizabad, the maximum yield (22.45 t/ha) and C:B ratio 1:4.89 of broccoli cv. Fiesta was obtained by 15th October planting at spacing of 45 x 30 cm. Hence, this date of planting and spacing is recommended for Faizabad conditions.
27. At Ranchi, transplanting of broccoli in October from 15-30th at 45x30 cm spacing recorded the maximum mean yield and C:B ratio 1:4.89. Hence, this date of planting and spacing is recommended for Ranchi conditions.

Fertilization studies

28. At NRC (O&G), the application of NPK @ 50:50:80 kg/ha as basal + 100 kg N in seven split through drip irrigation expressed better yield (29.6 t/ha) and highest C:B ratio i.e., 1:1.63 in onion. Whereas for garlic application of NPK @ 50:50:50 kg/ha as basal + 50 kg N in seven split through drip irrigation gave yield of 7.91 tonnes / ha with maximum C:B ratio 1:2.93. Hence, it is recommended for Pune conditions of Maharashtra.

Physiology & Biochemistry

Physiology

At IIVR Varanasi, the effect of NAA on fruit yield in chilli was recorded on two chilli varieties viz., LCA-235 and KA-2 for two years. Significantly higher yield was realized with the application of 15 ppm NAA at flowering stage. Numerically yield of LCA-235 was higher compared to KA-2, but statistically both were at par.

Studies made on morpho-physiological response of capsicum in different seasons at IIHR, Bangalore revealed that in December planting, the maximum leaf area was recorded in cv. Indra at the flowering stage and in Arka Mohini at fruiting stage. Maximum flower and fruits were observed in cvs. Indra and Arka Mohini. PPF_D varied from 818 to 1103 $\mu\text{m moles}^{-2}/\text{s}$ during the period. Rate of photosynthesis was maximum in cv. Indra during both the flowering and fruiting stages (18.57 and 17.67 $\mu\text{m moles}^{-2}/\text{s}$, respectively). Stomatal conductance was maximum in cv. Indra at both flowering stage and fruiting stage. cv. Indra recorded the highest yield per plant of 112 g/plant followed by Arka Gaurav (89 g). Harvest index was maximum in cv. Indra (49%).

Biochemistry

There were three trials allotted to PAU, Ludhiana & IIVR, Varanasi and one trial each to NHRDF, Nasik and NRC O&G, Pune. IIVR, Varanasi and PAU, Ludhiana conducted all the three trials and presented the results.

1. At PAU, Ludhiana, 128 genotypes of tomato were analyzed for various biochemical parameters. The dry matter ranged from 1.91 to 10.46 %, TSS from 3.63 to 6.80 ° brix and pH from 3.13-4.80, respectively. Acidity, an important processing parameter ranged from 0.23 to 0.83 g/100 ml juice. Carotenoid content was in the range of 1.04 to 12.88 mg/100g whereas, lycopene an important antioxidant was found to be in the range of 0.58 to 9.76 mg/100g. Ascorbic acid ranged from 6.83 to 40.96 mg/100 ml juice.
2. In muskmelon, twelve genotypes were evaluated in which dry matter ranged from 7.78 to 12.02 g/plant, TSS from 8.4 to 13.2; acidity in the range of 0.07 to 0.48 g/100ml and ascorbic acid in the range of 16.20 to 78.30 mg/100ml juice.
3. In carrot, nine genotypes were analyzed, in which, the carotenoids ranged from 2.78 to 9.63 mg/100 gm. Total sugars as well as reducing sugars were also analyzed which ranged from 3.78 to 6.12 % and 1.72 to 2.70 %, respectively.
4. At IIVR, Varanasi fifty tomato accessions were analyzed. The pH varied from 3.8 to 5.1; TSS ranged from 3.0-6.0 °Brix. The acidity of tomato ranged between 0.256 to 0.704 %. Ascorbic acid content varied from 13.74-42.28 mg/ 100g. The total carotenoids ranged from 0.531 to 10.81 mg/100g. The lycopene content varied between 0.099 to 7.558 mg/100g.
5. Twenty five cabbage varieties/hybrids were analyzed for quality characters. The ascorbic acid and total carotenoid contents ranged between 9.75 to 40.95 mg/100g and 0.088 to 0.568 mg/100g, respectively. Total carbohydrate and crude fiber content were analyzed on dry weight basis. There was comparatively less variation for carbohydrate content, which ranged from 24.67 to 35.39 % DW, and the fiber content ranged from 10.50 to 31.60 %.
6. Eight promising lines of bitter melon were analyzed for vitamin C and carotene contents. The vitamin C content ranged from 35.09 to 105.26 mg/100g and carotene content ranged from 1.82 to 9.13 mg/100g.
7. Estimation of nitrate and nitrite content in leafy vegetables was conducted at IIVR, Varanasi. The nitrate and nitrite content was analyzed in five different varieties/hybrids of cabbage, which ranged from 384.73 to 432.55 and 0.43 to 0.59 mg kg⁻¹ fresh weight, respectively.
8. At PAU, Ludhiana, analyses of 128 genotypes of tomato showed oxalate content in the range 4.43-16.01 mg/100g. The Cherry type exotic lines consistently showed low oxalate content.
9. Estimation of capsaicin and oleoresin contents was done in 53 chilli genotypes at PAU, Ludhiana. Capsaicin content ranged from 0.31 to 0.83 %, while the colouring matter was in the range of 81.11 to 265.32 ASTA units. Oleoresin analyses were performed only in 43 selected lines, which ranged from 5.68 to 21.44 %.
10. At IIVR, Varanasi, sixteen promising lines of chilli were analyzed at red ripe stage for their quality characters. The ascorbic acid content ranged from 13.28 to 152.72 mg/100 g. The capsaicin and oleoresin contents ranged from 0.17 to 1.47 % and 9.8 to 17.2 %, respectively.
11. At NHRDF, Nasik, the biochemical composition of four onion varieties was analyzed where Agrifound Red showed significantly higher TSS (18%), dry matter (19.19%), protein (2.10%), sugar (11.52 %), acidity (0.48 %), total ash (0.95 %) and ascorbic acid (39.36 %) as well as highest colouring matter (0.26 OD at 535 nm).

12. At NRC (O&G), Pune, the kharif season crop failed due to heavy rains, however the varieties were again planted in late kharif and rabi seasons and the analysis work is in progress.

Insect Pest Management

Sex pheromone based IPM technology involving mass trapping through use of plastic funnel baited with sex pheromone @ 100 traps/ha, shoot clipping at weekly interval from 20 DAT and 4 sprays of NSKE (4%) at 15 days interval from flowering was found to be effective for the management of brinjal shoot and fruit borer (*Leucinodes orbonalis*) at Sabour, Ludhiana, Rahuri, Anand and Katrain centers.

IPM tactics involving erection of yellow sticky traps @ 1/hill after germination, clipping of infested basal leaves, application of neem soap @ 10 g/litre at two leaf stage and application of Deltamethrin @ 0.5 ml + 20 ml of jaggery per liter at 50% flowering or initiation of female flowers stage is most effective in the management of leaf miner (*Liriomyza trifolii*) and fruitfly (*Bactrocera tau*) in cucumber with C: B ratio of 1:1.54 at Solan.

Cabbage hybrid, KIRCH-5 was found suitable for cultivation in the plains under Varanasi conditions with less infestation of Diamondback moth.

Four foliar sprays of NSKE (4%) at 10 days interval starting from 20 days after planting have been found effective for the management of Diamondback moth (*Plutella xylostella*) and aphids in cabbage at Solan.

Disease Management

This year one recommendation as detailed below was made on the basis of pooled data of four years and C: B ratio.

Integrated management of soil borne diseases of vegetables with non-chemical methods

Incorporation of green manure (*Sesbania*) and application of neem cake @ 10 q/ha coupled with seed, soil and seedling treatment with *Trichoderma viridae* recorded only 6% disease incidence and gave maximum fruit yield (199.78 q/ha) with higher cost benefit ratio of 1:20 in brinjal. The check treatment registered highest disease incidence of 30.4% with lowest fruit yield of 121.47 q/ha in the agro-climatic conditions of Bhubaneswar. The same treatment recorded lowest disease incidence of only 3.76% and gave maximum green pod yield of pea i.e., 33.23 q/ha, with maximum cost benefit ratio of 1:18. The check treatment recorded highest disease incidence of 31.73 % and gave lowest pod yield of 10.71 q/ha.

Seed Production

1. Based on two years studies, presoaking of seeds in 50°C hot water for 30 minutes or dipping in 0.25% HCl for 30 minutes is recommended under Srinagar and Kanpur conditions for higher germination of okra seeds.
2. Based on three years studies, chilli seeds treatment with 10⁻⁵M CaCl₂ or PHBA is recommended to retain maximum germination upto 16 months under Bhubaneswar conditions.
3. On the basis of two years studies, seed treatment with Carbendazim(2%) in tomato, *Trichoderma* (5g/kg seed) in bell pepper & 0.25% HCl dip for 30 minutes in brinjal under Solan conditions and *Trichoderma* (5g/kg seed) in tomato and okra under Varanasi & Kanpur conditions is recommended for higher seed yield and quality.
4. Based on three years studies it is recommended that higher yield of quality seeds in okra can be obtained by kharif sowing under Bhubaneswar conditions.
5. Spray of 100 ppm boron on tomato under Solan conditions, 100 ppm ferrous sulphate on brinjal