

4. Insect and Nematode Control

- For the control of jassids and shoot and fruit borer in okra 4 sprays with endosulfan at 500 g a.i./ha at 14 days interval starting from 15 days after germination has been recommended under Rahuri conditions of Maharashtra.
- One application of phorate at 1 kg a.i./ha 10 days after planting, followed by one spray with Malathion (500 g a.i./ha) and fenvalerate (50 g a.i./ha) 60 days after planting was found effective against onion thrips under Sabour conditions of Bihar.

XIII-Workshop

Venue : Jawahar Lal Nehru Krishi Vishwavidyalaya, Jabalpur

Date : 15th - 18th December, 1993

Breeding : Varietal Trials

Open Pollinated Varieties

The Committee identified the following varieties for release based upon the results of 3 years.

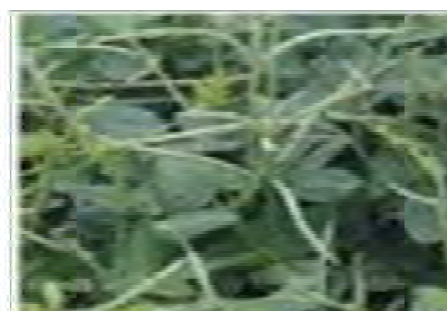
| | Crops | Varieties | Breeding centres | Recommended Zones |
|----|------------------|-----------------------|------------------|-------------------|
| 1. | Brinjal (long) | BB-26 | Bhubaneswar | V |
| 2. | Brinjal (long) | Punjab Barsati | Ludhiana | IV |
| 3. | Cowpea | Sel. 2-1 | Faizabad | IV |
| 4. | Onion | Agri. Found Light Red | AADF | VI |
| 5. | Onion | Punjab Red Round | Ludhiana | IV |
| 6. | Garlic | G-50 | AADF | IV |
| 7. | Pea (Mid season) | VL-6 | AADF | IV |
| 8. | Pea (Mid season) | PH-1 | Hisar | VII |
| 9. | Pea (Early) | Ageta -6 | Ludhiana | I, IV, VI |



BB-26 (Utkal Keshari)



Punjab Barsati



Sel-2-1 (Narendra lobiya-1)



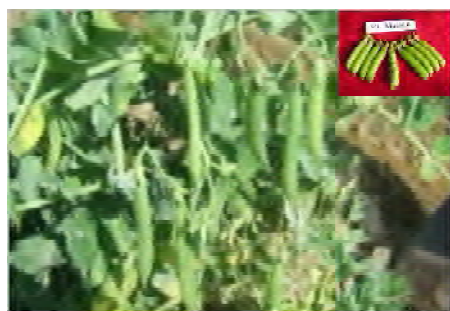
Agrifound Light Red



Punjab Red round



G-50 (Yamuna Safed-2)



VL-6



PH-1



Ageta-6

Hybrid Trials

The Committee identified the following F1 varieties for release:

| | Crops | Varieties | Breeding centres | Recommended Zones |
|----|------------------------|--|------------------|----------------------|
| 1. | Brinjal (long) | ARBH-201 | Ankur Seed | IV, V, VI and VII |
| 2. | Brinjal (round) | NDBH-1 | Faizabad | IV, VI and VII |
| 3. | Brinjal (small round) | ABH-1 | Anand | IV, VI and VII |
| 4. | | MHB-10 (Thorny Bicolour) | MAHYCO | IV, VI and VII |
| 5. | | MHB-39 (Purple oval small Non-thorny) | MAHYCO | IV, VI and VII |
| 6. | Cabbage | NATH-401 | NATH Seeds | I, IV, V, VI and VII |
| 7. | Tomato (Indeterminate) | FM-H-2 (Arka Vardhan) | IIHR | I, IV and VII |
| 8. | Tomato (Determinate) | Pusa Hybrid-2 | IARI | I, IV, VI and VII |



ARBH-201 (Shyamal)



NDBH-1 (Narendra Hybrid Brinjal-1)



ABH-1



MHB-10 (Kalpataru)



MHB-39 (Ravaiya)



Cabbage Nath-401



FMH-2 (Arka Vardan)

Pusa Hybrid-2

Resistant Varietal Trials

After going through the presentations of reports by various centres and the data complied by PDVR for the year 1991-92 and 1992-93, the following recommendations have been emerged.

- In peas mid-season group resistance to powdery mildew var. JP-83 has been identified for Durgapura (Rajasthan) and Jabalpur (M.P.) areas.
- In Peas mid-season group resistance to powdery mildew var. FC-1 has been identified for Solan (H.P.), Bangalore (Karnataka) and Durgapura (Rajasthan).
- In tomato, determinate type resistant to bacterial wilt, the var. LE-79-5 was recommended for Bhubaneshwar (Orissa), Bangalore (Karnataka), Palampur (H.P.), Dapoli (Maharashtra) and Vellanikkara (Kerala).



Pea JP-83



FC-1 (Arka Ajeet)



LE-79-5 (Mukthi)

Vegetable Agronomy

The following recommendations were finalized by the Committee:

- Application of 120 kg N₂, 30 Kg P₂O₅ and 10 g K₂O/ha gave the highest yield of 11.16 q/ha of dry chillies (var. Jawahar -219) with cost benefit ratio of 1:2.17. Hence, it is recommended for Jabalpur conditions for transplanted chilli crop.
- Application of 120 kg N₂ and 60 kg P₂O₅/ha is recommended for maximum dry chilli yield and economic return of variety Pusa Jwala under Kalyanpur conditions.
- Application of 100 kg N₂ 80 kg P₂O₅ and 60g K₂O/ha is recommended for maximum economic yield of garlic bulb under Kalyanpur conditions.
- Application of 120 kg N₂ +60 kg P₂O₅ and 60g K₂O/ha with plant spacing of 60 x 60 cm is recommended for obtaining maximum yield of mid-season cauliflower var. Pant Subhra under Kalyanpur conditions.
- Application of nitrogen @ 120 kg /ha along with 60 kg of P₂O₅ and the planting distance of 60 x 40

cm gave maximum seed yield of 4.21 q/ha with cost benefit ratio of 1:3.15 in cauliflower var. Improved Japanese at Jaipur. Hence, it is recommended for Jaipur conditions.

- Application of 125 kg N₂, 60 kg P₂O₅ and 40 kg K₂O/ha along with additional dose of 25 kg N₂/ha through foliar application is recommended to get the highest yield (16.25q/ha) of dry chillies with maximum cost benefit ratio of 1:3.34 under Jabalpur conditions.
- For maximum yield and economic return, the application of nitrogen @ 40 kg basal + 20 kg top dress + 20 kg/ha foliar spray is recommended for tomato crop under Hyderabad and Solan conditions. This treatment gave the cost benefit ratio as 1:2.57. Yield of this treatment at Solan was 693.25 quintal and cost benefit ratio was 1:4.86.
- Application of Pendimethalin @ 1.0 kg a.i./ha as pre-emergence spray along with one hand weeding at 45 DAP gave the highest yield (214.42 q/ha) with cost benefit ratio of 1:2.36 in the variety Pusa Ruby at Jaipur, hence it is recommended for Jaipur region.
- For chemical weed control in tomato, the pre-emergence application of Oxyfluorofen @ 0.25 kg a.i./ha, combined with one hand weeding at 45 DAP is recommended for tomato under Tamil Nadu conditions. This treatment expressed the maximum yield 290.93 q/ha.
- For chemical weed control in brinjal, application of Fluchlorain @ 1.5kg a.i./ha + one hand weeding at 30 DAP is recommended for Hyderabad area. The maximum yield under this treatment was recorded 213.54 q/ha with cost benefit ratio 1:2.43.
- Since Five crop rotation viz., okra-tomato-bean, tomato-bean-okra, brinjal –onion-bean, okra-tomato-bottle gourd and okra-bean-onion were equally remunerative for the stability in yield, crops like tomato or onion may be included in cropping system to realize higher return under Bangalore conditions.
- Out of six rotations, okra-tomato-bitter gourd have the maximum return of Rs. 28707/ha with cost benefit ratio of 1:2.06 under Kalyanpur conditions. Next best rotation was cowpea-cauliflower-onion. Hence, they are recommended for central U.P.
- Application of *Azospirillum* @ 2 kg/ha as basal application in combination with 75% recommended N₂, i.e. 56 kg/ha is recommended for chillies under Tamil Nadu conditions.
- Application of 100 kg N₂, 60 kg P₂O₅ and 60 kg K₂O/ha along with *Azospirillum* treatment @ 500 g/ha seed treatment + 1 kg/ha seedling dipping + 5 kg/ha soil application is recommended for onion bulb crop under Sabour conditions.

Insect Pest Management

Brinjal

Three sprays of cypermethrin @ 30 g a.i./ha at 40, 55 and 70 DAT effectively controlled fruit borer manifesting maximum net profit at Hyderabad and Rahuri conditions while carbofuran 36 as soil application + 3 sprays of cypermethrin @ 30 g a.i./ha at 40, 55 and 70 DAT gave maximum net profit at Sabour conditions.

Tomato

Application of Fenvelerate @ 30 g a.i./ha, twice/thrice after flower imitation at fortnightly interval was effective and economical against tomato fruit borer under Rahuri conditions.

Okra

Most suitable sowing period for okra crop was considered as 15th to 30th July when the crop suffered minimum and escaped insect pests attack in Ludhiana conditions. Whereas under Rahuri condition

June-July and January-February months were found most suitable when the insect damage can be minimised to a greater extent.

The action threshold of leaf hopper in okra would be 2.5 nymphs/leaf which required 4 alternate sprays of Endosulfan (500 g a.i./ha) and Deltamethrin (10 g a.i./ha) and manifested maximum net profit.

Cabbage

The use of mustard as trap crop proved quite effective in restricting DBM incidence on cabbage. The cost benefit ratio was also higher under Rahuri conditions.

Disease Control

Chilli: Powdery mildew disease (Rahuri 1989-90 to 1992-93)

To control powdery mildew disease of chilli cv. Pusa Jwala effectively at Rahuri or similar agro-climatic conditions, it was recommended to give three sprays of Sulfex @ 0.3% or Topsin M @ 0.05% or Karathane @ 0.1%. Three sprays of fungicide should be given at 15 days interval soon after the incidence of the disease. These fungicidal treatment have made the disease intensity at lower level and increased the yield per hectare from 43.50 to 53.19% over control and, therefore, a net additional profit per hectare from Rs. 8000 to 12000.

Cabbage: *Erwinia* rot (Katrain – 1989-90 to 1991-92)

Four sprays application of Plantomycin (500ppm) + Blitox (3000 ppm) mixture was found more effective in controlling *Erwinia* rot of cabbage in seed crop at Katrain centre. The fungicidal treatment has maintained disease intensity at lower level and increased yield (14.42 q/ha) over control (8.71 q/ha). This treatment resulted in a net profit of Rs. 188508/ha.

Okra : Powdery mildew disease (IIHR – 1989-90 to 1991-92)

Based on 3 years trial it was conducted that the disease can be controlled effectively either by:

- Sulfex 0.3% - 5 sprays at 10 days interval.
- Calixin 0.05% - 4 spraying at 10 days interval.
- Bengard 0.1% - 4 sprays at 10 days interval.

Cucumber: Downy mildew disease (IIHR- 1989-90 to 1991-92)

The disease can be controlled by:

- Dithane Z-78 - 0.3% - 5 sprays at 10 days interval or
- Dithane M-45- 0.3% - 5 sprays at 10 days interval or
- Aliette - 0.3% sprays at 10 days interval.

Onion : Purple blotch (Junagadh – 1989-90 to 1992-93)

Based on 4 years trial, it is recommended to control purple blotch disease of onion seed crop by providing 3 sprays of Ziram @ 0.15% or Mancozeb @ 0.2% or Carbendazim @ 0.05%.