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Pusa Safed Baingan-1: A new brinjal variety

Pusa Safed Baingan-1 is the first white coloured oval fruited brinjal variety which has been developed by single plant selection from an indigenous material collected from the farmer's field of West Garo Hills, Meghalaya by the Division of Vegetable Science, ICAR-Indian Agricultural Research Institute, Pusa, New Delhi. The materials were highly variable and single plant selection was carried out till the progeny became homozygous. This variety was identified by IARI Variety Release Committee, recommended for release by the Delhi State Seed Sub-Committee on 19th Dec, 2017 and notified by the Central Sub Committee on Crop Standard, Notification and Release of varieties for Horticultural Crops vide S.O. 692 (E) in 2019 for cultivation in the National Capital Region of Delhi including Delhi and adjoining areas in the states of Haryana, Rajasthan and Uttar Pradesh in *kharif*.

THE plants of Pusa Safed Baingan-1 are non-spiny with semi erect branches. The leaves are green with green mid-ribs and veins, attaining a height of 85-90 cm at peak fruiting stage. Flowers are light purple in colour. The fruits are small oval round, egg shaped and average fruit weight is 50-60 g with non-spiny green calyx. The fruits are borne in clusters. It is an early variety having a maturity period between 50-55 days from transplanting to first fruit harvest. The average fruit yield of the variety is 35 t/ha and the performance over the years in IARI, New Delhi and different locations are given in Table 1 and Table 2. Brinjal is one of the vegetables having highest antioxidant activities owing to its high content of phenolics and Pusa Safed Baingan-1 is having high total phenolic content (31.21 mg GAE/100 g) with high antioxidant activity (3.48 CUPRAC µ moltrolox/g, 2.58 FRAP µ moltrolox/g) (Table 3). The growers will be benefited because of its attractive white coloured fruit, high yielding, non-spiny calyx and less number of seed at marketable stage. There is also a long standing demand by the consumer for white coloured brinjal probably due to its medicinal as well as nutritional value given to diabetic patients and also for strengthening gums from ancient time.

Field view of Pusa Safed Baingan-1

Turn to page 29

Continued from Cover II

Pusa Safed Baingan...

Production technology

Pusa Safed Baingan-1 can be grown in sandy loam to clay loam soil rich in organic matter with a pH of 6.5 to 7.5. A temperature range of 25-30°C is most favourable for obtaining good crop growth and yield. In North Indian plains, particularly Delhi and its adjoining areas i.e the states of Haryana, Rajasthan and Uttar Pradesh, the summer crop can be grown from the months of February - May and during the *kharif* it can be grown from June - November. About 350-400 g seed is sufficient for raising seedlings for one hectare. The seeds are sown in raised beds in nursery at 1 cm deep and 5-7 cm apart in rows. Prior to sowing, the seeds are treated with Captan @ 2 g per kg seeds. Seeds can also be treated with *Trichoderma viride* @ 5 g/kg before sowing. The nursery beds can be treated with a mixture of 1 kg *Trichoderma* and 25 kg of cow dung manure which was kept in the shade for one week. Before sowing 10 kg FYM, 1 kg neem cake, 50 g VAM, 100 g Superphosphate, 10 g furadon per square meter should be mixed. After sowing, the beds are covered with dry grass immediately followed by irrigation. Precautions should be taken in the nursery to avoid water stagnation by providing proper drainage facilities to prevent water logging and damping off disease. The seeds germinate within 4-5 days; therefore, dry grass should be removed immediately after seedling emergence. To avoid disease infestation, the beds are drenched with Captan @ 2.5 g/ litre and can be repeated after 7 days interval. Watering should be done for proper growth. Irrigation should be withholded 4-5 days before transplanting for hardening of seedlings. Fruit and shoot borer infestation can be managed by placing the pheromone traps in nursery area or by spraying of Spinosad @ 4 ml/10 l of water.

Transplanting and fertilizer management

The field is prepared well in advance with repeated 4-5 times ploughing followed by pre-planting spray of Pendimethalin 30% a.i (2.5-3 litre in 600 litre/ha) after giving light irrigation. About 30-35 days old seedlings are transplanted when they attain 12-15 cm height and have 3-4 leaves. Once the seedlings are uprooted, they are first soaked for 15 minutes in Captan solution (2 g/l) and then transplanted in the field. About 25-30 tonnes FYM, 50-55 kg urea, 325-350 kg SSP and 75-100 kg MOP/ha should be mixed in the soil during field preparation as basal dose. The seedlings are planted in ridges and furrows at a spacing of 75 cm (row to row) × 60 cm (plant to plant) during the *kharif* season. Nitrogen in the form of urea @ 50 kg each is applied two times, once after one month of transplanting and again 3-4 weeks later. Irrigation should be given at 10-15 days interval or depending upon the weather condition.

Plant protection

The main pests of brinjal are fruit and shoot borer, jassids, epilachna beetle and mites. Fruit and shoot borer occur throughout the crop growing season however, jassids and epilachna beetle cause more damage during the vegetative growth. The major damage to the crop is caused by fruit and shoot borer which is the most damaging pest of brinjal. This pest can be managed by setting up pheromone traps at 10-12/ha or by cutting and removing the infested shoots, i.e half inch below the bore point and burying them deep into the soil. However, the lure of the trap should be changed regularly at an interval of 15-20 days. Spraying with Spinosad @ 4.5 ml/10 litre of water before flowering or at fortnightly interval will help in managing the pest. The main diseases are Fusarium wilt, little leaf and Phomopsis blight. The crop is also being attacked by a complex virus and the only way to manage is to uproot the infested plants and bury deep in the soil to avoid further spread. Spraying of Confidor @ 1 ml/l of

Fruits of Pusa Safed Baingan 1

Seeds of Pusa Safed Baingan 1

Table 1. Mean performance of Pusa Safed Baingan-1 at IARI, New Delhi during 2013-14, 2014-15 and 2015-16

Variety	2013-14		2014-15		2015-16	
	Total fruit yield (t/ha)	% Increase over best check	Total fruit yield (t/ha)	% Increase over best check	Total fruit yield (t/ha)	% Increase over best check
Pusa Safed Baingan - 1	34.80	11.50	36.78	9.85	35.41	14.63
DBOR-94	31.20		33.48		30.89	
Pusa Bindu	26.78		27.89		28.14	
Aruna	24.32		24.64		23.52	
Pusa Ankur	21.12		23.52		21.60	
CD at 5%	4.28		1.03		0.90	
CV (%)	8.23		1.88		1.72	

Table 2. Mean performance of Pusa Safed Baingan-1 at different locations during 2013-2014

Variety	IARI Regional Station, Karnal, Haryana		IARI-KVK, Shikohpur		Seed Production Unit, IARI, New Delhi	
	Total fruit yield (t/ha)	% Increase over check	Total fruit yield (t/ha)	% Increase over check	Total fruit yield (t/ha)	% Increase over check
Pusa Safed Baingan - 1	34.88	28.23	31.36	23.07	30.88	25.63
Pusa Bindu	27.20	-	25.48	-	24.58	-

Table 3. Nutritional composition of Pusa Safed Baingan-1

Variety	Total phenol (mg GAE/100g)	Antioxidant CUPRAC (μ moltrolox/g)	Antioxidant FRAP (μ moltrolox/g)
Pusa Uttam	21.57	2.03	1.13
Pusa Anupam	24.48	1.89	1.14
Pusa Kranti	19.67	1.97	1.03
Pusa Bindu	24.02	2.61	1.68
Pusa Upkar	31.59	2.67	1.49
Pusa Safed Baingan - 1	31.21	3.48	2.58
Pusa Hara Baingan - 1	33.50	4.31	3.07
G-164	24.31	1.69	0.85
Pusa Purple Round	21.50	2.25	1.40
Pusa Purple Cluster	29.23	2.75	1.77
CD at 5%	4.58	1.26	0.14
CV (%)	14.25	2.36	3.62

Table 4. Minimum seed standards for foundation and certified seeds of Pusa Safed Bainagn-1

Seed standard	Foundation seed	Certified seed
Pure seed (minimum)	98	98
Inert matter (maximum)	2	2
Other crop seeds	None	None
Weed seeds	None	None
Objectionable weed seed	-	-
Germination (minimum)	70	70
Moisture		
a) Normal container	8	8
b) Vapour proof container	6	6

water to control vector is useful. Fruit rot or phomopsis blight can be managed by pre-sowing treatment of the seeds with Captan @ 3 g/kg seeds (dry dressing) and spraying the affected plants with Dithane-M-45 @ 2.5 g/l of water. Little leaf can be managed by removing the affected plants in the early stages and spraying the affected plants with Acetamiprid 20% SP @ 100 g/ha to control the vector.

Harvesting and yield

The fruits are ready for first picking 50-55 days after transplanting when they have become shiny white in colour, have attained the marketable size but are still immature, soft and tender to touch and when cut, the seeds have not turned brown. The average fruit yield is 350 q/ha.

Seed production

The seeds of Pusa Safed Baingan-1 can be carried out during the *kharif* season from June to mid-December and it should be noted that the maturity of fruits should not coincide with the rainy season. Brinjal is an often cross pollinated crop which requires an isolation distance of 400 m and 200 m for the production of foundation and certified seeds, respectively. The flowers are light purple in colour. A minimum of three inspections is needed for rouging out the off types and unwanted plants i.e. a) before flowering or vegetative stage; b) at flowering and fruit setting stage and c) at fruit maturing stage. The diseased infected plants should be removed from the seed production field to avoid further spread. The matured and ripened fruits are ready for harvest when they have turned yellow in colour. The seeds are extracted the next day either manually by beating with a stick, seed extractor or with the help of a seed extracting machine. The seeds are then washed in clean water and dried in the shade till the moisture content of the seeds reaches 8% or below followed by sun. The average seed yield is 150-200 kg/ha. The minimum seed standards for foundation and certified seeds of brinjal are given in Table 4.

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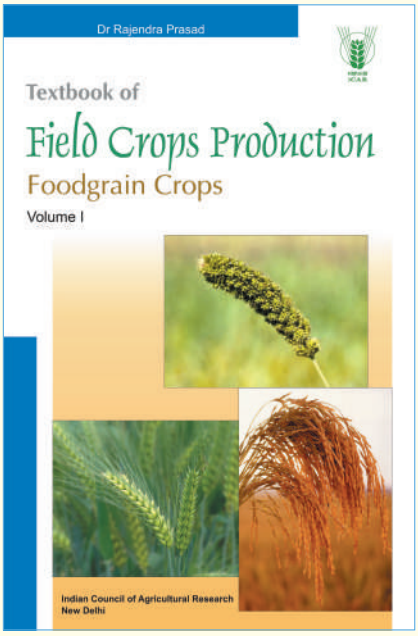
Textbook of Field Crops Production – Foodgrain Crops



(Volume I)

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TECHNICAL SPECIFICATIONS

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