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Thar Avani: A new variety of round shape bottle gourd



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Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] variety Thar Avani is developed at ICAR - Central Horticultural Experiment Station (CIAH-RS), Godhra, Gujarat through hybridization followed by selection from the segregating population of LS-4xLS3-2 and advanced to F8 and identified/released at institute level. Plants are highly vigorous with dense foliage, male and female flowers emerge from 7th and 11th nodes, respectively. Each plant produces about 24-32 female flowers and set harvestable sized fruits between 57-62 days after sowing. The fruits are round with 22.8cm in length, 39.4 cm girth and weight of each fruit ranged between 750-860g. The fruits are characterized with high flesh thickness, TSS (8.1-8.7°), ascorbic acid (21.6 mg/100g) with attractive creamy white flesh colour. Each plant produces about 12.91kg with 43.0 t/ha under rainfed semi-arid conditions. Fruit attains harvestable stage at 54-63 days after sowing for culinary purposes and 120-140days for seed purpose.

Thar Avani

The fruits are round with 22.8cm length, 39.4 cm girth, 8.1-8.7° TSS, 21.6 mg/100g ascorbic acid and 12.91 kg fruit weight. It have recorded comparatively higher antioxidants contents and activity viz. 76.08, 95.43, 71.38 and 325.16 mg GAE/100 g total phenols in fruit, epicarp, mesocarp and leaves, respectively; 11.32 and 243.35 CE mg/100 g total flavonoids in seed and leaves, respectively; 31.20, 32.08 and 42.70 µmol TE/g CUPRAC in fruit, mesocarp and seed, respectively; 36.18 and 21.53 µmol TE/g DPPH in epicarp and 29.84, 25.93, 60.38 and 30.85 µmol TE/g FRAP in fruit, mesocarp, seed and leaves, respectively. It also recorded comparatively highest potassium (1641.14), Magnesium (155.36), Iron (12.42) and Cu (0.24) in fruit and Calcium (610.73), Magnesium (158.17), Iron (1.86), and Copper (0.29) in leaves (mg/100 g dw).

Agro-techniques

Soil and field preparation:

It is a warm season crop, requires fertile, aerated soil with pH 5.5 to 6.5 for its better growth. The soil with high organic matter is suitable for high yield; the low organic matter soil exhibits poor vine growth. Sandy loam with well-drained soil favours good vegetative

growth followed by fruit development. Its growth and development in clay soil is comparatively poor. The field should be ploughed 3-4 time using tractor and make the soil fine tilth and weed free. The flat bed or ridges and furrow system is followed to plant the crop.

Seed sowing and Planting

It is propagated through seed. The seeds of freshly harvested fruits records higher seed germination under field condition than older ones. The seeds are rich in oil and have hard seed coat, which cause more viability loss and poor germination. Hence, soaking of seed over night in water enhances seed germination. The seeds are either sown directly in the field or the seedlings are raised in the polythene bags or plug trays in mid December to mid January for early summer crops. The 1-2 true leaf stage of seedlings is transplanted in the main field. The best time to plant bottle gourds is late June or early July for kharif season while in spring-summer, sowing should be done in the month of February-March. For direct sowing, four seeds are sown in each pit at a depth of 2.0cm. About 1-1.5kg seed is required to cover 1 ha area. The pointed side of the seed facing down is good for better germination and the seeds start germinating after 4th days. After germination, the 2 healthy seedlings are maintained in each pit and the remaining unhealthy seedlings are thinned out. It grows up to 3.0m; hence more plants can be accommodated by planting at 2.0x1.5m or 2.0 x 1.0m spacing.



Field view of Thar Avani at developing stage

Training and pruning

It requires proper training and pruning for getting good quality fruits with higher yield. Training plants to bower helps to tap sun light more effectively to increase yield. After germination of seed, the vine is to be trailed on bower system with the help of jute string. Axillary buds of growing vines should be removed till vines reach the bower height. When vine likely to touch bower, apical bud is removed at 10-15 cm below bower to allow 2 or 3 branches to spread over bower. After formation of 4-5 fruits, vines are again pruned allowing 2-3 axillary buds only to grow on primary vines. It is also advisable to remove all yellow- and pale-coloured older leaves near bottom portion.

Fertilizer management

Organic manure is beneficial for better growth and fruit development. Hence, soil applied with 15-20 tonnes of FYM by spreading method at the time of field preparation with half dose of nitrogen and full dose of phosphorus and potassium. The application of 60-80 kg N, 40-60 kg P and 60-80 kg K is ideal recommended dose/ha. The application of 50:25:50g urea, single super phosphate and murate of potash, respectively to each pit at 30 days after sowing to enhance the yield.



Thar Avani at farmer's field on *pandal* system

Irrigation

Bottle gourd is a deep-rooted crop, it has been observed that the roots may reach even 1.5m below ground level to get water; hence, it can tolerate dry conditions well. However, extended dry periods will result in poor fruit set and/ or poor fruit development and size. The seeds are sown in dry soil and light irrigation is advocated. The life saving irrigation is advocated 3rd day of sowing and subsequent irrigation is done 7 days interval during summer or depending on prevailing agro-climatic



Tender fruit ready to harvest for culinary purposes

conditions for another season. Flowering to fruit development is the sensitive phase of the crop growth, ensuring sufficient moisture in the soil is essential as the proportion of male blossoms usually increases when plants are under stress.

Weed management

Clean cultivation is highly advisable as the bottle gourd likes to grow vigorously. Hence, controlling weeds through frequent, shallow cultivation or 3-4 hand-weeding and hoeing is usually advocated during crop growth. Pre-emergence herbicide Pendimethalin 2.0l/ha is advocated to control weeds before sowing or planting of seedlings in the main field.

Harvesting and yield

It attains harvestable stage at 52-63 days after sowing for green fruits and 120-140days for ripe fruits for



Mature fruits of Thar Avani for seed extraction

seed extraction. The fruits picked every 3-4 days interval. Its fruit has good shelf life with less weight loss, firmness and colour retention up to 3-5 days during summer and 10-12 days of storage during winter under room temperature. It gives 12.9 kg fruits by producing 16-20 fruits per plant and weighing about 700-800 g each with yield potential of 43.0 t/ha.

Plant protection

Bottle gourds are infested with many pests and diseases. The main pest of bottle gourd is fruit fly, the adult flies make a sting on young immature fruit and lays the eggs. White coloured maggot's starts developing inside the fruit. Hence placing bait to attract the adult flies is advisable to control them. Powdery mildew is the serious diseases affecting rainy season crop, while this variety very less affected (5-10%) under semi arid condition of western India.

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