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**Drumstick variety Thar Harsha and Thar Tejas:  
A boon for nutritional and socio-economic  
security in tribal belt of semi-arid region**



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The plants of Thar Harsha grow up to 405.6cm and spreads 330.2cm (East-West) and 390.4cm (North-South). It is a medium sized tree having larger sized dark green leaves. The leaflets are of 54.5 cm long and 35.2cm width and having blend leaf apex. Due to its dense foliage nature, it comes to flowering during December-January as compared to a month later than its parent and comes for harvest during April-June. It takes at least 160-180 days to reach harvesting (Late maturity type). It has very strong and long peduncle (20-25.3cm) withstands heavy bearing load of tree. Each tree produces about 314 fruits, weighing each at 155.3g. The pods are uniformly green from stalk to floral end as compared to its parent. The tree sturdy nature facilitates the set pods to reach marketable size despite of prevailing severe drought situations and recorded with 20-30 per cent greater marketable yield and 85.9 per cent more total yield as compared to check under drought conditions. The plants of Thar Tejas grow up to 265-318 cm and spreads 261.5cm (East-West) and 287.2cm (North-South). It recorded 2.74 m plant height, 245 pods per plant, 218 g each pod weight, fruit length 45-48 cm and 9-10 seed per pod under rainfed semi-arid conditions. Fruits mature during January-March. It is a comparatively early flowering, and early maturing comes to harvest during January-March. The least field infestation of leaf eating caterpillars and pods are least affected by fruit fly resulting higher per cent of marketable pods as compared to the Thar Harsha and PKM-1. This genotype suits for table/export purpose due to uniformly parrot green and medium long pod having more flesh content with lesser seeds. The proposed genotype recorded highest protein, potassium, iron and zinc in dry pod powder as compared checks. It also has recorded highest dry matter, protein, calcium, magnesium, iron, manganese, and zinc in dry leaves powder as compared checks.

### Production technology

#### Soil and climate

The soil selection for drumstick cultivation should be at normal pH from 6.0 -7.5. Clay loam soil is good for its commercial cultivation. The high clay soil is not good for its growth as the water stagnates during rainy season would cause severe loss to vegetative and yield parameters. The field should be ploughed 3 times with cultivator to make the soil to a fine tilth. The drumstick variety Thar Harsha was developed under rainfed hot

semi-arid environment having soil depth ranged from 0.50 to 0.70 m, whereas the mean maximum and minimum temperature varied between 28.4 to 46.5 °C and 12.7 to 26.7° C, respectively, and total annual minimum and maximum rainfall ranged from 293.24 mm to 941.25 mm with relative humidity 27.55-92.50 per cent during the period under study, however the annual water need or potential evapotranspiration of the site ranges between 1500 mm.

### Nursery management

Seed requirement for covering one hectare area is 600-650g. The fully filled and borer free seeds should be used for sowing. The nursery raised plants or direct seed sown method can be adopted. For nursery method, the seeds should be sown in the polythene bags, which was filled with pot mixture of 1:1:1 ratio of soil: sand: FYM. Nursery should be raised in the month of January when the germination and plant health was observed best. The germination starts after five to seven days of sowing and the sufficient sun light should be ensured to the nursery. The low light encourages lanky seedlings growth causes bending plants. The healthy, straight and strong plants reached at least 30cm height can be transplanted in the main field. In the direct seed sown method, the seeds should be sown at 1.5 - 2.0 cm depth in the pits as soon as the monsoon starts. To avoid mortality of seeds in the main field, 30-40 per cent nursery seedling population should be maintained simultaneously to gap filling.



Seedlings ready for transplanting

### Field preparation

Pits of 60cm x 60cm x 60cm size should be prepared at spacing of 3.0M x 3.5 M before on set of monsoons. About 20 kg FYM, 50 g N, 100g P and 100g K should be mixed thoroughly with topsoil to fill the pits. While filling of pits, the filled level should be maintained at least 15 cm above ground level, so that the pit level will be equalized after sinking during rainy season. 50 g N should be applied 45 days after transplanting.

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### Nipping

Nipping off terminal shoot tip should be performed at height of 1.25-1.5 M from ground level to encourage the lateral branches. The nipping below or at 1.0 M from ground level, the tree produced laterals at the ground level rather than the top which causes difficulty in undertaking mechanical inter cultivation activities.

### Nutrient management

In general, the crop doesn't exhibit any nutritional disorder however rarely some plants exhibit chlorosis symptoms on leaves during rainy season and January-February. To harvest potential yield, the plants should be fertilized with application of 20Kg FYM per pit and basal dose with 150g of DAP and 100g of MOP per tree for higher yield during July-August. The 100g dose of nitrogen should be applied as top dressing at the end of August for better growth and development of plant.

### Irrigation

Though, drumstick is a hardy tree and can survive without watering under rainfed condition. Considering its flowering and fruit development, the first phase of fruiting falls in rainy season when capacious irrigation water is available. However, the second phase falls in the summer months when the irrigation water is deficit. Hence, plants are required to irrigate during summer at 15 days interval to realize greater marketable pods. Because 60-70 per cent root system concentrated in the top 40 cm of soil and only meagre per cent of root length observed below 60cm.

### Pruning

Pruning is an important operation to be performed in drumstick; in addition to thinning of



Pruned orchard of drumstick

vegetative shoots emerges in crowded manner. The vegetative shoots emerge at the main trunk at near ground level are removed and the dead wood are also cut. The flowering and fruit setting takes place in the current season vegetative shoot, pruning is imperative to induce more vegetative shoots. As the last harvest is over, the tree should be pruned at 1.25-1.5 M from ground level and the cut portion should be pasted with Bordeaux paste to control further infection. While pruning, it must be ensured that every pruned branch should have 4-5 active buds in it. The pruning without leaving buds inside branches causes development of shoot in crowd manner around the active bud regions, which causes shelter for some pest. The new shoots emerge from the cut region at 10-15days after pruning, five to six healthy shoots are allowed to grow and the proper distance of 20-30cm between the shoots. The unhealthy, crowded, diseased and weak shoots are thinned out.

### Harvesting

The first harvest can be obtained in the month of November-December followed by December-March



### Thar Harsha plant laden with tender pods

depending on the flowering season. In general, the fruit set after February doesn't attain the marketable size due to shortage of moisture for pod development. The optimum time of harvesting is plumpy appearance with shallow ridges on the pods. The yield of drumstick increases as the tree age advances. On an average, 38-42kg pods per tree can be harvested.



Harvested tender pods of Thar Tejas

### Insect pest and disease

Drumstick is not generally affected by major diseases; however, leaf eating caterpillar and fruit fly are the major devastating pest of this crop. The leaf eating caterpillar (*Noorda blitealis* WLK) defoliates the entire crop which affects the flowering phase if crop is not managed properly, hence timely pest control management is very essential to protect the crop. Spraying of Dichlorvos @ 2.0ml/lit water from top to trunk of the tree controls effectively, and the death or fallen larva from the tree after the spray indicates the effectiveness of the spray.

Fruit fly lay eggs in the fully opened flowers, and the hatched fly emerges out from fully matured fruits. The gummy exudates make the fruit unmarketable. For effective control, the IPM with soil application of thiamethoxan 25WG @ 1.5g/l water thrice at monthly interval after 4-5 months after planting, Collection and destruction of fruit fly damaged pods and foliar spray of Spinosad 45 SC@ 0.75ml/l water and profenofos 50EC @1.2ml/l water is found to be best in minimizing pod damage and soil pupae.

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