

## Pusa Rakshit (DTPH-60) : New promising tomato hybrid for cultivation under protected conditions

**The development of tomato hybrid for protected conditions by public sector will not only ensure off-season availability, increase in the productivity and quality, but also make available the hybrid seeds at cheaper rate to the farmers. The newly developed tomato hybrids Pusa Rakshit (DTPH-60) has thick pericarp, attractive red colour, uniform round fruit and high yielding ability.**

**T**HIS hybrid has been developed by Division of Vegetable Science, ICAR-IARI, New Delhi for cultivation under protected conditions. It is indeterminate in growth habit and first picking at 75 days after transplanting. Fruits borne in cluster (5-6) with uniform in size. Fruits are round, deep red in colour with average fruit weight of 105 g. The pericarp thickness is 7.5 mm which makes it suitable for long distance transportation. TSS of red ripe fruits is 5.1°brix, acidity 0.5% and lycopene content 6.0 mg/100 g. The average fruit yield is more than 16 q/100 square meter area of naturally ventilated polyhouse in 8-9 months crop duration from September to May.

### Crop production

#### *Climatic requirement and sowing time*

It requires relatively warm season for its growth and development. The ideal night and day temperature for fruit set and colour development is 20°–25°C. Under environmentally controlled polyhouse, it can be grown round the year, whereas in naturally ventilated polyhouse transplanting is done in September. Well-drained sandy loam soil with pH of 6-7 is ideal for growing good crop and 125 g seed is sufficient for transplant in 10,000 m<sup>2</sup> in polyhouse area.

#### *Raising of nursery and transplanting*

Nursery should be raised either in polyhouse or insect proof net house. It should be raised in soilless media using cocopeat, perlite and vermiculite in 3:1:1 ratio to produce disease free and healthy seedlings. After 25 days of sowing, seedlings become 10-12 cm in length and 4-5 leaves are ideal for transplanting. It should be kept for 2-3 days for hardening before transplanting to minimize transplanting shock and better crop stand.

Transplanting should be done on both sides of 15 cm raised bed of 0.75 m width. There should be 30 cm distance between two beds. The seedlings should be transplanted at 60 cm distance within row on both sides of the raised bed. It should be planted under drip

irrigation system with mulch for efficient use of water and fertilizers.

#### *Manuring and fertigation*

Well rotten FYM @10 t/4,000 m<sup>2</sup> polyhouse area and NPK and other micronutrients should be applied as per the stage of the crop and structures in use. It is necessary to maintain even moisture during the crop period. Fertigation is essential at the time of flowering and fruiting. Irrigation is applied at 8-10 days' interval in winter season whereas during summer months, irrigation is applied at 4 days' interval depending upon weather conditions.

#### *Inter-culture*

Hoeing should be done as often as necessary to control weeds. Beds before mulching and transplanting should be sprayed with stomp @ 2 ml/litre of water solution for controlling the pre-emergence of weeds.

#### *Training, pruning and trellising*

Staking is an important operation in tomato under protected condition. Staking should be done 20-25 days



Fruits of tomato hybrid Pusa Rakshit (DTPH-60)



Tomato hybrid Pusa Rakshit (DTPH-60) in field and under low cost polyhouse

after transplanting. The plants should be loosely tied on vertical stakes. The timely staked plants produce more and better quality fruits. All the side branches/shoots should be removed/pinched at early stage to maintain 2-3 branches from 5<sup>th</sup> node onwards on stem. Plants are supported by plastic wire or blinder twine loosely anchored with plastic clip at base of plant to overhead support wires running to the length of row of bed. Overhead wires running over the row of the bed are fitted 8-10 feet above and firmly supported with structure. Stem/vine of the plant is either fitted in round plastic clip of one-inch diameter with hanging twine or twine is wrapped around stem below the leaves clockwise leaving top 15 cm shoot of the growing plant. Regular pruning of side shoots should be done for entire crop duration. After first harvest, the leaves touching the ground (up to one feet from ground) should be removed which improves air circulation and reduces disease incidence.

#### *Pollination*

Since, tomato is a self-pollinated crop having bisexual flower, therefore normal flowering and fruiting takes place in sunny weather, however for better fruit setting in foggy or cloudy weather electric vibrators or air blowers or manual shaking can be used for effective pollination during 10 to 11 AM and 2 to 3 PM in the day.

#### *Harvesting*

Harvesting starts 70-75 days after transplanting. Harvesting depends upon purpose for which fruits are harvested and distance over which they are to be transported. Tomato is harvested at mature green stage for long distance transportation. For short distance transportation fruits are harvested at pink stage and for processing fully ripe red colour tomatoes should be harvested.

#### *Average yield*

Fruit yield is around 16 q/ 100 m<sup>2</sup> of naturally ventilated polyhouse.

#### *Plant protection*

The warm, humid conditions and abundant food under protected conditions provide an excellent, stable environment for pest development. Sanitation, soil solarization, mulching and fumigation are done to manage pest in protected condition. Major pest of tomato under polyhouse are whiteflies and mites, which come inside with the workers due to frequent entry in the polyhouse. Nematode are also a major problem in polyhouse. The polythene used as cladding material should have 200-micron thickness and UV stabilized. Similarly, insect proof net should be of 40 mesh. Building a screened foyer to create a double-door entry partially solves the problem of wind-carried insects. Our major emphasis should be on prevention of entry of pest inside the protected structure. The seedling should be raised in protected environment for transplanting. The lower or damaged leaves should be removed to make ground clear for proper ventilation and to avoid spread of pests. For whiteflies, aphids and leafminer adults, yellow sticky cards (8 × 12) should be placed @ 5/100 sq. m. area for control of pest in the protected environment. Hang the yellow sticky cards/ traps in the crop with the help of strings about 4" to 6" above the plant canopy. As the crop grows, cards can be moved up. Change the cards when more than 60-70% of the area is covered by trapped insect. For effective management of pest and diseases Integrated Pest Management (IPM) strategies need to be followed. If required apply dicofol @ 2 ml /litre or spiromesifen 1 ml/3 litre water to control mites and trizophos or flonicamid @ 1 ml/3 litre water to control whitefly. For fungal diseases mixture of 1 g carbendazim and 1 g mancozeb @ per litre water solution can be applied.

For further information, please write to:

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