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Thar Ganga

A high yielding and long podded Indian bean variety for rainfed cultivation

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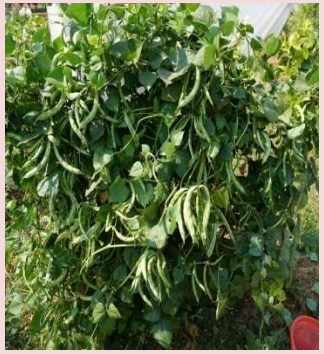
Thar Ganga is a high yielding and long podded variety of Indian bean developed by ICAR-CIAH, RS-Central Horticultural Experimental Station (CHES), Vejalpur, Godhra, Gujarat. This variety has been developed through pure line selection breeding method from local material collected from Dahod district, Gujarat and its performance for horticultural traits was tested over the years at experimental farm of the station.

Salient features of Thar Ganga

It is a heavy yielder having attractive long green pod appearance. The pods are long having an average pod length of 17.0cm and an average pod girth of 5.20cm with pod weight of 15.20g. It takes 80-85 days for first flowering and the first harvest of fresh pods starts at 98 to 110 days after sowing. A total of 800-1200 pods per plant with on an average yield of 8-10 kg/plant of fresh pods are obtained under the dry land semi-arid conditions with yield potential of 60-65 t/ha. The variety 'Thar Ganga' has higher nutritional value in terms of antioxidants, proteins, vitamins, micro nutrients and minerals. It is rich in β-carotenes (12.8mg/100g) on fresh weight basis, proteins (4.4g/100g) and other antioxidants like total phenols (264.6 mg GAE/100g), flavonoids (40.20 mg cat.equi/100g), total antioxidants (345.50mg AAE/100g) and Vitamin-C (7.2g/100g). It is performing well under rainfed semi-arid conditions and showed moderately resistance to dolichos bean yellow mosaic virus disease under field conditions.



PRODUCTION TECHNOLOGY

Soil and climate

It is a cool season crop but grows well under warm, humid conditions at temperatures ranging from 18-35°C and is fairly tolerant to high temperatures. The bean is drought hardy and is grown in wide areas under diverse climatic conditions such as arid, semiarid, subtropical and humid regions, low lands and uplands and pH varying from 5.3 to 6.0 is suitable.

Sowing, seed rate and spacing

The seeds are dibbled or drilled behind the plough. The climbing types are sown near houses and allowed to climb on the roof tops. The seed rate for this crop is 5-8 kg/ha (pole type) with a spacing of 1m × 2m is followed.

Manure and fertilizer

About 25t/ha of well decomposed FYM should be applied to the soil at the time of land preparation. Application of NPK 20:60:60 kg/ha is recommended. Half of N along with entire dose of P and K fertilizer should be applied at sowing time. The remaining half dose of N should be top dressed 30 days after sowing.

Intercultural operations

Weeds may be controlled mechanically or by using weedicides. Pre sowing application of fluchloralin @ 2litre/ha check the weed growth for 20-25 days. Thar Ganga, being a pole type it needs support, since the plants have twinning growth habit. The plants should be trained on thin bamboo stakes for better growth and fruit set. Over-crowding of plant vines due to non-staking affects formation of pods and yield adversely. Staking improves plant spread and photosynthetic activity. As a result, there is higher yield due to higher number of pods per plant. Light irrigation is given when required. For higher yield the crop should be irrigated regularly at 7 -10 days interval. Flowering and pod development period are the critical stages.

Harvesting and Yield: The crop is ready for harvest after 100-110days after sowing with 9-10 picking at 7 days interval. Fully grown immature pods are harvested with an average yield of 60-65tonnes/ha of green pods are obtained.

Major diseases and insect pest management

Powdery mildew (*Leveillula taurica var. macrospora*): The infection on leaves appears initially as small darkened areas, later becoming white powdery growth which spreads to stems and other parts of the plant. In severe infections the leaves become chlorotic and fall off. Pods are reduced in size and distorted in shape. Plant growth is reduced due to defoliation.

Control measures: Spray with 0.5% wettable sulphur or with benlate or Bavistin 0.15%. If needed, repeat the spray at 14-day intervals.

Dolichos bean yellow mosaic virus disease (DYMVD): It is a viral disease and spreads by the whitefly (*Bemisia tabaci*). Leaves of the diseased plants are reduced in size and develop bright yellow patches interspersed with green areas. In severe cases, the entire leaf looks golden yellow in colour.

Control measures: Remove and destroy the infected plants. Control the insect vector by spraying Diafenthiuron 50WP @1.5g/litre, Imidacloprid (17.8% SL) @ 1ml/litre or Acetamiprid 2ml/litre of water. Repeat the spray at 10-15days intervals based on the insect vector population.

Leaf spot (*Cercospora dolichii*): The affected leaves have circular to angular spots with grey centre and reddish border. The spots gradually cover the entire leaf.

Control measures: Destruction of diseased plant materials and proper crop rotation has to be done. Spraying with benomyl @ 0.2% or Dithane M-45or Blitox @ 0.2% or Thiram @0.2%

Ashy stem blight (*Macrophomina phaseoli*): Black sunken cankers on cotyledons and stem of young seedlings which results in damping off and death of seedlings. Yellowing and drooping of foliage in older plants. The disease is seed borne. Warm and humid weather are favorable for the disease infection.

Control measures: Destruction of diseased plant debris left from previous crop and follow phytosanitary measures. Use disease free seeds. Seed treatment with Thiram (2g/kg). Avoid excessive soil moisture. Use organic manure preferred.

Bean Aphid (*Aphis craccivora*): It Suck the plant sap which results in stunted plant growth, curling of leaves, twisting of twigs and developing fruits and sometimes shedding of flowers. Aphids excrete honeydew, a sugary substance that causes sticky, shiny leaves and black sooty mold growth and it spreads plant diseases (a large number of viruses are vectored by aphids).

Control measures: Use the yellow sticky traps (10 numbers/ha). Spraying of neem oil @ 3% followed by the systemic insecticides such as., Dimethoate 30% EC (Rogor) @2ml/litre or Imidacloprid (17.8%SL) @ 1ml/litre of water. If required, repeat the spray at fortnightly intervals.

Pod borer (*Helicoverpa armigera* and *Adisura atkinsoni*): It is a polyphagous pest and is an important pest on dolichos bean, cowpea and other pulses. Caterpillar first feeds on leaves, later bores into pods and feeds on seeds thereby, reducing the marketable yields drastically. Larva is seen feeding with the head alone thrust inside the parts and the rest of the body hanging out. Boreholes on pods, absence of seeds on pods and defoliation in early stages are the symptoms of attack.

Control measures: Both the species of pod borer are effectively controlled by spraying NSKE 5% and use of chemical insecticides like spinosad 45 EC @ 0.4 ml/litre or Emamectin benzoate @ 0.4 g/litre reduces the incidence of pod borer effectively.

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