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FASAI

Muskmelon

Botanical Name : *Cucumis melo* L.

Family : *Cucurbitaceae*

Chromosome No. : $2n=24$

Origin : *Tropical Africa*

Common name : *Kharbuza*

Economic importance and uses

- Musk Melon is valued as a summer fruit. It is stated to have a cooling effect on the body system. Further, it is a demulcent, diuretic and aphrodisiac. It is applied as a lotion in several skin conditions

Climate and Soil

Climate

- Muskmelon is essentially a warm season crop grown mainly in tropical and sub-tropical regions. Generally a long period of warm, preferably dry weather with abundant sunshine is required. Melons require fairly high temperature of 35-40°C during the fruit development. Cool nights and warm days are ideal for accumulation of sugars in the fruits. Maturity is hastened if nights are warm.
- The average temperature for good growth would be around 30-35°C with maximum ranging around 40°C and minimum between 20-25°C for musk melon. They are very susceptible to frost. Excess humidity will promote diseases like Powdery Mildew, Downy Mildew, anthracnose and viral diseases and pests

such as fruit fly. For good quality and sweetness in muskmelon, dry weather during fruit development is necessary.

Soil

- The soils should not crack in summer and should not be water logged in rainy season. Muskmelon prefers a soil PH of 6-7 and it is slightly more tolerant to soil acidity than cucumber. A well drained loamy soil is preferred for all the cucurbits including muskmelon, cucumber and watermelon. Soil temperature should be less than 100C or otherwise there would not be any seed germination. Lighter soils that warm quickly in spring are usually used for early yields. In heavier soils vine growth will be greater and fruits mature late.

Varieties

- Muskmelon is a polymorphic taxon, encompassing a large number of botanical and horticultural groups. It includes both dessert as well as cooking and salad types like cucumber. African botanists (Nandin, 1859) divided this species into several botanical varieties adopting a trinomial classification.

These includes

Cucumis melo var. agrestis.

Cucumis melo var. cultura.

Cucumis melo var. reticulatus (netted melons).

Cucumis melo var. cantalupensis (cantaloupe melons)

Cucumis melo var. inodorus (winter melons & crenn Shaw).

Cucumis melo var. flexuosus (snake or serpent or long melon).

Cucumis melo var. chito (mango melon or lemon melon).

Cucumis melo var. momordica (snap melon).

Cucumis melo var. conomom (oriental pickling melon).

Several varieties have been bred in India and released for commercial cultivation. Important characteristics of these varieties are described below.

Pusa Sharbati:

- An early cultivar maturing in 85 days, leaves 5 lobed, green, pubescence and medium long petiole. Salmon orange flesh is firm and thick with small seed cavity, moderately sweet (11-12% TSS). It is a derivative from the cross Kutana X PMR-6 of USA.

Pusa Madhuras:

- It is a selection from a Rajasthan collection with roundish flat fruits weighing a kg or slightly more. Vigorous vines, leaves entire green pubescent with large petioles. Salmon-orange flesh, juicy and sweet (12-14% TSS) and poor keeping quality. The average yield is 12-16 t/ha. Suitable for growing in northern India.

Pusa Rasraj (F1):

- It is F1 hybrid (Monoecious 3x Durgapura Madhu) developed and released by IARI. It has been recommended for commercial cultivation in Delhi, U.P, Punjab, and Haryana & Bihar. Average fruit weight is 1-1.2 kg; high yielding (25t/ha) producing sweet (11-12% TSS), take 75-80 days for first harvest. Suitable for both garden land river bed cultivation.

Hara Madhu:

- It is released by PAU, Ludhiana. It is a late cultivar developed from a local collection of Haryana. Vines are 3-4 m long and vigorous. Very sweet (12-15% TSS) and poor keeping quality.

Punjab Sunheri:

- A derivative from the cross Hara madhu x Edisto, early maturing, pale green, thick skin, salmon orange and thick flesh, moderate sweetness (11-12% TSS) released by PAU, Ludhiana.

Punjab Hybrid (F1):

- It is a F1 hybrid between a male sterile line (ms1) and Hara Madhu. Vines are long (2-2.5m) vigorous and luxuriant growth. Early maturing with orange fresh and netted skin, Suitable for distant transportation and released by PAU.

Punjab Rasila:

- It is developed from a cross between C.melo var.momordica 'phut' x Indian cultivar. Fruits are round, green thick, juicy and it takes 80 days for fruit picking and about 10 days earlier than Hara madhu. Average yield is 16t/ha. Fruit weighing about 600g, TSS around 11% resistant to powdery mildew & moderately resistant to downy mildew. Released by PAU, Ludhiana.

Durgapura Madhu:

- A very early cultivar confined to Jaipur region of Rajasthan .Fruits are oblong weighing to 500-600g, Pale green rind, light green flesh, very sweet 13-14% TSS, seed cavity big.

Arka Rajahans:

- Mid season variety bearing large oval fruits and fruits has transportable quality. It is tolerant to powdery mildew, keeping quality excellent.

Arka Jeet:

- An early cultivar selection from Bati strain of Uttar Pradesh. Relatively dwarf habit. Fruits are flat small weighing about 300-500g. Orange to orange brown skin, white flesh, big seed cavity, very sweet (12-14%TSS). Excellent flavour and high vitamin C content.

Sona (cantaloupe):

- A hybrid from Indo American hybrid seeds company. Fruits are closely netted, slightly ribbed, orange cream colored, tolerant to Powdery & Downey Mildew and possess good keeping quality.

Swarna (cantaloupe):

- This is also a hybrid from IAHS, Fruit is yellow orange in colour with very sweet, dark orange flesh inside. It can withstand long distance transport.

Gujarat muskmelon-1:

- It is a selection from local collection from sabarkantha district in Gujarat. Fruits are small, tasty, lemon yellow and 5-6 fruits per /plant. Gujarat muskmelon-2 : It is a selection from local collection from sNagpur area of Maharashtra. Fruits are medium in size, tasty , 4-5 fruits /plant and average fruit weight is 1.3 kg. Skin is orange green with slight netting and no suture.

Season

- Jan-Feb months are preferred for sowing but there should be high temperatures at the time of fruit maturity and ripening which increases the sweetness. During rainy seasons non dessert forms of muskmelon are grown primarily in most parts of the country. In North India, early sowing is generally done in riverbeds in November and it extends to mid-February in garden lands.

Sowing

- Seeds soaked in water for 12-24 hours before sowing gives better germination. This is practiced if temperature is very low. If transplanting is to be done, seeds can be sown in PE bags (15x10cm) of 100-200 gauge and germinated under cover to protect them from low temperature. The seedlings are transplanted from the bags at two true leaf stage. Normally the cucurbits do not stand transplantation beyond the stage due to tap root system. The recommended seed rate per hectare is 1.25 kg. Various systems of sowing are followed such as furrow, bed, pit and mounds. In case of furrow sowing the furrows are made at 2.0-3.0 meters with a plant to plant distance of 0.9m with 4-5 seeds in each hill and two vines are finally retained in each hill. Sowing is usually done at top of the sides of furrows and the vines are allowed to trail on the ground.
- Pit system is practised especially during rainy season and in river bed cultivation. The pits spaced at 1.5 to 2.0 are dug about a meter deep and well mannered with FYM. 5-6 seeds are sown in a pit and finally 2-3 vines are retained in each pit. In riverbed system of sowing, i.e. in trenches of 30 cm wide, 60 cm deep and of a convenient length is done. The distance between 2 trenches is kept 2-3m. The trenches are filled with FYM, 3-4 seeds are sown in the pits / trenches.

Spacing

- The spacing required for sowing depends upon the crop and the variety grown. In general row to row distance of 2.5-3m and hill distance of 60-90 cm is advocated for muskmelon.

Seed treatment

- Soaking of seeds in Ethephon at 480 mg/litre for 24 hours improved the germination in muskmelon. At low temperature seed dressing with thiram controlled fungi effectively and also enhanced seed germination. The seeds of muskmelon should be soaked in water overnight and then should be kept in moist cloth or gunny bag near a warm place before planting. Germination starts within 3-4 days.

Training and pruning

- Pruning (as the first hermaphrodite flower is borne on secondary branch arising from the eighth node, the secondary branches are pinched off up to the seventh node) in combination with staking is found to be more effective. Removing the secondary shoots up to the 7th node on the main stem is found optimal to improve plant growth and fruit set and induce early flowering. The yield and fruit quality is improved with pruning in muskmelon. Fruits from pruned plants have higher TSS, ascorbic acid and reducing sugars and better pulp thickness than unpruned plants.

Nutrition

- Well-rotten farm yard manure at the rate of 25t/ha is applied to the field at the time of land preparation. Full dose of P&K and ½ of N should be applied as basal dose, remaining of N should be applied at the time of earthing at 4 weeks after sowing. Foliar application of N & K at 1.5% increases the numbers of hermaphrodite flowers. An application of Ca (20-30PPM) and Boron (7.5-10.0 PPM) promotes plant growth, increases fruit yield, flesh and rind thickness.

Irrigation

- Usually pits, ridges or beds are lightly irrigated a day or two prior to sowing of seeds and subsequent irrigation is given 4-5 days after seed sowing. In

general, irrigation once in 5-6 days will be necessary depending upon soil, temperature and location. It is always necessary to keep moisture well maintained at the root zone to provide rapid tap root development. Irrigation water should not wet the vines or vegetative parts, especially when flowering, fruit set and fruit development is in progress. Usually frequent irrigation is to be reducing when fruits reach maturity and completely stopped at the last stages of harvest. Frequent irrigation is very important in spring summer crop, while in rainy season crop, irrigation may not be necessary at all if rainfall is well distributed between July-September.

Weeding

- During early stage of crops, beds, ridges etc. need to be kept free from weeds. At the time of top dressing with nitrogenous fertilizers, weeding and earthing up are done when the vines start spreading; weeding in between the rows or ridges becomes unnecessary since vine growth can smother the weeds. Most of the pre and post emergence weedicides are phytotoxic to the seedlings or reduce plant growth in muskmelon. Application of fluchloralin alone or nitrofen reduce the uptake of N, P & K by weeds in both direct sown and transplanted crops of muskmelon. Some times, nutrient uptake by the crop is enhanced by herbicide application compared to that with no weed control.

Use of Growth regulators

- In muskmelon application of ethrel (250ppm) increases the fruiting and in turn the yield. Exogenous application of silver thiosulphate (300-400ppm) induces the male flower in gynocious muskmelon. These chemicals/plant growth regulators should be applied twice at 2 true leaf stage and second at 4 true leaf stage. NAA at 25 ppm and GA at 10 ppm increases the fruit yield.

Harvesting and yield

- Fruits have to be picked at full maturity stage, ready to be consumed as dessert fruit; the fruit usually will be ready in 30-35 days. Yield varies with the varieties used. Average yield of musk melon is about 15-20 t/ha. Hybrids give about 25t/ha.