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Scientific Cultivation of Dragon Fruit

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INTRODUCTION

Dragon Fruit (*Hylocereus spp.)* is also known as 'Pitaya', 'Pitahaya', strawberry pear, noblewoman and queen of the night throughout the world. Dragon Fruit as is a super fruit originated from central and South America that is grown all over the world. The dragon fruit was introduced in India in the 1990s. Dragon fruit is climbing vine belongs to cacti family which has worldwide recognition, first, as ornamental plants than as a fruit crop. The flower is so beautiful that it is nicknamed as "Noble Woman" or "Queen of the Night" It has a faint, sweet taste much like an earthy watermelon. It's a fast growing crop and the plant as can produced for more than eight to ten years. The fruit of this plant having red skin covered with large scale and white or pink flesh contains some black seeds. It can be used in jams, ice creams, jelly production, fruit juice and wine. In world, Vietnam solely produced and exports more than 50% dragon fruit. It is established as a new crop in India. Most widely cultivated and commonly available cultivars of dragon fruit in India are the red skin-white flesh (93%) followed by red skin-purple/red flesh (6.5%) and yellow skin-white flesh (less than 0.5%).

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Types of Dragon fruit:

In India, three main varieties are cultivated:

1. ***Hylocereus megalanthus***: yellow colour fruit with colour flesh and it is also known as Pitaya amarilla or yellow pithaya.
2. ***Hylocereus costaricensis****:* Red colour fruit with red colour flesh and it is also known as a Pitaya roja or red fleshed pithaya.
3. ***Hylocereus undatus***: Pink colour fruit with white colour flesh and also known as Pitaya blanca or white fleshed pithaya.

Hylocereus megalanthus

Hylocereus costaricensis

Hylocereus undatus

Chemical Composition and its uses:

Compositions	**Uses**
Vitamin B_2	Adds an essential nutrient in the diet and gives an energy production.
Vitamin C	Boost immune system, cardiovascular disease, eye disease and even skin wrinkling.
Iron	Vital for brain and muscle functionality
Antioxidants	Protect cells against the effects of free radicals that can cause cancer, heart disease and other diseases
Magnesium	Increase energy, important for regulating Sodium, Potassium and Calcium levels, relax muscles, nerves and anxiety, muscle recovery.
High in Fibre	Fibre reduces the risks of heart disease, control blood sugar level; lowering cholesterol levels and maintains bowel health.

Soil

Dragon fruit can be grown on wide range of soils from loam to sandy loam and clay loam. However, sandy soils with good organic matter with good drainage capacity are best for its cultivation. It prefers slightly acidic soil with pH 5.5-6.5 and also can tolerate some salts in soil.

Climate

It is hardy and grows in diverse climatic conditions. They prefer temperatures between 20-30 ^{0}C. Dragon fruit is a cactus and temperatures under 8 ^{0}C will injure it over time.

Land preparation:

Land should be ploughed twice till soil achieves the fine tilth and weed free. The operation can be done by tractor drawn implements. As part of land/field preparation apply any organic compost in proportionate ratio.

Propagation:

There are two methods of propagation in dragon fruit plant:

1. Seed Propagation

This is a simple method of propagation of dragon fruit plant. Germination of seed starts in 3-4 days of sowing and seedlings can be potted 4-5 weeks after germination. They are ready to transplanting in 9-10 months. This method is simple, however the quality of new offspring cannot be guaranteed due to cross pollination. Furthermore, the growth of seedlings very slow and the more time taken to reach fruit bearing age (usually 3-4 years) in compare to plant propagated by cuttings propagated by seeds. Seed propagation method is not suitable for commercial cultivation of dragon fruit.

2. Vegetative Propagation

Vegetative means of propagation in dragon fruit is easiest, cheapest and most common method. Cuttings of plants used for propagation. An about 15-40 cm length cuttings should use for planting in the field. The longer cuttings, faster regeneration rate of new shoots. Pile up these cutting two days before the potting. By this method of propagation flowering starts after one or two year of plant establishment. Mature cutting are better to use as they are resistant to insects and snails damage.

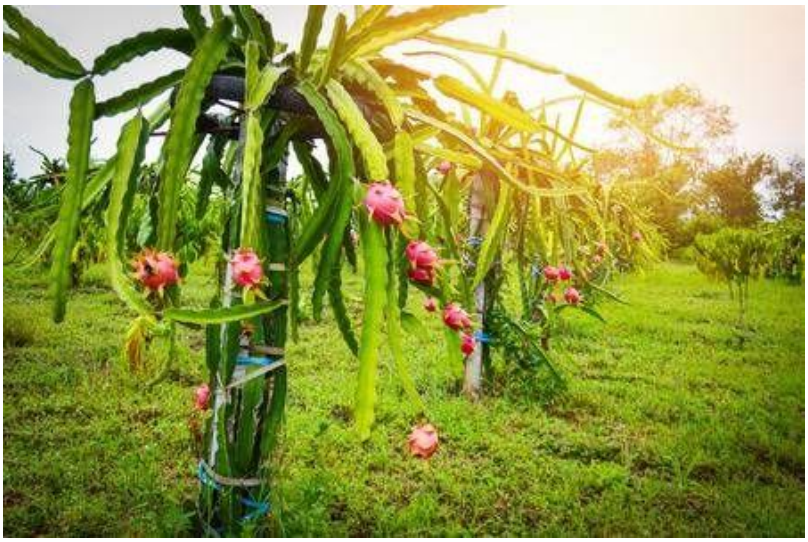
Planting:

Planting of dragon fruit may be done throughout the year. However, the best time for planting of seedlings is at beginning of rainy season, particularly in seasonally dry regions where irrigation facility in constantly not available. The best time of day is late afternoon to early evening. The planting a seedlings or cuttings should 30 cm deep with spacing of 3x3 or 4x3 meters.

To get the proper development and up right growth of the plant, these should be supported by wooden columns or concrete as the plant becomes mature it forms aerial roots from the branches hence it is recommended to have round/circular metal frame to maintain the balanced dragon shrub with a spacing of 3x3 or 4x3 meter.

Trellising:

Dragon fruit is a climbing cactus; the vines have to train and allow to climb concrete post, walls, fences or tree for support. Avoid to climb the plants on wooden or iron post because the life of dragon fruit vine upto 20 years; so durability of post is considerable. The post should be very strong as 3-4 years old plants may weight approximately 100 kg. The suggested post size is 10-15 cm in diameter with 2 meter of height and also should be buried 40 cm in ground.



Irrigation:

These plants require less water compared to other plants. The rainfall requirement is 1150-2200 mm per year. If the rainfall is well distributed irrigation may not be required. Avoid excess irrigation because it may promote fungal and bacterial infection. At the time of planting, flowering, fruit, development stage and hot dry climate conditions, frequent irrigation are required. Fruit splitting may occur when exposed to dry and wet periods during fruit development stage. Micro-irrigation systems in addition to mulching will be very useful to control soil moisture. About 2–4 litres of water weekly twice per plant is sufficient during the summer/dry days. However, water requirement may increase or decrease depending upon soil, climate and plant health.

Nutrient Application

Dragon fruit requires judicious application of fertilizer for higher growth and yield. There is no recommendation of fertilizers for dragon fruit in India. If the orchards is located in uplands use of organic fertilisers (neem cake, cow dung, Vermicompost or poultry manure) in 1–3 times per year *i.e.*, about 15–20 kg/application/vine before and after the production season is very important.

Issues in Flowering:

Generally, sunburn is a common problem in dragon fruit for semi-arid and arid regions and it can be minimize by shading with 25-30% either by planting shade-providing trees (such as *Moringa*, *Sesbania* and *Melia dubia* etc.) or installing artificial shade nets during the harsh summer months.

Pest:

Dragon fruit is comparatively free from pests. The common pests are mealy bugs, snails, termites, scale insects, ants, fruit flies, borer, bats, rat and birds.

Diseases

A few diseases have been reported in dragon fruit.

- Soft watery Stem Rot disease in dragon fruit is caused by bacteria *Xanthomonas compestris* due to over watering.
- Brown spot caused by *Dothiorella.*
- Anthracnose disease also been reported in dragon fruit.

Marketing:

Dragon fruit is having a huge demand in India as well and one can earn a good profit through dragon fruit as the benefit of this fruit is also very good for healthy living.

Harvesting

Generally, harvesting should done after 30−35 days after flowering when skin colour of fruit changes from green to red or pink for better firmness, eating and storage quality.

Yield

The average weight of fruit is 350 g. Bearing starts with in six to nine months and yield can be obtained from second year. The average yield 12-15 t/ha at the end of third year and onwards.