

Dragon Fruit Cultivation in India: A New Opportunity for Farmers

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India's agricultural sector has always evolved with changing times and market demands. In recent years, dragon fruit, also known as pitaya or strawberry pear, has emerged as a high-value, low-maintenance crop that promises significant returns to farmers. With its exotic appearance, sweet refreshing taste, and numerous health benefits, dragon fruit is not only capturing consumers' attention but also reshaping the future of horticulture in India.



Origin and Global Significance

Dragon fruit belongs to the cactus family (Cactaceae) and is believed to have originated in Central and South America. The fruit gained popularity in Asian countries like Vietnam, Thailand, Malaysia, and the Philippines, where it is cultivated extensively for export. In India, it was initially introduced around 1990s, but large-scale commercial cultivation has gained momentum only during the last decade, especially after 2020, due to rising market awareness and government encouragement.

Botanical Description

- **Scientific Name:** *Hylocereus undatus* (white-fleshed), *Hylocereus costaricensis* (red-fleshed), *Hylocereus megalanthus* (yellow-skinned)
- **Family:** Cactaceae
- **Plant Type:** Climbing cactus (succulent)
- **Lifespan:** 20–25 years
- **Flowering Time:** Night-blooming flowers (called “Queen of the Night”)
- **Fruit Shape:** Oval, with bright pink or yellow skin and green scales

Varieties of Dragon Fruit

The major varieties grown in India include:

1. ***Hylocereus undatus*** – White pulp with pink skin (most common)
2. ***Hylocereus costaricensis*** – Red pulp with red skin (rich in antioxidants)
3. ***Hylocereus megalanthus*** – Yellow skin with white pulp (sweeter and smaller in size)

Among these, the **red and white-fleshed types** are most suitable for Indian conditions due to their adaptability and market preference.

Climatic and Soil Requirements

Climate:

- Ideal temperature: **20°C to 30°C**
- Can tolerate short periods of 38°C but sensitive to frost.
- Requires **dry tropical and subtropical** climate.
- Sensitive to water stagnation and extreme cold.

Soil:

- **Type:** Sandy loam or well-drained soils
- **pH Range:** 6.0 to 7.0
- Avoid clayey or saline soils.
- Adding **organic compost** and sand improves aeration and fertility.

Land Preparation and Planting Method

1. Land Preparation:

- Deep plough the land and remove weeds.
- Create ridges or raised beds for better drainage.

2. Pit Preparation:

- Dig pits of **60×60×60 cm** at a spacing of **2 m × 2.5 m** (about 1600–1800 plants per acre).
- Fill pits with topsoil, sand, compost, and farmyard manure in equal proportion.

3. Support Structure (Trellis System):

- Dragon fruit is a climbing cactus, hence needs support.
- Use **cement poles or wooden pillars (6–7 feet height)** with a circular iron frame at the top.
- Four plants are planted per pole and allowed to climb.

4. Planting Season:

- Best time: **June to August** (monsoon season)
- Propagation: By **stem cuttings (30–40 cm length)** treated with fungicide before planting.



Irrigation Management

- Being a succulent, dragon fruit requires **less water**.
- **Drip irrigation** is most suitable to maintain soil moisture.
- Avoid waterlogging; it can cause root rot.
- Watering frequency: Once every **10–15 days** during summer, and once a month in winter.

Flowering and Fruiting

- Flowering starts **8–12 months** after planting.
- The flowers bloom **at night** and last only for one night — hence called “**Night Blooming Cereus**.”
- Fruits mature **30–50 days** after flowering.
- Peak harvesting season: **July to November**.
- Each plant can produce **40–60 fruits annually** under good management.



Pollination

- Dragon fruit is **self-sterile** in some varieties, requiring **hand pollination or cross-pollination** between red and white varieties.
- Hand pollination at night (8 PM–11 PM) increases fruit size and yield.

Fertilization

- Apply **10–15 kg of organic manure per plant per year**.

- Supplement with **N:P:K (20:20:20)** fertilizers in liquid form through drip.
- Apply **micronutrients (zinc, boron, iron)** once every 3–4 months for healthy growth.

Pest and Disease Management

Dragon fruit is relatively pest-resistant. However, common issues include:

- **Aphids and Mealybugs:** Control with neem oil spray.
- **Stem Rot and Anthracnose:** Avoid excess moisture; use copper oxychloride spray.
- **Snails and Ants:** Use organic traps or lime barriers.

Harvesting and Yield

- Fruits are harvested when skin color changes from green to bright pink or red.
- Average yield:
 - **Year 1:** 2–3 tonnes/acre
 - **Year 2–3:** 6–8 tonnes/acre
 - **Full maturity (after 4 years):** 10–12 tonnes/acre
- Fruits are packed in ventilated cartons and stored at **8–10°C** for 3–4 weeks.

Economic Analysis (Per Acre)

Particulars	Cost (₹)
Land preparation & poles	80,000
Planting material	60,000
Drip irrigation	25,000
Fertilizer & labor	35,000
Total Initial Investment	2.0 lakh – 2.5 lakh
Annual Maintenance	40,000 – 50,000
Yield (after 2 years)	8–10 tonnes
Selling price	₹150–250/kg
Net Income	₹6–8 lakh per acre/year

Government Support and Schemes

The **National Horticulture Board (NHB)** and **State Agriculture Departments** provide:

- Subsidies for planting material and drip systems.
- Financial aid for post-harvest management and cold storage.
- Technical guidance under **Mission for Integrated Development of Horticulture (MIDH)**.
- Promotion under the “**Kamalam Fruit Mission**” (especially in Gujarat and Madhya Pradesh).

Export and Market Potential

India imports dragon fruit mainly from **Vietnam, Thailand, and Malaysia**, but local production is rapidly increasing. There's huge export potential to **Gulf countries and Europe** due to high shelf life and unique flavor. Urban supermarkets, online platforms, and fruit chains now offer premium rates for fresh and organic dragon fruit.

Health Benefits of Dragon Fruit

Dragon fruit is a **superfood** packed with:

- **Vitamin C, B1, B2, and B3**
- **Antioxidants (betacyanin, betaxanthin)**
- **Dietary fiber for digestion**
- **Iron and calcium for bones**
- **Low sugar and cholesterol-free content**

It helps in boosting immunity, reducing weight, improving heart health, and maintaining glowing skin.

Future Prospects

With the rising demand for exotic fruits and the government's push for crop diversification, dragon fruit can become the **next revolution in Indian horticulture**. Its **low water requirement, high returns, and export value** make it an ideal crop for **progressive and climate-smart farming**.

Conclusion

Dragon fruit cultivation is more than just an agricultural venture—it's a symbol of innovation and opportunity. Indian farmers adopting this fruit are not only improving their incomes but also contributing to a more sustainable and diversified agricultural landscape. With proper training, support, and market linkage, **India has the potential to become a global hub for dragon fruit production** in the coming decade.