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"Desert Jewel": Pioneering Production Technologies for Khejri Fruit Crop Cultivation

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Summary
The article explores entrepreneurial farming strategies and current knowledge for the Khejri fruit crop, a valuable desert resource. Key measures include precision irrigation, fertilization, and integrated pest management. Yield enhancements and climate-resilient practices are also explored. These strategies can enhance productivity and sustainability, ensuring the crop's continued viability.

Introduction
The Khejri tree, a vital ecological, economic, and cultural resource in arid regions like Rajasthan, India, is known for its resilience and nutritional value. Despite challenges like limited water resources, soil degradation, and climate variability, recent agricultural technologies can enhance productivity and sustainability by utilizing modern irrigation techniques, sustainable farming practices, and genetic improvements.

Scientific Name And Family
The Botanical name of khejri is *Prosopis cineraria*. It belongs to the family "Leguminosae"

Origin and Distribution
It is native of western and southern part of India.

Soil and Climate
The tree grows on a variety of soil but prefers alluvial soil consisting of various mixture of sand and clay. It can tolerate moderate salinity of soil dries up in very high salinity. The tree is frost resistant and tolerate extreme temperature ranging from 40-45°C in summer to less than 10°C in winter. The tree can withstand hottest winds and driest season and stay alive where other plants cannot survive.

Botany
It is large much branched medium size with dark green foliage. Trunk is dark grey, bark splitted with deep fissures and rough. Branches slender with thorn 3-6cm length, 8-12 pairs of leaflets, which are oblong and unequal sides. Flowers- Auxiliary, yellow in slender panicle. 7- 11cm long mostly solitary or in terminal panicles. Calyx long, cup shaped, Corolla is yellow 3mm long, stamens recurved, filaments are long, pods are straight at distal end, cylindrical 10-20cm long thick brown pulp. Seeds- 10-15 embedded in the pulp. Flowering takes place during February to march.

Species

Some important species are:

- ✓ *Prosopis juliflora*
- ✓ *Prosopis glandulosa*
- ✓ Prosopischilensis
- ✓ Prosopis alba
- ✓ *Prosopispallida*

Varieties

Thar Shobha : It is a seedling selection released by at Central Institute of Arid Horticulture, Bikaner in 2007. It is the first high yielding and better quality khejri (Prosopis cineraria) variety,Suitable for cultivation in Thar Desert. It performs better in arid condition. Thar Shobha has been recommended for uniform tender pod harvesting for vegetable use.Sangri is Light green in colour, straight, roundish flat, soft, length range from 18.2521.15 cm and Weight between 2.152.75 g. A five year grafted plant yields a harvest of about 4.25 kg Tender pods (sangri) and 6027 kg fodder (loong) per year.

Nutritive Value

Crude protein	11.9-18.0% (leaves), 18 % (kernals)
Crude fibre	13-22% (leaves), 26 % (kernals)
Nitrogen free extract	43.5% Nitrogen free extract (leaves)
ash	6-8% ash (leaves)
Ether extract	2.9% Ether extract (leaves)
calcium	2.1% calcium (Leaves), 0.4 % (kernals)
Phosphorus	0.4% Phosphorus (kernels)
Iron	0.2 % (kernels)
Fat	2 % (kernels)
Carbohydrate	56% (kernels)

(Meghwar & Dhanker, 2022)

Medical Properties

Khejri flowers is mixed with sugar and used during pregnancy as safeguard against miscarriage. Water soluble extract from stem bark exhibits anti inflammatory properties. The bark of the tree is dry, acrid bitter with sharp taste, used as tonic, cured leprosy, dysentery, bronchitis, asthma, piles, cold and cough. The smoke of the leaves is good for eye troubles.

Uses

The dried pods are used to make flour. Khejri plants are highly valued for timber and fuel. Khejri leaves are important source of fodder in desertic areas. It is probably known as ‘loong’ in rajasthan. Immature pods are used for vegetable.

Propagation

Khejri is mainly propagated through seeds. Seed propagated plants have variation in their population and very slow in growth but due to ease of technique it is commercially used. Seeds are soaked for 24 hours before sowing in polythene bag or in nursery beds, seeds will germinate after 3 weeks of sowing. Direct sowing of seed in field gave poor germination and survival whereas seedlings raised has better growth. They are asexually propagated by cutting, layering and budding and micropropagation, bht it is not perform well under extreme arid agroclimate. So Budding or grafting should adopted for khejri (Meena et al.).

Planting

In agro-forestry system, it can be planted at 3 x 3 m, 5 x 5 m as sole crop in arid region. As mixed crop 8-10 m spacing in considered optimum. For fruit production from vegetative propagated improved varieties 5-6m spacing js practiced.

Training and Pruning

Seedlings plants are very slow growing which needs frame working for 2-3 years. The apical dorminace in the plant should be broken@ 150-200cm from the ground level. Well spaced secondary and tertiary branches should be allowed to form the strong frame of the tree. Khejri plants responds to pruning.

Nutrient Management

Khejri plant is Leguminous tree which fixes the atmosphere nitrogen. In arid region, generally khejri plants are not fertilizer however, application of organic manure to new plantation improves growth.

Water Management

These plants do not require irrigation after plant establishment. These plants may not affect with moisture stress.

Disease and Pest

Khejri plant is generally free from diseases and pests, however, some pests of minor importance have been noticed particularly on the unmanaged plants.

Pod borers: Pod borer have been found to attack during flowering and the developing pods at immature green stage. The pest can be controlled by sanitation in the vicinity of plant and removal of dense branches for proper light and air circulation. Foliar spray of monocrotophos 0.01% twice at 7 Day interval after fruit set.

Shoot gall: It is formed on tender shoots and flowering panicles caused by *Lasiopterariasp.* It can be controlled by removal of affected portion, field sanitation and spray of systematic insecticide. Other pests are Nocturnal chaffer bettles, Desert locust, termites (Haldhar & Maheshwari, 2018).

Harvesting

Fruit (pod) ripes by june. The physiological maturity in pods for culinary purpose takes place during April to may. Ripening of pods takes place about 140-150 days after fruit set.

Yield

50 kg dry wood (fuel), 30 kg dry leaves (cattle feed), 5-7 kg dried pods (Vegetable purpose), 20-25kg Mature dried pods (Making flour)

Post Harvest Technology and Value Added Products

15-20 days old pods which have not developed bold seed, should be harvested for vegetable purpose as well as for dehydration. The dehydrated pods are used as pickles, cookies, and dishes,flour used to make bread and bakery products like Lalkisangri, panchkutta (Meena et al., 2021).

Conclusion

The Khejri tree, with its rich cultural heritage and ecological significance, will continue to thrive as a cornerstone of sustainable agriculture, offering valuable lessons and benefits for future generations.

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