



APRICOT CULTIVATION IN HIGH ALTITUDE TEMPERATE ZONE OF LADAKH

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ABSTRACT

Ladakh produces 62% apricots in India and has a comparative advantage as it does not coincide with the main apricot season of the world. Hence, it gets premium prices. It is a good livelihood option for Ladakh dwellers. The majority of production is consumed locally. Every part of apricot fruit has economic value. Inefficient production and processing techniques coupled with a disorganized market waste 40-60% of apricot production. The fruits contain several desirable secondary metabolites for good human health. Apricot farming may become very profitable by using post-harvest processing.

INTRODUCTION

Apricot is a stone fruit grown in temperate Ladakh. The area under commercial apricot production is very limited. Every part (kernel and shell) of apricot fruit has economic value besides the food value of flesh.

Ladakh has 62% share in apricot production in India. The area under apricot cultivation is 2,303 ha with a total production of approximately 15,789 tonnes of fresh apricot, approximately 5,040 tonnes of dried apricot. In Kargil district apricot area has increased by 9.4% while decreased by 16.9% in the Leh district. The decline in the apricot area in Leh district is attributed to plants mortality in flood-affected areas. Majority of apricot production is consumed locally and small quantity in dried form is sold outside Ladakh. The inefficient production and processing techniques coupled with an unorganized sector lead to 40-60 percent of apricot production being wasted.

Villages that are located in a narrow valley below 9,500 feet elevation produce the best quality dried apricots. Premium quality dried apricots (Halman/Phating) in Kargil district are produced in villages like Hardaz, Karkichu, Majidas, Kharul, Hundurmal, Shilikchay, Gongma Kargil, Manjee, Batalik, Chulichan, Gurgurdo, Sanatsey, Hordas, Garkhon, Darchik, Sanjak and Dargo. Similarly, in Leh district premium quality dried apricots are produced in Dha, Biama, Hanu Thang, Achinathang, Lehdo, Skurbuchan, Domkhar-Dho, Takmachik, Turtuk, Bokdang and Thang.

LADAKHI APRICOTS

For fresh consumption, the most preferred apricot variety is Raktsey Karpo for its appearance, sweetness, juiciness, aroma, and color. It contains significantly higher sorbitol that is used as a sweetener in various food products viz; sugar-free sweets and chewing gum. Fruit sweetness increase with increasing altitude. Apricots of Ladakh region have a comparative advantage as it does not coincide with the main apricot season and can be marketed over an extended period.

USES

Orange-reddish fruit of apricot are consumed as fresh and are preserved by drying, canning, frozen, and baby food. Fruits are also used in making wine, brandy and jam. Kernels are used for edible purposes while seed oil in the pharmaceutical, food and cosmetics industries.

Fruits contain a number of desirable secondary metabolites for human health. Antioxidant activity is quite high due to its rich polyphenolic content. Apricot is rich in carbohydrates, fibers, minerals, vitamins (A, C, K, and E), protein, soluble sugars, carotenoids, phenolics, pectin, fatty acids, and minerals. Fruit consumption maintains blood sugar, lowers blood cholesterol and body weight.



Dried Apricots



Apricot nuts



Stoneless dried apricots (Chuli)

Chutney from unripe fruits and papad from fully ripened pulp are good dietary supplements due to their antioxidants and fatty acids contents. Kernel oil is used in the cosmetic industry to make massage oils, soaps, creams, balms, and skin care lotions, besides being used in treating dermatitis and dandruff.



Apricot Papad



Apricot oil

PLANTING SEASON

Apricot nurseries are planted in the dormant stage during March and April. High mortality rates in planting occur after leaf emergence due to transplanting shock. Besides, direct transplanting in the field often increases mortality, especially in the initial two years. Growing nursery plants in polybags is quite successful, having a 95% success rate in field condition and helping in extending planting season.

CULTIVARS

The majority of the trees are of seedling origin. However, grafting is widely practiced in selected patches on seedling rootstock to grow premium quality cultivars, especially Halman and Raktsey Karpo. Wide variation exists within Halman and Raktsey Karpo. The other varieties grown are Narmu, Khante, Margulam, and Tokpopa.

CLIMATE REQUIREMENT

Apricots with white flesh and sweet kernel are best grown in dry temperate areas up to 3000 meters above mean sea level, whereas yellow flesh apricots with bitter kernel require slightly warm climatic conditions and are grown at 1000 to 1500 meters above mean sea level. For better fruit settings, long, cool winters with a frost-free period are required.

SOIL REQUIREMENT

Apricot can be grown on a wide variety of soils, but it thrives well on well-drained deep soils with good moisture-holding capacity and good organic matter. In the Ladakh region, wild apricots are grown in well-drained sandy soils with less fertility.

PROPAGATION

Apricots are propagated by budding. Wild apricot rootstocks, grown from seeds, are used for budding. Seeds need stratification for breaking dormancy before sowing in polybags. Seedlings are ready for grafting in one year. Grafting in first week of February is recommended.

LAND PREPARATION, SPACING, AND PLANTING

Digging of 1x1x1 meter size pits is done before 30 days of planting. Pits are filled with well-decomposed FYM and soil mixture. Seedlings of 1 year age transplanted to the main field at 3x3 meter spacing. Straw mulching is done for conserving soil moisture and weed control.

INTERCROPPING

Using interspaces of apricot plantation for intercropping provides income besides conserving soil fertility. Alfalfa, barley, wheat or mustard are grown as intercrops for an initial 2 to 5-years.

TRAINING AND PRUNING

Pruning and training of trees are not done in Ladakh. Trees gain height in the absence of training and pruning, leading to small and low-quality fruits.

IRRIGATION

Apricots require assured irrigation for cultivation. Irrigation frequency is maintained at 8 to 10 days intervals during hot and dry periods (May to June). Since the trees are sensitive to water logging, excess water should be drained out. The adoption of a micro-irrigation system is a viable option for the Ladakh region.

WEED CONTROL

Weeds compete vigorously with apricot trees. Ladakh being an organic state, cultural and manual weed control practices are followed. Mulching is the best practice to check weed growth.

MANURES AND FERTILIZERS

Apricots in Ladakh are grown without any manures and fertilizers, resulting in low productivity and small fruit size. The application of organic manure helps harvest good yields.

PESTS AND DISEASES

Climate change plays a challenging role in the growth and development of new pests in the region. Few insects that emerged in recent years are codling moth, aphid, and yellow tail moth. The yellow tail moth was not a regular pest, but it ruined the apricot crop in the Dha-Hanu and Sham belt of Ladakh during 2013-2016. Apricot plants infest with diseases like rot, dieback, wilt, powdery mildew, bacterial canker, and rust.

APHIDS: Aphid infestation remains severe on Halman cultivars compared to others. It damages floral and vegetative bud by sucking sap, due to which unfolding leaves curl up, remain stunted, get distorted, and later turn pale. Consequently, the fruit-set is poor with a pre-mature fruit drop and forming of sub-normal fruit. Severely infected ones get their leaves curling inwards and eventually dry out and shade.

CODLING MOTH: Codling moth (*Cydia pomonella*), a severe insect pest, is widely distributed in Ladakh. It is the most persistent, destructive, and difficult to control pests of fruit crops.

YELLOW TAIL MOTH: Yellow tail moth (*Euproctis similis*) is not a regular insect pest of fruit crops in Ladakh. However, it emerged as a major pest of apricot during 2013-2016 in Dha-Hanu and Sham belt of Leh district. Extensive defoliation of apricot trees is done by the caterpillar stage of the moth for their feeding activities, leading to reduced growth and destruction of fruits.

MANAGEMENT STRATEGIES

Cultural control methods are the most effective and economical way to avoid many pest problems and reduce trees' susceptibility to damage. Destroying the fallen fruit, removing dead leaves from trees after mid-November, removing the dead and injured twigs and branches, and removing debris removal where insect larvae harbors during winter.

HARVESTING

Fruits for fresh market are manually picked. Apricot fruits generally mature in July-August depending upon variety. Firm apricots are picked manually over 2-3 times for fresh consumption or processing. Fruits are plucked when the surface color changed from green to yellowish. For drying of apricots, fully ripen fruits are harvested.

YIELD

Apricot plant gives 50 to 85 kg fruits per tree. Plant of 20 years old tree can give 150-600 kg fruits. On a hectare basis, 15-25 tons of fruits can be harvested.

APRICOT DRYING

Generally, in Ladakh, apricots are sun-dried under the shade. However, nowadays, different types of driers are available. Solar drier gives an advantage in the time, appearance, and quality of dried apricots.



Drying process of apricots

CONCLUSION

The processing of the apricot can make apricot farming more profitable. Few privately-owned firms produce processed products in small quantities which are consumed mostly in local. Candys and papads are also made from apricot. Therefore, it is a good livelihood option for Ladakh dwellers. Cottage industries may flourish very well with market support. Enough scope is there to enhance the market share of apricot-based value-added products.

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