

LITCHI

Botanical name – *Litchi chinensis* L.

Family- Sapindaceae ; Sub-family- napeleae

Origin- South china

Chromosome no. - $2n= 28, 30$

Edible Part- fleshy aril

Fruit type- Nut

Auto tetraploidy found in litchi.

Introduction- The litchi is the most important sub-tropical evergreen fruit crop. Litchi fruit is famous for its excellent quality, characteristic pleasant flavour and attractive red colour. Litchi is liked very much as a table fruit all over the world but in china it is popular in dried or canned state. Dried litchi known as “Litchi Nut” which tastes somewhat like the raisin.

Nutritive value- Litchi fruit consists 60 % juice, 8 % rag, 19 % seed, 13 % skin which varies depending upon the variety and climate. Sugar contains 7-18 % but average 11.85 %, acid 0.20-0.64 %, vitamin C 40-90 mg/100g, 0.8-0.9 % protein, 0.3 % fat and pectin, calcium, iron and phosphorus also available in minute quantity.

Botany and classification-Litchi belongs to the sapindaceae or soapberry family and sub-family napeleae. This family consists of about 125 genera and more than 1000 species. Litchi tree grows to a height of 6-9 m with spreading branches and a dense light-green shining foliage.

Litchi trees bear 3 type petalless flowers. Panicle type racemose inflorescence with old season terminal bearing habit.

Soil and climate-Litchi grows best in deep, well drained, loamy soil rich in organic matter. pH range between 5.5-7 and high lime content also beneficial for litchi. Use of soil from under old trees of litchi for planting new ones, to assure presence of the mycorrhizal fungi at the new planting site.

Litchi being a subtropical fruit thrives best under moist subtropical climate. Litchi usually likes low elevation but can be grown up to an altitude of 800 meters with varying degree of success. Temperature range in summer less than 41* C and during winter greater than 1-4 C. Litchi survives below 0* C for short time but long duration causes freezing injury. Dry hot winds are harmful for litchi cultivation it causes fruit cracking. Humidity ranges between 70-85 % is best for litchi cultivation.

Improved Varieties-While selecting litchi varieties for planting an orchard, a few points should be kept in mind. Fruits of the varieties should be bright red colour and average fruit diameter should not be less than 4 cm. The fruits should not be prone to splitting.

The characteristics of the important litchi varieties are as follows:

Dehradun: Early, heavy and regular bearer cultivar. An attractive colour but fruit is susceptible to sunburn and cracking. Fruit ripening in second week of June. Pulp/stone ratio is 3.75:1 and T.S.S. is 17 percent.

Calcuttia: Late and heavy bearer cultivar suitable for hot and dry areas. 80-100 kg fruit per tree per year. Fruit ripening in 3rd week of June. Pulp/stone ratio is 4.78:1 and T.S.S. is 18 percent.

Seedless late: Late and alternate bearer with shrivelled seed and greater proportion of pulp in fruit. Pulp/stone ratio is 28:1 and T.S.S. is 18.7 percent.

Rose scented: Fruits have distinct rose aroma and attractive pink skin and heart shaped. Medium yielding and moderately susceptible to sunburn and cracking. Pulp/stone ratio is 6.40:1 and T.S.S. is 12.79 percent.

And other important cultivars are Saharanpur, muzzafarpur, bombai and gulabi.

Propagation: Litchi can be propagated from seed or through vegetative means.

Seed: Mostly seed propagation may be followed for raising rootstock because the trees raised from seed are very slow to come into bearing. Seed also loses its viability within 4-5 days of its extraction from the fruit.

Vegetative propagation: Litchi can be propagated through layering, cutting, budding and grafting. Air layering is used commercially for raising litchi plants because its success is higher than other vegetative methods.

Air layering: Air layering is also called “marcottage” in china and Hawaii and “gotee” in India. In this method a ring of bark, about 2 cm wide just below a bud, is removed from a healthy and vigorous twig of about one year old and 2.5-4 cm in diameter. The cut is then surrounded a mud ball containing rotted plant material or sphagnum moss, wrapped with polythene sheet. To make it practically air tight to keep it in position, both ends are tied with fine rope or rubber bands. When sufficient roots have formed in about 2 month's time, the branch is cut below the soil and sphagnum moss and potted in the nursery. After removing the air layers from the mother plant, at first it is desirable to provide some shade and protection from the wind and it is necessary to cut back the top of the branch, so as to secure a proper proportion of leaves to root.

Planting: The young litchi plant is very delicate and if proper care is not taken at the time of planting, the mortality after planting is heavy. First of all before planting, the land should be cleared of all the bushes and other wild vegetation and levelled with gentle slope on one side of the plot, on the opposite direction of irrigation source. Then pits of dimension 1 meter cube should be dug at the desired points a few weeks before the actual planting. These are kept open for 15-20 days and then refilled with a mixture of well-rotted Farm yard manure 20-25 kg, bone-meal 2 kg and sulphate of potash 400 gm and mix it properly with soil.

Litchi trees are usually planted according to the square system, 10 meter apart each way, i.e., in rows and plants. Water is applied immediately after planting. Rainy season is best for planting.

Cultural Practices:

Training and pruning: Training of young litchi plants to establish a good frame work is necessary. And pruning for removal undesirable growth and diseased plants part. Litchi trees bear flower on old and current season's growth so some pruning to promote new growth.

Manuring: It is also well-established fact that acute shortage of nitrogen, phosphorus and potassium seems to stunt to all forms of litchi growth, including floral initiation. An application of these nutrients has been reported to increase fruit yield. Micronutrients, such as Zn, Boron and copper, also play a important role in litchi

Nutrition, especially with regard to increase in flowering and fruit set, fruit drop and fruit quality.

The following fertilizer schedule is recommended for North Indian litchi orchard:

Age of plants (years)	Farmyard manure kg/tree	CAN kg/tree	Superphosphate kg/tree	Muriate of potash gm/tree
1-3	10-20	0.3-1	0.2-0.6	60-150
3-6	25-40	1-2	0.75-1.25	200-300
6-10	40-50	2-3	1.5-2	300-500
10 and above	60	3.25	2.25	600

Irrigation: Adequate soil moisture is considered essential for litchi cultivation. In areas, where annual rainfall is more than 125 cm and well distributed through-out the year, litchi can be grown without irrigation.

Adequate frequent watering is essential for the bearing trees. If litchi orchard is not frequently irrigated during the spring and summer months, there is chance to serve fruit drop. At fruit set, irrigation is given at three weeks interval which is reduced as the atmospheric temperature increases. During fruit development period irrigation should be given twice a week.

Tillage: maintenance of good sanitary conditions is a must for keeping an orchard in healthy and disease free condition. Cultivation plays a vital role in killing the weeds, to incorporate fertilizers and green manure and to facilitate absorption of water in the soil. Biological activities of the soil are also increased due to better aeration as a result of cultivation.

Intercropping: The litchi is a slow growing tree and takes at least six years to come to flowering and fruiting. Therefore, intercropping of young orchard, till the trees come into bearing is beneficial practice, both from the needed income and improved soil management point of view. At places near big cities vegetables are good intercrop.

Weed control: control of weeds in litchi orchard is an important aspect as these compete with the litchi plants for their nutrients and moisture. In India, weeds are controlled mainly by hand weeding or hoeing. Diuron or atrazine 2 kg active ingredient per acre as a pre-emergence.

Insect-pests:

Leaf roller: *Sllepta lunulis*

This pest is active from march to November. A very active green caterpillar rolls the leaf and feeds green matter within the roll. spray 800 ml of malathion 50 EC in 500 litres of water per acre.

Grey weevil: A small grey weevil feeds at the leaf edge cutting 'U' shaped. The insect is active from February to august. Two Spray of 1 kg sevin in 500 litre water per acre in 15 days interval.

Mites: *Eriophyes sp.*

Both adults and nymphs infest the leaves. The leaves become thick, curl up and eventually dry. Attack starts in march and serious in july. The mites can be controlled by spraying the trees with 0.05% Dimethoate.

Mealy bug: *Drosicha mangiferae*

Mealy bug does a lot of damage during flowering and fruiting stage when a large number of nymphs crawl up the tree and congregate on the growing shoots and panicles and suck the sap.

Diseases: Litchi is almost free from fungus disease.

Physiological Disorders:

Sun burning: In this disorder fruit becomes sun-burn like due to direct exposure to sun light.

Skin-cracking: Inadequate soil moisture, high temperature and low humidity during the early stage of fruit growth results in the skin becoming hard and inelastic, it may then crack when it is subjected to increased internal pressure as a result of rapid aril growth following irrigation. Follow proper irrigation schedule and mulching.

Harvesting:

Litchi fruit starts bearing in January to February and takes 55-65 days after fruit setting to get maturity.

The various criteria recommended for judging fruit maturity are days after fruit set, development of colour on fruit, flatness of tubercles and smoothness of epicarp and chemical changes in fruit,

Yield: It is a highly variable factor and depends upon the variety and age of plant, environmental conditions, incidence of pest and diseases and above all the upkeep of the orchard. Litchi trees takes 6-8 years for bearing. In India a full grown tree, on an average, bears about 80-150 kg/tree at the age of 15-20 year.

Storage: Litchi Fruit is highly perishable and requires special kind of post-harvest handling. Freshly harvested fruits retain its colour and quality only for 2-5 days at room temperature. Pre-cooled litchi fruits stored at 0-1* C can be kept fresh for approximately 30 days and shipped for distance market.