Review Article

Cape gooseberry: A new cash crop in India

Abstract

CAPE GOOSEBERRY (Physalis *peruviana* L.) is an annual growing fruit crop belonging to the family Solanaceae. It is cultivated in tropical and sub-tropical region of the world. Cape gooseberry is herbaceous or soft wooded plant usually reaches2-3 feet height. Capgooseberry is cultivated in different types of soils but sandy loam soil is preferred for getting higher production. The fruit of Cap gooseberry have better aroma with1.8% protein, 0.2% fat,11.5 % carbohydrate,10mg calcium,60mg phosphorous,18mg iron,49mg ascorbic acid ,vitamin A(2380 IU) and pectin0.9%. Due to the good amount of pectin present in Cap gooseberry its value added product Jam is made of very good quality.

Introduction:

CAPE GOOSEBERRY (Physalis *peruviana* L.) is an annual growing fruit crop belonging to the family Solanaceae. The plant of Cape gooseberry is herbaceous or soft wooded plant usually reaches 2-3 feet height. Cape gooseberry is extensively grown in tropical and subtropical region of the world. The latitude ranges is about 45^0S and 60^0N, it can be grows at high elevation up to 500-3000m from msl (1600-9800ft). The fruit is small (1- 3.5cm in diameter) yellow orange berry fruit enclosed by the large accrescent epicalyx and resemble tomato in shape with sweeter taste, better aroma and higher pectin content.It is also commonly called Poha or Poha berry in Hawaii, Golden berry in South Africa and Rashbhari, Makoi, Tepari, Husk cherry, Peruvian ground cherry in India. The name of Cape gooseberry is most probably derived from the name of "Cape of God Hope'' of South Africa where it was commercially grown.The ripe fruits are eaten as fresh fruit and used in making excellent quality of jelly, sauces and particularly jam for which it is called as "Jam fruit of India" The fruits are also

Picture: 1 Plant of Cape gooseberry

attractive sweet when dipped in chocolate or other glazes or pricked and rolled in sugar. The fruits contain 1.8% protein, 0.2% fat and 11.5% carbohydrates. It is also content 10 mg of calcium,60mg of phosphorus and 18mg of iron, thiamine 0.1mg and 1.70mg niacin and high level of vitamin A, B, C.

It contains 2380 IU of vitamin A and 49 mg of vitamin C, and produce 55 calories of heat per 100g.of fruit.(Khan and Gower,1955).

BOTANICAL CLASSIFICATION:

Cape gooseberry (Physalis *peruviana* L.)belongs to the family solanaceae. The family solanaceae contributes a number of economic crops such as potato, tomato, brinjal, chilli and Cape gooseberry belonging to different genera.The special features of this family are **taproot** system, stem- erect or climber, **Leaves**: Alternate, simple or pinnately compound (rarely),exstipulate; reticulate venation and the **gynoecium** is bicarpellary and syncarpous with superior **ovary** having axile placentation.The family solanaceae has 102 genera and nearly 2,500 species,many of considerable economic importance as food and drug plants. The genus *Physalis*,has 80 species some of which are important. The species *alkekengi* and *peruviana*produce edible fruit commonly known as winter cherry and cape gooseberry. Cape gooseberry is a diploid species with **2n = 48**, different chromosome numbers might exist among genotypes since 2n = 24 has been reported for wild ecotypes, 2n = 32 for the cultivated Colombia ecotype and 2n = 48 for the cultivated Kenya ecotype.

Picture 2: Mature fruit of Cape gooseberry.

Picture 3: Open calyx of Cape gooseberry

Picture4:Mature fruit closed by calyx

Origin and Distribution:

The species belongs to genus *physalis* are commercially grown in temperate and tropical region of the world. These are perennial in temperate region and annual in tropical and subtropical region. Cape gooseberry comprises of three species and they are originated from tropical Asia and South America. *Physalisperuviana* is originated from South America and are native of Peru and Northern part of chilli, rest other species (*ixocarpa* and *pubescence*) are originated from tropical Asia and Indian.

Portugeese and Spanish voyagers introduced this crop in various part of the world. Cape gooseberry name are derived from the name of Cape of Good Hope of South America where it is commercially grown. Presently this species *peruviana*is commercially widely grown in tropical and subtropical region of the world. Australia , Indonesia, Sri Lanka, India, Myanmar, Malaysia, Pacific Island, Bangladesh, Southern China, Vietnam, Cambodia, Southern Thailand, South African countries, Algeria and Western African countries, Portugal, Italy Greece. In the North, cape gooseberries can grow at an elevation up to 4,000 feet, and in the South, up to 6,000 feet. Regions of India cultivating the fruit commercially are West Bengal, north India, and eastern India. The perennial Cape gooseberry can grow wherever tomatoes grow In India's southern hill countries

SOIL:

Cape gooseberry can be grown in wide range of soil but sandy loam soils are best for higher production. Plant can be grown in plains and as well as hills up to elevation of 1800m.As an easy to grow plant, Cape gooseberry is adaptable to different soil conditions with a pH of 5.1-6 being perfect for them. They can grow in clay or sandy conditions though well-draining and somewhat fertile soil amended with compost and well-rotted manure will grow a very happy plant.

Climate:

A warm climate, similar to their native South American growing conditions is ideal for Cape Gooseberries. So wait until the soil temperature is 50-77°F (10-25°C) to plant them and preferably on the warmer side of this range. It can be grown in tropical and subtropical regions.

Sunlight:

Cape Gooseberries grow best in full sun of 6-8 hours perday, and they will also grow in partial shade. So pick a sunny spot in the garden to help this plant thrive.

Physalis *peruviana* varieties:

The genus Physalis is made up of many different species. In the following section we will introduce Physalis *peruviana* varieties.

Cape gooseberry (Physalis *peruviana*)

The tastiest and probably best-known physalis species is the Cape gooseberry, also commonly known as the ground cherry, golden berry or poha berry. The berries are packed with vitamins and the vibrant color makes them a popular edible garnish with a tangy-sweet flavour. Cape gooseberries can thrive in most environments from tropical to temperate climates, making them an excellent addition to any green space.

The best **Physalis *peruviana*** varieties:

Heitmann:

This variety, bred specifically for early ripening, can grow up to 150cm. The fruit is a little smaller than other types, but it makes up for that in the large quantity of husked berries it yields.

Inca Plum:

These plants grow up to 150cm high with a high yield of cherry-sized berries. The deep orange berries are sweet and juicy with just the right level of acidity.

Lady Madonna:

This juicy-sweet variety has strikingly elongated pods with large orange-yellow berries, and also grows up to about 150cm in height.

Little Lanterns:

This physalis is perfect for growing in a pot, in a hanging basket or on the balcony. They produce an abundant yield of cherry-sized, orange fruits.

Preciosa:

This is one of the smaller physalis varieties, only growing up to about 80cm in height. It produces lots of small golden-yellow fruits and ripens as early as mid-August

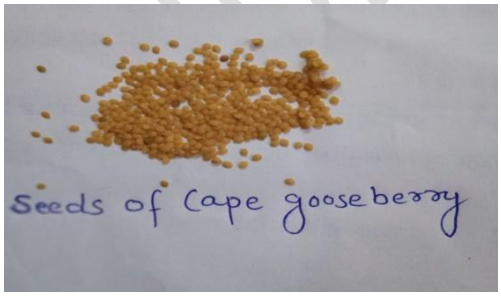
Schonbrunner Gold:

The sweet, tangy fruits of this variety are particularly large, and a lush dark yellow colour. The plant can grow up to 2m high.

CULTIVATION

Picture 5: Cultivation of Cape gooseberry

Picture 6: Seeds in Cap gooseberry fruit



Picture 7: Seeds of Cape gooseberry

Propagation:

Seed propagation is widely adopted in the propagation of cape gooseberry for annual crop, but the perennial crop which can be thrive upto 4 years may be propagated by vegetative means. The seeds of Cape gooseberry are very small so it is very difficult to sown. It is sown in the seed beds

for raising seedlings after that transplant in main field. Seed bed should be raised up to height of 8-10cm, wide1.5m and long 4 m. 4-6 kg of seed is sufficient for 1 hectare land transplantation.

For small area seeds can be grow in seed pans for easy handling. Seeds after sowing it should be covered with leaf mould and capiously watered.

In the case of vegetative propagation shoot cutting and layring are commonly practiced with varying success. One year old plant should be selected for vegetative propagation; cuttings should be at least 20-25cm long is selected from the mature but succulent shoots during the rainy season when the atmospheric temperature and humidity remain comparatively high. Layring are more effective as well as cuttings.

Planting and aftercare:

Time of seed sowing is varying accordingly climatic conditions of growing region. In Sub tropical region of annual production second fortnight of october is preferable for seed sowing in seed beds or seed pans. Seed should be sown before 6-7 weeks prior for open condition transplanting. When they attend height of 20-25 cm it should be transplanted in main field with spacing of 0.8-1.0 m between row and plant. Light irrigation and shade is required for few days.

Manuring:

Before transplanting soil should be prepared to fine tilth and well mixed with 20 tones FYM or organic manure and 3.5 quintal of single super phosphate, 1.2 quintals of muriate of potash and 1.0 quintal of urea per hectare.

Top dressing of 75kilogram urea per hectare is given 30 days after planting on seedling it is very effective for rapid growth and again 50 kg of urea should be applied 20-25 days afterwards.

Irrigation:

If natural irrigation is not available then 7-8 irrigation is required for proper growth. Depending on soil moisture irrigation should be given at 10-15 days interval. During the flowering time irrigation can be helpful for minimizing flower drop. During fruit development irrigation helps in increase production as well as fruit size and quality.

Fruit maturity:

Cape gooseberry became harvestable after 55 days of anthesis. Cape goosebeery is a climacteric fruit so matutre fruit should not be harvested. Over mature fruit shed naturally on the soil and spoil.Fruits should be harvested when fruit turn light greenish yellow in colour and stored in a room temperature until they turn greenish yellow to golden yellow in colour and after transported to market for sell.

Plant protection:

Cape gooseberry crop is less prone to disease and pests. Generally powdery mildew and leaf spot are occurs and it can be controlled by two foliar spray of wettablesulphur and 0.4% fitolan respectively intervals of 15 days applied.

Fruits are damaged by birds if they are over ripe so expose over ripening of fruit to resolve this damage.

Yield:

Cap gooseberry is a minor crop it is cultivated as an intercrop in orchard, it gives additional income to the farmers to maximize land utility.

Generally cap gooseberry produce 4-6 tone cap gooseberry per hectare. Perennial variety produce higher yield.

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