

CAPE GOOSEBERRY GROWER'S MANUAL

Scientific name: (*Physalis Peruviana*)



1.0 Introduction

Cape gooseberry is an indigenous tropical and subtropical it can survive in extreme hot and cold climatic season. It is a small to medium sized deciduous tree and can grow up to 1.5m in height with crooked trunk spreading branches. Cape gooseberry is commonly known to grow naturally in the wild but currently farmers are growing it commercially. The fruits are green but turn orange-yellow upon ripening.

1.1 Uses

The fruit is referred to as a wonder fruits due to its many health benefits. It is power house of antioxidant, ease digestion, promote weight loss, good for eyesight, regulation of blood pressure and control and management of diabetes. It is used in baked goods and to make jams, chutneys and sauces.

1.2 Counties grown

In Kenya, gooseberries are grown in Kiambu, Nakuru, Kericho, Kisii, Embu, Nyandarua, Nyeri, Kirinyaga and Transnzoia.

1.3 Ecological Requirements

For good performance gooseberry requires:

Rainfall. 650-900 mm.

Soil: Light to medium heavy soil high in organic matter and not purely sandy with PH 5.5-7.5.

Temperature:

Day time temperature of 22-28°C and night temperature of 7-13°C.

2.0 Good Agricultural Practices (GAPs)

Horticulture industry in Kenya is guided by a code of practice KS1758 which is a standard for flowers, vegetable, fruits, herbs and spices for both local and export market. The standard aims at ensuring food safety, environmental sustainability and social accountability by following good agricultural practices from production, processing, transportation and marketing of fresh produce.

The manual seeks to adopt climate smart technologies aimed at increasing production and productivity, enhancing resilience and reducing greenhouse gas emissions

2.1 Crops Establishment

Before establishing your crop, prepare a crop calendar based on market survey findings. This will guide on when and how to go about crop establishment and management.

2.1.1 Land preparation.

The land should be ploughed and harrowed to fine tilth preferably during the dry season. Crop rotation is recommended and should not follow a crop of solanaceous family.

2.1.2 Soil and water testing

The testing is recommended before planting to guide on fertilizer and manure application and water suitability for irrigation.

2.1.3 Planting and Spacing.

Gooseberry is propagated by seeds or stem cuttings for commercial purposes. The seedlings can be acquired from registered commercial nurseries. The recommended spacing is 1 m within the row and 1.5 between the rows. Apply farmyard manure at planting.



Fig1: Illustration of planting spacing of Goose berry

2.2 Crop Management

2.2.1 Crop and water requirement

This depends on crop water requirement determined by the stage of the crop, soil type and prevailing climatic conditions.

2.2.2 Crop nutrition.

It is recommended that green-manure preferably from legume crops (cowpeas, desmodium and beans) are incorporated into the soil to improve soil fertility. Optimal yield can be attained with minimal or no fertilizers.

2.2.3 Mulching and Weeding

Mulching is recommended for water retention and weed control. For maximum production, the field should be kept weed free.


2.2.4 Pruning and Training/ Trellis



Weak branches and suckers should be removed. The plants should be cut back at maturity to induce regeneration or new growth for the following next crop. This is done just before the beginning of the rain season. Gooseberry is a bushy crop with thick branches. Training by trellis is necessary for the plant during growth. Trellis makes it easy to carry out agronomical practices, hence improved production and quality of the fruits.




2.2.5 Pest and Disease Management



Integrated crop management (ICM) is the best option for food safety. These practices include scouting of pests, field hygiene, proper spacing, physical methods, and biological methods like use of pheromone traps and others that will only give option of using Pest Protection Products as last option. The products must be registered for use on the crop in Kenya. (www.pcpb.go.ke/list-of-registered-products/)

Common Pests

Pest/Disease/deficiency	Symptoms/Signs	Control
Red spider mite (<i>Tetranychus</i> Spp) 	<ul style="list-style-type: none">-Infested leaves turn silvery and brownish in colour-The leaves have cobwebs on the lower leaf surface-The pest develops	<ul style="list-style-type: none">-Weed control to remove alternate hosts-In severe infestation, burn the plants.-Intercrop with Onions or garlic.-Practice field hygiene.

<p>Photo: Fauna Press/FLPA Images of Nature Copyright: Flora Press/FLPA</p>	<p>rapidly during warm dry weather -High population causes drying and defoliation of leaves Which leads to smaller and lighter fruits.</p>	<p>-Plant host Plants for predatory mites such as pigeon peas. -The natural enemy <i>Phytoseilus pepersimilis</i> (predatory mite) has been very effective when used in greenhouses -Foliar sprays with recommended chemicals</p>
<p>Cutworms (<i>Agrotis</i> spp)</p>  <p><small>Photo courtesy of: M.D. Agriculture, Soils & Crops Branch</small></p>	<p>-Early in the season, cutworms may cause stand loss by cutting off seedlings or recently planted plants at the soil line - Later in the season, the pests can also injure by eating irregular holes in the surface of the fruits -Infestation are sporadic and more common in weedy spots, soils high in Organic matter and poor drainage.</p>	<p>-Early land preparation and elimination of weeds at least 2 weeks before planting. -Use of the bio-pesticide <i>Bacillus thuringiensis</i> (B.t.) -Soil solarization -Chemical sprays with recommended chemicals</p>
<p>White flies (<i>Bemisia tabaci</i>)</p>  <p>Photo: Clemson University - Extension Slide Series, Bugwood.org (CC BY USDA Cooperative)</p>	<p>- White mealy flies that fly from foliage when Plants are disturbed. -They suck sap and infested plants are low in vigor, may wilt, turn yellow in colour and eventually die. -The larvae secrete honeydew which support growth of black sooty mould</p>	<p>-Keep the field weed-free through regular Weeding. -Mount yellow sticky traps to monitor population. They Can also be used for mass trapping of adult flies. -Use of neem products</p>

<p>Slugs/Snails</p>  <p>https://www.bitesizedgardening.co.uk</p>	<ul style="list-style-type: none"> -shiny trail of mucus they leave behind as they move. -formation of irregular holes -plant wilting due to roots damage 	<ul style="list-style-type: none"> -Collect and remove slugs by hand to reduce populations. -Use of predators' e.g. hedgehogs, toads and ground beetles, -Use parasitic nematodes. -Drowning the slugs in water (bury tins at ground level and fill with water) and add yeast to attract the Slugs. -Use of molluscicidal pellets containing Iron phosphate. -Organic pellets
<p>Aphids (<i>Myzus persicae</i>)</p>  <p>https:// oxfarm.co.ke</p>	<ul style="list-style-type: none"> -Aphids feed by piercing and sucking sap from tender shoots and leaves -Young shoots and leaves become stunted -leaves are curled and twisted. -They transmit Mosaic virus disease 	<ul style="list-style-type: none"> -Crop rotation -weeding -Use biological control like parasitic wasp and neem based insecticides -Use pyrethrin based pesticide.
<p>Powdery mildew (<i>Leveillula spp.</i> (<i>Oidiopsis</i>))</p>  <p>© A.M. Varela, icipe</p>	<ul style="list-style-type: none"> -The leaves are covered with gray-white powdery fungal patches. -fruits turn brown as they age when infected by powdery mildew. -Infected leaves may become distorted, turn yellow with small patches of green, and fall prematurely. 	<ul style="list-style-type: none"> -Prune and open up the canopy to allow air flow and hasten drying of foliage.

<p>Damping off. (<i>Rhizoctonia solani</i>)</p>  <p>https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.gardeningknowhow.com</p>	<p>-Plants wilt and suddenly die. -Roots have dark coloration or milk area when dissected.</p>	<p>-Control by digging ditches along contours to improve drainage -Planting on raised beds -Thin the seedlings in seedbeds to permit good air circulation. -Avoid excessive watering and fertilization, particularly with nitrate. -Avoid field operations when wet.</p>
<p>Leaf spot(<i>Cercospora capsici</i>)</p>  <p>https://www.dreamstime.com/leaf-spot-disease-cape-gooseberry-plant-wilt-image199106811</p>	<p>-Irregular spots on leaves that are brown or tan in the center with a cream/yellow border.</p>	<p>-Control by Pruning plants to allow the leaves to dry up quickly. -Use sulfur according to the manufacturer's recommendation.</p>

2.3 Harvesting.

It takes 14-16 weeks from planting to harvesting

2.3.1 Maturity indices

Maturity indices of Gooseberry includes:

- Calyx turning to light brown color.
- Color of fruit change to yellow orange
- Husk turn to beige.

2.3.2 Harvesting method

Picking is done by hand every 2 to 3 weeks, although some growers prefer to shake the plants and gather the fallen fruits from the ground in order to obtain those of

more uniform maturity. Harvested cape gooseberry should be put in clean plastic crates.

In rainy or dewy weather, the fruits are not picked until the plants are dry. Berries that are wet should be dried in the sun for a short time then stored under shade.

2.3.3 Expected Yield

The average yield is 2 to 4.5 tons per acre depending on agro-ecological zones, soil-type, soil nutrition management and crop management practices.

2.4 Post-harvest handling techniques

2.4.1 Sorting

Remove and discard any diseased or damaged fruits. This should be done in a cool, clean collection shed.

2.4.2 Packaging

Packaging of harvested fruits should be done to maintain quality, preferably in crates and transported in closed trucks as per the Crops (Horticultural crops) Regulation 2020.

2.4.3 Storage

The fruit should be stored under shade in a fully aerated room. It is recommended not to remove the calyx until ready for use. Fruits with intact calyx have a shelf-life of 4 to 6 weeks if kept at room temperature in a well aerated room.

For prolonged storage (4 to 5 months), gooseberry fruits should be stored at 2-4°C.

3.0 Gross Margin analysis for 1 acre as at 2024

Item	Unit	Quantity	Cost/unit	Total Cost
Gross Income GI	Kg	4,000	100	400,000
Variable cost				
Seeds	gm	40	120	4,800
Land leasing	acre	1	15,000	15,000
Soil test	1	1	3,000	3,000
Manure	Tons	20	1,000	20,000
Ploughing	acre	1	5,000	5,000
Harrowing	acre	1	3,500	3,500
Transplanting	Mds	6	500	3,000
1 st Weeding	Mds	7	500	3,500
2 nd Weeding	Mds	7	500	3,500
3 rd Weeding	Mds	7	500	3,500
Foliar	lts	4	500	2,000
Fungicides	Kgs	1.5	1,100	1,650
Insecticides	lts	2	600	1,200
Spraying	Mds	2	550	1,100
Harvesting	Mds	9	400	3,600
Total Variable cost				74,350
Gross margin (Gross income-Total variable cost)				325,650

References

1. Tyagi S. and Sahay S. (2016). Cape Gooseberry (*Physalis peruviana* L.): A new cash crop in India. <http://www.krishisewa.com/articles/production-technology/722-cape-gooseberry>
2. Cape Gooseberry (*Physalis peruviana* L.) Growing and Utilization in Kenya <https://www.kalro.org/crops-propagation-e-books/cape-gooseberry-physalis-peruviana-l-growing-and-utilization-in-kenya/>
3. Training Systems for Cape Gooseberry Production in South of Brazil Cultivated in Latosol <https://juniperpublishers.com/artoaj/ARTOAJ.MS.ID.556193.php>
4. How to Grow Cape Gooseberry <https://www.gardeningchannel.com/grow-cape-gooseberry/>
5. https://infonet-biovision.org/plant_pests
6. <https://www.kalro.org/divisions/crops/gooseberry/>