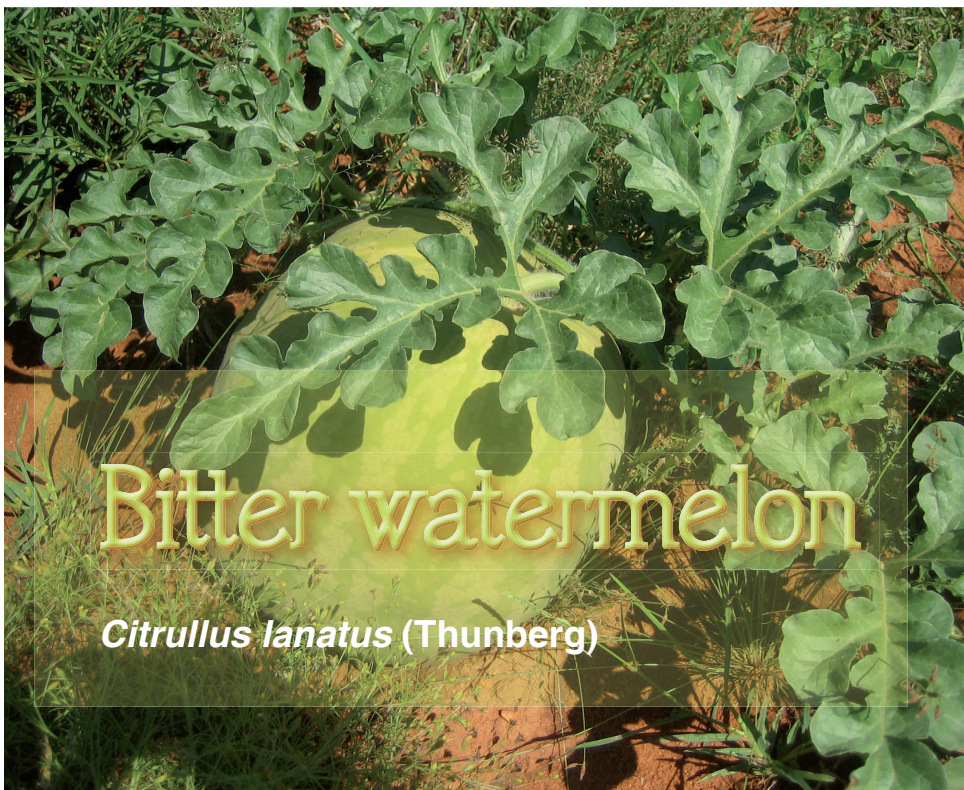


• PRODUCTION GUIDELINES •



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Department:
Agriculture, Forestry and Fisheries
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Bitter watermelon

Citrullus lanatus (Thunberg)

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CONTENT

General aspects	1
Cultivation practices	4
Post-harvest handling	6
Utilisation	6
References	7

GENERAL ASPECTS

Classification

Scientific name: *Citrullus lanatus* (Thunberg) Matsum. subsp. *Lanatus*
Common names: Tsamma melon, wild watermelon, karkoer, makataan, T'sama, Lerotse
Family: Cucurbitaceae

Origin and distribution

Bitter watermelon originated from southern Africa and occurs naturally in South Africa, Namibia, Botswana, Zimbabwe, Mozambique, Zambia and Malawi. It is widely distributed in Africa and Asia.

Production levels

South Africa

Bitter watermelon is produced in the warmer parts of the entire country and in more or less sandy, drier areas of southern Africa, chiefly in the Kgalagadi region of the Northern Cape. It is also found growing or under cultivation in the Mpumalanga, North West, Limpopo, KwaZulu-Natal, Free State, Western Cape and Eastern Cape provinces. No statistical data are available on the production levels of bitter watermelon in South Africa as the crop has not entered the market.

International

The plants cultivation spread slowly into the rest of Europe and by the early 1600s it was being widely cultivated, although generally only on a small scale. The plant grows best where there are long, hot summers. As one goes north in Europe, conditions for growing them become more unsuitable. North American Indians took to watermelons enthusiastically



when they were introduced there by Spanish explorers in the 1500s. Through passing of seed from tribe to tribe, watermelon cultivation in North America spread faster than European exploration of that region. Bitter watermelon is traditionally cultivated in intercropping farming systems, especially in Africa. Although bitter watermelon is cultivated in many countries, there are no statistical data on the production and marketing trends of the crop.

Major production areas in South Africa

Bitter watermelon is produced in all provinces of South Africa, although it is not common in some other parts of Mpumalanga, KwaZulu-Natal, Eastern Cape and Western Cape.

Cultivars

Many varieties of the plant have been cultivated in Africa, varying in fruit size, fruit shape, flesh colour, rind colour and seed colour. No cultivar of bitter watermelon has been developed in South Africa yet.

Description

Mature plant

The plant is a creeping annual herb that can grow up to 10 m long.

Stems

The stems are rather firm and stout; up to 3 m long with curly tendrils and normally lie or creep on the ground with curly tendrils.

Roots

The plant features a highly branching taproot, extending up to 1 m deep into the soil.

Leaves

The leaves are herbaceous, but rigid. They are 60 to 200 mm long and 40 to 150 mm wide. The leaves are hairy, deeply palmate, with 3 to 5 lobes and a petiole which is approximately 2 to 19 cm long. The leaf stalks are somewhat hairy and up to 150 mm long. The tendrils are rather robust and are usually divided in the upper part.

Flowers

Male and female flowers occur on the same plant with the hairy flower stalk up to 40 m long. They are pale green in colour.



Fruit

The fruit shape and appearance are quite varied, ranging from round to cylindrical. The fruit size also varies from small to very large, about 1,5 to 20 cm in diameter. The fruit is normally yellow or light green to a single colour to various striped patterns on the fruit surface. The skin can be solid green or green striped with yellow. The pulp varies from yellow or green to dark-red colours.



Seeds

The seeds are numerous, flat and oval, and are mostly 6 to 12 mm long. They vary in colour ranging from red, black or dark brown; and sometimes even white or mottled.



Essential parts

Essential parts are tender leaves, seeds and fruit.

Soil and climatic requirements

Temperature

The crop is sensitive to cold temperatures and best suited for any climate that has a long, warm summer, with temperature ranging from 18 to 35 °C.

Soil requirements

Bitter melon prefers loose, sandy and well-fertilised soils. The crop does best on a rich, sandy loam, although it will grow in most soil types

provided the soil is well drained. It also grows best at a soil pH of between 5,6 and 7,0, but will tolerate a pH as low as 5,0.

CULTIVATION PRACTICES

Propagation

Watermelons are propagated by seed.

Soil preparation

The soil should be prepared one month before planting. The field should be deeply ploughed and the ground levelled, using harrow. All stones should be removed. Raised beds about 10 to 50 cm high are recommended to improve drainage and rooting.

Remove all the weeds, particularly perennial grasses, before planting. The soil may be fertilised with organic or inorganic material.

Planting

Bitter watermelon is usually direct seeded. It is planted in rows 2 to 2,5 m apart and spaced 0,5 to 2 m between the plants. It is often intercropped with maize and sorghum.

Fertilisation

The crop responds well to fertiliser and the quantity required, depends on the nutrient status of the soil. When using chemical fertiliser, it is recommended to use a 2: 3: 2 or 3: 2: 1 mixture at the general application of 40 g/m.

When using poultry or pig manure, a 10-ℓ bucket is recommended to cover an area which is 20 cm wide and 15 m long. The same procedure is applicable for the use of kraal manure, but a 10-ℓ bucket is recommended to cover 5 m.

Irrigation

The plant has deep roots and can survive relatively dry conditions. However, it requires regular irrigation to avoid water stress. The plant has a high rate of water loss via evaporation and therefore supplementary irri-

gation is necessary, especially when the crop is grown on light, sandy soils. Drip or trickle irrigation is recommended in areas where water conservation is critical. Plenty of water in the first two months of its growing period. Irrigate with at least 4,5 to 5 l of water per day. Excessive water application should be avoided to prevent the leaching of nutrients.

Weed control

Weed control can be done through cultivation, by hand or hoeing. The weeding should be done two or three times before placing a thick vegetative cover on the ground. The process should be done 6 to 8 weeks after sowing. Pre and post-emergence herbicides can be used and when these are used, application to the weeds should be 3 days before sowing the crop.

Pest control

The most important pests, among others, are aphids, spider mites, spotted and striped cucumber beetle and thrips. Some natural predators such as ladybirds and soldier beetles can be used to feed on the eggs or adults of some pests. It was reported that repellent plants such as broccoli and radish can be planted with bitter watermelon to ward off some pests like cucumber beetles. A mixture of wood ash with hydrate lime or hot pepper and garlic in water can be sprayed onto the leaves to control some of the pests. Other pests, such as root-knot nematodes (*Meloidogyne incognita*), should also be controlled when they cause problems.

Disease control

The plant is susceptible to a wide range of diseases, among others, downy mildew (*Pseudoperonospora cubensis*), *Cercospora* leaf spot (*Cercospora citrullina*), damping off (*Macrophomina phaseolina*) and anthracnose (*Colletotrichum*).

Diseases can be controlled by planting disease-free seeds. Other methods such as soil fumigation, good sanitation, crop rotation and mulching are recommended to control diseases. Overhead irrigation should be avoided to minimise wetting of the leaves.

Harvesting

Harvesting maturity

The fruit of watermelon reaches maturity within 75 to 95 days after planting. When the fruit is ready for harvest, normally the tendril right behind each fruit will dry down to the base.

Harvesting methods

A sharp knife is used to cut the fruit from the vine, rather than pulling, twisting, or breaking it off (to reduce the chances of stem decay). Leave a long stem on the fruit.

POST-HARVEST HANDLING

Sorting and grading

The fruit is sorted and graded according to size and colours. Damaged fruit is discarded.

Storage

The fruit should be cooled as soon as possible after harvest and can be stored satisfactorily at 15 °C for up to 2 weeks. For long-term storage, the fruit should be kept at about 12 °C.

Transport

The fruit is susceptible to breakage and bruising and should be handled and transported with care. After harvest, load the fruit directly into the truck for the market or haul it to a central grading station for reloading. Traditionally, the crop has been hauled in bulk, using trucks.

UTILISATION

The fruit of bitter watermelon is a source of water in dry seasons. The leaves and young fruit are utilised as green vegetables. The roasted seeds are edible. The juice is made into a fermented drink and syrup. Fresh flesh can be cooked for making porridge. The fruit is also used for making jam.

The fruit is mostly used as fodder, but also for the production of citron peel or pectin.

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