



How to Grow Watermelons

Zambia Agribusiness Society

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Introduction

History and Background

Watermelon, [Citrullus lanatus](#), is part of the [Cucurbitaceae](#) family and is thought to have originated in Southern Africa. Today, watermelon is cultivated all over the world on all five continents.

Watermelon is frost sensitive and are *monoecious* (both male and female flowers are produced on the same plant). The flowers remain open for approximately a day and are insect pollinated. Watermelons are usually eaten as fruit, in fruit salads or as deserts.



Figure 1. Fruit Salad

Sweet and delicious, watermelons contains vitamins A, B6 and C and a significant measure of [lycopene](#), a phytonutrient, good for heart, bone and prostate health. The antioxidants in watermelons maintain the body's cells and protect against cancer.

Fat-free and low in calories, the fruit scores high on weight-loss diets. And since watermelon is about 92% water, it is a great way to hydrate when temperatures are high.

Climatic Requirements

- Optimum germination temperature: 27-32°C, with night temperature not lower than 24°C.

- Optimum growth temperatures at night are 18-20°C, and day 24-30°C, and for ripening 15-25°C.

Soil Requirements

- Watermelons can be grown on a wide range of soil types although sandy soils are preferred. The highest yields will generally be produced on well-drained sandy-loam soils. Heavy clay soils, soils with obstructed drainage, or very shallow soils should be avoided.
- Soil pH should be about 5.8-6.2 (H₂O). It is usually recommended to lime soil with pH values below 5.5 (H₂O).

Product Types

All Sweet type watermelon varieties produce cylindrical and elongated fruit with a medium-green and dark-green striped rind and bright red flesh. The All Sweet types can produce fruit of medium, large or jumbo size depending on the cultivar.



Figure 2. Sweet Type Watermelon Variety

Crimson Sweet type watermelon varieties produce oval to round fruit with deep red/pink flesh and a pale-green and medium-green striped rind. The fruit can range from small, medium, large or jumbo size depending on the cultivar.

The Super-Small type watermelon varieties produce small fruit with very small seeds. These varieties have exceptional flesh quality and colour. Various cultivars with a range of rind patterns are available.

Fruit also vary from round to oval in shape, depending on the cultivar. They are intended for select markets, as they display well in retail stores.

Seedless watermelons are available with red, orange or yellow flesh and various rind patterns. These cultivars have exceptional flesh quality and colour. The fruit can range from small, medium or large size depending on the cultivar.

Cultivation Practices

Soil Preparation

Soil must be thoroughly and deeply cultivated to obtain a good root system. This allows optimal use of moisture and helps to prevent soil-borne diseases. The roots develop at a depth of 30-40cm and the soil structure at that level must be optimal. Soils must be free draining to below 1.2 m.

It is advisable that plants are grown on raised beds of at least 10cm high. Beds should be 1.8m to 2m apart (from bed centre to bed centre) and as wide as possible on top. Paths should be at least 60 cm wide.

Planting Periods

Watermelons are mostly planted in the spring and through the summer months, with limited planting during the winter in the warmer Northern part of South Africa.

Plant Population and Spacing



Figure 3. An ideal Plant Population and Spacing

A general spacing of between 4,000 to 8,000 plants per hectare is recommended.

Seedling Production

The seed of triploid watermelons is notoriously sensitive to very specific conditions during germination, as the tiny embryo is contained in a relatively large, hard seed coat. Temperature and moisture control is crucial to success, and too much moisture during germination can kill the seed.

Due to the higher seed cost, and since the outside climate is very difficult to control or predict, it is highly recommended to have seedlings made by a reputable nursery.

Transplanting Seedlings

Seedlings must be transplanted and watered as soon as possible after they have been obtained from the nursery. Planting trays should be kept cool and moist in the shade until used. When transplanting, roots should not be damaged by application of unnecessary pressure around the root module. Soil should be watered into contact with the roots rather than pressed in.

Interplanting Of Pollinators with Triploid Watermelon

It is necessary to interplant seedless (triploid) watermelons with a diploid watermelon as pollinator in order to achieve fruit set. The pollinator planting pattern may vary depending on individual grower requirements. The triploid x pollinator (diploid) planting ratios may vary depending on the season.

Viable pollen only travels approximately 2m, and more bees are necessary in order to achieve successful pollination. In the early season and in times of difficult pollination it is advisable to plant at a ratio of 2:1. In the main summer season under good conditions 3:1 seedless: pollinator ratio should be sufficient.

Fertilization

A pre-plant soil analysis should be done at least six months prior to planting, as this forms the basis for planning the fertilizer program. The soils should be analysed for EC (Electrical conductivity), pH, Na, P, K, Ca, Mg, Zn, S, B and Mo. Watermelons are reasonably sensitive to salt, displaying a 50% yield reduction in the range of EC 4-6 (mMhos/cm at 25 C). Consult a fertilizer or soil specialist on other remedies needed in terms of a soil sample result.

Approximate nutrient requirements depending on soil type, soil analyses, and crop load;

- N: 90-170 kg/ha: 30% pre-plant and the balance as two side dressings.
- P: 15-180 kg/ha: Apply pre-plant and work down to root depth.
- K: 40-250 kg/ha: 30% pre-plant and the balance as two side dressings, simultaneously with the N-application (e.g. KNO₃).

In addition to soil analyses, the water quality should be analysed as it can affect the growth of the plant.

Irrigation

Stage 1: Sowing To Emergence: Irrigate with plain water to field capacity, to a depth of at least 1m before sowing/transplanting. Keep the soil profile at field capacity until seedlings have emerged or roots are growing strongly from the seedling module.

Stage 2: Emergence To First Fruit Set: Plants should be watered more heavily at a lower frequency prior to fruit set. Use plant colour as a guide. Allow plants to get a

little stressed in order to induce deep root growth. When areas of stressed plants develop in the field at midday, apply water.

Stage 3: First Fruit Set to Harvest: During fruit enlargement, irrigation should be frequent and light. Irrigation should be reduced or stopped 7 to 10 days prior to harvest.

Bees and Pollination

Watermelon plants have separate male and female flowers on the same plant and bees are needed for pollination. When flowers appear, 2 to 4 bee hives should be placed per ha (up to 6 hives if there are no natural bees in the area).

Harvesting

Generally harvesting occurs 11-17 weeks after planting. One field can be harvested several times, 2-3 days apart. Maintaining healthy plants and care during harvest may allow subsequent fruit sets to develop and these may take several weeks longer to reach maturity.

Watermelon is harvested at full maturity and typically does not develop in internal colour or increase in sugar after being removed from the vine. Flesh colour should have reached a mid-pink to deep pink-red or crimson colour (characteristic of the cultivar) and must be firm and crisp.

Watermelon maturity can be determined by a combination of indicators:

- External fruit rind colour.
- Buttery-yellow colour of the ground spot.
- Various stages of floral bract (leaf) and tendril drying out near the fruit peduncle.
- Dull sound when thumped.
- Slight cracking sound internally, when whole fruit are pressed.
- Internal flesh colour should be properly developed and characteristic of the cultivar.
- Brix with a minimum refractometer reading of 9° Brix can indicate maturity.

Samples should be tasted throughout the field to confirm acceptable harvest indicators.

Watermelons should be harvested in the early morning, as hot fruit respire much more rapidly and lead to over-ripe fruit on delivery.

Cut the stem about 2-4 cm long; do not pull fruit from vines. The longer stems make it more difficult for rots to enter the watermelon. Regular sanitation of knives and pruning scissors is essential.

Harvested fruit should be kept under shade and transported to the pack house within the shortest possible time to prevent the fruit temperature from rising and minimise moisture loss.