

Watermelon (*Citrullus lanatus* Thunb. Matsumara & Nakai)

French: Pastèque; Spanish: Sandía; Italian: Cocomero; German: Wassermelone

Under Temperate Conditions

Crop data

Herbaceous annual of tropical African origin, trailing with branching stems up to 5 m long, and roots branched in upper 60 cm of soil. Harvested part: very heavy (2 kg to >20 kg), fleshy, multi-seeded fruits containing about 90 % water.

Plant density: 0.5-1.0/m², sown with pre-germinated seeds or transplanted with pot plantlets in rows according to the cultivar.

Protected cultivation under low tunnels is increasingly common. Yields: 25-75 t/ha. Prefers light to medium soils, well-drained and slightly acid (up to pH 5.5).

Requires temperatures of 21°-35 °C for seed germination, 35 °C for quick emergence and 21°-30 °C for growth, with a long frost-free growing season. Although it can withstand dry conditions the crop should be irrigated, mainly during fruit growth.

Nutrient demand/uptake/removal

1.7 kg N, 1.3 kg P₂O₅, 2.7 kg K₂O, 0.7 kg MgO per t of fruit. Peak uptake of nutrients and water occurs during fruit swelling.

Fertilizer recommendations

At least 30 t/ha of organic manure should be distributed along the rows or near plant holes. Experimental results suggest fertilizer application rates of 50-100 kg N, 100-150 kg P₂O₅, 140-200 kg K₂O per ha, which could be applied along the rows but not too close to the seed in order not to damage germination. N should be applied in split dressings, at planting, at branching, just before flowering and after setting of the first fruit, preferably in nitrate form. K is considered important in preventing fruit cracking. Application of calcium sulphate may be needed to lower the pH of alkaline soils.

Watermelons are sensitive to deficiencies of Mg, B, Fe and Zn. Foliar sprays of these nutrients, in some cases, have proved useful in enhancing the sugar content of the fruit.

Under Tropical/Subtropical Conditions

Crop data

Annual. Harvested part: Fruit. Flowers about 80 days after planting. Harvested 75 - 95 days after planting.

Plant density: 4 500 to 9 100 plants/ha. Preferably grown in sandy or sandy loam soils. Watermelons grown in heavy soils are subject to fruit cracking. Tolerant of acid soils. Adapted to a low ambient humidity.

Target marketable yields in intensive commercial production: 15 - 30 t/ha.

Nutrient demand/uptake/removal

Nutrient uptake/removal - Macronutrients					
Yield t/ha	kg/ha				
	N	P2O5	K2O	MgO	CaO
15	56	16	100	25	98
Source: various					

Plant analysis data

Plant analysis data - Macronutrients (optimum fertility conditions)							
Plant part	Growth stage	% of dry matter					
		N	P	K	Mg	Ca	S
Young mature leaf	Mid season	3.6	0.48	2.7	0.5	1.3	0.1
Source: various							

Plant analysis data - Micronutrients (optimum fertility conditions)						
Plant part	Growth stage	ppm dry matter				
		Fe	Mn	Zn	Cu	B
Young mature leaf	Mid season	33	30	15	4	15
Source: various						

Fertilizer recommendations

N or Mg deficiency will reduce fruit-set. Dolomitic limestone should be applied to offset Mg or Ca deficiencies. Pre-plant broadcast applications are recommended in preference to band-applied preplant fertilizer to prevent seedling salt injury. Cu deficiencies in organic soils may drastically reduce yields.

Present fertilizer practices

Senegal (Camberene)

In a light sandy soil in a semi-arid area apply 10 t/ha of organic manure, 60 kg/ha N, 60 kg/ha P2O5 and 120 kg/ha K2O in the following manner: All organic matter and one-third of the N, P2O5 and K2O broadcast before planting, another third sidedressed when the runners start to grow, and the remainder during the fruit enlargement stage.

Brazil (Minas Gerais)

Apply, firstly, 40 kg/ha N, 160 kg/ P2O5, and 90 kg/ha K2O incorporated in the soil at planting and, secondly, 100 kg/ha N broadcast in two equal dressings 15 and 30 days after transplanting.

Alternatively, incorporate 5 t/ha organic matter into the soil two or more weeks before transplanting.

Philippines

In the dry season apply 120 kg/ha N, 120 kg/h P₂O₅, and 120 kg/ha K₂O. Band one third at planting, sidedress the second third when the vines have reached about 1 m in length, and the remaining third when the first fruit is about the size of an egg.

Hawaii

Apply 224 kg/ha N, 600 kg/ha P₂O₅, and 220 kg/ha K₂O. Apply half the fertilizer at planting and the rest four weeks after planting. If the soils are low in Mg apply 170 kg/ha of magnesium sulphate.

Further reading

ELMSTROM, G.W.; FISKELL, J.G.A.; MARTIN, F.G.: Watermelon yield and quality: Effect of fertilizer rate and placement. Proc. Fl. St. Hort. Soc. 86, 196-200 (1973)

TAKEDA, K.Y.: Watermelon production. Hawaii Coop. Ext. Serv. Commodity Fact Sheet WA-3(A) (1981)