WATERMELON CULTIVATION TECHNOLOGY

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Abstract. *Watermelon is cultivated worldwide for its large edible fruit in favorable climates from tropical to temperate regions. It is a berry with a hard shell and no internal compartments, sweet, juicy, flesh usually dark red to pink, with many black seeds, sometimes seedless varieties are available. The fruit can be eaten raw or pickled. It can also be mixed into juice or drinks. Work in the framework of large harvests has created varieties resistant to various diseases. There are many cultivars that produce ripe fruit within 100 days of planting . In 2017, China produced two-thirds of the world's total watermelons.*

Key words: *watermelon cultivation technology, history, niche, heat values, watermelon root system, leaf, stem, fruit , root, greenhouse, development phase, soil preparation.*

INTRODUCTION

Watermelon is a southern region crop that requires a lot of light. Watermelons were originally cultivated for their high water content and were consumed not only as a food source but also as a water reserve during dry seasons. Watermelon seeds were found in the Dead Sea region, in the ancient inhabited areas of Bab-edh-Dhra and Tel Arad . In 2020, global watermelon production was 101.6 million tons . Chinese (mainland) watermelons accounted for 60 percent of the total harvest (60.1 million tons). Secondary producers include Turkey, India, Iran, Algeria and Brazil - all of them produced 2-3 million tons of the crop in 2020. Work in the framework of large harvests has created varieties resistant to various diseases. There are many cultivars that produce ripe fruit within 100 days of planting . In 2017, China produced two-thirds of the world's total watermelons.

Watermelon is a popular summer fruit, usually eaten sliced, in mixed fruit salads, or in juice form. Watermelon juice can be mixed with other fruit juices or

made into wine. If the plant is in the shade (dense planting, field wound with weeds or long cloudy weather), the development of watermelon and the filling of fruits is worse than if there is enough light. It is especially important to provide good lighting during the 4-5 true leaf stage of watermelon growth and during the fruiting period. The fruits of plants that do not receive enough light ripen later and last longer, they also ripen smaller and have less juice. **Temperature conditions in watermelon cultivation.** Watermelon is a heat-loving and heat-resistant plant. The optimal ripening temperature is 25-30 °C. When sowing seeds in open ground, the soil temperature at the depth of sowing should be at least 12 °C, but at 15 °C the seeds germinate well. Low temperatures lead to poor development of the root system and lack of yield. When growing seedlings, the temperature should be 23-27 °C, from the moment of planting until the appearance of cotyledon leaves on the soil. Then the temperature drops to 18-22 °C. It is very important to harden off the seedlings before planting them, and for three days before planting the plants in a permanent place, we need to maintain the same temperature as outside during the day.

In high humidity, young watermelon plants can withstand large temperature changes (from 2 to 50 °C) in a short period of time. However, prolonged exposure to temperatures below 5-7 °C will most likely result in seedling death. During the flowering period, the temperature should be 18-20 °C for good fruit production. For good development and high productivity of watermelon, the necessary amount of active temperature during the growing season is 2000-3000 °C.

Drought tolerance level of watermelon. Watermelon is a drought-resistant plant. A distinctive feature of the watermelon root system is its high absorption capacity, it is able to use moisture at a moisture level of 6%. The power of absorption reaches 10 atmospheres. The main root penetrates the soil at a depth of more than 1 m, covering 7-10 cubic meters of soil around it. Despite its resistance to drought, watermelon has a high water consumption. To get 5 kg of fruit from 1 sq.m, watermelon needs 160 liters of available water with optimal mineral nutrition for 1 sq.m, so it should be watered to get a high yield. Watermelon's need for soil moisture depends on the stage of crop development. The most moisture is needed during flowering and fruiting. Information about the transpiration coefficient (the amount of water a plant uses to produce 1 g of dry matter) is presented in the table below.

Table 1. ***Development phase of watermelon plants***

Stage of development	 Nish shooting	 Fabric formation	 Flowering	 Fruit formation
Days gone by	1-20	21-50	51-80	81-110
Transfer ratio	400-500	700-800	950-1050	800-900

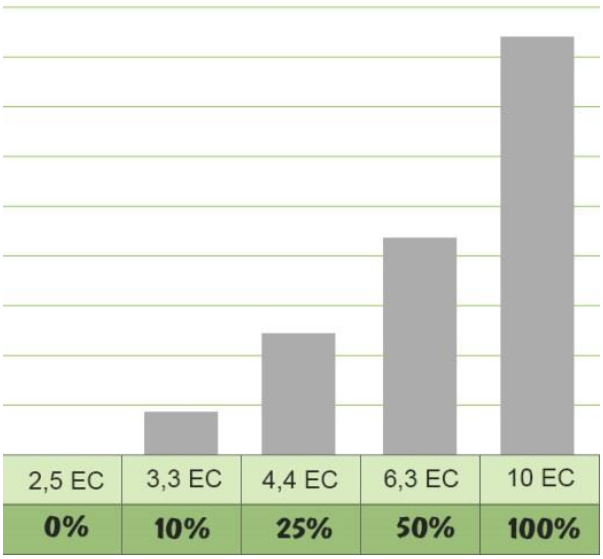
Transpiration coefficients. Excessive soil and air humidity also have a negative effect on plant and product quality, causing slow growth of watermelon, delay in flowering and decrease in fruit sugar content. The most harmful thing in the production of watermelon is a sudden change in humidity, because it leads to a significant decrease in the quality of the fruit and the loss of the yield. Therefore, it is necessary to try to maintain the humidity of the plowed layer at the level of 75-80% HB , and if possible, to maintain the humidity of the air at the level of 50-60% (by ventilation, when using a film). Shelters and small drip irrigation systems or field fog).

Watermelon prefers sandy, well-aerated soils. In heavy, dense soils, high-quality soil preparation, including forced deep plowing, plays an important role in increasing crop yields. Mud, waterlogged and poorly heated areas should be avoided. Watermelon is moderately sensitive to soil salinity. The diagram below shows an approximate average yield loss based on soil salinity.

Phase of alternating planting with watermelon . In the field, crop rotation at intervals of 3-4 years allows more productive use of the soil, shows the possibility of obtaining a full crop of the plant and in many cases reduces the cost of chemical treatment. The best predecessors for watermelon are winter wheat, perennial grasses and corn for silage, followed by black seeded winter wheat. In vegetable rotation, watermelon can be grown after root vegetables, onions and cabbage.

Soil analysis. Soil testing is an important part of growing watermelons, especially if you're renting a field and don't know its history, or if you've had soil problems in the past (see Diseases Caused by Soil Conditions).

Diagram 1. ***Watermelon crop loss due to soil salinity.***



If we plan to use irrigation or use foliar fertilizers, then soil analysis allows us to save money and better manage the development of crops without losing the yield. The correct selection of soil samples plays an important role in how useful the results of the analysis will be. Watermelon field samples should be taken in early spring, before any fertilizers or agrochemicals are applied, but after tillage, which can cause nutrient movement or leaching. First, it is necessary to check the level of field uniformity using the following indicators:

- *Soil color;*
- *Structure;*
- *Surface relief;*
- *Get stuck*

If field small , flat if and soil type , stranger herbs or it's a plant remains with damage level visible differences if not , he without 10-20 hectares one o ' average soil example taken can

The number of samples increases for agrotechnically uneven fields. Each sample should represent a certain area of the field with its characteristics. For the preparation of the soil sample, samples are taken from the selected area at a depth of 20-25 cm (preferably with a special drill), the area is passed diagonally, every 5-15 m samples are taken from, so at the end there are 10-20 samples with a total weight of about 10 kg. The soil from all the samples is poured into a paper bag or plastic film, mixed well, and an average soil sample weighing 1-2 kg is taken from the middle part, which is placed in a clean new paper bag, signed and transferred to the laboratory. As fast as possible. The soil sample should not be placed in a plastic bag or hermetically sealed box, because the lack of oxygen can cause

chemical reactions that complicate the chemical test. The sample should lose moisture while waiting for analysis.

The result of a properly conducted analysis should include the following indicators:

- *Granulometric composition;*
- *Acidity (ph);*
- *Organic material;*
- *Salinity (EC);*
- *Exchange cations (soil absorption complex);*
- *Macroelements (N, P, K);*
- *Meso- and microelements (Ca, Mg, Fe, Cu, Mo, Mn, Zn, etc.).*

Pay attention to acidity , because very alkaline (ph > 9) or acidic (ph < 4) soil is toxic to plant roots and generally unsuitable for cultivation. In acidic soils (ph 4.0-5.5), it is difficult for plants to absorb phosphorus, potassium, calcium, magnesium and sulfur, even if there is sufficient amount in the soil. At the same time, there is a risk of plant poisoning with aluminum, iron and manganese. In alkaline soils (ph 7.5-8.5), iron, manganese, phosphorus, copper, zinc, boron and most trace elements are less for plants. All of the above can cause a number of physiological diseases.

The stage of preparing the land for planting . The field begins to be prepared at the end of summer. After harvesting the predecessor, disking is carried out and time is given for the growth of weeds. If the field contains perennial weeds, spray with a sustained-release herbicide. When using herbicides of this group, you should follow the following:

- *Allow weeds to grow 10-15 cm high;*
- *Do not use the drug if drought or frost has affected more than 40% of the green mass of weeds;*
- *The application rate should be according to the manufacturer's recommendations and the level of weed infestation of the field.*

The next mechanical tillage of the soil should be done 3-4 weeks after the application of the drug, when the effect of the herbicide is already clearly visible and new, undamaged weeds begin to grow.
After the end of the effect of the herbicide, plowing is carried out at a depth of 25-30

cm, as weeds germinate, cultivation is carried out. Preparation of the soil by the semi-soil method allows planting winter wheat or rye for shoots.

The technology of growing seedlings has been known for several centuries. It has a number of advantages and disadvantages.

- *Receiving the product 1-2 weeks earlier compared to direct sowing;*
- *More efficient use of seeds, which is especially important when working with expensive seeds;*
- *Moisture that occurs with watermelon seedlings can be reduced due to the planting method;*
- *The same depth of planting seedlings contributes to the same development of the plant and the same ripening of the crop;*
- *This is the only economically feasible way to grow watermelon without seeds.*

Thickening of watermelon seedlings should begin 3-4 days before planting in the ground. Hardening is carried out by lowering the temperature in the greenhouse and reducing watering. Hardened plants are more resistant to low temperatures, drought and hot winds; in addition, their new roots develop much faster than those that are not rigid. However, over-hardened plants grow more slowly and in some cases do not fully recover. Watermelon seedlings should be planted in the soil a little deeper than when grown in a greenhouse, which allows to prevent the wind from damaging the root neck. No part of the peat cup should be on the soil surface, otherwise the peat will absorb moisture from the soil, act as a buffer and cause water stress for the seedlings . After planting, seedlings should be watered as soon as possible to eliminate air pockets formed during planting and moisten the soil, which will help the rapid development of the root system.

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