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## TOMATO GROWING TECHNOLOGY AND BIOLOGICAL FEATURES OF THE CULTURE

Submission Date: October 03, 2024, Accepted Date: October 08, 2024,

Published Date: October 13, 2024

Crossref doi: <https://doi.org/10.37547/ajahi/Volume04Issue10-04>

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### ABSTRACT

Tomato is a heat-loving annual crop that belongs to the nightshade family. Seeds begin to germinate at temperatures no lower than 10–15 °C. At a soil temperature of 15 °C, 14–22 days pass from sowing to emergence, and if it is below 10 °C, the seeds do not germinate at all.

### KEYWORDS

Sowing, tomato, seeds, soil, planting seedlings, irrigation.

### INTRODUCTION

The most favorable temperature for plant growth and development is 22–25 °C during the day and 15–18 °C at night. A decrease in temperature during this period leads to a delay in flowering, and at 10 °C the growth of the plants themselves slows down. Compared to other crops, tomatoes are less demanding of moisture. They develop a powerful taproot system. In non-seedling tomatoes, with optimal soil moisture, the bulk of the root system is located in the 0-60 cm layer, and with

seedling cultivation - 0-30 cm and rarely reaches 50 cm. Tomatoes require more moisture during the period of mass fruit formation, since its deficiency at this time leads to the shedding of buds and ovaries, delayed growth and formation of fruits on additional shoots.

### METHODOLOGY

The best types of soil for growing tomatoes are sandy loam and light loam, well-warmed, rich in humus, with a flat relief and neutral pH. This crop also responds well



to slightly acidic and slightly alkaline soils. Less suitable are heavy, waterlogged soils, where tomatoes are grown on ridges and ridges. The best predecessors for tomatoes are cucumbers, cabbage after the application of a large amount of fertilizers, root crops, onions. In field crop rotations - perennial grasses, mixtures of annual grasses for green mass, legumes, winter wheat. It is not recommended to plant tomatoes after potatoes, peppers, eggplants, since they are affected by the same diseases and pests. It does not tolerate permanent crops well and already in the third or fourth year, the yield begins to sharply decrease. Tomatoes are grown using seedlings and non-seedling methods. In the seedling method, soil preparation begins immediately after harvesting the predecessor crop by crushing plant residues with disc harrows. After 10–12 days, plowing is carried out to a depth of 22–25 cm on light soils and 25–27 cm on heavy soils. In the fall, one or two cultivations are carried out to control weeds and level the soil. In early spring, the soil is harrowed, if necessary, cultivated 2–3 times to a depth of 8–10 cm. Before planting, cultivate to a depth of 12–14 cm. For a seedless crop, soil cultivation should ensure the same seed sowing depth, obtaining friendly, uniform shoots, and reducing the number of weeds. Autumn tillage includes 1–2 stubble cultivations immediately after harvesting the predecessor, early autumn plowing with the application of mineral fertilizers to a depth of 27–30 cm. Then two cultivations are carried out, respectively, at 8–10 and 12–14 cm with

an interval of 10–12 days. Semi-fallow tillage in autumn makes it possible to sow in spring with a minimum number of tillage operations. If the soils are well leveled in autumn and there are no perennial weeds, 2–3-fold harrowing with medium harrows can be used instead of pre-sowing cultivation.

## DISCUSSION

With an uneven surface, pre-sowing cultivation is carried out with a combined unit to the depth of seed sowing. The main factor for soil cultivation in the seedless method of growing tomatoes, especially in the southern regions, is a decrease in the number of tillage operations in the spring, which allows you to significantly preserve moisture reserves in the soil and its structure. To obtain a 10 t yield, tomato plants use 33 kg of nitrogen, 13 kg of phosphorus and 45.5 kg of potassium. Organic fertilizers are not applied to tomatoes; they are best applied under the predecessor. During the growing season, at the beginning of crop development, it should first of all be provided with phosphorus and potassium. Then nitrogen nutrition is increased, and before fruiting — with potassium. Doses of mineral fertilizers are calculated by the balance method based on the results of agrochemical soil analysis, taking into account the removal of nutrients by the plant for the planned yield and their assimilation from fertilizers. On dark chestnut soils, it is effective to apply N120 P180 K60–90; on sod-podzolic soils — N60–80 P80–100 K80–100; on dark gray forest and podzolized chernozems — N80–90



P90–120 K70–120. On chernozem soils, N120 P120 K90 is applied to obtain a high yield. For the main application (under plowing or the first cultivation),  $\frac{2}{3}$  of the total dose of mineral fertilizers is used, and the rest is applied as additional feeding together with irrigation water (fertigation).

## RESULT

When growing tomatoes without seedlings, the seeds are sown at a time that guarantees uniform germination and protection from frost. In the south, this is April 25–30, in the central part — May 1–10. With such sowing dates, the shoots appear later than the last frost. Usually, in steppe conditions, frosts are most likely at the end of April and until the end of the first ten days of May. Delay in sowing reduces the yield by 20–25%. Under irrigation conditions, tomato seeds are usually sown to a depth of 3–4 cm. The sowing pattern is determined depending on the type of hybrid and growing conditions. With drip irrigation, a more technologically advanced sowing pattern is a strip sowing pattern of 90 + 50, 100 + 40, 180 + 30 cm with a distance between plants in a row of 30–35 cm. The advantage of such cultivation with large intervals between periods and strips is that the area that can be processed mechanically increases, which reduces labor costs, reduces the cost of the drip irrigation system due to the sparse pattern of laying irrigation pipelines (one pipeline inside the strip), and creates more favorable conditions for harvesting. The timing of planting seedlings in open ground depends on soil and climatic

conditions and the purpose of the product. For early sale on the fresh market in the south, seedlings are planted in the second or third decade of April. For medium fruiting periods, respectively, 1–15 May, 10–20 May and 15–25 May. Planting seedlings in open ground begins with early hybrids and ends with late ones. The soil is well moistened before and after planting. After 3-4 days, new plants are planted in place of the plants that did not take root. Good results are obtained by using cassette seedlings and mulch. Planting pattern: (30–40 + 140–150) x 35–40 cm — for growing tomatoes for processing and (40 + 140) x 45–50 cm for growing tomatoes for the fresh market. Modern technology for growing tomatoes, like other vegetable crops, involves the use of a drip irrigation system. Providing tomatoes with moisture at different stages of development and using different growing methods (seedling, non-seedling) differs significantly. With the non-seedling growing method, for normal development of the root system and vegetative mass, the optimal humidity range during the period of seedlings — the beginning of fruit formation is 65–70% of the FB. During the mass growth of fruits, the soil humidity should not be lower than 80–85% of the FB. During the fruiting period, to improve the quality of the products, the soil moisture should be reduced to 65-70% of the HB. This condition is especially important when growing tomatoes for processing, where the dry matter content (BRIX) is a significant indicator. For seedling tomatoes, the soil moisture should be 65-70% of the HB after planting.

After the seedlings take root, the soil moisture regime is maintained similarly to the non-seedling cultivation method. During the growing season, the required volume of soil moisture, i.e. the width and depth of the moistened zone, also changes. The width of the moistening strip is determined by the width of the sowing (planting) strip and should be at least 40 cm in the initial period of vegetation. With the onset of fruit formation, the volume of soil moistening with each watering should be gradually increased, and throughout the fruiting period, the moistening strip should be at least 60 cm at a depth of 40 cm. The moistening area in the first case is 20-22%, in the second it increases to 35% of the total field area. Depending on the pre-irrigation soil moisture value, the width and depth of the moistening strip and the irrigation rate change. On loamy soils during the rooting period of tomato seedlings and the beginning of fruiting, provided that the drip tape with droppers is located every 30 cm in the center of the tape and with a pre-irrigation soil moisture of at least 70% of the HB, the irrigation rate will be 50-60 m<sup>3</sup> /ha. The irrigation time with such a rate is approximately 3 hours. At the beginning of fruiting and during the fruiting period with a pre-irrigation soil moisture of 80-58% of the HB, a strip width of 60 cm and a depth of 40 cm, with a single-strip seeding scheme (140 + 40 cm), the

irrigation rate, accordingly, will be 70-90 m<sup>3</sup> /ha. Such irrigation requires 3.5 to 5 hours. During the period of intensive water consumption, the inter-irrigation period should last no more than 3-4 days. As the yield increases, irrigation at a rate of 110–130 m<sup>3</sup>/ha should be carried out much less frequently to maintain optimal soil moisture. During the first period of vegetation, from germination to the beginning of tomato fruiting, the humidity in the 20–25-centimeter zone is monitored. In this case, the tensiometer (its ceramic probe) is installed at a depth of 10–20 cm at a distance of 10 cm from the axis of the tape center towards the smaller row spacing. The pre-irrigation value of the soil moisture potential (tensiometer readings) in this period, depending on the soil type, is 0.063–0.074 MPa.

## REFERENCES

1. O'zbekistonning o'simliklar dunyosi. Toshkent, o'qituvchi, 1997 y.
2. Yoziyev L. H. Botanika.Qarshi, 2003 y.
3. Sahobiddinov S. S. o'simliklar sistematikasi. T., 1976 y.
4. To'xtaev A., Hamidov A. Ekologiya asoslari va tabiatni muhofaza qilish. T., 1994 y.
5. Ergashev A., Ergashev T. Ekologiya, biosfera va tabiatni muhofaza qilish. T., 2005 y.