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Agro biological methods of obtaining early and high-grade cotton harvesting

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Annotation: this article provides information on the methods of obtaining a high yield from cotton, varieties and seeds of cotton, how to obtain a crop

Key words: cotton cultivation, moisture, soil, cotton, nutrition

Cotton cultivation technology. Relation to temperature. Cotton is a typical short–day crop that cannot withstand negative temperatures. When the cold weather returns in the spring, the shoots are sparse, and the cotton has to be replanted. Seedlings die during frosts – 1 ... – 2 ° C, and adult plants – at – 3 ... – 5 ° C. The best temperature for the development of cotton is 25 ° C, during flowering 26 ...30 ° C. The sum of active temperatures for early–ripening varieties is 3000 ° C, medium–ripened - 3400, late-ripening - 4000 ° C.

Soil moisture requirements. Cotton is relatively drought-resistant. The plant is particularly demanding of moisture during flowering and the formation of pods. In Central Asia, cotton is cultivated only with irrigation.

Requirements for soil and nutrition elements. To form 1 ton of raw cotton together with the entire vegetative mass, cotton requires, on average, kg: nitrogen - 50...60, phosphorus – 10...15, potassium – 50...60, calcium – 50. Lack of nitrogen causes small-leaved and yellow-green color, plants become stunted, form few boxes. Excess nitrogen contributes to the strengthening of vegetative growth, maturation is delayed. The lack of phosphorus causes stunting and poor development of the root system, red veins appear on the leaves, the development of pods is delayed, the quality of the crop decreases. With a lack of potassium, brown spots appear on the leaves, the leaves curl and crumble. The incidence of wilt increases, the quality of the crop decreases. Meadow soils are among the best for cotton, meadow–marsh soils are also quite suitable after their reclamation. Cotton is relatively salt-resistant, plants can withstand such a concentration of salts at which other cultivated plants are oppressed and die. However, to obtain a high yield on saline soils, it is necessary to carry out washing irrigation. Fields with a close groundwater level are of little use for cotton, it is better if the groundwater lies deeper than 3 m from the soil surface.

Place in the crop rotation. Cotton can be grown in one place for a long time, but with permanent culture, infection accumulates, pests and diseases spread, especially wilt. The stems and roots of cotton are removed from the field, and numerous watering and row-to-row treatments lead to accelerated decomposition of organic matter and a decrease in soil fertility. Alfalfa plays a special role in crop rotations with cotton. Under the influence of alfalfa, the supply of organic matter and nutrients increases, the water-physical properties of the soil improve, salinity decreases, the soil is freed from weeds and pathogens of cotton infection, especially wilt. In addition, alfalfa is considered a high-quality fodder crop. Cotton is grown mainly in 10- and 9-pole crop rotations with three alfalfa fields. Before sowing alfalfa, planning, washing, etc. are carried out. After plowing alfalfa, cotton is sown for 4 years.

Tillage. Tillage depends on the predecessor. After harvesting cotton, they start harvesting its stems, if the stems are infected with wilt, they are necessarily removed from the roots and taken out of the field. In uninfected fields, the stems are crushed and plowed. If cotton is sown after alfalfa, before plowing, the soil is husked to a depth of 5 ... 6 cm to prune the roots to prevent their regrowth, or special adaptations are made to the upper body of the plow. Immediately before sowing on unsalted soils, harrowing with malovanie is used (leveling the soil with a small one). When compacting the soil, it is loosened with a chisel cultivator with harrowing.

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Fertilizer system. Cotton consumes a large amount of nutrients for the formation of the crop. Special attention should be paid to the timely and correct application of the necessary mineral fertilizers, trace elements in order to increase the endurance of plants to diseases and adverse external conditions. Organic fertilizers are also used, but organic matter is recommended to be applied only for 3-4 years after plowing alfalfa – 30 ...40 tons of manure per 1 ha for basic tillage from autumn. The norms of nitrogen, phosphorus and potassium depend on the type of soil, the placement of the cotton field in the crop rotation and the planned harvest, and are also introduced in the fall for plowing (60-70% of the calculated norm for the season for phosphorus and potassium, and the rest is pre–sowing or simultaneously with sowing and fertilizing for the vegetation of the crop). The fertilizers applied must be balanced in nitrogen, phosphorus and potassium. Large doses of nitrogen fertilizers and increased irrigation rates of cotton, as studies have shown, enhance the development of verticillous wilt (wilt), lead to a delay in the ripening of the pods. A lot of unripe raw cotton in the form of dried apricots is harvested from such crops. In this regard, the combination of optimal nitrogen fertilizer norms and irrigation norms is important in curbing the development of verticillose wilt and increasing the yield of raw cotton.

Seed preparation. For sowing, conditioned seeds are used, pubescent and bare. The cotton plants are preparing and etching the seed material, which guarantees the protection of plants in the early and most vulnerable stage of development. For pre-sowing preparation of cotton seeds, Syngenta can offer KRUISER 350 – insecticidal seed protectant (thrips, aphids, whitefly) and fungicidal protectant - Maxim XL (protection against root rot and gommosis). And immediately before sowing, farms are moistened (500-700 liters of water per 1 ton of seeds). Moistened seeds are stewed for 12 ... 18 hours. Bare seeds do not moisturize.

Sowing seeds. It is very important to sow cotton in the optimal time. It is sown when the soil temperature is stable at 12 ... 14 ° C. The method of sowing cotton is wide-row, with row spacing of 60 or 90 cm. Apply nest sowing with distances between nests 10...30 cm. With the dotted method, seeds are sown every 10 cm by 1 ... 2 into the nest. In this case, uniform placement of plants and a given density are ensured – 100 ... 150 thousand plants per 1 hectare without thinning seedlings. The seeding rate depends on the width of the row spacing, the sowing scheme, and conditions during the sowing period. For bare seeds, it should not exceed 25-30 kg / ha, and for pubescent seeds – 60 ... 70 kg / ha. Medium–fiber varieties are grown at a density of 100... 120 thousand plants per 1 ha, thin-fiber varieties - at 120 ... 150 thousand. Depending on the variety and placement scheme, the density can be increased to 150...170 thousand plants per 1 ha.

Plant care. To destroy the soil crust, crops are harrowed with tooth harrows across the rows before the emergence of seedlings. After the emergence of seedlings and before the closing of the rows, row-to-row processing of crops is carried out. Depending on the number of watering and clogging, 4-7 cultivations are carried out. Herbicides are used against weeds before sowing cotton for vegetating weeds HURRICANE FORTE 500 V.R. (3-7 days before sowing against annual and perennial cereal and dicotyledonous weeds), also before sowing or before germination of GEZAGARD 500 S.K. culture (against annual dicotyledonous and cereal weeds), DUAL GOLD 960 K.E. (against annual cereals and some dicotyledonous weeds), or a well-proven GEZAGARD 2.0 + DUAL GOLD 1.0 l/ha tank mixture. According to the vegetation of the crop against annual and perennial cereal weeds – FUSILADE FORTE 150 k.e.

Diseases cause great harm to cotton – wilt, root rot, gommosis, and among the pests are spider mites, thrips, aphids, cotton scoops, caradrina. Agrotechnical methods of combating wilt and other diseases – sowing with healthy seed material with mandatory treatment before sowing with fungicidal (MAXIM XL), insecticidal (KRUISER 350) or insecticidal mordants allowed for use; do not exceed the norms of nitrogen fertilizers; cotton-alfalfa crop rotation, as well as mandatory harvesting and export of cotton stems outside the field with roots. Cotton crops are treated with chemical and microbiological preparations only after examination and establishment of the number of pests and treatment begins when the economic thresholds of harmfulness (EPV) are exceeded. Against cotton scoops, caradrina, spider mites, aphids and thrips, cotton crops are sprayed with insecticides PROCLAIM FIT 450, V.G., ENGIO 247, S.K., KARATE ZEON 050, S.K., KARATE 050, K.E., PIRINEX SUPER, K.E., VERTIMEK 018, K.E. In addition to the mentioned products, Syngenta recommends using the latest generation biological fertilizer for cotton vegetation, consisting of a mixture of amino acids and peptides (62.5%) – IZABION, which increases yield and product quality. It helps the plant to overcome stresses caused by hail, drought, frost, diseases and pests, chemicals (burns), soil

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salinization and other adverse factors. It can be used both in pure form and in a mixture with systemic insecticides and fungicides used on cotton crops.

Harvesting. The maturation of cotton pods on the bush lasts more than 2 months. For the use of machine cleaning, it is necessary to accelerate the maturation of the boxes and artificially cause leaf fall. To do this, defoliation is carried out – the treatment of cotton with chemicals for rapid leaf fall. If there is insufficient leaf fall after defoliation, desiccation is carried out – drying of plants on the root. Cotton harvesting machines are used to collect raw cotton. Machine harvesting of raw cotton is carried out in two steps as the boxes are opened. The first collection begins 8-10 days after defoliation. By this time, 50-60% of the boxes are opened and at least 80% of the leaves fall off. The second collection is carried out 12-15 days after the first. The collection of dried apricots (unopened boxes) is carried out by harvesting machines.

In the conditions of the Surkhan-Sherabad valley, M.Tajiyev (1980), in experiments with fine-fiber cotton, revealed a positive effect of crop rotation on the main technological properties of cotton fiber. The lowest breaking load and fiber maturity were obtained with monoculture. Where cotton was grown according to annual and perennial predecessors (alfalfa and a combination of corn and sudanka with intermediate crops), these indicators were significantly better.

Analysis of numerous data shows that many environmental factors affect the quality of cotton, but it mainly depends on the fertility of the land. The use of only mineral fertilizers for a long time leads to their depletion. Compensation for the removal of nutrients from the soil can be achieved only by mastering cotton -alfalfa and other types of crop rotations, applying at least 20 tons/ha of rotted manure for the main plowing and using balanced norms of mineral fertilizers. As a result, soil fertility will increase, plant growth and development conditions will improve, crop accumulation will increase, and its quality will improve.

In recent years, Tashkent varieties (Tashkent-1,3) have become widespread. bred on the basis of the wild form of sh,1sapi/p,9, however, difficulties have arisen in their industrial processing. This is due to the fact that along with good economically valuable traits cotton has inherited negative ones, in particular, a predisposition to porosity "skin with fiber". When gining raw cotton, the skin is separated along with the fiber, which clogs the fiber and reduces its quality. The main reason lies in the change in the hardness of the seed peel. A combination of these factors, or one of them, leads either to insufficient accumulation of phenolic compounds (tannins) during seed development, or to insufficiently intensive oxidation of them and weak water release by cells during maturation. This also explains the decrease in the hardness of the seed peel of seeds of late harvest from immature pods. In the years with early and cool autumn, the clogging of the fiber with the seed peel of the same variety increases compared to the year with a prolonged warm autumn, which occurs as a result of mass under-ripening of seeds and a decrease in the hardness of the peel. To eliminate this undesirable phenomenon, it is necessary to choose appropriate agricultural techniques, eliminate excess moisture and fertilizers, and under-maturity of seeds.

The cultivation of cotton on manure and crop rotation fertilized backgrounds contributes to the better preservation of the formed boxes on the plant with an increase in the mass of raw cotton in them by I - 1.3 g compared with the boxes obtained on the non-fertilized background. As a result, the yield of raw cotton on manure and crop rotation backgrounds is 1.5 - 2.5 times higher than on the control non-fertilized.

A high yield of raw cotton 33.5 - 38.1 c /ha with a high yield of 85-98% of first-class fiber is formed in conditions of full nutrition of plants (on manure and crop rotation backgrounds) regardless of the growing zone.

When cultivating cotton against the background of mineral nutrition with an average yield of 32.3 c/ha of first-class fiber, less was obtained - 72-83%. The least of all first-class fiber (46-53%) with an average yield of 14.6 c/ha was obtained on a non-ventilated background.

The index of the breaking load of the fiber from the boxes of the first places from the central part of the bush, depending on the background of fertility, varies slightly - by 0.1 - 0.2 gs. The background of fertility has a noticeable effect on the breaking load of the fiber in the boxes from the peripheral part of the bush, i.e. on the boxes distant from the main stem. So, in the conditions of a crop rotation fertilized background, the difference in the breaking load of the fiber in raw cotton from the boxes from the central part of the bush and the periphery is 0.4 -0.6 gs, and on the non-fertilized background up to 1.0 gs.

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Growing cotton on manure and crop rotation backgrounds contributes to the formation of fiber with high maturity (2.0 - 2.1) both in the central part of the bush and on the periphery. On non-winded and mineral backgrounds, the maturity coefficient of the fiber from the peripheral boxes decreases to 1.7 - 1.8.
The background of fertility has practically no effect on the staple mass-length of cotton fiber.
Cotton on highly fertile organic-mineral backgrounds (manure and crop rotation) has a healthier fiber.
Under these conditions, mechanical and biological damages amount to 2-7%, whereas on non-wind and mineral backgrounds this indicator is 2 times higher (reaches 15%).
The mass of 1000 seeds and their maturity on an unadorned background are quite low - 89-105 g and 83-96%, respectively. These indicators are especially low for seeds from the peripheral part of the cotton bush, regardless of the cultivation zone. And only on organo-mineral and crop rotation fertilized backgrounds cotton yields seeds with high weight (109-130 g) and maturity (90-100%) both in the central part of the bush and on its periphery. At the same time, the growth of the tissue of the base of the outer integument of the seed peel in the form of loose layered thickenings, leading to a decrease in the mechanical strength of the peel and the formation of the "skin with fiber" defect during gining, does not occur.

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