

Effects of Mineral and Biohumus Fertilizers on Tomatoes Grown in Greenhouses on Typical Gray Soils

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Abstract:

Among the vegetable crops of our republic, the tomato plant occupies an important place, and it is one of the most cultivated crops in our country. Therefore, it is necessary to increase the production of tomatoes in order to meet the demand of the population for fresh fruit and canning industry. This can be achieved not only by creating new high-yielding varieties, but also by introducing intensive technologies of tomato cultivation, increasing productivity while reducing the cost of production.

Keywords: Mineral fertilizers increase the growth of tomatoes in greenhouses, improve the quality of yield.

Enter. Today, tomato is one of the most widely cultivated vegetable crops in the world due to its valuable and dietary properties. To date, more than 1,000 different varieties of tomatoes have been created, and they are grown in open and protected areas (for example, in greenhouses). Currently, about 4.4 million hectares, 153 million tons of gross crops are grown in the world. The main tomato growing countries are China (45.4 million tons), USA (14.14 million tons), India (11.15 million tons), Turkey (10.7 million tons), Egypt (10.0 million tons). Tomato is considered one of the main vegetable crops in Uzbekistan, and 40-45% of the total area of vegetable crops is tomato. In 2010,

tomatoes were grown on 75,000 hectares in Uzbekistan. 70% of the gross harvest is processed, 10-15% is sold in the local market, and 15-20% is exported.

Early blooming of tomatoes in Uzbekistan Shafaq, Sevara; medium-fast Peremoga-165, Vostok-36, Progressivniy; It is advisable to plant mid-late Volgogradsky 5/95, TMK-22, Novinka Pridnestrovya, Bahadir, Uzbekistan-178, Surkhan-142, Sample varieties and Sultan F1, Soprano F1, Superstrain hybrids, mid-late October 60, Yusupovsky, Doni-2000 varieties.

Selection of land Rich in nutrients, light sandy loam, non-saline, all types of soil are suitable. Tomatoes grow especially well on meadow, meadow-gray and typical gray soils.

In order to provide the population with this valuable vegetable crop in the late autumn, winter, and spring season, tomatoes are widely grown in protected ground structures in addition to open fields. While tomatoes are grown in specially heated greenhouses on large farms, they are grown in high and low plastic tunnels (greenhouses) on private farms. While the maximum yield of tomatoes in the open field is 100-150 t/ha, in modern greenhouses this figure can be 600 t/ha. In greenhouses, tomatoes are mainly grown in soil or in organic (peat, sawdust, humus, coconut husk, etc.) and inorganic (perlite, vermiculite, mineral wool, etc.) media that replace it. Special first-generation tomato hybrids are mainly grown in greenhouses.





In order to provide the population with fresh fruits all year round in Uzbekistan, tomatoes are grown in heated greenhouses in 3 seasons: autumn-winter (from the beginning of August to January of the following year), winter-spring (from January to July) and long-term (beginning in August and continuing until July of the following year). Thus, taking into account the above, the results of field experiments on the study of the effect of mineral fertilizers on the growth, development, and productivity of tomatoes were analyzed. A total of 3 thousand 157 farms and agricultural enterprises have greenhouses on 6 thousand 297 hectares in the republic and regions of our country. Of these, 3,000 farms and agricultural enterprises operate greenhouses on 5,229 hectares.

During January-December 2022, 301,000 tons of agricultural products were grown in greenhouses. From this, 211 thousand tons of tomatoes were harvested. The products grown in the greenhouse were mainly exported to Russia and neighboring countries.



Research methods. Tomatoes are plants that need a lot of phosphorus including

150-170 kg of potassium, 200-250 nitrogen and 250 phosphorus are required to get 301-302 thousand tons of harvest from 1 hectare. Potassium increases cell hydrophilicity and water retention capacity. Lack of potassium disrupts nitrogen, phosphorus and carbohydrate exchange in tomatoes. A large amount of carbohydrates accumulates in the leaves and the process of their flow to the flowers and shovels is disturbed (slowed down).

Research results and their discussion. The supply of crops with the main nutrients is first of all reflected in their growth during the growing season. Optimum macro- and microelement nutrition not only leads to the normal development of the vegetative organs of crops, but also increases their productivity.

According to the results of research in all experimental options, there was no difference in the transition periods in the phenophase of growth and development of crops. Differences in the phenophase of the growth and development of crops were determined in comparisons during 3 years of research.

The identified differences in the phenophase of plant growth can be explained by different periods of planting, as well as the existing greenhouse microclimate conditions in the years of the study.

The length of the main stem, which was directly measured before the first harvest, showed that it depends on mineral-organic nutrition (3.4 For example, during the 3-year research, the length of the main stem in the options where only NPK was used was on average 121 ± 4.39 is equal to cm., this ratio was statistically significantly lower than the other options with added manure or biohumus. However, the addition of biohumus increases the length of the main stem to 133.4 ± 6.18 cm (N250 : P250: K150 +BG30) and 138.8 ± 4.08 cm (N250 : P250: K150 +BG45).

It can be seen that compared to a single application of 45 t/ha of biohumus, the triple application divided at 15 t/ha leads to greater elongation of the main stem and an increase in lateral branches.

Nitrogen nutrition, nutrition of micronutrients, scientific research on plant growth, among foreign and republican scientists, Kirilov and Sengak (143,114), while considering the issues of N, P, K supply of vegetable seedlings, found that at a low level of mineral nutrition, seedling habituation decreases and seedling adaptation to the field increases. In the study of Asadov and Gadjeiev (13) on increasing the efficiency of fertilizer application to vegetable crops, mineral fertilizers were applied throughout the growing season to provide the plant with nutrient elements in order to increase plant nutrition. It is recommended that it be included as a lib. According to the authors, according to the calculation of the coefficient of application, 60% of phosphorus should be applied when plowing, 30% of nitrogen and potassium should be applied before planting, 20% of phosphorus, potassium, nitrogen should be applied to the soil or furrows, 10% of phosphorus and up to 25% of nitrogen and potassium should be applied to the fruit. during the period of bearing, it is necessary to insert it into the future tillage. When Nuriddinov and Berezhnova (63) determined the quality of manure, they determined its total nitrogen content to be 0.37%, N-NO₃ – 31/35 mg/kg. Papova and Gerosimov (69) showed that the full rate of mineral fertilizers needed by the plant can be introduced in the form of additional feeding with an aqueous solution of urea at a concentration of 0.2-0.5%. they showed. In this case, the amount of nitrate contained in the greenhouse soil will be lower compared to the nitrogen added to it.

Summary.

Biohumus can be used as a source of nutrients in tomato cultivation under protected soil conditions.

The introduction of 45-60 t/ha of biohumus at the rate of 15 t/ha in the background of N250-260:P250:K150 creates the most optimal conditions for plant nutrition.

When mineral fertilizers are added together with biohumus, the uptake of nutrients by the tomato crop increases with an increase in the rate of biohumus. Optimum removal of nitrogen, phosphorus and potassium is observed when 45-60 t/ha of biohumus is added against the background of NPK.

Three or four times introduction of biohumus at the rate of 15 t/ha against the background of NPK increases the number of fruits, their mass and market value compared to the option with NPK and 75 t/ha of manure.

On the background of NPK, introduction of 45 and 60 t/ha of biohumus at the rate of 15 t/ha made an average of 16.8 and 17.4 kg/m² in three years.

It was achieved when 45 t/ha of biohumus was introduced in the background of N250-260:P250:K150.

LIST OF REFERENCES USED

1. In the research of Asadov and Gadjiev (13) on improving the efficiency of applying fertilizers to vegetable crops, mineral fertilizers were used throughout the growing season to evenly supply the plant with nutrients to increase plant nutrition. they recommend that it is advisable to introduce it in parts
2. When Nuriddinov and Berezhnova (63) determined the quality of manure, they determined its total nitrogen content to be 0.37%, N-NO₃ – 31/35 mg/kg. Therefore, as a source of nitrogen, manure application can be an additional contribution to the available nutrients in the soil. For example, it was found that 2% organic matter is present in a 30 cm layer of soil, which indicates the presence of 400 kg/ha of organic nitrogen.
3. Papova and Gerosimov (69) showed that the full rate of mineral fertilizers needed by the plant can be introduced in the form of additional feeding with an aqueous solution of urea at a concentration of 0.2-0.5%. they showed. In this case, the amount of nitrate contained in the greenhouse soil will be lower compared to the nitrogen added to it.