



The Effect of Mineral Fertilizers on the Productivity of Lemon Varieties

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Abstract: in the article, the results of the research conducted in order to study the effect of mineral fertilizers on the productivity of lemon varieties are presented with an in-depth analysis. It is also noted in the article that the effect of mineral fertilizers, together with the number of lemons, has a great positive effect on the weight of lemons. Therefore, it was stated that the yield of lemons grown on heavily fertilized land is higher than the control option.

Keywords: mineral fertilizers, lemon varieties, productivity, number of fruits, growth, and development.

Introduction

The content of organic and mineral fertilizers in the soil is of great importance in the growth, development and formation of fruits of fruit plants. Some soil science scientists say that the composition of mineral and organic substances in the upper part of the soil and the lower part of the soil is formed at different rates. It has been proven that it depends on the soil structure.

Similarly, the content of nitrogen, phosphorus and potassium minerals in the soil mainly depends on the level of humus in the soil.

The use of organic and mineral fertilizers is of great importance in increasing the permanent fertility of the soil and growing high and quality crops from plants.

Fertilization is a very important agrotechnical event, and it is considered an event that regulates the growth and development of fruit plants. The effect of fertilizing on citrus plants is of great importance in extending their life, forming a large and strong body, forming real fruit flowers, and giving an abundant and high-quality harvest.

Organic fertilizers, that is, humus, are an important source of nutrients for citrus plants, as well as for all fruit plants. It contains on average up to 0.8% nitrogen, 0.2-0.3% phosphorus and 0.5-0.6% potassium. In nature, various organic fertilizers are used for fruit plants, such as horse, cattle, sheep, goat, poultry and pig manure. Among them, horse, sheep, goat and poultry humus are included in the group of slowly decomposing humus due to the low moisture content, and due to the high moisture content of black cow and pig humus, they are included in the group of fast decomposing humus.

Black mole humus is considered safe and effective for plants grown in greenhouse conditions.

Citrus plants, like other fruit plants, are demanding of organic and mineral fertilizers and will produce abundant crops every year when applied consistently. Organic fertilizers have a particularly good effect on productivity. Rotten sheep manure and cattle manure, poultry manure, humus

compost are used as organic fertilizers. The content of organic fertilizer, which is given in full rate for each plant, consists of: 120 grams of nitrogen, 80 grams of phosphorus, 60 grams of potassium and 10 kilograms of humus. These standards help the plant to grow, develop and create the necessary nutrient base.

According to some researchers, the approximate norms for organic and mineral fertilizers for citrus plants are as follows: 40 g of nitrogen, 20 g of phosphorus, 10 g of potassium for 1-2-year-old seedlings; 80 g of nitrogen, 40 g of phosphorus, 20 g of potassium for 3-4-year-old plants; For plants 5-6 years old and older, it is recommended to give 100 g of nitrogen, 50 g of phosphorus and 40 g of potassium fertilizers.

Fertilizing citrus plants with manure has a good effect. It is prepared by mixing equal amounts of cattle manure and poultry litter in water. It is possible to water this fertilizer 5-6 times a year.

Some citrus scientists say that high results have been achieved by applying an average of 60-80 tons of organic fertilizer per hectare to lemon groves in greenhouse conditions.

Similarly, it has been determined that the use of fertilizers consisting of nitrogen-phosphorus-potassium minerals gives good results after the lemon plant has entered full harvest. Nitrogen 80-90 kg/ha, Phosphorus 60-80 kg/ha, Potassium 90-100 kg/ha. Urea fertilizer is also recommended for lemon groves.

Some fruit plants are very sensitive to fertilizers containing trace element potassium. Therefore, it is recommended to be very careful about the methods and standards of their use.

Likewise, the use of micro-fertilizers in the growth and development of lemon plants also has a good effect. Including Boric acid, Manganese, 25% Med sulfate, Zinc and minerals.

Since the lemon plant belongs to the type of evergreen and deciduous citrus plant, feeding them with microelements through the leaves has been tested by scientists. Such microelements as "Gumi", "Kemera Agro", "Kemera universal", "Kemera-super", "Kemera-combi" in the form of powder, whose composition is rich in nitrogen, phosphorus, potassium and other minerals of various standards and characterized by good solubility in water including

The demand for nitrogen, phosphorus and potassium fertilizers and their standards when lemon plants are cared for in complex greenhouses in the rapidly changing climate of Uzbekistan has not been scientifically substantiated to date.

Materials and Methods

Experiments on the effect of mineral fertilizers on the productivity of lemon varieties were carried out in a 0.5-hectare film greenhouse in Boka district of Tashkent region. Experiments were conducted in 4 sections. The area of each section is 300 m², before planting lemons, each section was treated with 1800 kg (60 t/ha) of organic fertilizer, i.e. black cattle humus. Special pits were prepared for planting 3 rows of lemon seedlings in a 3x3m planting pattern in each section, and 3-year-old lemon seedlings were planted. In the first row, 13 lemon seedlings of the small-sized Meyer variety were planted, in the second row 13 lemons of medium-growing, local Tashkent variety, and in the third row 12 lemons of strong growing, local Yubileyni variety were planted. In the experiment, 38 lemon seedlings were placed in each section in a checkerboard pattern.

In the experiment, holes 50 cm deep and 50 cm in diameter were prepared for lemon seedlings of each variant, and organic and mineral fertilizers were added to them in the following order:

In option 1 (control) - 20 kg of rot in each pit;

in the II option - a mixture of 20 kg of humus, 32 g of nitrogen, 25 g of phosphorus and 17 g of potassium per pit;

in the III variant - a mixture of 20 kg of humus, 50 g of nitrogen, 40 g of phosphorus and 25 g of potassium per pit;

In option IV, a special feeding area was created with a mixture of 20 kg of humus, 50 g of nitrogen,

50 g of phosphorus and 40 g of potassium in each pit.

In the experiment, the following normative methods were used to observe the effect of mineral fertilizers and their rates on the formation of generative organs in lemon plants, including the number and weight of fruits per bush, and to determine the most convenient and inexpensive fertilizing methods:

1. Without mineral fertilizers (control)
2. Normal fertilization N₋₃₆₀kg, P₂O₅-280kg, K₂O-180 kg; 1 : 0.77 : 0.50;
3. Average fertilization N₋₅₅₀kg, P₂O₅-450kg, K₂O-270 kg; 1.5 : 1.25 : 0.75;
4. Strong fertilization N₋₅₅₀kg, P₂O₅-550 kg, K₂O-450 kg; 1.5 : 1.5 : 1.25.

The data obtained from the experiments were processed in the method of dispersion analysis recommended by BA Dospekhov [1].

Results and Discussion

1. In an experiment conducted on the Meyer variety of lemon, the use of mineral fertilizers in normal rates increased the number of fruits per bush from 180 to 260 pieces compared to the control, while the use of mineral fertilizers in medium rates increased the number of fruits from 180 to 275 pieces, and the use of mineral fertilizers in strong rates increased the number of fruits from 180 to 260 pieces. affect the bear showed.

Table 1 Study of the effect of mineral fertilizers on the productivity of lemon seedlings of different varieties.

Options	Fertilization standards	Lemon varieties	Number of fruits in per bush, bush/piece	Weight of one fruit, grams	Average weight of fruits per bush, kg				Average yield, t/ha
					II - year	III - year	IV - year	Average in three years	
Control	Without mineral fertilizers	Meyer	180	80	2,5	12,0	18,0	9,5	12,7
		Tashkent	194	120	4,5	15,2	23,3	14,3	19,1
		Yubiley ni	212	500	17,0	98,0	106,0	73,7	98,2
Normal fertilization	N – 360 kg/ha, P ₂ O ₅ – 280 kg/ha, K ₂ O – 180 kg/ha; 1:0,77:0,50.	Meyer	300	80	2,6	16,0	24,0	14,2	19,0
		Tashkent	288	180	4,5	20,0	51,9	25,5	34,0
		Yubiley ni	231	800	17,5	105,0	184,8	102,5	136,6
Moderate fertilizing	N - 550 kg/ha, P ₂ O ₅ - 450 kg/ha, K ₂ O - 270 kg/ha; 1,5: 1,25:0,75	Meyer	275	100	2,6	15,0	27,5	15,0	20,0
		Tashkent	303	180	4,5	28,8	54,6	30,0	40,0
		Yubiley ni	228	800	16,0	104,0	182,4	100,8	144,0
Strong fertilization	N - 550 kg/ha, P ₂ O ₅ - 550	Meyer	275	100	2,5	14,0	27,5	14,6	19,5
		Tashkent	308	180	4,5	29,0	55,5	30,0	40,0

	kg/ha, K ₂ O – 450 kg/ha; 1,5: 1,5: 1,25	Yubiley ni	230	800	17, 0	115, 0	184, 0	105,3	140,0
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Similar results were observed in the experiments conducted on the medium-growing Tashkent and strong-growing Yubileyni varieties of lemons.

In the experiment, the use of mineral fertilizers in the Tashkent variety increased the number of fruits per bush from 158 to 294 pieces, in the Yubileyni variety from 150 to 212 pieces, compared to the control. up to and the use of mineral fertilizers in strong norms showed its effect on increasing the number of fruits in the Tashkent variety from 180 to 313 pieces and in the Yubileyni variety from 150 to 260 pieces.

In such an experiment, the weight of one fruit of lemon varieties and the average total weight of fruits per bush were calculated. According to the results of the experiment, in the third year, the Meyer variety planted without mineral fertilizers averaged 14.4 kg per bush, and the Tashkent variety averaged 25.2 kg. and in the Yubileyni variety, an average of 90 kg of lemon fruit was formed, in the case of simple fertilizing, this indicator increased from 14.4 kg to 26.0 kg (1.1 times) in the Meyer variety, from 25.2 kg to 52 in the Tashkent variety.

Accordingly, increasing the norms of mineral fertilizers had a positive effect on increasing the productivity of lemon varieties, including lemons grown without mineral fertilizers in Meyer, Tashkent and Yubileyni varieties, this indicator increased from 14.4 kg to 27.5 kg in Meyer variety in medium and strong fertilizing options. up to 28.0 kg (1.9 times), in the Tashkent variety from 25.2 kg to 55.4-56.3 kg (2.0-2.2 times) and in the Yubileyni variety from 90 kg increased to 184.8 - 208.0 kg (2.0-2.2 times).

When the land area in the greenhouse is prepared by fertilizing only organic fertilizer at the rate of 60 t/ha without the use of mineral fertilizers, it is possible to harvest up to 17.7 tons of small-sized lemons from each hectare of the Meyer variety lemon grove, up to 28.8 tons of medium-growing lemons from the Tashkent variety seedlings, and up to 100 tons from the strong-growing Yubileyni variety lemon grove. If 1 hectare of land is fertilized normally, i.e. 60 tons of organic fertilizer, 360 kg of N, 280 kg of P₂O₅, and 180 kg of K₂O, the yield of lemons of the Meyer lemon orchard is up to 28.8 tons per hectare (161% compared to the control). medium-growing lemon from the Tashkent variety lemon orchard up to 58.8 tons (204.1% compared to the control) and from the Yubileyni variety lemon orchard with a strong growth up to 188.8 tons (188.8% compared to the control).

When the amount of mineral fertilizer is increased by 1.5 or 2.0 times, the yield per hectare increases to 172.3-175.7% in the Meyer variety, 214.2-217.7% in the Tashkent variety, and 205.5-231.0 in the Yubileyni variety. percent increase is achieved.

In the experiment, it was observed that the effect of such mineral fertilizers, along with the number of lemons, also had a positive effect on the weight of the lemons. Due to this, it was observed that the yield of lemons grown on heavily fertilized land was higher than that of the control option.

Conclusion

When growing lemon plants in greenhouses, it was observed that all varieties, regardless of their growth rate, require organic fertilizers as well as mineral fertilizers.

Fertilizing each hectare of land with a mixture of 60 tons of organic fertilizers, 550 kg of N, 450 kg of P₂O₅ and 270 kg of K₂O will give good results when lemon plants are grown in greenhouses. In this case, it is possible to increase the fruit yield of each bush by 1.9-2.0 times. Also, this fertilization method and rate is relatively convenient, cheap and effective.

When the amount of mineral fertilizer is increased by 1.5 or 2.0 times in lemon orchards, the productivity per hectare increased to 172.3-175.7% in the Meyer variety, 214.2-217.7% in the Tashkent variety compared to the control, and 205.5-231 in the Yubileyni variety.

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