

Ways to Give Lemon Plants a Compact Shape When growing them in Complex Greenhouses

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Abstract: *in the article, the results of the research carried out in order to improve the methods of giving them a compact shape in the cultivation of lemon plants in complex greenhouses are presented with an in-depth analysis. The article also provides valuable information on the influence of different shaping methods on the morphological and biological development of lemon seedlings of different varieties.*

Keywords: *lemon, complex greenhouses, cultivation, compact formation, seedling.*

Introduction

The most important factor affecting the growth, development, productivity, quality of the fruit, as well as the life of the plants is the agrotechnics of shaping.

In recent times, great attention is being paid to the establishment of medium-sized and slow-growing intensive orchards along with strong growing orchards. There are ways to shape fruit trees of different growth rates.

In addition to all kinds of fruit orchards, a lot of attention is being paid to the establishment of small-scale, that is, intensive orchards. A number of scientists have proved that along with the efficient use of land, the production of abundant and high-quality crops in fruit orchards is related to the proper organization of agrotechnical activities carried out in them.

Feeding alone will not be enough for a high and stable yield of lemons, for the normal growth and development of trees. It is also important to manage the growth and yield by pruning and pruning the growing branches and forming branches in accordance with the age of the tree, and to train the plants regularly and systematically.

Failure to properly care for the antlers is often the main reason for reduced productivity or its absence at all. In the care of the antler, it is crucial to give it the right shape by cutting it. The main purpose of pruning is to achieve the correct proportion of growing and bearing branches each year. For example, if the tree does not grow new branches during the year, it will not produce a normal crop next year. By cutting, branches with low yield, thickened and overshadowing each other are removed.

Some scientists say that in order to regulate the growth, development, productivity and quality of fruit plants, three agrotechnical activities are mainly carried out in them: cutting, shaping and pruning.

The method of shaping lemon trees, which are the most widely grown citrus plants, in greenhouses,



which has a positive effect on the growth, development, productivity, quality of the crop and their life, has not been thoroughly studied and scientifically substantiated.

Materials and Methods

Taking into account the above, scientific research was conducted in 2014-2017 in 3 sections of a 0.5-hectare film greenhouse established in Yangiyol district of Tashkent region in order to identify compact, convenient, cheap and effective ways to shape lemon plants and introduce them to production.

The experiment was carried out in the variants of giving a lemon plant a spherical shape (control), giving a lemon plant an oval shape, and growing a lemon plant in the palmetta method.

For the experiment, 3 sections of the 0.5-hectare film greenhouse established in the Yangiyol district of the Tashkent region were separated. The area of each section is 210 m², and before planting lemons, each section was treated with 1800 kg (60t/ha) of organic fertilizer.

Section I. Seedlings were planted in a 3.0x1.5m layout using the Shpalera method. The number of seedlings is 59, of which:

In the 1st row, cut lemons of the Meyer variety, a total of 20 pieces;

In the 2nd row, there are a total of 19 pieces of medium-growing Tashkent variety of lemon;

In the 3rd row, 20 pieces of Jubilee variety, which grows strongly lemons;

Section II. Spherical shape (control), seedlings were planted in a 3.0x3.0m scheme. The number of seedlings is 29, of which:

In the 1st row, cut lemons of the Meyer variety, a total of 10 pieces;

In the 2nd row, a total of 9 pieces of medium-growing Tashkent variety of lemon;

In the 3rd row, 10 pieces of Jubilee variety, which strongly grows lemons;

Section III. Oval shape, seedlings were planted in a 3.0x2.0m scheme. The number of seedlings is 44, of which:

In the 1st row, cut lemons of the Meyer variety, a total of 15 pieces;

In the 2nd row, a total of 14 pieces of medium-growing Tashkent variety of lemon;

In the 3rd row, the Jubilee variety, which grows lemons strongly, 15 pcs.

A total of 132 3-year-old lemon seedlings were planted in special holes.

Shaping of seedlings was done twice a year according to research options. Phenological observations were made in the first, second, and third years after planting, and a three-year average was recorded for summary.

Morphological and biological changes in lemon seedlings, the formation of generative organs, the number of fruits, their weight, the total weight of fruits per bush, and the average yield per hectare were calculated according to each selected method.

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

Results and Discussion

During the experiment, very important information on the morphological formation of the lemon plant was obtained. For example, it was found that the lemon plant undergoes two periods of rapid growth and development during the growing season when it is kept under greenhouse conditions. In



this case, the awakening and rapid growth of growing and productive shoots of two-year varieties formed in the previous year is observed. It was found that the beginning of the first growth period is in February and the end of growth is in May, while the second rapid growth and development is in June and the end of growth is in September. This information allows to determine if a lemon plant needs to be shaped twice in one growing season and the timing of shaping.

Table 1 Effect of different shaping methods on morphological and biological development of lemon seedlings of different varieties

Forming methods	Lemon varieties	Planting scheme, m	Number of fruits, bush/piece	Fruit weight, grams	Total weight, bush/kg	Average yield, t/ha
Spherical (control)	Meyer	3,0 x 3,0	280-300	100	28-30	33,3
	Tashkent	3,0 x 3,0	270-280	180	48-50	55,6
	Yubileyni	3,0 x 3,0	200-220	800	170-180	190,0
Oval	Meyer	3,0 x 2,0	160-180	100	16-18	29,9
	Tashkent	3,0 x 2,0	160-170	180	30-32	54,0
	Yubileyni	3,0 x 2,0	120-130	800	102-104	173,2
Shpalera (palmetta) method	Meyer	3,0 x 1,5	150-160	80	12-13	28,8
	Tashkent	3,0 x 1,5	130-132	150	20-21	46,6
	Yubileyni	3,0 x 1,5	40-45	600	24-28	62,2

The results of the experiment show that when the lemon plant is cared for in greenhouse conditions, it was found that this plant requires free growth and development. When the seedlings were shaped in this way, up to 300 lemon fruits with an average weight of 100 grams were formed per bush, 280 lemon fruits with an average weight of 180 grams in the medium-growing Tashkent variety, and 220 lemon fruits weighing up to 800 grams in the strong-growing Yubileyni variety. The average yield from each hectare of land was calculated to reach 33.3 tons for the Meyer variety, 55.6 tons for the Tashkent variety, and 190 tons for the Jubilee variety.

When such lemon trees are planted densely, i.e. when they are planted in a 3.0x2.0 meter scheme, the method of giving them an oval shape is naturally used. Despite the fact that the fruits of this method kept their weight, their number was slightly reduced. This leads to a decrease in the total weight of the yield obtained from each bush of lemon seedlings grown in this way. However, due to the large number of seedlings per hectare, the total productivity per hectare remained. The yield of lemon grown by this method is 29.9 t/ha in the Meyer variety (33.3 t/ha in the Spherical method), 54.0 t/ha in the Tashkent variety (55.6 t/ha in the Spherical method) and 173.2 t/ha in the Jubilee variety. ha (Spherical method was 190 t/ha).

It was found that the Shpalera method of planting lemon seedlings very densely and forcing them into sybbags is not suitable for this type of plants. It was observed that the number of fruits per bush decreased by 2 times and the weight of fruits decreased significantly. Despite the fact that the number of seedlings per hectare is twice as large when lemons are grown by the Shpalera method, it was found that the productivity per hectare can decrease by two, and in some strong growing varieties, by three times, due to the decrease in the quality of the fruits formed in them.

In order to obtain abundant and high-quality harvest from seedlings of lemon varieties with different growth power, growing them in the Spherical or Oval method gave good results.

Conclusion

When caring for lemon plants in greenhouses, regardless of their growth strength, spherical or oval shaping is considered the most effective, cheap and convenient way to plant seedlings of all



varieties. Because it was determined that they belong to a type of plant adapted to free growth according to their morphological structure.

When caring for lemon plants in greenhouses, it is recommended to shape them twice a year. The application deadlines are in May and September of the year.

In lemon orchards, by forming twice a year, it is possible to increase the yield, quality, and life of the plant up to 2 times.

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