

## Fruiting Period and Yield of Olive Varieties

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**Abstract:** *in the article, the results of the research conducted in order to study the dates and productivity of olive varieties are presented with an in-depth analysis.*

**Keywords:** *olive varieties, harvest, harvest time, productivity.*

### Introduction

The genus *Olea* belongs to the *Oleaceae* family and consists of 30 species, about 600 genera, which differ from each other in their chromosomal composition. In particular, the number of chromosomes in olive (*Olea europaea* L.) is  $2n = 46$ . The genus *Olea* is divided into three sections: *Tetrapilus*, *Paniculatae*, and *Olea*. The genus *Olea* itself is divided into two parts: *Ligustroides* and *Olea*. The genus *Olea* includes only one species, *Olea europaea* L. There are more than 1000 species (subspecies) of *Olea europaea* L.

Cultivation of the olive plant under conditions favorable to the plant allows for regular high yields. Olives can be harvested traditionally, that is, by hand, but in some countries, the harvest of the olive plant is carried out in large areas with special harvesting machines.

According to scientific data, the harvester can harvest 450 kg of crops in 8 hours of work per day. Vegetative reproduction in plants starts early by 4-5 years before the harvest period, and the yield of seedlings is significantly delayed by 10-12 years.

The olive tree has a good yield when the flowers occupy about 1% of the total number of flowers on the tree.

### Materials and Methods

The researches were carried out at the Bandikhon experimental farm belonging to the Research Institute of Horticulture, Viticulture and Winery named after Academician M.M.Mirzaev and at the experimental field of the horticultural farm "Sunbul Sultan Moviya" of the Oltinsoy district of the Surkhondarya region.

Each option has 4 returns, the planting scheme is 5x5 m (400 trees are planted per 1 ha). Feeding area 25 m<sup>2</sup>. Analyzes were conducted on 40 trees per replicate. One return area is 1000 m<sup>2</sup>.

In the experiments, phenological indicators were studied: 10%, 75% indicators were recorded in the "budding", "flowering", "fruiting" and "ripening" phases.

During the research, the following biometric measurements were taken: the height of the main body, the length and number of side branches of the first order, the length and number of side branches of the second order and the number of leaves on the main stem, the number of leaves on the side branches of the first order, the number of leaves of the side branches of the second order and the leaf level of vegetation. was measured during the period.



The degree of pigmentation (coloring state of fruits) before ripening of fruits was determined, and its dependence on the sum of active temperature (°C), as well as fruit shape, color, weight, full characteristics, periods of entering and ripening, and productivity were monitored.

The phenological observations, biometric calculations and laboratory theoretical and practical analyzes carried out during the research were based on Kh.Ch. Buryev and others' "Methodology of calculations and phenological observations during experiments with fruit and berry-fruit plants" [8], mathematical-statistical processing of experimental data was conducted according to the method recommended by A. Dospekhov [7].

### Results and Discussion

The absence of agrotechnical measures in the care of olive trees, the lack of processes related to pollination, watering, and cutting, leads to a lack of yield in olive plant varieties. The duration of regular harvest is not characteristic of the nature of olive trees, however, there are interruptions in the functioning of the reproductive organs due to the influence of unfavorable weather conditions, supply of nutrition and water, as well as the deterioration of the physiological condition of the olive plant, there are periods of low yield with years of full harvest. being in a mutual sequence, the duration of yielding was clearly observed in the conditions of Surkhandarya region.

The productivity of Krymskaya 172, Nikitskaya I, Nikitskaya II varieties of olive grown in the conditions of Surkhandarya region is clearly shown.

However, if we look at varieties that produce high yields several years in a row, continuous yielding is not a biological characteristic of the olive plant. In our conditions, the high percentage of infected flowers may be one of the reasons for the low possibility of continuous harvest from olive trees.

In addition to these reasons, agricultural agrotechnics (irrigation regime, strong and irregular cuttings, preparation of large quantities of olive cuttings) and in some years low temperatures that cause great damage to the olive plant can be an important reason for continuous harvest.

**Table 1. Yield of olive varieties, 2020-2022.**

Varieties	Yield from 1 tree, kg					Yield, t/ga				
	2020	2021	2022	Average	Compared to control, %	2020	2021	2022	Average	Compared to control, %
Krymskaya 172 (control)	8,0±3,0	9,5±3,0	11,0±2,0	9,5	100,0	3,2	3,8	4,4	3,8	100,0
Nikitskaya I	9,1±4,0	9,8±4,0	10,9±3,0	9,9	104,6	3,6	3,9	4,4	4,0	104,6
Nikitskaya II	10,5±3,0	11,2±4,0	12,5±4,0	11,4	120,0	4,2	4,5	5,0	4,6	120,0

During the research, the productivity of the studied varieties was analyzed in 2020-2022 (Table 1).

Krymskaya 172 (control) variety of olive yielded 8.0 kg per tree in 2020, 9.5 kg in 2021, 11.0 kg in 2022, average yield was 9.5 kg. It was found out that in Nikitskaya I variety, compared to the control, the average yield from 1 bush was 400 g higher, and in Nikitskaya II variety, it was 1.9 kg higher.

When the yield from one tree is calculated per hectare (400 olive trees per hectare), the average yield in our control variety is 3.8 t/ha, Nikitskaya I variety is 4.0 t/ha, and Nikitskaya II variety is 4.6 t/ha. observed.



So, it was determined that although the number of bushes on 1 ha area was the same, the total productivity was different. It can be considered as a biological feature of the variety.

Depending on the size and fleshiness of the olive fruit and the moisture content of the fruit, the varieties are divided into: canned, canned oil (universal) and oil. Fruit development primarily depends on temperature conditions, air humidity and nutrients. The largest fruits are obtained under conditions of a favorable combination of these factors.

Consequently, the shape of fruits at the highest temperature in summer should be larger than the size of fruits in cooler summer areas, other things being equal. This situation was confirmed in the summer period in Surkhandarya region.

The results of the research conducted on the size of olive fruits were also analyzed, and the data obtained based on the study of fruit size and grouping of varieties are presented in Table 2. We grouped the size of the fruits according to the following scale: up to 150 in very large fruits per 1 kg; large fruits - up to 200, medium - up to 300, small fruits - more than 300 (see Table 2).

**Table 2. Grouping of olive fruits by size (number of fruits per 1 kg), 2020-2022**

Varieties	Fruit size, pcs			
	2020	2021	2022	Average
Krymskaya 172 (control)	90	92	98	93,3
Nikitskaya I	144	147	155	148,7
Nikitskaya II	186	190	196	190,7

Based on the results of the analysis, it was determined that the Nikitskaya II variety takes the main advantage among the olive varieties with an indicator of 190.7 kg when compared in terms of volume. The Nikitskaya I olive variety (148.7 kg) belongs to the medium size group.

It was observed that the volumetric value of 1 kg of fruit in Krymskaya 172 varieties, selected as a control, recorded a significantly lower indicator (93.3 kg) than the rest of the varieties. Comparing the results of the experiments carried out over the years, it was found that the size of the fruits of the Krymskaya 172 (control) variety is significantly smaller than the Nikitskaya II variety, that is, by 73.6. The results obtained at the end of the observations showed that the size of fruits in the Nikitskaya II variety is relatively high.

**Table 3. The mutual ratio of flesh and stone of fruits of olive varieties (%), 2020-2022**

Varieties	Йиллар	The proportion of pulp and stone		
		E/D= 80%	E/D= 85%	E/D= 90%
Krymskaya 172 (control)	2020	72:28	74:26	82:18
	2021	74:26	76:24	84:16
	2022	75:25	75:25	86:14
	Average	74:26	75:25	84:16
Nikitskaya I	2020	78:22	80:20	86:14
	2021	79:21	82:18	88:12
	2022	80:20	84:16	87:13
	Average	79:21	82:18	87:13
Nikitskaya II	2020	80:20	84:16	88:12
	2021	81:19	85:15	89:11
	2022	79:21	86:14	88:12
	Average	80:20	85:15	88:12

Note: E-Fruit %; D-grain in %.



An important indicator in the technological assessment of olives is the relationship between the ratio of flesh to grain. It should be noted that the thicker the flesh of the olives, the higher the oil yield. It was observed that the thickness of the pulp is low when it is up to 80%, when it is up to 85% it is medium and when it is up to 90% it is high. In our control variant, the ratio of fruit flesh and pulp was on average 74:26, in Nikitskaya I variety 79:21 and in Nikitskaya II variety 80:20, it was found to be at the lower level. It was found that in Krymskaya 172 (control) variety, the ratio of flesh and pulp was on average 84:16, in Nikitskaya I variety 87:11 and in Nikitskaya II variety 88:12.

Based on this, it can be said that in the results obtained in the cross-section of the years, in terms of the ratio of fruit flesh and pulp, the Nikitskaya II variety showed superiority with high indicators.

When the results of the evaluation of the taste of the fruits of olive varieties were analyzed in the 5-point system, it was observed that the flesh of the olive fruit is soft, oily, very dense, the peel is thin, and the taste is oily. Studies were analyzed according to scales such as fruit size, appearance, flesh consistency, taste classification, overall taste rating, and overall fruit rating. During the procedures, it was observed that Nikitskaya II variety was highly rated with 4.4-4.5 points for fruit size and overall fruit evaluation, showing superiority in these two aspects compared to other varieties. In the Nikitskaya I variety, these indicators were found to be 4.1-4.3 on average.

Fruit size, appearance and overall taste score of Krymskaya 172 (control) seedlings as well as overall fruit score were 4.0, respectively, compared to other varieties as a control variety; 4.5; 4.4; With the results of 4.3 points, Nikitskaya recorded results close to the I olive variety.

When the results were analyzed, it was found that these varieties are considered to be olive varieties introduced from other regions of the country and from abroad and from other regions of the country.

During the research, the relationship between the ripening period of the early olive fruits and the fruit weight was found to be smaller in the shape of the olive fruits when compared between years.

As a result of analytical observations, it became clear that the Nikitskaya II variety prevails in terms of fruit ripening period. In the control variety, relatively late fruiting was observed. Thus, based on all indicators of the mechanical composition and taste of the fruits, Nikitskaya I, Nikitskaya II and Krymskaya 172 (control) varieties of olives were studied and it was observed that there were significant differences between the varieties.

## Conclusion

In the Nikitskaya II variety, the earliest onset of fruit ripening was on average on September 8, and full ripening was on September 21, while the latest ripening was observed on September 11-19.

It was found that the average yield of olive variety Krymskaya 172 (control) is 9.5 kg, the average yield of Nikitskaya I variety is 400 g, and the average yield of Nikitskaya II variety is 1.9 kg. When the yield from one tree is calculated per hectare (400 olive trees per hectare), the average yield in our control variety is 3.8 t/ha, Nikitskaya I variety is 4.0 t/ha, and Nikitskaya II variety is 4.6 t/ha. observed.

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