

## International Journal of Agriculture Extension and Social Development

Volume 6; Issue 2; Jul-Dec 2023; Page No. 21-22

Received: 12-08-2023  
Accepted: 10-09-2023

Indexed Journal  
Peer Reviewed Journal

### Determination of apple harvesting time in intensive gardens

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DOI: <https://doi.org/10.33545/26180723.2023.v6.i2a.189>

#### Abstract

The article carried out research work on the correct determination of the timing of the collection of apple fruits in intensive orchards. It should be noted that the correct organization of the timely collection of fruits in intensive apple orchards is one of the important agrotechnical measures. Among the above varieties of apples, the Fuji variety has a sugar content of 13-14%, Pink Lady 12.5-13.5%. The shelf life of these varieties is also high, the Fuji variety is about 180 days, the Pink Lady variety is about 240 days.

**Keywords:** Garden, stock, varieties, apple tree, seedlings, tree, planting scheme, bud, branches, flower, fruit, harvest

#### Introduction

In recent years, a number of measures have been implemented in our republic to improve the quality of fruit products, increase their exports, further expand the areas of intensive orchards, and further improve the agrotechnical measures carried out in them. The new types of fruits are being introduced, suitable for the climatic conditions of Uzbekistan, they are being studied on a scientific basis and used in production. In the new Development Strategy of the Republic of Uzbekistan for 2022-2026, "Increasing the incomes of peasants and farmers by at least 2 times through the intensive development of agriculture on a scientific basis and bringing the annual increase in agriculture to at least 5 percent are identified as important strategic objectives. The Decree of the President of the Republic of Uzbekistan No. PD-52 dated December 15, 2021 "On measures for state support of the fruit and vegetable industry, further development of the cluster and the system of cooperation in the network", No. PD-5009 dated February 26, 2021 "Agriculture of the Republic of Uzbekistan Decisions on measures to implementation in 2021 of the tasks defined in the Development Strategy for 2020-2030, as well as the tasks specified separately in other regulatory documents" [1, 9].

It is known that the yield of any agricultural plants directly depends on the planting pattern. This problem is especially deepened in intensive apple orchards, which are now being built on a huge scale in the republic. Thus, the optimization of tree placement schemes in intensive apple orchards allows to fully use the potential productivity of varieties and grow quality products.

Yakubov M.M., Nazarova D.G. and others [7; pp. 35–38] studied the following phenophases in fruit apple plants: bud swelling; leaf bud swelling, flower bud swelling (vegetation start); the beginning of flowering, full flowering and the end of flowering; end of branch growth (end of vegetation).

In the study, the period of bud formation and fruit ripening was studied every other day, the flowering period - every day, the end of the branch growth period, the beginning and

end of the flowering period were studied once a day in five days. As a result, according to the influence of climatic conditions on the phenophases, the beginning of the growing season, the duration of the growing season, apple varieties were recommended for different regions [4; 36–37-p.]. V.I. Senin [5; pp. 11–13] growth, development and productivity of various apple varieties grafted on M-VII grafts for more than 20 years at the Institute of Irrigated Horticulture, grafted on small grafts M-VIII and M-IX and medium-sized M-II and M-IV studied in comparison with the state of these varieties.

M.P. Tarasenko [6; pp. 9–15], and is also confirmed by the data of many other scientists, in his special experiments, the growth period of the XVI graft type began very late in the mother nursery, but in garden conditions, the early start of growth was noted in varieties grafted to it in garden conditions.

G.M. Karakhodzhaeva and Kh.A. Boboeva [3; 63–67-p.] in studies conducted in the conditions of the central region of Uzbekistan, the state and productivity of summer, early autumn and autumn apple tree varieties were observed when grafting M-IX. In the course of the research, 11 varieties created in Uzbekistan, 5 in the USA, 14 in Ukraine, 2 in Japan, 1 in Canada, Krasnodar and France were studied and evaluated for productivity.

#### The conditions and method of the research

The experiments were carried out according to the methodology developed at the Department of Fruit and Vegetables and Viticulture. The field experiments were carried out in an apple orchard on the experimental territory of the Information and Consulting Center (Extension center) of the Tashkent State Agrarian University.

The biometric measurements and calculations: carried out on 10 plants of each variant. The experiment was studied in four replications. The experiments by Kh. Ch. Buriev and others "Method of calculations and phenological

observations in experiments with fruit and berry plants” (2014), V. F. Moiseichenko “Methodology of accounting and observations in experiments with fruit and berry crops” (1967) in accordance with the recommendations given in the literature, and the statistical processing of experimental data, method of analysis of variance was carried out by the according to the method of B. A. Dospikhov (1985) [8].

**Research Results:** It should be noted that the timely harvesting of apple fruits is one of the agrotechnical elements that have a strong impact on their safety. In intensive apple orchards, it is even more important to organize harvesting of fruits correctly and on time.

It is difficult to tell how ripe an apple just by looking at it. The appearance and taste of an apple helps determine if it is ripe. But these indicators can be different over the years and in different parts of the tree. Therefore, other indicators must be used.

The ripeness of apples can also be determined by a starch test. The starch Test, as apples ripen, the starch in them slowly turns into sugar. Apples can be harvested to keep the optimal ratio of sugar and starch in the refrigerator. If the apples harvest late, all the starch turns into sugar, and as a result, such apples cannot be stored for a long time. Sugar in the cells of an apple breaks down during storage and hardens during storage.

**Table 1:** Determining the optimal period for harvesting apples.

Apple variety	Sugar content, %	Hardness	Day from flowering to harvest	Acidity level at harvest	The shelf life (day)
Jonagold	12-13,5	5,9-6,6	144	3,7-5,6	150
Idared	10,5-11,5	5,9-6,8	155	5,4-7,0	130
Elstar	11,5-12,5	6,3-6,6	132	5,8-7,8	135
Fuji	13-14	6,5-7,5	178	4-4,5	180
Golden Delicious	11,5-13	6,6-7,0	140	3,8-5,7	165
Red Delicious	11-12	6,6-7,5	145	2,3-3,8	120
Granny Smith	10-11	6,8-7,7	170	6,3-9,5	120
Pink Lady	12,5-13,5	6,5-7,6	175	4-4,5	240
Gala	11,5-12,5	7,0-7,5	115	3,4-4,4	130
Braybourne	11,5-12,5	8,6-9,5	168	6,0-6,7	150

In order to check it, iodine preparations or Lugol's solution can be used, that sold in pharmacies. The solution is prepared by adding iodine or Lugol's solution to water and placing apples divided into two parts in it for 30 seconds. The results are then compared with the following standard ratio of starch and sugar. The iodine reacts with starch and turns black. And the sugar stays white. In this way, it can be checked the ratio of starch and sugar. The starch test can be started 2-3 weeks before harvesting the fruit. The results have to be written down in a notebook by using the annual data, determine the timing of the next year's harvest.

### Conclusion

It should be noted that the correct organization of timely harvesting of fruits in intensive apple orchards is one of the important agrotechnical measures. When determining the most favorable periods for harvesting apples, it can be determined by checking the starch test.

Among the above apple varieties, the Fuji variety has a sugar content of 13-14%, it was 12.5-13.5% in Pink Lady. The shelf life of these varieties is also high, the Fuji variety made up 180 days, the Pink Lady variety was 240 days.

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