

(RESEARCH ARTICLE)



## Evaluation of promising breeding apple varieties in Azerbaijan

Sadygov Aladdin Nemat \*

*Breeding, Azerbaijan Science Research Institute Fruit and Tea, Guba, Guba, Azerbaijan.*

International Journal of Life Science Research Archive, 2022, 03(01), 191–194

Publication history: Received on 20 August 2022; revised on 26 September 2022; accepted on 29 September 2022

Article DOI: <https://doi.org/10.53771/ijlsra.2022.3.1.0103>

### Abstract

The article discusses the creation of new varieties with high efficiency (in F1) using in the initial parent lines (in F2) in the creation of new varieties in the selection program of the plant flora of Azerbaijan, local, introduced varieties of fruit crops and selection of the Scientific-Research Institute of fruit growing and tea growing, the ripening period, yield, average mass of the final results are reported.

**Keywords:** Apple; Breeding; Cultivars; Yield; Quality indicators; Azerbaijan

### 1. Introduction

Along with the existence of different types of climate conducive to the formation of a great diversity of soil and vegetation cover of Azerbaijan, the strong solar radiation and heat corresponding to the geographical location of the country creates favorable opportunities for the cultivation of many agricultural crops. As it is known, about 65% of the flora of the Caucasus and 11% of the flora of the world have been registered in Azerbaijan about 4500 higher plants. As a result of the evolutionary process, the formation of new forms of a number of plants proceeded very quickly [1,5].

There are a large number of apple varieties and forms created on scientific basis in the direction of folk selection and targeted selection in Azerbaijan, as well as introduced. At present, the existence of extremely unpromising varieties in orchards, the completion of the pomological age periods of most varieties, the average yield of less than 30-50 centers, as a result, requires the selection of high-yielding and high-quality varieties and the creation of new varieties with high genetic characteristics through selection [4].

In our republic by many researchers (P.A. Ryabchenko, P.V. Kuznetsov, A.C. Rajabli, M.P. Maximova, Z.A. Guided, I.M. Axundzadeh) sorting and selection work of apples were carried out, about 30 new varieties were created. The evaluation of these varieties created by folk selection and artificial selection and introduced at the same time from the point of view of modern selection, selection according to quality indicators and their effective use in improving the variety composition in the creation of new varieties have not been studied.

Comparative study of varieties, study of individual quality indicators, selection according to positive economic characteristics, and use in repeated hybridization in selection work allows to develop new varieties with high productivity through selection.

In order to overcome the shortcomings of the introduced, local and the breeding varieties of the Scientific Research Institute of Fruit and Tea Cultivation, by conducting "recrossing" between the best varieties from F1, from parental pairs that flower at the same time, ripen at different times, and have fertile pollen. In terms of solving ecological problems,

\* Corresponding author: Sadygov Aladdin Nemat  
Breeding, Azerbaijan Science Research Institute Fruit and Tea, Guba, Guba, Azerbaijan.

the creation of varieties with relatively low height, quick fall to the bar, and high taste is one of the urgent problems of creating promising forms and varieties that require little application of chemical preparations [6].

---

## 2. The material of the study

In the research work, as material for obtaining new breeding varieties, existing local, introduced, breeding apple varieties of Fruit and Tea Cultivation Institute of Azerbaijan were taken.

---

## 3. Research methodology

In carrying out the research, Q.A. Lobanov, A.S. Morozov and others. "Program on the introduction and breeding of fruit plants" (1972) [2], G.A. Lobanov's "Program and methodology of fruit, berry and stone plants" (1973) [3], A.S. Tatarinseva "Selection and varietal study of fruit-bearing plants" (1981) [7], etc. performed using the mentioned methods.

---

## 4. Experimental part

Since 1986, we have continued the selection research work on the apple plant on the existing fund, and obtained high-efficiency varieties that correspond to the soil and climate conditions of the republic.

Among the varieties obtained as a result of research, Fahima, Nigar, Zafar belong to the group of summer, Sulh, Marfa varieties belong to the group of autumn varieties, and other varieties belong to the group of winter varieties.

While studying the productivity indicators of the varieties, it was determined that the productivity of summer varieties is 180-230 cents per hectare; in autumn varieties, this indicator was 160-184 cents, while in winter varieties, the productivity indicators differed in the range of 150 (Nuran, Sarvan) -280 cents (Sevinc).

Compared between the varieties, Sevinj, Sadaf, Emil, Elvin, Davamli, Gizil taj, Makhmari varieties have a high yield of 220-280 cents, 59-70 cents more than the other varieties. In other varieties, the yield indicators were in the range of 150-211 sen.

The average weight of the fruit in summer varieties was 130-140 g, in autumn varieties 155-160 g, and in winter varieties 120-150 g. Compared to other winter varieties, Sadaf, Makhmari, Sevinj, Emil varieties had 20-30 g more mass.

Varieties were kept in normal room conditions at +6-8 °C and humidity at 65-70%. That is, under those conditions, summer varieties stayed 13-20 days, autumn varieties stayed 25-30, and winter varieties stayed 110-145 days. Compared to the varieties, Sadaf, Sevinj, Shabran, Gobustan, Elvin, Davamli varieties stayed 20-35 days longer than the other varieties.

Varieties were resistant to scab 0.6-1.3 points, and 0.5-1.2 points to powdery mildew. Among the varieties, Sadaf, Qizill Taj, Gobustan, Shabran, Emil, Elvin, Nubar, Ulvi varieties were infected with a score of 0.5-0.9 and they were found to be more resistant than the other varieties.

The amount of total sugar in the fruits belonging to the varieties was determined to be 8.61-11.7%. Thus, 10.65-11.7% was determined in Sadaf, Sarvan, Makhmari, Gobustan, Shabran, Ulvi varieties, and 8.61-10.81% in other varieties. The amount of vitamin "C" was determined to be 3.51-6.53 mg%. While it is 6.41-6.53 mg% in Sadaf, Makhmari, Gobustan, Ulvi varieties, it is 3.51-5.51 mg% in other varieties.

The tasting price of the varieties was satisfactory and was rated 4.0-5.0 points. Sadaf, Gizil taj, Elvin, Emil, Davamli varieties were evaluated with 5.0 points, and other varieties with 4.2-4.7 points. The yield of commercial varieties of fruits of the I group was 89.7% in the Sadaf variety, 87.3% in the Zaka variety, 89.3% in the Vatan variety, and 88.3% in the Ülvi variety. The output of the first group commercial varieties of other varieties was 77.3-87.3%. The continuation of active growth phases in plants lasted 223-227 days (Table).

Thus, after studying the productivity, disease and pest resistance, quality indicators and active development phases of selected apple varieties in the last five years, it was determined that these indicators correspond to generally accepted methods in fruit growing.

**Table 1** Characterization of selected apple varieties (average indicators for 2018-2022 years)

Sort	Ripening period	Productivity, sen / ha	Medium size of the fruit mass, q	Duration of Stay, days	Resistance to diseases, 5 points		Total sugar, %	Vitamin "C", mg%	Tasting price, 5 points	I Group marketable sort output, %	Continuation of vegetation, day
					scab	Powdery mildew					
Fahima	Summer	210	140	15-20	1.2	0.7	8.71	5.51	4.7	87.3	224
Nigar	Summer	180	135	13-17	1.3	0.8	8.88	3.74	4.2	79.4	225
Zafar	Summer	230	130	14-20	1.2	0.6	8.76	5.51	4.5	86.5	225
Zaka	Summer	220	135	15-20	1.2	0.7	8.61	5.41	4.3	87.3	227
Sulh	Autumn	184	160	25-30	1.3	0.8	8.74	4.51	4.4	77.4	224
Marfa	Autumn	160	155	25-30	1.2	1.2	8.95	3.91	4.7	74.6	225
Xazar	Winter	180	130	110	0.9	0.9	8.65	4.21	4.9	81.7	223
Ulvi	Winter	210	135	130	0.8	0.8	10.65	6.41	4.9	88.7	226
Vatan	Winter	255	125	125	0.7	0.7	9.55	4.51	4.8	89.6	227
Nubar	Winter	195	133	130	0.8	0.6	9.55	4.51	4.7	87.6	225
Chiraqqala	Winter	210	135	135	0.7	0.7	8.68	4.64	4.1	88.4	226
Davamli	Winter	255	120	140	0.7	0.8	9.45	3.51	5.0	79.6	226
Emil	Winter	265	140	140	0.6	0.7	8.76	5.41	5.0	81.7	224
Elvin	Winter	260	137	135	0.6	0.7	9.34	5.54	5.0	82.6	226
Payizliq Guba	Winter	185	127	130	1.3	1.1	8.70	3.56	4.0	79.8	227
Winter Guba	Winter	190	130	130	1.2	1.1	9.60	3.94	4.3	80.6	225
Sevinj	Winter	280	140	145	0.7	1.2	9.21	5.44	5.0	89.6	225
Shabran	Winter	210	130	140	0.9	0.9	10.55	4.61	4.2	82.3	225
Qobustan	Winter	190	125	140	0.9	0.8	10.77	6.21	4.8	82.6	227
Zumrud	Winter	211	130	130	0.9	1.2	9.93	5.51	4.5	81.7	226
Qizil Taj	Winter	230	135	135	0.8	0.7	9.61	5.64	5.0	88.6	224
Eldar	Winter	155	120	120	1.2	0.9	8.62	3.56	4.4	77.3	226
Makhmari	Winter	220	145	130	1.1	0.8	10.81	6.51	4.3	82.3	224
Nuran	Winter	150	130	130	1.2	0.7	9.87	5.41	4.6	80.6	227
Sarvan	Winter	150	130	135	1.3	0.6	11.6	5.51	4.7	81.7	225
Sadaf	Winter	260	150	145	0.7	0.5	11.7	6.53	5.0	89.7	225

## 5. Results

By studying the gene pool of the apple plant in Azerbaijan, folk selection with high quality indicators, introduced and existing varieties of the Scientific Research Institute of Fruit and Tea were used in the selection program in the parental

lines, and high efficiency varieties suitable for the soil and climate conditions of the fruit growing regions of the country were obtained. It is appropriate to apply it in the farms of peasants (farmers) and state enterprises in fruit growing economic regions.

---

## 6. Conclusion

In the acquisition of new breeding varieties, high efficiency varieties were obtained using the gene pool of the apple plant. Those varieties are currently used in farms and are considered useful in the future.

---

### Compliance with ethical standards

#### *Acknowledgments*

Dear “redaction”, I am grateful you for your hard work and help me for this article.

---

### References

- [1] Akparov Z.I. Azerbaijan plant genetic resources study and utilization in breeding abstract of doctorate dissertation Baku. 41.
- [2] Lobanov G. A, Morozov AS. Methodology for the introduction and sort study of fruit plants. Michurinsk .1972; 343.
- [3] Lobanov GA. Breeding and sort study of fruits, berries and stone fruits. Michurinsk. 1973; 492.
- [4] Sadigov AN. Phenogram of regionalized and promising apple varieties. Scientific Works of Az. Science Research Institute Gardening and Subtropical Plants Volume XV. Baku. 2004; 19-23.
- [5] Sadigov AN. Genetic resources of apple plant in Azerbaijan. Conference material. Baku. 2006; 165-166.
- [6] Sadigov AN. History and current state of apple breeding in Azerbaijan. Journal. Baku. 2008; 54-56.
- [7] Tatarinsev AS. Selection and sorting of fruit and berry plants. Moscow. 1981; 367.