

UDC 634.1 1 :631.52  
AGRIS F30

https://doi.org/10.33619/2414-2948/89/15

## CORRELATION OF TYPES OF FRUIT FORMATIONS, YIELD AND ECONOMIC INDICATORS OF NEW BREEDING APPLE CULTURES IN AZERBAIJAN

©*Sadygov A., Dr. habil., Scientific Research Institute of Fruit Growing and Tea Growing of the Ministry of Agriculture of Azerbaijan, Zardabi, Azerbaijan, zahid.mustafayev67@mail.ru*

## СООТНОШЕНИЕ ТИПОВ ПЛОДОВЫХ ОБРАЗОВАНИЙ, УРОЖАЙНОСТЬ И ЭКОНОМИЧЕСКИЕ ПОКАЗАТЕЛИ НОВЫХ СЕЛЕКЦИОННЫХ СОРТОВ ЯБЛОНИ В АЗЕРБАЙДЖАНЕ

©*Садыгов А. Н., д-р с.-х. наук, Научно-исследовательский институт плодородства и чаеводства Министерства сельского хозяйства Азербайджана, п. Зардаби, Азербайджан, zahid.mustafayev67@mail.ru*

*Abstract.* The results of a long-term study of biological and economic indicators of new apple breeding varieties, including the number of fruits, fruit weight, yield and comparative economic evaluation of the variety, are presented. Selected by a set of valuable traits for widespread introduction into industrial gardens varieties: Nigar, Zaka, Zafar, Udvi, Watan, Emil, Elvin, Sevinj, Gobustan, Gyzyt taj, Mahmari, Sadaf, Sahil and Shabran.

*Аннотация.* Приведены результаты многолетнего изучения биологических и хозяйственно ценных показателей новых селекционных сортов яблони, в том числе количество плодов, масса плода, урожайность и сравнительная экономическая оценка сорта. Выделены по комплексу ценных признаков для широкого внедрения в промышленные сады сорта: Нигяр, Зака, Зафар, Удьви, Ватан, Эмиль, Эльвин, Севиндж, Гобустан, Гызыл тадж, Махмари, Садаф, Сахил и Шабран.

*Keywords:* apple tree, variety, selection, fruiting, productivity, Azerbaijan.

*Ключевые слова:* яблоня, сорт, селекция, плодоношение, урожайность, Азербайджан.

### Introduction

Azerbaijan is an ancient center of fruit culture and a center for the formation of a number of valuable fruit plants. The natural and economic conditions of Azerbaijan favor the development of valuable varieties of plants. A lot of work on breeding new, high-quality varieties of apple trees in the Azerbaijan Scientific Research Institute of Fruit and Tea Growing was first started in the early thirties in the Guba-Khachmaz zone. Apple tree varieties created here (Azerbaijan, Sheref, S. Vurgun, Quba Reneti, Fakhime, Gyzyt Guba, Sharg, Shah Dag, Bezekli, Guba Reneti, Galib, Kommunar, etc.) were widely tested in various soil and climatic regions of Azerbaijan [1].

Starting from 1985, the selection work on the apple tree was started by studying the ogrobiological, incoming and continuing by repeated (F<sub>2</sub>) hybridization and crossing of new varieties Fakhima, Nigar, Zafar, Sulkh, Marfa, Ulvi, Vatan, Nyubar, Chiraggala, Davamly, Emil, Elvin, Guba autumn, Guba winter, Sevinj, Gobustan, Zumurud, Gyzyt taj, Eldar, Mahmari, Nuran, Sarvan, Sadaf, Sahil and Shabran. The economic and biological properties of new breeding varieties

of apples were studied, they studied ripening, fruiting, the number of fruit organs, including fruit rods, fruit weight, yield, varieties, comparative economic evaluation of varieties, etc.

During the research, indicators Guba region, where research work was carried out, lies in the zone of a moderately warm semi-humid climate, the thermal regime of the region is quite favorable for the growth of apples.

#### *Materials and Methods*

The objects of the study were 26 new breeding varieties of apple trees. The study of the economic and biological characteristics of new breeding varieties of apple trees was carried out in the Guba region breeding garden of the experimental base of the Research Institute of Fruit and Tea Growing. The varieties Papirovka, Azerbaijan and Renet Champagne, released in the Guba-Khachmas zone of Azerbaijan, were taken as control. The Guba region is granite from the east and northeast with the Khachmas district, and from the west and south-west it rests on the watershed miniyu of the Main Caucasian Ridge. The work was carried out in accordance with the “program and methodology for the study of fruit, berry and nut crops” Michurinsk (1973) [3]. A. S. Tatarintseva “selection and variety science of fruit and berry crops” (1981) [4]. E. N. Sedova and T. I. Oglischova “program and methodology variety study of fruit, berry and nut crops” (1999) [5]. The average annual temperature here is 9.7°C. 17°C; the absolute minimum in severe winters reaches -27°C. Precipitation is 90,540 mm per year [2].

#### *Results and discussion*

In the economic and biological assessment of a variety, the productivity of trees and precocity, with good fruit quality, are very important indicators. The time of entry of the variety at the time of fruiting is considered to be a year after planting trees in the garden, when at least 3 kg per accounting tree.

As a result of studying this issue, it has been established that the grafting of this issue has been established that the grafting on MM-106, Nigar, Zaka, Zafar, Ulvi, Vatan, Nyubar, Chiraggala, Emil, Elvin and Sevinj, planted at one year of age, come into fruition at 5-6 years after planting in the garden (Table).

In the biology of tree fruiting, the ratio of trees is of great importance and the ratio of types of fruiting organs to vegetative ones is of great importance. The nature of fruiting depends on the genotype of the variety, the age of the tree, agricultural technology and climatic conditions, in most varieties of apple trees at a young age, fruiting on fruit twigs and ends and growth of the skeletal type prevails, subsequently the placement of fruits on perennial overgrowing branches, kolchatka.

Data on the accounting of fruit formations in 18-year-old trees show that in apple varieties at this age, the number of annelids predominates, and other fruit twigs change quite noticeably. The number of ringlets in all varieties prevails and ranges from 86.4 (Eldar) to 97.4 (Ulvi). Fruit twigs from 0.3 (Makhmari) to 6.2 (Eldar) and rings only from 1.6 (Ulvi) to 7.3 (Marfa).

In the conditions of the Guba-Khachmas zone of Azerbaijan, the net weight of sales of new breeding varieties of apple trees ranged from 130 (Eldar) to 189 (Sadaf) g. The largest fruits are Sevinj (210 g), Gobustan (198 g), Sadaf (195 g), Ulvi (195 g), Zaka (171 g), Watan (170 g).

Over the years of research, the yield of summer varieties is from 155 cwt/ha (Fahima) to 171 cwt/ha (Zaka) with the yield of the control variety Paping 160 cwt/ha. The highest yield was obtained from the Zaka variety — 11 cwt/ha. Autumn varieties yield from 153 cwt/ha (Sulh) to Marfa 159 cwt/ha. Comparisons of the control variety of Azerbaijan, a high yield of 7 cwt/ha was obtained from the Marfa variety.

Table

THE RATIO OF TYPES OF FRUIT FORMATIONS, PRODUCTIVITY  
 AND ECONOMICS OF NEW APPLE BREEDING VARIETIES (2020-2022)

| Variety              | Maturation | Rootstock | Enter into fruiting | General quantity fruit bodies, th | Including by types of fruit formations, % |             |         | Fruit weight, g |         | yield, cwt/ha | Comparative economic evaluation of varieties, % |
|----------------------|------------|-----------|---------------------|-----------------------------------|---|-------------|---------|-----------------|---------|---------------|---|
|                      |            |           |                     |                                   | Kolchatki                                 | fruit twigs | General | Medium          | maximum |               |   |
| Paping               | summer     | MM-106    | 5-6                 | 313                               | 91.2                                      | 3.7         | 5.2     | 120             | 125     | 160           | 100   |
| Fahima               | summer     | MM-106    | 5-6                 | 296                               | 88.3                                      | 4.5         | 7.2     | 138             | 140     | 155           | 95.7  |
| Nigar                | summer     | MM-106    | 4-5                 | 316                               | 92.6                                      | 3.1         | 4.3     | 139             | 141     | 165           | 103.8   |
| Zack                 | summer     | MM-106    | 4-5                 | 319                               | 93.4                                      | 2.3         | 4.3     | 135             | 139     | 171           | 108.8   |
| Zafar                | summer     | MM-106    | 4-5                 | 314                               | 92.1                                      | 2.7         | 5.2     | 136             | 140     | 165           | 103.8   |
| Azerbaijan (k)       | autumn     |           | 5-6                 | 329                               | 90.3                                      | 4.3         | 5.4     | 120             | 125     | 157           | 100   |
| Sulh                 | autumn     | MM-106    | 5-6                 | 315                               | 89.4                                      | 3.8         | 6.8     | 175             | 180     | 153           | 96.8  |
| Martha               | winter     | MM-106    | 5-6                 | 317                               | 88.4                                      | 4.3         | 7.3     | 160             | 165     | 159           | 101.5   |
| Renet champagne (to) | winter     | MM-106    | 5-6                 | 338                               | 93.4                                      | 2.3         | 4.3     | 120             | 125     | 165           | 100   |
| Ulvi                 | winter     | MM-106    | 4-5                 | 403                               | 97.4                                      | 1.0         | 1.6     | 137             | 140     | 195           | 123.2   |
| Watan                | winter     | MM-106    | 4-5                 | 321                               | 94.6                                      | 2.3         | 3.1     | 140             | 145     | 170           | 104.1   |
| Nyubar               | winter     | MM-106    | 4-5                 | 339                               | 87.8                                      | 4.8         | 7.4     | 138             | 140     | 155           | 95.4  |
| Chiraggala           | winter     | MM-106    | 4-5                 | 402                               | 96.4                                      | 1.2         | 2.4     | 150             | 163     | 180           | 111.4   |
| Davamli              | winter     | MM-106    | 5-6                 | 321                               | 89.6                                      | 4.1         | 6.3     | 153             | 155     | 154           | 91.5  |
| Emil                 | winter     | MM-106    | 4-5                 | 403                               | 95.4                                      | 2.0         | 2.6     | 153             | 156     | 193           | 121.7   |
| Elvin                | winter     | MM-106    | 4-5                 | 405                               | 95.6                                      | 1.8         | 2.6     | 156             | 158     | 196           | 123.9   |
| Guba autumn          | winter     | MM-106    | 5-6                 | 365                               | 93.8                                      | 2.3         | 3.9     | 160             | 170     | 160           | 95.9  |
| Guba winter          | winter     | MM-106    | 5-6                 | 366                               | 93.9                                      | 1.9         | 4.2     | 162             | 165     | 164           | 99.2  |
| Sevinj               | winter     | MM-106    | 4-5                 | 407                               | 94.5                                      | 1.9         | 3.6     | 150             | 155     | 210           | 134.3   |
| Gobustan             | winter     | MM-106    | 4-5                 | 403                               | 93.4                                      | 3.0         | 3.6     | 150             | 154     | 196           | 134.3   |
| Zumrud               | winter     | MM-106    | 5-6                 | 336                               | 89.6                                      | 3.6         | 6.8     | 155             | 160     | 165           |   |
| Gyzyl taj            | winter     | MM-106    | 5-6                 | 404                               | 96.4                                      | 1.5         | 2.1     | 155             | 163     | 175           |   |
| Eldar                | winter     | MM-106    | 5-6                 | 326                               | 86.7                                      | 6.2         | 7.1     | 130             | 133     | 155           |   |
| Mahmari              | winter     | MM-106    | 5-6                 | 407                               | 97.8                                      | 0.3         | 1.9     | 163             | 167     | 210           |   |
| Nuran                | winter     | MM-106    | 5-6                 | 357                               | 89.7                                      | 3.9         | 6.4     | 143             | 145     | 156           |   |
| Sarvan               | winter     | MM-106    | 5-6                 | 405                               | 93.6                                      | 2.5         | 4.3     | 155             | 163     | 195           |   |
| Sadaf                | winter     | MM-106    | 5-6                 | 426                               | 97.3                                      | 0.8         | 1.9     | 189             | 195     | 210           |   |
| Sahil                | winter     | MM-106    | 5-6                 | 431                               | 96.4                                      | 0.7         | 2.9     | 145             | 153     | 210           |   |
| Shabran              | winter     | MM-106    | 5-6                 | 426                               | 95.3                                      | 1.8         | 2.9     | 138             | 143     | 205           |   |

Winter varieties have yields ranging from 154 cwt/ha (Davamli), 210 cwt/ha (Sevinj, Sadaf and Sahil) while the yield of the control variety Renet Champagne is 165 cwt/ha. The highest yield was obtained from the variety Sevinj, Sadaf, and Sahil — 45 cwt/ha, the lowest — in the Davamli variety — 11 cwt/ha.

Winter varieties have yields ranging from 154 cwt/ha (Davamli), 210 cwt/ha (Sevinj, Sadaf and Sahil) while the yield of the control variety Renet Champagne is 165 cwt/ha. The highest yield was obtained from the variety Sevinj, Sadaf, and Sahil — 45 cwt/ha, the lowest — in the Davamli variety — 11 cwt/ha.

Comparative economic evaluation of summer varieties 95.7-108%, autumn varieties 96.8-101.5% and winter varieties within 91.5-127.2% (Table).

Economically profitable varieties, due to which it is possible to significantly improve the industrial assortment of apple trees in the Guba-Khachmas zone: Nigar, Zafar, Zaka, autumn varieties Marfa, winter varieties Ulvi, Chiraggala, Emil, Elvin, Sevinj, Gobustan, Gyzyt taj, Mahmari, Sarwan, Sadaf, Sahil and Shabran.

#### *Conclusion*

Thus, as a result of our research, new breeding varieties have been identified Nigar, Zafar, Zaka, Marfa, Ulvi, Chiraggala, Emil, Elvin, Sevinj, Gobustan, Gyzyt taj, Mahmari, Sarwan, Sadaf, Sahil and Nabran.

#### *References:*

1. Garagurbanly, I. S., Aliev, V. M., & Bayakhmadov, I. A. (2018). Yablonya. Baku. (in Azerbaijani).
2. Gidayatli, Z. A. (1966). Seleksiya yabloni v usloviyakh Kuba-Khachmasskoi zony Azerbaidzhanskoi SSR: Avtoref. ... kand. s.-kh. nauk. Baku. (in Azerbaijani).
3. Lobanov, G. A., Zaets, V. K., Stepanov, S. N. (1973). Programma i metodika sortoizucheniya plodovykh, yagodnykh i orekhoplodnykh kul'tur. Michurinsk. (in Russian).
4. Tatarintsev, A. S., Zaets, V. K., & Lobanov, G. A. (1981). Seleksiya i sortovedenie plodovykh i yagodnykh kul'tur. Moscow. (in Russian).
5. Sedov, E. N., & Ogoltsova, T. P. (1999). Programma i metodika sortoizucheniya plodovykh, yagodnykh i orekhoplodnykh kul'tur. Orel. (in Russian).

#### *Список литературы:*

1. Гарагурбанлы И. С., Алиев В. М., Баяхмадов И. А. Яблоня. Баку, 2018. 254 с.
2. Гидаятли З. А. Селекция яблони в условиях Куба-Хачмазской зоны Азербайджанской ССР: автореф. ... канд. с.-х. наук. Баку, 1966. 28 с.
3. Лобанов Г. А., Заец В. К., Степанов С. Н. Программа и методика сортоизучения плодовых, ягодных и орехоплодных культур. Мичуринск, 1973. 495 с.
4. Татаринцев А. С., Заец В. К., Лобанов Г. А. Селекция и сортоведение плодовых и ягодных культур. М.: Колос, 1981. 367 с.
5. Седов Е. Н., Огольцова Т. П. Программа и методика сортоизучения плодовых, ягодных и орехоплодных культур. Орел: ВНИИСПК, 1999. 606 с.

*Работа поступила  
в редакцию 25.02.2023 г.*

*Принята к публикации  
05.03.2023 г.*

---

#### *Ссылка для цитирования:*

Sadygov A. Correlation of Types of Fruit Formations, Yield and Economic Indicators of New Breeding Apple Cultures in Azerbaijan // Бюллетень науки и практики. 2023. Т. 9. №4. С. 121-124. <https://doi.org/10.33619/2414-2948/89/15>

#### *Cite as (APA):*

Sadygov, A. (2023). Correlation of Types of Fruit Formations, Yield and Economic Indicators of New Breeding Apple Cultures in Azerbaijan. *Bulletin of Science and Practice*, 9(4), 121-124. <https://doi.org/10.33619/2414-2948/89/15>