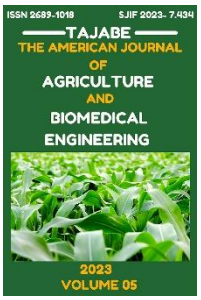
The American Journal of Agriculture and Biomedical Engineering
(ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals



Journal Website: https://theamericanjournals.com/index.php/tajabe

Research Article

SELECTION OF COLD-RESISTANT APRICOT VARIETIES

Submission Date: April 18, 2023, **Accepted Date:** April 23, 2023,
Published Date: April 28, 2023 |
Crossref doi: https://doi.org/10.37547/tajabe/Volume05Issue04-02

Karshiev Alisher Esanovich
Academician Makhmud Mirzaev Scientific Research Institute Of Horticulture, Viticulture And Winemaking, Uzbekistan

ABSTRACT

In the article, the adverse effects of winter and early spring cold temperatures on apricot trees are studied in the conditions of the Kashkadarya region of local and imported apricot varieties, and the biological characteristics of apricot varieties resistant to stress factors were isolated as a result of research observations to select promising varieties that are resistant to any weather conditions. and other positive features are listed.

KEYWORDS

Branch, winter, damage, cold, quality, bud, flower, fruit, crop, garden, local, selection, climate, impact, resistant.

INTRODUCTION

The resistance of fruit trees to low temperatures depends to a certain extent on the temperature and light regime, the amount of precipitation and their distribution during the growing season. With these factors, not only the general development of fruit trees is determined, but also their timely cessation of growth, their early adaptation to winter climatic conditions. Winter hardiness of fruit trees is an acquired biological characteristic, and the level of their appearance can change as a result of the natural climatic conditions of the region where the fruits are grown and the agrotechnics used.

In many horticultural data, it is believed that the degree of damage to the bodies of fruit plants depends not only on the dynamics of temperature drop, but also on the level of agrotechnics in this year. Late watering, too much nitrogen fertilization, transplanting seedlings to low relief areas or planting in areas

The American Journal of Agriculture and Biomedical Engineering
(ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals

without air drainage are significantly affected by low temperatures in the winter-spring season [1].

The authors' long-term research shows that the buds of leguminous fruit species go through important stages in autumn, winter and spring. In this case, the development of internal structures also occurs during the period of rest. It is at this time that the archaesporial tissue is formed. The emergence of plants from deep sleep ends with the cessation of the development of some tissues and the formation of proliferating cells in the case of meiosis. The slowdown of development in the winter-spring season is characteristic of more winter-hardy varieties. Based on the above, it was noted that the development characteristics of morphogenesis are a biological characteristic that determines the winter resistance of flower buds of leguminous fruits [2, 3].

In horticulture, the term "cold tolerance" refers to the biological adaptation of plants to adverse winter conditions, and the ability of biologically specific plants to withstand low negative temperatures. Many varieties of pome fruit trees are more resistant to frost than fruit trees with seeds, especially early blooming varieties, if the flower buds are damaged by frost, this will have a negative effect on the yield. It changes the period of fruit production, and in some years it causes the complete death of fruits [4].

The resistance of plants to low temperatures and adaptability to cold depends on the rapid functioning of the process of metabolism and the ability to absorb other metabolic processes. This has led to the maintenance of a complex of functions related to cell development [5].

According to the results of the conducted research, the cold temperature below -1.1-1.6 ℃ in spring damages the flowers of the main fruit species, and the temperature -2-3 ℃ in autumn has a negative effect on fruit storage. Leaves and shoots of immature branches freeze at 4-5 ℃. Premature shedding of leaves and loss of active properties reduces winter resistance of trees [6, 11].

Temperature extremes, which destroy many inflorescences, can have different effects even on the same variety and depend on the adaptation of meteorological factors, the growing conditions of the variety and the specificity of the genotype. Thus, depending on the genotypic specificity of the varieties, the critical temperature for apricot buds is -1.1 -5.6 ℃, for flowers -0.6 -2.8 ℃, and for born fruits -0.7 -2.2 ℃ organized [7, 12].

Different parts of flowers are not equally resistant to low temperatures. First of all, seeds of flowers are affected, and pollinators are affected to a lesser extent, and this is a characteristic not only of apricots, but also of other cultivated fruits. Flowers and fruits that have been severely damaged by frost drop immediately after flowering. Partially damaged ones later develop as underdeveloped fruits that are smaller and more parthenocarpic [8, 11, 12].

Research methods.Experiments were conducted in the apricot collections of the Kashkadarya Research Institute of Horticulture, Viticulture and Winery Research Institute named after academician Makhmud Mirzaev, and the level of winter resistance of apricot varieties was covered in the article. Field and laboratory experiments and the results of scientific developments were tested and applied in the production of generally accepted methods in fruit growing [9,10].

Research results: In assessing the low temperature resistance of the studied apricot varieties, according to the results of the research, in our observations

The American Journal of Agriculture and Biomedical Engineering
(ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals

conducted in the local and imported apricot collection planted in 2011, the average indicator was determined in the following order, from the budding of the trees to the end of the flowering phase in 2017-2019.

The swelling of flower buds on the trees of Vympel variety started on March 14, 2017, in the option of leaving the annual growing branches without shortening, March 17 in the option of leaving ¼ part of the annual growing branches cut, and March 15 in the option of leaving 1/3 and ½ of the annual growing branches cut. Compared to the standard variant, it was observed that the varieties of the experimental variant bloomed 3-5 days later on average.

In 2018, the annual growing branches started on March 4 in the control option without cutting, in the option with ¼ of the annual growing branches cut, it fell on March 18, in the options with 1/3 and ½ part left and cut, these indicators were returned on March 6 and 5. Compared to the standard variant, it was observed that the experimental variants bloomed on average from 2 to 16 days later.

In 2019, these indicators started on March 7 in the control option that did not cut annual growing branches, in March 12 in the option with 1/4 of the annual growing branches cut, and in the options with 1/3 and ½ part left and cut, these indicators were returned on March 9 and 10. From the obtained results, it was found that the budding dates of the known tree buds differed from 3 to 12 days in the options where the remaining, i.e. annual growing branches were cut by leaving ¼, 1/3 and ½ of them, compared to the control option.Compared to the standard variant, it was observed that the experimental variants bloomed 3 to 5 days later on average.

The budding phase also started on March 18 in 2017 in the option that did not cut the annual growing branches, March 21 in the option with ¼ of the annual growing branches, and March 21 in the option with 1/3 and ½ of the annual growing branches, these indicators were returned on March 19.

In 2018, annual growing branches started on March 8 in the option of not cutting annual growing branches, March 12 in the option of leaving ¼ of annual growing branches, and in the option of leaving 1/3 and ½ of the branches cut, these indicators were returned on March 10 and 9.

In 2019, annual growing branches started on March 10 in the option of not cutting annual branches, in the option of leaving 1/4 of the annual growing branches and cutting them, it was determined on March 14, and in the options of leaving 1/3 and ½ of the branches, these indicators were returned on March 11 and 13. From the obtained results, it was found that the tree budding dates differed from 2 to 13 days in the variants that were cut with ¼, 1/3 and ½ of annual growing branches, compared to the control variant.

In this variety, the period from the flowering phase to the fruit ripening dates was observed in the experimental variants as follows. In the control option, flowering began on March 21, 2017, and the fruits began to ripen on June 15. In the option where ¼ of the annual growing branches were cut, the beginning of flowering was observed on March 24, and the ripening of the fruits was determined on June 16. 1/3 and ½ of the annual growing branches were cut. and in the left-cut variants, these indicators showed the beginning of flowering on March 23 and 22, and the beginning of fruit ripening on June 14 and 15. In the control option, flowering began on March 11, 2018, and the fruits began to ripen on June 3. and the ripening of maevas was determined on June 3. In the options where 1/3 and 1/2 of annual growing branches were cut, these indicators returned the beginning of flowering on

The American Journal of Agriculture and Biomedical Engineering
(ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals

March 14 and 12, and the beginning of ripening of fruits corresponded to June 1 and 2.

Accordingly, in 2019, these indicators began to bloom on March 13, and the fruits began to ripen on June 12. In the variant where ¼ of the annual growing branches were cut, the beginning of flowering was observed on March 17, and the beginning of ripening of maevas was determined on June 11. In the options where 1/3 and 1/2 of annual growing branches were cut, these indicators, i.e., the beginning of flowering was returned on March 16 and 14, and it was found that the beginning of ripening of fruits coincided with June 9 and 11.

From the yellowing of the leaves to the end of flowering and the length of the growing season were observed as follows. In the control option, in 2017, tree leaves began to turn yellow on October 17, and the end of flowering was determined on November 14. The period of annual vegetation from the date of the budding of the flower buds to the end of the growing season was 245 days. In the case where annual growing branches were cut by ¼, the leaves started to turn yellow on October 23, and the end of pruning lasted until November 19.

From the date of budding of the flower buds to the end of the growing season, i.e., the annual vegetation period was 247 days. In the options where 1/3 and 1/2 of the annual growing branches were cut, these indicators were found that the leaves of the trees started to turn yellow on October 19 and 18, and the end of flowering lasted until November 17 and 16. It was found out that the period of annual vegetation period was 247 and 246 days, respectively, from the date of budding of the flower buds to the end of the growing season. (Table 1).

Experiments were conducted in autumn, November and all months of winter to determine the resistance of flower buds to cold (low temperatures) in apricot varieties. Observations were made in special refrigerators for direct exposure to low temperatures of –20, –25, –30 and –35 °C for 6 hours to evaluate the frost resistance of apricot buds and one-year branches. Stems and buds damaged by cold were evaluated as a percentage (Table 2).

Local and introduced apricot varieties planted in 2011 were studied to study their resistance to low temperatures, and the results of Vympel, Avitsenna, Rukhi juvonon miona, Alisher, Kursadyk, Krasnoshekiy, Krasniy partizan, Burievestnik and Sarvari varieties were presented.

When studying the frost resistance of apricot varieties:In the Avicenna cultivar, 1.0% and 1.1% of shoots were damaged in November at -30 °C, and no damage was observed in the other varieties in these months. In January, 1.6% were damaged at -35 °C temperature, in February, 2.1% were damaged at -30 °C temperature, and 2.5% were damaged at -35 °C temperature. In the Vympel variety, 1.1% and 1.7% damage was found at temperatures of -30 °C and -35 °C, respectively. In the Alisher variety, 1.1% was damaged at -35 °C, in the Krasnosheki variety, 1.0% was damaged at -30 °C, and 1.5% was damaged at -35 °C. In the Krasniy partizan variety, 1.1% damage was recorded only in February at a temperature of -35 °C. In the Burievestnik variety, 1.0% was damaged at -35 °C in January, and 1.1% at -30 °C in February, and 1.6% at -35 °C.

Table 1

2011 Phenological observations on cultivated apricot cultivars

The American Journal of Agriculture and Biomedical Engineering (ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals

No	Varieties	Years	Bud bulge	Bud-lashi	Flowering			Complete leaf release	The fruit begins to	Leaf yellow-	Hazonrezglik			Vegetation period
					start niche	In full bloom	finish-sh				start niche	It's full	finish-sh	
1	Vympel	Naz	14/III	18/III	21/III	25/III	28/III	14/IV	15/VI	17/X	21/X	6/XI	14/XI	245
		1-q/q	17/III	21/III	24/III	28/III	31/III	19/IV	16/VI	23/X	23/X	12/XI	19/XI	247
		2-q/q	15/III	19/III	23/III	27/III	30/III	17/IV	14/VI	19/X	22/X	9/XI	17/XI	247
		3-q/q	15/III	19/III	22/III	26/III	29/III	16/IV	15/VI	18/X	20/X	8/XI	16/XI	246
		Naz	4/III	8/III	11/III	14/III	21/III	6/IV	3/VI	9/X	5/X	13/X	2/XI	243
		1-q/q	8/III	12/III	15/III	19/III	25/III	10/IV	3/VI	16/X	8/X	17/X	9/XI	246
		2-q/q	6/III	10/III	14/III	18/III	24/III	10/IV	1/VI	13/X	6/X	14/X	7/XI	246
		3-q/q	5/III	9/III	12/III	16/III	23/III	8/IV	2/VI	11/X	4/X	12/X	31/X	242
		Naz	7/III	10/III	13/III	19/III	25/III	13/IV	12/VI	7/XI	29/X	18/XI	26/XI	264
		1-q/q	12/III	14/III	17/III	23/III	28/III	16/IV	11/VI	11/XI	31/X	24/XI	30/XI	267
		2-q/q	10/III	13/III	16/III	22/III	28/III	16/IV	9/VI	9/XI	30/X	22/XI	30/XI	265
		3-q/q	9/III	11/III	14/III	20/III	26/III	14/IV	11/VI	8/XI	29/X	20/XI	28/XI	264
2	Kursodic	Naz	18/III	22/III	25/III	28/III	1/IV	19/IV	19/VI	4/XI	30/X	23/XI	1/XII	258
		1-q/q	20/III	24/III	28/III	31/III	4/IV	23/IV	18/VI	10/XI	3/XI	25/XI	5/XII	260
		2-q/q	19/III	23/III	28/III	31/III	4/IV	21/IV	15/VI	8/XI	2/XI	24/XI	2/XII	258
		3-q/q	18/III	22/III	26/III	30/III	3/IV	20/IV	17/VI	7/XI	31/X	23/XI	2/XII	259
		Naz	9/III	12/III	15/III	19/III	23/III	10/IV	5/VI	5/X	8/X	24/X	8/XI	243
		1-q/q	13/III	16/III	19/III	22/III	27/III	14/IV	4/VI	9/X	11/X	27/X	15/XI	246
		2-q/q	12/III	15/III	17/III	21/III	25/III	13/IV	2/VI	9/X	10/X	27/X	14/XI	246

The American Journal of Agriculture and Biomedical Engineering (ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals

		3-q/q	10/III	13/III	16/III	21/III	24/III	11/IV	3/VI	7/X	9/X	25/X	10/XI	244
		Naz	12/III	17/III	19/III	22/III	28/III	12/IV	6/VI	3/XI	11/XI	21/XI	4/XII	267
		1-q/q	17/III	21/III	23/III	26/III	31/III	16/IV	5/VI	8/XI	16/XI	25/XI	6/XII	264
		2-q/q	15/III	19/III	22/III	25/III	30/III	15/IV	1/VI	7/XI	15/XI	24/XI	7/XII	266
		3-q/q	14/III	18/III	21/III	24/III	29/III	14/IV	3/VI	5/XI	13/XI	22/XI	6/XII	267

Table 2

Frost resistance of branches in apricot varieties % (as a result of direct cooling)

Varietal name	10.11.2018				10.12.2018				10.01.2019				10.02.2019			
	-20	-25	-30	-35	-20	-25	-30	-35	-20	-25	-30	-35	-20	-25	-30	-35
Vympel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.7
Avicenna	-	-	-	1.0	-	-	-	1.0	-	-	-	1.6	-	-	2.1	2.5
Ruhi djuvanon miona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alisher	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1
Kursadyk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Krasnosheki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.5
Krasny is a partisan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1
Burievestnik	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	1.1	1.6
Lord	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CONCLUSIONS

1. The most damage among the studied varieties1.0% damage was observed in Avicenna variety in November and December at -35°C temperature. and in January, 1.6% was affected at -35°C temperature, in February, 2.1% was affected at -30°C temperature, and 2.5% was affected at -35°C temperature.
2. In most varieties of apricots, the growing season begins early, according to their biological characteristics, early flowering varieties begin budding in January-February, while damage was observed due to short-term cold weather in the spring season.
3. Among the studied varieties, Rukhi juvonon miona, Korsadiq and Sarvari varieties were distinguished by their adaptability to natural climatic conditions,

The American Journal of Agriculture and Biomedical Engineering (ISSN – 2689-1018)
VOLUME 05 ISSUE 04 Pages: 14-20
SJIF IMPACT FACTOR (2020: 5. 34) (2021: 5. 554) (2022: 6. 291) (2023: 7. 434)
OCLC – 1121105746
Publisher: The USA Journals

their resistance to cold compared to other varieties in all periods of observations.

4. During the rest period of apricot varieties, that is, in November, December, January and February, the resistance of branches to low temperatures was observed, and cold resistance was observed in an artificial refrigerator at temperatures of -20, -25, -30, -35°C. It was noted that most of the studied varieties are resistant to cold.

REFERENCES

1. Dragavtseva, I. A. Ekologicheskie osnovy optimalo razmeshcheniya abrikosa na Severnom Kavkaze /Autoref. dis.. d-ra s.- x. nauk.- Michurinsk, 1991. -51 p.
2. Moskalenko. K.M., Khalin. G. A. Zimostoykost sortov abrikosa selextsii Nikitskogo botanicheskogo sada // Povyshenie produktivnsoti abrikosovykh nasijdeniy : sb. nauchn. tr. Yalta, 1986, vol. 100- p. 75-81.
3. Yablonsky, E. A. Elmanova T. S. Physiologiya ustoychivosti abrikosa k zimnim neblagopriyatnym usloviyam // Povyshenie produktivitsi abrikosovykh nasajdeniy : sb. nauchn. tr. Yalta, 1986, T. 100- p. 81-90.
4. Cherpakhin V.I., Babuk V.I., Karpinchuk T.K. Plodovodstvo / Pod ed. - M.: Agropromizdat, 1991.- 271 p.
5. Klimov S. V. Bioenergeticheskaya concept ustoichivosti plant k low temperature / S. V. Klimov // Uspekhi sovremennoy biologii. – 1997. – T.117, Vyp. 2. - S. 133-154.
6. Cherepakhin V.I., Babuk V.I., G.N. Karpenchuk Plodovodstvo / Pod editor. V. I. Cherepakhina.- M.: Agropromizdat 1991.- 271 p.
7. Sholokhov, A. M. Morozostoykost tsvetochnyx pochek apricot // Sadovodstvo.- 1964.- №2.- p. 23.
8. Soloveva, M. A. Zimostoykost plodovykh kultur pri razlichnykh usloviyax vyrashchivaniya / M.: Kolos, 1967.- 240 p.
9. Pierce. S. "Polevye opyty s plodovymi derevyami"
10. Epifanov B. D., Polikarpov V. P. Faktory, vliyayushchie naustoychivost plodovykh k vesennim zamorozkam // Sadovodstvo.-1986.- № 2 S- 7-8.
11. Yakubov Mirdjamil Mirziyatovich, Mirzakhidov Ormon & Dilshod Obidzhanov. Restoration and propagation of the local pear variety "zukhra" in danger of extinction. The American Journal of Agriculture and Biomedical Engineering, (2022). 4(09), P. 17–21. Published Date: September 30, 2022 | Crossref doi: https://doi.org/10.37547/tajabe/Volume04Issue09-04
12. Karakhodjaeva G., Obidzhanov D., Mirzaev M. The importance of nutrients in the leaves in the fertilization of apple orchards //The American Journal of Agriculture and Boimedical Engineering. (ISSN – 2689-1018) Published: May 30, 2022 | Pages: 46-49. Doi: https://doi.org/10.37547/tajabe/Volume04Issue05-12