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DELAYED HARVEST OF MARANDI AND ALA SHANY TABLE GRAPE VARIETIES IN THE CONDITIONS OF THE ABSHERON PENINSULA

The chemical composition of the berries and the organoleptic properties of the table grape varieties Marandi and Ala Shany, grown in the Absheron region and stored on the plant until the end of November, were studied. The results indicate that with timely and high-quality agricultural practices during the growing season, it is feasible to store grapes on the plant for two months or longer after reaching full maturity. For two months following the conclusion of the mass harvest, the grapes generally maintain their marketable appearance and quality, which makes delaying grape harvesting economically viable, considering the price differences between the mass harvest and two months later.

Keywords: table varieties, Absheron Peninsula, harvest time, chemical composition.

Introduction. The consumption of fresh grapes is significant for humans throughout the year. Table grapes are a promising source of phenolic substances with high antioxidant activity. Table grape varieties can be considered a source of substances that can prevent oxidative stress and gastric inflammation, including for consumers who do not drink wine. (Restani et al., 2016; Di Lorenzo et al., 2019).

The fact that grapes are a seasonal plant limits their availability on the market in fresh form to 3-4 months (depending on the ripening period of the variety). The difference in the selling price of grapes during mass harvesting and in the autumn-winter period determines the interest of producers in the later arrival of a quality product on the market. Choosing a suitable post-harvest processing technology is decisive for maintaining the quality of table grapes. There are many studies investigating various methods for organising the year-round consumption of grapes. A literature review shows that post-harvest storage of grapes worldwide is based mainly on methods involving SO₂ fumigation. Although this method is very effective in controlling rot, it is increasingly restricted in many countries because residual SO₂ can be dangerous for people with allergies and damage the stems of the bunches and berries. Therefore, the focus is on using healthy materials and safe, simple and innovative technologies. Recent studies show that many methods can be an alternative to SO₂. In particular, heat treatment, improved atmosphere packaging, ethanol, ozone and chitosan (a natural polysaccharide) are considered healthy approaches when used correctly. In addition, researchers generally recommend using a combination of tools to achieve the best results. (Novello et al., 2017)

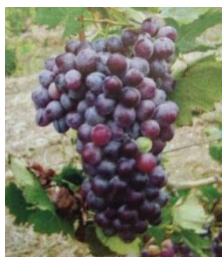
The main task during the long-term storage of grapes is to ensure the stability of the original characteristics of the product or their change with minimal losses. There are several ways to store grapes, of which the one that requires the least additional effort and resources, if natural conditions allow, is storing grapes on vines.

Materials and methods. The relief of the Absheron Peninsula is flat and hilly. The climate type is dry subtropical; active temperatures reach 4000-5000 °C, and the average annual precipitation is 150-250 mm. As climate change progresses, precipitation levels could rise to 300 mm, indicating a gradual shift in the climate type on the peninsula from continental to

temperate. The soils are grey-brown, sandy loam, sandy, etc. The peninsula territory is exposed to strong winds. On the Peninsula, grapes have been cultivated since ancient times; it is a region of table viticulture.

As the object of the study, we chose the table grape varieties Marandi and Ala shany grown in the Absheron Ampelographic Collection of the institute.

Below is a brief description of these varieties (Panahov & Salimov, 2012).



Marandi (Fig. 1). The leaves are large (21 x 20 cm), 5-bladed. The flowers are hermaphroditic. Clusters are medium to large (16-20 x 10-13 cm) and conical in shape, with a dense structure. The berries are large (19.2 x 16.3 mm), oval-shaped, dark red, and with 1-3 seeds. The vegetation period lasts 169 days. The growing force of the plants is high (287 cm). Shoots are well-matured (79%). The sugar content in the berries is 18.4 g/100 cm³, and the titrated acidity is 4.63 g/dm³. Yield per hectare is 151.0 c.



Ala shany (Fig. 2). The leaves are medium or large (18 x 14 cm), 5-bladed. The flowers are hermaphroditic. Clusters of medium size or large size (14-22 x 12-16 cm), conical and wingy shaped, thick. The berries are large (24 x 20 mm), oval-shaped, dark blue, with 2-3 seeds. The vegetation period lasts 172 days. The growing force of the plants is high, ranging from 230 to 285 cm. Shoots are well-matured (88%). The sugar content in the berries is 21.0 g/100 cm³, and the titrated acidity is 7.3 g/dm³. Yield per hectare is 173.3 c.

Technological work was conducted in the Apsheron ampelographic collection, and physical and chemical studies were performed in the institute's laboratories, using the ampelographic descriptors of the International Organisation of Vine and Wine (OIV, 2018).

Results and discussions. The mass harvest of the grapes grown in the Institute's vineyard was completed in the first half of September; to check the suitability of the grapes for storage on the vine, some batches of the varieties studied were left on the plant until the second half of November when the precipitations increased; at the same time, regular checks were made on the appearance of the grapes and their biochemical composition was studied. (Fig. 3, Table 1).



Fig. 3. Grapes stored on the vine (late October)

The visual assessment revealed that no noticeable changes were detected in the colour of the combs and the appearance of the berries in the bunches left on the vine for two months after the mass harvest ended. Regarding the changes in chemical composition, it was observed that from the onset of berry ripening to full maturity, the sugar content increases while acidity decreases. When

stored on the plant, the reverse process occurs, or the values of the studied indicators remain stable (Table 1).

Table 1

Dynamics of changes in the biochemical composition of the berries

Variety	date	Sugar		change, %	Acidity		change, %
		g/100 sm ³	OIV-505		g/dm ³	OIV-506	
Marandi	12.08	17,9	5	-	5,3	3	-
	08.09	18,6	5	+10	4,9	3	-11
	18.10	16,9	5	-11	7,1	3	+7
Ala shany	18.08	13,4	3	-	8,7	5	-
	14.11	14,3	3	+9	8,0	5	-10
	15.12	14,5	3	+1	10,4	5	+8

(Tukey test, $p < .05$)

The table shows that one month after the end of mass harvesting, the sugar content of the Marandi variety decreased by 1.7 g/100 cm³ (11%), and the acidity increased by 2.2 g/dm³ (7%). In the Ala shany variety, an increase in both the sugar content (+1%) and acidity (+8%) of berries was observed from mid-November to mid-December; thus, the organoleptic properties of the berries remained stable throughout the entire storage period.

Conclusions. Leaving grape bunches on the vine does not require additional labour or material investments. The data obtained indicates that with proper agricultural practices and protective measures during the growing season, grapes in the Absheron region can be left on the vine for two months or more. The price difference between table grapes during the ripening period and late autumn can be as much as three to four times, making it economically viable to keep grapes on the plant.

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ЗАТРИМКА ЗБОРУ ВРОЖАЮ СОРТІВ СТОЛОВОГО ВИНОГРАДУ МАРАНДІ ТА АЛА ШАНІ В УМОВАХ АБШЕРОНСЬКОГО ПІВОСТРОВА

Було досліджено хімічний склад ягід та органолептичні властивості столових сортів винограду Маранді та Ала Шані, вирощених в Апшеронському районі та збережених на кущі до кінця листопада. Результати показують, що за своєчасних та якісних агротехнічних заходів протягом вегетаційного періоду можливо зберігати виноград на рослині протягом двох місяців і більше після досягнення повної стиглості. Протягом двох місяців після завершення масового збору виноград зазвичай зберігає свій товарний вигляд та якість, що робить відтермінування збору винограду економічно доцільним, враховуючи різницю в цінах між масовим збором та збором через два місяці.

Ключові слова: столові сорти, Апшеронський півострів, терміни збору врожаю, хімічний склад.