QUALITY AND PRESERVATION CAPACITY OF APPLE VARIETIES INTRODUCED IN MOLDAVIA

CALITATEA ŞI CAPACITATEA DE PĂSTRARE A SOIURILOR DE MĂR INTRODUSE ÎN R. MOLDOVA

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Abstract. *The Republic of Moldavia possesses all the natural conditions for the intensive development of fruit-growing. This branch from ancient times had and still has chances to remain one of the pillars of the national agriculture since it constitutes a wealth determining the effectiveness of the entire agrarian sector of the country. Occupying only 6,5 – 7,0% from the surface of the republic's arable lands, in the last two decades fruit-growing insures permanently about 15-20% from the income resulted from the trading of the agricultural production. In the intensive orchards of Moldavia apple trees predominate occupying more than 70% from the surface of 110 thousands ha and give 60-70% from the entire fruit harvest.*

Rezumat. *Republica Moldova dispune de toate condiţiile naturale pentru dezvoltarea intensivă a pomiculturii. Această ramură din străvechi timpuri a fost şi are şanse să rămână unii dintre pilonii agriculturii naţionale, deoarece ea constituie un belşug, determinând eficienţa întregului sector agrar al ţării. Ocupând doar 6,5 – 7,0% din suprafaţa terenurilor arabile ale republicii, pomicultura în ultimile două decenii asigură în permanenţă circa 15-20% din veniturile băneşti de la comercializarea producţiei agricole. În livezile intensive ale Moldovei predomină mărul ce ocupă mai mult de 70% din suprafaţa de 110 mii ha şi dau 60-70% din roada totală a fructelor.*

The industrial cultivation of apples highlighted the qualities and draw-backs of the district assortment. For example the breed Jonathan is strongly attacked by the apple mildew, the Golden Delicious from the Codru area and especially from the North proved to be less resistant to frost and the red Delicious is attacked catastrophically and everywhere by scald.

The future apple breeds are dictated by the social-economic level of the society development, the producers' and consumers' needs. The consumer asks permanently better fruits, ore qualitative, more beautiful and more qualitative products resulted from the fruit processing. The producer is not interested to maintain in production the breeds unsolicited by the market since the rapid change of assortment by a new cultivation, with an accelerated potential to get the harvest with high productivity and qualities brings substantial benefits. Tree must produce fruits early even in the first 1 – 2 years after their plantation in the orchard, with little vigor, frameworks well garnished with fruits of the spur type do as to increase their density by hectare. (I. Ţurcan, V. Bucarciuc 1995).

From this reason, in the last years in Moldavia, the breeds immune to diseases have been introduced and try to be produced: Prima, Redfri (coop. 13), Pristila, Golden Resistant,

Coop 10, Flirina and Jonofri. Breeds Prima, Pristila and Redfri are immune to the apple scurf. The Coop breed 10 is immune to scurf and mildew. The breeds immune to diseases need 6-8 chemical treatments ant the ones accustomed to them need even 12 or more. The cultivation of the immune breeds on special massifs leads to the decrease of the chemical processing where energetic expenses reach 50 %, and the dose of insect-fungicides – 70% for an orchard hectare. (V.F. Bucarciuc 1991).

The new breed introduced in the Moldavian orchards is Melrose. It ha advantages in what concerns size, colour, structure-texture of tissues, chemical quality and the gustatory qualities of fruits. But this is not enough. Also important is how they are kept.

MATERIAL AND METHOD

In 2002-2003 and 2003 –2004 we made some experiments to check the quality and capacity of maintenance of the new breed resistant to diseases. As a witness we took the prized breed Wegner. The breed Melrose is introduced in Moldavia being immune to scurf and mildew. The apples for experiments were harvested in the Association „Prietenia Agro" Soroca District. The apples of these breeds get ripe and are picked up in the third decade of September, the beginning of October. The pulp of the new breed Melrose is white towards yellowish, quite hard, crispy, and succulent. It has a sweet acidulated taste, very balanced and pleasant and a proper flavor. Melrose is good for middle draught.

The average mass of a fruit was determined by weighing 100 fruit and dividing it by 100 for the breeds Melrose and prized Wegner.

The apples harvested from the orchard were packed in standard cases no. 3 and preserved in the frigorific installation from the commune Truşeni, municipality of Kishinev, at the temperature of 0…-1^{0}C, with a relative air humidity of 90% in normal atmosphere (0,03% CO_2, 20,8% O_2) MEO (normal gaseous environment) and in the variant MGM (modified gaseous environment) packed in polyethylene bags with a thickness of pellicle of 40-50 microns, air tight where temperature was 0…± 1^{0}C, the relative air humidity was 90-95%, CO_2 3-5%, O_2 5-7%.

The quality of the orchard apples after preservation was determined according to the state standard 21122-75: Fresh apples, winter breeds.

After preservation we determined the weight losses according to the method VNII COOP.

RESULTS OBTAINED

In table no. 1 we give the results for apple quality after harvest at the Association „Prietenia Agro" Soroca District.

Table 1

Influence of breeds on the apple quality after harvest

Breeds	Years of experiments	Fruit quality			Average mass of a fruit		Fruit diameter mm
		Superior quality and first quality	Second quality	Third quality	in g	In % as compared to the witness	
Melrose	2002-2003	79,6	14,4	6,0	168,4	104,5	6,8
	2003-2004	92,4	4,2	3,4	172,3	103,7	7,0
Prized Wegner (witness	2002-2003	62,9	25,6	11,5	161,1	100	6,5
	2003-2004	69,3	22,8	7,9	166,2	100	6,7

Table 2

Apple quality after preservation %

Breeds	Preservation without an artificial cooling					Preservation with an artificial cooling				
	Duration of preservation in days	Weight losses	First quality	Non-standard production	Waste	Duration of Preservation in days	Weight losses	First quality	Non-standard production	Waste
2002-2003										
Melrose	120	3,5	90,5	1,9	4,1	180	2,0	96,8	1,0	0,4
prized Wegner (witness)	105	4,2	86,4	3,6	5,8	165	2,2	93,7	2,1	2,0
2003-2004										
Melrose	120	4,0	87,3	4,9	3,8	180	2,6	95,0	1,2	1,2
prized Wegner (witness)	105	4,7	85,6	3,8	5,9	165	3,5	90,1	2,4	4,0

The data from table 1 show us in a convincing manner that the quality of apples (extra and first equality) is higher at the new breed introduced in Moldavia – Melrose, as compared to the prized breed Wagner (witness). For example the fruits of the breed Melrose (extra and first equality) in 2003 reached 92,4%, the second quality 4,2% and the third quality 3,4%, and the pomological prized breed Wagner reached 69,3%, 22,8%, 7,9%.

The fruits of the Melrose breed have an average mass bigger by 3,7…4,5%, they have a bigger diameter than the prized Wagner breed from Moldavia. The fruits of the Melrose breed introduced in Moldavia are more colored, have higher gustatory qualities than the prized Wagner breed.

For preservation we put apples of extra and first quality in frigorific installations.

Research has proved that the new apple breed Melrose distinguishes itself by high trading qualities even after preservation.

From experiments we notice that the apples of the experimented breed Melrose have a longer preservation period both in MGO and in MGM, both in the preservation seasons from 2002-2003 and 2003-2004, as compared to the prized Wagner breed (witness).

The partial pressure of gases in the polyethylene bags (MGM) influences essentially the intercellular gaseous composition that regulates the physical and biochemical processes in fruits and leads to the weight losses in the period of preservation.

One of the main indicators of apple quality after preservation is the first quality of fruits. The first quality of fruits after preservation of the breed Melrose in the conditions of all types of packing was much higher than for the prized Wagner breed.

CONCLUSSIONS

As a conclusion we mention: comparing the quality of fruits after harvest for the apple breed introduced in Moldavia we see that the trees with immunity to scurf and mildew necessitating 4... 6 treatments against these diseases while the prized Wagner breed needs 10---12 treatments. The breed Melrose has a preservation capacity higher than the prized Wagner breed. This will allow us to provide consumers with fresh apples for a longer term since they almost lack pesticides and thus they do not cause damages to the human health.

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