

FRUIT QUALITY EVALUATION OF SOME SWEET CHERRY CULTIVARS IN IASI, ROMANIA

ÎNSUȘIRI ALE CALITĂȚII FRUCTELOR LA UNELE SOIURI DE CIREȘE

**SÎRBU Sorina¹, BECEANU D.², CORNEANU G.¹, PETRE L.¹,
ANGHEL Roxana Mihaela², IUREA Elena¹**

¹Research and Development Station for Fruit Growing, Iasi, Romania

²University of Agricultural Sciences and Veterinary Medicine Iasi, Romania

Abstract. *The consumer test are frequent met in public places, due the great importance of the point of view of sweet cherry's consumers for melioration works. In june 2008, Fruit Growing Research Station Iasi were organised a consumer test in the Central Market of City, were we presented four sweet cherry cultivars: Bucium, Van, Tereza and Ștefan. The parameters on test were the following: external aspects (colour and shine of skin), fruit size, pulp firmity and the taste. The judgement index for every parameter was expressed on a growing scale from minimum 1 to highest 5. We analized in laboratory the soluble substance content (SSC °Bx), the titrable acidity (TA %), average of fruit size (g), average of stone size (g) and pulp firmity through registering the average deformation of fruit (mm/kg). The results of consumer test was compared with quality analyses made on the same samples in laboratory and we observed the must appreciate was Bucium, with 7,4 g fruit weight, SSC 15.9 °Bx and 0,96 % malic acid/100 g fruit weight, followed very closely by Van.*

Key words: *Prunus avium L., cultivar, consumer test, sugar, acidity, preference, Bucium, Van, Tereza, Ștefan*

Rezumat. *Pentru amelioratori, este de mare importanță părerea consumatorului de cireșe, de aceea testele de degustare în spații publice sunt tot mai des întâlnite. SCDP Iași a organizat un test de degustare în luna iunie 2008, în Piața Centrală Iași, la care au fost prezentate patru soiuri de cireș: Bucium, Van, Tereza și Ștefan. Parametrii urmăriți în cadrul fișei de degustare au fost: aspectul exterior (culoarea și luciul epidermei), dimensiunile fructului, fermitatea pulpei și gustul. Indicele de apreciere pentru un parametru a fost exprimat pe o scară crescândă de la minim 1 la un maxim de 5. În același timp, în laborator s-au realizat analize privind conținutul în substanță uscată solubilă (SUS °Bx), aciditate titrabilă (% acid malic), greutatea medie a fructului (g), greutatea medie a sâmburelui (g) și fermitatea pulpei prin înregistrarea rezistenței la deformare (mm/kg). Rezultatele testului au fost confruntate cu analizele calitative realizate la aceleași probe. S-a observat că soiul Bucium a fost cel mai apreciat de consumatori, cu 7,4 g greutate medie a fructului, SUS 15.9 °Bx și aciditate titrabilă de 0,96 %, fiind urmat de soiul Van la mică diferență.*

Cuvinte cheie: *Prunus avium L., cultivar, test de degustare, zahar, aciditate, preferință, Bucium, Van, Tereza, Ștefan.*

Fruit quality evaluation by organoleptic test is commonly used when seeking widespread cultivar of new or want a confrontation on the quality of several cultivars (Lugli *et al.*, 2006). Studies by this method on sweet cherries are interesting results, but are still least widely. Cherry consumer opinion is very important for breeders, so taste tests in public places are increasingly common. In France, CTIFL (Centre Technique Interprofessionnel des Fruits et Légumes) and experimental area La Tapy, organized taste tests in French restaurants to businesses in the area of Paris and Provence-Alpes-Côte d'Azur (Charlot *et al.*, 2002). In Italy, Lugli *et al.*, 2006 presents the results of a taste test organized in a celebration of sweet and sour cherry of Vignola. In the UK, was asked opinion consumer cherry in a questionnaire to find out why they are consumed and are the quality (Wermund, 2005). Also in SUA were evaluated in a consumer sensory evaluation some sweet cherry cultivars (Turner *et al.*, 2008). It was found that aesthetically, sweet cherry are more appreciated when are with great size, bright color, very intense dark red, but not necessarily to black. In terms of taste qualities, is preferable to high sugar content and low acidity with a good balance that ensures pleasant taste (Lugli *et al.*, 2006, Wermund *et al.*, 2005).

MATERIALS AND METHODS

Test tasting of sweet cherries was organized in Central Market, in June 2008, by FGRS Iași, Romania. The test samples were presented to each of 4 kg of 4 different varieties of cherries: *Van*, *Tereza*, *Stefan* and *Bucium*. Attended by 61 persons of both sexes, aged between 14 and 70 years. Samples were collected at the first hours of the morning and transported immediately for tasting in the market (3 km distance) and for laboratory tests (at 6 km distance). Each tasters received a sample of 3-4 fruits from each cultivar and a charter noted that feedback. Sheet used to test tasting referred to the main parameters that characterize the quality of sweet cherries represented by the appearance (skin color and gloss), fruit size, flesh firmness, taste and an overall appreciation of the fruit. Index of appreciation for a parameter was expressed on a scale increasing from 1 minimum to a maximum of 5, as follows: 1 = unpleasant, 2 = liked least, 3 = neutral, 4 = pleasant, 5 = very pleasant. The results were subjected to analysis to check significance variant (Leonte, 1997), using Microsoft Excel. To determine the size of the fruit were weighed samples of 50 fruit and was determined average fruit weight (g) and average weight of stone (g), using an electronic precision balance Radweg, then based on these measurements to calculate the pulp / stone ratio. Titratable acidity (TA) was determined by neutralizing solution of sodium hydroxide 0.1 N to the point of equivalence using timolftalein as an indicator. Soluble substance content (SSC) was determined using a Zeiss refractometer. Determination of firmity pulp was achieved on 30 fruit samples by measuring the deformation resistance of the fruit, using a mechanical device (Sirbu *et al.*, 2007). And these data were verified by statistical analysis and determination variant meanings (Leonte, 1997).

RESULTS AND DISCUSSIONS

Organoleptic test organized by the FGRS Iassy, Romania into Central Market has shown significant differences between cultivars presented (Table 1) which allows diversification assortment of sweet cherry. Expressed general appreciation of the tasters, *Bucium* cultivar was most preferred, with an average score of 4.3.

On fruit appearance, the color and luster, *Bucium* was most preferences lead to all cultivars, with an average score of 4.7, while the lowest grade was obtained from *Tereza* with an average of 4.2, although the this parameter is not very different between cultivars. At all parameters follow, *Bucium* was most preferred, with highly significant statistical difference, compared to the alternatives, but also to the *Van* took witness is noted with an average of over 4.5 in every feature.

Cultivar taken as a control (*Van*) was appreciated by notes very close to those obtained with the cultivars *Stefan* and *Tereza*. Thus, the fruit size of *Van* obtain 3.7 also *Stefan* and *Tereza* notes similarly (3.5 and 3.6). In firmness and taste, *Van* was noted on average by 4.2, as well as cultivar *Tereza* (table 1).

Table 1

Consumer test results from Central Market Iassy, Romania (15 June 2008)

Sample	Average notes obtained at every parameter				
	Appearance	Fruit size	Flesh firmness	Taste	Overall appreciation
Van - control	4.3	3.7 ⁰⁰⁰	4.2 ⁰⁰	4.2 ⁰⁰⁰	3.8 ⁰
Ştefan	4.0	3.5 ⁰⁰⁰	3.9 ⁰⁰⁰	3.9 ⁰⁰⁰	3.6 ⁰⁰⁰
Bucium	4.7*	4.5***	4.6***	4.6***	4.3***
Tereza	4.2	3.6 ⁰⁰⁰	4.1 ⁰⁰⁰	4.2 ⁰⁰⁰	3.8
Media/parametru	4.3	3.83	4.21	4.2	3.87
DL 5%	0.33	0.027	0.014	0.004	0.010
DL 1%	0.47	0.039	0.019	0.006	0.014
DL 0.1%	0.66	0.054	0.027	0.008	0.02

In all samples, test results of tasting were confronted with the parameters determined in the laboratory and noted that *Bucium* was preferred by consumers. As physical features *Bucium* recorded an average weight of 7.4 g and an average deformation of the fruit of only 3.35 mm / kg (table 2), which means that the sweet cherries are preferred for large, with great firmness. Although *Tereza* has made the cultivar a great pulp / stone ratio, that the average weight was lower than in *Bucium*, has led to neglect by consumers to this issue. Biochemical characteristics were also less important for consumers, accounting for a variety *Bucium* content soluble solids (SSC) 15.9 ° Bx and a level of titrable acidity (TA) of 0.96% malic acid/ 100 g fruit. In these features, *Tereza* and *Van* had higher values, with a SSC / TA ratio balanced of 18.86 and 19.09 respectively (Table 3), but having fruit smaller, consumers preferred *Bucium*.

However, it can be said that taste is an important parameter in consumer preferences, *Stefan* had a low SSC (13.2 ° Bx) and titrable acidity (TA) of 0.81% and was noted for consumers with an average of only 3,9, compared to other cultivars which have been recorded on average more than 4th mark.

Table 2

Physical features of some sweet cherry cultivars (2008)

Cultivar	Average fruit weight (g)	Average stone weight (g)	Fruit/stone ratio	Average fruit deformation (mm/kg)
Van	6,4	0,34	18,75	4,3
Ștefan	6,0	0,36	16,45	6,02
Bucium	7,4	0,42	17,78	3,35
Tereza	6,1	0,29	21,32	4,25

Table 3

Biochemical features at some sweet cherry cultivars (2008)

Cultivar	SSC °Bx	TA (% ac. malic/100 g fruit)	SSC/TA
Van	16.6	0.88	18.86
Ștefan	13,2	0,81	16,3
Bucium	15,9	0,96	16,56
Tereza	16,8	0,88	19,09

CONCLUSIONS

Organoleptic analysis of cultivars of sweet cherry faced with qualitative parameters measured by laboratory tests have provided interesting indications on consumer preferences to these samples.

Cultivars studied where the conditions necessary marketing, accounting notes average over 3.5 (minimum necessary for extra quality class) for all parameters follow.

For consumers, the appearance is very important, the fruit size is a parameter determining their preferences, and taste, sweet cherries require a SSC exceeds 16 ° Bx and acidity of 0,8-0,9% (Predieri, 2005, Charlot et al., 2002).

Best appreciated by consumers was *Bucium*, which met an average of 4.54 characteristics points, followed by *Van* with 4.04 points.

REFERENCES

1. Buret M., Fils-Lycaon B., 1990 – *Maturation et qualité de la cerise. Recherches nouvelles, diversification et innovation dans le domaine des fruits et légumes*. Annales du colloque, Paris, Edit. Apria, p. 53-73.
2. Charlot G., Lespinasse Natascha, Scadella Danielle, Simard Valérie, 2002 – *Du sucre, un minimum d'acidité et une bonne fermeté*. Reussir fruits et légumes, n° 207, p. 38-39.
3. Leonte C., 1997- *Ameliorarea plantelor horticole și tehnică experimentală (lucrări practice)*, Ed. „Ion Ionescu de la Brad”, Iași, 222 pp.
4. Lugli S., Donati F., Grandi M., Gaiani Anna, Sansavini S., 2006 – *Nuova cerasicoltura ad un bivio : continuare con i duroni o introdurre nuove varietà?*, Frutticoltura, n.9, p. 30-34.
5. Predieri S., 2005 – *Studiare la qualità per valorizzare la ciliegia*. Frutticoltura, n. 3, p. 36-39.
6. Sirbu Sorina, Beceanu D., Corneanu G., Palade I., 2007- *Preliminary research concerning deformation resistance of fruits at new sweet cherry cultivars created at Fruit Growing Development Station Iași – Romania*. Lucr. Șt. UȘAMV Iași, Seria Agricultură, vol. 50.
7. Turner J., Seavert C., Colonna A., Long L.E., 2008 – *Consumer sensory evaluation of sweet cherry cultivars in Oregon*. U.S.A., Acta Hort., ISHS, 795: 781-786.
8. Wermund U., Fearne A., Hornibrook S.A., 2005 - *Consumer Purchasing Behavior with Respect to Cherries in the United Kingdom*. Proc.4th IS on Cherry, Acta Hort., ISHS, 667: 539-544.