

EUROPEAN CRITERIA TO APPRECIATE THE CHERRIES' QUALITIES

D. BECEANU*

University of Agricultural Sciences and Veterinary Medicine of Iași

Received January 3, 2007

ABSTRACT - *The European criteria for estimating the cherries qualities were formulated by the authors quoted, as a general concept, or were particularized according to the optimum moment of harvesting, destination, as concrete reference marks in the assessment of the existing assortment or of some recent creations for harvesting. We could find criteria of appreciating the acceptability of cherries by the consumers in different European countries. These criteria have recommended in the culture a certain cultivar, with distinct quality fruits, quality criteria regarded in the dynamics of ripeness and post-harvesting, during valorization, as well as specific acknowledged criteria regarding the production and valorization directions (consumption in fresh state, differentiated industrialization). This study has shown the complexity of the qualitative evaluation criteria and the importance of this field of production at the European level.*

Key Words: cherries, quality, criteria, European assessment

REZUMAT - *Criterii europene de apreciere a calității cireșelor. Criteriile europene de apreciere a calității cireșelor sunt formulate de autorii citați ca un concept general sau sunt particularizate, în funcție de momentul optim de recoltare, destinație, respectiv ca repere concrete în aprecierea sortimentului existent sau a unor creații recente de cultivare. Putem distinge criterii de apreciere de primă importanță pentru acceptabilitatea cireșelor de către consumatorii din diferite țări europene, criterii care recomandă în cultură un anumit cultivar care produce fructe cu calități distincte, criterii de calitate privite în dinamica maturării și după recoltare, pe parcursul valorificării, precum și criterii specifice pe direcțiile de producție și valorificare consacrate (consum în stare proaspătă, industrializare diferențiată). Studiul întreprins indică complexitatea criteriilor de evaluare calitativă a cireșelor și arată importanța acestui sector de producție la nivel european. Spațiul redus acordat pentru publicare nu a permis evidențierea tuturor aspectelor și implicațiilor existente.*

Cuvinte cheie: cireșe, calitate, criterii, evaluare europeană

* E-mail: dumitru.beceanu@gmail.com

D. BECEANU

The sweet cherries are non-climacteric fruits, very perishable or perishable that have a relatively limited valorization period in the Northern hemisphere, situated between the beginning of May and the beginning of July, under conditions of Romania. Their thin epidermis and the structural-textural firmness of the elastic type, and the special sensitivity to dehydration of the peduncle (stalk) determine a valorization in demanding conditions (Buret, 1990; Petre, 1992; *** , 1993).

There are two types of species: the firm flesh cherries (firm flesh, duroni, bigareaux)- (*P. avium* var. *duracina*, e.g. *Hedelfinger*, *Pietroase de Cotnari*) and soft flesh cherries (soft flesh, tenerine, guignes, geants, hearts) – (*P. avium* var. *juliana*, e.g. *Ramon Oliva*). Other classifications rely on the juice colour or the grouping according to the maturation moment (Webstwe & Looney, 1996). Bargioni, G. (1996) assesses that a classification of species (cultivars) in groups is not simple, since the firmness may be influenced by climate, stock and fruit loading of the trees. The optimum moment of harvesting is also much influenced by climatic conditions and stock. The most appreciated evaluation criteria of the species refer to productivity, maturation time, fruit size, skin colour, followed by resistance to chapping, pulp firmness and perishable character during valorization.

Kaack, K et al. (1996) establish a series of quality criteria specific to the cherries for processing, that constitute a group of preferred species, according to its specificity (conservation in syrup, crystallization, freezing, liqueurs, jams and marmalades).

There are countries where cherries are pressed, juice is fermented and the product obtained is sold under the improper name of cherry “wine”. For some of these uses, size and shape of the fruit, aspect, colour, flavour, succulence, percentage of pulp and firmness are appreciated. The sensitivity to chapping, the maturation period, the productivity and the adaptability to the mechanized harvesting are also important.

In Europe, the main and the most advantageous direction of valorization is the fresh state consumption, a field where a deficit covered by importations is registered. At the secondary level, some of the cherries are industrialized, but we can talk of specialization in this domain only in the countries with advanced horticulture. In the following lines we shall try to present the methodology of qualitative evaluation used by diverse European authors when characterizing the assortment or some species of a more recent creation.

Sportelli, Gf. (2004), evaluating the cherry assortment recommended in the South of Italy, refers to the ratio sugar/acidity, pulp consistence (firmness), size, sensitivity to chapping, uniformity, length of peduncle, colour, resistance to manipulation and transport and certain diseases, respectively, without giving priority to a special feature (Sportelli, 2004).

Predieri, S. (2005) makes a complete evaluation of the qualitative criteria specific to cherries. First, he mentions the exterior aspect and the internal qualities

EUROPEAN CRITERIA FOR CHERRIES' QUALITIES

(including the sensorial ones). He also mentions the Regulation of the European Committee, establishing the specific norms of trading applicable to cherries (214 from February 6, 2004), underlining the compulsoriness of the freshness state and turgescence. He defines the calibers characterizing the Extra category (at least 20 mm), I and II (17 mm), respectively. The importance of the exterior aspect, the absence of malformations and flaws, the intensity of homogeneity and colour shading and the freshness of the peduncle and fruit are pointed out. The buyer is firstly attracted by colour, while fruit sweet taste is the second decisive criterion in appreciating quality. In Norway, the size of fruit matters a lot, too. In England, they appreciate the homogeneity and shining aspect (the skin glitter), as well as the fruit sweetness (Predieri, 2005).

A complex sensorial evaluation highlights for each criterion a series of specific nuances. The taste is nuanced by sweetness, flavour, solid residue (extract) and acidity. The consistence (firmness) is tightly related to maintaining quality during valorization, being evaluated instrumentally (nondestructively). The coloration and the soluble dry substance appear in tight correlation. The increase in the sugar contents towards 15-19g%, in parallel with the diminution in the acidity coincides with the change of colour. The soluble dry matter tends to values between 12 and 21 degrees Bx, glucose between 4.9 and 7.1 g%, fructose between 5.7 and 8.9 g% and sorbitol between 0.9 and 3.6 g%. The fruit homogeneity is achieved by manual presorting or sorting (after pre-cooling) or recently introduced mechanized variant. Cherries have a high variability of fruits according to their position on the branch and in the tree (interior – exterior, exposure).

The sensorial analysis will take into account the maximal importance of the exterior features (colour, size, uniformity, and glitter). The acceptability of taste in cherries relies on an equilibrium sugar/acidity to the advantage of sugar. The ratio Bx degrees / titrating acidity is appreciated between the values of 1.5 and 2, where the soluble dry matter will be of at least 15-16 Bx and of optimum 17-19 Bx. The taste is nuanced by the contents in tannin and chlorogenic acid (negative features). Flavour is not very relevant (Predieri, 2005).

Neri, Fiorella et al. (2005) assess the cherry quality in the context of their valorization. They appreciate especially the fruit colour and glitter, the pulp turgescence (freshness) and the gustatory characteristic features. After harvesting, the cherries are exposed to some alteration phenomena, caused by *Monilinia*, *Botrytis*, *Penicillium*, *Alternaria*, *Rizophus* and senescence, respectively, in the context of losing humidity. Gradually, they lose their crispy character and freshness, and finally appear phenomena like withering and browning of stalks, staining and pathogen alteration of fruits. They mention the importance for quality of the optimum moment of harvesting followed by pre-cooling and immediate valorization or temporary refrigerating conservation. The features considered to be of first importance for the sensorial evaluation refer to aspect (size, skin

D. BECEANU

colour, pulp colour) and taste (sweetness, acidity, predominant taste, flavour/grassy taste) (Neri, Fiorella et al., 2005).

Roselli, G. (2006) characterizes cherries of Italian origin (Toscana and Umbria) from morphological, chemical and sensorial viewpoints. He insists on the firmness of epidermis and pulp, contents of simple sugars (glucose, fructose) and organic acids (apple acid, tartaric), fruit size and contents in anthocyanic acids. The instrumental analysis focused on the colour hue, weight and caliber, and the chemical analyses, on the determination of pH, acidity, soluble dry matter and sugars (Roselli et al, 2006).

Simard, Valerie et al. (1998 – 2006) assert that the date of harvesting cherries is a difficult decision to take; although colour remains a good (visual) criterion, one must not neglect firmness, sugar contents and acidity. Firmness may vary from one year to another, to an equal colour. The possibility to assess the quality of an assortment according to a certain colour stage is considered an “utopia”. The caliber and colour are interdependent, and are influenced by the conditions of the culture year and the tree loading. The cherries quality may be related to the climatic conditions of a certain year, but it is more important to harvest each assortment at the right time (Simard, 2002; Simard, 2006; Simard, 1998).

The author evaluates the quality of the cherry assortment cultivated in France, according to some relatively limited criteria: sensitiveness to chapping, firmness, caliber and colour characteristic to the optimum moment of harvesting.

Simard, Valerie (2002) also concretizes the preoccupations related to quality of the participants to the fourth ISHS Congress (USA 2001) on the cherry tree culture. Among the criteria mentioned, the fruits of big caliber, resistance to chapping and colour are first taken into consideration (Simard, 2002).

Edin, M. (1996) estimates from the qualitative viewpoint, the French assortment of cherries referring to firmness degree, sensitiveness to chapping, general aspect, caliber, crispy aspect, sugar contents, acidity and gustative quality.

Albertini, A (2001) characterizes from the qualitative viewpoint, the cherry assortments according to size, fruit shape, colour and pulp consistence, skin aspect and taste (including the ratio sugar/acidity). He also mentions the stone size, contents of dry matter, resistance to manipulation, adaptability for some assortments to the mechanized harvesting and industrialization.

Buret, M. (1990) carries out a large study on the relation between the quality of cherries and their degree of maturation. He classifies the evaluation criteria into five categories: physical criteria (weight, density, firmness, and colour), nutritional criteria (soluble dry matter, sugars, acidity, pigments, pectic substances, and vitamins), hygienic criteria (the presence of some noxious substances), organoleptic criteria (visual, smell, flavour, texture) and technological criteria (preservation capacity, favorable qualities for conservation – trading – industrialization) (Buret, 1990).

EUROPEAN CRITERIA FOR CHERRIES' QUALITIES

Lugli, S. (2003), referring to the objectives of genetic breeding of cherries in Italy and on the world level, concretizes the specific preoccupations related to quality. The quality as a whole or the subordinate aspects regarding the fruits colour and their resistance to chapping are associated to the resistance to diseases or the adaptability to mechanized harvesting. Referring strictly to the coordinates of the fruit quality, he asserts their conditioning as a good species, in correlation with the environment factors and the culture technology: adequate sizes, high consistence of pulp, high contents of sugars and a balanced ratio with organic acids, high levels of polyphenols and aromatic substances. Other aspects with an esthetic value, which are important for trading: fruit size, skin colour and intensity of glitter. Finally, he mentions some features related to valorization, especially for the exportation species: a good behavior in the final stages of maturation and post-harvesting period and a good resistance to manipulation.

He comments the promoting of an assortment for industrialization that adapts to the mechanized harvesting. The positive feature of suberizing the scar produced at peduncle separation, by avoiding the loss of juice, and beginning of some oxidative or even pathogen phenomena may represent a good character. Achievements in this field were obtained by Bargioni from ISF Verona (cultivars Enrika and Bargioni 137), and Brozik in Hungary (Long, 2006).

Lugli, S. (2006) mentions a group of six basic criteria for the qualitative analysis of cherries: weight, pulp firmness, epidermis elasticity, epidermis colour, soluble dry matter and titrating acidity (Lugli et al., 2006).

Charlot, G et al. (2002) analyze, from the qualitative viewpoint, the French assortment of cherries, pointing out the importance of sugar contents, minimum acidity and good firmness. Some physical-chemical features may be determined very precisely: colour, according to the CTIFL colour code, caliber (grams), firmness measured penetrometrically, contents of soluble dry matter (degrees Brix) and acidity (measured titrimetrically). The sensorial appreciation includes the external colour, crispy character, firmness, succulence, balanced taste (the ratio glucides /acidity), intensity and persistence of the characteristic flavour etc.

For the valuation by the consumers, a scoring comprising a note of general impression and a specific note for the quality features more appreciated was made up: contents in sugars, acidity, crispy character, succulence, fondant character, colour, caliber and flavour. Finally, the question whether the person in question would like to buy the respective cherries and what qualitative criterion/criteria were decisive for that decision were formulated. The most appreciated batches had better contents of soluble dry matter, acidity and firmness. The less appreciated assortments lacked succulence and had a too high firmness (Charlot et al., 2002).

Charlot (2003) presents the cherry assortment cultivated in France by maturation stages. For each species, especially for the most important ones, he presents fruit size, sensitiveness to chapping, firmness, gustatory quality, balanced

D. BECEANU

character between the sweet and acid taste and more or less crispy character (Charlot et al., 2005).

Charlot et al. (2005) investigate the perception of the cherry quality by the French consumer. They noticed a low knowledge of species, and that cherries have a short period of consumption (from the beginning of May to the end of July, with a maximum at the middle of June). They also notice the preference for the red cherries to the detriment of the bicolor ones. They appreciate the initiative of some producers to offer sorted cherries of a much bigger caliber (32-34 mm), as well as the preoccupation for freshness, sugar contents and even a characteristic flavour (Charlot, 2003).

REFERENCES

- Braniște N., 2001** – *Present problems of garden plant breeding*. Hortinform no. 3
- Budan S., Braniște N., 2001** – *Breeding of fruit growing species, future achievements and orientation*. Hortinform no 5
- Buret M., 1990** – *Maturation et qualité de la cerise. Recherches nouvelles*. A. C. Apria, Paris
- Bru M., Simard Valerie, 2002** – *Cerise, des techniques pour maintenir la qualité des fruits*. Réussir Fruits et Légumes. Mai, Paris, Toulouse
- Brunner Chaterine, 2006** – *La cerise s` exprime dans ses terroirs*. Réussir Fruits et Légumes. Avril , Paris, Toulouse
- Capocasa F. et al., 2006** - *Le varietà e i portinnesti per la coltivazione nel medio Adriatico*. Revista Frutticoltura no 12, Rome, Bologna
- Cardinale Celine, Simard Valerie, 1999** - *Fraîcheur sur la ligne*. Réussir Fruits et Légumes. Mai , Paris, Toulouse
- Charlot G. et al., 2002** – *Cerise, du sucre un minimum d`acidité et une bonne fermité*. Réussir Fruits et Légumes. Mai, Paris, Toulouse
- Charlot G. et al., 2005** – *La cerise s`inscrit dans la segmentation*. Réussir Fruits et Légumes. Juin, Paris, Toulouse
- Charlot G., 2003** – *La scelta varietale del ciliegio in Francia*. Frutticoltura no 6, Rome, Bologna
- Delarue E., 2006** – *Raissoner l`approche du verger*. Réussir Fruits et Légumes. Avril Paris, Toulouse
- Kaska N., 2006** – *Sempre piu competitiva la cerasicoltura in Turchia*. Frutticoltura no 9, Rome, Bologna
- Long L., 2006** – *Tendenze evolutive della cerasicoltura nel Nord-Ovest degli Stati Uniti*. Frutticoltura no. 9, Rome, Bologna
- Lugli S., 2003** – *Il miglioramento genetico del ciliegio dolce in Italia e nel mondo*. Revista Frutticoltura nr. 6, Rome, Bologna
- Lugli S. et al., 2006** – *Nouva cerasicoltura ad un bivio: continuare, con i duroni o introdurre nuove varietà?* Frutticoltura no 9, Rome, Bologna
- Lunati F., 2005** – *La cerasicoltura nazionale tra luci ed ombre*. Frutticoltura no 3, Rome, Bologna
- Miguel Ellena et al., 2003** – *Il boom della cerasicoltura cilena*. Frutticoltura no. 6, Rome, Bologna
- Millan M., 2005** – *La cerise dans la palette du code couleur*. Réussir Fruits et Légumes. Juin, Paris, Toulouse

EUROPEAN CRITERIA FOR CHERRIES' QUALITIES

- Neri Fiorella et al., 2005** – *Qualità, serbevolezza e suscettibilità alle alterazioni di cultivar di ciliege*. Frutticoltura no. 3, Rome, Bologna
- Petre I., 1992.** – *Behaviour of some cherry tree varieties with early ripeness in the forest steppe area of Moldavia*. Scientific works. Fruit Growing Research Institute of Pitești-Mărăcineni vol. XV
- Petre I., 1991** – *Investigation in orchard on some cherry tree varieties in the first ten years since planting*. Scientific works. Fruit Growing Research Institute of Pitești-Mărăcineni vol. XIV
- Petre L., Petre P.R., 2004** – *Five new cherry tree varieties at Fruit Growing Research Station of Iași*. Hortinform no 4
- Predieri S., 2006** - *Studiare la qualità per valorizzare la ciliegia*. Frutticoltura no. 3, Rome, Bologna
- Raimondo A. et al., 2006** - *Le cultivar siciliane di ciliege dolce: aspetti fenologici, morfologici e genetico-molecolari*. Frutticoltura no 9, Rome, Bologna
- Roman R., 1998** – *Genetical breeding of fruit tree assortment, bushes, stocks and dendrological plants*. Hortinform no 4
- Roman R. et al., 2004** – Contribution on improving the assortment of fruit trees for new plantations from Romania. Scientific works. Fruit Growing Research Institute of Pitești-Mărăcineni
- Roselli G. et al., 2006** – *Caratterizzazione morfo-fisiologica e delle proprietà salutistiche di cultivar di ciliege toscane ed umbre*. Frutticoltura no 9, Rome, Bologna
- Simard Valerie, 2002** – *La cerise dans la nouveauté d'une recherche active*. Réussir Fruits et Légumes. Avril, Paris, Toulouse
- Simard Valerie, 2006** – *Il faut bien choisir ses variétés*. Réussir Fruits et Légumes. Avril, Paris, Toulouse
- Simard Valerie, 1998** – *Savoir récolter au bon moment*. Réussir Fruits et Légumes. Mai, Paris, Toulouse
- Sportelli G.F., 2004** – Frutticoltura meridionale stretta tra Mediterraneo e UE a 25. Frutticoltura no 11, Rome, Bologna
- Sportelli G.F., 2004** – *Ciliege, nuove varietà per il Sud*. Frutticoltura no. 9, Rome, Bologna
- Usenik V. et al., 2006** – *Effects of rootstocks and training system on growth, precocity and productivity of sweet cherry*. Journal of Horticultural Science & Biotechnology, London, Kent
- Webstwe A.D & Looney, 1996** – *Cherries: Crop Physiology, Production and Uses*. CAB International
- ***, **2006** - *Des cerises dans leurs terroirs*. Réussir Fruits et Légumes. Avril, Paris, Toulouse
- ***, **2000** - *L'horizon s'éclaircit*. Réussir Fruits et Légumes. Mai, Paris, Toulouse
- ***, **1993** - *Cerise*. Fruits et Légumes no 107, Avril, Paris, Toulouse
- ***, **1995** - *Cerise: des atouts dans le jeu*. Fruits et Légumes no 142, Paris, Toulouse
- ***, **1998** - *Cerise d'industrie*. Fruits et Légumes no 164, Paris, Toulouse
- ***, **1995** - *Cerise. Variétés: enrichir la gamme*. Fruits et Légumes no 147, Paris, Toulouse