

**CERCETĂRI PRIVIND DINAMICA UNOR ÎNSUȘIRI FIZICO-CHIMICE PE PERIOADA MATURĂRII FRUCTELOR LA UNELE SOIURI DE CIREȘ**  
**RESEARCH CONCERNING OF PHYSICO-CHEMICAL DYNAMICS FEATURES DURING RIPENING AT SOME SWEET CHERRY CULTIVARS**

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**Abstract**

Research has been done in 2009, from May 19 to June 22, with five sweet cherry cultivars with medium maturation (*Maria, Lucia, Golia, Van* and *Boambe of Cotnari cl.7*), in which were observed changes of physical and chemical parameters during ripening. Determinations were made on the equatorial diameter and fruit weight in six phases corresponding to different stages of maturation between 29 and 63 days after full bloom. There have been changes of these parameters between the first phase and the sixth stage of maturation, as follows: fruit weight increased at *Boambe Cotnari cl.7* from 1.31 g up to 29 days after full bloom up to 7.44 g 63 days after full bloom; equatorial diameter increased at *Van* from 12.60 mm to 23.28 mm. Determination of soluble solids content was done in three phases between 49 and 63 days after full bloom and increased at *Maria* from 11.68% up to 16.60%. The study of the physical and chemical features dynamics, corresponding changes of the fruit's taste and appearance, give the possibility to establish the optimal period for harvesting.

**Keyword:** cherry, varieties, features, maturation phase

**Cuvinte cheie:** cireș, soiuri, însușiri, faze de maturare

**1. Introduction**

Cherry is a fruit growing species with a great economical importance, given the nutritional, technological and commercial characteristics of fruit, which has optimum agrobiological conditions in Romania and showed its potential (Grădinariu & Istrate, 2003; Petre, 2006).

Cherries are the first fruit (part II of May until mid-July) at a time when other fruits are missing on market, so are consumed mainly non-processed (Ghena & Braniște, 2003; Petre, 2005). These fruit is beyond in almost all fruit tree species regarding average of total sugar content, tannoids, protein, minerals and vitamin C (Budan & Grădinariu, 2000). On fresh fruit market there are preferred cultivars with fruits like `bigarreau` type, with bright red or bi-coloured skin colour, with cracking resistance, available for transport and temporary storage, exceeding 7 g in weight (Budan & Grădinariu, 2000).

During maturation, fruit size and soluble substance content increased (Buret & Fils Lycaon, 1990; Sîrbu et al, 2009; Simard, 2005; Simčič et al., 1998; Sîpos, 1996; Tudela et al., 2005) and changes of colour parameter determined the optimal time for harvest (Webster & Looney, 1996; Petre, 2006).

The aim of this study was to improve the assortment of sweet cherry for NE area of Romania, by promotion of new cultivars created at FGRS Iassy and establishment of the optimal harvest period, and also the dynamics of physico-chemical characteristics of fruits during ripening.

**2. Material and methods**

The researches was made in 2009, from May 19 up to June 22, having five sweet cherry cultivars with maturation into medium season, as research material (*Maria, Lucia, Golia, Van* and *Boambe Cotnari cl.7*), grafted on *Prunus mahaleb*.

Trees are planted at a distance of 5 x 4 m, with flattened free palmetto as crown shaped without training support and having 18 years after planting.

Fruit size (equatorial diameter in millimetres), fruit weight (g) and soluble solids content (SSC%) were determined.

Equatorial diameter of the fruit was determined using a manual calliper rule on samples of 15 fruits each in four repetitions, in six different stages of maturation, every eight days (Buret & Fils Lycaon, 1990; Tudela et al., 2005; Sîrbu et al, 2009).

Fruits were weighed also on samples of 15 fruits in four repetitions, in 6 different stages of maturation, using an electronic balance (Radwag type, with precision 0.01 g).

Soluble solids content was determined on samples of 15 fruits in four repetitions, in three different stages of maturation, using a manual refractometer (Zeiss type).

Determinations were used in statistical processing of data by analysis of variance for bifactorial experiences.

**A** factor is the maturation phase and has six graduations in determinations on fruit weight and equatorial diameter, as follows:  $a_1 = 29$  days after full bloom (DAFB),  $a_2 = 36$  DAFB,  $a_3 = 43$  DAFB,  $a_4 = 50$  DAFB,  $a_5 = 57$  DAFB,  $a_6 = 64$  DAFB.

For soluble solids content (SSC), **A** factor has three graduations, respectively:  $a_1 = 43$  DAFB,  $a_2 = 57$  DAFB,  $a_3 = 64$  DAFB.

**B** factor was the cultivar and it has five graduations, as follows:  $b_1 = Maria$ ;  $b_2 = Lucia$ ;  $b_3 = Golia$ ;  $b_4 = Van$  and  $b_5 = Boambe$  by *Cotnari cl. 7*.

### 3. Results and discussions

In the first maturation phase (29 DAFB) equatorial diameter registered statistical differences with highly significance at *Lucia* (1.31 mm), *Van* (1.2 mm) and *Boambe by Cotnari cl.7* (0.75 mm) compared with *Maria*; also *Golia* registered negative significantly differences compared with *Lucia* (-0.74 mm) (table 1).

In second phase of maturation (36 DAFB), the largest growth increments (very significant) were obtained from *Golia* (1.39 mm) compared with *Maria* and *Van* (1.89 mm, 1.66 mm) compared with *Maria* and *Lucia* (table 1). Between 43-50 days after full bloom (stage third of maturation) equatorial diameter has highly significant positive differences at *Lucia* (4.95 mm), *Golia* (2.31 mm), *Van* (4.57) and *Boambe by Cotnari cl.7* (1.49) compared with *Maria* (table 1).

In fourth phase of maturation (50 DAFB), *Lucia* and *Van* registered positive differences compared with *Maria* (1.84 mm and respectively 0.99 mm), also *Golia*, *Van* and *Boambe by Cotnari cl.7* registered negative values compared with *Lucia* (table 1).

In fifth stage of maturation (57 DAFB), *Lucia*, *Golia* and *Van* showed positive values compared with *Maria* (1.54 mm, 0.96 mm and respectively 0.79 mm) but *Van* and *Boambe by Cotnari cl. 7* showed negative values compared with *Lucia*.

In the sixth stage of maturation (64 DAFB), *Van* and *Boambe by Cotnari cl.7* exceeded very significantly compared with *Maria*, *Lucia* and *Golia* (table 1).

About difference of equatorial diameter of the fruit from the same cultivar in different stages of maturation we registered values showed in table 2. So, at first four stages of maturation (I-IV, that means 29-50 DAFB), all cultivars showed highly significant positive values.

*Maria* (2.21 g), *Van* (2.87 g) and *Boambe by Cotnari cl.7* (2.76 g) (table 2) exceeded very significantly positive in the last stages of maturation.

Fruit weight differences between cultivars at 29 days after full bloom were statistically insignificant, except *Lucia* (0.32 g) which has significant differences compared with *Maia* (table 3). *Lucia* and *Van* have been very significantly positive differences in fruit weight in the second and third phases of maturation, compared with *Maria* and *Golia* (table 3).

In fourth and fifth phases of maturation, *Van* and *Boambe by Cotnari cl.7* were very significant in differences compared with *Maria*, *Lucia* and *Golia*, also *Lucia* and *Golia* showed highly significant differences in positive compared to *Maria* (table 3).

Between 29-64 DAFB, all cultivars showed positive highly significant increases in fruit weight except *Lucia* and *Golia*, which recorded negative differences at 64 DAFB (sixth phase of maturation) (table 4).

In the first maturation stage (50 DAFB) distinct significantly positive differences in soluble solids content at *Van* (2.46%) and *Boambe by Cotnari cl.7* (2.46%) compared with *Maria* (table 5) were recorded. Between 50-57 DAFB, *Boambe by Cotnari cl.7* showed a significant negative difference in soluble solids content compared with *Lucia* (1.82%) (table 5). Between 57-64 DAFB, *Van* (4.4%) and *Boambe by Cotnari cl.7* (3.47%) showed highly significant positive values compared with *Lucia*, also *Golia* (2, 93%) showed distinct significant differences compared with *Lucia* (table 5).

At all five cultivars, differences in soluble solids content in eight days distance were positive, registering a high increase (from 0.53 to 3.72%) from a maturation stage to another (table 6).

### 4. Conclusions

1. Increases in fruit size within 29-64 days after full bloom are continuous at *Van* and *Boambe by Cotnari cl.7*, but *Maria*, *Lucia* and *Golia* increases are stopped at 57 days after full bloom.

2. Also, regarding the fruit weight were noted again *Van* and *Boambe by Cotnari cl.7* with values ranging from 7.1 to 7.4 g within 57-64 days after full bloom. We mention that these were recorded in difficult conditions of the 2009 year when has been deep drought.

3. Soluble solids content with higher values (16.29 to 17.75%) were recorded between 57-64 days after full bloom at *Golia*, *Van* and *Boambe by Cotnari cl.7*, so that at the optimum harvest period for them.

4. *Golia*, *Van* and *Boambe by Cotnari cl.7* can be regarded as valuable of sweet cherry varieties for medium harvest season.

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## Tables and figures

**Table 1. Differences in the fruit equatorial diameter (mm) at different cultivar in the same stage of maturation**

Comparison between cultivars	Difference (mm) and significance	Comparison between cultivars	Difference (mm) and significance
a <sub>1</sub> b <sub>2</sub> - a <sub>1</sub> b <sub>1</sub>	1,31 <sup>+++</sup>	a <sub>4</sub> b <sub>2</sub> - a <sub>4</sub> b <sub>1</sub>	1,84 <sup>+++</sup>
a <sub>1</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>1</sub>	0,57	a <sub>4</sub> b <sub>3</sub> - a <sub>4</sub> b <sub>1</sub>	0,61
a <sub>1</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>2</sub>	- 0,74 <sup>00</sup>	a <sub>4</sub> b <sub>3</sub> - a <sub>4</sub> b <sub>2</sub>	- 1,23 <sup>00</sup>
a <sub>1</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>1</sub>	1,20 <sup>++</sup>	a <sub>4</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>1</sub>	0,99 <sup>++</sup>
a <sub>1</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>2</sub>	- 0,11	a <sub>4</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>2</sub>	- 0,85 <sup>00</sup>
a <sub>1</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>3</sub>	0,63	a <sub>4</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>3</sub>	0,38
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>1</sub>	0,75 <sup>++</sup>	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>1</sub>	0,43
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>2</sub>	- 0,56	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>2</sub>	- 1,41 <sup>000</sup>
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>3</sub>	0,18	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>3</sub>	- 0,18
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>4</sub>	- 0,45	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>4</sub>	- 0,56
a <sub>2</sub> b <sub>2</sub> - a <sub>2</sub> b <sub>1</sub>	0,19	a <sub>5</sub> b <sub>2</sub> - a <sub>5</sub> b <sub>1</sub>	1,54 <sup>+++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>1</sub>	1,39 <sup>+++</sup>	a <sub>5</sub> b <sub>3</sub> - a <sub>5</sub> b <sub>1</sub>	0,96 <sup>++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>2</sub>	1,16 <sup>++</sup>	a <sub>5</sub> b <sub>3</sub> - a <sub>5</sub> b <sub>2</sub>	- 0,58
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>1</sub>	1,89 <sup>+++</sup>	a <sub>5</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>1</sub>	0,79 <sup>++</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>2</sub>	1,66 <sup>+++</sup>	a <sub>5</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>2</sub>	- 0,75 <sup>00</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>3</sub>	0,50	a <sub>5</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>3</sub>	- 0,17
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>1</sub>	- 1,23 <sup>00</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>1</sub>	0,71
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>2</sub>	- 1,46 <sup>000</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>2</sub>	- 0,83 <sup>00</sup>
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>3</sub>	- 2,62 <sup>000</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>3</sub>	- 0,25
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>4</sub>	- 3,12 <sup>000</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>4</sub>	- 0,08
a <sub>3</sub> b <sub>2</sub> - a <sub>3</sub> b <sub>1</sub>	4,95 <sup>+++</sup>	a <sub>6</sub> b <sub>2</sub> - a <sub>6</sub> b <sub>1</sub>	- 0,57
a <sub>3</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>1</sub>	2,31 <sup>+++</sup>	a <sub>6</sub> b <sub>3</sub> - a <sub>6</sub> b <sub>1</sub>	- 1,74 <sup>000</sup>
a <sub>3</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>2</sub>	- 2,64 <sup>000</sup>	a <sub>6</sub> b <sub>3</sub> - a <sub>6</sub> b <sub>2</sub>	- 1,17 <sup>00</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>1</sub>	4,57 <sup>+++</sup>	a <sub>6</sub> b <sub>4</sub> - a <sub>6</sub> b <sub>1</sub>	1,45 <sup>+++</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>2</sub>	- 0,38	a <sub>6</sub> b <sub>4</sub> - a <sub>6</sub> b <sub>2</sub>	2,02 <sup>+++</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>3</sub>	2,26 <sup>+++</sup>	a <sub>6</sub> b <sub>4</sub> - a <sub>6</sub> b <sub>3</sub>	3,19 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>1</sub>	1,49 <sup>+++</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>1</sub>	1,26 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>2</sub>	- 3,46 <sup>000</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>2</sub>	1,83 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>3</sub>	- 0,82 <sup>00</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>3</sub>	3,0 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>4</sub>	- 3,08 <sup>000</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>4</sub>	- 0,19

LD 5%= 0,73 mm

LD 1% = 0,98 mm

LD 0,1% = 1,26 mm

 a<sub>1</sub>= 29 DAFB;

 a<sub>3</sub>= 43 DAFB;

 a<sub>5</sub>= 57 DAFB;

 a<sub>2</sub>= 36 DAFB;

 a<sub>4</sub>= 50 DAFB;

 a<sub>6</sub>= 64 DAFB;

 b<sub>1</sub>= Maria;

 b<sub>2</sub>= Lucia;

 b<sub>3</sub>= Golia;

 b<sub>4</sub>= Van;

 b<sub>5</sub>= Boambe by Cotnari cl.7

**Table 2. Differences in equatorial diameter (mm) from the same cultivar in different stages of maturation**

Comparison of maturation phase	Difference (mm) and significance	Comparison of maturation phase	Difference (mm) and significance
a <sub>2</sub> b <sub>1</sub> - a <sub>1</sub> b <sub>1</sub>	3,42 <sup>+++</sup>	a <sub>4</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>4</sub>	1,17 <sup>++</sup>
a <sub>2</sub> b <sub>2</sub> - a <sub>1</sub> b <sub>2</sub>	2,34 <sup>+++</sup>	a <sub>4</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>5</sub>	3,69 <sup>++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>3</sub>	4,24 <sup>+++</sup>	a <sub>5</sub> b <sub>1</sub> - a <sub>4</sub> b <sub>1</sub>	0,29
a <sub>2</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>4</sub>	4,11 <sup>+++</sup>	a <sub>5</sub> b <sub>2</sub> - a <sub>4</sub> b <sub>2</sub>	- 0,01
a <sub>2</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>5</sub>	1,44 <sup>+++</sup>	a <sub>5</sub> b <sub>3</sub> - a <sub>4</sub> b <sub>3</sub>	0,64
a <sub>3</sub> b <sub>1</sub> - a <sub>2</sub> b <sub>1</sub>	- 0,44	a <sub>5</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>4</sub>	0,09
a <sub>3</sub> b <sub>2</sub> - a <sub>2</sub> b <sub>2</sub>	4,28 <sup>+++</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>5</sub>	0,57
a <sub>3</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>3</sub>	0,48	a <sub>6</sub> b <sub>1</sub> - a <sub>5</sub> b <sub>1</sub>	2,21 <sup>+++</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>4</sub>	2,24 <sup>+++</sup>	a <sub>6</sub> b <sub>2</sub> - a <sub>5</sub> b <sub>2</sub>	0,10
a <sub>3</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>5</sub>	2,28 <sup>+++</sup>	a <sub>6</sub> b <sub>3</sub> - a <sub>5</sub> b <sub>3</sub>	- 0,47
a <sub>4</sub> b <sub>1</sub> - a <sub>3</sub> b <sub>1</sub>	4,75 <sup>+++</sup>	a <sub>6</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>4</sub>	2,87 <sup>+++</sup>
a <sub>4</sub> b <sub>2</sub> - a <sub>3</sub> b <sub>2</sub>	1,64 <sup>+++</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>5</sub>	2,76 <sup>+++</sup>
a <sub>4</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>3</sub>	3,05 <sup>+++</sup>		

LD 5%= 0,72 mm      LD 1% = 0,98 mm      LD 0,1% = 1,29 mm  
 a<sub>1</sub>= 29 DAFB;      a<sub>3</sub>= 43 DAFB;      a<sub>5</sub>= 57 DAFB;  
 a<sub>2</sub>= 36 DAFB;      a<sub>4</sub>= 50 DAFB;      a<sub>6</sub>= 64 DAFB;  
 b<sub>1</sub>= Maria;      b<sub>2</sub>= Lucia;      b<sub>3</sub>= Golia;      b<sub>4</sub>= Van;      b<sub>5</sub>= Boambe by Cotnari cl.7

**Table 3. Differences in fruit weight (g) in different cultivars in the same stage of maturation**

Comparison between cultivars	Difference (g) and significance	Comparison between cultivars	Difference (g) and significance
a <sub>1</sub> b <sub>2</sub> - a <sub>1</sub> b <sub>1</sub>	0,32 <sup>+</sup>	a <sub>4</sub> b <sub>2</sub> - a <sub>4</sub> b <sub>1</sub>	0,03
a <sub>1</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>1</sub>	0,21	a <sub>4</sub> b <sub>3</sub> - a <sub>4</sub> b <sub>1</sub>	0,40 <sup>++</sup>
a <sub>1</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>2</sub>	- 0,11	a <sub>4</sub> b <sub>3</sub> - a <sub>4</sub> b <sub>2</sub>	0,37 <sup>0</sup>
a <sub>1</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>1</sub>	0,18	a <sub>4</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>1</sub>	0,95 <sup>+++</sup>
a <sub>1</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>2</sub>	- 0,14	a <sub>4</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>2</sub>	0,92 <sup>+++</sup>
a <sub>1</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>3</sub>	- 0,03	a <sub>4</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>3</sub>	0,55 <sup>+++</sup>
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>1</sub>	0,15	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>1</sub>	0,90 <sup>+++</sup>
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>2</sub>	- 0,17	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>2</sub>	0,87 <sup>+++</sup>
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>3</sub>	- 0,06	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>3</sub>	0,51 <sup>+++</sup>
a <sub>1</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>4</sub>	0	a <sub>4</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>4</sub>	- 0,05
a <sub>2</sub> b <sub>2</sub> - a <sub>2</sub> b <sub>1</sub>	0,78 <sup>+++</sup>	a <sub>5</sub> b <sub>2</sub> - a <sub>5</sub> b <sub>1</sub>	1,61 <sup>+++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>1</sub>	0,31 <sup>+</sup>	a <sub>5</sub> b <sub>3</sub> - a <sub>5</sub> b <sub>1</sub>	0,70 <sup>+++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>2</sub>	- 0,47 <sup>00</sup>	a <sub>5</sub> b <sub>3</sub> - a <sub>5</sub> b <sub>2</sub>	- 0,91 <sup>000</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>1</sub>	1,19 <sup>+++</sup>	a <sub>5</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>1</sub>	0,57 <sup>+++</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>2</sub>	0,41 <sup>++</sup>	a <sub>5</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>2</sub>	- 1,04 <sup>000</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>3</sub>	0,88 <sup>+++</sup>	a <sub>5</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>3</sub>	- 0,13
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>1</sub>	- 0,15	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>1</sub>	1,12 <sup>+++</sup>
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>2</sub>	- 0,93 <sup>000</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>2</sub>	- 0,49 <sup>00</sup>
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>3</sub>	- 0,46 <sup>00</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>3</sub>	0,42 <sup>++</sup>
a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>4</sub>	- 1,34 <sup>000</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>4</sub>	0,55 <sup>+++</sup>
a <sub>3</sub> b <sub>2</sub> - a <sub>3</sub> b <sub>1</sub>	1,60 <sup>+++</sup>	a <sub>6</sub> b <sub>2</sub> - a <sub>6</sub> b <sub>1</sub>	- 0,37 <sup>0</sup>
a <sub>3</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>1</sub>	0,75 <sup>+++</sup>	a <sub>6</sub> b <sub>3</sub> - a <sub>6</sub> b <sub>1</sub>	- 1,13 <sup>000</sup>
a <sub>3</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>2</sub>	- 0,85 <sup>000</sup>	a <sub>6</sub> b <sub>3</sub> - a <sub>6</sub> b <sub>2</sub>	- 0,76 <sup>000</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>1</sub>	1,44 <sup>+++</sup>	a <sub>6</sub> b <sub>4</sub> - a <sub>6</sub> b <sub>1</sub>	0,91 <sup>+++</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>2</sub>	- 0,16	a <sub>6</sub> b <sub>4</sub> - a <sub>6</sub> b <sub>2</sub>	1,28 <sup>+++</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>3</sub>	0,69 <sup>+++</sup>	a <sub>6</sub> b <sub>4</sub> - a <sub>6</sub> b <sub>3</sub>	2,04 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>1</sub>	0,06	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>1</sub>	1,28 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>2</sub>	- 1,54 <sup>000</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>2</sub>	1,65 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>3</sub>	- 0,69 <sup>000</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>3</sub>	2,41 <sup>+++</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>4</sub>	- 1,38 <sup>000</sup>	a <sub>6</sub> b <sub>5</sub> - a <sub>6</sub> b <sub>4</sub>	0,40 <sup>++</sup>
<b>LD 5%= 0,30 g</b> <b>LD 1% = 0,40 g</b> <b>LD 0,1% = 0,51 g</b> a <sub>1</sub> = 29 DAFB;      a <sub>3</sub> = 43 DAFB;      a <sub>5</sub> = 57 DAFB; a <sub>2</sub> = 36 DAFB;      a <sub>4</sub> = 50 DAFB;      a <sub>6</sub> = 64 DAFB; b <sub>1</sub> = Maria;      b <sub>2</sub> = Lucia;      b <sub>3</sub> = Golia;      b <sub>4</sub> = Van;      b <sub>5</sub> = Boambe by Cotnari cl.7			

**Table 4. Differences in fruit weight (g) of the same cultivar in different stages of maturation**

Comparison between maturation stages	Difference (g) and significance	Comparison between maturation stages	Difference (g) and significance
a <sub>2</sub> b <sub>1</sub> - a <sub>1</sub> b <sub>1</sub>	1,01 <sup>+++</sup>	a <sub>4</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>4</sub>	1,08 <sup>+++</sup>
a <sub>2</sub> b <sub>2</sub> - a <sub>1</sub> b <sub>2</sub>	1,47 <sup>+++</sup>	a <sub>4</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>5</sub>	2,41 <sup>+++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>3</sub>	1,11 <sup>+++</sup>	a <sub>5</sub> b <sub>1</sub> - a <sub>4</sub> b <sub>1</sub>	0,17 <sup>+++</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>4</sub>	2,02 <sup>+++</sup>	a <sub>5</sub> b <sub>2</sub> - a <sub>4</sub> b <sub>2</sub>	1,75 <sup>+++</sup>
a <sub>2</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>5</sub>	0,71 <sup>+++</sup>	a <sub>5</sub> b <sub>3</sub> - a <sub>4</sub> b <sub>3</sub>	0,47 <sup>+++</sup>
a <sub>3</sub> b <sub>1</sub> - a <sub>2</sub> b <sub>1</sub>	0,60 <sup>+++</sup>	a <sub>5</sub> b <sub>4</sub> - a <sub>4</sub> b <sub>4</sub>	- 0,21 <sup>000</sup>
a <sub>3</sub> b <sub>2</sub> - a <sub>2</sub> b <sub>2</sub>	1,42 <sup>+++</sup>	a <sub>5</sub> b <sub>5</sub> - a <sub>4</sub> b <sub>5</sub>	0,39 <sup>+++</sup>
a <sub>3</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>3</sub>	1,04 <sup>+++</sup>	a <sub>6</sub> b <sub>1</sub> - a <sub>5</sub> b <sub>1</sub>	1,62 <sup>+++</sup>
a <sub>3</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>4</sub>	0,85 <sup>+++</sup>	a <sub>6</sub> b <sub>2</sub> - a <sub>5</sub> b <sub>2</sub>	- 0,36 <sup>000</sup>
a <sub>3</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>5</sub>	0,81 <sup>+++</sup>	a <sub>6</sub> b <sub>3</sub> - a <sub>5</sub> b <sub>3</sub>	- 0,21 <sup>000</sup>
a <sub>4</sub> b <sub>1</sub> - a <sub>3</sub> b <sub>1</sub>	1,57 <sup>+++</sup>	a <sub>6</sub> b <sub>4</sub> - a <sub>5</sub> b <sub>4</sub>	1,96 <sup>+++</sup>
a <sub>4</sub> b <sub>2</sub> - a <sub>3</sub> b <sub>2</sub>	0,03	a <sub>6</sub> b <sub>5</sub> - a <sub>5</sub> b <sub>5</sub>	1,78 <sup>+++</sup>
a <sub>4</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>3</sub>	1,22 <sup>+++</sup>		
<b>LD 5%= 0,04 g</b> <b>LD 1% = 0,05 g</b> <b>LD 0,1% = 0,07 g</b> a <sub>1</sub> = 29 DAFB;      a <sub>3</sub> = 43 DAFB;      a <sub>5</sub> = 57 DAFB; a <sub>2</sub> = 36 DAFB;      a <sub>4</sub> = 50 DAFB;      a <sub>6</sub> = 64 DAFB; b <sub>1</sub> = Maria;      b <sub>2</sub> = Lucia;      b <sub>3</sub> = Golia;      b <sub>4</sub> = Van;      b <sub>5</sub> = Boambe by Cotnari cl.7			

**Table 5. Differences in soluble solids content (%) in different cultivars in the same stage of maturation**

Comparison between cultivars	Difference (SSC%) and significance	Comparison between cultivars	Difference (SSC%) and significance
a <sub>1</sub> b <sub>2</sub> -a <sub>1</sub> b <sub>1</sub>	1,0	a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>3</sub>	0,28
a <sub>1</sub> b <sub>3</sub> -a <sub>1</sub> b <sub>1</sub>	1,18	a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>1</sub>	- 0,15
a <sub>1</sub> b <sub>3</sub> -a <sub>1</sub> b <sub>2</sub>	0,18	a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>2</sub>	- 1,82 <sup>0</sup>
a <sub>1</sub> b <sub>4</sub> -a <sub>1</sub> b <sub>1</sub>	2,46 <sup>++</sup>	a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>3</sub>	- 0,04
a <sub>1</sub> b <sub>4</sub> -a <sub>1</sub> b <sub>2</sub>	1,46	a <sub>2</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>4</sub>	- 0,32
a <sub>1</sub> b <sub>4</sub> -a <sub>1</sub> b <sub>3</sub>	1,28	a <sub>3</sub> b <sub>2</sub> - a <sub>3</sub> b <sub>1</sub>	- 2,18 <sup>0</sup>
a <sub>1</sub> b <sub>5</sub> -a <sub>1</sub> b <sub>1</sub>	2,46 <sup>++</sup>	a <sub>3</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>1</sub>	0,75
a <sub>1</sub> b <sub>5</sub> -a <sub>1</sub> b <sub>2</sub>	1,46	a <sub>3</sub> b <sub>3</sub> - a <sub>3</sub> b <sub>2</sub>	2,93 <sup>++</sup>
a <sub>1</sub> b <sub>5</sub> -a <sub>1</sub> b <sub>3</sub>	1,28	a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>1</sub>	2,22 <sup>+</sup>
a <sub>1</sub> b <sub>5</sub> -a <sub>1</sub> b <sub>4</sub>	0	a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>2</sub>	4,40 <sup>+++</sup>
a <sub>2</sub> b <sub>2</sub> - a <sub>2</sub> b <sub>1</sub>	1,67	a <sub>3</sub> b <sub>4</sub> - a <sub>3</sub> b <sub>3</sub>	1,47
a <sub>2</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>1</sub>	- 0,11	a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>1</sub>	1,29
a <sub>2</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>2</sub>	- 1,78	a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>2</sub>	3,47 <sup>+++</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>1</sub>	0,17	a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>3</sub>	0,54
a <sub>2</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>2</sub>	- 1,50	a <sub>3</sub> b <sub>5</sub> - a <sub>3</sub> b <sub>4</sub>	- 0,93
LD 5%= 1,81 %      LD 1% = 2,43 %      LD 0,1% = 3,19 % a <sub>1</sub> = 50 DAFB; a <sub>2</sub> = 57 DAFB;      a <sub>3</sub> = 64 50 DAFB; b <sub>1</sub> = Maria;      b <sub>2</sub> = Lucia;      b <sub>3</sub> = Golia;      b <sub>4</sub> = Van;      b <sub>5</sub> = Boambe by Cotnari cl.7			

**Table 6. Differences in soluble solids content (%) of the same cultivar in different stages of maturation**

Comparison between maturation stages	Difference (SSC%) and significance	Comparison between maturation stages	Difference (SSC%) and significance
a <sub>2</sub> b <sub>1</sub> - a <sub>1</sub> b <sub>1</sub>	1,04 <sup>+</sup>	a <sub>3</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>4</sub>	3,47 <sup>+++</sup>
a <sub>2</sub> b <sub>2</sub> - a <sub>1</sub> b <sub>2</sub>	2,71 <sup>+++</sup>	a <sub>3</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>5</sub>	2,54 <sup>+++</sup>
a <sub>2</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>3</sub>	0,75	a <sub>3</sub> b <sub>1</sub> - a <sub>2</sub> b <sub>1</sub>	1,67 <sup>+</sup>
a <sub>2</sub> b <sub>4</sub> - a <sub>1</sub> b <sub>4</sub>	- 0,25	a <sub>3</sub> b <sub>2</sub> - a <sub>2</sub> b <sub>2</sub>	- 2,18 <sup>00</sup>
a <sub>2</sub> b <sub>5</sub> - a <sub>1</sub> b <sub>5</sub>	- 0,57	a <sub>3</sub> b <sub>3</sub> - a <sub>2</sub> b <sub>3</sub>	2,53 <sup>+++</sup>
a <sub>3</sub> b <sub>1</sub> - a <sub>1</sub> b <sub>1</sub>	3,71 <sup>+++</sup>	a <sub>3</sub> b <sub>4</sub> - a <sub>2</sub> b <sub>4</sub>	3,72 <sup>+++</sup>
a <sub>3</sub> b <sub>2</sub> - a <sub>1</sub> b <sub>2</sub>	0,53	a <sub>3</sub> b <sub>5</sub> - a <sub>2</sub> b <sub>5</sub>	3,11 <sup>+++</sup>
a <sub>3</sub> b <sub>3</sub> - a <sub>1</sub> b <sub>3</sub>	3,28 <sup>+++</sup>		
LD 5%= 1,31 %      LD 1% = 1,76 %      LD 0,1% = 2,34 % a <sub>1</sub> = 50 DAFB;      a <sub>2</sub> = 57 DAFB;      a <sub>3</sub> = 64 DAFB b <sub>1</sub> = Maria;      b <sub>2</sub> = Lucia;      b <sub>3</sub> = Golia;      b <sub>4</sub> = Van;      b <sub>5</sub> = Boambe by Cotnari cl.7			


**Golia cv.**