



**University of Agronomic Sciences and Veterinary Medicine of Bucharest**  
**Faculty of Horticulture**

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Fruit pomological characteristics of three blackberry  
(*Rubus sp.*) cultivars

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# Introduction

The main objectives of the study were :

- Analysis and comparison of physio-chemical parameters of fruits from three thornless blackberry cultivars in the Bucharest area (Thornfree, Thornless Evergreen and Chester).
- Analyzes and comparisons between the areas of Bucharest and Dâmbovița on fruits of the same cultivar, Thornfree, harvested in similar periods
- The influence of the harvesting time on the physio-chemical characteristics of the fruits and the influence of the storage time on the characteristics of the fruits.



# Materials and Methods

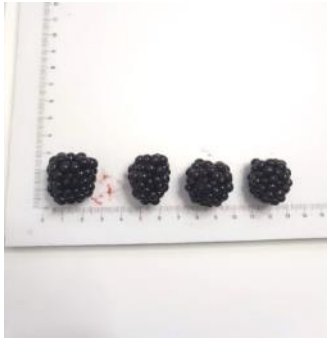
## 1. *Biological material*

### ➤ **Thornfree cultivar**

It has vigorous bushes with very long stems (up to 4-8 m), requires support and is very early for ripening. The ripening of the fruits starts in the second decade of August and lasts until October, reaching up to 10 harvests every 5 days.

The fruits are large, conically elongated, reaching 6 grams, with a sweet and sour taste . The average production per hectare is 14 tons (Ghena and Braniște, 2003).



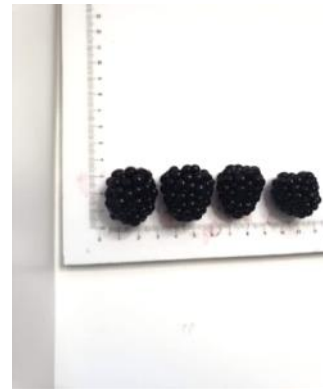


### ➤ **Thornless Evergreen cultivar**

It has medium vigor bushes with long stems (3-6 m), is sensitive to rust and less resistant to frost than Thornfree. The fruits are medium, conical round 3-4 grams with a sweet taste; they are firm, resistant to transport. Fruit ripening takes place from the second decade of August to the second decade of September. Estimated production of 12-14 t / ha (Ghena and Braniște, 2003).

### ➤ **Chester cultivar**

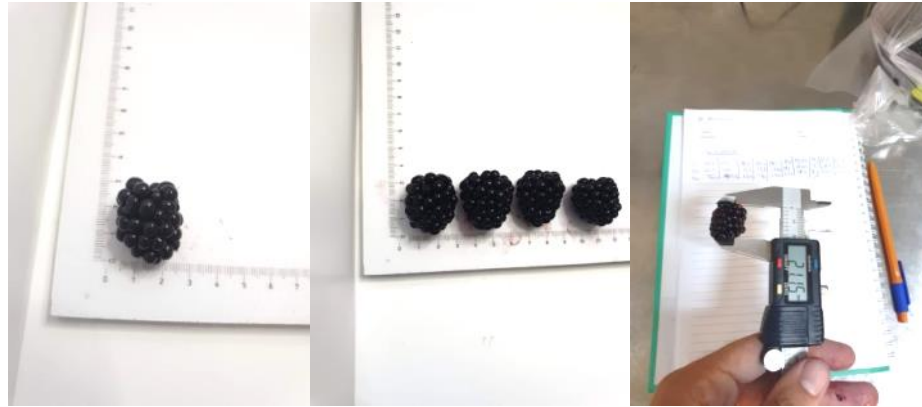
- a very vigorous, productive variety, with late maturation and relatively resistant to frost.
- resistance to diseases and environmental factors.
- The fruits are of good quality, 6 g on average, with aromatic taste and glossy appearance.
- The ripening period is from the first decade of August to the last decade of September.
- The estimated yield is 12-18 t/ha (Galletta et al., 1998).



# Materials and Methods

## 2. *Biometric and biochemical analyzes*

### 1. Biometric analyzes



### 2. Determination of total fruit acidity by titration



TitroLine easy

# Materials and Methods

## 3. Determination of the amount of total dry matter (SUT - %)



Oven Memmert UN110

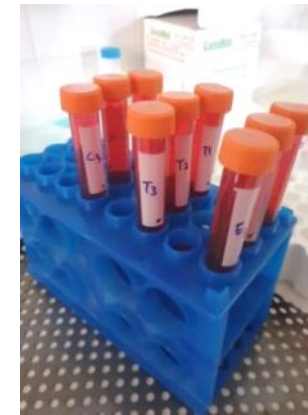
## 4. Determination of total sugar content by refractometer



Refractometer Krüss DR301-95

# Materials and Methods

## 5. Determination of total anthocyanin content



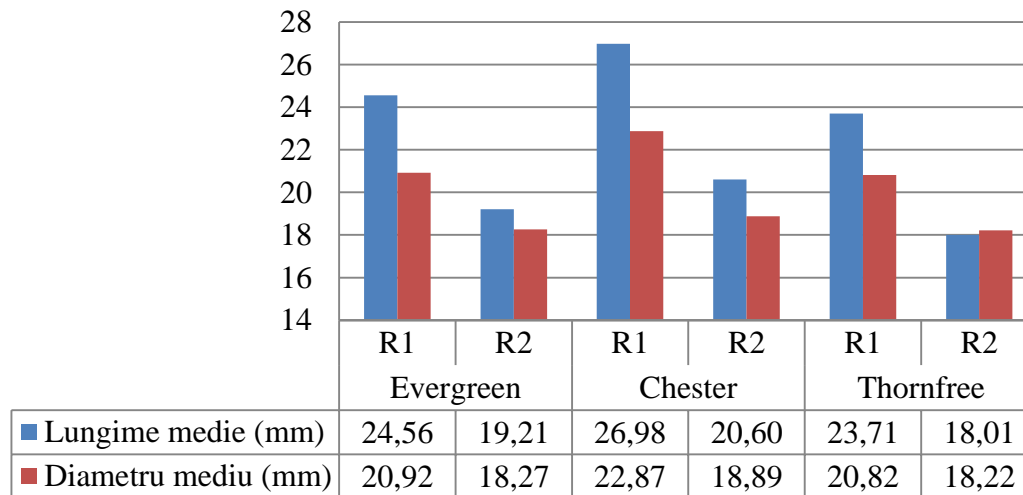
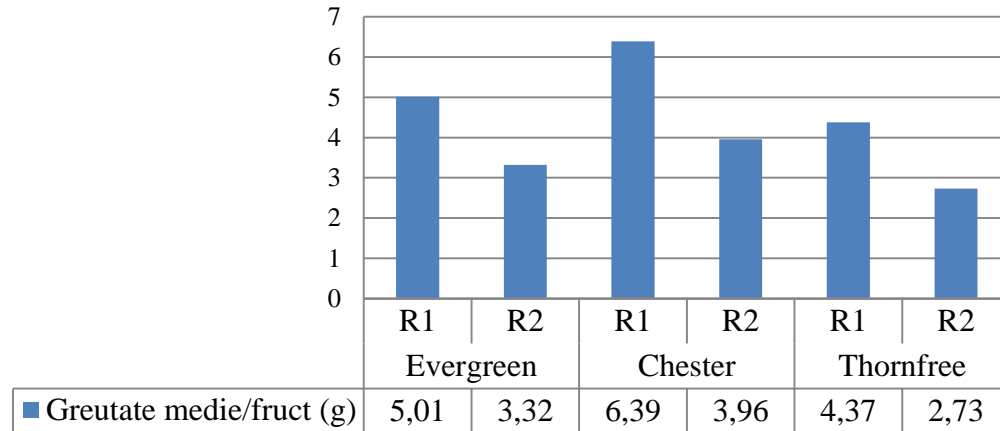
Spectofotometer Specord 210 Plus

## ***3. Influence of storage period on biochemical parameters***

- 85% humidity
- 1-2 °C

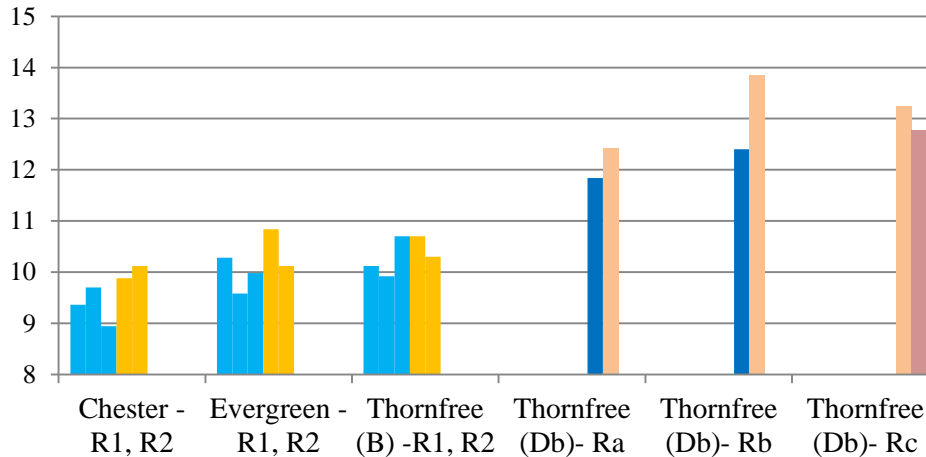
# Results and discussions

## *1.The influence of harvest time and cultivar on the physical parameters of the fruit*



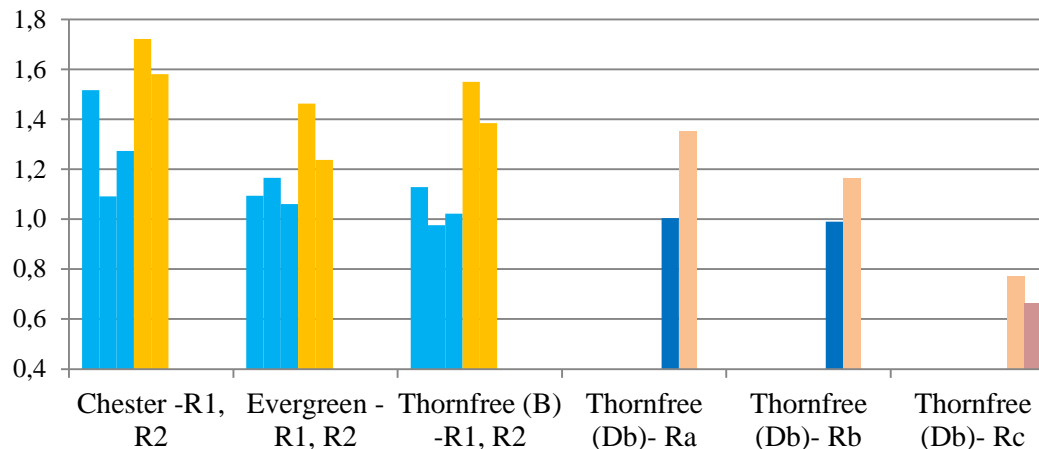


## ***Influence of harvest time and cultivar on soluble dry matter (SUS -% Brix)***



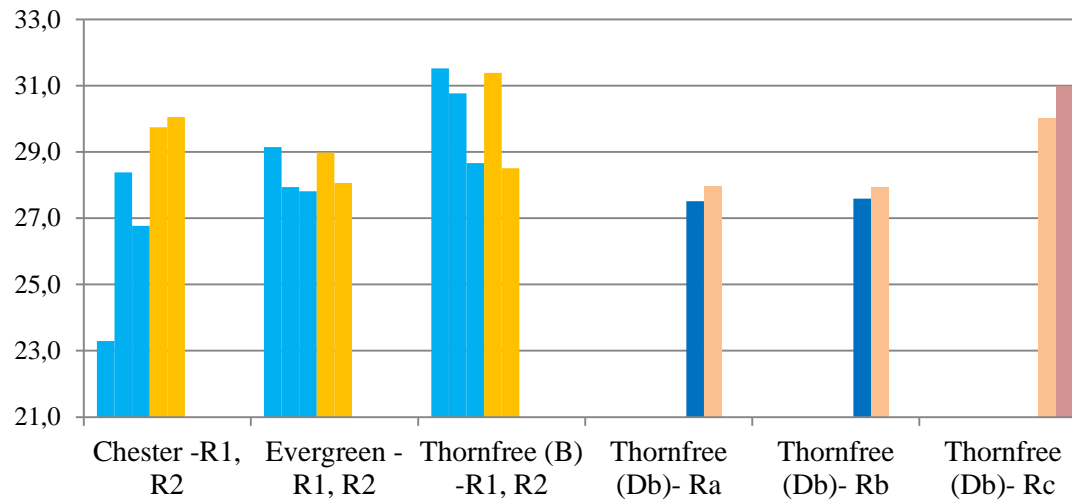
Harvest	Variety	23.07	30.07	5.08	13.08	14.08	20.08	23.08	27.08
<b>R1 (22.07.2019)</b>	Chester	9,36	9,7	8,94					
	Evergreen	10,28	9,58	9,98					
	Thornfree(B)	10,12	9,92	10,7					
<b>R2 (7.08.2019)</b>	Chester				9,88			10,12	
	Evergreen				10,84			10,12	
	Thornfree (B)				10,7			10,3	
<b>3.08.2019</b>	Thornfree (DB)					11,84	12,42		
<b>9.08.2019</b>	Thornfree (DB)					12,4	13,86		
<b>17.08.2019</b>	Thornfree (DB)						13,24		12,78

### 3. Influence of harvest time and cultivar on total titrable acidity (citric acid %)



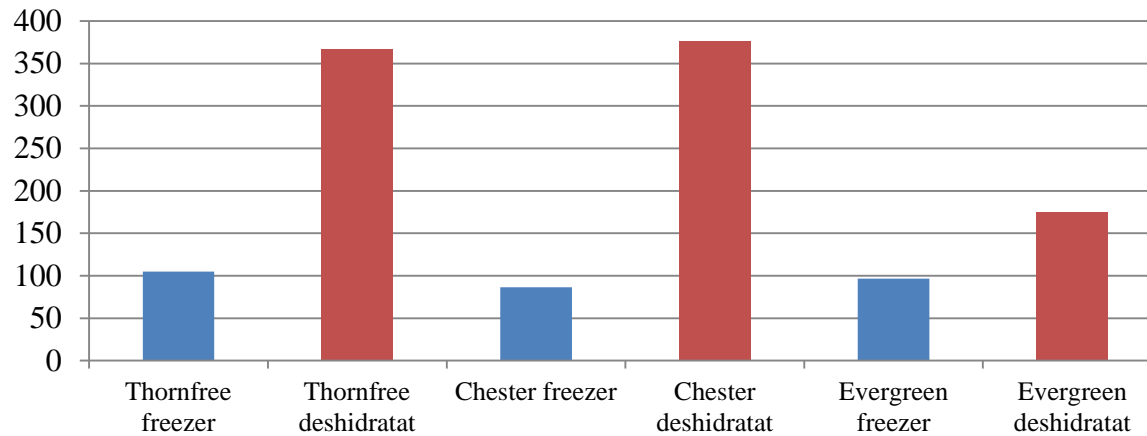
Harvest	Variety	23.07	30.07	5.08	13.08	14.08	20.08	23.08	27.08
R1	Chester	1,516	1,091	1,274					
	Evergreen	1,094	1,166	1,061					
	Thornfree (B)	1,128	0,975	1,021					
R2	Chester				1,721			1,581	
	Evergreen				1,462			1,237	
	Thornfree(B)				1,550			1,385	
3.08.2019	Thornfree (Db)					1,004	1,351		
9.08.2019	Thornfree (Db)					0,990	1,164		
17.08.2019									
9	Thornfree (Db)						0,770		0,663

#### 4. Influence of harvest time and cultivar on total dry matter (SUT - %)



Harvest	Variety	23.07	30.07	5.08	13.08	14.08	20.08	23.08	27.08
R1	Chester	23	28	27					
	Evergreen	29	28	28					
	Thornfree (B)	32	31	29					
R2	Chester				30			30	
	Evergreen				29			28	
	Thornfree (B)				31			29	
3.08.2019	Thornfree (Db)					28	28		
9.08.2019	Thornfree (Db)					28	28		
17.08.2019	Thornfree (Db)						30		31

## 5. The influence of harvesting time and cultivar on the anthocyanins content



Sample	Anthocyanins mg/100 g FW	Standard deviation
Thornfree freezer	104,84	6,54
Thornfree deshidratat	367,71	0,10
Chester freezer	86,25	3,03
Chester deshidratat	377,17	18,27
Evergreen freezer	96,60	0,96
Evergreen deshidratat	174,53	16,03

# Conclusions and recommendations

- Chester presented the largest fruits in terms of both weight and size in both harvests, followed by Evergreen and Thornfree.
- The cultivar with the highest soluble dry matter at the time of harvest was the Evergreen with values of 10.28% Brix at the first harvest and 10.84% Brix at the second harvest. In all three cultivars there was an increase in the amount of soluble dry matter from the first harvest to the second harvest (9.36% -9.88% Chester, 10.28% -10.84% Evergreen, 10.12% -10.7% Thornfree Bucharest, 11.84% -12.4% -13.24% Thornfree Dâmbovița). There were no significant changes during storage.
- Total dry matter showed close values regardless of cultivar, time of harvest or storage time and varied around 30%, the blackberries thus showing favorable properties for processing.
- Regarding the amount of anthocyanins, this time the Thornfree cultivar stands out with 104.84mg/100g fw followed by the Evergreen cultivar and then the Chester cultivar. Dehydrated fruits showed two or three times the amount of anthocyanins than fresh samples.
- Comparing the analyzed parameters of the Thornfree cultivars, the one from Dâmbovița with the one from Bucharest, we notice that at similar harvest data, the amount of soluble dry matter was higher (10.7% -11.84%) and the total acidity was lower (1,550 % - 1.004%). A possible cause of these quality differences between the fruits of the Dâmbovița variety and the one from Bucharest may be the wider availability of the fruits and the time of harvest.