

THE EVOLUTION OF THE WATERMELONS CULTURE OVER TIME

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ABSTRACT

*Research into the cultivation of watermelons began many years ago. At the beginning, at RDSPCS Dăbuleni, the study of as many varieties and hybrids as possible was considered, in order to determine which ones find optimal conditions for growth and development on sandy soils and which meet the demands of the constantly changing market. Another important concern in the research activity at RDSPCS Dăbuleni was related to the obtaining of extra-early and early productions. In the traditional culture, established by direct sowing, mulching the soil with polyethylene ensured a production increase of 5.2 t/ha, 0.9 t/ha representing extra-early production, and in the seedling culture, by mulching the total production increased by 7.2 t/ha, and extra-early production increased by 2.3 t/ha compared to the non-mulched crop. Plant grafting, regardless of cultivar, rootstock and protection method, showed resistance to the attack of *Fusarium oxysporum*, even when crop rotation was not respected, but did not influence the attack of foliar pathogens (*Alternaria cucumerina* and *Colletotrichum lagenarium*).*

INTRODUCTION

In Romania, watermelon is known, depending on the region, as *harbuz* (Moldova), *lubenita* (Banat and Oltenia), *lebenita* (Ardeal), *boșar*, *dână* (Dobrogea). One of the most recognized regions of the country for the production of watermelons is the southwest of Oltenia, especially the Dăbuleni area (Nanu et al. 2005). Watermelon fruits are consumed at physiological maturity, being highly appreciated by consumers for their juiciness, refreshing taste and their biochemical composition, which gives them a significant therapeutic value (Chilom 2002). In some arid regions of Africa, the natives use the fruits of watermelons as the only source of water during the dry season, while in South America the mature fruits subjected to fermentation serve to obtain drinks with organoleptic properties similar to beer or syrup. Traditionally, in Asia, the seeds of some local varieties are eaten roasted, while in the Mediterranean area of Europe the fruits constitute a major fodder in animal nutrition (Marinescu et al. 2020). Watermelon seeds also have multiple therapeutic uses. Everywhere on the meridians and parallels of the world, the fruits of watermelons with a refreshing sweet taste are unanimously appreciated as a dessert, constituting, through their export over long distances in the off-season, a luxury vegetable for famous restaurants (Dumitru Maria et al. 1989).

MATERIAL AND METHODS

The study was carried out in the research field at RDSPCS Dăbuleni, starting from 1970. During this period, research was carried out that focused on technological aspects (optimal number of plants / hectare, selection of the most suitable varieties/hybrids, weed control, diseases and pests control, crop irrigation, early and total production assessment), but also breeding aspects (creative and conservative breeding). Research is still being done today, considering the need to adapt the watermelon cultivation technology to the existing climate changes, but also to the ever-changing market requirements.

RESULTS AND DISCUSSIONS

An essential factor in the technology is the variety which, through its genetic endowment, can impress a certain adaptability to the conditions of the area and implicitly high productions, that is why the first researches focused on the study of an assortment of varieties existing at that time: *Baby Sugar*, *Dr Mauch*, *Lovrin 532*, *De Miniș*, *Charleston Gray*, *Malali*, *Vidra 6*, *New Hampshire*, *Cole,s Early* and *Timpuriu de Canada* (Spirescu, 1983, Ciuciuc Elena, 2013).

The productions of these varieties varied within very wide limits from 11.9 t/ha to 60.1 t/ha, and the fruit size had values between 1.4-10.9 kg/fruit (Fig. 1).

The variety *Charleston Gray*, which was in the assortment of varieties cultivated on sandy soils for a long time, stood out both by the productions achieved and by the size of the fruits.

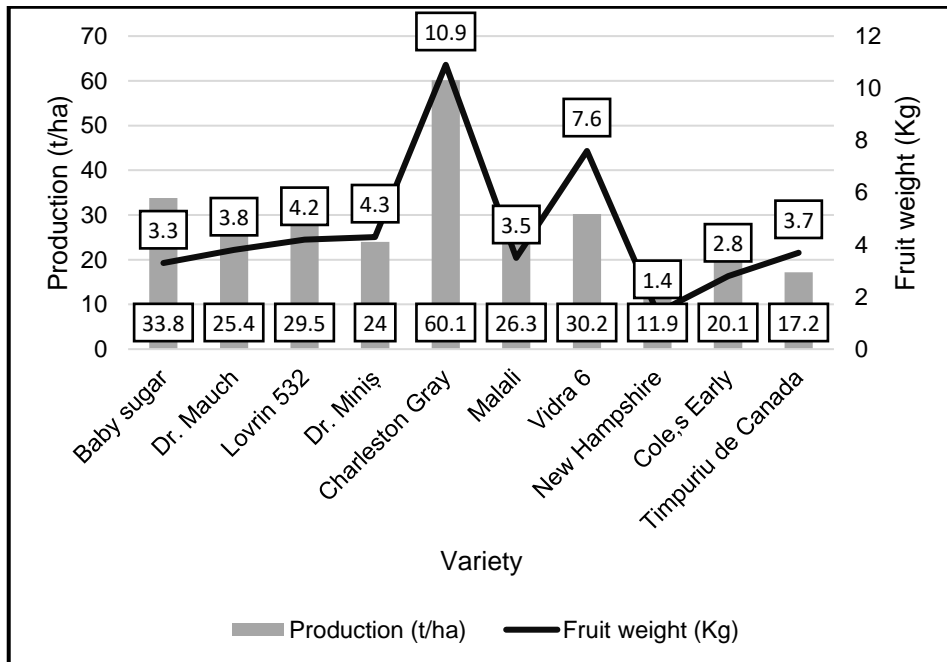


Figure 1. Watermelon yields and average fruit weight by variety (1980-1982)

Considering the importance of the cultivation of watermelons for the area of sandy soils and taking into account the fact that the recommended varieties were sensitive to the attack of some pathogens, especially *Fusarium oxysporum*, in 1978 a watermelon improvement program was initiated, which led to the approval of three varieties: De Dăbuleni (1986), Dulce de Dăbuleni (1989) and Oltenia (2004). The varieties created at SCDCPN Dăbuleni have proven their productive potential, being recommended for cultivation in areas favorable to the cultivation of watermelons (Table 1).

With the passage of time, the hybrids created by specialized companies from Romania but also from outside are making their presence felt more and more, coming to dominate the market of watermelons in the country.

Table 1

The behavior of some watermelon cultivars on sandy soils during 2015-2017
(culture established by seedling)

Cultivar	Production dynamics (t/ha):			Total production (t/ha)
	1-10.07	11-20.07	21-31.07	
De Dăbuleni	-	1.2	32.6	33.8
Dulce de Dăbuleni	-	0.9	38.6	39.5
Oltenia	-	-	42.1	42.1
Susy F1	10.2	6.7	13.3	30.2
Baronesa F1	7.7	7.7	22.1	37.5
Oneida F1	8.0	7.3	12.1	27.4
Huelva F1	10.0	8.5	18.3	36.8
62-269 F1	6.9	9.8	19.3	36.0
Fantasy F1	14.1	5.2	16.3	35.6
Tarzan F1	8.1	4.8	10.6	23.5
Grand Baby F1	5.6	7.7	14.8	28.1
LF 6720 F1	4.3	7.5	12.1	23.9

Since 1977, research has been carried out regarding the influence of land modeling on the earliness, quality and size of production. It has been demonstrated that, on land modeled in raised furrows, with a crown width of 94 cm, the harvesting of watermelons begins 2-3 days earlier than on unmodeled land. In the period 1980-1983, the first research was carried out on the cultivation of watermelons by seedling and the protection of the culture with a polyethylene tunnel. In order to ensure optimal conditions for the plants, perforated foil was also experimented with.

One of the most important concerns in the research activity, in the culture of watermelons, carried out at RDSPCS Dăbuleni, was related to obtaining extra-early and early productions in sheltered spaces and in the field.

The staggered production is conditioned by the earliness of the variants studied as a result of the system of cultivation and plant protection. The vegetation state of the plants presented a big advance in the variants established by seedlings and protected, which determined the realization of extra-early productions.

Table 2

Experimental results regarding obtaining early productions of watermelons on sandy soils from Däbuleni (1980-1983), (Sugar Baby variety)

Technological variant	Total production (t/ha)	Production obtained during the period (t/ha):			
		June	1-15 July	16-31 July	1-20 August
Classic culture by sowing at the optimal time (25-30.IV)	25.4	-	-	7.0	18.4
Culture established by early sowing (10-21.IV) protected in perforated tunnel 1/3	25.7	-	1.0	12.1	12.6
Culture established by early seeding protected with imperforate tunnel	30.4	-	0.7	13.6	16.1
Culture established by early sowing mulched with transparent polyethylene film	30.6	-	0.9	13.0	16.7
Culture established by early sowing mulched with transparent polyethylene film and perforated tunnel 1/3	29.7	-	2.05	12.8	14.8
Culture established by seedling (planted on 22-27.IV)	26.3	0.6	2.00	10.5	13.2
Culture established by seedling, protected in a tunnel made of fully perforated foil (planted on 20-28.IV)	31.2	1.0	3.1	16.2	10.9
Culture established by seedling protected in perforated tunnel 1/3	33.8	0.6	5.1	5.7	17.2
Culture established by seedling protected with mulch	33.5	0.5	4.4	4.9	18.3
Culture established by seedling mulched with transparent polyethylene film protected in tunnel of fully perforated film	39.6	2.8	8.1	10.9	19.3

When the crop was established by seedling, protected in low shelters made of fully perforated polyethylene, and the land was mulched with transparent polyethylene film, the first fruits were obtained in the last decade of June (22-25) 30

days earlier than in a classic culture sown at the optimal time (Table 2). This was also the most productive variant (39.6 t/ha, of which 10.9 t/ha extra-early production and 19.3 t/ha early production).

An important role in increasing production and earliness is also mulching the soil with polyethylene, which also contributes to maintaining water in the soil, reducing evapotranspiration and fighting weeds in the plant row. In the culture by sowing, mulching the soil with polyethylene ensured a production increase of 5.2 t/ha, 0.9 t/ha representing extra-early production, and in the culture by seedling by mulching the total production increased by 7.2 t/ha, and extra-early production increased by 2.3 t/ha compared to the unmulched crop (Spireescu and Toma, 1990, Toma, 1977).

In the period 1981-1983, a number of 10 herbicides existing at that time were tested, applied in different doses and combinations and different times of application. The obtained results highlighted the effectiveness of herbicides on weeds in the watermelon culture and on production (Spireescu, 1984). Research was continued in the period 1991-1994 by testing new herbicides (Table 3).

Table 3

Herbicides recommended for growing watermelons on sandy soils

Herbicide (commercial product)	Dose (kg, l/ha)	The moment of application
Balan 18 EC	6,0	p.p.i
Dachtal	6,0	preemergence
Lasso 48 EC	4,0	preemergence
Stomp 330 EC	4,0	preemergence
Dual 960 EC	3,0	preemergence
Stomp 330 EC + Fusilade	4,0+2,0	preemergent and postemergent

CONCLUSIONS

For the area of sandy soils from Dăbuleni, watermelons represent one of the few species that can profitably exploit this category of soils.

The RDSPCS Dăbuleni researchers, aware of the importance of melons for the Dăbuleni area, acted permanently in order to establish cultivation technologies according to market requirements but also to adapt it to the constantly changing climatic conditions.

Aware of the importance of the cultivar (variety, hybrid) in the success of a watermelon crop, at RDSPCS Dăbuleni, the improvement activity took shape through the creation and homologation of three varieties: *De Dăbuleni* (1986), *Dulce de Dăbuleni* (1989), *Oltenia* (2004).

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