ON THE EFFECT OF USING THE BOSTIM PREPARATION ON YIELDING POTENTIAL AND ON QUALITY IN SOME WATERMELON CULTIVARS WITH DIFFERENT FERTILIZATION AND IRRIGATION

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Abstract: *Setting a watermelon culture in the field with maximum economic efficiency supposes, besides the use of performing hybrids and the application of modern cultivation technologies that ensure optimal growth and development conditions for the plants. Among these conditions are maintaining optimal temperature, moisture, and nutrients at the level of the root system, of temperature and atmospheric moisture at the level of ground parts of the plant – all this through proper application of cultivation technology. Increasing yielding capacity in a watermelon plant can also be done through the stimulation of a larger number of flowers in parallel ensuring technological measures for the plants' growth, development, and maturity. Research was carried out on competitive compared crops using tri-factorial experiments with the sub-divided plot system and with three replications. The experiment aimed at studying experimental crop hybrids from the point of view of the interaction between experimental factors (Factor A – cultivation technology, Factor B – hybrid, and Factor C – flower fecundation stimulation method) that were the main technical elements of a frame technology for the improvement of the cultivation of water melon in low tunnels of poly-ethylene sheet under present conditions. We studied 8 hybrids, of which 5 are extra early and early (Crisbey F1, Red Comat F1, Lady F1, Red Star F1, and Audry F1) and 3 are semi-late and late (Dumara F1, Montana F1, and Caravan F1). The paper presents the effect of stimulating flower fecundation with Bostim and of applying modern cultivation technology in order to maximise the yielding potential of the studied hybrids. Modernising known cultivation technologies through drip-irrigation improvement and through proper fertilisation with modern fertilisers such as Kemira or Agriplant will have an impact on the yielding and quality potential of the studied hybrids. Thus, we can recommend specific methods to reach this goal and contribute to the deepening of theoretical and practical knowledge in the field. The increase in yield obtained through the application of the modernised cultivation technology is 17.3 t/ha (115.6%). Applying the preparation Bostim through spraying determined an increase of the number of flowers fecundated per plant and implicitly of the yield with both cultivation technologies. The increases in yield obtained with both classical improved and with modernised cultivation technologies are 13.3 and 20.2% respectively in the early and semi-early hybrids and 14.1% and 19.6% respectively in the case of late and semi-late hybrids. The paper present the effect of stimulating flower fecundation with the BOSTIM preparation and the effect of applying modern cultivation technology in order to get maximum yielding potential in the studied hybrid*

Key words**:** *hybrid, technology, irrigation, fertilization, yielding potential, yield, preparation*

INTRODUCTION

Water melon field culture used to be practiced until the appearance and use in agriculture of plastic materials using two methods of setting a culture, i.e.: the setting method in not protected field through direct sowing and the setting method in not protected field through plantlet planting (when the environmental temperature was optimal).

In time, with the appearance of plastic materials and of the opportunity of using them as protection of vegetable crops in the field against late white frosts (caused by setting the crops earlier than usual) the cultivation technology of water melon was improved and later on

modernised. At present, we can speak of an *"improved classical technology of cultivation of water melons"* and about a *"modernised technology of cultivation of water melons in low tunnels made of poly-ethylene sheets"*.

In the classical cultivation technology through either direct sowing in the field or through planting plantlets in open field, they still use less performing domestic fertilisers.

Protecting the plantlets with low tunnels of poly-ethylene, applying polyethylene mulch on the soil in the tunnel, and using modern fertilisers (of the Kemira – Cropcare, Ferticare or Agriplant type) and using specific preparations to stimulate flower fecundation allows yield performances in early cultivars and at quantity and quality levels.

In this paper, we present the effect of stimulation of flower fecundation with the preparation Bostim and of applying modern cultivation technology, aiming at obtaining maximum yielding potential of the studied hybrids.

MATERIAL AND METHODS

The goal of the research we have carried out was to study the ways of enhancing maximum yielding potential in some hybrids acknowledged as very valuable from the point of view of the quantity and quality by applying the two cultivation technologies: the improved classical technology and the modernised technology. Our goals were as follows:

- studying new hybrids acknowledged as having a high yielding potential with the two cultivation technologies (improved classical and modernised);
- checking the possibilities of reaching in practice the theoretical yielding potential confirmed by some companies as a result of testing in our own fields;
- analysing the effect of using the preparation Bostim on flower fecundation and, implicitly, on the quantitative and qualitative yielding potential of the studied hybrids.

The experimental plot was set near the village of Sâmbăteni, commune Păuliş, in the Western Arad Plain, in the flooding plain of the Mureş River, on a private vegetable farm.

Research was carried out on comparative competition cultures, using the tri-factorial experiment method based on subdivided plot system with three replications during the period 2008-2009.

The experiment aimed at studying the comparative competition culture from the point of view of the interaction between the different factors that will be essential technical elements of a frame technology for the cultivation of water melons in low tunnels of poly-ethylene.

Factor A – Cultivation technology:

a_1 – Classical improved cultivation technology (planting plantlets and fertirrigation with domestic fertilisers);

a_2 – Modernised cultivation technology (planting plantlets with mulching the tunnel soil with poly-ethylene sheets and protecting the crops in low tunnels and fertirrigation with modern fertilisers of the Kemira-Cropcare and Ferticare type).

Factor B – Hybrid:

Early and semi-early hybrids

b_1 – Crisby F_1; b_2 – Red Comet F_1; b_3 – Lady F_1; b_4 – Red Star F_1; b_5 – Audry F_1;

late and semi-late hybrids

b_6 – Dumara F_1; b_7 – Montana F_1; b_8 – Caravan F_1.

Factor C – Method of stimulation of flower fecundation:

c_1 – no stimulation;

c_2 – stimulation of flower fecundation with the preparation BOSTIM.

Experimental data obtained after research were processed after current statistical-mathematical methods.

RESULTS AND DISCUSSIONS

Table 1 shows that mean yields per plant and per ha, from the point of view of the number of fruit per plant and of the mean fruit weight, are within very wide variation limits, between 1 and 1.5. To give an example concerning the mean yield per plant, extreme limits are maximum 25.414 kg per plant to Montana F1 and minimum 10.086 kg per plant in Red Comet F_1, while the maximum mean yield per ha is 177.9 t/ha in Montana F1 and minimum 70.6 t/ha in Red Comet F_1. We need to mention that minimal yields per plant and per ha are when there is no stimulation of flower fecundation (c_1) and maximal ones are when there is stimulation of flower fecundation b Bostim (c_2).

Table 1.

Synthesis of mean yield results during the period 2008-2009 in early, semi-early, and late water melon by applying the improved classical and the modern cultivation technologies (planting plantlets and fertirrigation and planting plantlets with tunnel soil mulching with poly-ethylene and protecting the crop in low tunnels and fertirrigation) with stimulation of flower fecundation with the preparation BOSTIM

Factor A (cultivation technology)	Factor B (hybrid)	Factor C (flower fecundation stimulation factor)	Mean yield			Mean yield for											
						Factor B			Factor C			Factor A					
			Kg/plant	t/ha	% compared to c_1	t/ha	% compared to $a_1b_1c_1$ and a $_2b_1c_1$	% compared to $a_1b_1c_2$ and a $_2b_1c_2$	t/ha	t/ha	% c_2 compared to c_1	t/ha	% compared to a1	t/ha	% compared to a1	t/ha	% c_2 compared to c_1
a_1 – classical technology	b_1 - Crisby F_1	c_1	12.657	88.6	100.00	94.9	107.1	93.9	$a_1b_{1\text{-}5}c_1$	$a_1b_{1\text{-}5}c_2$	113.3	105.3	100.0	111.2	100.0	a_1c_1	a_1c_2
		c_2	14.442	101.1	114.10												
	b_2 - Red Comet F_1	c_1	10.086	70.6	100.00	75.5	85.2	74.7									
		c_2	11.486	80.4	113.88												
	b_3 - Lady F_1	c_1	12.800	89.6	100.00	95.9	108.2	94.9									
		c_2	14.600	102.2	114.06												
	b_4- Red Star F_1	c_1	17.543	122.8	100.00	130.5	147.3	129.1	98.7	111.8						104.0	118.2
		c_2	19.743	138.2	112.54												
	b_5 - Audry F_1	c_1	17.429	122.0	100.00	129.7	146.4	128.3									
		c_2	19.614	137.3	112.50												
	b_6 - Dumara F_1	c_1	14.743	103.9	100.00	111.7	126.1	110.5	$a_1b_{6\text{-}8}c_1$	$a_1b_{6\text{-}8}c_2$	114.1	120.9	100.0			100.0 %	100.0 %
		c_2	17.071	119.5	115.01												
	b_7 - Montana F_1	c_1	18.371	128.6	100.00	136.8	154.4	135.3	112.9	128.8							
		c_2	20.700	144.9	112.67												
	b_8 - Caravan F_1	c_1	15.171	106.2	100.00	114.2	128.9	112.9									
		c_2	17.443	122.1	115.18												
a_2 – modernised technology	b_1 - Crisby F_1	c_1	15.171	106.2	100.00	117.1	110.3	91.6	$a_2b_{1\text{-}5}c_1$	$a_2b_{1\text{-}5}c_2$	120.2	121.9	115.8	128.5	115.6	a_2c_1	a_2c_2
		c_2	18.271	127.9	120.43												
	b_2 - Red Comet F_1	c_1	11.014	77.1	100.00	86.2	111.8	90.5									
		c_2	13.600	95.2	123.47												
	b_3 - Lady F_1	c_1	14.528	101.7	100.00	112.1	110.2	91.6									
		c_2	17.485	122.4	120.35												
	b_4- Red Star F_1	c_1	17.771	131.4	100.00	144.2	109.7	91.8	110.7	133.1						116.8	140.2
		c_2	22.428	157.0	119.48												
	b_5 - Audry F_1	c_1	19.571	137.0	100.00	149.9	109.4	92.0									
		c_2	23.271	162.9	118.90												
	b_6 - Dumara F_1	c_1	15.586	109.1	100.00	120.2	110.2	91.7	$a_2b_{6\text{-}8}c_1$	$a_2b_{6\text{-}8}c_2$	119.6	139.5	115.4			112.3 %	118.6 %
		c_2	18.743	131.2	120.25												
	b_7 - Montana F_1	c_1	21.471	150.3	100.00	164.1	109.2	92.2	127.0	151.9							
		c_2	25.414	177.9	118.36												
	b_8 - Caravan F_1	c_1	17.386	121.7	100.00	134.1	110.1	91.5									
		c_2	20.928	146.5	120.38												

Among the five semi-early and early hybrids we need to point out the hybrid Red Star F1 (b_4) which yielded most under the impact of the two graduations of the Factor C (c_1 – 122.8 t/ha and c_2 – 138.2 t/ha) and Audry F1 (b_5) with 122.0 t/ha in c_1 and 137.3 t/ha in c_2, respectively.

Among the semi-late and late hybrids we need to point out the hybrid Montana F1 (b_7) with 128.6 t/ha in c_1 (no stimulation) and 144.9 t/ha in c_2 (stimulation of flower fecundation with the preparation Bostim) followed by Caravan F1 (b_8) with 106.2 t/ha in c_1 and 122.1 t/ha in c_2.

From the point of view of the appearance of fruits in July, its share of the total yield per ha is between 37.7-65.5 t/ha in early and semi-early hybrids with no stimulation of flower fecundation (c_1) and between 45.5-78.1 t/ha using the preparation Bostim to stimulate flower fecundation (c_2). In late and semi-late hybrids, the variation limits are 55.5-68.7 t/ha in c_1 (no stimulation) and between 67.5-81.8 t/ha in c_2 (stimulation of flower fecundation with the preparation Bostim). When thoroughly analysed, we can see that over 50% of the total yield is obtained in June (2^{nd} and 3^{rd} decades) while in late and semi-late hybrids it is below this threshold. To note that in the 1^{st} decade of June (1-10 July) there is no yield of water melons with classical cultivation technology (planting plantlets in the open field).

Higher yield results in these hybrids are the effect of applying modernised cultivation technology which differs from the classical improved cultivation technology by the protection of the plantlets with poly-ethylene sheets under the form of low tunnels and application of poly-ethylene mulch under which we introduced the hose of the fertirrigation installation. We also applied fertirrigation with chemical fertilisers of the Kemira type (Cropcare in basic fertilisation and Ferticare during vegetation).

Table 2 shows that fruit weight is between 4.939 kg per piece (minimum) in Red Comet F_1 in c_1 (no stimulation) and 12.057 kg per piece (maximum) in Caravan F_1 in c_2 (stimulation of flower fecundation with the preparation Bostim) in early and semi-early hybrids. In late and semi-late hybrids, variation limits of the minimal and maximal fruit mean weight are 13.321 kg per piece in c_1 (no stimulation) and 17.296 kg per piece in c_2 (stimulation of flower fecundation with the preparation Bostim).

Mean yields per plant under the impact of modernised cultivation technology (a_2) are superior, with values between 11.014 kg per plant in Red Comet F_1 in c_1 (no simulation) and 23.271 kg per plant in Audry F1 in c_2 (stimulation of flower fecundation with the preparation Bostim) which corresponds to a mean yield per ha of 77.1 t/ha in Red Comet F_1 (minimal) and 162.9 t/ha in Audry F1 (maximum) in the group of early and semi-early hybrids (b_1-b_5).

In late and semi-late hybrids, minimal and maximal yields are 109.1 t/ha in Dumara F1 (b_6) in c_1 (no stimulation) and 177.9 t/ha in Montana F1 (b_7) in c_2 (stimulation of flower fecundation with the preparation Bostim).

Table 2 presents a comparative synthesis of experimental results obtained through classical improved and through modernised technologies. We can see that yields obtained through the application of modernised technology (a_2) in all the studied hybrids are higher than those obtained through the application of classical improved cultivation technology (a_1) with shares between 7 and 19.8% in Red Star F1 (b_4) and Lady F1 (b_3) in c_1 (no stimulation) and between 13.6 and 26.5 % in Red Star F1 (b_4) and Crisby F1 (b_1) in c_2 (stimulation of flower fecundation with the preparation Bostim), in early and semi-early hybrids. In late and semi-late hybrids, variation limits are between 5 and 16.9 % in c_1 (no stimulation) in Dumara F1 (b_6) and Montana F1 (b_7) and 9.8-22.8 in c_2 (stimulation of flower fecundation with the preparation Bostim) in the same hybrids.

Tables 3 and 4 show the results of statistical calculus specific to the variance analysis method, resulting in significance of the differences in yield as an effect of the interdependence of experimental factors.

Table 3 shows the results of unilateral, combined analysis of experimental factors in early and semi-early hybrids:

- the mean of the yields obtained through modern cultivation technology (a_2) is statistically ensured, the difference in yield being very significantly positive (***) compared to a_1 (mean of yields obtained with classical improved cultivation technology);

- the mean of yields in Red Comet F_1 (b_2) is statistically ensured, the differences in yield being very significantly negative (000) compared to the mean of the yield in the hybrid Crisby F_1 (b_1);

- the mean of the hybrids Red Star (b_4) and Audry F1 (b_5) is statistically ensured, the significance of the differences in yield being very significantly positive (***) compared to the mean of the yields in the hybrid Crisby F_1 (b_1) and Red Comet F_1 (b_2) and distinctly significantly positive (**) compared to Red Star F1 (b_4);

- the mean of the yields under the impact of the preparation Bostim (c_2) applied to stimulate flower fecundation is statistically ensured, the signification of the differences in yield being very significantly positive, which points out its efficacy.

Table 2.

Comparative synthesis of mean yield results during the period 2008-2009 in early, semi-early, and late water melon by applying the improved classical and the modern cultivation technologies (planting plantlets and fertirrigation and planting plantlets with tunnel soil mulching with poly-ethylene and protecting the crop in low tunnels and fertirrigation) with stimulation of flower fecundation with the preparation BOSTIM

Factor B (hybrid)	Factor C (flower fecundation stimulation factor)	Factor A												
		a_1 – CLASSICAL improved cultivation technology						a_2 – MODERNISED cultivation technology						
		Mean yield		Of which in				Mean yield			Of which in			
		Mean weight per fruit (g/piece)	t/ha	July (2^{nd} + 3^{rd} decades)		August (1^{st}, 2^{nd} and 3^{rd} decades)		kg/ plant	t/ha	% compared to a_1	July (2^{nd} + 3^{rd} decades)		August (1^{st}, 2^{nd} and 3^{rd} decades)	
				t/ha	%	t/ha	%				t/ha	%	t/ha	%
b_1 – Crisby F_1	c_1 – no stimulation	7.191	88.6	48.1	54.3	40.5	45.7	15.171	106.2	119.9	73.2	68.9	33.0	31.1
	c_2 – stimulation with BOSTIM	8.023	101.1	58.4	57.8	42.7	42.2	18.271	127.9	126.5	92.5	72.3	35.4	27.7
b_2 – Red Comet F_1	c_1 - no stimulation	4.072	70.6	31.0	43.9	39.6	56.1	11.014	77.1	109.2	47.1	61.1	30.0	38.9
	c_2 – stimulation with BOSTIM	5.496	80.4	37.5	46.6	42.9	53.4	13.600	95.2	118.4	61.6	64.7	33.6	35.3
b_3 – Lady F_1	c_1 - no stimulation	9.481	89.6	38.1	42.5	51.5	57.5	14.528	101.7	113.5	60.5	59.5	41.2	40.5
	c_2 – stimulation with BOSTIM	10.429	102.2	45.8	44.8	56.4	55.2	17.485	122.4	119.8	77.6	63.4	44.8	36.6
b_4 – Red Star F_1	c_1 - no stimulation	8.084	122.8	57.6	46.9	65.2	53.1	17.771	131.4	107.0	89.1	67.8	42.3	32.2
	c_2 – stimulation with BOSTIM	9.015	138.2	68.0	49.2	70.2	50.8	22.428	157.0	113.6	111.9	71.3	45.1	28.7
b_5 – Audry F_1	c_1 - no stimulation	10.499	122.0	62.1	50.9	59.9	49.1	19.571	137.0	112.3	78.0	56.9	59.0	43.1
	c_2 – stimulation with BOSTIM	11.538	137.3	74.3	54.1	63	45.9	23.271	162.9	118.6	99.9	61.3	63.0	38.7
b_6 – Dumara F_1	c_1 - no stimulation	13.020	103.9	37.2	35.8	66.7	64.2	15.586	109.1	105.0	60.5	55.5	48.6	44.5
	c_2 – stimulation with BOSTIM	14.345	119.5	45.8	38.3	73.7	61.7	18.743	131.2	109.8	80.3	61.2	50.9	38.8
b_7 – Montana F_1	c_1 - no stimulation	10.438	128.6	40.1	31.2	88.5	68.8	21.471	150.3	116.9	82.8	55.1	67.5	44.9
	c_2 – stimulation with BOSTIM	11.500	144.9	50.6	34.9	94.3	65.1	25.414	177.9	122.8	105.5	59.3	72.4	40.7
b_8 – Caravan F_1	c_1 - no stimulation	14.586	106.2	33.8	31.8	72.4	68.2	17.386	121.7	114.6	53.3	43.8	68.4	56.2
	c_2 – stimulation with BOSTIM	16.151	122.1	40.9	33.5	81.2	66.5	20.928	146.5	120.0	70.9	48.4	75.6	51.6

A first conclusion to be drawn is that of the superiority of the hybrids Red Star F1 and Audry F1 from the group of early and semi-early cultivars compared to Crisby F1, Red Comet F1 and Lady F1from the point of view of the level of yields, of the efficacy of the preparation Bostim and of the superiority of the modernised cultivation technology compared to the classical improved one.

Table 3.

Impact of singular and experimental factor interaction on yield in early and semi-early water melon cultivars with stimulation of flower fecundation with the preparation BOSTIM during the period 2008-2009

Variant	Mean yield (t/ha)		Relative yield (%)	Difference (± t/ha)	Significance of the difference
1. Impact of cultivation technology on yield					
a2-a1	121.88	105.30	115.75	16.58	***
DL 5%= 0.37 DL 1%= 0.56 DL 0.1% = 0.89					
2. Impact of early and semi-early hybrid on yield					
b2-b1	80.83	105.95	76.29	-25.13	000
b3-b1	104.03	105.95	98.18	-1.93	-
b4-b1	137.35	105.95	129.64	31.40	***
b5-b1	139.80	105.95	131.95	33.85	***
b3-b2	104.03	80.83	128.70	23.20	***
b4-b2	137.35	80.83	169.94	56.53	***
b5-b2	139.80	80.83	172.97	58.98	***
b4-b3	137.35	104.03	132.04	33.33	***
b5-b3	139.80	104.03	134.39	35.78	***
b5-b4	139.80	137.35	101.78	2.45	**
DL 5%= 1.49 DL 1%=2.06 DL 0.1% =2.83					
3. Impact of the method of stimulating flower fecundation on yield					
c2-c1	122.48	104.70	116.98	17.78	***
DL 5%=0.99 DL 1%=1.34 DL 0.1%=1.79					
4. Impact of interactions between the different cultivation technologies and the same or different early and semi-early hybrids					
a2b1-a1b1	117.05	94.85	123.41	22.20	***
a2b2-a1b2	86.15	75.50	114.11	10.65	***
a2b3-a1b3	112.05	96.00	116.72	16.05	***
a2b4-a1b4	144.20	130.50	110.50	13.70	***
a2b5-a1b5	149.95	129.65	115.66	20.30	***
a2b2-a1b1	86.15	94.85	90.83	-8.70	000
DL 5%=1.92 DL 1%=2.66 DL 0.1%=3.68					
5. Impact of the interaction between the same cultivation technology and different early and semi-early hybrids					
a1b2-a1b1	75.50	94.85	79.60	-19.35	000
a1b4-a1b1	130.50	94.85	137.59	35.65	***
DL 5%=2.11 DL 1%=2.91 DL 0.1%=4.01					
6. Impact of the interactions between the same cultivation technology and different methods of stimulating flower fecundation					
a1c2- a1c1	111.88	98.72	113.33	13.16	***
a2c2- a2c1	133.08	110.68	120.24	22.40	***
DL 5%= 1.40 DL 1%= 1.89 DL 0.1%= 2.53					
7. Impact of the interactions between the same hybrid and different methods of stimulating flower fecundation					
b1c2- b1c1	114.50	97.40	117.56	17.10	***
b5c2- b5c1	150.10	129.50	115.91	20.60	***
DL 5%=2.21 DL 1%= 2.99 DL 0.1%=4.00					
8. Impact of the interactions between different hybrids and the same or different methods of stimulating flower fecundation					
b2c1- b1c1	73.85	97.40	75.82	-23.55	000
b4c1- b1c1	127.10	97.40	130.49	29.70	***
DL 5%=2.16 DL 1%= 2.95 DL 0.1%=4.00					
9. Impact of interactions between different cultivation technologies and the same or different methods of stimulating flower fecundation					
a2c1- a1c1	110.68	98.72	112.12	11.96	***
a2c2- a1c1	133.08	98.72	134.81	34.36	***
DL 5%=1.05 DL 1%= 1.44 DL 0.1%=1.98					
10. Impact of interactions between the same cultivation technology and the same hybrid and different methods of stimulating flower fecundation					
a1b1c2- a1b1c1	101.10	88.60	114.11	12.50	***
a2b5c2- a2b5c1	162.90	137.00	118.91	25.90	***
DL 5%= 3.13 DL 1%=4.23 DL 0.1%=5.66					
11. Impact of interactions between the same cultivation technology and different hybrids and the same method of stimulating flower fecundation					
a1b2c1- a1b1c1	70.60	88.60	79.68	-18.00	000
a2b5c2- a2b4c2	162.90	157.00	103.76	5.90	***
DL 5%=3.06 DL 1%=4.17 DL 0.1%=5.66					
12. Impact of interactions between different cultivation technologies and the same hybrid and the same method of stimulating flower fecundation					
a2b1c1- a1b1c1	106.20	88.60	119.86	17.60	***
a2b5c2- a1b5c2	162.90	137.30	118.65	25.60	***
DL 5%=2.93 DL 1%=4.00 DL 0.1%=5.43					

The complex analysis under 4-12 under the impact of the interaction of experimental factors shows that the significance of the differences in yield is very significantly negative in most cases.

Table 4.

Impact of singular and experimental factor interaction on yield in late and semi-late water melon cultivars with stimulation of flower fecundation with the preparation BOSTIM during the period 2008-2009

Variant	Mean yield (t/ha)		Relative yield (%)	Difference (± t/ha)	Significance of the difference
1. Impact of cultivation technology on yield					
a2-a1	139.45	120.87	115.38	18.58	***
DL 5%= 1.18 DL 1%= 1.78 DL 0.1% = 2.87					
2. Impact of late and semi-late hybrid on yield					
b7- b6	150.43	115.93	129.76	34.50	***
b8- b6	124.13	115.93	107.07	8.20	***
b8- b7	124.13	150.43	82.52	-26.30	000
DL 5%= 1.49 DL 1%=2.06 DL 0.1% =2.83					
3. Impact of the method of stimulating flower fecundation on yield					
c2-c1	140.35	119.97	116.99	20.38	***
DL 5%=1.59 DL 1%=2.16 DL 0.1%=2.88					
4. Impact of interactions between the different cultivation technologies and the same or different late and semi-late hybrids					
a2 b6-a1 b6	120.15	111.70	107.56	8.45	***
a2 b7-a1 b6	164.10	111.70	146.91	52.40	***
DL 5%=2.31 DL 1%=3.26 DL 0.1%=4.67					
5. Impact of the interaction between the same cultivation technology and different late and semi-late hybrids					
a1 b7-a1 b6	136.75	111.70	122.43	25.05	***
a1 b8-a1 b7	114.15	136.75	83.47	-22.60	000
DL 5%=2.44 DL 1%=3.36 DL 0.1%=4.63					
6. Impact of the interactions between the same cultivation technology and different methods of stimulating flower fecundation					
a1c2- a1c1	128.83	112.90	114.11	15.93	***
a2c2- a2c1	151.87	127.03	119.55	24.83	***
DL 5%= 2.25 DL 1%= 3.05 DL 0.1%= 4.07					
7. Impact of the interactions between the same hybrid and different methods of stimulating flower fecundation					
b6c2- b6c1	125.35	106.50	117.70	18.85	***
b8c2- b8c1	134.30	113.95	117.86	20.35	***
DL 5%=2.76 DL 1%= 3.73 DL 0.1%=4.99					
8. Impact of the interactions between different hybrids and the same or different methods of stimulating flower fecundation					
b8c1- b7c1	113.95	139.45	81.71	-25.50	000
b7c2- b6c1	161.40	106.50	151.55	54.90	***
DL 5%=2.60 DL 1%= 3.55 DL 0.1%=4.81					
9. Impact of interactions between different cultivation technologies and the same or different methods of stimulating flower fecundation					
a2c1- a1c1	127.03	112.90	112.52	14.13	***
a2c2- a1c1	151.87	112.90	134.51	38.97	***
DL 5%=1.97 DL 1%= 2.77 DL 0.1%=3.96					
10. Impact of interactions between the same cultivation technology and the same hybrid and different methods of stimulating flower fecundation					
a1 b6c2- a1 b6c1	119.50	103.90	115.01	15.60	***
a2 b7c2- a2 b7c1	177.90	150.30	118.36	27.60	***
DL 5%= 3.90 DL 1%=5.28 DL 0.1%=7.06					
11. Impact of interactions between the same cultivation technology and different hybrids and the same method of stimulating flower fecundation					
a1 b7c1- a1 b6c1	128.60	103.90	123.77	24.70	***
a1 b8c1- a1 b7c1	106.20	128.60	82.58	-22.40	000
DL 5%=3.68 DL 1%=5.02 DL 0.1%=6.80					
12. Impact of interactions between different cultivation technologies and the same hybrid and the same method of stimulating flower fecundation					
a2 b6c1- a1 b6c1	109.10	103.90	105.00	5.20	**
a2 b8c2- a1 b8c2	146.50	122.10	119.98	24.40	***
DL 5%=3.59 DL 1%=4.95 DL 0.1%=6.81					

Table 4 shows the results of the variance analysis of the semi-late and late hybrids analysed unilaterally under 1, 2 and 3:

- the significance of the differences in yield in all comparisons between hybrids are very significantly positive and negative which point out the superiority of the hybrid Montana F1 (b_7) compared to Dumara F1 (b_6) and Caravan F1 (b_8) with the mention that all the hybrids yielded over 110 t/ha;

- the mean of yields obtained through the application of modernised cultivation technology (a_2) is statistically ensured, the significance of the differences in yield being very significantly positive (***) compared to a_1 (the average of the yields obtained after the application of the classical improved cultivation technology);

- the mean of the yield obtained after the impact of the preparation Bostim (c_2) to stimulate flower fecundation is statistically ensured, which shows the efficacy of its application in late and semi-late hybrids too.

The complex analysis under 4-12 shows that in most comparisons the yields obtained are statistically ensured and the differences in yield are in most cases very significantly positive (in most cases) and negative

CONCLUSIONS

1. The cultivation technology applied in water melon hybrids cultivated in the field or protected in poly-ethylene tunnels under the impact of the setting method and of the stimulation of the flower fecundation plays a decisive role in the yielding potential pf the studied hybrids.

2. The modernised cultivation technology (planting plantlets, protecting the crop in low polyethylene tunnels, mulching with poly-ethylene sheets, drip irrigation and fertirrigation with fertilisers of the Kemira type) proved superior to the classical cultivation technology (planting plantlets, irrigation and fertilisation through dripping installation), a conclusion also supported by the yield level of the cultivated hybrids from a quantitative (mean yield per ha), qualitative and yielding time (early yield during the first two decades of July, when the valorisation price is maximum).

3. The increase in yield obtained through the application of the modernised cultivation technology is 17.3 t/ha (115.6%).

4. The hybrids Audry F_1 and Red Star F_1 from the group of early hybrids and Montana F_1 from the group of late hybrids are to be noted from the point of view of the yielding level under the impact of both cultivation technologies (Audry F_1 – 129.7-149.9 t/ha; Red Star F_1 – 130.5-144.2 t/ha; Montana F_1 – 136.8-164.1 t/ha).

5. Applying the preparation Bostim through spraying determined an increase of the number of flowers fecundated per plant and implicitly of the yield with both cultivation technologies. The increases in yield obtained with both classical improved and with modernised cultivation technologies are 13.3 and 20.2% respectively in the early and semi-early hybrids and 14.1% and 19.6% respectively in the case of late and semi-late hybrids.

6. We recommend the pursue of the experiment to deepen the results obtained during the experimental years since the studied hybrids are particularly valuable and the modernised cultivation technology is a peak technology in the practice in the field.

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