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INFLUENCE OF TWO FARMING SYSTEMS ON THE PRODUCTIVITY OF WATERMELON

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Abstract

The investigation was carried out in 2023-2024 in the experimental field of the Department of Plant Production, Technical University - Varna. The Crimson sweet watermelon variety was cultivated in two farming systems: organic and conventional. In organic farming, two fertilizers are used - compost and Isabion. In the conventional farming were used - YaraMila Complex and N15P15K15 + 11 S. The results show that the total vegetative weight is highest in Compost + Isabion (860 g), followed by the independent application of Isabion (725.3 g), and the index was 476 g for the untreated control.

When comparing the two fertilization systems, the yield is higher in the conventional system (9234 kg/da for YaraMila+Isabion). In the organic system, yields of 5,287 kg/da (Compost+Isabion) and 4,965 kg/da (Isabion) were recorded.

Cucurbit powdery mildew and cotton aphid were observed in watermelon during growing season. Plant protection in organic farming included two applications of fungicide Taegro and insecticide Afitek. In conventional farming was used fungicides Cideli Top and Zoxis, and insecticides Decis and Afinito. The results demonstrated that disease incidence of powdery mildew and density coefficent of cotton aphid were significantly lower after the pesticides application in the two farming systems than the untreated control.

Key words:* *conventional technology, organic technology, watermelon, powdery mildew, cotton aphid

INTRODUCTION

In recent years, organic farming develop relatively fast because of the environmentally friendly and healthy food that consumers are interested in worldwide. Organic food production is growing at around 6 to 9% per year, generates €20 billion per year and occupies 5.4% of EU agricultural land because of being friendly to soils, natural resources and human factors (http://faostat.fao.org/; Willer et al., 2021; 2023). In addition to the well-known production of vegetables and fruits such as peppers, tomatoes, apples, plums, pears, consumers are increasingly interested in organically grown watermelons.

Watermelon (*Citrullus lanatus* (Thunb.) Matsum. & Nakai) originates from South Africa. It is a valuable source of vitamins B, A, C, E, H, PP, as well as minerals such as potassium, calcium, phosphorus, sodium, magnesium, iron, lycopene and plant fiber (Whitaker and Davis, 1962).

Watermelons are a typical seasonal fruit in Bulgaria and are found in almost all regions of the country, with the main are of production between north and south Bulgaria. In southern Bulgaria, cultivation by seedlings is favoured under irrigated conditions and early and medium production are prefered. In northern Bulgaria, watermelon cultivation is concentrated on medium-early and late varieties on larger areas. Direct sowing of the seeds is preferred method in this part of the coutry.

In recent years, there has been an increasing trend in the area of this crop. In 2024 it reached 5 344 ha, 1700 ha more than in 2023. The production reached 69

605 t, with an average yield of 1 629 kg/da (Agrostatistics, Ministry of Agriculture, 2024).

The total number of certified organic growers in Bulgaria in 2018 was 6,660 and the area under Vegetables cultivated for fruit was 1 125 ha, but there is no information about the area cultivated with watermelon (Agrostatistics, Ministry of Agriculture, 2023).

Research about this crop in the country is mainly focused on biological requirements, agronomic peculiarities, influence of mineral fertilization on productivity and quality under conventional cultivation technology (Tringovska and Kanazirska, 2003; Tringovska, 2005; Naskova et al., 2021; Plamenov et al., 2021; Syofia and Pohan, 2015; Zaller, 2007). The possibilities of growing this crop organicaly are limited (Sreenivas et al., 2009; Yankova & Boteva, 2022).

The success of any organic production requires a detailed knowledge not only of the technology of cultivation of a crop, but also of the economically important pests, which are limiting biotic factor. The most widespread watermelon diseases in Bulgaria are: cucumber mosaic (*Cucumber mosaic virus*), bacterial wilt of cucurbits (*Erwinia tracheiphila* (Smith) Bergey et al.), angular leaf spot of cucumber (*Pseudomonas syringae* pv. *lachrymans* Dye & Wilkie), downy mildew of cucurbits (*Pseudoperonospora cubensis* Rostovtsev), powdery mildew of cucurbits (*Erysiphe cichoracearum* de Candolle), anthracnose of cucurbits (*Colletotrichum orbiculare* Damm, P.F. Cannon & Crous). Watermelons are attacked by polyphagous pests of Order *Orthoptera* (*Acrididae*, *Tettigonidae*, *Gryllidae*, *Gryllotalpidae*), Order *Homoptera* (*Aleyrodidae*, *Aphididae*), Order *Coleoptera* (*Elateridae*, *Tenebrionidae*, *Scarabaeoidea*), Order *Lepidoptera* (*Agrotis* sp., *Euxoa* sp., *Plusia* sp.). At present, 40 fungicides and 55 insecticides are authorised for use in the country, of which only 5 fungicides and 3 insecticides are applicable to organic farming of this crop.

The aim of the present study is to investigate conventional and organic watermelon farming technology by comparative testing of some quantitative parameters, fertilizers and crop protection products in this crop.

MATERIAL AND METHODS

The investigation was carried out in 2023-2024 on Calcic chernozems soil, in the experimental field of the Department of Plant Production at the Technical University - Varna.

Watermelon variety Crimson sweet was used. It has been selected in the USA and is suitable for cultivation in different climatic conditions. It is a medium-early variety with a growing period of 90 days. The fruits are round in shape and 10-12 kg. The skin is light green with dark green stripes. The flesh is deep red in colour.

The experiment was laid out in a block design, in 3 replications and experimental plot size 10 m². Plants were grown on a lecho-furrow surface with a high flat bed at 200/80 cm. Direct sowing of seeds was carried out.

Two watermelon farming systems, organic and conventional, were investigated.

Variants in biological technology:

1. Control - untreated
2. Compost - 25 kg/da, before sowing;
3. Isabion - 300 ml/da, applied during fruit set and growth, foliar application every 10-14 days;
4. Compost + Isabion -25 kg/da, pre-sowing and 300 ml/da, applied during fruit set and growth, foliar application over 10-14 days;

Variants in conventional technology:

1. Control - untreated
2. YaraMila Complex - YaraMila Complex 12-11-18 + 2.7MgO + 20SO3 + 0.015B + 0.2Fe + 0.02Mn + 0.02Zn - 25 kg/da, before sowing; YaraMila Complex - 10 kg/da, applied at the beginning of flowering;

3.YaraMila Complex + Isabion - YaraMila Complex 12-11-18 + 2.7MgO + 20SO3 + 0.015B + 0.2Fe + 0.02Mn + 0.02Zn - 25 kg/da, pre-sowing; Isabion - 300 ml/da, fruit set and growth, foliar application in 10-14 days;
4. NPK 15:15:15 +11 S - 15 kg/da, before sowing and 30 kg/da applied during vegetation.

Characteristics of fertilizers used

In organic cultivation, two organic fertilizers were used:

Compost - obtained as a result of accumulated poultry litter, rotten fruit and other organic waste. It is applied before the first cultivation.

Isabion - a biostimulant of natural origin which, through its high concentration of active substance, effectively stimulates the main physiological processes in plants. Isabion supports vegetative growth and root development. It induces the formation of more flowers, improves pollination and fruit formation. At the same time, it increases the yield and quality of the fruits. Contains 11.7% total nitrogen (N), 10.3% organic nitrogen (N) and 11% amino acids.

In conventional technology, standard fertilizers are used:

YaraMila COMPLEX 12-11-18 + 2.7MgO + 20SO3 + 0.015B + 0.2Fe + 0.02Mn + 0.02Zn - Complex fertilizer designed to maximize yield and quality, ensuring balanced absorption of essential plant nutrients. The nutrients in YaraMila COMPLEX act in synergism, giving much higher quality crop nutrition and greater application efficiency.

N15P15K15 + 11 S - Mineral compound fertilizer. The balanced nutrient content helps to fully satisfy the macronutrient needs of plants. Content: total nitrogen - 15.0%; ammoniacal nitrogen - 14%; P_2O_5 - 15%; K_2O - 15% and S - 11%.

Indicators and methods of the study

Biometric measurements, an average of 5 plants per replicaion:

- ✓ Root - weight, (g);
- ✓ Stem - length, (cm), weight, (g);
- ✓ Leaves - weight, (g);
- ✓ Total vegetative mass - (g/plant).

Fruit morphology - fruit weight, kg; peel thickness, mm - 5 fruits per replication were analyzed.

Total yield - kg/da.

Plant protection:

In the experimental plot, after germination, multiple visual surveys were carried out at 3-day intervals to detect the presence of pests and diseases.

A macroscopic method was used to identify diseases based on symptoms. Disease incidence (DI) was calculated according to the McKinney Index (1923):

$DI = \sum(n.k).100/N.K$,

where n - infection class frequencies, k - number of plants of each class, N - total of observed plants, K - highest value of the evaluation scale.

Percentage leaf surface area diseased by powdery mildew was assessed visually with a modified Horsfall–Barratt scale (1945), where 0=0%, 1=0–2%, 2=2–7%, 3=7–13%, 4=13–21%, 5=21–30%, 6=30–40%, 7=40–50%, 8=50–60%, 9=60–70%, 10=70–79%, 11=79–87%, 12=87–93%, 13=93–98%, 14=98–99%, and 15=100%.

The presence of insects was detected by visual inspection and placement of yellow sticky traps randomized within the experimental area, 1 in each replication.

Aphid density was recorded using the percentage of leaves/leaf petioles infested and the mean number of aphids in colonies. The results are presented by the complex indicator "Density coefficient" (DC), which is calculated by the formula: $DC = P.a/100$, where: P - percentage of infested area (% infested leaves); a - average density (average number of aphids in colonies) (Andreev, 2018).

Mathematical processing of results – Duncan's Multiple range and multiple F-test (Duncan, 1955).

RESULTS AND DISCUSSION

The results from this investigation showed that the root weight varied from 40.0 to 87.0 g in organic farming and from 42.5 to 105.0 g in conventional. In organic watermelon cultivation, the highest root weight was measured in the combined application of Compost + Isabion - 87.0 g (Table 1). The differences between the other fertilization options were small and unsignificant. The results obtained were statistically significant compared to the control.

Similar results were obtained with the conventional technology as the highest root weight was measured in the YaraMila+Isabion variant - 105.0 g, followed by YaraMila - 96.0 g. The results obtained were statistically significant against the control.

Stem height ranged from 156.0 cm (for the control) to 185.0 cm (for Compost+Isabion) for organic farming and from 149.0 cm (for the control) to 194.0 cm (for YaraMila+Isabion) for conventional farming technology.

Under the influence of the applied fertilization, the total vegetative weight ranged from 476 g (control) to 860 g (Compost + Isabion). Plants grown under combined fertilization with Compost + Isabion (860 g) had the highest vegetative weight, followed by the variant with Isabion application alone (725.3 g). The increase over the control was 80, 6% and 52, 4%, respectively.

The results are unidirectional under conventional technology for the total weight formed. The highest vegetative weight was measured with the fertilizer combination YaraMila+Isabion (1,444.0 g), followed by YaraMila (1,415.0 g).The results obtained were statistically proven against the control. The results for the other parameters correlated with those obtained for total vegetative weight.

Table 1. Biometric analysis of Crimson Sweet variety

Variants	Root		Stems				Leaves		Fresh weight of plant, g	
	Weigh,g		Height,cm		Weigh,g		Weigh,g			
Organic technology										
Control	40,0	b	156	c	212,0	c	224,0	d	476	d
Compost	65,0	a	176	b	282,5	b	292,5	c	640	c
Compost + Isabion	87,0	a	185	a	383,0	a	390,0	a	860	a
Isabion	60,0	a	160	a	323,8	a	341,5	b	725,3	b
Conventional technology										
Control	42,0	b	149	c	224	c	234,6	c	500,6	d
YaraMila	96,0	a	189	a	656	ab	663	a	1415	b
NPK	90,0	a	180	b	556,6	b	586,5	b	1233,1	c
YaraMila+Isabion	105,0	a	194	a	663,5	a	675,5	a	1444	a

a,b,c,d – Duncan`s multiple range test (p<0,05)

The results obtained for vegetative weight are confirmed by Rani et al. (2008), Syofia and Pohan (2015) and Yankova et al., (2021). The authors investigated that the use of biofertilizers improves nutrient uptake by plants and leads to the formation of greater vegetative biomass. The tested fertilization options under organic and conventional cropping scheme significantly influenced the vegetative development of watermelons (Table 2). As a result of the applied organic fertilization system, 860 g of above ground weight was recorded in the variety Crimson sweet which reached over 80.7 % of the control. Under the conventional system, weight of 1 444 g was recorded, which is 88.5 % more than the control.

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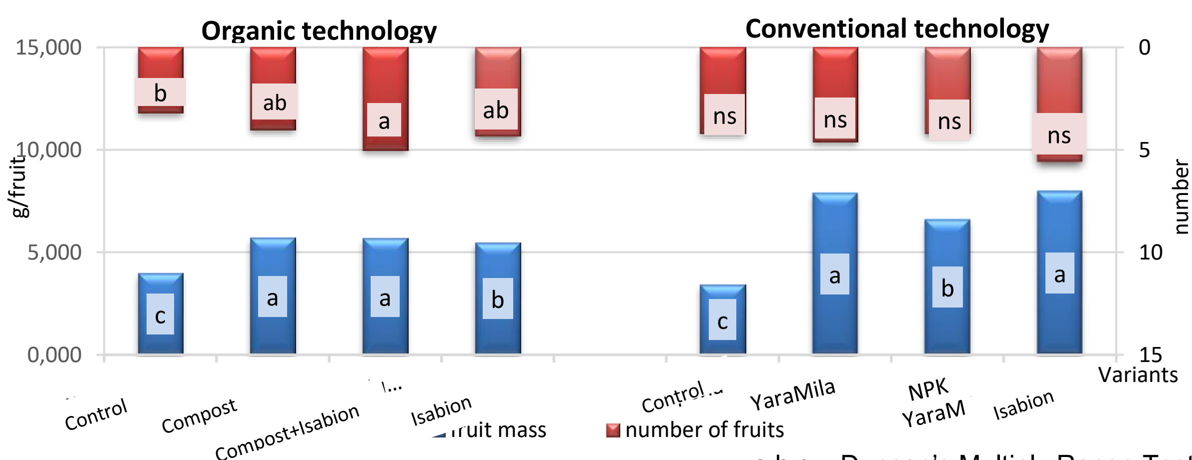
Table 2. Effect of fertilization systems on vegetative weight, g / plant

№	Variants	Aboveground mass of the plant, g		%/K
		Organic technology		
1	Control	476	d	100
2	Compost	640	c	134,43
3	Compost + Isabion	860	a	180,67
4	Isabion	725,3	b	152,37
		Conventional technology		
1	Control	500,6	d	100
2	YaraMila	1415	b	282,66
3	NPK	1233,1	c	246,32
4	YaraMila+ Isabion	1444	a	288,45

a,b,c,d – Duncan's Multiply Range Test, P<0.05

Growing conditions and nutrition are among the main factors influencing vegetative and productive traits in watermelons (Vassileva et al., 2013; Vassileva, 2015). This is also confirmed by the data obtained on fruit weight and number in the variety Crimson sweet. As a result of the tested fertilization schemes, fruit weight varied from 3 980 g to 5 480 g g/plant in the organic and from 3 430 g to 7 990 g g/plant in the conventional technology (Figure 1). The highest fruit weight was obtained from plants grown under the conventional system with combined fertilization with YaraMila+Isabion (7 990 g) followed by the variant grown under the organic method Compost+Isabion (5 480 g). The difference between the two cultivation systems were statistically significant.



a,b,c – Duncan's Multiply Range Test, P<0.05

Fig.1 Effect of fertilization of the Crimson sweet variety

Similar results were found for the number of fruits formed. Their number varied from 3.22 to 5.0 pieces/plant in the organic technology and from 4.2 to 4.6 pieces/plant in the conventional technology. The highest number of fruits per plant was recorded under the conventional farming system (5,6 pieces/plant), followed by the organic system (5,0 pieces/plant). The excess over the control was 56.3 % and 33.3 %, respectively, and no statistically significant differences were found between the fertilisation systems.

The two fertilization systems had a positive effect on fruit morphology in the Crimson sweet cultivar (Table 3). The fruit weight ranged from 3.980 kg (for the unfertilized control) to 5.710 kg (for the Compost+Isabion variant) and 3, 430 kg (for the control) to 7.990 kg (for the YaraMila+Isabion variant of the conventional system). The results obtained are statistically significant.

Table 3. Effect of fertilization on fruit morphology, Crimson sweet variety

Variants	Fruit weight, kg		%/K	Crust thickness, mm		%/K
			Organic technology			
Control	3,980	c	100	10	a	100
Compost	5,710	b	143,5	8,0	ab	80
Compost + Isabion	5,678	ab	142,6	7,5	b	75
Isabion	5,480	b	137,7	8,3	ab	83
			Conventional technology			
Control	3,430	c	100	11,4	c	100
YaraMila	7,890	a	230,0	12,5	b	109,6
NPK	6,600	c	192,4	13,9	a	121,9
YaraMila+ Isabion	7,990	a	232,9	12,8	ab	112,3

a,b,c – Duncan's Multiply Range Test, P<0.05

Under the influence of the applied fertilization systems, differences in bark thickness were found. The lowest values were recorded under the organic cultivation system - 7.5 mm (Compost + Isabion), with statistically significant differences, which is an indicator determining the quality of production. The fruit grown with conventional fertilization had the highest peel thickness - 13.9 mm in the variant with NPK fertilization applied.

Yield is the main indicator of the economic efficiency of farming system, determining the effect of the application of technological elements. The tested fertilizers had a positive effect on the yield of watermelons cv. Crimson sweet, with an increase ranging from 10.7 to 27.3 % compared to the control under the organic technology and from 52.6 to 76.4 % under the conventional scheme. The highest impact on yield was found in the conventional cultivation system using YaraMila+Isabion (76.4%), where the average fruit weight was also the highest (Table 4). In the organic system, the yield increase was 27.3 % compared to the control with combined application of Compost+Isabion. The differences between the two fertilization systems tested were statistically significant.

In 2023, no phytopathogens or insects were found on the experimental plot. The reason for this probably lies in the high average daily temperatures during the period May-September, along with the lack of rainfall and low humidity. As a preventive measure, the plants of both cultivation technologies, without the control, were treated once at the 2-3 leaf phenophase as follows: with the fungicide Taegro in the organic technology and Cydeli Top + Decis in the conventional technology. By the end of the growing season, no pests were found in the experimental plot.

Table 4. Yield watermelons, variety Crimson sweet

№	**Variants**	**Kg/da**		**%/K**
		Organic technology		
1.	Control	4154	**c**	**100**
2.	Compost	4598	**b**	110,7
3.	Compost + Isabion	5287	**b**	127,3
4.	Isabion	4965	**a**	119,5
		Conventional technology		
1.	Control	5234	**d**	100
2.	YaraMila	8754	**b**	167,3
3.	NPK	7987	**c**	152,6
4.	YaraMila+ Isabion	9234	**a**	176,4

a, b, c, d – Duncan's Multiply Range Test, P<0.05

White powdery spots of mycelia, a definite symptom of powdery mildew disease of cucurbits, were observed on individual leaves of plants in the experimental area at the beginning of June (05.06) in 2024, at the 2-3 leaf stage of watermelon. Two genera are considered the predominant fungi that cause powdery mildew in cucurbits, *Sphaerotheca fuliginea* (Schlechtend.:Fr.) Pollacci (syn. *Podosphaera xanthii* (Castagne) Braun & Shishkoff) and *Erysiphe cichoracearum* DC. S. *fuliginea* (syn. *Golovinomyces cichoracearum* Heluta) (Pitrat et al., 1998). Powdery mildew symptoms on cucurbits typically appear as white powdery spots of mycelia and conidia on both sides of the leaves, but may appear on petioles and stems. Symptoms first develop on older leaves reducing plant canopy, and subsequent yield through decreased fruit size and number of fruit per plant (McGrath and Thomas, 1996). The DI in this assessment was 9.86% in the control, 9.18% in the conventional technology and 10.3% in the organic technology (Table 5).

Table 5. Disease incidence (DI) of cucurbit powdery mildew and Density coefficient (DC) of cotton aphid in organic and conventional farming of watermelon in 2024.

Variants	Phenophase											
	2-3 actual leaves				Growth of the fruit				Maturity			
	Powdery mildew, DI		Cotton aphid,DC		Powdery mildew, DI		Cotton aphid,DC		Powdery mildew, DI		Cotton aphid, DC	
Control	9,86	a	15,6	a	35,86	a	24,0	b	56,78	a	53,8	a
Organic technology	10,30	a	10,6	b	22,18	b	28,8	a	24,80	b	8,6	b
Conventional technology	9,18	b	5,1	c	21,26	c	18,6	c	16,80	c	5,8	c

a,b,c – Duncan's Multiply Range Test, P<0.05

Next day after the assessment (06.06) the fungicide application was made (Table 6). The PPP used were those applied in the previous year.

Twenty days later (25.06) second assessment was made. The control treatments showed higher DI (35.86%) (Table 5). In the experimental plots treated with Cydeli Top the DI was 21.26% and in those treated with Taegro DI =22.18%. The differences between the experimental treatments are significant. On the next day (26.06), at fruit set phenophase, a second treatment was made (Table 6). The fungicide ZOXIS was applied in the conventional technology and Taegro in the biological technology.

During the third assessment, twenty days later (16.07) the DI of control variants reached 56.78%. In the plots treated with

ZOXIS the index was 16.8% and in those with Taegro 24.8%. The results are statistically significant (Table 5).

Table 6. Plant protection products used on watermelons in 2024.

Variants	Phenophase			
	2-3 actual leaves		Growth of the fruit	
	Fungicide (act. lead)	Insecticide (act. lead)	Fungicide (act. lead)	Insecticide (act. lead)
Control	Water	Water	Water	Water
Organic technology	Taegro *(Bacillus amyloliquefaciens strain FZB24 - 1 x 10^{13})*	-	Taegro *(Bacillus amyloliquefaciens strain FZB24 - 1 x 10^{13})*	*Afitek* *
Conventional technology	Cideli Top (Difenoconazole + Ciflufenamide)	Decis 100 EC (deltamethrin)	ZOXIS 250 SC (azoxystrobin)	Affinto (flonikamid)

* - the insecticide is applied twice, over a period of 10 days

The results of present study showed that the combination of fungicides based on difenoconazole + cyflufenamid and azoxystrobin resulted in a significant reduction of the downy mildew DI on watermelons. Difenoconazole is one of the most commonly used fungicide against powdery mildew in a number of crops such as grapevine (Reuveni et al. 2023), rose (Kumar and Chandel, 2018) as well as other ascomycete fungi.

Strobilurin fungicides such as azoksistrobin (also known as Qo inhibitors) are frequently recommended for control of cucurbit powdery mildew (McGrath, 2004; Keinath and DuBose, 2004) and powdery mildew in other crops such as grapes (Ahila et al., 2015), common wheat (Koleva et al., 2022) and etc. According to Keinath and DuBose (2004) fungicide program to control powdery mildew on watermelon should include at least two fungicides with different modes of action to reduce the risk of fungicide resistance and improve control of resistant isolates.

In early June (02.06) wing aphids were observed on yellow pan traps in the experimental plot. Therefore, in the first treatment (06.06) in the experimental variants under conventional technology, the insecticide Decis was also applied. Ten days later (16.06) the first colonies were observed on the lower surface of the leaves and petioles of the watermelon. According to the identification key of Blackman and Eastop (2004), the specimens found belonged to the taxonomic species *Aphis gossypii* Glov. The DC of the untreated control was 15.6, in conventional technology variants was 5.1 and in organic technology 10.6 (Table 5). The low values of DC in the conventional technology are explained by the application of insecticide. Ten days later (26.06), the DC was higher in all variants. The highest values are onserved in biological technology (28.8), followed by the control - 24.0, and in conventional technology - 18.6. Therefore, along with the second fungicide application, the experimental treatments were treated with the insecticides: Afinito in conventional and Afitek in biological technology (Table 6). Ten days after treatment, the DC in the control variants reached 53.8 (Table 5). The coefficient was 5.8 in the conventional farming and 8.6 in the biological. A comparative analysis of DC in the two assessments, before and after the application of the insecticides, shows that the values of DI of cotton aphid in conventional and organic farming system were significantly lower the untreated control (Table 5) but unsignificant between them.

The thresholds of economic harmfulness of aphids in vegetable crops vary between 5-10% (Andreev, 2018). The results of the present study show that two applications of the insecticide Afitek in organic watermelon production and a double application of insecticides, Decis and Afinito, respectively, maintains the cotton aphid population below the pest thresholds.

Organic farming of any crop is a challenge with respect to plant protection. A major reason for this is the limited number of plant protection products allowed for application in this technology. The results of the study showed the effectiveness of the fungicide Taegro against watermelon powdery mildew and the insecticide Afitek against cotton aphid.

Taegro is a broad-spectrum fungicide showing effectiveness towards Fusarium Head Blight of wheat (Bleakley et al., 2013), potato early blight (Mishra et al., 2019), leaf spot of tomato (Tiwari et al., 2020), apple powdery mildew (Nasir et al., 2017) etc. *Bacillus subtilis* induced systemic defense responses in plants by production of pathogenesis related proteins like b-1,3-glucanase and the defense enzyme phenylalanine ammonia-lypase and oxidative enzymes like peroxidase, polyphenol oxidase and superoxide dismutase (Tiwari et al., 2020). The bacteria promote plant growth and yield by production of plant growth hormones like IAA and GA3 in combination with increased availability of nutrients (Adinarayana et al., 2018).

Afitek EK is a product for mechanical blocking and removal from plants of aphids, spider mites, eriophyid mites, shield aphids, leaf flyes, whiteflyes and thrips on cereal, vegetable, fruit, berry (including vines) and ornamental plants. The mode of action is based on purely physical mechanism. After application, it spreads over the entire surface of the plant, covers the insects' bodies with a three-dimensional polymer network, immobilizes them and results in death within minutes. It is not a plant protection product according to EU Regulation 1107/2009.

CONCLUSIONS

The results of the present investigation on the influence of conventional and organic farming systems on productivity ow watermelon showed that the tested conventional and organic fertilizers have a positive influence on the vegetative development of watermelons. The plants with the largest vegetative weight were grown with the combined fertilization with Compost + Isabion (860 g), followed by the independent application of Isabion (725.3 g). The increase over control was 80.6% and 52.4%, respectively.

When comparing the two fertilization systems, the yield is higher with the conventional system. Bioproducts have a significant positive effect on the thickness of the bark. In the biological cultivation system, yields of 5,287 kg/da (Compost+Isabion) and 4,965 kg/da (Isabion) were recorded, the excess compared to the control of 27.3% for the Compost+Isabion variant and 19.5% when fertilizing with Isabion.

The obtained results of the comparative test on the influence of biofertilizers and cultivation schemes on growth and productive manifestations are the basis for developing scientifically based recommendations for fertilization in the production of watermelons under the conditions of conventional and organic production.

The fungicide Cideli Top (conventional technology) and Taegro (organic technology), leads to a reliable decrease in DI compared to the untreated control.

The combined application of fungicides based on difenoconazole+ciflufenamide and azoxystrobin leads to a reliable decrease in DI of powdery mildew on watermelons.

Two applications of the insecticide Afitek in organic watermelon production and a double application of the insecticides Decis and Affinto, respectively, kept the cotton aphid population below the harmful thresholds.

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