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Influence of Herbagreen mineral fertilizer on seed production of cucumber, melon and zucchini

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Abstract. *The effect of Herbagreen mineral fertilizer on seed production of cucumber, melon and zucchini was evaluated. Three times treatment with the fertilizer at a dose of 0.04% at an interval of 14 days has a positive effect on seed yield in the studied cultures. Proven high effect was established in the indicator number of fruit per plant. There were no significant differences between treated and untreated (control) variants at the indicators: number of seeds per fruit, number of seeds per gram, weight of seeds per fruit (g), number of seeds per gram; absolute mass of seeds (g). Increasing the yield of the seed does not have any negative effect on the quality of the seeds. By the worked out regression equations the effect of application of Herbagreen could be foreseen.*

Keywords: Seed, yield, quality, Cucurbits, fruit, number

Introduction

Breeding of varieties, their maintenance and seed production are one of the main activities in Maritsa Vegetable Crops Research Institute (MVCRI), Plovdiv. In this relation the main purpose in our research investigations are to increase the yield and improve the quality of vegetable crops (Todorov, 2005; Masheva and Mihov, 2008). Plant breeding and seed production of ten vegetable crops from five botanical families is conducted. Species of the family *Cucurbitaceae* are represented by cucumbers, melons and zucchini.

Increasing the effect of the seed production is associated with the use of mineral fertilizers, organic products and preparations that improve the nutrition and metabolism of plants. In previous studies in the MVCRI preparations that give good effect on seed yield in different vegetable crops were tested. The yield of seed from leek is increased by 50% after treatment with the preparation Reward. Soil application of vermicompost increased seed yield in tomatoes from 24% to 45% (Dintcheva et al., 2010). Over the past few years preparation Herbagreen is applied in plant production areas. Herbagreen affects plants in different ways, such as directly involved in photosynthetic processes. Herbagreen is a leaf fertilizer which is produced by natural minerals. The product is produced by a patented technology of processing calcite called "tribomechanical activation", that produces microscopic or nanoparticles of rock ($CaCO_3$). The nanoparticles of the preparation entering the leaf through the stomata which allows to form carbon dioxide (CO_2), calcium oxide (CaO), silicium dioxide (SiO_2), magnesium oxide (MgO) and microelements, which are utilized by the cells. Carbon dioxide is included in the process of photosynthesis. By means of sunlight, water and CO_2 the first organic compounds are formed. In this way CO_2 from Herbagreen is absorbed directly in leaves instead of its obtaining from the atmosphere only (Dumancic, 2010).

The direct effect of the preparation is expressed in enhanced vegetative growth, increased yields and the tolerance of plants to biotic and abiotic stresses. In many crops a positive effect from its use is established. In grape vine Herbagreen enhances vegetative growth of shoots and roots (Kara and Sabir, 2010) and increases the yield and quality of grapes (Akin, 2011), in leaf lettuce it increases the yield (Ugrinovic et al., 2011). Schwarz and Weihrauch (2012) reported a synergistic effect in the combined use of copper preparations and Herbagreen in conducting control of downy mildew in hops.

At present there are no studies concerning the effect of Herbagreen on yield and quality of seeds in cucurbit crops. This motivated us to conduct a study with the purpose to establish the effect of the preparation Herbagreen on yield and quality of seeds of cucumbers, melons and zucchini in their seed production.

Material and methods

The trials were carried out at the MVCRI Plovdiv in 2011 and 2012. A comparative study of the preparation Herbagreen on the seed production of parental components of the following hybrid cultivars was performed:

- *Cucumbers.* Kiara F_1 – long type parthenocarpic cultivar (Dutch type), maternal line L1987/9 and line pollinator 8284/5-2-6-6;
- *Melons.* Pobeditel F_1, maternal line K/15-6 and line pollinator 5-1-2;
- *Zucchini.* Izobilna F_1, maternal line G-1 and line pollinator Yantra.

Parental lines of cultivar Kiara F_1 were grown in greenhouse with total plot area of 140 m^2 and these of Pobeditel F1 and Izobilna F_1 under field conditions with total plot area of 400 m^2 and 200 m^2, respectively.

The scheme of planting was in conformity with the requirements of crops: cucumbers – 100+60 x 45 cm=0.36 m^2 nutrition area per plant; melons – 160 x 50 cm = 0.80 m^2 nutrition area per plant; zucchini – 120 x 80 cm = 0.96 m^2 nutrition area per plant.

On the basis of agrochemical analysis the recommended quantities of mineral fertilizers were applied on the experimental plots. Herbagreen treatment was made three times at an interval of 14 days. The first treatment was applied in mass flowering stage of the cultures. The concentration of the prepared solution was 0.04%.

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The obtained suspension was stirred and then was immediately applied to the plants (Dumancic, 2010). A sprayer with a volume of 15 L was used.

The assay was carried out in two variants for each crop – treated with Herbagreen and untreated (control). The fruits were harvested randomly from treated and control variants after their maturing.

The analysis of data was performed on a sample of 30 fruits per each variant. The following indicators were recorded: number of fruit per plant, number of seeds per fruit, weight of seeds per fruit (g), number of seeds per gram, the absolute mass of seeds (g) and weight of seed per plant (g).

Data were processed by analysis of variance, Paired sample T test and regression analysis. To calculate the results a programme product SPSS 12 for Windows was applied.

Results and discussion

Cucumber

Results of the test of Herbagreen show that in production of seeds from cucumber variety Kiara F1 differences in the studied indicators occurred between the treated and control variants (Table 1). Differences are significant according to indicator fruit number per plant in the two years of study. In 2011, the number of fruit per plant in the control variant was 5.55, while in the treated – 6.68, or 120.36% compared to the control. In the second year, the results were confirmed as the number of fruit on treated plants was 117.09% compared to the control. Proven differences between the two variants were not found in the indicator number of seeds per fruit. A similar tendency was found in the indicator weight of seeds per fruit (g). Differences between the two variants were not proven, but in the first year the control exceeded the treated variant by 0.09 g.

The number of seeds per gram and the absolute mass of seeds are indicators that reflect the seed quality. The content of cucumber seeds per gram varies from 30 to 33. The absolute mass of seeds is measured by the weight of 1000 seeds, which indicates the extent to which they are plump. Usually good plumped seeds have higher absolute mass. In cucumbers it varies from 30 to 34 g (Murtazov et al., 1976).

In our research we found that the differences between the two variants were not proven as absolute mass was 30 g on average for both years. After the treatment with Herbagreen the quality of seeds of cucumber variety Kiara F_1 was not decreased, but more fruits per plant were received, thereby obtaining more seeds per plant on average. Results indicate that in a treated variant more seeds per plant are obtained – in the first year by 117.40%, and in the second – by 139.23%, which indicates that the preparation Herbagreen increases seed yield, without contributing significantly to affect by their quality.

Melon

In the production of melon seed – cv. Pobeditel F_1, it was found that the number of fruit per plant increased after treatment with Herbagreen. In the first year, the increase in the number of fruits was 117.71% as the difference was not significant, but in the second year it was 120.14% and the difference was proven (Table 2). Indicators number of seeds and weight of seeds per fruit exceeded the control variant but the differences were not proven. Regarding indicators number of seeds per gram and absolute mass of seeds that assess the quality of seeds significant differences in the parameters were not established either. They varied within the standards 20 – 35 per 1 g and 35 –45 g per 1000 seed number (absolute mass). The values

Table 1. Analysis of variance of the results in seed production of cucumber cultivar Kiara F1 treated with Herbagreen

Variants	Paired Differences	% to control	Mean	SD	Paired Differences	% to control	Mean	SD
			2011				2012	
				Fruit number per plant				
Herbagreen	***1.13	120.36	6.68	1.90	**0.9	117.09	6.17	1.62
Control			5.55	1.72			5.27	1.44
				Seed number per fruit				
Herbagreen	-1.4	98.81	115.86	46.56	21.0	119.61	128.07	48.14
Control			117.26	39.61			107.07	39.61
				Seed weight per fruit, g				
Herbagreen	-0.09	97.46	3.45	1.27	0.61	118.92	3.81	1.03
Control			3.54	1.23			3.21	1.27
				Seed weight per gram				
Herbagreen	0.25	100.75	33.65	4.80	-0.7	97.95	33.28	5.58
Control			33.40	3.29			33.98	3.92
				Absolute mass of seeds, g				
Herbagreen	0.04	100.13	30.24	3.83	0.96	10.22	30.70	4.27
Control			30.20	2.70			29.75	2.95
				Seed weight per plant, g				
Herbagreen	3.42	117.40	23.05	8.49	**6.63	139.23	23.53	6.38
Control			19.63	6.83			16.90	6.71

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Tabel 2. Analysis of variance of the results in seed production of melon cultivar Pobeditel F1 treated with Herbagreen

Variants	Paired Differences	% to control	Mean	SD	Paired Differences	% to control	Mean	SD
		2011				2012		
Fruit number per plant								
Herbagreen	0.17	117.71	1.13	0.25	*0.19	120.14	1.13	0.16
Control			0.96	0.12			0.94	0.11
Seed number per fruit								
Herbagreen	51.70	117.85	341.33	152.26	14.2	104.67	318.40	153.23
Control			289.63	127.46			304.20	81.97
Seed weight per fruit, g								
Herbagreen	1.91	113.88	15.67	7.21	0.41	102.94	14.49	7.26
Control			13.76	5.98			14.08	4.53
Seed number per gram								
Herbagreen	0.81	103.82	22.01	2.35	-0.01	99.95	22.15	2.36
Control			21.20	2.93			22.16	2.93
Absolute mass of seeds, g								
Herbagreen	-2.16	95.51	45.90	4.57	-0.20	99.55	45.60	4.56
Control			48.06	6.83			45.80	5.62
Seed weight per plant, g								
Herbagreen	*4.50	134.03	17.70	8.15	*3.14	123.73	16.38	8.20
Control			13.21	5.74			13.24	4.26
Fruit weight, kg								
Herbagreen	0.16	108.00	2.16	1.00	0.51	126.70	2.42	1.12
Control			2.00	0.43			1.91	0.46

* p ≤ 0.05;** p ≤ 0.01;*** p ≤ 0.001

Table 3. Analysis of variance of the results in seed production of zucchini cultivar Izobilna F1 treated with Herbagreen

Variants	Paired Differences	% to control	Mean	SD	Paired Differences	% to control	Mean	SD
		2011				2012		
Fruit number per plant								
Herbagreen	**0.52	135.14	2.00	0.58	*0.60	139.13	2.13	0.64
Control			1.48	0.51			1.53	0.52
Seed number per fruit								
Herbagreen	-21	89.01	170	72.28	-19.2	89.05	156.07	68.68
Control			191	76.88			175.27	94.79
Seed weight per fruit, g								
Herbagreen	-1.18	95.95	27.69	11.36	-3.45	87.35	23.85	9.03
Control			28.86	10.81			27.31	12.37
Seed weight per gram								
Herbagreen	0.25	96.20	6.33	1.84	0.63	110.17	6.78	2.34
Control			6.58	1.39			6.16	1.23
Absolute mass of seeds, g								
Herbagreen	10.60	106.70	168.74	40.97	-6.57	96.10	161.94	47.54
Control			158.14	31.83			168.51	33.50
Seed weight per plant, g								
Herbagreen	*12.66	129.62	55.37	22.73	9.03	121.61	50.81	19.23
Control			42.72	16.00			41.78	18.92

* p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001

of the index seeds weight per plant exceeded the control variant by 134.03% and 123.73% for the two years of study as they are proven.

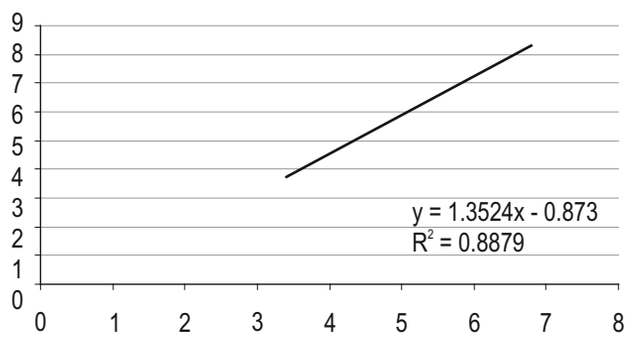
We determined the effect of Herbagreen on the fruit weight (kg) in cv. Pobeditel F_1. Botanical maturity of melons is identical to the economic maturity in which the influence of the preparation on the weight of the fruits can be established. In our research we found that the differences between the two variants are not significant. Therefore Herbagreen increases the number of fruits per plant without reflection on the fruit weight.

Zucchini

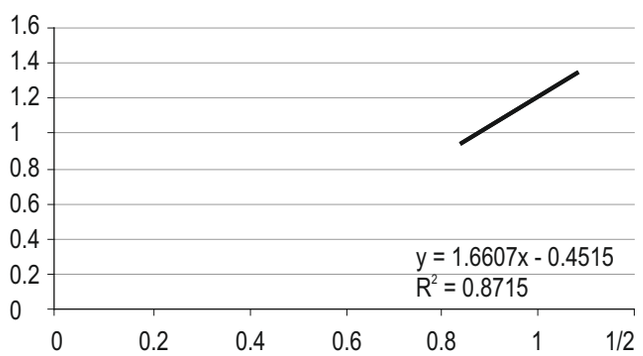
The tendencies established in the cucumber and melon were confirmed in zucchini parental lines of cv. Izobilna F_1 as well. Herbagreen affected positively the fruit number per plant as the treated variant exceeded the control by 0.52 fruit (135.14%) and 0.60 fruit (139.13%) for the two years of study, respectively (Table 3). There were no significant differences between the two variants according to seed number per fruit and weight of seeds per fruit. Also there were not significant differences between the two variants according to number of seeds per gram and absolute mass of seeds. The weight of the seeds per plant of the treated variant exceeded the control by 129.62% and 121.61% during the two years of study. This is due to the formation of more fruits per plant.

The obtained results showed that Herbagreen has a positive effect on the yield of cucumber, melon and zucchini seeds. This percentage varies from 17% to 39% on average for the three crops. A similar effect is obtained in application of the organic product vermicompost in seed production of tomatoes (Dintcheva et al., 2010).

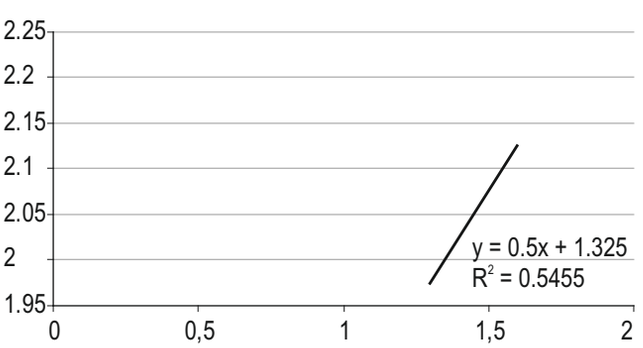
Regression equations based on the number of fruit per plant were worked out (Figure 1). The regression equation for cv. Kiara F_1 is reliably at significance level P = 0.05, and the coefficient of determination is high (R^2 = 0.8879). Linear regressions for cv.



Cucumber - fruit number per plant



Melon - fruit number per plant



Zucchini - fruit number per plant

Figure 1. Regression equations expressing the influence of the preparation Herbagreen on the number of fruits per plant.

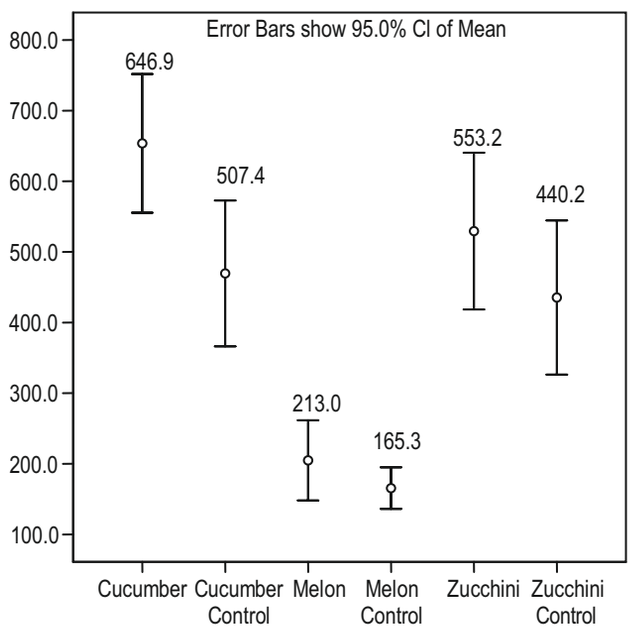


Figure 2. Yield of seeds kg/ha average for the period and confident intervals

Pobeditel F_1 and cv. Izobilna F_1 are also high: R^2 = 0.8715 and R^2 = 0.5455. Through these equations the effect after treatment with Herbagreen can be provided.

It was found that seed yield per hectare was higher after treatment with Herbagreen in all tested variants (Figure 2). Seed yield of cucumber was 646.9 kg/ha for the treated variant and 507.4 kg/ha for the control. The yield increase was by 27% more compared to the control. The quantities of seeds are on the upper limit of the possibilities for the crop. The yield of the melon seed was 165.3 kg/ha for the control and 213.0 kg/ha for the treated variant, i.e. 29% higher. These yields are above the average for Bulgaria. The yield of zucchini seeds was 440.2 kg/ha for the control variant and 553.2 kg/ha for the treated one which was 26% higher.

Conclusion

Herbagreen has a proven positive effect on the seed yield of cucumber, melon and zucchini. The yield increase is mainly due to the increased number of fruits per plant. Increasing the number of fruit per plant does not reduce the quality of the seeds. Regression

equations that have been worked out could foresee the effect of application of Herbagreen. Herbagreen can be successfully used in seed production of cucumber, melon and zucchini.

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References

Akin A, 2011. Effects of Cluster Tip Reduction and Some Growth Regulating Applications on Grape Yield and Quality of the Müşküle Grape Variety. Yuzuncu Yil University Journal of Agricultural Sciences, 2011, 21, 2, 134-139.

Dintcheva Ts, Boteva H and Dimov I, 2010, Effect of vermicompost from cow manure on seed production of Tomato (Lycopersicon esculentum) Proceedings of 45 Croatian and 5 International Symposium on Agriculture, 1, 60-64.

Dumancic D, 2010. Herbagreen (Practical information) http://5k.web.tr/dokuman/Prof_Dr_Dumancic_Herbagreen_Article.doc

Kara Z and Sabir A, 2010. Effects of Herbagreen application on vegetative developments of some grapevine rootstocks during nursery propagation in glasshouse. In: 2nd International Symposium on Sustainable Development, June 8-9 2010, Sarajevo.

Masheva S and Mihov M, 2008. Trends of the research work in vegetable crops and potatoes in Bulgaria. ISHS Acta Horticulture, IVth Balkan symposium on vegetables and potatoes, 9-12 September 2008, Plovdiv, Bulgaria, 1, pp. 45-52.

Murtazov T, Minkov I, Petrov H, Georgieva M and Kanev D, 1976. Manual for a vegetable breeding and seed production. Publishing Hr. G. Danov, Plovdiv, 214.

Schwarz J and Weihrauch F, 2012. Versuche zur Reduzierung kupferhaltiger Pflanzenschutzmittel im ökologischen Hopfenbau. In: Wiesinger K & Cais K (Hrsg.): Angewandte Forschung und Beratung für den ökologischen Landbau in Bayern. Ökolandbautag 2012, Tagungsband. – Schriftenreihe der LfL 4/2012, 107-113.

Todorov Y, 2005. History, Achievements and Trends in Breeding of Vegetable Crops and Potatoes. Bulgarian Journal of Agricultural Science, 11, 445-458.

Ugrinovic M, Oljaca S, Bradar M, Zdravkovic J, Girek Z and Zdravkovic M, 2011. The effect of liquid and soluble fertilizers on lettuce yield. Contemporary agriculture: 63(497.1)(051)-"540.2" ISSN 0350-1205 60 (1-2) 110 -115, 2011.

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Todorov N and Mitev J, 1995. Effect of level of feeding during dry period, and body condition score on reproductive performance in dairy cows,IXth International Conference on Production Diseases in Farm Animals, Sept.11 – 14, Berlin, Germany, p. 302 (Abstr.).

Thesis:

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