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Agriculture and Environment

Productivity and quality of open field tomato after application of bio-fertilizers

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Abstract. Field experiments for the effect of bio-fertilizers: Labin, Bio One, Tecamin, Agriful, Humustim and Biohumus on productivity and fruit quality of determinant tomato, variety Trapezitsa were performed on strongly leached meadow cinnamonic soil at the experimental field of the Vegetable Crops Research Institute Maritsa during the period 2008–2010. The fruit number per tomato plant increased up to 38.2% towards the control (without fertilization) by using bio-fertilizers Tecamin and Agriful. Similar were the results for the mass of fruits per plant, where the increase was up to 33.3% towards the control. After mineral fertilization the total tomato yield is the highest on average for the period of study. An increase of the yield in tomato with reduced mineral fertilization is established after application of bio-fertilizers 12.1% on average from 7.8% /after fertilization with Labin/ to 18.3% /after fertilization with Tecamin/ towards the control. A positive effect by fertilization with Tecamin (38.8%) and Agriful (36.3%) is established on early production. In mineral fertilization this index is lower (23.7%). Bio-fertilizers Tecamin and Agriful have a positive effect on the content of vitamin C and dry matter.

Keywords: *Solanum lycopersicum* L., bio-fertilizers, productivity, fruit quality

Introduction

Rapid development of biological agriculture in the last years requires the elaboration of ecological methods corresponding to the requirements of EC for obtaining biological produce (Kostadinova et al., 2003; Karova, 2010; Yankova and Todorova, 2011). The effectiveness of vegetable production is directly related to the researches in the field of fertilization because it is a serious intervention for the soil and its misuse can not only cause serious damage to the soil fertility but also cause environmental problems and worsen the quality of the produce. Intensive work is performed to increase the efficiency of mineral fertilization of the plants as well as new forms of fertilizers and methods of their application are searched (Tringovska, 2005).

The requirements for environmental protection and consumption of safety foods are the main factors for expanding the biological production. On a world scale this problem is with an increasing influence and one of the priorities in the research work is the improvement of the fertilization models (Aliyu and Kuchinda, 2002). An alternative to the application of chemicals in agriculture is the introduction and use of fertilizers. It was established that with application of bio-products the growth of tomato (Mitova and Dinev, 2011; Tringovska and Kanazirska, 2007), pepper (Todorova et al., 2013; Vlahova, 2013), potato (Cholakov and Boteva, 2010), cabbages and cucumbers (Dimov et al., 2007) is faster. The application of Emosan and Lubrikal stimulate the foliage formation. They have a positive effect on the functional activity of the photosynthetic apparatus, increase the dry matter accumulation and stimulate root system development (Karanatsidis and Berova, 2009).

The purpose of the investigation was to establish the effect of bio-fertilizers on the productivity and fruit quality of tomatoes to

optimize plant nutrition in biological tomato production.

Material and methods

The experimental work was carried out on strongly leached meadow-cinnamon soil of the experimental field at the Vegetable Crops Research Institute Maritsa, Plovdiv with determinant tomato, variety Trapezitsa.

Variants:

- Control – non fertilization;
- Mineral fertilization – $N_{200}P_{140}K_{160}$;
- Labin – 0.3% - foliage feeding – three times during vegetation;
- Bio One – 1650 mL/ha - soil fertilization double during vegetation: when planting and at hoeing;
- Tecamin max – 2 L/ha soil fertilization – when planting;
- Agriful – 40 L/ha - double - when planting and at hoeing;
- Humustim – 400 mL/ha - soil fertilization - when planting and foliage feeding double: blooms – 0.05% and fruiting – 0.05%;
- Biohumus – 200 mL/plant when planting.

The soil has slight mechanical composition, sand-silt with mineral nitrogen content ($N-NH_4^+ + N-NO_3^-$) – 2.4 mg 100 g⁻¹ soil (determined by distillation); movable P_2O_5 forms (by Egner-Reem method) and K_2O (flame photometric) – 20.5 mg and 18.7 mg/100 g soil, respectively; soil reaction $pH_{(H_2O)} = 7.0$ (potential-metric); soluble salt total concentration – by electro-conductibility (EC mS/cm) and humus content – 2.1% by Tyurin.

The necessary amounts of mineral fertilizers are determined on the basis of the agro-chemical analysis of the soil. In the basic

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fertilization were applied $P_{140}K_{160}$ as triple superphosphate and potassium sulphate. The nutrition was twofold with ammonium nitrate: for variant 2 – mineral fertilization: N_{20} . The nutrition was the same for the variants with bio-products being a necessary methodical condition to highlight their impact – 50% less nitrogen fertilizer rate.

Description of the bioproducts

Labin Amimoatsidos 24%. Leaf fertilizer based on amino acids, obtained by controlled hydrolysis of natural proteins. The fertilizer is rich in free amino acids and peptides of low molecular weight. Improves growth, flowering and fruit formation. It contains 12% of free radicals, 24% common amino acid being peptides, 8.2% total nitrogen, 4.6% organic nitrogen protein, 2.0% alpha-amino nitrogen, 3.6% ammonia nitrogen, 60.0% of organic substance. It does not contain chlorine and heavy metals.

BioOne. Microbiological fertilizer, natural, ecologically clean liquid product 100/330g per hectare provide 15 – 20 kg of active nitrogen, helps the absorption of residual phosphorus and potassium, retains moisture in the soil, does not contain genetically modified organisms recognized by all organizations controlling organic farming including the Institute OMRI, officially registered with the Ministry of Agriculture and Forestry.

Tecamin max. Organic liquid fertilizer plant provenance, extracts of seaweed. In combination with plant protection products increases sustainability of production during transport. Manufacturer: AgriTeco Fertilizantes- Spain.

Agriful. Organic liquid fertilizer plant provenance. Used vegetable extracts from barley, wheat, corn and molasses from the cane. It contains fulvic acids, polysaccharides and complex vitamins. Manufacturer: Agritecno Fertilizantes, Spain.

Humustim. Organic fertilizer with pH = 8 – 9 and the following composition: dry matter - including ash and minerals 12.50% organic substances, including humic acids, fulvic acids – 58.95% and 5.0%; total potassium 7.83%; total nitrogen 3.0%; total phosphorus 1.14%; total calcium 3.92%; total magnesium 1.11%; trace elements zinc, copper, molybdenum, cobalt, boron, sulfur and the like.

Biohumus. Bioproduct obtained as a result of nutrition of red Californian worm (*Lubricus rubellus* and *Eisenia foetida*) with organic residues. Contains nutrients, vitamins, amino acids, antibiotics, hormones (N 1.2 – 2.0%, P 0.8 – 1.6%, K 0.5 – 1.0%, Ca 4.0 – 6.0%, Mg 0.5 – 1.0%, Fe 0.5 – 1.0%, organic content 40 – 50%

humic acid up to 14%, fulvic acids - up to 7%. It is rich in beneficial microorganisms. Manufacturer: farm producing organic liquid fertilizer village of Kostievo municipality, Maritza - Plovdiv).

The plants were grown from seedlings in an unheated greenhouse. The experiment was set by block method in 4 replications by 120+40/35 cm scheme with area of 9.6 m². The plants were grown by technology for mid-early production.

Indicators of study

- **Agrochemical analysis of the soil** – before setting the experiment in order to determine the kind and quality of fertilizers for basic fertilization and monthly – for feeding. The analyses were carried out using the following methods: mineral N / NH_4^+ + NO_3^- – by distillation; movable P_2O_5 – colorimetrically; movable K_2O – by flame photometry; pH_{H_2O} – potentiometrically, humus (in Tyurin), total concentration of soluble salts - by electrical conductivity (EC mS / cm) (Gorbanov et al., 1990).

- **Economic earliness** – the yield obtained until August 5 (methodology of IASAS). Selected only ripe fruits.

- **Productivity of plants** – analyze 10 plants of recurrence and 10 fruits of replications in mass fruitage; number of standard fruits per plant, weight of tomatoes fruit (g/plant), total yield (kg/ha).

- **Fruit quality** – from an average sample containing 20 fruits for each variant were analyzed: dry matter content (refractometrical), ascorbic acid (by Tilmans reaction) and total sugars (by Shoolin-Regenbogen).

- **Analysis of variance** were made for obtaining results (Duncan, 1955).

Results and discussion

It has been found that the application of bio-fertilizers increases, average for the period, the number of fruit with 7,7 pieces per plant (38.2% more towards the control) (Figure 1). The largest number of fruits per plant was recorded after mineral fertilization, - 31.2 pieces per plant, respectively, that exceeds the untreated control with 34%. The greatest increase in the number of fruits towards the control was established in application of Tecamin (with 24.7%) and Agriful (23.0%) among the applied bio- fertilizers. Differences between the two variants are not mathematically significant. The influence of the

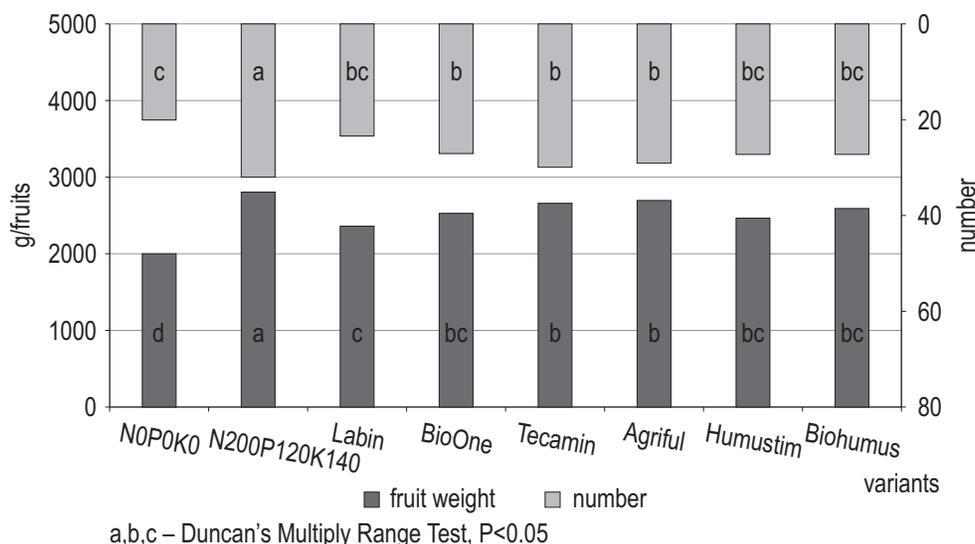


Figure 1. Effect of fertilization on the number and weight of fruits

Table 1. Influence of the applied fertilization on yield /average for the period/

No	Variants	$\bar{x} \pm sd$		%/K
1	N ₀ P ₀ K ₀	29800 ± 373.6	d	100
2	N ₂₀₀ P ₁₄₀ K ₁₆₀	37480 ± 441.4	a	125.8
3	Labin	32133 ± 416.3	cd	107.8
4	BioOne	32203 ± 378.2	d	108.1
5	Tecamin	35263 ± 243.9	b	118.3
6	Agriful	34643 ± 786.5	b	116.3
7	Humustim	33033 ± 814.5	cd	110.9
8	Biohumus	33673 ± 736.5	cd	113.0
Average effect				112.1

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

other bio-fertilizes on this indices was less slightly expressed. The results correlate with those observed in tomatoes by Boteva and Cholakov (2010).

Similar results were obtained for the fruit weight per plant. The plants with the greatest fruit weight were those fertilized with Tecamin, followed by plants, fertilized with Agriful, and the increase compared to the control is 33.3% and 31.7%, respectively.

The highest total yield, average for the period of the study, was recorded in tomato with mineral fertilization – 37480 kg/ha, as the

Table 2. Economic earliness, kg/ha

No	Variants	$\bar{x} \pm sd$		Index earliness %
1	N ₀ P ₀ K ₀	13115 ± 135	e	100
2	N ₂₀₀ P ₁₄₀ K ₁₆₀	16386 ± 614	b	123.7
3	Labin	14353 ± 353	d	115.9
4	BioOne	15456 ± 456	c	124.9
5	Tecamin	18715 ± 417	a	138.8
6	Agriful	17876 ± 302	a	136.3
7	Humustim	16228 ± 299	c	117.8
8	Biohumus	17500 ± 610	ab	133.4

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

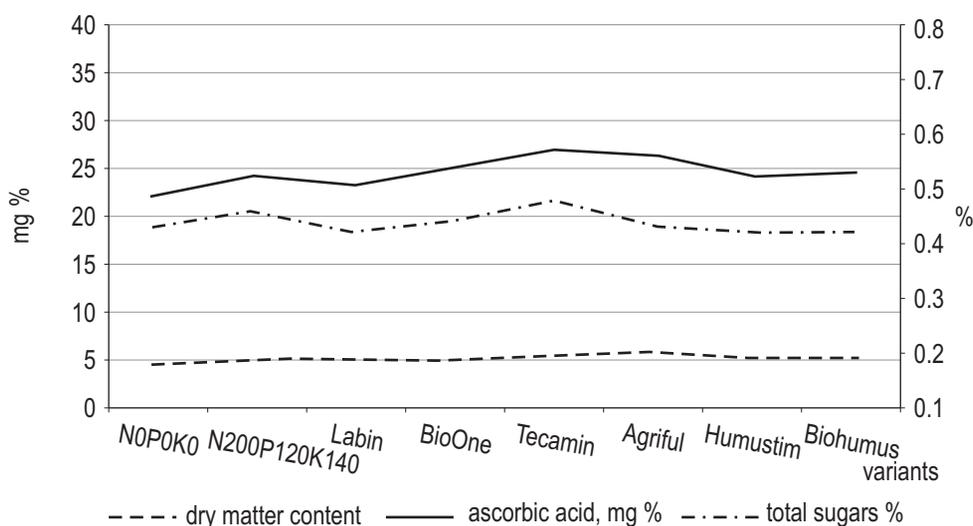


Figure 3. Chemical analysis of the tomato fruits /average for the period/

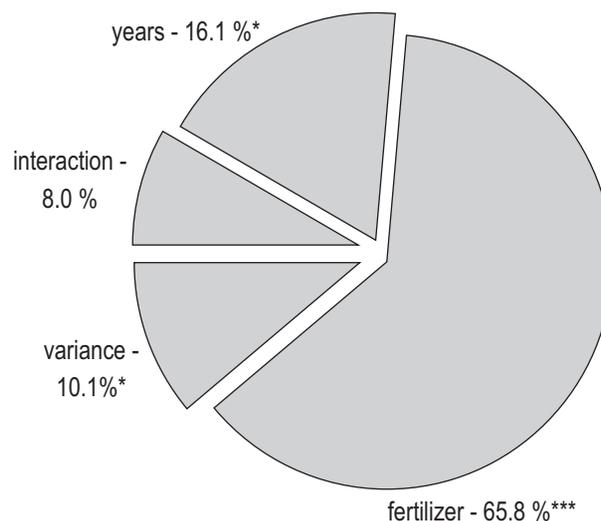


Figure 2. Influence of factors - fertilization and year on the total yield

increase compared to the untreated plants is 25.8% (Table 1).

The average effect of the applied fertilizers is 12.1 per cent more compared to the control (7.1% up to 23.5%). The greatest increase of this character, that is statistically significant, was obtained after fertilization Tecamin – 3 5263 kg/ha, as the increase towards the control is by 18.3%. The plants, fertilized with Agriful – 3 4643 kg/ha or 16.3% more than the control are in the second place. The difference between the yields of the two variants is not mathematically significant. These results are confirmed by studies in pepper (Dintcheva et al., 2010), potatoes (Cholakov et al., 2012) and tomatoes (Boteva and Cholakov, 2010).

Two-way dispersionin analysis indicates that the applied fertilization has proven greater influence on the yield - 65.8 compared to the total year of tomato - 16.1% of the total variance (Figure 2).

A positive effect of the applied bio-products was established on the earliness. The highest index of earliness was recorded in the variants fertilized with Tecamin and Agriful 38.8% and 36.3%, respectively. Differences between the two variants are not statistically significant. The results demonstrate that in mineral fertilization this index is less than 23.7%.

Bio-fertilizers have a positive effect on the vitamin C and dry matter content to mineral fertilization (Figure 3). Fertilization with Tecamin and Agriful results in the increase of this character, as the difference in values is small and insignificant. The deviations in the content of sugars in the fruit between the variants are small and a trend is not established. Unsubstantiated statistical differences about the impact of bio-fertilizers with tomatoes, cucumbers and peppers have been identified by other researchers (Tringovska, 2005; Arnaudov and Boteva, 2014; Vlahova, 2013).

Conclusion

The application of the bio-products increases the number of fruit 7.7 pieces on average per plant (38.2%) compared to the control. The greatest increase was established in fertilization with Tecamin (24.7%) and Agriful (23.0%). Similar results were obtained for the fruits weight per plant, where the increase was 33.3% compared to the control.

A positive effect of fertilization with Tecamin (38.8%) and Agriful (36.3%) was established on the earliness. In mineral fertilization this character is lower 23.7%. The average effect of the applied bio-products on the yield of tomato is 12.1% more compared to the control (7.1% up to 23.5%). The greatest increase in the yield that was statistically significant, has been obtained after fertilization with Tecamin – 3 5263 kg/ha, and the increase towards the control is 183%. Fertilization with Tecamin and Agriful has a positive effect on the vitamin C and dry matter content to mineral fertilization.

References

- Aliyu L and Kuchinda N**, 2002. Analysis of the chemical composition of some organic manures and their effect on the yield and composition of pepper. *Crop Research*, (Hisar) 23, 362-368.
- Arnaudov B and Boteva Hr**, 2014. Study of the influence of some bioproducts over the glasshouse cucumber's growth expressions and productivity. «Scientific Information Centre». The modern science and scholar. The collection of scientific articles on materials of International scientific practical conference (May 15, 2014, Almaty City), 113-117.
- Boteva Hr and Cholakov T**, 2010. Study the impact of organic fertilizers when growing tomatoes in field conditions. *Journal of International Scientific Publications, Ecology & Safety*, 4, 153-161.
- Cholakov T and Boteva Hr**, 2010. Influence of fertilization by vermicompost on the yield from early potatoes. *Journal of International Scientific Publications Ecology & Safety*, 5, 198-20 (Bg).
- Dimov I, Antonova G and Arnaudov B**, 2007. Results of the application of Humustim some tomatoes, cucumbers and cabbage. Humustim - a gift of nature, the fertilizer of the future. Ed. "Dimi 99" LTD. Sofia, 204 (Bg).
- Duncan D**, 1955. Multiple range and multiple F-test. *Biometrics*, 11, 1-42.
- Dintcheva Ts, Boteva H and Dimov I**, 2010. Effect of vermicompost from cow manure on seed production of Tomato (*Lycopersicon esculentum*). *Proceeding of 45 Croatian and 5 International Symposium on Agriculture*, 1, 60-64.
- GORBANOV C, VELCHEV B, MATEV J, TANEV H, RACHOVSKI D and TOMOV T**, 1990. Guide exercises in agricultural chemistry. Zemizdat, Sofia; 158 (Bg).
- Karanatsidis G and Berova M**, 2009. Effect of organic-N fertilizer on growth and some physiological parameters in pepper plants (*Capsicum annum* L.). XI Anniversary Scientific Conference Biotechnol. & Biotechnol. Eq. 23/2009/SE, 254-257.
- Karova A**, 2010. Control and certification of organic agriculture in Bulgaria. *Proceedings of the VIII th National Scientific and Technical Conference Ecology and health*, Plovdiv, Bulgaria, 19 May, 73-76 (Bg).
- Kostadinova P, Lecheva I, Bencheva N, Angelova R and Popov V**, 2003. Agroecology and management of agroecosystems, Publish SciSet-Eco, Sofia (Bg).
- Kostadinov K, Filipov S and Boteva Hr**, 2013. Effect of the substrate on the productivity of greenhouse tomato. Scientific-practical conference "Scientific support for Potato, Vegetable and Melon: Achievements and Prospects", Kazakh Research Institute of Potato and Vegetable, 294-296.
- Mitova Iv and Dinev N**, 2011. A comparative study of organic and mineral fertilization on growth and reproductive manifestations of tomatoes. *Soil Science, Agricultural chemistry and ecology yearsq XLV*, 1-4, 158-163 (Bg).
- Cholakov T, Boteva Hr and Dimova D**, 2012. Yields of early potatoes in conventional and organic production. *Plant Science, years. L.*, 43-46.
- Tringovska I**, 2005. Influence of some organic products on the nutrition environment and biological manifestations of greenhouse tomatoes. Thesis for PhD, Institute of Vegetable Crops Maritsa, Plovdiv (Bg).
- Tringovska I and Kanazirska V**, 2007. Effect of some organic fertilizers on plant growth and fruit yield of greenhouse tomatoes. *Proceedings of the International Conference Research people and actual tasks on multidisciplinary sciences*, 1, 32-36 (Bg).
- Todorova V, Yankova V and Masheva St.**, 2013. Manifestations of Bulgarian pepper varieties grown in conditions of organic production. *Plant science*, 50, 34-37 (Bg).
- Vlahova V**, 2013. The impact of biofertilization on the quality parameters of the pepper fruit (*Capsicum annum* L.) in organic agriculture condition. *Scientific paper Series B, Horticulture*, LVII, Bucharest, 289-294
- Yankova V and Todorova V**, 2011. Possibilities for Biological Control of Some Pests in Field Pepper Production. *Journal of Agricultural Science and Forest Science*, X, 52-57.

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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, September 11-14, Berlin, Germany.

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Animal welfare

Studies performed on experimental animals should be carried out according to internationally recognized guidelines for animal welfare. That should be clearly described in the respective section "Material and methods".

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