A COMPARATIVE STUDY ON THE DEVELOPMENT OF THE TOMATO PLANTS TREATED WITH TWO PHENOXY ACETIC GROWTH STIMULATORS, IN FIELD CULTURE

STUDIU COMPARATIV ASUPRA DEZVOLTARII PLANTELOR DE TOMATE TRATATE CU DOI BIOSTIMULATORI FENOXIACETICI, CULTIVATE IN CAMP

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Abstract: *In this paper we evaluated the data obtained from two consecutive years, regarding the development of the plants (height, number of flowers and of fruits per plant); we considered the average values for the five variants, recording the plants's evolution after each of the three treatments applied.*

The growth stimulators we used were: - substance I -2-chloro, 4-sulphonamido phenoxyacetic acid and - substance II - 4-chloro, 2-sulphonamido phenoxyacetic acid (the active ingredient of ASFAC-4), both synthetic auxins.

To determine the influence of the growth stimulators from the phenoxyalkyl carboxilic acids′s class: 2-chloro, 4-sulphonamido phenoxyacetic acid and 4-chloro, 2-sulphonamido phenoxyacetic acid on tomato plants there will be observed the development of the plants for the same type of tomato plants, cultivated in field, for two consecutive years.

In the present paper, we will have in view the measurements of height, number of flowers and of fruits per plant, as average value from two consecutive years for four variants of leaf applicated treatment (two dillutions for each substance) compared to the blank′s value.

MATERIAL AND METHOD

The experiments were conducted starting from *Buzău 1600* tomato seedlings, treated with the two substances through leaf applications.

The first treatment was applied after 15 days from the transplantation of the seedling from the vegetation pot into the field; the second treatment was applied before flowering (middle of June) and the third one, before fruitening (late July).

We used two dillutions for each active substance, as it follows:

- variant V_1 - distillated water, used as blank;
- variant V_2 - 2-chloro, 4-sulphonamido phenoxyacetic acid, 25 ppm;
- variant V_3 - 2-chloro, 4-sulphonamido phenoxyacetic acid, 20 ppm;
- variant V_4 - 4-chloro, 2-sulphonamido phenoxyacetic acid, 25 ppm;
- variant V_5 - 4-chloro, 2-sulphonamido phenoxyacetic acid, 20 ppm;

The dillutions were made in distillated water and the substances were applied as natrium salts, which increased their solubility.

The variants were positioned in a randomly type experiment, as required, in order to be possible to obtain statistically corect average results.

Measurements were made before the application of the next treatment and the results concerning production were also recorded, but they are the subject of another study.

RESULTS AND DISCUSSIONS

The obtained average data after the first treatment related to the height of the plants and the number of flowers were:

Table 1.

The average values for the plants's height and for the number of flowers for flower-levels I and II after the first treatment

Variant	Height (cm)			Number of flowers per plant					
	y 1	y 2	A.v.	year 1		year 2		Average value	
				level I	level II	level I	level II	level I	level II
V_1	54	45	49,5	32	37	20	27	26	32
V_2	53	48	50,5	33	42	25	30	29	36
V_3	51	47	49,0	32	40	28	32	30	36
V_4	50	50	50,0	31	33	31	35	31	34
V_5	55	53	54,0	36	43	34	36	35	39,5

From the average values we observed that variant V_3 is the only variant with a lower value than the blank's average one. All the other variants overrate with 0,5 (V_4) to 4,5 (V_5) cm the average height of the blank (fig. 1).

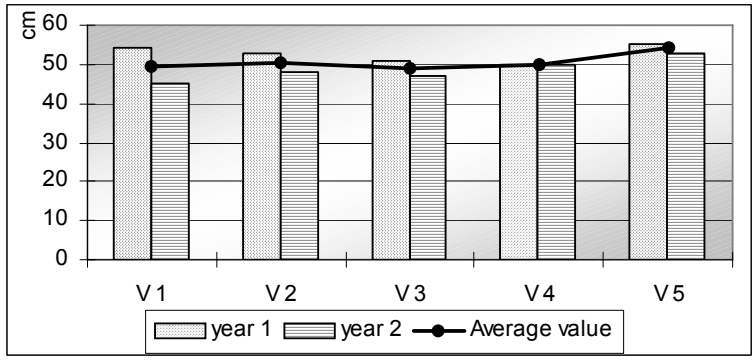

Figure 1. Average plants's height values after the first treatment

The number of flowers on a plant was higher for the second flower-level and all the treated variants registered an increase with 3-9 flowers per level, the highest value compared to the blank being observed for V_5 variant. (fig. 2).

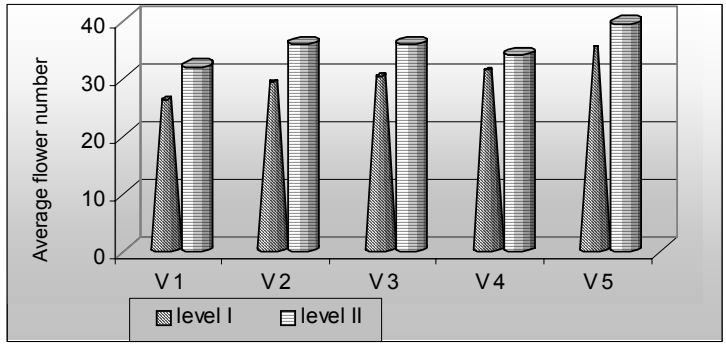

Figure 2. The average number of flowers per plant after the first treatment

The same parameters were observed after the second treatment:

Table 2.

The average values for the plants's height and for the number of flowers/number of fruits for flower-levels I and II after the second treatment

Variant	Height (cm)			Number of flowers/number of fruits per plant					
	y 1	y 2	A.v.	year 1		year 2		Average value	
				level I	level II	level I	level II	level I	level II
V_1	75	66	70,5	7,1/2,6	7,7/1,3	4/1,5	5,7/3	5,6/2	6,7/2,2
V_2	77	68	72,5	6,3/2,7	6,3/1,5	6/2,7	7/3	6,2/2,1	6,7/2,3
V_3	76	75	75,5	5,0/2,7	6,1/0,5	5/2,7	8,7/5,3	5/2,7	7,4/2,9
V_4	77	75	76,0	6,2/3,5	6,3/1,5	7/4,3	9,3/5	6,6/3,9	7,8/3,3
V_5	82	79	80,5	5,2/2,8	6,1/1,0	7/3,3	8,7/5,7	6,1/3,1	7,4/3,4

The average height′s value of the plants overrated with 2 to 10 cm the blank′s value, for both used growth stimulators. Again, the substance 2 had a better influence (fig. 3).

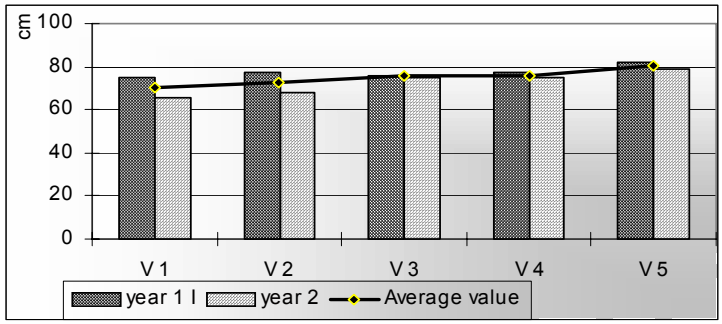

Figure 3. Average plants′s height values after the second treatment

The average number of flowers was maintaining it′s higher value on the second level, too, even if the differences between the variants were smaller. the variant with the biggest number of flowers at both flower-levels is V_4 - substance 2, dillution 25 ppm (fig. 4).

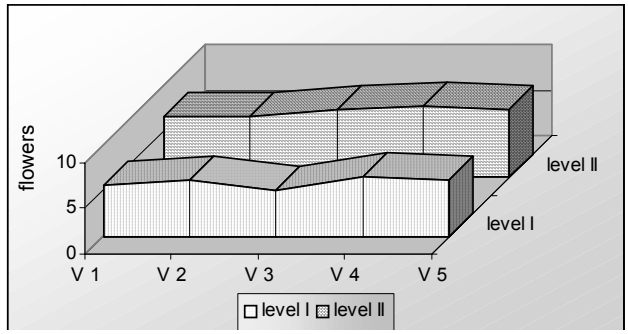

Figure 4. The average number of flowers per plant after the second treatment

The appearance of the fruits, in average number of 1,5 - 5,7 per plant, was observed at both flower-levels (fig. 5) and variant V_4 had maximum values here, too (3,9 fruits/level I and 3,3 fruits/level II).

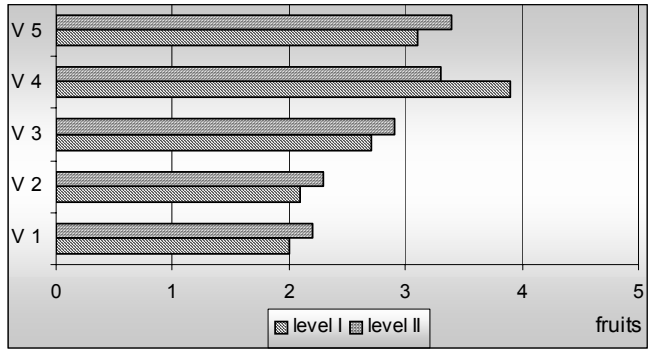

Figure 5. The average number of fruits per plant after the second treatment

In the second half of July the third treatment was applied and there were observed the plant′s height, the number of the flowers and of the fruits per plant.

Table 3.

The average values for the plants′s height and for the number of flowers/number of fruits for both flower-levels after the third treatment

Variant	Height (cm)			Number of flowers/fruits per plant		
	y 1	y 2	A.v.	year 1	year 2	Average value
V_1	112	75	93,5	1,4/2	2,5/2	2/2
V_2	120	78	99	1,6/2	2,1/2,4	1,9/2,2
V_3	123	83	103	1,8/1,8	2,4/3	2,1/2,4
V_4	123	87	105	2,1/2	2,9/2,3	2,5/2,2
V_5	123	91	107	2,1/2	3,3/2,6	2,7/2,3

The differences between the average values of plants′s height of the treated variants and the blank′s one raised up with 5,5 - 13,5 cm. The best developed plants were registered at variants V_5, V_4 and V_3 (fig. 6).

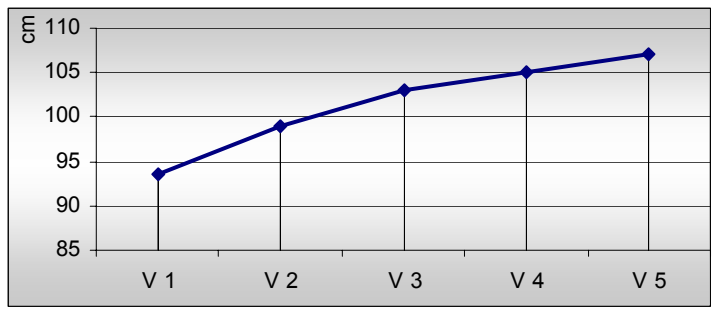

Figure 6. Average values for the plants's height after the third treatment

The ratio between the number of flowers and the one of the fruits per plant was still low, even if the variants V_4 and V_5 had more flowers than fruits per plant, compared to the blank and to the variants treated with the substance 1, at which the ratio was reversed (fig. 7 and fig. 8).

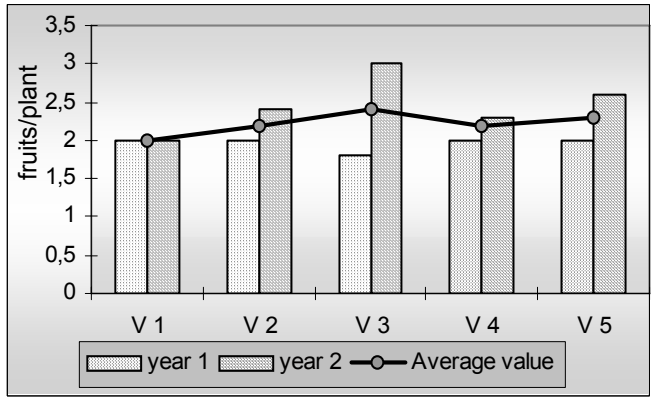

Figure 7. The average number of flowers per plant after the third treatment

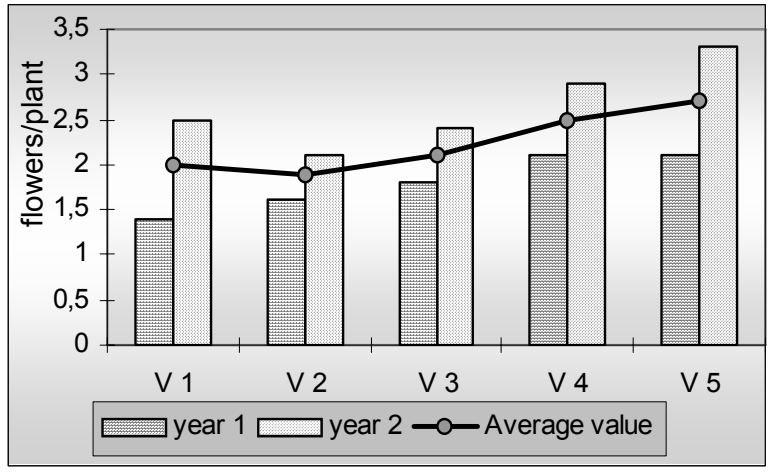

Figure 8. The average number of fruits per plant after the third treatment

CONCLUSIONS

In what concerns the experiment conducted on tomato plants in field culture, we observed the following:

1. Both growth stimulators had a positive influence on the general development of the plants, prooving the features of the regulator′s group they are part of.

2. The two established dillutions in the treatments gave positive results after each application, in the elected key moments of the developmnet of the plants (15 days after transplantation, before flowering and before fruitening), so the cumulated effect to be optimal.

3. The best results, on all observed parameters (in average values) were registered for substance 2, in dillution of 20 ppm.

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