

## THE STUDY OF THE INFLUENCE OF SOME ORGANIC PRODUCTS ON THE GERMINATION OF CUCUMBER SEEDS

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**Key words:** organic agriculture, germination, cucumber, seeds

### INTRODUCTION

Romania is the 6th largest producer of cucumbers in the European Union, although from the point of view of the cultivated areas it occupies the 4th place among the states of the community block. While, in 2015, 2,374 million tonnes of cucumbers were harvested in the EU, Romania recorded a production of 127.700 tonnes, representing about 5,4% of the total Union. In Romania, two years ago, the area cultivated with cucumbers was 5.620 hectares (Dumitrescu et al., 1977; Ciofu et al., 2003).

For optimal germination of cucumber seeds, the following conditions must be met:

- until dawn, the optimum temperature should be between 22-26°C, 100% humidified and complete lack of light;

- place the peat in the trays, draw the rows with a slight push of the substrate and place the seeds one by one;

- it is covered with a fine layer of dry peat of maximum 0,5 cm and it is not watered afterwards until dawn (Apahidean A.S. and Apahidean M., 2001; Călin M., 2010; Ciofu et al., 2003; Dumitrescu et al., 1977; Munteanu N., 2000; Stan et al., 2003).

The goal of our experiment was to evaluate the influence of some specific fertilizers used in organic agriculture. Because the chemical treatments with syntetich chemical substances are not recommended in organic agriculture, we experimented the following products: Funres, Blocks, *Azospirillum lipoferum*, *Azotobacter chroococcum*, *Bacillus megaterium*, Rom-Agrobiofertil NP.

The organic products used in the experiment have several advantages, among which are the following:

- they can be integrated very easily into the treatment schemes;

- they also act as biostimulators;

- they have no aggressive effect on agricultural crops;

- they give power to plants and increase the activity of photosynthesis (Munteanu, 2000; Munteanu and Fălticeanu, 2008; Püntener, 1981; Sima, 2009; Stan et al., 2003; Stan and Munteanu, 2001; Stoian).

### MATERIAL AND METHODS

Research on the efficacy of biological products and herbal extracts was performed under laboratory conditions (Table 1).

For the experiment the following materials were used:

- transparent plastic trays;

- peat, germinator, water;

- cucumber seeds from the "Mapamond" variety;

- fertilizers allowed in organic agriculture.

The experiment contain seven variants and each variant in three repetitions. The number of seeds used in the each variant was 150; 50 for each repetition. The seeds were placed in trays, and then covered with a layer of peat about 3-4 cm. The quantities of substances were prepared for each variant and repetition, then were used as a treatment over previously prepared trays. The variants were introduced in the germinator under optimal conditions at 26°C.

Table 1. The list of organic fertilizers use in experiment

Variant	The product	Active substance	Concentration (%)
V1	Funres	Extracts of <i>Mimosa tenuiflora</i> and citrus	0,25
V2	Blocks	Seaweed extract	0,25
V3	<i>Azospirillum lipoferum</i>	<i>Azospirillum lipoferum</i>	1
V4	<i>Azotobacter chroococcum</i>	<i>Azotobacter chroococcum</i>	1
V5	<i>Bacillus megaterium</i>	<i>Bacillus megaterium</i>	1
V6	Rom-Agrobiofertil NP	Mix bacteria of <i>Azospirillum lipoferum</i> , <i>Azotobacter chroococcum</i> and <i>Bacillus megaterium</i>	3
V7	Untrated	x	x

## RESULTS AND DISCUSSIONS

The ecological biostimulation products used in this experiment have a strong influence on vegetables and we wanted to observe their effect on the germination of cucumber seeds. The germination rate is shown in figure 1.

After five days the germination rate is 100% at V2 - Blocks 0,25%, V4 - *Azotobacter chroococcum* 1% and V5 - *Azotobacter chroococcum* 1% and at variants V1- Funres 0,25 % , V3 - *Azospirillum lipoferum* 1% and V6 - Rom-Agrobiofertil NP 3%, the germination rate is 99%.

As for the germination rate in the V7 (control variant), we can observe that it is 99.5%.

As we can see from figure 2, in day three, the highest average cucumber seeds germination is recorded in all the treated variants. In control (V7) we see also in day four a higher average of seeds germination (Figure 3). In conclusion, the treated variants (V1-V6) had an average of the germinated seeds higher than the control variant (V7) .

In the variants treated with Funres (V1) and *Azotobacter* (V4), the highest percentage (13,776%) on day three can be observed a lower germination rate in the V7 control variant (9,443%).

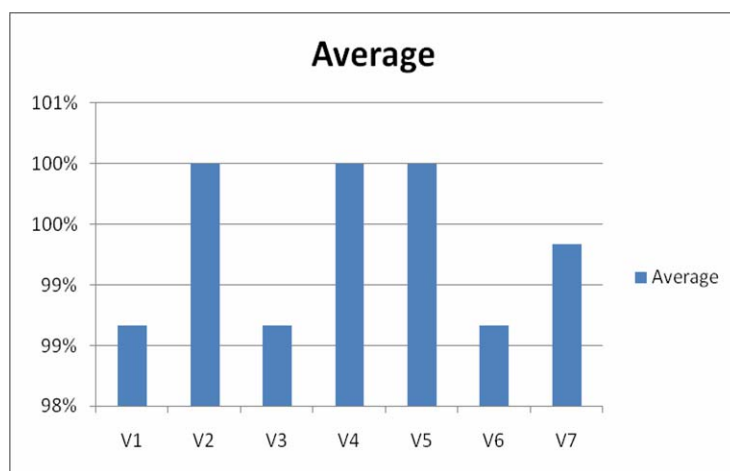


Fig.1 Rate of germination of cucumber seeds

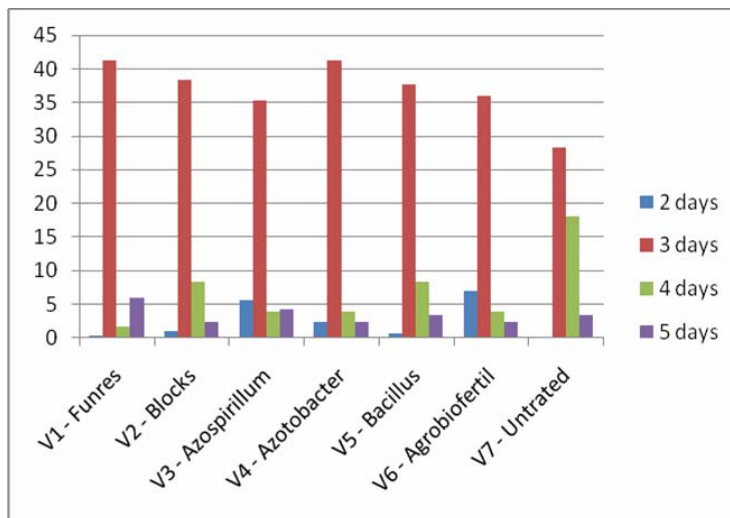


Fig. 2 The average of seeds germination by days

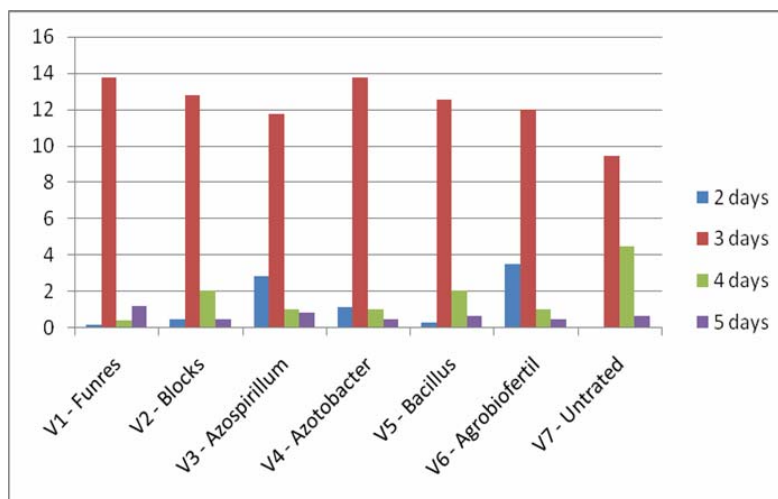


Fig. 3 Speed of germination on cucumber seeds

## CONCLUSIONS

The ecological biostimulation products used in this experiment have a strong influence on the germination of cucumber seeds.

After five days the germination rate is 100% at V2 – Blocks 0,25%, V4 – *Azotobacter chroococcum* 1% and V5 – *Bacillus megaterium* 1%. At variants V1 – Funres 0,25%, V3 – *Azospirillum lipoferum* 1% and V6 – Rom-Agrobiofertil NP 3% the germination rate is 99%.

In day three, the highest average cucumber seeds germination in all the treated variants was recorded. In conclusion the treated variants (V1-V6) had an average of the germinated seeds higher than the control variant (V7).

The speed of germination of cucumber seeds in the variants treated with Funres (V1) and *Azotobacter* (V4) had the highest percentage (13,776%) on day three. A lower germination rate is observed in the V7 control variant (9,443%).

## ABSTRACT

The organic products can be integrated very easily into the treatment schemes, also act as biostimulators[.

The experiment was performed under laboratory conditions. A number of seven variants were made and each variant in 3 repetitions. The number of seeds used in the variant was 150; 50 for each repetition.

After five days the germination rate is 100% at V2 – Blocks 0,25%, V4 – *Azotobacter chroococcum* 1% and V5 – *Bacillus megaterium* 1%. At variants V1 – Funres 0,25%, V3 – *Azospirillum lipoferum* 1%, V6 – Rom-Agrobiofertil NP 3% the germination rate is 99%.

In day three, the highest average cucumber seeds germination in all the treated variants was

recorded. In conclusion the treated variants (V1-V6) had an average of the germinated seeds higher than the control variant (V7).

The speed of germination of cucumber seeds in the variants treated with Funres (V1) and *Azotobacter* (V4) had the highest percentage (13,776%) on day three. A lower germination rate is observed in the V7 control variant (9,443%).

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