The Influence of Bio-Phyto-Modulators in the Biological Development of Seed Germination in Tomato and Pepper Plants

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Abstract

The objective of the research was to observe the influence of A.D. type bio-phyto-modulators upon seed germination and plant biology. The biological material subject to analysis was represented by Coral variety of tomato and hybrid Blondy F1 pepper seeds. As part of this experiment DEA A.D. type bio-phyto-modulators has been used. For germination rhythm determination was used one version in 4 replications with 15 seeds each, which was attached a DEA type device and one control version, with no device attached. In the fourth day from seeding in variant with the tomatoes and DEA, the first plants appeared, and until the sixth day all of the 15 seeds were germinated. The germination for "witness" variant began as late as day six and finished in tenth day. For the pepper seeds the sample with DEA began germination in the eighth day and ended in twelfth day while "the witness" began germination in the twelfth day and ended in the fifteenth. We can see that in both cases where was located the DEA type device germination occurred faster than normal germination time 6-8 days for tomatoes and 10-14 days for peppers. Using AD type bio-phyto-modulators brought a beneficial contribution increasing germination speed for both species.

Keywords: *bio-phyto-modulators, vegetables, water, soil, air, germination.*

INTRODUCTION

Vegetable stand alone as a science occurred as it has moved from the application of technology becoming more sophisticated with the advent and development of culture forced in greenhouses and hotbeds, or protected, plastic or glass shelters without a permanent source of heating, where the majority of environmental factors may be directed by man, with the transition to vegetable cultivation by new principles (Indrea *et al.*, 2009). Related Industry, emphasizing trends of production specialization and integration with recovery. This transformation has been possible with the development and continuous improvement of the material base (Ceausescu *et al*., 1984).

Tomato seed has become a model system of seed germination research. Its size is relatively larger than seeds in other plant species. (Cristina Martinez-Andujar *et al*.,2012).

Pepper (*Capsicum annuum L.)* is a species of great economic importance and food belonging to the Solanaceae family. The great importance is that can be consumed both raw and canning industry, or paprika (Vatca *et al*., 2007). Pepper is considered a concentrated of vitamins that are easily assimilated by the human body. See the model!

Beneficial action and efficiency of AD type bio-phyto-modulators is known in human medicine, veterinary medicine, as well as on plants. The active ingredient for AD type bio-

phyto-modulators is organic. Not the amount of substance that they contain is important, but the energetic and informational mark that they own and can print, send, produce and generate the crystal structures (liquid crystal) that needs optimizations. The action of type AD bio-phyto-modulators is based on the principle of resonance (www.viatasienergie.ro).

Due to the promising results obtained in human medicine, this paper proposes to observe the influence of A.D. type bio-phyto-modulators on tomato and pepper seed germination.

MATERIALS AND METHODS

Biological material analyzed consisted of tomato Coral varieties seed and hybrid Blondy F1 pepper seeds research being conducted in physics laboratories of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. In this experiment we used DEA type bio-phyto-modulators, for both tomato seeds, as well as for pepper, following germination and plant development. For germination rhythm determination were used one version in 4 replications with 15 seeds each, which was attached to a DEA type device and one control version, with no attached device. The seeds were placed in pots with planting substrate composed of peat, with a height of 5 cm. Seeds were covered with 0.5 cm of planting substrate (www.marcoser.ro). Temperature for germination ranged between 24 to 26 degrees and a humidity of 70% for both species.

RESULTS AND DISCUSSIONS

On the fourth day after seeding the tomatoes and device version DEA were first plants in all replications, and by the sixth day all 15 seeds by replications were germinated. In the control version, germination began only on the sixth day and ended on the tenth day as shown in table 1.

Seed peppers, sample device DEA began germination on the eighth day and ended the day 12th while the control germination began on the 12th and ended on the 15th day (Tab.2).

We can see that in both cases where the DEA type device was set germination occurred earlier than normal germination time of 6-8 days for tomato or 10-14 days from pepper.

Tab. 1 Effect of DEA type bio-phyto-modulators on the energy of germination (%) of the tomatoes seeds variety Coral

Day / Replication	1	2	3	4	5	6	7	8	9	10
1	-	-	-	27	60	100	100	100	100	100
2	-	-	-	47	73	100	100	100	100	100
3	-	-	-	40	73	100	100	100	100	100
4	-	-	-	47	80	100	100	100	100	100
Control	-	-	-	-	-	13	40	67	80	100

Tab. 2 Effect of DEA type bio-phyto-modulators on the energy of germination (%) of the pepper seeds hybrid Blondy F1

Day / Replication	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	33	53	80	93	100	100	100	100
2	-	-	-	-	-	-	-	27	46	73	87	100	100	100	100
3	-	-	-	-	-	-	-	31	50	79	92	100	100	100	100
4	-	-	-	-	-	-	-	30	49	83	90	100	100	100	100
Control	-	-	-	-	-	-	-	-	-	-	-	24	38	75	100

Due to the relatively recent patenting of the A.D. type bio-phyto-dynamic modulators and incipient phase in agricultural research comparison with previous findings is not possible.

CONCLUSION

Using bio-phyto-modulators brought an intake beneficial effect on plant germination and they are more vigorous than those of the control.

A.D. type bio-phyto-modulators effect was visible in accelerating the plants sprung both in tomato and pepper seeds.

The higher germination energy we have under laboratory conditions, the germination will be higher in the field.

REFERENCES

1. Ceausescu, I. Balasa, M., Voican, V., Savițchi, P., Roger, Gr. (1984). "General and Special Vegetable" Didactic and Pedagogic, Bucharest.
2. Indrea, D., S.AL. Apahidean, M. Apahidean, D. Mănuțiu, R. Sima. (2009) "Culture vegetables" Ceres Publishing, Bucharest.
3. Martínez-Andújar C., E.W. Pluskota, G.W. Bassel, M. Asahina, P. Pupel, T.T. Nguyen, N. Takeda-Kamiya, D. Toubiana, B. Bai, R.J. Górecki, A.Fait, S. Yamaguchi, H. Nonogaki. (2012). The Plant Journal. 71: 575-586.
4. Vatca, S., S. Gadea, M. Zdremţan (2007). "Plant Physiology - Practical" AcademicPres Publishing House, Cluj-Napoca.
5. www.viatasienergie.ro. Accessed 16 May 2013.
6. www.marcoser.ro. Accessed 12 March 2013.