THE EFFECT OF THE FOLIAR FERTILIZERS OVER THE SOLAR GREENHOUSE CULTIVATED TOMATOES PRODUCTION

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Abstract

The foliar types applied to the solar greenhouse grown tomatoes, determined different effects regarding the quantity of the tomato production.

The best results were obtained when balanced complex types Basfoliar 36 Extra, were used.

Key words: foliar fertilization, mineral fertilizer, vegetative phenophases, balanced nutrition, tomatoes.

INTRODUCTION

Phasial fertilization has been applied with the purpose of providing plant necessities during the vegetative phases. Foliar fertilization is done using mineral fertilizer solutions.

The foliar fertilizers are complex liquid solutions, having macro- and microelements, used extraradicular, ensuring that nutritional ions penetrate into the leaves, simulating absorption, translocation and assimilation of the nutrients into the soil, with positive effects over the quantity and quality level of horticultural farming. (Rusu et al., 2001, 2005; Mărghitas M. et. al., 2005)

This type of fertilization is mostly recommended for protected space cultures, during critical times of maximum consumption or times of maximum efficiency, in the morning or at night, when temperature is lower, so that the solution penetrates slower into the leaf, and evaporation loss is reduced. (Apahidean S., M. Apahidean, 2000)

Protected space cultures need higher doses of nourishing elements, compared to the field cultures, due to much higher productivity. (Heuvelink E., 2006; Apahidean Al.S., M. Apahidean, 2004)

Mineral absorption and the nourishing elements consumption are directly connected with water absorption and water use, so that, during spring we notice a higher consumption, during summer, consumption is also increased, and these levels decrease in autumn. (Rusu M., 1991,1993).

For stabilizing the doses for tomatoes grown in protected spaces, we must take into consideration a series of factors: the level of nourishing elements in the soil, the vegetative phases of the plants, and also a series of

physical factors (light, temperature, humidity), and, lastly, we must also think about the planned production. (Ciofu R., et.al, 2004).

Furthermore, the proportion between the different nourishing elements must be balanced and correlated with the vegetation phases and environment conditions during the vegetation period. (Voican V., Lăcătus V., 1998).

MATERIAL AND METHODS

The experiments took place in a solar greenhouse in Oradea-Sântandrei, where the tomato hybrid Cronos- F1 was used.

The culture was grown on a cambic chernozem soil, with a suitable fertilization technology, having the following agrochemical particularities: neuter pH (7,2-7,3), a good organic matter supply (humus 4%), a good phosphor content (124-134 ppm), and also a very good potassium level (388-433 ppm).

The fertilization diagram comprises a type of foliar fertilizers, that differ from the compositional point of view and also from the nourishing element record point of view (Table 1).

Table 1

The foliar fertilizers assortment applied to solar greenhouse cultivated tomatoes at Oradea-Santandrei (2005)

No. var.	Foliar type*	Solution concentration %
1	Witness	-
2	Folplant 231	1%
3	Folplant 411	1%
4	Polyfeed 19-19-19	1%
5	Basfoliar 36 Extra	1%
6	Ecofert 1 + Ecofert 2	1%
7	Magnesium sulfate	1%

* three treatments: the first one at first inflorescence, the other treatments after 14 days.

Foliar fertilization was done in the morning, by pulverization on the plant. Three foliar treatments were applied: the first one at first inflorescence, the other treatments after 14 days.

RESULTS AND DISCUSSION

Subsequent to the experiments done in the solar, it has been confirmed the significant effect of the foliar fertilizers over production, on an agrochemical optimized soil (by organic-mineral fertilization).

Following the results obtained (Tabel 2, fig. 1) we can notice a significant effect of the most balanced and complex foliar fertilizers from the point from view of the composition of the nourishing elements.

Tabel 2

The effect of some foliar fertilizers types on the yield of solar greenhouse cultivated tomatoes at Oradea (2005)

No. var.	Foliar assortment	Solution concentration	Medium production		Difference t/ha	Difference meaning
			t/ha	%		
1	Witness	-	74.36	100	-	-
2	Folplant 231	1%	80.18	108	5.82	-
3	Folplant 411	1%	84.12	113	9.76	*
4	Polyfeed 19-19-19	1%	91.70	123	17.34	*
5	Basfoliar 36 Extra	1%	96.12	129	21.76	**
6	Ecofert 1 + Ecofert 2	1%	86.14	116	11.78	*
7	Magnesium sulfate	1%	76.48	103	2.12	-

LSD 5% 9.00
LSD 1% 18.00
LSD 0.1% 21.00

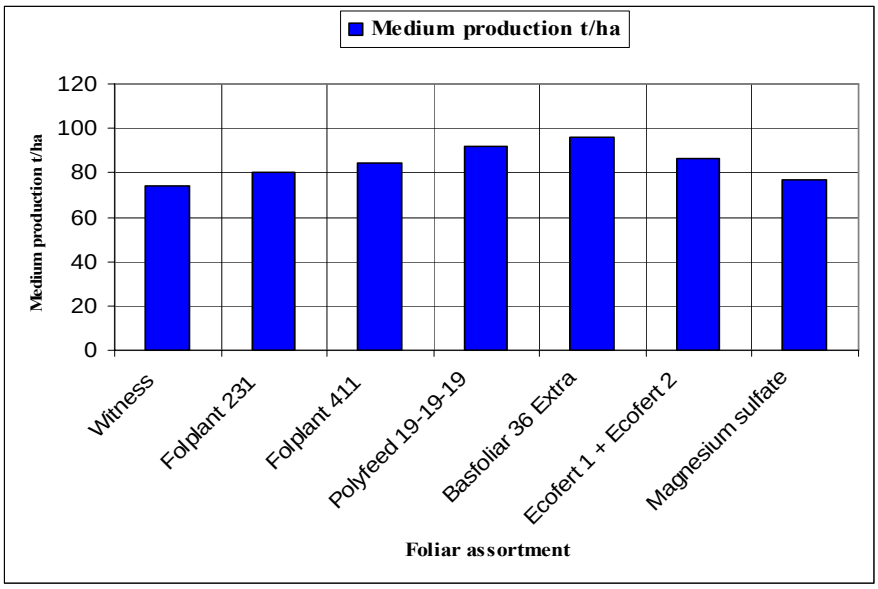

Figure1:The efect of some foliar fertilizers types on the field of solar grenhouse cultivated tomatoes (Oradea, 2005)

Related to production, the best results were obtained to the type fertilized with Basfoliar 36 Extra. These results are due to the effect and direct circuit of microelements contained by this foliar type.

The other foliar fertilization types are less efficient over production, due to their composition: a lower macro and microelements content of the Folplant and Ecofert types, the absence of macro elements for the Polyfeed 19-19-19 product or unilateral Magnesium Sulfate fertilization (the magnesium being responsible for the quality of production).

CONCLUSION

Foliar fertilizations are justified for intensive cultures in protected spaces, on agrochemical-optimized soils, by organic-mineral fertilizations, in vegetative phenophases, with a high consumption of nourishing elements (at first inflorescence).

Foliar fertilizations which proved their efficiency are those with balanced and complex macro elements (N, P, K) and microelements (Fe, Mn, B, Zn, Cu, Mo) composition. Some of these also contain biologically active substances, that replenish the role of these fertilizers, stimulating physiologically and biologically the vegetal metabolism, playing an essential part in controlling and sustaining of the photosynthesis (Fe, Mn, Cu).

Following these experiments using different foliar fertilizers, the most significant results regarding tomato production, were obtained when using the Basfoliar 36 Extra fertilizer, a fertilizer with balanced and complex composition, applied on an agrochemical optimized soil.

Foliar fertilizers contain nourishing elements in relatively low doses, but well balanced, and some have even ecological protective effects (the Ecofert type, which contains protean substances also).

In order to increase the efficacy of foliar fertilization, it is absolutely necessary to do soil and plant analyses (a foliar diagnosis).

Research follow-up regarding the effect of foliar fertilizers for a higher production, and also for the quality of tomatoes grown in protected spaces cultures, is advised.

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