THE INFLUENCE OF PHASE FERTILIZATION ON DAHLIA FLOWERS QUALITY AND YIELD

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Abstract

Dahlia is one of most popular flowers, cultivated in green spaces for decoration and as cut flowers (interior decoration in vases). Dahlia variabilis "Golden Wonder" cultivar (fam. Asteraceae) displays double, composite flowers which, are conspicuous, 15-20 cm in diameter, composed of long, ligulate, thin and tubulous individual flowers, sinuated toward the apex: it is a particularly ornamental plant resembling chrysanthemums. There are several biological characteristics connected to propagation and dormancy which must be taken into consideration in order to apply a correct cultivation technology and to obtain substantial yields of quality flowers.

Key words: *Dahlia variabilis*, foliar fertilization, flower quality, cuttings, Wuchsal

INTRODUCTION

The experiments on the influence of phase fertilization on quality production of *Dahlia* flowers were conducted during 2010-2012 in a nursery from the locality Leş, situated in Bihor County, North-Western Romania. Propagation was performed by means of root cuttings forced in a warmed greenhouse solarium (16-22°C), using a substrate composed of peat and sand in equal parts. After the first emerged shoots reached 9-12 cm in height, the cuttings were harvested using a sharp knife, performing the section at the node level due to the fact that the shoots were hollow. The obtained cuttings were stimulated to root in a substrate of peat and sand in equal proportions. The rooting took place within 30-35 days.

MATERIAL AND METHOD

The rooted cuttings were planted in the nursery soil with the aim of producing plants devised for cut flowers. The nursery soil nutrient content is depicted in the table 1.

Table 1

Results of soil analysis before plantation

The content of water soluble mineral substances (1:5)mg/100 g dry soil					**Humidity %**	**Mineral residuals**	**pH**
N	P_2O_5	K_2O	CaO	MgO	63	0.37	6.8
15	9	40	39	9			

During the vegetation period, foliar fertilizations were performed using Wuchsal (N:P:K=1:2:1). Apart from nitrogen, phosphorus and potassium, Wuchsal contains microelements (Fe, Cu, Zn, B, S, Co).

The experiment is depicted in table 2.

Table 2

Experimental blocks

Block	**The concentration of the fertilizer solution %**	**Frequency of fertilizations**	**Number of fertilizations**
V_1	blank	-	-
V_2	0.1	weekly	20
V_3	0.1	Every two weeks	10
V_4	0.2	weekly	20
V_5	0.2	Every two weeks	10
V_6	0.25	weekly	20
V_7	0.25	Every two weeks	10
V_8	0.3	Every two weeks	10

RESULTS AND DISCUSSIONS

From the inspection of table 3 results that the flower yield harvested and sold varied between 68 stalks/m^2 in the blank block (unfertilized) and 128 stalks/m^2 in fertilized block 6, using as fertilizer Wuchsal 0.25/week.

Table 3

Total yield of *Dahlia variabilis* flowers under the influence of foliar fertilizations

Blocks	**Flower yield**		**±D**	**Significance of the difference**
	Absolute Stalks/m^2	**Relative % Stalks/m^2**		
V_1 – blank (unfertilized)	68	100	-	-
V_2 – fertilized with Wuchsal, concentration 0.1% weekly	100	147	32	*
V_3- fertilized with Wuchsal, concentration 0.1% every two weeks	90	132	22	-
V_4- fertilized with Wuchsal, concentration 0.2% weekly	120	176	52	***
V_5- fertilized with Wuchsal, concentration 0.2% every two weeks	96	141	28	*
V_6 - fertilized with Wuchsal, concentration 0.25% weekly	128	188	60	***
V_7 - fertilized with Wuchsal, concentration 0.25% every two weeks	108	158	40	**
V_8 - fertilized with Wuchsal, concentration 0.3% every two weeks	115	169	47	**

DL 5% - 22.76
1% - 34.15
0.5% - 51.23

In relative terms, one can observe that the yield increased to 88% in block 6 (fertilization with Wuchsal 0.25%, weekly) and to 76% in block 4 (fertilization with Wuchsal 0.2% weekly), an extremely significant difference as compared to the blank. Block 7 (fertilized with Wuchsal, concentration 0.25% every two weeks) and block 8 (fertilized with Wuchsal, concentration 0.3% every two weeks) were characterized by very significant differences as compared to the blank while the blocks 2 and 5 were significantly different as compared to the blank.

However, for block 3 (fertilized with Wuchsal, concentration 0.1% every two weeks) yielding a surplus of 22 stalks/m^2 compared to the blank, the difference was not statistically significant.

The quality performance of *Dahlia* flowers is influenced by foliar fertilizers as one can see from table 4.

Table 4

The influence of foliar fertilizers upon the quality of *Dahlia variabilis* flowers

Blocks	**Flower yield in *Dahlia variabilis***		
	Totals of stalks/m^2	**Of which, first quality**	
		Absolute stalks/m^2	**Relative %**
V_1 – blank (unfertilized)	68	49	72
V_2 – fertilized with Wuchsal, concentration 0.1% weekly	100	85	85
V_3- fertilized with Wuchsal, concentration 0.1% every two weeks	90	72	80
V_4- fertilized with Wuchsal, concentration 0.2% weekly	120	102	85
V_5- fertilized with Wuchsal, concentration 0.2% every two weeks	96	78	81
V_6 - fertilized with Wuchsal, concentration 0.25% weekly	128	104	81
V_7 - fertilized with Wuchsal, concentration 0.25% every two weeks	108	86	80
V_8 - fertilized with Wuchsal, concentration 0.3% every two weeks	115	92	81

In the case of the blank (unfertilized), from the total yield, 72% were first quality flowers while in fertilized blocks, this proportion exceeded 80%.

CONCLUSIONS

Dahlia sp. cultivation is an entertaining activity as well as profitable depending on the cultivation technology applied.

Flower yield was enhanced in blocks were the foliar fertilization was applied weekly using a concentration of 0.2 and 0.25% (V_4 and V_6).

Blocks where fertilization was applied every two weeks resulted in enhanced yields as compared to the blank (V_3, V_5, V_7 and V_8).

Excepting the blank, in all blocks the proportion of first quality flowers raised over 80%.

The best results with regard to yield and the number of quality flowers were obtained in block 6 (fertilized with Wuchsal, concentration 0.25% weekly).

Rooting of the cuttings was obtained within 30-35 days.

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