THE INFLUENCE OF PHASE FERTILIZATION ON THE QUALITY OF *BEGONIA TUBERHYBRIDA* FLOWERS

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Abstract

Begonia tuberhybrida, is a plant which propagates through seeds and clonally, by tuber splitting, after the emergence from the dormant stage. Tuber splitting is performed using a sharp knife taking into consideration the rule of at least two buds per tuber fragment. The fragments are planted separately in individual pots.After 8-10 weeks from planting, first transfer to small 6-7 cm in diameter pots is performed. To the commercialization period, there are 2-3 transfers needed to accommodate the growing plants (the last transfer in 15-16 cm pots).The species vegetates well in rooms with windows facing Southern, Eastern or Western expositions. Plants must be watered every 3-4 days (0.2-03 l of water in 15-16 cm diameter pots).Begonia tuberhybrida, is highly decorative species, embellishing the rooms or hallways, alone or in combination with other plants.

Keywords: *Begonia tuberhybrida*, phase ferilization, Wuchsal, seed propagation, tuber splitting

INTRODUCTION

Begonia tuberhybrida, is an indoor plant which is considered decorative due to its leaves and flowers, growing slowly during the winter and spring (Sonea et al., 1983).

The leaves are heart shaped, green with lighter marbling on the upper side (Vlad, 2012). The flowers are solitary, with 5 petals and upward bent apices are differently colored (Preda, 1979).

The fruit is a pod containing 20-30 brown seeds (Zaharia, 1994).

The plant requires a cool climate, 15- 16°C, with the exception of planting period when the favorable temperature must raise to 22°C, moderate watering, abundant aeration, full light and the absence of cold air currents (Anton, 1990: Pîrvulescu, 1995). Decorative value increases with age and plant dimensions (Sadofsky, 1996).

There are several cultivars characterized by differently colored flowers displaying a wide palette, from white to red. Some cultivars present simple flowers, others present double flowers, some are fragrant, and other cultivars are not. There were obtained cultivars with long flower stems employed for cut flowers. Differences between cultivars arise from the position of flowers with respect to leaves, and from the number, the color and the marbling model of the leaves (Ştefan, 1987).

MATERIAL AND METHODS

During the present study, the cultivar Superb was employed: it is characterized by carmin-red flowers.

Seeds were planted in March, in a substrate composed of soil with partially decomposed foliar litter and sand in proportion 1:1. The planting was performed in rows, separated by 2 x 1 cm soil strips, at 1 cm deep.

After ten weeks, plantlets were moved to pots of 6-7 cm in diameter using a substrate composed of soil with partially decomposed foliar litter (2 parts), garden soil (one part), field soil (one part) and sand (one part).

At the next stage, grown plants were transferred to larger pots (15-16 cm in diameter), the same pots in which plants were finaly sold.

The soil depth at which plants are transferred is an important factor: the tuber must be covered by a thin layer of soil in order o avoid to expose the tuber, which determines the hardening of the epidermis with unfavorable repercussions on its development.

The transfer from smaller pots to larger pots was performed when plants were fully developed and physiologically active with care not to disturb the roots and adhering soil which incorporates fine rootlets. This intervention is performed when the roots include entirely the soil inside the pot, are white-yellowish colored and have reach the margin of the pot.

Every year, at the end of the flowering period when plants dropped the aerial parts (May-June), the pots were moved to shaded places.When the tuber emerged from the dormant stage, it was moved to fresh soil substrate within same pot or a different one of the same size.

With proper care, the plants bloomed abundantly.

Other maintenance interventions consisted in watering, fertilizations, dusting of the leaves and soil mobilization for improved aeration.

The fertilization of soil mixtures was the same for all experimental variants. Phase fertilizations were performed with Wuchsal which contained as active ingredients N 9%, P_2O_5 9%, K_2O 7% and microelements (Fe, Cu, Zn, B, S). The employed concentraion was 0.1% at the first two fertilizations, 0.2% at the next two fertilizations and 0.3% at the rest of fertilizations.

The experimental design consisted of 5 variants in blocks subdivided in 3 repetitions. The area of the unit experimental plot was of 10 m^2 (30 potted plants) and of 30 m^2 (90 potted plants) of a variant. The total area of experimental plots summed 150 m^2 and 450 potted plants.

RESULTS AND DISCUSSION

The results showed that the greatest number of flowers per plant was obtained in variant no. 2 (v2) which was fertilized once a week (table 1): the

number of flowers per pot reaches 48 being followed by variant 3 (culture fertilized once every two weeks) with 37 flowers per pot, variant 4 (culture fertilized once every three weeks) with 32 flowers per pot and variant 5 (culture fertilized once every four weeks) with 27 flowers per pot.

Table 1

The number of *Begonia tuberhybrida,*flowers, Superb cultivar per potted plant under phase fertilization (average values), Sîntandrei (Bihor County), 2014-2015

Variants	Number of flowers		±D	The significance of the difference
	Absolute (stems/pot)	Relative %		
V1 – control culture	23	100	-	-
V2 – culture fertilized once a week	48	209	25	***
V3 – culture fertilized once every two weeks	37	161	14	**
V4 –culture fertilized once every three weeks	32	139	9	*
V5 – culture fertilized once every four weeks	27	117	4	-

LSD 5% - 8,1
LSD 1% - 13.5
LSD 0.1% - 21,3

Statistical analysis showed an extremely significant difference between variant 2 (culture fertilized once a week) and control, highly significant difference between variant 3 (culture fertilized once every two weeks) and control, and significant difference between variant 4 (culture fertilized once every three weeks).

Concerning the length of the floral stem, the results showed that it reached 51 cm in variant 2 (culture fertilized once a week) and 22 cm in control (table2).

Significance level of the analyzed differences showed that there were extremely significant between variant 2 and control, highly significant between variant 3 and control, between variant 4 and control and variant 5 and control.

Table 2

Length of the *Begonia tuberhybrida,* floral stems, Superb cultivar, in potted culture, under the influence of phase fertilizations (average values), Sîntandrei (Bihor County), 2014-2015

Variants	Length of floral stem		±D	The significance of the difference
	Absolute cm	Relative %		
V1 – control culture	22	100	-	-
V2 – culture fertilized once a week	51	232	29	***
V3 – culture fertilized once every two weeks	40	182	18	**
V4 –culture fertilized once every three weeks	36	164	14	**
V5 – culture fertilized once every four weeks	31	141	9	**

LSD 5% - 8,7
LSD 1% - 13.9
LSD 0.1% - 22,2

CONCLUSIONS

- All growth elements ; length of floral stem, flower diameter, average weight per plant reached greater values in variant 2
- Taking into account the origin of *Begonia tuberhybrida,,* (shaded places at the forest edges) during May-August when solar radiation is too intense, plants require shading. The shading must take account of plants requirements and be at an average level.
- During the nights, it must be avoided that the leaves become wet.
- The culture of *Begonia tuberhybrida* is a rewarding activity, nevertheless, it must be adjusted to the applied technology..

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