RESEARCH ON THE INFLUENCE OF ORGANIC FERTILIZATION ON THE QUALITY OF POLYANTHES TUBEROSA FLOWERS

Vlad Ioan*, Vlad Ioana Andra*, Vlad Mariana*

* University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048, Oradea, Romania, e-mail: ioanvlad2006@yahoo.com

Abstract

The tuberose is a perennial garden flower, known since long time in Romania, which hasbeen imposed on the market only in the last thirty years due to the elegance of the flowers and to the pleasant fragrance. Large areas cultivated with tuberoses are placed in the surroundings of big cities such as Bucuresti, Sibiu, Alba Iulia and Oradea. In Leş (Bihor County) nursery, between 2008 and 2012 a study was developed on the influence of fertilization upon the quality of tuberose flowers.

Key words: *Polyanthes tuberosa*, organic fertilizers, flowers 'quality.

INTRODUCTION

The tuberoses are planted in the field during the month of April, 10-15 cm deep, function of the dimension of the bulbs (Vlad, 2011). At the end of October, the bulbs are extracted out of the soil and are cleaned to get rid of adhered soil (Herwig, 2005). After surface drying, the bulbs are deposited at 2-8°C being either stratified in sand or peat, or spread in thin layers in wooden boxes (Garibaldi, 1993).

MATERIAL AND METHOD

For the study, were employed conspicuous bulbs, of 5-8 cm diameter which have been planted in the fields on 8th April, 12th April (2009), in 15th April and (2010), in 10th April (2011) and 16th April (2012).

The experimental design consisted of the following variants:

V1 – control (unfertilized)
V2 – fertilized culture using 5 kg/m^2 manure
V3 – fertilized culture using 10 kg/m^2 manure
V4 - fertilized culture using 15 kg/m^2 manure
V5 - fertilized culture using 20 kg/m^2 manure

Each plot covered 100 m^2 and was planted with 1300 bulbs.

The measurements consisted of; the length of flower shoot, the length of the spike and the number of flowers per spike.

Table 1 depicts the proportion of first class quality flowers; 76% in control and 94% in variant 2 (fertilized culture using 5 kg/m^2 manure).

Table 1

The quality of flowers of *Polyanthes tuberosa* under the influence of organic fertilization (mean values 2006-2012)

Variants	Flower yield			±D	Significance of the difference
	Total Shoots/m^2	First quality			
		Absolute Shoots/m^2	Relative %		
V1 – control (unfertilized)	7.5	6.0	100	-	*
V2 – fertilized culture using 5 kg/m^2 manure	9.1	8.1	130	1.9	**
V3 – fertilized culture using 10 kg/m^2 manure	10.4	9.5	153	3.3	***
V4 - fertilized culture using 15 kg/m^2 manure	10.9	10.1	161	3.8	***
V5 - fertilized culture using 20 kg/m^2 manure	11.7	11	177	4.8	***

LSD 5% - 1.3, LSD 1% - 2.1, LSD 0.1% - 3.7

Statistical analysis indicates that there is a significant difference between variant 2 and the control, distinctly significant between variant 3 and the control and highly significant between variants 4 and 5 and the control.

Concerning the length of the flower shoot, this is longer in variant 5 (fertilized culture using 20 kg/m^2 manure) compared to variants 2, 3 and 4.

Table 2

The length of flower shoot in *Polyanthes tuberosa* under the influence of organic fertilization (mean values 2008-2012)

Variants	Length of the flower shoot		±D	Significance of the difference
	Absolute cm	Relative %		
V1 – control (unfertilized)	60	100	-	-
V2 – fertilized culture using 5 kg/m^2 manure	82	136	22	*
V3 – fertilized culture using 10 kg/m^2 manure	96	160	36	**
V4 - fertilized culture using 15 kg/m^2 manure	102	170	42	***
V5 - fertilized culture using 20 kg/m^2 manure	110	183	50	***

LSD 5% -18,2; LSD 1% - 27,3; LSD 0.1% - 41,0

Statistical analysis indicates that there is significant difference between variant 2 and the control, distinctly significant between variant 3 and the control and highly distinctive between variants 3 and 4 and the control.

The length of the spike varies among variants: it is larger in variant 5 (fertilized culture using 20 kg/m^2 manure) exceeding the control with 73% at a highly significant difference (Table 3).

Table 3

The length of floral spikes in *Polyanthes tuberosa* under the influence of organic fertilization (mean values 2008-2012)

Variants	Length of the floral spikes		±D	Significance of the difference
	Absolute cm	Relative %		
V1 – control (unfertilized)	15	100	-	-
V2 – fertilized culture using 5 kg/m^2 manure	17	113	2	-
V3 – fertilized culture using 10 kg/m^2 manure	18	120	3	-
V4 - fertilized culture using 15 kg/m^2 manure	21	140	6	**
V5 - fertilized culture using 20 kg/m^2 manure	25	173	11	***

LSD 5% -3.9
1% - 6.3
0.1% - 10.1

Statistical analysis indicates distinctly significant difference between variant 4 (fertilized culture using 15 kg/m^2 manure) and the control. Between variants 2 and 3 and the control the difference is not statistically significant.

Concerning the number of flowers per spike the results are summarized in Table 4. The greatest number of flowers per spike was obtained in variant 5 where the difference compared to the control reaches 35% (highly significant difference). Between variants 2 and 3 and the control, the difference is not statistically significant.

Table 4

The number of flowers per spike in *Polyanthes tuberosa* under the influence of organic fertilization (mean values 2008-2012)

Variants	Number of flowers/spike		±D	Significance of the difference
	Absolute cm	Relative %		
V1 – control (unfertilized)	17	100	-	-
V2 – fertilized culture using 5 kg/m^2 manure	18	105	1	-
V3 – fertilized culture using 10 kg/m^2 manure	18	105	1	-
V4 - fertilized culture using 15 kg/m^2 manure	20	117	3	**
V5 - fertilized culture using 20 kg/m^2 manure	23	135	6	***

LSD 5% - 1.6
1% -2.8
0.1% -4.8

CONCLUSIONS

- Organic fertilization increases the quality of *Polyanthes tuberosa* flowers, however, a differential increase depending on the fertilization level.
- The best results were employed in variant 5 (fertilized culture using 20 kg/m^2 manure).
- Good results were obtained also in variants 4, 3 and 2 with different levels of fertilization.
- High values were obtained also for the length of flower shoot, length of the spike and the number of flowers per spike in variant 5 (fertilized culture using 20 kg/m^2 manure) followed by variant 4, 3 and 2.

REFERENCES

1. Davidescu D., Davidescu V., 1999, Agrochimia horticola. Romanian Academy Publishing House.
2. De Jaeger P., Heillo N.V., 1988, For you, garden. De Jaeger & Sons, Heillo, Holland.
3. Garibaldi A.E., 1993, Tratato di floricultura. Edagricola, Italy.
4. Granger J., Laury J.C., 1997, Maitrise de la croissance par le DIF sur *Impatiens* de nouvelle Guinee. P.H.M. Revue Horticole.
5. Grunert C., 1997, Balkonblumen. Newmann Verlag, Leipzig.
6. Heitz H., 1991, Balcon und Kübelpflanzen. Munchen.
7. Herwig R., 2005, Bulbs you can grow. Collier MacMillan Publishers, London.
8. Ivascu M., 2007, Flori comestibile. S[n[tate ;I culoare. Cetatea de Scaun Publishing House. Tirgoviste.
9. Kiaer E., Huxley A., 1971, Plante annuelles et bulbeuses. Politikens Forlag, Copenhagen.
10. Kiselev E.G., 1996, Floricultura. Agro-Silvica Publishing House, Bucuresti.
11. Lamesn E., 1970, Floriculture. La maison rustique. Paris.
12. Lane C., 1997, Cottage garden annuals. David & Charles Publishing House, London.
13. Laurie A., 2008, Commercial flower farming. McGraw – Hill Book Company, New York.
14. Preda M., 1979, Floricultura. Ceres Publishing House. Bucuresti.
15. Reeker R., 2002, Torfibel für Gartner. Parey publishing House, Berlin.
16. Schosser G., 2006, Pflanzenkultur mit dem Planzenstrahler. Ost Osram Grubtt, Berlin.
17. Şelaru E., 1988, Florile din gradina mea. Ceres Publishing House. Bucuresti.
18. Sonea V., Pavel A., Ailincai N., Şelaru E., Floricultura.
19. Vlad I., 2011, Floricultură. Publishing House University of Oradea.
20. Vlad I., 2012, Amenajarea spatiilor verzi. Publishing House University of Oradea.
21. Zaharia D., 2005, Floricultură. Risoprint Publishing House, Cluj-Napoca.