

TUBEROUS ROOT AND FLOWERS PRODUCTION OF *DAHLIA VARIABILIS* IN THE CLIMATIC CONDITIONS IN ORADEA

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Abstract

The dahlia was introduced in Europe in 1789. Native to Mexico, it was brought to the Botanical Gardens of Madrid, where it bloomed for the first time in 1791. Abbot Cavanilles, at the time director of the garden, named the flower Dahlia, as homage to A. Dahl, Swedish botanist and student of Linnaeus. He introduced the flower as Dahlia variabilis. (Șelaru, Elena, 1995). In 1972 the species Dhaliajuarezi (cactus Dahlia) was brought to the Netherlands from Mexico. It has tubular florets and it was dedicated to the President of the Mexican Republic at the time. (Preda, M, 2001)

In 2015 France allocated 65 Ha for the culture of Dahlia tubers, occupying the fourth place after gladioli, tulips and irises. (Vlad, I, 2001).

Key words: *Dahlia variabilis*, tubers, planting substrate, flowers.

INTRODUCTION

The Dahlia tuber production is an activity that consists in two distinct phases: multiplication and the planting itself. Multiplication was made with cuttings from the mother plants as basic material. (Zaharia, 2004)

MATERIAL AND METHODS

Forcing tuberous roots in order to obtain cuttings was made at the end of January in the greenhouse on the parapet heated at 15-20⁰C. The tubers were placed one next to the other in a substrate with good water retention, yet well drained at the same time. We used a mixture of red peat and silica in equal parts. It was compulsory to clear the parcel, since we found many dormant buds that would rapidly form stems from which we would harvest cuttings. We used the following varieties: Picasso with red double flowers, Alaska with white double flowers, Miramar with red flowers, Miranda and Festival with white flowers, Defile with purple flowers, Preference with pink flowers.

RESULTS AND DISCUSSION

Cuttings were taken from a length of 7-10 cm with the help of a well sharpened grafting knife. It was necessary to take precautionary measures during this operation, that is to say, the grafting knife was disinfected with alcohol 700+ copper oxyquinoline from one plant to another.

We resorted to harvesting simple, herbaceous cuttings, unlike in the not so distant past when heel cuttings were used, that guaranteed a very good start but had the disadvantage of only allowing a small number of cuttings per plant (6-10 cuttings). However, 30-60 simple cuttings can be harvested within 2-3 months. The cuttings were placed in 7 cm diameter pots in a mixture of red peat and sand in equal parts at a temperature of 18-22°C and relative humidity of 70-80%. The rooting duration was 28 days, after which the cuttings were planted in a cold greenhouse (10-12°C). The obtained plants were pinched twice.

Planting in the field was done in May since the Dahlia is sensitive to cold temperatures on the one hand and on the other hand, we sought to obtain medium-sized tuberous roots that yield the biggest flower production. The Dahlia does well in numerous types of soil provided that the pH is neutral or slightly acidic and that the soil is well drained.

To date, few studies have been made with regard to the fertilisation of Dahlias. A tuberous root plant, the Dahlia requires a fertilisation of the type 1:2:3. Excess nitrogen should be avoided, as it causes an intense development of the leaves that is detrimental to the thickening of the tuberous roots. Roottuberisation is induced by short days, which is why specialists avoid nitrogen fertilisation and partially suppress the leaves in the second half of summer. The tuberous roots were harvested in October. After suppressing the leaves, the tubers were removed from the soil through mechanical or manual means. The stems were removed and the material thus prepared was aired in the field or in the storage room, after which it was sorted and conditioned. During winter, the roots can be kept in crates stored in cellars at a temperature of 4-10°C and relative humidity of 60-70%. The production of tuberous roots obtained is shown in Table 1.

Table 1

Dahlia tuberous root production (average values 2015-2016) Oradea

Variants	Tuberous root production		±D	Difference significance
	Absolute t/ha	Relative %		
V ₁ - Alaska variety (control sample)	10,2	100	-	-
V ₂ - Picasso variety	13,9	136	3.7	***
V ₃ - Miramarvariety	10,7	105	0.5	*
V ₄ - Festival variety	11,2	110	1.0	**
V ₅ - Miranda variety	11,5	113	1.3	**
V ₆ - Perfection variety	12,6	124	2.4	***
V ₇ - Defile variety	12,9	126	2.7	***

LSD 5%- 0.47; LSD 1%- 0.94; LSD 0.1% - 1.88

The production of Dahlia tuberous roots differs in the same conditions of vegetation from one variety to another. Thus, the varieties Perfection, Defile and Picasso yield a production 24-26% higher than Alaska with a very significant difference, while the varieties Festival and Miranda have a

distinctive significant difference from the control sample. Miramar has a significant difference.

Table 2

Dahlia flower production obtained according to the cultivated variety
(average values 2015-2016) Oradea

Variants	Flower production		±D	Difference significance
	Absolute stalks/m ²	Relative %		
V ₁ - Alaska variety (control sample)	70	100	-	-
V ₂ - Picasso variety	98	140	28	***
V ₃ - Miramarvariety	79	113	9	*
V ₄ - Festival variety	83	119	13	*
V ₅ - Miranda variety	85	121	15	*
V ₆ - Perfection variety	87	124	17	**
V ₇ - Defile variety	91	130	21	**

LSD 5%- 8.3; LSD1%-15.1; LSD 0.1% - 27.2

The harvested and sold flower production had values between 70 stalks/m² for the Alaska variety (V₁) and 98 stalks/m² for the Picasso variety(V₂), with a very significant statistic difference between the Picasso and Alaska varieties, a distinctive significant difference between the varieties Defile, Perfection and Alaska and a significant difference between the varieties Miranda, Festival, Miramar and Alaska,Table 2. As shown in Table 3, the average length of the flower stalks ranged between 67 and 99 cm, with a very significant difference between the varieties Picasso, Defile and the control sample, a distinctive significant difference between the varieties Perfection, Miranda and the control sample, a significant difference between the Festival variety and the control sample and an insignificant difference between the Miramar variety and the control sample.

Table 3

Length of Dahlia flower stalks according to variety (average values 2015-2016) Oradea

Variants	Flower production		±D	Difference significance
	Absolute stalks/m ²	Relative %		
V ₁ - Alaska variety (control sample)	70	100	-	-
V ₂ - Picasso variety	98	140	28	***
V ₃ - Miramar variety	79	113	9	*
V ₄ - Festival variety	83	119	13	*
V ₅ - Miranda variety	85	121	15	*
V ₆ - Perfection variety	87	124	17	**
V ₇ - Defile variety	91	130	21	**

LSD 5%- 6.1; LSD1%-11.2; LSD 0.1% - 20.1

CONCLUSIONS

- The tuberisation of Dahlia roots is favored by short days. After two months, the cuttings planted in protected areas at the beginning of December had the first tuberous roots.

- The process of tuberisation and the apical plant growth are inversely proportional for the Dahlia.
- Excessive nitrogen fertilisation is to be avoided since it leads to a too intense development of the leaves, detrimental to the thickening of tuberous roots.
- Harvesting simple, herbaceous cuttings lead to obtaining 30-60 cuttings from each tuberous root within two months, as opposed to harvesting heel cuttings: 6-10 cuttings from each root within the same amount of time.
- It is compulsory to disinfect grafting knives when harvesting cuttings after moving from one plant to the other.
- Native of the Mexican plateaus with clay-siliceous soils, the Dahlia does well in various types of soil, provided they are well drained, sunny and have a neutral or slightly acidic pH.
- When the ventilation and temperature conditions in the storage rooms are unsatisfactory, there is the risk of fungus appearing on the tuberous roots and thus there is also the risk of considerable loss of material. Among the main pathogens in this category, *Fusarium oxysporum* and *Botrytis cinerea* are more frequent and cause more damage.

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