

DETERMINING THE OPTIMAL SOWING PERIOD AT A VARIETY FROM *Dahlia variabilis* SPECIES FROM MIGNON GROUP

Mihai Radu POP*

*"Lucian Blaga" University of Sibiu, Faculty of Faculty of Agricultural Sciences, Food Industry and Environmental Protection, Sibiu, Romania
Corresponding author: Mihai Radu Pop, "Lucian Blaga" University of Sibiu, Faculty of Agricultural Sciences, Food Industry and Environmental Protection, 5-7 Ion Ratiu, Sibiu, Romania, tel.: 0040269234111, fax: 0040269234111, e-mail: mihaipop76@yahoo.com

Abstract. Planted in addition to walls, to the south of the massif, in groups, beats or lawns, Dahlia beautifully decorates parks and gardens. The rebates are used especially varieties with small waist [6]. Today, when the development of green spaces is a real concern of people, we consider important to provide technology for the production of plants that can offer the widest possible variety of species with the widest possible decor period. Thus, the present article presents researches about determining the period of sowing for dwarf dahlias produced in pots, with spring and early summer flowering and used for decoration in green areas. In this experiment were taken in the account characters such seed germination period, plant height, time to flowering, flowering period, flower area, mass of seeds from a plant.

Key words: *Dahlia variabilis* Mignon Yellow Shades, autumn sowing, early flowering

INTRODUCTION.

Dahlia is original from Mexico. There were first flowers of Dahlia, the first species that were the starting point in getting new varieties, more and more interesting by setting up the flowers and their color [13].

In 1872 there were already several thousand varieties of dahlias with simple or abundant flowers, but of which very few have been preserved to this day. The mankind sought new forms to be noted by the number of inflorescences, their size, early flowering etc. [15].

Dahlias are herbaceous plants, perennial with tuberous roots, leaves and stems have elongated flowers with different shapes and shades [4]. Usually in early spring, with root tubers are planted in a land not too sandy or too compact to full sun. Are watered every second day and clean the flowers wilted. In November cuts shoots to 20 cm from the ground and remove the tubers. It is dry and cover with sand or peat or kept in a dark room, not too hot, not too dry, discover [14].

Dahlia variabilis culture can be established by direct sowing [7]. If this is done in the field, then recommended period is from May to June, and flowering will be in September. If the culture is held in pots and greenhouse then autumn sowing will be carried out in September-October and flowering from April to June [9]. Studies presented in this article give a series of experiments to determine the best sowing period in *Dahlia variabilis* species for production of material used for decoration of green spaces. These surveys are designed to improve technology this species in order to obtain quality with a maximum effect in Romania.

MATERIALS AND METHODS

In the current study has been used on additive, purchased from specialized shops, belonging to the species *Dahlia variabilis* from the group Mignon Yellow Shades variety. Sowing was performed during autumn, in an artificially heated greenhouses, on four different dates from a period of two weeks from September 10. After seed germination seedlings were

transplanted at 30 cm distance between plants in row and 30 cm between rows of plants. Dahlia seeding was individually reared in pots. Variants of work were established according to the date on which seeding was done. For the relevance of the experiment, were performed four repetitions for each variant in different parts of the hothouse. Based on the sowing dates, were set the following variants: V_1 = September 10; V_2 = September 25; V_3 = October 10; V_4 = October 25.

The experiment was mono factorial and was organized after randomized blocks method [2]. Measurements and observations were made over two years and data was recorded in tabular form to be subjected to analysis [3].

Characters subject to measurements and observations were:

1. duration of germination of seeds (days) was the time required from sowing until sprouting.
2. plant height (cm) was measured from the ground up to the highest branch.
3. time to flowering was recorded at the time of sowing until the appearance of first flowers.
4. flowering period (days) consists of the period between the first and last flower.
5. flower area (cm²) is the area that falls a flower and was calculated using the formula $(3.14 \times R^2)$: where R is the radius and was determined by dividing the diameter by 2. Diameter was measured by describing a circle around the flower
6. mass of seeds from a plant is given by the quantity of seeds produced in all flowers of a plant in a growing season.

RESULTS

The results were very interesting for all six characters studied. Table 1 show that for *Dahlia variabilis* species the range of tolerance to the temperature regime for germination of seeds is very wide, however, is an optimum temperature of 21.90 points at which seeds germinate quickly.

At experimental variations sown in the first two data, flowering started in mid March, while variants sown in the last two data, flowering began on 11 and April 22.

Table 1. Experiment observation made for *Dalia variabilis* species.

No.	Variant	Sowing time	Average temperature in the crop area during sowing ($^{\circ}\text{C}$)	Flowering period
1	V ₁	10 Septembre	23.9	20 March- 22 June
2	V ₂	25 Septembre	21.9	23 March- 5 July
3	V ₃	10 Octobre	20.3	11 April – 12 June
4	V ₄	25 Octobre	18.6	22 April – 20 June

For the character represented by the period of seed germination, the fastest germination time was noted in version V₂ of 5 days, this variation being sown on

September 25. The maximum germination was 8.49 days and was highlighted at V₄ which was sown on October 25.

Table 2. Values recorded of the characters taken in the Studion at *Dalia variabilis*.

No.	Variant	Germination period (days)	Plants height (cm)	Time to flowering period (days)	Flowering period (days)	Flower area (cm ²)	Quantity of seeds (g/plant)
1	V ₁	6.67	27.98	190	94.14	36.95	7.3
2	V ₂	5	52.2	178.63	103.45	69.23	12.03
3	V ₃	6.54	46.65	181.15	62.27	61.37	9.11
4	V ₄	9.49	36.43	177.32	55.68	43.43	6.22

At 18.6 $^{\circ}\text{C}$ seed needed more than 9 days to germinate. These results are confirmed by Harmann and Kester (1989) [4], indicating that the seed germinates in one to four weeks at temperatures of 18 $^{\circ}\text{C}$ to 30 $^{\circ}\text{C}$.

Maximum plant height recorded was 52.2 cm, shown at version V₂ followed by V₃ with 46.65 cm. These values are above the average in the literature [5], which has an average value of 45 cm.

The minimum number of days to flowering was 177.32 for the emergence of first flower and was recorded when seeds were sown on October 25 (V₄). The maximum duration was 190 days and recorded the first version that sowing took place on September 10 (V₁). Variant V₂, which has good performance for the other characters studied took 178.63 days to flowering and remaining in bloom for 108 days (Table 1).

The longest flowering period was 103.45 days and was carried by variant in which the seed was sown on September 25 (V₂), followed by the V₁ and V₃ with values of 94.14 and 62.27 days. All these variants have remained equal with the other when the statistical interpretation. Variant V₄ remained the least flowering time, 55.68 days. It seems that shorter period of vegetative growth negatively influenced this variant.

The largest size in flowers was made in V₂ and was 69.23 cm (Table 2). Size of flowers at V₃ variants was 61.37 cm² and was statistically the same as V₂. V₄ and V₃ variants produced smaller flowers.

The quantity of seeds showed a positive correlation with other characters studied. The number of seeds was highest in the variant V₂, which was followed by 12.03 g V₃ variant, with a value of 12.03 g. The small amount of seed was 6.22 g and occurred in version V₄ sown on October 25.

DISCUSSION

Moore (1985) [12] showed that if Dahlia seeds are sown during May-June flowering occurs from September to November. Unfortunately at this time in Romania are low temperatures and this process is a threat to prosperity and we thought that solutions must be found to obtain in 1991 [10] explained that the

species *Dahlia variabilis* seeds can be sown throughout the year, but that the severe winter temperatures can be harmful to plants. Prosperity can be achieved during the spring in warmer areas and during the summer or late autumn in colder areas. Some authors in 2000 [1] suggested that the species *Dahlia* seeds should be sown better during August / September to get a good crop of flowers in spring. As can be seen from Table 1 variants sown in September began flowering in mid-March. So variations sown on September 10 and September 25 began flowering about 20 days earlier than the version in which the sowing was done on October 10. Variants sown in October began flowering in April. These variants were sown in October with a flowering period of one month shorter. On the other hand, literature [8] shows that *Dahlia* seeds germinate in four weeks up to 20-30 degrees C. It can be concluded that variations sown on September 25 had the longest period of bloom is the best option for flower production. V₂ variant was sown in September 25 has produced the large flower. This data could be correlated with plant height.

In our studies the differences recorded between experimental variants to start flourishing, could be attributed to temperature. Thus, at the variations sown in September had the first days after emergence a high temperature of 20 $^{\circ}\text{C}$, until mid-October. Crops sown in October received the first days after the emergence lower temperatures. So we conclude idea that high temperatures during the onset of vegetative growth has helped to complete this phase soon to enter the reproductive phase in March.

At the same time are reports [1] showing that different 30 days can lead to delays of up to days for germination. In our article analysing the data about the duration of germination of seeds from Table 2, we can see that a difference of 30 days from sowing seed can lead to a difference of 3 days in seed germination.

Seed germination was delayed by more than a day and half when sowing was carried out 15 days earlier or after the optimum sowing which was September 25 in this experiment.

In literature [11] we found some studies on seven varieties of dahlias in terms of plant height, number of days to flowering, flower quality, size of flowers. In his

article Vigour and Kenya reported that varieties were higher in terms of plant height and flower size. Period of prosperity for the best variety in Kenya named 13,3-15,5 days. Similar characters and we've been interested in measuring the variety Yellow Shades. Such has been observed that variations sown in October began flowering in April. These variants sown in October had a flowering period of one month shorter. It can be concluded that variations sown on September 25 had the longest period of prosperity, thus, being the best option for flower production.

Variant V_2 was sown in September 25 and produced flowers with the largest size. This data could be correlated with plant height.

Seeds germinated quickly produced high quality flowering plants. Seed which needed more time to germinate plants produced flowers of inferior quality and yields have been low and the other characters considered for the study of this variant compared to the seeds germinated quickly.

Plant height shows possibilities of capturing favorable weather conditions. Variant V_2 , where the seed has germinated faster, recorded more vigorous plant specimens in comparison with other variants. It may be noted at this time a positive correlation between the duration of seed germination and plant height.

REFERENCES

- [1] Afzal, M., Mian, M.A., Shah, R.A., Awan, B.M., (2000): Effect of Different Sowing Times on The Performance of Dahlia (*Dahlia variabilis*). Pakistan Journal of Biological Sciences, pp. 150-152.
- [2] Ardelean, M., (2006): Principii ale metodologiei cercetării agronomice și medical veterinare. AcademicPres, Cluj-Napoca, 156 p.
- [3] Ardelean, M., Sestraș, R., (1996): Breeding plants and experimental tehnic. Issue 2, Agronomia, Cluj-Napoca, 100 p.
- [4] Beffa, M.T., (2001): Plante de balcon și grădină. Alfa Press, Bucharest, pp. 136-139.
- [5] Cantor, M., Pop, I., (2008): Floricultură - Baza de date. Todesco Press, Cluj, pp. 142-144.
- [6] Davidescu, V., Davidescu, D., Milițiu, A., (1992): Din secretele florilor. Ceres Press, Bucharest, 208 p.
- [7] Fălticeanu, M., (2008): New varieties of annual and perennial flower species, suitable for "bio" cultivation, created and certified at V.R.D.S. Bacău. Revista Lucrări științifice a Universitatii de Științe Agricole și Medicina Veterinara "Ion Ionescu de la Brad" Iași, seria Horticultură, 51: 823-825.
- [8] Hartmann, H.T., Kester, D.E., (1989): Plant Propagation. 4th Ed.. Prentice-Hall, Inc., Englewood Cliffs, N.J., U.S.A., pp: 699 -700.
- [9] Hessayon, D.G., (2007): Expert în cultivarea florilor. Alfa Press, Bucharest, pp. 60-61.
- [10] Khan, M.A., Gul, B., (2002): Some ecophysiological aspects of seed germination in halophytes. pp: 56-68. In Liu, X., Liu, M., (eds.): Halophyte Utilization and Regional Sustainable Development of Agriculture. Metereological Press, Beijing.
- [11] Mishra, H.P., Singh, K.P., Mishra, G.M., Prasad, B., (1990): Performance of some *Dahlia variabilis* varieties under late planted conditions in calcareous soil of plains, Haryana, Journal of Horticultural Sciences, 19: 284-290.
- [12] Moore, J.P., Harrison, M., Monfries, M., Simon, H., Clarke, C., Best, R., Whelen, R., Simpson, J, Massey, M., Bradley, R., (1985): The complete Australian Gardner. Bay. Books, Sydney and London, pp: 344, 416 - 419.
- [13] Șelaru, E., (2007): Cultura florilor de grădină. Ceres Press, Bucharest, pp. 831.
- [14] Toma, F., (2005): Îngrijirea și pregătirea pentru iarnă a speciilor floricole din parcuri și grădini. Lucman Press, Bucharest, 287 p.
- [15] Toma, F., (2009): Floricultură și Artă florală, vol. IV - Specii utilizate pentru decorul parcurilor și grădinilor, Invel Multimedia, Bucharest, 317 p.

Submitted: 10 April 2010

Accepted: 28 Aprilie 2010

Analele Universității din Oradea – Fascicula Biologie

<http://www.bioresearch.ro/revistaen.html>

Print-ISSN: 1224-5119

e-ISSN: 1844-7589

CD-ISSN: 1842-6433