ECOLOGICAL REQUIREMENTS AND SUBSTRATES USED IN THE CULTIVATION OF PELARGONIUM SPECIES

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Abstract. *In the paper, we make a brief presentation of the ecological requirements of the Pelargonium species under the climatic conditions of Timiş County, Romania. We present climate factors, edaphic factors, and substrates used in geranium that are grown in pots, as well as care works specific to this species. Pelargonium species has the advantage that it can be cultivated both directly in the soil in the garden and in various pots. Research took place in Giarmata, Timiş County, Romania, on a vertic chernozem, and the substrates used were both mineral and organic materials as well as various mixtures. We used fine peat (TS3), river sand, fallow soil, vermiculite, and perlite for species cultivated in pots of different sizes and garden land, compost, barbel and river sand in the case of those cultivated directly in the soil. River sand has an important role in obtaining a good soil drainage and air and water supply capacity favourable to the cultivation of this species. The compost used was obtained from various household materials and vegetable residues and was treated with calcium carbonate (dust lime). The paper has a practical goal and presents the benefits of using culture substrates to help Pelargonium species to adapt more easily to those climate and edaphic factors specific to Giarmata, Timiş County, Romania, and earlier blossom in various dishes and to prolongate the flowering period.*

Keywords*: Pelargonium, ecological requirements, climate factors, edaphic factors, substrates*

INTRODUCTION

Lately, the flower assortment has seen a continuous diversification as a result of the activity of selection and improvement of existing or introduced forms of spontaneous flora, but especially by creating new varieties and cultivars that meet desired qualities.(ANTON DOINA, 1992; BĂLA MARIA, 2003, 2017; CANTOR MARIA, IOANA POP, 2005, 2008; NICU CARMEN, ANTON DOINA, MANDA MANUELA, 2007)

Geranium is a rustic, decorative plant due to both leaves and flowers, originating in South Africa, with a long flowering period which makes it one of the most widespread plants. (TOMA FLORIN, 2009; MIHUȚ AURELIA, RADOS DENISA, CIOLAC VALERIA, MIHUȚ CASIANA, 2019, AURELIA MIHUȚ, PAȘCALĂU C., CASIANA MIHUȚ, MIRCOV V.D., 2018; AURELIA MIHUȚ, FLORINA NICOLETA BOJINESCU, CASIANA MIHUȚ, VALERIA CIOLAC, 2018; ȘUMĂLAN RADU, 2009)

In the Victorian period, when flower bouquets constituted the means of communication, geranium received various associations and meanings. In Poland, they are a symbol of hope and among the few flowers that grow on former industrial lands with polluted air, being highly appreciated for reconditioning the environment. (MIHUȚ CASIANA, RADULOV ISIDORA, 2012; MIHUȚ CASIANA, OKRÖS A., IORDĂNESCU OLIMPIA, 2012; MIRCOV V.D., NICHITA IULIANA ANCA, CIOLAC VALERIA, OKROS A., MIHUT CASIANA, COZMA ANTOANELA, DUDAS M., 2019; L. NIȚĂ, K. LAȚO, SIMONA NIȚĂ, ALINA LAȚO, CASIANA MIHUȚ, ANIȘOARA DUMA COPCEA, 2012; SAIDA FEIER DAVID, NICOLETA MATEOC –SÎRB, TEODOR MATEOC, CRISTINA BACĂU, ANIȘOARA DUMA COPCEA, CASIANA MIHUȚ, 2020)

MATERIAL AND METHODS

The *Pelargonium* species can be cultivated on various culture substrates, starting from garden earth (if it is rich enough in organic matter), from spring to autumn, to the use of mixtures formed by fallow soil, peat, manure, compost, as well as various mixtures thereof with perlite, vermiculite, sand, etc. Diameter pots ranging from 18 to 60 cm were used for species cultivated in substrates and fallow soil in mixture with garden earth, compost, manure and river sand for those directly grown on the ground.

RESULTS AND DISCUSSIONS

Below, vegetation factors are presented specific to this plant and substrates used in gardens and apartments, geranium being one of the plants that can be cultivated with good results in different conditions, except for winter (end of October, beginning of May), when it needs protection.

1. Requirements for Vegetation Factors

Pelargonium species is a species capable of vegetating and blossoming throughout the year, if it has favourable conditions. Under the conditions of our country, in winter, this species pass through a rest period, when a cool space must be ensured and watering is reduced.

As for light and temperature, especially in terms of floral induction, it has special requirements. Optimal temperature must be around 15-18°C. In some species (*grandiflorum*), the differences in heat between day and night must be larger and nocturnal temperature must be much lower, 7-10°C. Light is the one that influences the flowering process. Generally, *Pelargonium* needs well-lighted spaces, even bearing direct sunlight, but not the insolation during mid-day associated with very dry air.

Under the conditions of Giarmata, Timiş County, Romania, this species has adapted well enough both in pots and cultivated directly in the soil.

In this study we examined two species of *Pelargonium*, *P. zonale* and *P. peltatum*.

P. zonale was cultivated both in pots and soil, while *P. peltatum* was cultivated in pots, pots and in 18-60 cm flower stands. In species cultivated in pots, the substrate used was: commercial universal soil in trade, fallow soil and river sand, compost, fallow soil and sand, peat, vermiculite and fallow soil, sand and peat, perlite and peat. Three replications using different dimensions were conducted, namely: R1 – 18 cm; R2 – 24 cm; R3 – 40 cm and R4 – 60 cm and two replications in *P. zonale* were conducted, using garden soil (R5) and a mixture of garden soil, compost, sand, and manure (R6).

The highest increases were in *P. zonale* variant cultivated in the ground, where garden earth was used in mixture with compost and sand. This variant also had a more abundant flowering in May (08.05.2020) until the end of October when it was transferred to 24 cm diameter pots.

In *P. peltatum*, the best increase was in the variant 40 cm flower stands were used with two plants. Flowering began at the end of May (24.05.2020) and it ended in November. In that species, during the cold period, the pots were kept in a warm greenhouse at a temperature of 18-22°C.

Watering was done with moderate amounts of water held at room temperature, the variant with pearl and peat being the most rarely watered, once every 3-4 days even during summer, since perlite combined peat has a higher water storage capacity compared to other substrates used.

The culture substrate in all variants had a low acid reaction (pH range 6-6.5).

The care works applied were: watering according to the substrate used and the environmental temperature on a daily basis 18 and 24 cm diameter plots during the summer, where peat in mixture with river sand was also used; soil aeration, in the variants cultivated directly in the soil; application of liquid fertilizers specially designed for this species at a 50 ml dose in 10 L, applied weekly; removing wilted flowers and dried leaves and a number of phytosanitary treatments. In spring, in March, cuts were made to correct the shape of the plant and surface soil was replaced in the variants cultivated in pots.

CONCLUSIONS

Under the conditions of Giarmata, *Pelargonium* species is the species in which flowering continued throughout the year. Of the two species (*P. zonale* and *P. peltatum*), *P. zonale* had a much more vigorous development, and flowering in grounded variants was much more abundant.

P. zonale species were cultivated both in pots of various sizes and directly in the soil, while *P. peltatum* was cultivated only in 18-60 cm pots (pots and flower stands).

The most vigorous increases were in *P. zonale* that was cultivated directly in the soil (garden soil in mixture with compost and sand). In this variant, flowering was more abundant.

P. peltatum species had the best increase in the variant with 40 cm diameter pots were used. Flowering began on 24.05.2020 and ended in 28.11.2020. For the cold period, the pots were kept in a warm greenhouse at temperatures between 18-22°C.

In both varieties, the culture substrate had a low acidic reaction (pH = 6-6.5).

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