

THE INFLUENCE OF SUBSTRATUM OVER THE PRODUCTIVITY AND QUALITY OF *DIANTHUS CARYOPHYLLUS*

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Abstract

In Romania the flowers are popular and appreciated by buyers, that is why in the Greenhouse Complex of Oradea, in 2010-2012 were made experiments wich can prove the positive effect of substratum over the productivity, quality and growth of plants.

The Dianthus caryophyllus species were used in the experiment with big red flowers, hartshaped, bright – green leaves (7-12 cm/ 0.5 – 1 cm), with long stems (Georget, 1999).

Thwe beauty of flowers, the fact that they can be hold a long time in water, the high productivity make`s Dianthus a very beloved greenhouse plant, Analysing European producers and buyers opinion the Dianthus is on the 6th place, after carnations, roses, tulips, chrysanthemums and gerberas (Selaru, 2004).

Keywords: *Dianthus caryophyllus* peat, wood sail sphagnum moss, perlit, sheep manur.

MATERIALS AND METHODS

The experiment contains three version:

V1 – culture on substratum: 10% peat, 75% wood soil, 5% sphagnum moss, 5% perlit, 5% sheep manur

V2 – culture on substratum: 30% peat, 50% wood soil, 10% sphagnum moss, 5% perlit, 5% sheep manere.

V3 – cultura on substratum: 50% peat, 25% wood soil 15% sphagnum moss, 20% perlit

The thickness of culture substratum was 40 cm place don warmed barriers. Every version had 2 barriers of 60 mp eachone, accordingly 120 mp.

The substratum was fertilized the same way for each version. During the experiment the pH was maintained between 4.5 – 5.6. The plants were planted in august assuring a density of 7 plants/mp on a barrier. (Lammene, 2000). During the experiment there were made 40 fertilizations with a complex fertilizer with a concentration of 0.1 – 0.3% (Zahana, 1994).

Acording to table 1 the results were: 90.2 flowers /mp at version 1 (substratum formed by 10% peat, 75% wood soil, 5% sphagnum moss, 5% perlit, 5% sheep manur) 100.2 flowers / mp at version 2 (substratum formed by 3% peat 50% wod soil, 10% sphagnum moss 5% perlit and 5% sheep manur), 56.94 flowers/mp at version 3 (substratum formed by 50% peat, 25% wood soil, 15% sphagnum moss and 20% perlit).

Table 1

The production of *Dianthus caryophyllus* depending on the substratum's influence

| Versions | Flower productivity | | Difference | The significance on the difference |
|---|---------------------|-------------|------------|------------------------------------|
| | Absolut (flower/mp) | Relativ (%) | | |
| V1 – 10% peat, 75% wood soil, 5% sphagnum moss, 5% perlite, 5% sheep manure | 90.2 | 100 | - | - |
| V2-40% peat, 50% wood soil, 10% sphagnum moss, 5% perlite and 5% sheep manure | 100.2 | 111 | 10 | ** |
| V3 – 50% peat, 25% wood soil, 15% sphagnum moss and 10% perlite | 105.3 | 116,7 | 15 | *** |

DL 5% - 6.2

DL 1% - 8.1

DL 0.1% - 14.6

That can be seen the rise in production, on relative aspect, with 11% on V₂ and with 16% on V₃ as the V₁ variant.

On the qualitative aspect, the production of *Dianthus caryophyllus* is positively influenced by the growing substratum.

At version 1 (substratum formed by 10% peat, 75% wood soil, 5% sphagnum moss, 5% perlite, 5% sheep manure), 83% of flowers were of excellent quality, at version 2 (substratum formed by 30% peat, 50% wood soil, 10% *Sphagnum* moss, 5% perlite and 5% sheep manure), 89% of flowers were of excellent quality, at version 3.91 % of flowers were of excellent quality.

Making an economic analyzing of the 3 version the best substratum was formed by 50% peat, 25% wood soil, 15% sphagnum moss and 10% perlite. Because of the high quality of flowers and high productivity, the value of the production was 2.0 million lei/ha (version 2). The price of the flowers depends of the cutting period.

The value of the flowers was 2.1 million lei/ha (version 3). The price of the flowers depended of the cutting period.

Analising the experiences, the cost of electric energy and indirectly expences are 20% of all expences level.

Table 2

The production quality of *Dianthus caryophyllus* influenced by the growing substratum

| Variants | Productivity of cut flowers | | |
|---|-----------------------------|---------------------|-------------|
| | Total (flower/mp) | Excelent quality | |
| | | Absolut (flower/mp) | Relativ (%) |
| V1 – 10% peat, 75% wood soil, 5% sphagnum moss, 5% perlit, 5% sheep manur | 90.2 | 75 | 83 |
| V2 – 30% peat, 50% wood soil, 10% sphagnum moss, 5% perlit and 5% sheep manur | 100.2 | 89 | 89 |
| V3 – 50% peat 25% wood soil, 15% sphagnum moss and 20% perlit | 105.2 | 96 | 91 |

Table 3

Productivity, expense and profit

| Variantes | Expense (thousand lei/ha) | Productivity (thousand flowers/ha) | The value of productivity (thousand lei/ha) | Profit (thousand lei/ha) |
|---|---------------------------|------------------------------------|---|--------------------------|
| V1 – 10% peat, 75% wood soil, 5% sphagnum moss, 5% perlit, 5% sheep manur | 1456000 | 902000 | 1804000 | 348000 |
| V2 – 30% peat, 50% wood soil, 10% sphagnum moss, 5% perlit and 5% sheep manur | 1467000 | 1002000 | 2004000 675000 | 537000 |
| V3 – 50% peat, 25% wood soil, 15% sphagnum moss and 10% perlit | 1479500 | 1053000 | 2106000 | 626500 |

The profit at version 3 was higher with 89500 lei/ha as at version 2 and with 278500 lei/ha as at version 1.

CLONCUSIONS

Growing *Dianthus caryophyllus* in greenhouse is a good source of money.

Version 2 and 3 had a high productivity because of the higher percent of peat and the perlite 11% higher at version 2 (substratum formed by 30% peat, 50% wood soil, 10% sphagnum moss, 5% perlite and 5% sheep manure), and with 31% higher at version 3 (substratum formed by 50% peat 25% wood soil, 12% sphagnum moss and 10% perlite) as at version 1 (substratum formed by 10% peat, 25% wood soil, 15% sphagnum moss, 10% perlite).

The substratum with peat and perlite kept the water and thermic energy inside. The cost for obtaining the peat – perlite substratum were recovered by the profit.

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