

**THE HYDROCULTURE OF *EUPHORBIA PULCHERRIMA* WILLD.****ZSUZSA TURI - FARKAS**

Kecskemét College, Faculty of Horticulture, Department of Horticulture  
Kecskemét 6000. Erdei F. tér 1-3., Hungary  
turine.zsuzsa@kfk.kefo.hu

**ABSTRACT**

*Euphorbia pulcherrima* is getting more popular. Its decorative upper leaf rosettes are colourful (red, pink, white). This is typically a short day plant. It is a water demanding plant, so it can be used in hydroponics. This growing method is getting more importance in our days, because closed-cycle system satisfies the strictest environmental requirements. The growing was taking place in two growing houses, the French Filclair plastic house and Prmeur-1 German glass house. The purpose of the research was to compare varieties and the effect of the two growing houses. According to our findings the height of 'Freedom Red' – as a medium growth variety – exceeded that of 'Cortez Red' and 'Cortez White' varieties. The number of leaves of 'Cortez White' variety exceeded the two other varieties. As for the diameter of the rosettes 'Freedom Red' variety had the best quality, as these were the biggest. By comparing the two growing houses (Filclair plastic and Primeu-1) we found that growing houses did not influence the quality (height, number of leaves, diameter of upper leaves) of the flowers at any of the 3 varieties.

**Keywords:** variety test, plant height, number of leaves, diameter of upper leaves, growing equipment.

**INTRODUCTION**

After we terminated growing greenhouse cut flowers we started to grow poinsettia in hydroponics at the College Faculty of Horticulture of the Kecskemét College. This plant is mostly grown in pots but also used as cut flower in our days. The popularity of poinsettia is increasing. Its red, pink, and white rosette upper leaves are very ornamental. Most of the grown varieties have red rosettes. These are the most popular. Poinsettia is a typically short day plant. Due to its high water demand it is successfully grown in hydroponics. Hydroponic growing technique is spreading, because closed circulating systems satisfy the strictest environmental demands. The purpose of the research was to compare different varieties in two different growing houses.

Poinsettia is originated in Central America highlands, in humid, tropic climate. The plant height can be 3-4 meter. It is a bush or a tree. It is a monoecious, bisexual, with very reduced flowers at the shoot tip. The upper leaves are toning from the end of November till the end of December in our light conditions (IMRE, 1999). It is an obligate short day plant. Its critical light time is 12 hour. The period of reaction time, from the beginning of short day until booming, is 8-11 weeks depending on variety (GYARMATHY, 1998). 18-24 °C is its optimal temperature demand (OSZKÓNÉ, 1979; IMRE, 1999; DALLMANN, WARTENBERG, 1999; SCHMIDT, 2002). According to NAGY (1986) in generative stage 18 °C is enough. It needs a continuous water supply, but is sensitive to slack water. It demands light, slightly acidic (6,0-6,5 pH) growing substrate. It demands nutrients (MERZ, 1999). It is especially sensitive to the lack of Molybdenum in low pH (IMRE, 1999). It tolerates medium nutrient concentration (NAGY, 1986). This plant is propagated in a vegetative way, by shoot cuttings. The timing of cutting determines the quality of the goods. Retardants (Alar, CCC, Basacel) can be used to have a more compact plant with more branches. According to the latest findings a better branching can be achieved without nipping.

Erwinia and Pytium and Rhizoctonia bacteria can infect poinsettia (MERZ, 1999). Its most common pests are glasshouse whitefly, wooly scale insect and the larvae of Lycoriella

modesta in the soil (NAGY, 1986; GYOLLAINÉ, 1999). Trichogamma can be used against glasshouse whitefly resistant races as a biological control (KREBS, 1993).

## MATERIAL AND METHOD

We tested 3 varieties in our research:

- 'Freedom Red': red upper leaves, medium growth. Its reaction time is 6-7 weeks.
- 'Cortez Red': red upper leaves, compact growth. Its reaction time is 8 weeks.
- 'Cortez White': white upper leaves, compact growth. Its reaction time is 8 weeks.

Two types of growing houses were used: French Filclair plastic and East-German Primer 1 glass house. Poinsettia rooted cuttings were planted in 12 cm diameter pots in the first decade of August. Chopped Polyurethane-ether foam was used as growing substrate. Potted plants were placed in beds which were padded by plastic foil. Nutrient solution was circulated in a closed system between the nutrient solution container and the beds. As we stated it before closed circulation systems meet the strictest environmental requirements. Volldünger fertilizer was used for nutrient supply. During growing we continuously measured and adjusted EC and pH of nutrient solution. We set the pH to 5.0-6.5 and the conductivity to 2,5-3,5 mS/cm. Plant protection was made similar to conventional growing method. Plants were raised without retardants and nipping. The development of the plant, plant height, number of leaves and the diameter of rosettes before marketing were measured weekly. The research was repeated in 4 times. During the research we compared the effect of applied varieties and growing houses.

## RESULTS

In poinsettia hydroponics the height of 'Freedom Red' variety, that is a medium growth variety, exceeded that of the 'Cortez Red' a 'Cortez White' varieties (*Table 1*). The later varieties had a compact shape.

**Table 1. Poinsettia height in different growing houses  
Kecskemét, year 2010**

| Dates of measurements | average plant height ( cm ) |       |              |       |                |       |
|-----------------------|-----------------------------|-------|--------------|-------|----------------|-------|
|                       | 'Freedom Red'               |       | 'Cortez Red' |       | 'Cortez White' |       |
|                       | plastic                     | glass | plastic      | glass | plastic        | glass |
| 08 09                 | 13                          | -     | 11           | -     | 11             | -     |
| 15 09                 | 15                          | -     | 13           | -     | 13             | -     |
| 22 09                 | 17                          | -     | 15           | -     | 15             | -     |
| 29 09                 | 20                          | -     | 18           | -     | 18             | -     |
| 06 10                 | 22                          | -     | 20           | -     | 21             | -     |
| 13 10                 | 24                          | 24    | 20           | 23    | 23             | 22    |
| 20 10                 | 26                          | 25    | 23           | 23    | 24             | 23    |
| 27 10                 | 30                          | 28    | 26           | 27    | 27             | 26    |
| 03 11                 | 33                          | 33    | 29           | 31    | 30             | 29    |
| 10 11                 | 37                          | 38    | 31           | 33    | 32             | 31    |
| 17 11                 | 38                          | 40    | 32           | 34    | 31             | 31    |
| 24 11                 | 38                          | 40    | 33           | 34    | 33             | 32    |

Source: TURI – FARKAS (2010)

As far as leaf development is concerned 'Cortez' variety had the most compact shape.

They formed the most leaves and had a bushy shape (*Table 2*). 'Cortez White' had the most leaves exceeding the two others.

**Table 2. Poinsettia leaf number in to different growing houses  
Kecskemét, year 2010**

| Dates of measurements | average number of leaves (peace) |       |              |       |                |       |
|-----------------------|----------------------------------|-------|--------------|-------|----------------|-------|
|                       | 'Freedom Red'                    |       | 'Cortez Red' |       | 'Cortez White' |       |
|                       | plastic                          | glass | plastic      | glass | plastic        | glass |
| 08 09                 | 15                               | -     | 14           | -     | 15             | -     |
| 15 09                 | 17                               | -     | 16           | -     | 16             | -     |
| 22 09                 | 20                               | -     | 19           | -     | 19             | -     |
| 29 09                 | 22                               | -     | 22           | -     | 21             | -     |
| 06 10                 | 24                               | -     | 36           | -     | 50             | -     |
| 13 10                 | 26                               | 24    | 41           | 38    | 61             | 46    |
| 20 10                 | 27                               | 26    | 41           | 41    | 64             | 49    |
| 27 10                 | 29                               | 30    | 44           | 45    | 66             | 58    |
| 03 11                 | 31                               | 32    | 49           | 49    | 75             | 63    |
| 10 11                 | 33                               | 34    | 55           | 58    | 83             | 72    |
| 17 11                 | 34                               | 37    | 58           | 63    | 91             | 58    |
| 24 11                 | 34                               | 38    | 60           | 66    | 102            | 88    |

Source: TURI – FARKAS (2010)

As far as the upper leaf rosettes' diameter is concerned 'Freedom Red' was the most favourable (*Table 3*). These leaves were the biggest of all the varieties.

**Table 3. The diameter of decorative poinsettia upper leaves in different houses  
Kecskemét, year 2010**

| diameter of upper leaves ( cm ) |       |              |       |                |       |
|---------------------------------|-------|--------------|-------|----------------|-------|
| 'Freedom Red'                   |       | 'Cortez Red' |       | 'Cortez White' |       |
| plastic                         | glass | plastic      | glass | plastic        | glass |
| 30                              | 30    | 26           | 24    | 23             | 22    |

Source: TURI – FARKAS (2010)

## CONCLUSIONS

When the two houses (Filclair plastic and Primer-1 glass) are compared (see in *Tables 1-2-3*) we found that the type of house only slightly influence flower quality (height, number of leaves, diameter of upper leaf rosette).

Only two variants were considered: growing house and variety. 'Freedom Red', a variety of medium growth, had higher shoots than that of 'Cortez'.

'Cortez Red' and 'Cortez White' varieties had a compact growth, but an intensive development of foliage.

'Freedom Red' had the largest bracts diameter. Growing houses had no significant effect on the quality attributes of flower.

This growing method makes it possible to grow not only cut flower and potted plants, but also mother plant in hydroponics. Furthermore it makes possible to further utilize foam mediums that were used in a previous cut flower growing.

**REFERENCES**

- DALLMANN, M., WARTENBERG, S. (1999): Qualitätsplus durch weißen Tischbelag. *Deutscher Gartenbau* 20. 18 - 19 p.
- GYARMATHY S. (1998.) Mikulásvirág in Czáka Sarolta: Cserepes dísznövények. Mezőgazda Kiadó, Budapest. 112 - 126 p.
- GYOLLAINÉ MERÉNYI A. (1999): A mikulásvirágról. *Kertészet és Szőlészet* 30. 12 - 13 p.
- IMRE Cs. (1999): A mikulásvirág termesztése in Schmidt Gábor: Növényházi dísznövények termesztése KÉE Kertészeti Kar Budapest, Jegyzet. 147 - 151 p.
- KREBS, E - K. (1993): Bemisia in Poinsettien biologisch bekämpfbar. *Gartenbau magazine* 58 - 60 p.
- MERZ, F. (1999): Poinsettien. *Deutscher Gartenbau* 26. 34 - 35 p.
- NAGY B. (1986): Növényházi dísznövények termesztése és hajtatása. Mezőgazdasági Kiadó, Budapest 319 - 324 p.
- OSZKÓNÉ SIPOS E. (1979): A mikulásvirág. Mezőgazdasági Kiadó, Budapest 216 p.
- SCHMIDT G. (2002): Növényházi dísznövények termesztése. Mezőgazda Kiadó, Budapest, 626 p.