

The Evaluation of Grafting Success Rate in Some Rose Cultivars by the Application of Treatments with Ceraltin®

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Abstract. The rose is a very popular plant species, it has an outstanding ornamental value and it has been grown since ancient times (Palocsay and Wagner, 1966). Tree roses are represented by the cultivars that are trained with trunk and stem or they are obtained by grafting some erect or even climbing cultivars, in the latter case weeping roses would result (Mateescu, 2002). The research was carried out in the experimental field of the Floriculture Laboratory in the framework of the Fruit Research Station Cluj. The aim of the research was to contribute to the increase of the success rate in the process of obtaining tree roses, by the use of Ceraltin® for increasing the grafting compatibility and better subsequent plant growth. The research was carried out in the years 2009-2011, as a series of bi-factorial experiments, in which the two factors, the cultivar and treatment with Ceraltin®, each had four, respectively two graduations. The experimental results were processed by the analysis of variance, by the “Duncan” test (Ardelean *et al.*, 2002). Based on the experimental data, we conclude that the highest grafting success rate, in all the rose cultivars we studied, was obtained as a result of using the Ceraltin® for increasing grafting compatibility. The statistical rate of the effect of the treatment with the Ceraltin® is very high (82%) as compared to the effect of soil (16%), whereas the effect of interaction of the two factors is only 2 % of the total effects.

Keywords: tree rose, grafting, Ceraltin®, rootstock

INTRODUCTION

Due to its great availability, the rose has accompanied people in everyday life by its decorative use in parks, gardens and rooms, by its presence in the most solemn moments in life, in nutrition, perfumery, natural medicine, literature, art, architecture and many other domains (Selaru, 1998).

Tree roses are very appreciated and cultured more and more in gardens and public parks (Cainrs, 2000).

Among the cultivars that are grafted on trunks there are the *Thea Hybrida*, *Floribundas* (seldom *Polyanthes*) and climbing roses with soft branches (for weeping or pendulous roses). The production of tree roses takes three or four years. According to the four year procedure, in the first two years the rootstock trunks are formed, and in the following two years these are transplanted, grafted and they form a crown (Wagner, 2002).

The aim of the research was to contribute to the increase of grafting success rate in the process of obtaining tree roses by the use of Ceraltin® for increasing grafting compatibility and better subsequent plant development.

MATERIALS AND METHODS

The research was carried out in the experimental field of the Floriculture Laboratory in the framework of the Fruit Research Station Cluj in a period of three years (2009-2011).

The grafting method with detached branch (simple copulation) was used, in the first decade of May. The Ceraltin® was applied immediately after grafting.

Rootstock description. *Rosa canina* „inermis” has good vigour, it forms lax bushes, with brownish-green branches. The leaves are middle-sized, mat, grayish green, the flowers are pale pink towards white. It has a long growing period, it can be grafted until September. The root system is rich. It can be used for all types of roses. It is one of the most used rootstocks.

The description of the rose cultivars that were studied:

1. „Golden Elegance” - it forms vigorous bushes, 100/50 cm, with long, reddish branches. The flowers are large and involutes (30 petals), the buds are elongated, they open slowly and in spiral, they are golden yellow, sometimes with pale pink nuances and weak perfume. This cultivar was bred at the Fruit Research Station Cluj, homologated in 1995.
2. „Foc de Tabără”- it has average vigour, 70/45 cm, with semi-erect branches; average-sized, dark green, shiny leaves. The flowers are involutes (30 petals), they are large, grouped into clusters, the petals are bright red and do not become discoloured and are odourless. This cultivar was bred at the Fruit Research Station Cluj, homologated in 1970 and it is very widespread in Romania.
3. „Afrodita”- it is a shrub rose cultivar with great vigour. The flowers are: involute, the petals are magenta-pink in colour, they are perfumed, very good disease resistance, good frost resistance. This cultivar was bred at the Fruit Research Station Cluj, homologated in 1995.
4. „Porta Nigra” - it forms bushes of average vigour, 60-80/45 cm, robust and compact. The flowers are large, involute (40-50 petals), the buds are pointed-spherical, the petals are carmine-red, shiny and intensely perfumed, the odour being similar to that of fresh apples (Desimpelaere, 1997). It was obtained in France in the year 1992.

The experiment was organized in randomized blocks, with three repetitions, nine rose plants/ repetition and it was bi-factorial.

Factor A – the cultivar with 4 graduations:

- a₁ – „Golden Elegance”
- a₂ – „Foc de tabără”
- a₃ – „Porta Nigra”
- a₄ – „Aurora”

Factor B – The treatment variant, with two graduations:

- b₁ – grafting without treatment with the Ceraltin®
- b₂ – grafting with treatment with the Ceraltin®

By combining the experimental factors 6 experimental variants resulted, which were placed in three repetitions, each repetition including nine plants, so that 162 grafted roses were studied.

The results were processed by the analysis of variance, by the “Duncan” test (Ardelean *et al.*, 2002).

RESULTS AND DISCUSSION

The results regarding the influence of the two experimental factors upon grafting success in the rose cultivars that we studied are presented in Tab. 1.

Tab. 1

Grafting success rates in the rose cultivars, with the application of treatments with Ceraltin® s
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Factor B	Factor A				Average B
	a ₁	a ₂	a ₃	a ₄	
b ₁	88.3e	87.9f	86.8g	84.8h	86.9N
b ₂	97.4a	95.1c	94.7d	96.8b	96.0M
Average A	92.9A	91.5B	90.8C	90.8C	

SD 5% for two means = 3.6-3.8%

SD 5% for two means = 2.5%

SD 5% for two means of interaction = 5.1-5.4%

Note: The difference between any two values followed by at least one common letter is not significant (Duncan test, $p < 0.05$).

The data in Tab. 1 show that the highest grafting success rate was achieved in the Golden Elegance cultivar (92.9%), with a difference significantly superior to all the other cultivars. Porta Nigra and Aurora cultivars (90.8 %) are situated at a difference significantly inferior to the other variants resulted by combining the experimental factors.

The best results were obtained by applying the treatment with the Ceraltin® in the process of grafting, as in this case there was a 96.0 % success rate, compared to the variant where grafting was done without applying the Ceraltin® (86.9 %).

Regarding the interaction of the two experimental factors presented in Tab. 1 it is evident that the variant represented by cultivar Golden Elegance and the application of the Ceraltin® treatment for grafting (97.4 %) is significantly superior to all the other variants, this expression resulting from the combination of the two experimental factors. The poorest results were obtained in the Aurora cultivar by grafting without applying the Ceraltin® (84.8%).

The statistical rate of the effects of the cultivar (Factor A), of the treatment with the Ceraltin® (Factor B) and that of the interaction between A x B, the effect of the years of experimentation and the interaction between these factors and the years of experimentation (uncontrollable factors) upon the grafting success rate in roses are presented in Fig. 1.

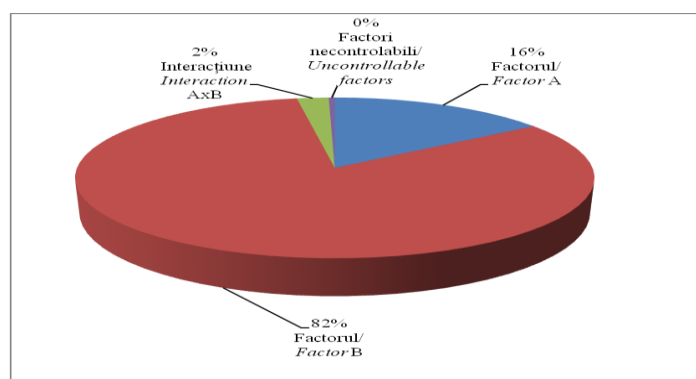


Fig. 1. The importance of the effects of experimental factors and the interaction between this factors upon the grafting success rate in roses

The effect of the treatment with Ceraltin® upon this characteristic is very strong (82%). The cultivar had a far greater influence (16%) than that of the interaction between the experimental factors (2%).

The statistical rate of the effect of the interaction between the factors and the years of experimentation leads to the conclusion that the aforementioned did not interact in favour of obtaining superior results regarding the grafting success rates.

From Figure 1 it can be observed that the influence of the uncontrollable factors upon the characteristic analysed in the experiment was of 0 %. This shows that the error did not influence the significance of differences.

CONCLUSIONS

Based on the analysed data we can conclude that the highest grafting success rate was obtained as a result of the use of the Ceraltin® for increasing grafting compatibility in all the rose cultivars we studied. The interaction between the analysed factors, cultivar- Ceraltin® treatment, yielded minimal values (2%).

As a result, it is recommended to extend the usage of the Ceraltin® for increasing grafting compatibility and subsequent plant development, in the production process of tree roses.

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