

EFFECTS OF THE ROOTSTOCK *ROSA CANINA* VAR. *LAXA* ON THE GROWTH AND DEVELOPMENT OF FIVE MINIATURE ROSE CULTIVARS

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ABSTRACT

Generally, in Republic Kosovo rose propagation by budding resulted in about 100-130 thousand seedlings during a year. In Kosovo the most frequent rootstocks for roses are species *Rosa canina* 'Laxa'. Miniature varieties of roses (*Rosa hybrida* L.) are among the most important garden plants in our country.

The goal of this research was to study the level of compatibility for some Miniature Roses, a same rootstock of *Rosa canina* 'Laxa'.

Roses are conventionally propagated by cutting, budding, grafting and layering. Cutting and budding would be the simplest way to increase the desirable rose varieties. Plant propagation by grafting is one of the oldest horticultural practices and one that has intrigued the gardening and non-gardening public alike.

In this study there are included five miniature rose cultivars: 'Zwergkönig', 'Roulettii', 'Bianco', 'Fire Princess', 'Dresden Doll'. The experiment was conducted during 2010-2011, tested in a commercial farm in Prizren, Kosovo. During the vegetation these parameters were measured: number and diameter of roots, length of flower stems, diameter of structural shoots, number of flowers etc.

There was found a significant level of compatibility between rootstock with all tested cultivars.

Key words: miniature roses, rootstock, grafted, compatibility

INTRODUCTION

Traditionally, roses are supplied to the grower as grafted plants in which the cultivar is grafted onto a rootstock. Grafting is a technique in which parts of different plants are physically combined and continue growth as a single plant (HARTMANN AND KESTER, 2002).

The part of the graft combination which constitutes the upper part of the plant is referred to as the 'scion'. Rootstock may affect (either directly or indirectly) scion characteristics such as plant architecture, vigour, nutrient status, flower yield and quality of flowers (DE VRIES AND DUBOIS, 1996).

Miniature varieties of roses (*Rosa hybrida* L.) are among the economically most important garden plants in the Republic of Kosovo. Generally, in our country rose propagation by budding resulted in about 100-130 thousand seedlings during a year.

In Kosovo the most frequent rootstock for roses is *Rosa canina* cultivar 'Laxa' (BALAJ, 2011). For miniature rose propagation, garden cultivars are propagated by T-budding. Budding is a recognized commercial method of propagating roses throughout the world.

Interest in the use rootstock was in the first place in establishing the rapid economic multiplication of desirable scion cultivars that are unable to grow on their own roots.

For roses rootstock is used for several reasons, including economical aspects of propagation, flower production, flower quality, adaption to different kinds of soil and disease resistance (DE VRIES, 2003).

The number of axillary buds per plant and the number of released buds, but also the readiness to break out and, thereafter, the time required to develop a harvestable flower, are important

factors in determining the total amount of flowers produced. Production of roses depends on cultivar, rootstock and growing conditions. The use of rootstocks can be highly positive compared with their own roots, especially in the open (VECERA, 1967).

The goal of this research was to study the level of compatibility for some Miniature Roses, a same rootstock of *Rosa canina* 'Laxa'.

MATERIAL AND METHODS

In this study five miniature rose cultivars are included: 'Zwergkönig', 'Roulettii', 'Bianco', 'Fire Princess', 'Dresden Doll'. The experiment was conducted during 2010-2011, in a commercial farm in Prizren, Kosovo.

Propagation by grafting was conducted in August, in the form T-budding, at a height of 5 cm above soil level, on a same rootstock of *Rosa canina* 'Laxa'. The plants were planted in soil in raised beds in April, on a commercial farm. The grafted plants and the own rooted ones were planted in open fields in distance 70 x 25 cm. The scheme of experiment was a randomized complete block design with four replications. During the vegetation these parameters were measured: plant height, number and diameter of roots, length of flower stems, diameter of shoots, number of flower stems, number of flowers, etc. Kosovo is located in the central part of Balkan Peninsula. It lies between 41°50'58" and 43 ° 51'42" of northern geographic latitude and 20°01'3" and 21°48'02" of eastern geographic length. Kosovo has an area of 10,908 km². The average annual temperatures in Kosovo are 10 °C, with the minimum temperature of -27.2 °C and maximum of 39.2°C.



Figure 1. Produced seedlings from *Rosa canina* 'Laxa'

RESULTS AND DISCUSSION

Diameter of structural shoots, number and colour of flowers

Regarding the diameter of structural shoots according to the cultivars and influence by the rootstocks *Rosa canina* 'Laxa', the highest diameter was achieved with the cultivar 'Bianco' (5.5 mm), while the lowest diameter with the cultivar 'Fire Princess' (4.1 mm). The other cultivars were between these specified values. The diameter of flowers is a feature of the

cultivar, from our study about the mentioned rootstocks we have achieved the highest value in cultivar ‘Zwergkönig’ with 4.5 cm and the lowest one in cultivar ‘Bianco’ with a diameter of 3.9 cm. During the growth of shoots, the plant produces flowers even in the first year after grafting. This number is different, the highest is achieved in ‘Rouletti’ with 14.2 flowers and the lowest in ‘Fire Princess’ with 10.7 flowers per plant (*Table 1*).

Table 1. Diameter of structural shoots (mm), diameter flowers (cm), number of flowers

Cultivars	Diameter of structural shoots (mm)	Diameter of flowers (cm)	Number of flowers	Colour
‘Zwergkönig’	5.3	4.5	12.5	red
‘Roulettii’	4.8	4.3	14.2	pink
‘Bianco’	5.5	3.9	11.5	white
‘Fire Princess’	4.1	4.4	10.7	red
‘Dresden Doll’	5.3	4.1	12.8	yellow

Length, number and diameter of roots

The highest length of roots in the two years of study has been achieved at the cultivar ‘Zwergkönig’ (31.20 cm), while the lowest one at the cultivar ‘Roulettii’ (27.4 cm), the average values of other cultivars being between them. The highest diameter of roots was reached at the ‘Roulettii’ (6.72 mm), the lowest one at the cultivar ‘Fire Princess’ (5.78 mm). The number of secondary roots is different, according to cultivars and varies between the highest at the cultivar ‘Zwergkönig’ with 36.88 and the lowest at ‘Dresden Doll’ with 31.33 roots per plants (*Table 2*).

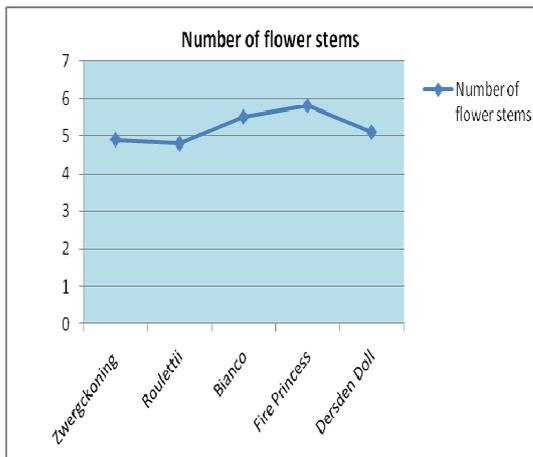
Table 2. Length, number and diameter of roots

Cultivars	Length(cm)	No. of roots	Diameter (mm)	Secondary roots
‘Zwergkönig’	31.20	5.11	6.12	36.88
‘Roulettii’	27.41	6.21	6.72	34.22
‘Bianco’	28.35	6.32	6.11	38.45
‘Fire Princess’	30.34	5.35	5.78	34.55
‘Dresden Doll’	31.08	5.55	6.32	31.33

Number of flower stems

To the roses it is important to be established an optimal number of flower stems (3-5) with a diameter of 4-5 mm, serving during the pruning to form the sprouts production area for the coming year. The biggest number of flower stems as the average of two years of study, we had at the cultivar 'Fire Princess' with 5.8 flower stems per plants, and the lowest at the cultivar Roulettii with 4.8, while the other cultivars were between the values mentioned above (Figure 2a).

a)



b)

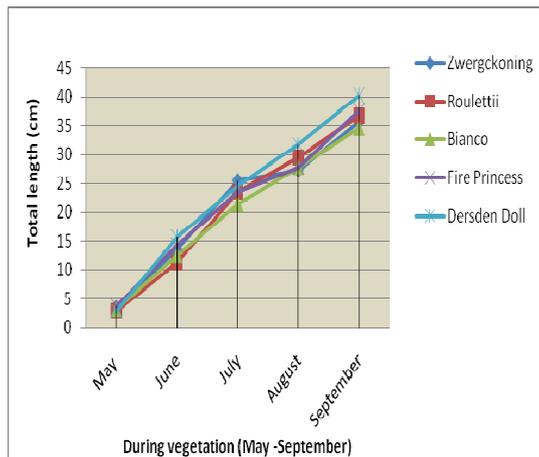


Figure 2. The number of flower stems (a) and the total length (cm) of flower stems (b) influenced by the rootstock *Rosa canina* 'Laxa'

Total length (cm) of flower stems as influenced by the rootstock

The growth of flower stems during the vegetation was various depending on cultivars. The highest growth was the cultivar Doll Dersden with (36.51 cm) and the lowest one was to Bianco with (27.92 cm). Other cultivars are in the interval between the values mentioned above (Figure 2b).

CONCLUSIONS

There was found a significant level of compatibility between the rootstock *Rosa canina* 'Laxa' and all tested miniature rose cultivars. This confirms the ability of using this rootstock in large scale commercial rose production in Kosovo climatic and soil condition. Significant mutual effects were also found between the rootstock and the commercial varieties according to the length and diameter of the flowering shoots, flower diameter of both the rootstock and the scion.

Rootstocks has a great effect in adaptation to certain pH values and drainage conditions of the soil, climatic factors, disease resistance, plant longevity, productivity and flower quality.

Therefore, recommend this kind of rootstock for the growing of miniature roses to be used in the future. However, the spreading other kind of rootstock is important in our country.

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