Results Concerning the Fusion Capacity of Some Cucurbits Grafted by Different Techniques

Mădălina DOLTU^{*}, Marian BOGOESCU, Dorin SORA

Department of Horticultural Cultures in Protected Spaces, Research and Development Institute for Processing and Marketing of Horticultural Products – Horting, 1A Intrarea Binelui Street, District 4, 042159, Bucharest, Romania;

^{*}Corresponding author, e-mail: *doltu_mada@yahoo.com*

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ABSTRACT

The research was realized in 2014, in the Department of Horticultural Cultures in Protected Spaces at the Horting Institute of Bucharest, Romania. This aimed to study the fusion capacity of some cucurbits grafted by different techniques (one-cotyledon [1], cleft – V shaped [2] and by approach [3]) in order to emphasise the best grafting method according to survival rate data. The experience was conducted on two F_1 hybrids (*Cucurbita* type) as rootstocks – ‘TZ148’ [T] and ‘Shintoza’ [S] and three F_1 hybrids as scions – ‘Mirabelle’ [M] (cucumber), ‘Vasko’ [V] (watermelon) and ‘Gina’ [G] (melon). The best grafting method was with one-cotyledon, followed by cleft (V shaped) and by approach. The grafting method is very important for a successful grafting.

Keywords: *Cucurbitaceae, grafting, methods, survival rate.*

INTRODUCTION

Grafting of cucurbits was briefly described in a seventeenth century book in Korea; this method is based on the fusion between scion and rootstock (Edelstein, 2004). Grafted vegetable culture is a common practice in Japan, Korea, China but it was also developed in several European countries like Spain and Italy (Lee, 1994). It also became a common production process in USA (King *et al.*, 2008). Grafting of vegetables is new in Morocco where cucurbits grafting started in 1998 (Besri, 2008). In Romania, the grafting started after 1973 (Tomescu, 2005) and it developed because the soil borne pathogens are a serious problem, that can be avoided by using resistant rootstocks.

AIMS AND OBJECTIVES

The research has aimed to study the fusion capacity of some cucurbits grafted by different techniques. This strategy led to the choice of best grafting method. If the diameters of the plants can be correlated, grafting can be successfully performed.

MATERIALS AND METHODS

The research was conducted in a greenhouse (plastic house) of the Horting Institute of Bucharest, in 2014. The experience was conducted on two F_1 hybrids (*Cucurbita* type) as rootstocks – ‘TZ148’ [T] and ‘Shintoza’ [S] and on three F_1 hybrids as scions – ‘Mirabelle’ [M] (cucumber), ‘Vasko’ [V] (watermelon) and ‘Gina’ [G] (melon); the experimental variants were [M]x[T] and [S] / [1] – control variant, [M]x[T] and [S] / [2], [M] x[T] and [S] / [3]; [V]x[T] and [S] / [1], [V]x[T] and [S] / [2], [V]x[T] and [S] / [3]; [G]x[T] and [S] / [1], [G]x[T] and [S] / [2], [G]x[T] and [S] / [3]; each variant contained 1000 grafted plants. After grafting, the plants were kept 7 days in plastic tunnel with 25°C and 80% relative air humidity prior to determine the survival rate. Three grafting methods (one-cotyledon; cleft – V shaped and by approach) were used. The grafting methods were evaluated by fusion capacity of cucurbits (survival rate), according to the Duncan test.

Fig. 1. Fusion capacity at cucurbits grafted by different techniques (photos source: Lee *et al.*, 2010).

RESULTS AND DISCUSSION

The grafting method has influenced the survival rate. The survival rate was determined 7 days after grafting, on plants with one true leaf, 4-5 mm diameter and 5-7 cm height. Some differences were obtained between the variants (Fig. 1).

The best grafting methods were with one-cotyledon and cleft (V shaped), followed by approach. Duncan test shows a significant difference between grafting techniques, even though, there was no significant difference between grafting with one-cotyledon and cleft (V shaped) grafting. The species/cultivar did not influence the grafting, no significant difference between scions and rootstocks being revealed. In the specialty literature, the results concerning the best grafting method are contradictory. Vuruskan and Yanmaz, 1991, have reported different results concerning the survival rate according to the grafting method, respectively 83.3% with cleft grafting, 69.7% with whip and tongue grafting and 43.7% with lateral perforation techniques; there were no significant differences between rootstock and scions. Rojas and Riveros, 2001, have reported similar results concerning the grafting techniques, only cleft grafting being lower. Mohamed *et al.*, (2014) had the best result with by tongue approach grafting method.

CONCLUSION

The best grafting technique was with one-cotyledon, followed by cleft (V shaped) and

afterwards by approach; the species/cultivar did not influence the grafting. The grafting method is very important for a successful grafting.

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