

(*Rosa hybrida* 'Habari')

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Effect of Different Methods of Canopy Management on Quality and Yield of Greenhouse Cut-Rose (*Rosa hybrida* 'Habari')

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Abstract

The present study investigates the influence of different methods of canopy management on cut rose yield with respect to marketable quality, and compares it with the traditional system. Experiment was based on a randomized complete block design with three replications and was performed in a greenhouse in the vicinity of Tehran during one year. Treatments included types of pruning or bending of primary stem in combination with several harvesting heights. Measurement of developmental stage and growth variables (time to bud sprout, development time from bud sprout to harvest, length, diameter, fresh and dry weight of harvested flowers) was performed through the growth cycles. Results showed that the plants experiencing higher cut position yield 30% and 18% more flowers than the traditional system and the treatments in which the primary stem was pruned or bent at the base, respectively. Extra stems percentage was higher in the treatments with bending shoots when compared with pruned shoots in the traditional method (40% vs. 15%). There were no significant differences among all the treatments for grade 1, 2, and 3 flowers. Orthogonal comparison of treatment group 3 (bending primary stem above 3 buds) with treatment group 5 (bending primary stem above 5 buds) indicated that the number of days needed to bud sprout was higher in group 3 than in group 5. Number of the leaves and length of the stem left under the bending or pruning height may account for the observed results.

Key Words: Bending, Canopy management, Rose, Training system

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⁶Trellis system

¹Bending
²Blind shoot
³Canopy
⁴Arching system

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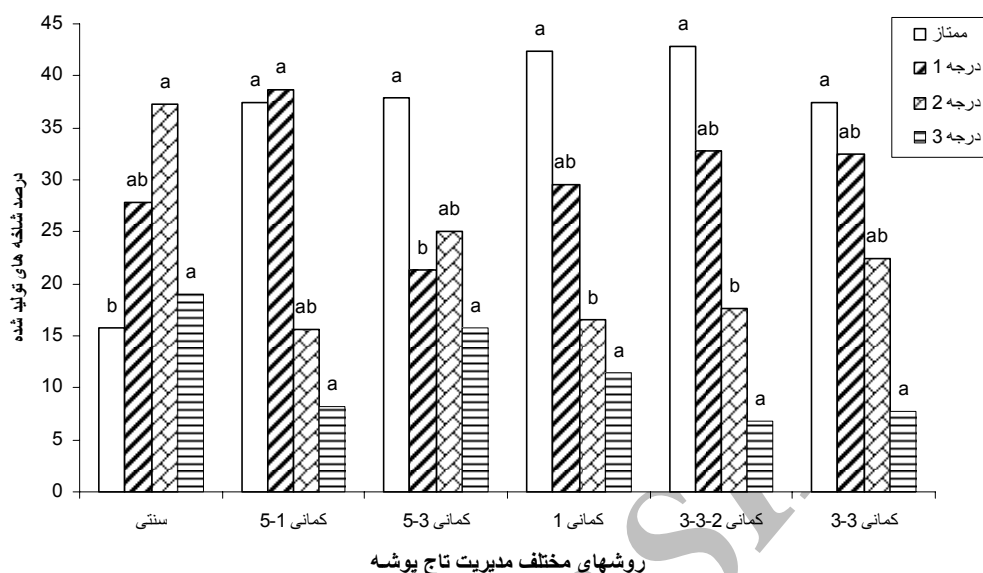
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Bredmose N, Hansen J and Nielsen J, 2001. Topophytic influences on rose bud and shoot growth and flower development are determined by endogenous axillary bud factors. Acta Hort 547: 177-183.

Byrne TG and Doss RP, 1981. Development time of 'Cara Mia' rose shoots as influenced by pruning position and parent shoot diameter. J Amer Soc Hort Sci 106: 98-100.

Champeroux A and Le Brjis M, 1995. Effect of the position of cuttings along the mother-stem (*Rosa hybrida* 'Rodriko') on degree of ramification in soilless culture. Acta Hort 424:347-349.

Kim SH and Lieth JH, 2004. Effect of shoot-bending on productivity and economic value estimation of cut-flower roses grown in coir and UC mix. Sci Hort 99: 331-343.

Kool MTN, 1996. System development of glasshouse roses. Dissertation. Wageningen Agricultural University. The Netherlands. 143 p.

Kool MTN, De Graaf R and Rou-Haest CHM, 1997. Rose flower production as related to plant architecture and carbohydrate content: effect of harvesting method and plant type. J Hort Sci 72: 623-633.

Kool MTN and Lenssen EFA, 1997. Basal-shoot formation in young rose plants: Effects of bending practices and plant density. J Hort Sci 72: 635-644.

Kool MTN and van De Pol PA, 1993. Controlling the plant development of *Rosa hybrida* 'Motrea'. Sci Hort 53: 239-248.

- Le Bris M, Champeroux A, Bearez P and Le Page-Degivry MT, 1998. Basipetal gradient of axillary bud inhibition along a rose (*Rosa hybrida* L.) stem: growth potential of primary buds and their two most basal secondary buds as affected by position and age. *Ann Bot* 81 (2), 301-309.
- Marcelis-van Acker CAM, 1993. Morphological study of the formation and development of basal shoots in roses. *Sci Hort* 54:143-152.
- Marcelis-van Acker CAM, 1994. Effect of assimilate supply on development and growth potential of axillary buds in roses. *Ann Bot* 73: 415-420.
- Morisot AP, Bearez M, Saoula B and Perez G, 1995. A down way of cutting roses: The 'Schuss' method. *Acta Hort* (424):351-353.
- Mosher JM and Turner DW, 1999. The impact of within-row spacing on the productivity of glasshouse roses grown in two planting systems. *J Hort Sci Biotech* 74 (6): 721-728.
- Ohkawa K and Suematsu M, 1999. Arching cultivation techniques for growing cut-roses. *Acta Hort* 482: 47-52.
- Pien H, Bobelyn E, Lemeur R and van Labeke MC, 2001. Optimising LAI in bent rose shoots. *Acta Hort* 547: 319-327.
- Sarkka LE and Eriksson C, 2003. Effects of bending and harvesting height combinations on cut rose yield in a dense planting with high intensity lighting. *Sci Hort* 98:433-447.
- Sarkka LE and Rita HJ, 1999. Yield and quality of cut roses produced by pruning or by bending down shoots. *Gartenbauwissenschaft* 64: 173-176.
- Shimizu-Sato S and Mori H, 2001. Control of outgrowth and dormancy in axillary buds. *Plant Physio.* 127: 1405-1423.
- Van Labeke MC, Dambre P and Bodson M, 2000. Effects of supplementary lighting and bending technique on growth, flowering and carbohydrate status of *Rosa hybrida* 'Frisco'. *Acta Hort* 515: 245-255.
- Van Winden W, 2001. Handbook for modern greenhouse rose cultivation. Applied Plant Research, Netherland
- Zieslin N and Halevy AH, 1976. Flower bud atrophy in 'Baccara' roses. VI. The effect of environmental factors in gibberellin activity and ethylene production in flowering and non-flowering shoots. *Physio Plant* 37: 331-335.
- Zieslin N and Khayat E, 1983. Involvement of cytokinin, ABA and endogenous inhibitors in sprouting of basal buds in rose plants. *P Gro Reg* 1: 279-288.
- Zieslin N and Mor Y, 1981. Plant management of greenhouse roses. Formation of renewal canes. *Sci Hort* 15:67-75.
- Zieslin N, Spiegelstein H and Halevy AH, 1978. Components of axillary bud inhibition in rose plants. IV. Inhibitory activity of plant extracts. *Bot Gaz* 139: 64-68.

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