

THE EFFECT OF PICKING TIME ON THE YIELD OF PEPPER

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Abstract - The effect of picking time on the yield of pepper

The main objective of our research work consists of determining the particular plant density suitable for spice pepper hybrids and of elaborating the trellis system and the pruning method. It is also among the aims to adjust the unheated greenhouse production technology of green pepper to the demands of spice pepper plants having a strongly different habit and to the harvestability of biologically mature fruits. We studied the effect of picking frequency and trellis type on yields and fruit quality. Containers were arranged in twin rows (90+60x32 cm plant spacing) and stems were trained vertically. Four independent replications were used. Plants had two stems and 4 of them were planted on each m². The highest yield, both in terms of fruit number and weight, was produced by the treatment, harvested in two week intervals. In terms of average fruit weight, the higher fruit weights were produced by the harvests with two week intervals.

Keywords: pepper, plastic cover, plant density, picking time, fruit quality,

INTRODUCTION

The spice pepper growing area decreased by 25% over the previous year, 2009: 2000 ha, 2010: 1500ha (FruitVeb 2010). The decrease was caused by ecological and economic changes. Due to the climate changes the risk of traditional spice pepper growing (outdoor, sowed or planted) have been increased concerning both the yield and the terms of quality. The growing risk is much higher without proper proportion of the individual living condition (temperature, light) so the quality values are not formed by a high level, as under protected and controlled conditions. Growing under plastic cover proves to be suitable production technology that can result earlier onset of picking, increased number of pickings, better quality (purity, in the first place), better (and cheaper) post harvest maturation and therefore higher quality of the ground product.

The crucial issue of production technology under plastic cover is plant density. Plant number per square meter has determinant influence on the amount of light that plants receive, on the feasibility of plant care operations and on the health condition of plants, i.e. plant protection (BOSLAND - VOTAVA, 2000). The optimal plant density could be 4-4,5-5 plants per square meter. The pruning method and the trellis system are correlated with plant density and have determinant influence on the amount of light that plants receive, on the micro-climate, on plant protection and on the number of pickings. In the intensive growing of green pepper under unheated greenhouse conditions it is the two stem pruning that has become widespread (DASGAN – ABAK, 2003; GYÚRÓS – SZŐRINÉ, 2005), in contrast to the less intensive technology where a cordon trellis system is used (ZATYKÓ, 2000, DUROVKA et al., 2006).

Since with cultivation under plastic cover higher yield can be achieved more water and nutrients are needed compared to conventional open field (extensive) crop production. Multiple picking requires a continuous plant growth. It can be reached by fertilizing several times a week or even every day with a fertilizer that provides immediately available nutrients for the plants (TERBE, 2009). When fertilizing, we need to focus on potash supply, since the formation of pigments is strongly influenced by potassium (IRINYI – KAPITÁNY, 2004).

The increased number of pickings increases total yields as with the removal of ripen fruits plants are relieved and therefore are permitted to develop and mature other fruits at high quality (DUROVKA et al., 2006).

Composition parameters are influenced by several production technology factors, starting from fertilizer application to the timing of harvest (BELAKBIR ET AL., 1998; BOSLAND - VOTAVA 2000; ANCHONDO ET AL., 2001; IRINYI – KAPITÁNY, 2004; IRINYI – SLEZÁK, 2006A,B.; GYÖKÖS ET AL., 2009).

The main objective of our research work consists of determining the particular plant density suitable for spice pepper hybrids and of elaborating the trellis system and the pruning method. It is also among the aims to adjust the unheated greenhouse production technology of green pepper to the demands of spice pepper plants having a strongly different habit and to the harvestability of biologically mature fruits. In the first year of the series of experiments over several years we studied the effect of picking frequency and trellis type on yields and fruit quality. In this publication we discuss the issues of yields and the temporal pattern of fruit ripening.

MATERIAL AND METHOD

The experiment was set up at the Experimental and Training Farm of the Faculty of Horticulture, Corvinus University of Budapest, in a high roof plastic greenhouse, using the (indeterminate) variety **Délibáb** in container growing.

Main technological parameters of the experiment:

Seedling raising was carried out in KITE trays with 96 cells (400 plants/m²), in seedling soil POT 20, with sowing date 1st April. Planting-out took place on the 20th May.

Treatments:

SP1/1: 1 plant/container, harvests at two week intervals,

SP2/1: 1 plant/container, harvests at four week intervals,

SP3/1: 1 plant/container, harvests at two week intervals, (later picking)

SP4/1: 1 plant/container, one picking,

Containers were arranged in twin rows (90+60x32 cm plant spacing) and stems were trained vertically. Four independent replications were used.

Composition of container soil: 48% fen peat, 32% fluvial sand, 10% raised bog peat and 10% perlite. We used black buckets having rigid walls, with a fill volume of 10 litres.

Plants had two stems and 4 of them were planted on each m².

Drip irrigation and fertigation were possible in accordance with plant requirements.

In the course of plant care operations after the two stem shaping pruning the main shoots were wound around the string and only branching lateral shoots were broken off above 2-3 internodes.

A preventive plant protection was used in the plastic tunnel against eventual infection by aphids, greenhouse whitefly, cotton bollworm, trips and powdery mildew. (Consequently, no yield loss from pests was observed.)

Picking dates according to the respective treatments are included in *Table 1*.

Table 1. Picking dates according to the respective treatments

Treatment	04.08.	18.08.	01.09.	15.09	29.09.	13.10.	27.10.	10.11.
SP1/1	X	X	X	X	X	X	X	X
SP2/1	X		X		X		X	X
SP3/1		X	X	X	X	X	X	X
SP4/1					X			X

At the pickings, in order to observe vegetative plant development, the longer main stem of each plant was measured.

Pickings were carried out in the state of biological maturity of fruits. The number and total weight of fruits picked per plot was registered, the healthy and ill (Ca deficient) fruits were separated from each other. In the investigations, calculations were made using the healthy fruits. Due to the prolonged vegetation in the case of SP4/1 treatment, instead of the planned single harvest we harvested twice.

RESULTS AND CONCLUSIONS

Though no statistical difference can be observed between the treatments, the highest yield, both in terms of fruit number and weight, was produced by the treatment SP3/1 (harvests at two week intervals) (*Figures 1-2*). In this treatment, yield per square meter was as high as 135 fruits in number and 3 kg in weight. In the case of the treatment SP2/1 where harvests occurred at four week intervals, fruit number was slightly increased, but yields were lower than in the former treatment. The treatment SP4/1 with one picking produced almost the same fruit number (111 fruits/m²) as the treatment SP1/1 until the same date (29th Sept) with five pickings. Considering fruit weight, it was inferior to the former two treatments, amounting to 2.3 kg/m².

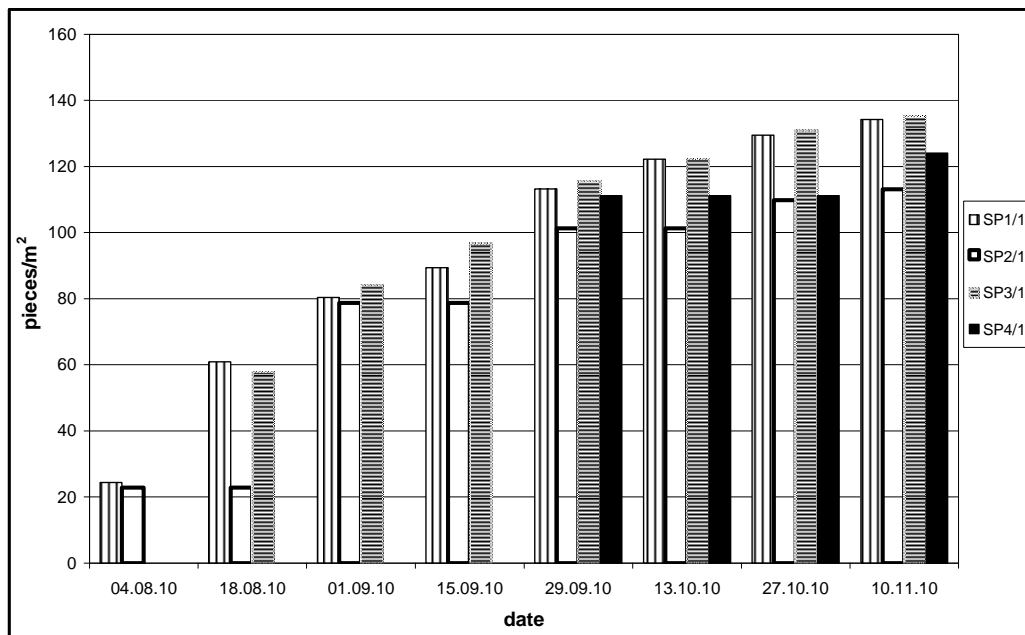


Figure 1. Effect of pickings on fruit number

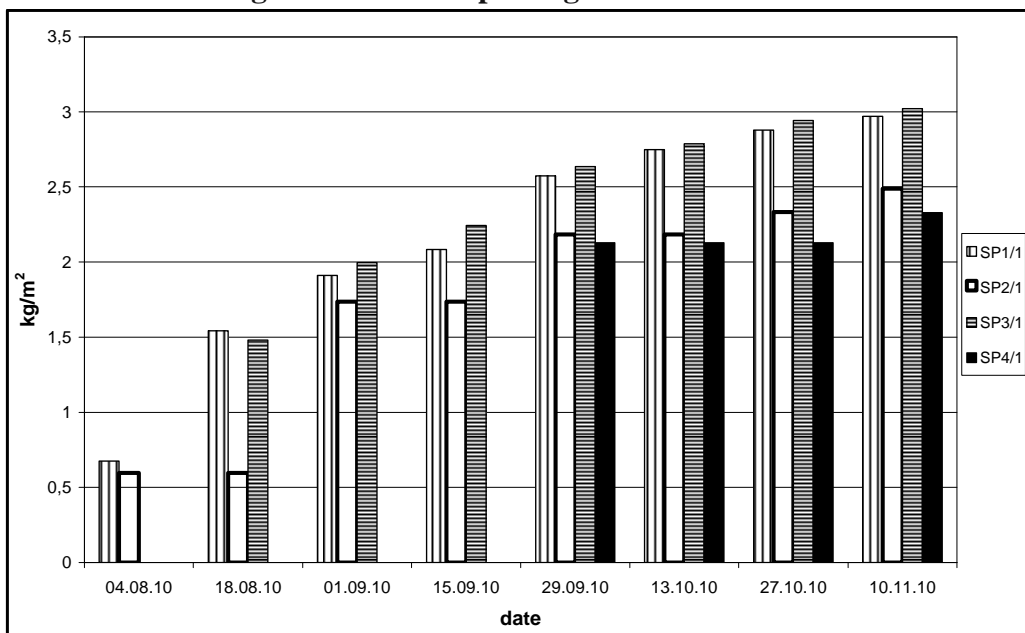


Figure 2. Effect of pickings on yields

In terms of average fruit weight, the higher fruit weights were produced by the harvests with two week intervals (SP1/1, SP3/1) (figure 3.). The fruits picked at 4 week intervals did not result in significantly lower yields, the difference was only 0,5 kg/m². Statistical results confirm that the frequency of harvests has strong effect on fruit number.

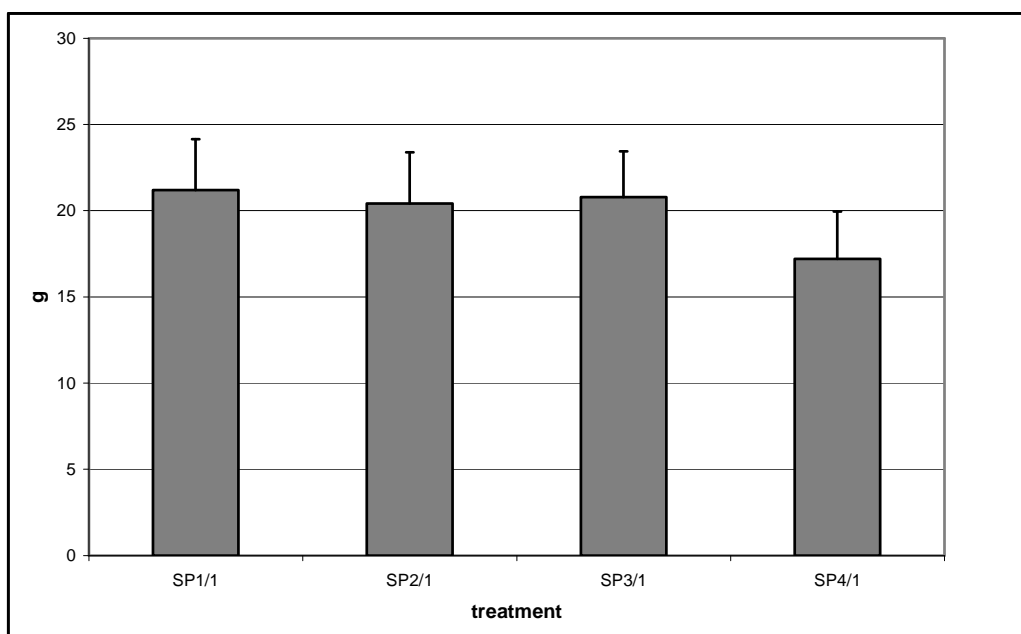


Figure 3. Average fruit weights per treatment

ACKNOWLEDGEMENT

Research work was supported by the grant TAMOP-4.2.1/B-09/1/KMR-2010-0005.

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